

**HALDIA DOCK COMPLEX
KOLKATA PORT TRUST**



ENGINEERING DEPARTMENT INVITE E-TENDER

[Tender No. SDM(P&E)/T/65/2020-2021

&

E-TENDER No. 2020_KoPT_561722_1]

FOR

**Supply, Installation, Testing and Commissioning of 33 kV Over Head Line &
Under Ground Cable from Intake Substation to GC Berth Substation for
strengthening of power supply arrangement of RMQC-3 of HDC, KoPT.**

June - 2020

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[Tender No. SDM(P&E)/T/65/2020-2021]

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KOLKATA PORT TRUST
HALDIA DOCK COMPLEX
SHORT E-TENDER NOTICE

E-Tender No. E-TENDER No. 2020_KoPT_561722_1

Online e-tenders are invited for the work of “**Supply, Installation, Testing and Commissioning of 33 kV Over Head Line & Under Ground Cable from Intake Substation to GC Berth Substation for strengthening of power supply arrangement of RMQC-3 of HDC, KoPT.**”

Date of Pre-Bid meeting: 10.06.2020, 11:00 Hrs. onwards.

Closing date & time of online submission of e-tender: 23.06.2020, up to 15:00 Hrs.

For details of tender and any corrigendum / addendum, please visit CPPP's e-portal <https://eprocure.gov.in/eprocure/app>

General Manager (Engineering)
Haldia Dock Complex
Kolkata Port Trust

KOLKATA PORT TRUST
HALDIA DOCK COMPLEX
NOTICE INVITING E-TENDER
(Tender No. SDM(P&E)/T/65/2020-2021)
E-Tender No. 2020_KoPT_561722_1

E-Tenders, under single stage two part system [Part I: Pre-qualification & Techno-commercial Bid and Part II: Price Bid] are invited on behalf of Haldia Dock Complex (HDC), Kolkata Port Trust (KoPT), from the intending bidders, fulfilling the “**Minimum Eligibility Criteria (MEC)**” and complying with the “Other documents” for the work of “**Supply, Installation, Testing and Commissioning of 33 kV Over Head Line & Under Ground Cable from Intake Substation to GC Berth Substation for strengthening of power supply arrangement of RMQC-3 of HDC, KoPT**”.

2.1 MINIMUM ELIGIBILITY CRITERIA (MEC):

- 2.1.1** The average annual financial turnover of the bidder, during the last three (3) years, ending 31st March, 2019, must be at least Rs 1, 12, 09,273.00. Auditor’s Report of the bidding firm, certified by Chartered Accountant (CA), for the years 2016-17, 2017-18 and 2018-19, including relevant Audited Balance Sheets and Profit & Loss Accounts, should be made available.

Note: The bidder upload the scanned copies of Annual Financial Turnover Statement (certified by CA) for the years 2016-17, 2017-18 and 2018-19 along with Balance Sheets and Profit & Loss Accounts.

- 2.1.2** The bidder must have experience of having successfully completed “Similar Works” [defined below] during last seven (7) years, ending last day of month previous to the one in which tenders are invited, and the experience must be either of the following :-

a) Three similar completed works of contract value not less than **Rs 1, 49, 45,698.00** each.

Or

b) Two similar completed works of contract value not less than **Rs 1, 86, 82,122.00** each.

Or

c) One similar completed work of contract value not less than **Rs 2, 98, 91,395.00**

The term “**similar works**” means –

“Supply, Installation, Testing & Commissioning of 11/22/33kV & above Substation at Central Govt. /State Govt. /Port sector/PSU or any reputed organization.”

Note: The bidder(s) will upload the scanned copies of work order(s) for similar works, successful completion certificates (with performance) from clients indicating the date of completion, value of work done, etc.

- 2.1.3 Bidder shall submit one experience certificate (i.e Work order and completion certificate) of having executed work on 22/33KV level or above system voltage during last 7(seven) years.**

- 2.1.4** Valid Electrical Contractor’s License issued by competent authority of State / Central Govt. in line with The Indian Electricity Rules, 1956.

Note: The bidder upload scanned copy of valid Electrical Contractor’s License.

Supply, Installation, Testing and Commissioning of 33 kV Over Head Line & Under Ground Cable from Intake Substation to GC Berth Substation for strengthening of power supply arrangement of RMQC-3 of HDC, KoPT.

2.2 DOCUMENTS

2.2.A. ESSENTIAL DOCUMENTS:

The bidder should also upload scanned copies of the following documents along with bids;

- a) Scanned copies of **Audited Balance Sheets and Profit & Loss Accounts for the years 2016-17, 2017-18 and 2018-19.**

In absence of audited Balance Sheet and Profit & Loss Account for the last financial year ending 31.03.2019, a certification regarding financial turnover (for the last financial year ending 31.03.2019) shall have to be submitted from the statutory auditor of the company / firm. As soon as the audited Balance Sheet and Profit & Loss Account would become available, the same should be submitted immediately.

- b) Scanned copies of work order(s) for similar works, successful completion certificates (with performance) from clients indicating the date of completion, value of work done, etc. Work Experience as a sub-contractor or supply contractor shall not be considered as requisite qualification.
- c) Scanned copy of **Power of Attorney (if applicable).**

2.2. B. OTHER DOCUMENTS:

- i. Goods and Services Tax (GST) Registration Certificate, issued by Government of India.
- ii. Valid **Profession Tax Clearance Certificate (PTCC)** or Up-to-date **Profession Tax payment challan**, if applicable. If this is not applicable, the bidder must submit [upload] a declaration in this regard.
- iii. Certificate for allotment of **Employees' Provident Fund (EPF) Code No. [Latest challan]** is to be submitted (uploaded)], if applicable. If this is not applicable, the Bidder should submit [upload] a declaration (in the form of Affidavit), in this regard.
- iv. Registration certificate of **Employees' State Insurance (ESI)** authority, if applicable.
- v. If this is not applicable, necessary document(s) [to establish Non-applicability], along with **affidavit, affirmed before a first-class Judicial Magistrate** to that effect, are to be submitted [uploaded]. Moreover, such bidder(s) shall have to submit a declaration, confirming that they will obtain registration certificate of ESI authority, if required, and they will indemnify **Kolkata Port Trust** against all damages & accident occurring to their labourer (including that of sub-contractor's labourers), in connection with the instant contract, in case they become a Successful Bidder.
- vi. PAN Card, issued by Income Tax Department, Government of India.
- vii. Certificate of **MSME / Micro & Small Enterprises (MSEs) / DIC / SSI / National Small Industries Corporation (NSIC)** to get benefit in this regard.

- 2.3 The bidders are required to submit bid as per the instructions of the instant bidding documents (including Notice Inviting e-Tender). Bid will be considered rejected if any of the essential documents as mentioned in Clause no. 2.2.A is not submitted by the bidder. Essential documents means papers related to "Minimum Eligibility Criteria (MEC)", including Bid Document fee, Earnest Money Deposit and Power of Attorney.

2.4 AVAILABILITY OF THE BIDDING DOCUMENTS:

The bidding documents (in full) would be available in the following websites:-

- <https://eprocure.gov.in/eprocure/app> of **Central Public Procurement Portal.**
- <http://www.kolkataporttrust.gov.in> of **Kolkata Port Trust.**

Corrigenda, Addenda, Queries & Clarifications, if any, would also be available in the aforesaid websites.

2.5 PARTICIPATING IN THE BIDDING PROCESS:

The bidders will have to participate in the electronic bidding process through the website of CPPP (<https://eprocure.gov.in/eprocure/app>) only.

General Manager (Engineering)
Haldia Dock Complex
Kolkata Port Trust

SCHEDULE OF TENDER (SOT)

(Tender No. SDM(P&E)/T/65/2020-2021)

E-Tender No. 2020_KoPT_561722_1

3.1.	Name of work	::	Supply, Installation, Testing and Commissioning of 33 kV Over Head Line & Under Ground Cable from Intake Substation to GC Berth Substation for strengthening of power supply arrangement of RMQC-3 of HDC, KoPT.
3.2.	Tender Inviting Authority	::	General Manager (Engg.), Haldia Dock Complex, Kolkata Port Trust.
3.3.	Mode of Tender	::	e-Procurement System. Online (Part I: Pre-qualification & Techno-commercial Bid and Part II: Price Bid) through https://eprocure.gov.in/eprocure/app of CPPP <i>No physical tender is acceptable by Haldia Dock Complex, Kolkata Port Trust.</i>
3.4.	Estimated Cost	::	Rs 3,73,64,244.00 (excluding GST).
	i) Bid Document Fee (Cost of bidding documents)	::	The intending bidders should deposit Rs 2,950.00 (Indian Rupees: Two thousand nine hundred and fifty) only [including GST @ 18%], as Bid document Fee (non-refundable), to Haldia Dock Complex, through DD/Banker Cheque in favour of Kolkata Port Trust on any Scheduled/Nationalized Bank payable at Haldia, otherwise their offer will be summarily rejected. Copy of the DD/Banker's Cheque should be uploaded. In case the aforesaid Bid Document fee [non-refundable] is not deposited by the Bidder, the respective bid will be summarily rejected, treating the same as non-responsive.
	ii) Earnest Money Deposit (EMD)	::	The intending bidders must deposit Rs 7,47,285.00 (Indian Rupees: seven lakh forty seven thousand and two hundred eighty five) only, as Earnest Money, to Haldia Dock Complex, through DD/Banker Cheque in favour of Kolkata Port Trust on any Scheduled/Nationalized Bank payable at Haldia, otherwise their offer will be summarily rejected. Copy of the DD/Banker's Cheque should be uploaded. In case the said Earnest Money is not deposited by the bidder, the respective bid will be summarily rejected, treating the same as non-responsive.
			NOTE :: For exemption of Bid Document Fee and EMD to upload the scanned copy of the certificate from MSME / Micro & Small Enterprises (MSEs) / DIC / SSI / National Small Industries Corporation (NSIC) or any empowered Central / State Govt. authority is required in electronic format.

Supply, Installation, Testing and Commissioning of 33 kV Over Head Line & Under Ground Cable from Intake Substation to GC Berth Substation for strengthening of power supply arrangement of RMQC-3 of HDC, KoPT.

			<p>(ii) Earnest money and cost of tender document are to be physically deposited at the office of Tendering Authority [Sr. Dy. Manager (P&E Div.), 1st floor Jawahar Tower, Haldia Dock Complex, Haldia, PIN 721607], separately in a single sealed envelope, mentioning Tender no. with proper marking.</p> <p>Demand Draft /Banker's Cheque against Earnest money and cost of tender document, should be submitted/deposited on any scheduled/ nationalized Bank, by the bidder in favour of Kolkata Port Trust, payable at Haldia before opening of the tender, as specified in the Tender Document.</p>
3.5.	Completion Period	::	12 months
3.6.	Bid Validity	::	180 days.
3.7.	Performance Bank Guarantee / Security Deposit	::	10 % of the Contract Value (excluding GST) for completion period & during guarantee period (24 months) for complete project. in the form of Bank Guarantee.
3.8.	Guarantee Period	::	24 months for complete projects.
3.9.	Date, time and venue of Pre-Bid Meeting (off-line).	::	<p>10.06.2020 at 11:00 Hrs (IST). Office of Sr. Dy. Manager (P&E); Chiranjibpur; P.O. Haldia; Dist. Purba Medinipur; PIN: 721 604; West Bengal; India.</p>
3.10.	i) Starting date & time of submission of e-Tender at https://eprocure.gov.in/eprocure/app	::	16.06.2020 from 11:00 Hrs. (IST).
	ii) Closing date & time of submission of e-Tender at https://eprocure.gov.in/eprocure/app	::	23.06.2020 up to 15:00 Hrs. (IST).
	iii) Date & time of opening of Part-I (Techno-commercial Bid)	::	24.06.2020 up to 15:30 Hrs. (IST) onwards.
	iv) Date & time of opening of Part-II (Price Bid)	::	Shall be informed separately.
3.11.	Address of the Employer	::	<p>Kolkata Port Trust (KoPT). 15 Strand Road, Kolkata – 700 001, West Bengal, India.</p>

3.12.	Address of Engineer	::	<p>General Manager (Engineering), Haldia Dock Complex, Kolkata Port Trust.</p> <p><u>Address:</u> Engineering Department Jawahar Tower Complex ; P.O. Haldia Township; Dist. Purba Medinipur ; PIN: –721607, West Bengal, India.</p> <p>Telephone no. : + 91-3224-264496 e-mail : aganesan.hdc@nic.in</p>
3.13.	Address of the Engineer's representative	::	<p>Shri R.N.Roy, Sr. Dy. Manager (P&E), Haldia Dock Complex, Operational Administrative Building (1st floor), Chiranjibpur; P.O: Haldia; Dist. Purba Medinipur; PIN: 721 604; West Bengal; India.</p> <p>Telephone no. : + 91-3224-252526 Mobile no. : + 91 94340 74411 e-mail : rnroy.hdc@nic.in</p>

General Manager (Engineering)
Haldia Dock Complex
Kolkata Port Trust

SECTION – IV

Important instructions for Online Bid Submission

4.1 Introduction:

4.1.1 Bidders are requested to use internet Browsers Firefox version below 50 / Internet Explorer version 8 or above, and Java 8 Update 151 or 161.

4.1.2 Further, bidders are requested to go through the following information and instructions available on the CPP Portal <https://eprocure.gov.in/eprocure/app> before responding to this e-tender:

- Bidders Manual Kit
- Help for Contractors
- FAQ

Contact person (Haldia Dock Complex):

- (i) Shri R.N.Roy,
Designation: Sr. Dy. Manager (P&E),
Mobile No.: + 91 94340 74411
Landline: + 91-3224-252526
E-mail : rnroy.hdc@nic.in
- (ii) Sk. M.Rahman,
Designation: Deputy Manager
Mobile No.: + 91 94340 31203
Landline: + 91-3224-252543
E-mail : mrahaman.hdc@nic.in

Contact persons (CPP Portal):

- (i) Shri Nazmush
Mob: +91 95632 51950
E-mail: webhelpdesk@gmail.com
- (ii) **See CPP Portal for contact details.**

- 4.2 4.2.1** All entries in the tender should be entered in online Technical & Commercial Formats without any ambiguity.
- 4.2.2** E-tender cannot be accessed after the due date and time mentioned in NIT.
- 4.2.3** KoPT reserves the right to cancel or reject or accept or withdraw or extend the tender in full or part as the case may be without assigning any reason thereof.
- 4.2.4** Any order resulting from this tender shall be governed by the terms and conditions mentioned therein.
- 4.2.5** No deviation to the technical and commercial terms & conditions are allowed.
- 4.2.6** The bidders must upload all the documents required as per terms of tender. Any other document uploaded which is not required as per the terms of the tender shall not be considered.
- 4.2.7** The bid will be evaluated based on the filled-in technical & commercial formats.
- 4.2.8** Bidder has fully read and understood the entire Tender Document, GCC, Corrigendum and Addenda, if any downloaded from under the instant e-tender and no other source, and will comply to the said document, GCC, Corrigendum and Addenda”.

A declaration in this regard is to be made by the bidder.

- 4.2.9** (A) Tender will be opened electronically on specified date and time as mentioned in the NIT. Bidder's can witness electronic opening of Bid.

(B) Necessary addendum/corrigendum (if any) of the tender would only be hoisted in the CPP Portal

4.3 Instructions related to Micro & Small Enterprises (MSEs):

- 4.3.1** For exemption of Bid Document Fee and EMD certificate from MSME / Micro & Small Enterprises (MSEs) / DIC / SSI / National Small Industries Corporation (NSIC) or any empowered Central / State Govt. authority is required.
- 4.3.2** **Micro & Small Enterprises (MSEs)** registered with **NSIC under Single Point Registration Scheme (SPRS)** are eligible to get the benefits under new **Public Procurement policies** for MSEs as notified by the **Government of India, Ministry of Micro, Small & Medium Enterprises (MSME)** in **The Gazette of India** vide No. 503, dated 26.03.2012.
- 4.3.3** When splitting of tender quantity is not possible purely on technical ground, Trustees reserve the right not to negotiate price with MSE if their price is within the band of L1+15% in comparison with L1 price of non-MSE for consideration of award of order for 20% of tender quantity against any item as per new public procurement policy.
- 4.3.4** If **Micro & Small Enterprises (MSEs)**, registered with NSIC [under single point registration scheme] intend to participate with respect to items for which they are not registered with NSIC, then they will have to deposit full amount of **Bid Document Fee** and **Earnest Money**, in accordance with the **Schedule of Tender (SoT)**. Otherwise, their offer with respect to such items (for which they are not registered with NSIC) will not be considered.

4.4 Other Instructions related to e-Procurement:

- 4.4.1** All notices and correspondence with the bidder(s) shall be sent by e-mail only during the process till finalization of tender by HDC, KoPT. Hence, the intending bidders are required to ensure that their e-mail IDs provided are valid and updated at the stage of registration of bidders with CPPP (i.e., Service Provider). The intending bidders are also requested to ensure validity of their DSC (Digital Signature Certificate).
- 4.4.2** In all cases, an intending bidder should use their own ID and Password, along with Digital Signature, at the time of submission of their bid. It is mandatory that all bids are submitted with Digital Signature Certificate (DSC), otherwise the same will not be accepted by the system.
- 4.4.3** Addenda, Corrigenda and Queries & Clarifications (with respect to the instant e-Tender), if any, would be hosted in the e-Procurement portal of CPPP.
- Since there is no provision to take out the list of intending bidders downloading the bidding documents from the websites mentioned in the Tender Notice, the intending bidders are requested to check the website of CPPP to ensure that they have not missed any Addenda, Corrigenda and Queries & Clarifications, uploaded against the instant e-Tender, after downloading the bidding documents. The responsibility of downloading such Addenda, Corrigenda and Queries & Clarifications, if any, will be that of the intending bidders.
- 4.4.4** No deviation/variation of the techno-commercial terms and conditions of the bidding documents will be considered by HDC, KoPT. Submission of bid in the e-Tender

platform by any bidder confirms their acceptance of the techno-commercial terms and conditions of the bidding documents.

- 4.4.5** HDC, KoPT reserves the right to accept or reject any bid (in full or part) and to annul the bidding process and to reject all bids, at any time prior to contract award, without assigning any reason thereof and without thereby incurring any liability to the bidders.
- 4.4.6** Any order resulting from this open e-Tender shall be governed by the terms and conditions mentioned therein.
- 4.4.7** All electronic bids submitted during the e-Tender process shall be legally binding on the bidders. Any bid will be considered as the valid bid offered by that bidder and acceptance of the same by HDC, KoPT will form a binding contract, between HDC, KoPT and the bidder, for execution of the work. Such successful bidder shall be called hereafter the 'CONTRACTOR'.
- 4.4.8** The bids will be evaluated based on the filled-in Technical & Commercial formats and the requisite documents submitted (uploaded) by the bidders.
- 4.4.9** The documents uploaded by bidder(s) will be scrutinized. During scrutiny, in case any of the information furnished by the bidder is found to be false, Earnest Money Deposit of such defaulting bidder(s) will be forfeited. Punitive action, including suspension and banning of business, can also be taken against such defaulting bidder(s).
- 4.4.10** HDC, KoPT, at its discretion, may extend the closing date & time of e-Tender, prior to the closing date & time of e-Tender mentioned in the Schedule of Tender (SoT). However, the closing date & time of e-Tender will not be extended, under any situation, after the due date is over.

4.5 Opening of Part-I (i.e. Pre-qualification & Techno-commercial Bid) and Part-II (i.e. Price Bid) :

- 4.5.1** **Part I** (Pre-qualification & Techno-commercial Bid) will be opened electronically on specified date and time, as given in the Schedule of Tender (SoT). Bidder(s) can witness electronic opening of bid(s).
- 4.5.2** **Part II** (Price Bid) will be opened electronically of only those bidder(s), who qualify (ies) in the "Pre-qualification & Techno-commercial Bid" [Part I]. Such bidder(s) will be intimated date of opening of Part II (Price Bid), through e-mail, to valid e-mail ID(s) confirmed by them.

SECTION – V

INSTRUCTIONS TO BIDDERS (ITB)

A. GENERAL

5.1 Definition and interpretations :

- (a) the term “in writing” means communicated in written form (i.e. by mail, e-mail, fax, telex, etc.) and delivered against receipt;
- (b) except where the context requires otherwise, words indicating the singular also include the plural and words indicating the plural also include the singular;
- (c) “day” means calendar day; and
- (d) “procurement” means the entire work requirements, as specified in **Section VI Technical Specification**.

5.2 Fraud and corruption

5.2.1 It is the policy of **Kolkata Port Trust (KoPT)** to require that bidders, Contractors, Sub-contractors, and Consultants, observe the highest standard of ethics during the procurement and execution of such contracts. In pursuance of this policy, **KoPT** :

- (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, directly or indirectly, of anything of value to influence the action of a public official in the procurement process or in contract execution;
 - (ii) “**fraudulent practice**” means a misrepresentation or omission of facts, in order to influence a public procurement process or the execution of a contract;
 - (iii) “**collusive practice**” means a scheme or arrangement between two or more bidders, designed to establish Bid Prices at artificial , non competitive levels;
 - and
 - (iv) “**coercive practice**” means harming, or threatening to harm, directly or indirectly, persons or their property to influence their participation in procurement process or affect the execution of a contract;
- (b) will reject a proposal for award, if it determines that the bidder, recommended for award, has, directly or through an agent, engaged in corrupt, fraudulent, collusive, or coercive practices in competing for the contract in question;
- (c) Will terminate contract, if it determines at any time that representatives of KoPT engaged in corrupt, fraudulent, collusive, or coercive practices during the procurement or the execution of that

contract ;

- (d) will sanction a firm or individual, including declaring them ineligible, either indefinitely or for a stated period of time, to be awarded a contract if it at any time determines that they have, directly or through an agent, engaged in corrupt, fraudulent, collusive, or coercive practices in competing for, or in executing, a contract;

and

- (e) will have the right to require that a provision be included in Bidding Documents and in contracts, requiring bidders, contractors , subcontractors, and consultants to permit KoPT to inspect their accounts and records and other documents relating to the bid submission and contract performance.

5.2.2 Furthermore, bidders shall be aware of the provision stated in GCC.

5.3 Eligible bidders

5.3.1 A Bidder, and all parties constituting the Bidder, **should have the nationality of any country**. A Bidder shall be deemed to have nationality of a country if the Bidder is a citizen or is constituted, incorporated, or registered and operates in conformity with the provisions of the laws of the country. This criterion shall also apply to the determination of the nationality of proposed subcontractors or contractors for any part of the contract, including related services

5.3.2 A Bidder shall not have a conflict of interest. Any Bidder found to have a conflict of interest shall be disqualified. A Bidder may be considered to have a conflict of interest for the purpose of this bidding process, if the Bidder and one or more parties :

- (a) Submit more than one bid in this bidding process.

Or

- (b) are or have been associated in the past , with a firm or any of its affiliates which have been engaged by **KoPT** to provide consulting services for the preparation of the design, specifications, and other documents to be used for the procurement of the goods to be purchased under the instant Bidding Documents.

5.3.3 Participating by a Bidder in more than one bid shall result in the disqualification of all bids, in which such Bidder is involved.

5.3.4 A Bidder that is under a declaration of ineligibility by **KoPT**, in accordance with **ITB Clause No.5.2**, at the date of contract award shall be disqualified.

5.4 Authority in signing the bid / offer

5.4.1 In case the bid is submitted by a **Proprietorship Firm**, the same should be signed either by the **Proprietor** or other person(s), holding a valid **power of attorney / authorisation** from the proprietor, in connection with this bidding process. The signature of such power of attorney holder(s) / authorised person(s) should be attested by the proprietor. Such **power of attorney / authorisation** should be uploaded along with **Techno-commercial Bid [Part I]**.

5.4.2 In case the bid is submitted by a **Partnership Firm**, the same should be signed either by the partner(s), holding valid **power of attorney** from the

partners or other person(s), holding valid **authorisation** from such power of attorney holder(s) , subject to approval of the partner(s) in the matter of giving such authorization, in connection with this bid. The signature of such **power of attorney holder(s) / authorised person(s)** should be attested by the **partners or power of attorney holder**, as the case may be. Such **power of attorney / authorisation** should be uploaded along with **Techno-commercial Bid [Part I]**.

5.4.3 In case the bid is submitted by a **Limited Company**, the same should be signed by the person(s) holding valid **power of attorney / authorisation**, executed in his / their favour (in connection with this bid) and the signature of such **power of attorney holder(s) / authorised person(s)** should also be attested, in accordance with the constitution of the Limited Company. Such **power of attorney / authorisation** should be uploaded along with **Techno-commercial Bid [Part I]**.

5.4.4 Such **power of attorney holder(s) / authorised person(s)** should put his / their signature identical with the attested one, in the relevant documents submitted / uploaded, in connection with the instant bidding process [including “**Techno-commercial Bid**”]. In case of putting different signatures in different documents / offers, all such signatures should be attested by the same person in line with the above.

B. CONTENTS OF BIDDING DOCUMENTS

5.5 Sections of Bidding Documents

5.5.1 The contents of the **Bidding Documents** as detailed at “TABLE OF CONTENTS” should be read in conjunction with any addendum / corrigendum issued in accordance with **ITB Clause No. 5.7**.

5.5.2 The Employer (KoPT) is not responsible for the completeness or correctness of the bidding documents and their Addenda, if they were not obtained directly from the source indicated in Notice Inviting e-Tender.

5.5.3 The bidder is expected to examine all instructions, forms, terms, and specifications in the Bidding Documents. Failure to furnish all information or documentation required by the Bidding Documents [considering all addenda / corrigenda issued] may result in the rejection of the bid.

5.6 Pre-Bid Meeting

5.6.1 A prospective bidder requiring any clarification of the instant Bidding Documents shall contact **Sr. Dy. Manager (P&E), HDC**, in writing, or raise their enquiries during the **Pre-bid meeting**.

The **prospective bidders** are requested to submit their queries / observations / suggestions / requests for clarification, in connection with the instant Bidding Documents, in advance, to enable **KoPT** to prepare response / clarifications and make pre-bid meeting meaningful.

5.6.2 As indicated in the Schedule of Tender, pre-bid meeting will be conducted off-line on behalf of HDC, KoPT. The purpose of this pre-bid meeting will be to clarify issues and to answer questions on any matter (in connection with the instant Bidding Documents only) that may be raised at that stage.

Authorised representative(s) of the prospective bidders will be allowed to attend the **Pre-bid meeting**, which will be held on the date, time & at the venue stipulated in the **Schedule of Tender (SOT)**.

The **designated representative(s)**, who will be deputed to attend the **pre-bid meeting**, should submit their authorization in this regard. The signature of such designated person(s) should be attested by the authorized signatory of the prospective bidders. Otherwise, the designated person should have to submit the proof of his identity through other means.

5.6.3 The prospective bidders are advised to attend the pre-bid meeting. However, non-attendance at the pre-bid meeting will not be a cause for disqualification of a bidder.

5.6.4 Unless otherwise notified, **all the queries / observations / suggestions / requests for clarification** (related to the instant Bidding Documents only) [including the **queries / observations / suggestions / requests for clarification raised during pre-bid meeting**], received till the date of **pre-bid meeting**, will be considered. **KoPT's** response / clarifications (including description of queries / observations / suggestions / requests for clarifications, but without identifying its source), in this regard, will be communicated to all the known prospective bidders (i.e. who would **attend pre-bid meeting** or **submit queries / observations / suggestions** or **requested for clarification**), in writing, well in advance to the last date of submission of bids. The aforesaid **queries / observations / suggestions / requests for clarification** and **KoPT's** response / clarifications will also be hosted in the websites, as specified in the **Notice Inviting e-Tender**.

Any modification to the Bidding Documents, which may become necessary as a result of the **KoPT's response / clarifications**, so issued, shall be made through the issue of an addendum / corrigendum, pursuant to **ITB**.

5.6.5 The Bidder shall be deemed to have **examined** thoroughly the instant Bidding Documents, in full, [considering all addenda / corrigenda issued (if any)], **visited the site & surroundings** and to have **obtained all necessary information in all the matters** whatsoever that might influence while carrying out the job as per the conditions of the instant **Bidding Documents** [considering all addenda / corrigenda issued (if any)] and to satisfy themselves to sufficiency of their bid, etc. If they shall have any issue to be clarified, the same should be brought to the notice of **KoPT**, in writing, as set out in **ITB**.

The bidders are advised to acquaint themselves with the job involved at the site, like availability of labour, means of transport, communication facilities, laws and bye laws in force from Government of West Bengal & Government of India and other statutory bodies from time to time. The Bidder shall be deemed to have examined and collected all necessary information as to risk, contingencies and other circumstances, which may be necessary for preparing the Bid.

Visiting the site shall be at the bidder's own expense. Failure to visit to site will no way relieve the Contractor (successful Bidder) of any of their obligation in performing the work and liabilities & responsibilities thereof, in accordance of the contract.

5.6.6 Necessary Gate Pass/Dock Entry Permit, for entering into the Dock area, will be issued to the designated representative(s) of the prospective bidders, on chargeable basis [as per the extant "Scale of Rates" of KoPT, available at <http://www.kolkataporttrust.gov.in/> of Kolkata Port Trust], to visit the site, for the purpose of inspection only, on receipt of a formal written

request. The signature of such designated person(s) should be attested by the authorized signatory of the prospective bidders. Otherwise, the designated person(s) should have to submit proof of his/their identity through other means.

However, during the pre-bid meeting, if the prospective bidders are willing to enter into the dock area, they will be allowed through VIP Pass of HDC free of cost.

Such prospective bidder will be fully responsible for any injury (whether fatal or otherwise) to its designated representative(s), for any loss or damage to property, or for any other loss, damage, costs and expenses whatsoever caused, which, but for the granting of such permission, would not have arisen.

The prospective bidder will be liable to indemnify KoPT against any loss or damage to the property of KoPT or neighbouring property which may be caused due to any act of prospective bidder or their designated representative(s).

5.7 Amendment of Bidding Documents

5.7.1 At any time, prior to the last date for submission of bids, **KoPT** may, for any reason whether at its own initiative or in response to the **queries/ observations/suggestions/requests for clarification**, amend and modify the bidding documents by issuing Addenda/Corrigenda. Such Addenda/Corrigenda will be hosted in the websites, as specified in the **Notice Inviting e-Tender**.

5.7.2 Any Addendum/Corrigendum, thus issued, shall be part of the bidding documents and shall be communicated, in writing, to all the known prospective bidders (i.e. who would attend Pre-bid Meeting or submit queries / observations / suggestions or request for clarification), in writing, well in advance to the last date of submission of bids.

5.7.3 To give prospective bidders reasonable time to take the Addendum / Corrigendum into account in preparing their bids, KoPT may, at their discretion, extend the last date for submission of the bids, prior to the closing date & time of e-Tendering.

C. PREPARATION OF BIDS

5.8 Cost of bidding

The Bidder shall bear all costs associated with the preparation and submission of their bid, and **KoPT** shall not be responsible or liable for those costs, regardless of the conduct or outcome of the bidding process.

5.9 Language of Bid

The Bid, as well as all correspondence and documents relating to the bid, exchanged by the Bidder and KoPT, shall be written in the **English language only**. If the supporting documents and printed literature, that are part of the bid, are in another language, they must be accompanied by an accurate translation of the relevant passages in the English language, in which case, for purposes of interpretation of the bid, such translation shall govern.

5.10 Documents comprising the Bid

5.10.1 The Bid shall comprise of the following :-

(a) Pre-qualification and Techno-commercial Bid:

The Pre-qualification & Techno-commercial Bid comprises all documents [including the Bidding Forms (provided in these bidding documents), duly filled in, signed and stamped] required to be submitted as per the Notice Inviting e-Tender, Schedule of Tender (SOT), Instructions To Bidders (ITB) and any other relevant clause(s) of these bidding documents.

(b) Price Bid:

The Price Bid comprises the prices only and the same are to be submitted electronically, through the website of <https://eprocure.gov.in/eprocure/app> only.

5.11 Form of Tender

The bidder shall have to submit (upload) the “**FORM OF TENDER**”. This form **must be completed without any alterations** to its format, and no **substitutes shall be accepted**. All blank spaces shall be filled in with the information requested. Such **duly filled in “FORM OF TENDER”** should be uploaded.

5.12 Price Schedule

5.12.1 The Bidder shall quote their price on-line (**through CPP Portal only**) as per the **Price Schedule** (Bill of Quantities) in the Price bid (Part-II), without any condition or deviation. Price indicated anywhere else, in any other form or manner, will not be considered for evaluation of Price Bid.

5.12.2 The Bidder should submit (upload) the **unpriced** format [Bidding Form VI : **PRICE SCHEDULE**], of the instant Bidding Documents, duly filled in the GST rates at appropriate places and signed & stamped as token of acceptance.

5.13 Bid Prices

5.13.1 The prices are to be quoted by the Bidder **through CPP Portal**, considering the work requirements, as detailed in **Section VI (Technical Specification)** and other terms & conditions of the Bidding Documents (considering all addenda / corrigenda issued).

5.13.2 Except where otherwise expressly provided, the contractor shall have to provide all materials, labour, plant and other things necessary in connection with the contract, although everything may not be fully specified, and although there may be errors and omissions in the specifications.

5.13.3 The prices and rates entered (electronically through CPP Portal) **as per the Price Schedule** (Bill of Quantities), in the Price bid (Part-II), by the **Bidder**, shall include, inter alia, all costs and expenses involved in or arising out of the following:

- (a) Supply, delivery, inspection, transportation (including insurance), handling, receipt and storage of all required materials [in line with Technical Specification (Section VI)] and equipment at site.
- (b) The provision, storage, transport, handling, use, distribution & maintenance of all materials, equipment, machinery and tools, including all costs, charges, dues, demurrage or other outlays involved in transportation.

- (c) The provisions & maintenance of all their staff & labour and their payment, accommodation, transport, fares and other requirements.
- (d) All required first aid, welfare and safety requirements.
- (e) Damage caused to the work and /or construction, plant, materials and consumable stores caused by weather.

5.13.4 Tools, Tackles, lifting machineries, scaffolding, temporary lighting, different vehicular transport etc. required for execution of the whole work will have to be arranged by the Contractor, at their own risk, cost & arrangement, which may be considered, while submitting their rates in the offer.

5.13.5 Rates & amounts quoted by the bidders in the “PRICE SCHEDULE”, include all incidental charges [excluding Goods and Services Tax (GST)], as applicable, and charges for packing, forwarding, loading, handling, carrying to any lead, stacking, transportation, permits, overheads & profit, etc. necessary for the complete services as described in this Bidding Document.

GST, as applicable, shall be paid extra against proper invoice submitted by the Contractor.

The contractor will be required to submit GST compliant invoice with all required details and also be required to file timely and proper return so as to enable KoPT to get due credit against GST paid.

In case of any failure on the above account, GST amount, even if paid by KoPT, shall be recoverable from the Contractor.

5.13.6 All quoted rates will remain firm during the validity period of the bid / offer, including any / all extension thereof, agreed by the bidder.

However, changes **in statutory taxes & duties [other than GST] will be adjusted** (within the scheduled completion period), based on documentary evidence.

5.13.7 The Bidder should clearly understand that they shall be strictly required to conform to all terms & conditions of the instant Bidding Documents [considering all addenda / corrigenda (if any) issued], as contained in each of its clauses and **plea of “Customs Prevailing”** will not be, in any case, admitted as excuse on their part, for infringing any of the terms & conditions.

No request for change or variation in rates or terms & conditions of the contract shall be entertained on the ground that the successful Bidder has not understood the work envisaged in the instant contract.

5.14 Currencies of Bid

The **Bidders** should quote the prices in **Indian Rupees (Rs)** only.

5.15 Period of validity of bids

5.15.1 Bids shall remain valid for the period of **120 days** after the bid submission deadline date (considering extension thereof, if any) as prescribed in **ITB**. A bid, valid for a shorter period, shall be rejected by **KoPT**, treating the same as non-responsive.

5.15.2 In exceptional circumstances, prior to the expiration of the bid validity period, **KoPT** may request the bidders to extend the period of validity of

their bids. The request and the responses shall be made in writing.

A Bidder may refuse the request, without forfeiting their **Earnest Money Deposit (EMD)**. A Bidder granting the request shall not be required or permitted to modify its bid, except when option to do the same has been specifically granted by **KoPT**, in writing.

5.16 Earnest Money Deposit (EMD)

5.16.1 The intending bidders should deposit an amount specified in the **Schedule of Tender (SOT)**, as **Earnest Money Deposit (EMD)**, in accordance with the procedure mentioned therein.

5.16.2 Failing to deposit the Earnest Money, in accordance with ITB, shall be rejected by the Employer (KoPT), treating the same as non-responsive.

For exemption of EMD the bidder is required to upload the scanned copy of the certificate from MSME / Micro & Small Enterprises (MSEs) / DIC / SSI / National Small Industries Corporation (NSIC) or any empowered Central / State Govt. authority.

5.16.3 Refund of Earnest Money Deposit:

Earnest Money Deposit of the successful bidder shall be retained by KoPT and Earnest Money Deposit of the unsuccessful bidders [including the bidder(s) whose Price Bid would not be opened in line with **ITB**] shall be refunded, without interest, within 2 (two) months from the date of opening of Price Bids or on finalization/acceptance of tender, whichever is earlier.

In case the bid of the **successful bidder** is found acceptable to **KoPT** and contract is awarded with them, the **Earnest Money Deposit** of the **successful bidder (Contractor)** shall be retained by **KoPT** till submission of **Performance Guarantee / Security Deposit** (in accordance with **ITB**) and signing of the **Contract Agreement** by **KoPT** and the Contractor (in accordance with **ITB**), and shall be refunded thereafter.

In case, the successful bid is not found acceptable to KoPT, Earnest Money Deposit of the successful bidder shall be refunded after the decision, in this regard, is finalized by KoPT.

5.16.4 No interest shall be payable on the account of Earnest Money Deposit in any case.

5.16.5 Forfeiture of Earnest Money Deposit :

The EMD may be forfeited

(a) if a Bidder withdraws their offer within the validity period of the bid / offer; and / or, alters / amends any terms and / or condition and / or quoted rate(s), within the validity period of the offer (excepting when option to do the same has been specifically granted by Kolkata Port Trust, Haldia Dock Complex in writing) making it unacceptable to the Kolkata Port Trust, Haldia Dock Complex;

or,

(b) if the successful bidder,

i) fails to submit the Performance Guarantee / Security Deposit (as per SCC) for the specified sum and in the specified form, within the stipulated time;

and / or,

- ii) fails to carry out the work or to perform / observe any of the conditions of the contract,

For the purpose of this provision, the validity period (of the bid / offer) shall include any / all extension thereof, agreed by the Bidder in writing. KoPT shall also be at liberty to deduct any of their dues from Earnest Money. It should be however be clearly understood that in case of any default in any terms and or condition of the contract after placement of order but before submission of Performance Guarantee / Security Deposit (as per SCC), the same shall be dealt with in accordance with the relevant provisions of contract, including forfeiture of Earnest Money.

D. SUBMISSION OF BIDS AND OPENING OF BIDS (EXCEPT PRICE BID)

5.17 Submission of bids

- 5.17.1** Bidders shall have to submit their bids [both **Pre-qualification & Techno-commercial Bid** and **Price Bid**] on-line **through CPP Portal only**.
- 5.17.2** The Bidder should submit (upload) the scanned copies of all the relevant and required documents, statements, filled up formats, certificates, etc. [in accordance with **ITB**], in the aforesaid portal, in support of their **Pr-qualification Criteria and Techno-commercial Bid**.
- 5.17.3** Before scanning the aforesaid documents, all pages are to be signed by a person duly authorised to sign on behalf of the bidder, pursuant to **ITB**, and are to be embossed with their official seal, owing responsibility for their correctness / authenticity. All pages of the aforesaid documents should be serially marked.
- 5.17.4** Any inter-lineation, erasures, or overwriting, in the aforesaid scanned & uploaded documents, shall be valid only if they are signed by the aforesaid authorised person.
- 5.17.5** The Bidder will have to produce the original documents or any additional documents, if asked for, to satisfy **Haldia Dock Complex, Kolkata Port Trust**.
- 5.17.6** The **Price Bid** comprised the prices only and the same are to be submitted electronically, through the website of <https://eprocure.gov.in/eprocure/app> only. *No hardcopy of priced "Price Schedule" is required to be uploaded.*

5.18 Techno-commercial offer

- 5.18.1** No techno-commercial deviation and variation will be considered by KoPT, except where the Techno-commercial terms and conditions, will be found as impossible and irrelevant to the bidder.
- 5.18.2** If the Bidder deliberately gives wrong information or conceals any information / fact in their bid, which shall be favourable for acceptance of their bid, fraudulently, then the right to reject such bid at any stage of execution, without any financial liability, is reserved by **KoPT**.

5.19 Priced offer

The Bidder should quote the offered rate appropriately in the **PRICE BID**, electronically, through the website of **CPPP** only. *Price indicated anywhere else, in any other form or manner, would not be considered for evaluation of **Price Bid**.*

5.20 Deadline for submission of bids

5.20.1 Bids must be submitted within the closing date & time **indicated in the Schedule of Tender (SOT)**.

5.20.2 **KoPT** may, at its discretion, *extend the deadline for the submission of bids, prior to the closing date & time of e-Tendering*, by amending the Bidding Documents, in accordance with **ITB**, in which case all rights and obligations of **KoPT** and bidders previously subject to the deadline shall thereafter be subject to the deadline as extended.

5.21 Late Bids

This e-Procurement System would not allow any late submission of bid, after the closing date & time, as per the **Schedule Of Tender (SOT)** or extension, if any.

5.22 Withdrawal of bids

5.22.1 A Bidder may withdraw, substitute, or modify their bid on the e-Procurement System, before the closing date and time specified, but not beyond.

5.22.2 No bid may be withdrawn, substituted, or modified in the interval between the deadline for submission of bids and the expiration of the period of bid validity specified by the bidder on the “**FORM OF TENDER [for Techno-commercial (un-priced) Bid]**.” Or any extension thereof. Modification / Withdrawal of the bid sent through any other means shall not be considered by **KoPT**.

5.22.3 Withdrawal of bid during the interval between such closing time on due date and expiring of the bid validity period, may result in forfeiture of EMD in accordance with **ITB**.

5.23 Bid opening [except Price Bid]

5.23.1 The bids [**except Price Bids**], will be opened at the date & time, indicated in the **Schedule of Tender (SOT)**.

5.23.2 The on-line bid-opening event may be viewed by the bidders at their remote end, by logging on to the e-Procurement System. A copy of the bid opening record shall be made available on the e-Procurement System.

E. EVALUATION OF BIDS

5.24 Confidentiality

5.24.1 Information relating to the evaluation of bids and recommendation of contract award shall not be disclosed to bidders or any other persons not officially concerned with such process until publication of the contract award.

5.24.2 Any attempt by a Bidder to influence **KoPT** in the examination, evaluation and comparison of the bids, or contract award decisions may result in the rejection of their bid and forfeiture of **EMD**.

5.24.3 Notwithstanding **ITB Clause No. 5.24.2**, from the time of bid opening to the time of contract award, if any Bidder wishes to contact **KoPT** on any matter related to the bidding process, they should do so in writing.

5.25 Clarification of bids

To assist in examination, evaluation & comparison of the bids and qualification of the bidders, the Employer (**KoPT**) may, at their discretion, ask any bidder for a

clarification of their bid. The Employer (KoPT) may also ask any bidder to withdraw any terms/conditions mentioned by them in their offer, which are not in conformity with the terms & conditions specified in the bidding documents. In case any bidder fails to submit required clarification within the time stipulated by the Employer (KoPT), in this regard, the tender would be processed in absence of the clarifications, which may result in disqualification of the corresponding bidder for the instant tender. Any clarification submitted by a bidder, which is not in response to a request by the Employer (KoPT), shall not be considered. The Employer's (KoPT's) request for clarification and the response shall be in writing.

No change in the prices or substance of the bid shall be sought, offered or permitted, nor will the bidder be permitted to withdraw their bid before expiry of the validity period of the bid.

5.26 Deviations, reservations and omissions

During the evaluation of bids, the following definitions apply:

- (a) "Deviation" is a departure from the requirements specified in the bidding documents ;
- (b) "Reservation" is the setting of limiting conditions or withholding from complete acceptance of the requirements specified in the bidding documents ; and
- (c) "Omission" is the failure to submit part or all of the information or documentation required in the bidding documents.

5.27 Responsiveness of bids

5.27.1 Responsiveness of a bid would be determined on the basis of the contents of the bid itself, and clarification(s) in accordance with **ITB**.

5.27.2 A substantially responsive bid is one that meets the requirements of the Bidding Documents without material deviation, reservation, or omission. A material deviation, reservation, or omission is one that,

- (a) if accepted, would
 - i) affect in any substantial way the scope, quality, or performance of the work specified in the Contract; or
 - ii) limit in any substantial way, inconsistent with the Bidding Documents, KoPT's rights or the bidder's obligations under the proposed contract; or
- (b) if rectified, would unfairly affect the competitive position of other bidders presenting substantially responsive bids.

5.27.3 Bidders shall not contain the following information / conditions to consider them responsive :

- (a) Either direct or indirect reference leading to reveal the prices of the bids in the Techno-commercial offers;
- (b) Adjustable prices, other than the provisions stated in **ITB**.

5.27.4 If a bid is not substantially responsive to the requirements of the bidding documents, it shall be rejected by KoPT and may not subsequently be made responsive by the bidder, by correction of the material deviation, reservation, or omission.

5.28 Nonconformities, errors and omissions

5.28.1 During examination, evaluation & comparison of the bids and qualification of the bidders, the Employer (KoPT) may, at their discretion, ask any bidder for submitting any document(s) [in case of shortfall in required documents (relating to capacity or otherwise)]. In case any bidder fails to submit required documents within the time stipulated by the Employer (KoPT), in this regard, the tender would be processed in absence of the documents, which may result in disqualification of the corresponding bidder for the instant tender.

Any document submitted by a bidder, which is not in response to a request by the Employer (KoPT), shall not be considered. The Employer's (KoPT's) request for submission of further document(s) shall be in writing.

5.28.2 **KoPT** shall examine the bids [including the further documents / clarifications received in accordance with **ITB**] to confirm that all documents requested in **ITB** have been provided and to determine the completeness of each document submitted.

5.28.3 Provided that a bid is substantially responsive, **KoPT** may waive any nonconformities or omissions in the bid that do not constitute a material deviation.

5.29 Examination of Pre-qualification Criteria

5.29.1 At first, the contents of the documents, submitted in support of the Pre-qualification Criteria [including the further documents / clarifications received in accordance with **ITB**] will be scrutinized and evaluated.

5.29.2 KoPT may, at their discretion, seek any other detail(s)/document(s), in subsequent course, to ascertain and get confirmed about the competence of the bidder. In case any bidder fails to submit required detail(s)/document(s) within the time stipulated by the Employer (KoPT), in this regard, the tender would be processed in absence of the documents, which may result in disqualification of the corresponding bidder for the instant tender. While evaluating Pre-qualification Criteria, regard would be paid to National Defence and Security considerations of the Indian Government.

5.29.3 In case it is found that the Pre-qualification Criteria has not been fulfilled by the bidder or otherwise their participation has not been found acceptable to **KoPT**, the respective bid will be treated as non-responsive and "Price Bid" of the respective Bidder will not be considered further.

5.30 Examination of Techno-commercial offer

5.30.1 After scrutiny of the **Pre-qualification Criteria, Techno-commercial Bids** of the Pre-qualified bidders [as indicated above] will be scrutinized & evaluated.

5.30.2 **KoPT** shall examine the bid to confirm that all terms and conditions specified in the **Technical Specification (Section VI)**, **GCC (Section VII)** and **SCC (Section VIII)** have been accepted by the bidder without any material deviation or reservation or omission.

5.30.3 If on examination of the "**Techno-commercial Bid**" of pre-qualified bidders, it is found that they have not accepted all Techno-commercial terms & conditions of the Bidding Documents [considering all addenda / corrigenda, issued], "**Price Bid**" part of such bidder(s) will not be opened. "**Price Bid**" part of other bidder(s) will be opened subsequently as per procedure. Decision of **KoPT** on this matter shall be final.

5.31 Opening of Price Bid

PRICE BIDS of the bidders, who qualifies in the “Pre-qualification & Techno-commercial Bid”, will be opened on a later date, upon due intimation to the concerned bidders at their address furnished by them in their bid.

The on-line price-bid opening event may be viewed by the bidders at their remote end, by logging on to the e-Procurement System. A copy of the price-bid opening record shall be made available on the e-Procurement System

5.32 Comparison & Evaluation of Price-Bid and selection of Successful Bidder

5.32.1 While evaluating the Price Bids, the Price quoted by the Bidders against all items of the **Price Schedule** shall be taken into account and the **TOTAL PRICE**, which would be arrived at, by adding quoted prices of all items of the **Price Schedule**, will be considered for evaluation. Selection of the successful bidder will be made on the basis of the “**lowest TOTAL PRICE**” thus arrived.

5.32.2 In case it is found that the quoted “**TOTAL PRICE**” is same for two or more bidders and their bids become the lowest, the respective bidders will be given chance to submit their fresh Price Bid, subject to the condition that the fresh rate so quoted must be less than the rate quoted by the respective bidders earlier. Selection of the successful bidder will be made on the basis of the revised “**lowest TOTAL PRICE**” thus obtained.

5.32.3 The total prices will be evaluated based on price quoted at Part A and Part B.

5.33 KoPT’s right to accept any bid and to reject any or all bids

5.33.1 **KoPT** reserves the right to accept or reject any bid, and to annul the bidding process and reject all bids at any time prior to contract award, without thereby incurring any liability to Bidders.

F. AWARD OF CONTRACT

5.34 Subject to **ITB Clause No. 5.33.1**, **KoPT** shall award the contract to the Bidder whose offer has been determined to be the lowest evaluated bid [as per **ITB Clause No. 5.32**] and is substantially responsive to the Bidding Documents.

5.35 Notification of award

Prior to the expiration of the period of bid validity or extended validity in accordance with **ITB**, **KoPT** shall notify the **Successful Bidder**, in writing, that their bid has been accepted. The notification letter (hereinafter called the “**Letter of Acceptance**”) will be treated as “**Order Letter**” and will constitute the formation of the contract. Such order letter shall specify the “**Contract Price**” in line with **SCC Clause No. 11.1.4 a**).

5.36 Signing of contract agreement

5.36.1 After placement of order, **contract agreement** [as per the form furnished in **Section- XI**] should be executed between **Kolkata Port Trust** and the **Contractor (Successful Bidder)**. In this respect, within a week of receipt of intimation regarding acceptance of their bid, the successful bidder shall have to submit, at their cost, required **Stamp Paper** [Non-judicial Stamp Paper of worth not less than **Rs 50.00**] & **dummy papers** (for three sets).

Immediately after receipt of the above papers & documents, **KoPT** will send three sets of **contract agreement form** [one set printed on Stamp Paper & dummy papers and two sets printed on dummy papers], photocopy

of **one set of documentary transactions between them and KoPT** (till finalisation & award of the Contract) and **Contract Documents** [incorporating all accepted changes and addenda / corrigenda issued, if any], duly signed by the representative of **KoPT** at appropriate places on each pages.

Within a week, thereafter, the Contractor (Successful Bidder) shall have to return **Contract Agreement forms** (three sets) [after affixing their common seal], the set of **documentary transactions** and **Contract Documents**, duly signed by them at appropriate places on each page.

5.36.2 The **contract agreement form & Contract Documents** should be signed by the authorized persons of the Contractor, authorized in this respect.

5.36.3 After receipt of the **contract agreement forms** (three sets), duly signed by authorised person of **KoPT** & authorized person of the Contractor (Successful Bidder), the same shall be kept under **KoPT**'s custody, after affixing the Common Seal of **KoPT**.

One copy of such **executed contract agreement** (on dummy paper), along with one photocopy of signed **documentary transactions** and **Contract Documents** will be handed over to the Contractor for their record & future reference.

5.36.4 Until such contract agreement is executed, the other documents referred to the definition of the term "Contract" [**GCC Clause**], shall collectively be the contract.

5.37 Performance Guarantee / Security Deposit

5.37.1 Within **twenty-eight (28) days** of issuance of "**Letter of Acceptance**" by KoPT, the Successful Bidder shall provide the Performance Bank Guarantee in accordance with the Special Conditions of Contract, using the form furnished in Section XI.

5.37.2 Failure of the successful bidder to submit the above-mentioned Bank Guarantee for **Performance Guarantee / Security Deposit or sign the contract agreement** shall constitute sufficient grounds for the annulment of the award and forfeiture of the EMD in accordance with ITB.

5.37.3 All costs, charges & expenses, including Stamp Duty, shall be borne by the Successful Bidder.

5.37.4 **No interest / charge**, of whatsoever nature, shall be paid by KoPT on the amount of Performance Guarantee / Security Deposit, held by them (as per SCC) at any stage.

SECTION – VI
TECHNICAL SPECIFICATION

1.0 GENERAL

1. The works will be executed to comply with the General Specifications for Electrical works and conforming to the Indian Electricity Act & rules, BIS & direction of Engineer.
2. The work will be executed as per general arrangement drawing and detailed fabrication drawings duly approved by the Engineer. The various items of equipment will be ordered only after the drawings are approved and quantities in detail of various items are ascertained as per actual requirements. Therefore the actual quantities / measurement may vary from the stipulated quantities, which are only estimate.
3. The contractor/agency will engage suitable qualified/experienced/ licensed engineering supervisor for the work and suitable skilled personnel with required license for doing the erection work. Required special tools to be operated in the execution of the job.
4. The work will be performed as per the day to day instruction and approval of the engineer. All materials/ equipment will be used after taking approval of the Engineer.
5. Equipment will be duly inspected in the manufacturer's works / premises by TPI AGENCY before dispatch to the site.
6. The work will be executed as per the programme of completion of the project. The delivery & erection schedule of various materials/ equipment will be as per approval of Engineer.
7. The contractor holds responsibility for the entire job as per relevant specifications. If any item is left out within the schedule of work but if it is considered essential for the completion of the job, the contractor has to carry out the items as extra substituted item.
8. The contractor shall have to make arrangements, at his own risk and cost, for transportation of materials from the point of issue of stores to site of work, if any.
9. The contractor shall ensure that the staff employed by him for execution of the electrical work, possess the valid electrical license issued by competent authority. Consequences arising due to the default of the contractor in not complying with the above condition shall be the entire responsibility of the contractor.
10. All concealed work and earthing shall be done in the presence of the Engineer-in-charge or his authorized representative.
11. The schematic diagram/dimensional drawings of the various electrical cubical panels shall be got approved from the Engineer-in-charge before fabrication and shall comply with specifications and Indian Electricity Rules. The panels shall conform to IS: 8623/1993.
12. All panels/DB shall be suitable for 45°C ambient temperature.

13. The MCB shall be of the same make as that of MCB DB's. Contractor shall obtain approval of the Engineer-in-charge before procurement of MCB DB's. All DB's shall be double door type confirming to minimum IP-54 degree of protection.
14. Miniature Circuit Breaker shall comply with IS –8828-1996 / IEC 898. Miniature Circuit Breakers shall be quick make and break type for 230 / 415 V A.C., 50Hz application with magnetic thermal release for over current and short circuit protection. The breaking capacity shall not be less than 10KA at 415V A.C. The MCB shall be DIN mounted. The MCB shall be current limiting type (Class – 3).
15. MCB shall be as per their tripping characteristics curves defined by the manufacturer. The MCB shall have the minimum power loss (watts) per pole defined as per the IS / IEC and the manufacturer shall publish the values.
16. The MCB housing shall be heat resistant and having high impact strength. The terminal shall be protected against finger contact to IP20 degree of protection.
17. All model of modular accessories required for the work shall be got approved from the Engineer among the approved makes. The base plate shall be preferably in sheet steel or otherwise in unbreakable polycarbonate. The cover plates shall be screw less type in shade approved by the Engineer. The GI box shall be of the same make as the modular accessories.
18. Contractor shall have to check the site order Book for any instructions of Engineer or his authorized representative and sign the site order book. He shall be bound to ensure compliance with the instructions recorded there in.
19. All the MCCB's shall have microprocessor based trip unit for reliable protection and accurate measurement. The rated Service breaking capacity (kArms) shall be 100% of Ultimate breaking capacity (kArms). All MCCB's shall be current limiting type with features as per relevant IS codes and specification. There has to be total discrimination between the incoming and outgoing MCCB's and MCB's, as required, at the MDB's and DB's level.
20. MCCB's shall be used with rotary handle and terminal spreaders and all terminals shall be shrouded to avoid direct contact.
21. All measuring CT's, unless otherwise specified shall be cast resin CT's with class 0.5 accuracy. All digital measuring meter shall be with class 0.5 accuracy unless specified otherwise.
22. Mechanical Castle key interlock shall be provided among the incomer MCCB's, wherever, as applicable, two different incomer sources are provided in the panel as per the directions of the Engineer. The same is deemed included in the scope of work.
23. All measuring and indicating instruments shall be protected through MCB's of 0.5 Amps rating.
24. General arrangement drawing of the switchboard, LT/HT switchgear shall be approved by the Engineer before commencement of manufacturing.
25. Conduit layout as per switching arrangement shall be prepared by contractor and got approved from the Engineer before slab casting. At all expansion joints in the building suitable arrangement shall be ensured during conduiting.

26. Ratings, sizes and quantities shall be checked and considered for satisfactory operation of electrical system complete in all respect.
27. Conduits, Switchboards, Sockets to be provided on walls shall be open type unless specifically approved by Engineer.
28. Conduits on ceiling in existing system may be provided on surface and in new construction shall be open type.
29. All measuring and indicating instruments shall be protected through MCB's and isolating switches.
30. Breaker shall have LCD display to show the metering and protection parameters.
31. Equipments are to be inspected in the respective manufacturer works before dispatch and test reports as applicable as per BIS standards shall be provided for each equipment to Third Party Inspection (TPI) Agency. The TPI Agency is appointed by the port and cost of TPI Agency is borne by the Port.
32. The firm shall deploy only licensed personnel as required under IE Rules, for execution of the electrical works. The firm shall be liable to submit the list of such personnel along with the attested copy of the licenses at the time of execution.
33. It is important that every equipment is tested fully before dispatch.
34. All materials for the work shall be supplied from approved list of manufacturer and any item, not covered in approved list, shall be supplied after getting approval from Engineer-in-charge or his authorized representative.
35. Any materials brought for work which is not matching with specification will be rejected and the rejected materials shall be removed from site on the same day.
36. All fees payable to concerned authorities and other local bodies if any shall be paid by the contractors.
37. **Any part or whole of the system which requires approval of the Central Electricity Authority, or any other statutory body, should be arranged by the Contractor at his cost. It is the responsibility of the Contractor to submit the system drawings with all details to the Electrical Inspectorate and obtain their approval.**
38. Contractor shall obtain permit/approval from concerned authorities before commencement of work. All documents/drawings required for such permit/approval shall be prepared by the contractor.
39. Contractor shall have a valid "A" class electrical contract licence with HT installation issued by appropriate authorities.
40. Test certificates both type test and routine tests wherever required shall be furnished along with supply for all Electrical/Mechanical items.
41. Inspection / acceptance, in no way shall absolve the contractor from supplying material as per standards / codes and warranty or other obligations under the contract.
42. The contractor shall arrange the testing/measuring equipment by own cost to carry out pre-commissioning test of all equipment at site as per IER.

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43. All electrical works shall be tested by the contractor in the presence of TPI Agency and to the entire satisfaction as per IE Rules.
44. Soil bearing capacity:-5T/sq.mtrs. at the depth of 2.5Mtrs.
45. Data to be furnished by the bidder after award of order
- a) The contractor shall submit detail shop/fabrication/layout drawings for Package substation, cables, trench, High Mast, Feeder Pillar Boxes, Load Point Panels, Luminaire etc.
 - b) **Five** Set of copies of installation, operation and maintenance manuals, descriptive bulletins etc, shall be furnished prior to / at the time of despatch of all materials. Manuals shall include the following aspects:
 - i) Outline dimension drawing showing relevant cross sectional views, earthing details and constructional features including foundation drawing.
 - ii) Rated voltage, current, duty cycle and all other technical information which may be necessary for correct operation of the switchgear.
 - iii) Storage details for prolonged duration.
 - iv) Unpacking.
 - v) Handling at site.
 - vi) Erection
 - vii) Pre-commissioning test.
 - viii) Operating procedure.
 - ix) Maintenance procedures.
 - x) Precaution to be taken during operation and maintenance work.
 - c) Test Certificates
The contractor supply equipments from the Manufacturers, who are having type test certificate issued by CPRI / ERDA. Also, the contractor shall furnish the type test certificate issued by CPRI / ERDA to the manufacturers of similar rating during approval of above equipments.
 - d) On completion of work the contractor shall submit all drawings, manuals and test certificates, etc. for all equipment / materials ordered and as specified by the Engineer.

2.0 **SCOPE OF WORK**

(a) Electrical Works (Supply, Delivery, Installation, and Testing & Commissioning) at Intake sub-station.

- 1) 33kV, 800A, VCB PCVCB (1Sets).
- 2) Control relay Panel(1Set)
- 3) 3 Nos. 33 kV, Outdoor Single phase Current Transformer.
- 4) 3 Nos. 33 kV, Outdoor Single phase Potential Transformer.

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- 5) 2 Nos. 33 kV, 800A Gang Isolator.
- 6) 2.5'' Aluminium IPS Bus Bar.
- 7) Lattice type mounting structure for above equipments.
- 8) 30V Battery Bank and battery chargers for Control supply of PCVCB.
- 9) Earthing of all equipment at Yard and sub-station mentioned above.

(b) Electrical Works (Supply, Delivery, Installation, and Testing & Commissioning) UG Cable and Overhead Line from Intake sub-station to GC Berth Sub-station.

- 1) 33kV (E) XLPE, 3C X 120Sq.mm., Screened, Aluminium, armoured cables along with straight through and heat shrinkable cable end terminations (2Runs).
 - i) From 33kV Gang Isolator at Intake sub-station to be erected to 33kV, four pole Rail structure to be erected near Chiranjibpur fire station (2Runs).
 - ii) From 33kV, four pole Rail structure to be erected near GC Berth Main gate, Permit office to GC Berth sub-station(33kVPanel) (1Runs).
- 2) 33kV Double circuit, ACSR Dog conductor, Overhead Line connecting between four pole Rail structures near Chiranjibpur fire station to GC Berth Main gate, near Permit office.

Used /2nd hand Rail poles in requisite quantity and size would be supplied by HDC, KoPT on free of cost basis. However contractor shall arrange to transport Rail poles to site from stores of HDC.

- 3) Dismantling of existing 11kV Overhead Line (Single circuit Panther Conductor) and transporting dismantled items i.e. Rail pole, ACSR Conductors, Insulators etc. to site store of HDC. (Approx.300Mtrs. span).

(c) Electrical Works (Supply, Delivery, Installation, and Testing & Commissioning) at GC Berth sub-station.

- 1) 33kV, 1250A, VCB Panels (8 Panel).
- 2) 1 No. 33/3.3 kV, 6MVA Oil type Transformer.
- 3) 3.3kV, 1250A, VCB Panels (2 Panel).
- 4) 33kV (E) XLPE, 3C x 120 Sq.mm., Screened, Aluminium, armoured cables along with heat shrinkable cable end terminations. (From newly supplied 33kV VCB Panel to newly supplied 33/3.3kV, 6MVA transformer as mentioned above (2 Run of 3C x 120 Sq.mm.).
- 5) 3.3kV (UE) XLPE, 1C X 1000 Sq.mm., Screened, Aluminium, armoured cables along with heat shrinkable cable end terminations.(From newly supplied 3.3kV

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VCB Panel to newly supplied 33/3.3kV, 6MVA transformer as mentioned above (4 Run of 1C x 1000 Sq.mm.).

- 6) 30V Battery Bank and battery chargers for Control supply of HT Panel.
- 7) Earthing of all equipments.

(d) Civil Works

- 1) Design & Construction of **RCC Cable trench** from 33kV Gang isolator at Intake sub-station to out going cable trench with in sub-station premises. Design drawing shall be submitted before commencement of construction for approval.
- 2) Design & Construction of **PCC foundation for Rail pole structures for ACSR Dog conductor line**. Design drawing shall be submitted before commencement of construction for approval.
- 3) Design & Construction of **RCC Foundation** for PCVCB, Isolators, PTs and CTs at Intake sub-station.
- 4) Design & Construction of **RCC Foundation** for 6MVA transformer at GC Berth sub-station

(e) Salient Points.

- a. Equipment installation layout shall be submitted by the contractor before erection of equipment at site after approval by HDC, KoPT. Contractor shall arrange for all necessary means to erection / installation equipments as per manufacturer's guidelines.
- b. Laying of cables, cable end termination and straight through joints with the cables are to be executed by a Cable Jinter (having valid Electrical Workman's Permit, authorised for 33,000 Volts grade Cable laying and jointing, by the competent authority), under continuous supervision of the Contractor's Engineers/ Supervisors, holding certificate of competency.
- c. **Obtaining necessary clearance/permission for Road Crossing/ Railway Track Line Crossing/Utility crossing need to be obtained from National Highway Authority of India (NHAI)/Haldia Development Authority (HDA)/ South Eastern Railway (SER)/ Indian Oil Corporation Ltd. (IOC Ltd.) is in the scope of the contractor.**
However, clearance for Road Crossing/ Railway Track Line crossing under the jurisdiction of HDC, KoPT would be given by competent authority of HDC.
- d. Programme for Road Crossing, Railway Track Line Crossing wherever required (for Casing Pipe laying etc.), shall have to be coordinated
 - Through the authorized representative of the South Eastern Railway (SER)/ National Highway Authority of India (NHAI)/Haldia Development Authority(HDA) in advance, for having due clearance of blockage of Road/ Rail [for non Port Railway Track/ Road]
 - Through the authorized representative of the General Manager (Engg), HDC in advance, for having due clearance of blockage of Road/ Rail. Such clearance will be given within 7 (seven) days from the date of receipt of request from the contractor.

In case of Road Crossing, 50 % of the road width should be kept open for vehicular traffic movement. All roads so cut for the work, should be made good immediately after the purpose of road cutting is fulfilled.

- e. During execution of the work, if any damage takes place in the existing utility, the same will have to be mended good by the contractor, at their risk, cost and arrangement. Otherwise, the same will

be repaired/ replaced by HDC, either departmentally or through outside agency and the cost of repairing/ replacement will be recovered from the contractor, with departmental charges.

- f. The lengths of Reinforced Concrete Pipes, Galvanised Mild Steel Tubes, lengths of cable run through existing duct/ trench/ tunnel/ laid pipe/ installed cable tray inside the existing tunnel etc., as given in the Bill of Quantities are indicative only. The contractor shall have to ascertain the exact quantity and execute the work accordingly.
- g. For the purpose of application (by HDC, KoPT) for obtaining necessary approval/ clearance from the Regional Inspectorial Organization, Central Electricity Authority / Statutory Authority, the contractor would have to submit/ deposit required documents, drawings, test certificates/ reports etc. to HDC, KoPT. The contractor along with the required documents, drawings, test certificates/ reports etc. would also have to be present during inspection by the Regional Inspectorial Organization, Central Electricity Authority / Statutory Authority.
- h. The contractor should clearly understand that though the application would be made by HDC, KoPT to the Regional Inspectorial Organization, Central Electricity Authority / Statutory Authority, for obtaining necessary approval/ clearance from them, it is the responsibility of the contractor concerned to obtain the approval/ clearance from the Regional Inspectorial Organization, Central Electricity Authority / Statutory Authority against the work executed by the contractor.

3.0 INTAKE SUB-STATION.

Scope of the contractor is to design, supply, erect, test and commission all switchgears in the existing 33kV bay of Intake sub-station of HDC, KoPT.

Existing Isolator No.1/15 in 33kV Bay shall be utilised for bus changeover.

A tentative equipment layout of station is enclosed for reference.

3.1 33kV Porcelain Clad Vacuum Circuit Breaker

A TYPE

- i. Outdoor type Vacuum Circuit Breaker suitable for installation in open yard and in heavily polluted environment.
- ii. Three identical single pole units linked together for simultaneous operation, complete with supporting frames and tie-rods.
- iii. Capable of interrupting small inductive currents caused by switching of unloaded transformers and low capacitive current without causing undue over-voltage.
- iv. The circuit breaker is to be supplied complete with its control and relay panel.

B OUTDOOR APPLICATION:

Vacuum circuit breaker for outdoor application shall be fixed type of construction and the vacuum interrupter units together with the HV connections shall be enclosed in a sealed housing (preferably of porcelain) conforming to IP- 65 protection (IS: 2147). The operating mechanism, links, etc. shall be housed in a suitable cubicle and should be accessible for maintenance. The indicators and operating handle etc. shall be provided on the front side with a hinged door and locking device. The door shall open upwards (with hinge at the top) for protection against rain (when in open position).

C TECHNICAL PARTICULARS:

Item Description	Technical Particulars
Standards	IEC 56 –1 through 6, 1987
Nominal system voltage	33kV
Highest system voltage	36kV
BIL	170kVp
Power Frequency withstand voltage	70 kV rms
Rated frequency	50Hz
Rated continuous current	800A
Closing mechanism	Electrical spring charging With 230 V AC motor and local manual closing.
a. Closing coil/tripping coil (2 nos.) b. No. of Poles	30V D.C. 3
Short time current rating (3 secs)	31.5kA
Symmetrical short circuit withstand capacity	78.75kA
Capacitive current break capability	Shall be suitable for breaking capacitive current equivalent to rated current.
Temperature rise	Not to exceed 55 ⁰ C above ambient temp. of 50 ⁰ C.
Operating duty	0-3 min. CO-3 min.-CO
Dead time of breaker	Adjustable from 0.3 sec. to 15 sec.
Total break time for any current up to the rated breaking current measured from the instant of trip coil energisation	Less than 3 cycles
First pole to clear factor	1.3
Whether breaker is intended for rapid re – closing	Yes
Latching requiremnt	Trip free
System neutral	Solidly earthed
Min. creeping distance	25mm/kV
Control supply voltage	30V D.C.
Auxiliary, contacts with each circuit breaker	6NO+6NC
Accessories	Interchangeable at site
Type tests for performance verification	As per standards

D Bushings

- Equalized electrical stress internally and over the bushings surface.
- Free from radio interference.
- Provision for operation over normal operating temperature range.
- Leak – proof magnetic indicator at the top of the bushing to indicate oil level at all times.
- Bushing with combination potential and power transformer test cap.

E Operating Mechanism

Electrically / Manually operated mechanism. Breaker shall be provided with trip free mechanism.

- It shall be suitable for remote control from the control room.
- The operating mechanism shall be of spring charging type by electrical control under normal conditions. The mechanism shall be trip free electrically and mechanically.

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- The motor for spring charging shall be suitable for operation on 230 V AC supply and shall have overload protection.
- A local control switch with locking arrangement shall be provided for each breaker for local operating i.e. tripping and closing during maintenance, test etc.
- Trip/Normal/Close control switch shall be at remote & ON – OFF push button & Local/Remote selector switch shall be provided to be in mechanism cabinet.
- Interlocking shall be provided so as to prevent operation of breaker from remote position with selector switch in local position.
- Also facilities for remote indication of breaker “Open / Closed” position shall be visible in control room.
- Each breaker shall have ON / OFF indication lamps along with a mechanical “Open / Closed” position indicator visible to operating personnel standing in front of cubicle with the mechanism cabinet closed.
- An operation counter for each breaker shall be provided.
- Provision of connecting oscillograph recorder to measure the operation timings of the breaker.
- Provision of anti – pumping relay to prevent repetitive operations of breaker due to high-speed operation on release of the control switch.
- Two nos. of trip and one no. of close coils.
- Cabinet for operating mechanism and its accessories shall be as of IP – 55 protection with padlocking facility. Cabinet shall be simplex type, all equipment mounted on front side and wiring on back in proper wire ways.
- Panel illumination and anti-condensation heater shall be provided in the local and remote control panel with load break fuse switch and thermostat. It shall house relays for control & interlocking as per scheme requirement. Panel illumination shall be provided with door switch.
- Closing circuit to operate satisfactorily from 70% to 110% of the rated control voltage and tripping from 50% to 110% of the rated voltage.

F INTERLOCKS:

Opening or closing of the isolator / disconnecting switch shall be prevented when the breaker is in closed position.

G TERMINAL CONNECTIONS:

- Shall be suitable for 2.5” aluminium tube.
- Shall be suitable for terminal earth connector for earthing connections.

3.2 Indoor Control & Relay Panel :

Control and Relay Panel (associated with outdoor type 33 kV Circuit Breaker, as at Clause No.5.5.1), should be of Floor Mounted, Indoor, Free Standing, Cubical type. The Panel should consist of **fabricated Sheet Steel Enclosures** [duly painted (both inside and outside)] on the side, front, rear and top. The rear of the Panel should be in the form of lockable hinged flap door. The front of the Panel, which accommodates most of the mountings, should be fabricated with Sheet Steel of thickness not less than 3 mm. For the rest of the Panel, Sheet Steel of thickness not less than 2.5 mm. should be used.

The Panel should have adequate size and should be completed with wiring, earthing bar, fuses, links, vermin proof fitments, internal panel lighting arrangement (operated by a door switch), space heater, un-drilled Cable Gland Plate, etc. The Panel should be provided with facility for Remote Switching of the 33 kV Outdoor type Vacuum Circuit Breaker and should accommodate the followings :-

a) **Relays :**

- i. **I.D.M.T. type**, Numerical relay having **Over Current & Earth Fault** element (element of 5A), with **instantaneous** unit, shall have event logging features & shall be compatible with SCADA system
- ii. **Electro-** magnetic Type, master trip relay, supply voltage 30V DC.
- iii. Electro- magnetic Type, Trip circuit supervision relay.

The Relays should have necessary arrangement for re-setting the Trip Indication from outside of the Relay Cover.

- b) **Digital Display type Load Manager.**
- c) **Analogue type Voltmeter with Selector Switch**
- d) **Static TRIVECTOR Meter (for measuring Static kWH, Maximum Demand, Frequency, PF, kVAH. kVRH etc.)**
- e) **Static Power Factor Meter**
- f) **Necessary Indication Lamps (LED Type) & Push Buttons**
- g) **Any other equipments considered necessary to make the Panel complete in all respect.**

All the above equipments including Relays, Indicating Instruments, etc. should be flush mounted and to be provided on the front side of the Panel.

Mimic Diagram and **Symbols** showing the exact representation of the system complete with **Symbols & Colour Strips** to represent the Buses, etc. should be provided in the front of the Control Panel.

A Load Manager & Voltmeter:

The Load Manager should be of **digital type** and provided with direct reading scale. Accuracy class of Load Manager shall be Class-1.

Voltmeter shall be analogue type with selector switch. The maximum scale value of the Voltmeter should be 50% in excess of the Primary Voltage of the associated Potential Transformers. The rated voltage of the Voltmeter shall be 110 V AC, Accuracy Class 0.5 as per IS: 1248.

B Static TRIVECTOR Meter:

The Technical Specification of the Static **TRIVECTOR** Meter should be complied with IS: 14697 and following features:-

- a) Class of Accuracy : 1.0
- b) Frequency : 50 Hz. $\pm 5\%$
- c) Supply Voltage : 3 Phase, 3 Wire, 110 V
- d) Display Panel: Back-lit LCD type

C Indication Lamp:

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Indicating Lamp should be of LED type suitable for Panel Mounting with rear terminal connections. Lamp Covers should be of screwed type and translucent to defused light. The Lamp Covers should be coloured as:

“Red” for indicating **closed position** of the Breakers.

“Green” for indicating **opened position** of the Breakers.

D Selector Switches:

4 positions (3 way and off) should be provided for Voltmeter.

Two sets of Instruction Manuals for Erection, Operation & Maintenance and two sets of Drawings for Equipment Details should be submitted along with the above Control & Relay Panel.

3.3 Current Transformers

A Type:

- 33kV outdoor suitable for installation in open yard where no protection against sun, rain and inclement atmospheric conditions exist.
- Oil immersed, nitrogen topped, hermetically sealed type, self-cooled.
- Suitable for service in industrial environment.

B Secondary Circuit:

- Knee point voltage, burden, accuracy class shall be decided during detail engineering.
- Change in CT ratio shall be independent of primary circuit.
- All transformer leads from the multi – ratio current transformers to be carried in a single conduit to terminal blocks in the mechanisms housing for convenience in changing ratios.

C Technical Particulars:

Item Description	Technical Particulars
Standards	Relevant IS / IEC standards.
Nominal system voltage	33kV
Highest system voltage	36kV
BIL	170kVp
Power Frequency withstand voltage	70 kV rms
Rated frequency	50Hz
System neutral connection	Solidly earthed
Rated continuous current	150/5/5/5.
Short time current rating (3 secs)	31.5kA
Symmetrical short circuit withstand capacity	78.75kA
Class of insulation	B
Temperature Rise: <ul style="list-style-type: none"> - Oil top housing (measured by thermometer) - Winding (measured by resistance method) - oil level guage and pressure relief devices to be provided for all CTs 	40 ⁰ C 50 ⁰ C Yes
Mounting on steel structure	On steel structure
Creepage distance Total	25mm/kV
Protected	50% of the total creepage distance
Accuracy Class Class – 0.5 Class – 5P20 & PS	Metering Protection

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3.4 Voltage Transformers

A

Type:

- 33kV outdoor suitable for installation in open yard where no protection against sun, rain and inclement atmospheric conditions exist.
- Oil immersed, nitrogen topped, hermetically sealed type, self-cooled.
- Suitable for service in industrial environment.
- Single phase PT.

Secondary Circuit:

- Burden, accuracy class shall be decided during detail engineering.

B

Technical Particulars:

Item Description	Technical Particulars
Standards	Relevant IS / IEC standards.
Nominal system voltage	33kV
Highest system voltage	36kV
BIL	170kVp
Power Frequency withstand voltage	70 kV rms
Rated frequency	50Hz
System neutral connection	Solidly earthed
Ratio	$33000/\sqrt{3} / 110/\sqrt{3}$.
Short time current rating (3 secs)	31.5kA
Symmetrical short circuit withstand capacity	78.75kA
Class of insulation	B
Temperature Rise: <ul style="list-style-type: none"> - Oil top housing (measured by thermometer) - Winding (measured by resistance method) - oil level guage and pressure relief devices to be provided for all CTs 	40°C 50°C Yes
Mounting on steel structure	On steel structure
Creepage distance Total	25mm/kV
Protected	50% of the total creepage distance
Accuracy Class Class – 0.5 Burden	Metering 100VA

3.5 LIGHTNING ARRESTORS

A

Type

- Station class, 10 kA, heavy duty, non-linear resistance, metal oxide type gapless lightning arrester for 33 kV system.
- Self-supporting type in single pole assembly for line to earth connection.
- Suitable for pedestal mounting, outdoor installation in open yard.
- Shall be designed to provide maximum protection against overvoltage during switching of capacitor banks, unloaded transformers and reactors and lightning and switching surges.
- Las shall be capable of discharging severe switching and lightning surges.
- The installation shall be complete with line and earth side connections, operation counter, leakage current indicator and other accessories and devices including guiding rings for improving voltage distribution.

B Constructional Features

The arrestors shall be hermetically sealed type of self-supporting construction and shall be suitable for mounting on concrete or steel structures. They shall have adequate thermal discharge capacity for severe switching surges, long duration surges and multiple strokes.

- The lightning arrestors shall be fitted with pressure relief devices and arc diverting ports suitable for preventing shattering of porcelain housing and providing path for the flow of rated fault current in the event of an failure.
- Arrestors shall incorporate anti – contamination feature to prevent arrestor failure consequent to uneven voltage distribution across the stack, in the event of contamination of the porcelain.
- Seals shall be provided in such a way that these are always effectively maintained even when discharging the maximum lightning current.
- The end fittings shall be made of non – magnetic and corrosion proof material.

C Fittings & Accessories

- Arrestors shall be complete with insulating bases having provision for bolting to flat surface of structure.
- Self-contained discharge counters, suitably enclosed for outdoor use and requiring no auxiliary or battery supply for operation, shall be provided for each single pole unit. The cyclometer counters shall be visible through inspection window. The counter terminals shall be robust and of adequate size and shall be so located that incoming & outgoing connections are made minimum possible bends.
- Discharge counters shall be suitable to be mounted on support structure of the arrestors.
- The connecting conductor from LA earth terminal to discharge counter incoming terminal shall be insulated for a minimum of 4kV.
- Grading corona rings shall be provided on each complete arrestor unit as required for proper stress distribution.

D Technical Particulars:-

Item Description	Technical Particulars
Standards	Relevant IS / IEC standards
Type	ZnO, Gapless
Nominal system voltage	33kV
Highest system voltage	36kV
BIL	170kVp
Power Frequency withstand voltage	70 kV rms
Rated frequency	50Hz
Rated Arrestor voltage	30kV
Continuous operating voltage (rms)	24kV
System neutral connection	Solidly earthed
Front of wave spark over voltage	
a) Max. spark over voltage.	150kV peak
b) Virtual steepness of front rate of rise	300kV/micro – sec.
Maximum discharge capacity (4/20 micro – second wave)	100 kA peak
Nominal discharge current for 8/20 micro sec.	10kA peak
Long duration discharge class as per IEC-99-4	3
Maximum residual voltage at nominal (peak) discharge current of 10/20 micro sec wave	100 kVP
Maximum steep current impulse (1/20 micro sec.) residual voltage at nominal discharge current	110 kV (peak)
Thermal discharge capacity	Shall be adequate for switching surges, long duration surges and multiple strokes (shall be capable of

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	withstanding internal pressure developed due to the above discharge without operation of pressure relief vents).
Creepage Distance (nominal)	Suitable for heavily polluted atmosphere 30 mm/kV of highest system voltage

3.6 33kV Isolators / Disconnecting Switches

- **Application:**

These are to be used for:

- i. Breaker isolation/connection on no load
- ii. Line connection/isolation/ on no load.

A **Type & Construction:**

- ❖ Triple pole gang operated suitable for outdoor installation in open yard under the specified site conditions.
- ❖ Two post type with contacts coming in horizontal plain preferred.
- ❖ Common actuating mechanism for all three poles.
- ❖ Manually operable.
- ❖ Interchangeable single pole units.
- ❖ Clearance between live parts and ground structures, shall be as per the relevant standards.
- ❖ Length of break in full open position shall be such that there is possibility of arc over from the live parts to the de – energized parts.
- ❖ Switchblades shall be of copper and of one solid piece construction.
- ❖ Inter-phase clearance shall be minimum 3 meters and minimum-mounting height shall not be less than 3 meters.
- ❖ Speed of operation during opening or closing shall ensure minimum arcing.
- ❖ 33 kV isolator shall be horizontal double break type mounted on structure.

B **Making & Interrupting Capability**

Disconnecting blades shall be capable of carrying rated current continuously as well as specified short circuit current for the duration indicated without causing mechanical damage to any part under maximum temperature rise without damaging the insulation.

The switches shall be capable of making on to faults specified and withstanding the dynamic stresses involved.

Shall also be suitable for interrupting small inductive and capacitive currents such as those, which occur while disconnecting lines at no – load, bus transfer current or voltage transformers under energized condition.

C **Contacts:**

- a) High-pressure self-aligning adjustable type.
- b) Contact pressure shall be released before any movement of the blades in the opening direction takes place and shall be applied after the closing travel is completed.
- c) Contacts shall be of high-grade high conductivity heat resisting copper and silver-plated.
- d) Sufficient wiping action to make contacts self cleaning.
- e) Temperature rise of contacts shall not exceed 55⁰C over the ambient temperature of 50⁰C.

D **Operating Mechanism:**

- a) Operating mechanism and its controls shall be so designed that under no circumstances the travel of the switchblades is interrupted before it reaches the fully closed or open position.

- b) Provision for padlocking the mechanisms in either the open or closed position shall be provided.

E Interlocks

To be interlocked with associated isolators and circuit breakers through castle key and electrical interlock arrangement.

F Terminal Connections

Shall be provided with high conductivity terminal connecting suitable for tubular / ACSR conductors.

G Technical Particulars

Item Description	Technical Particulars
Standards	Relevant IEC / IS / BIS standards
Nominal system voltage	33kV
Highest system voltage	36kV
BIL	170kVp
Power Frequency withstand voltage	70 kV rms
Between poles to earth across Isolating distance	195 kV
Rated frequency	50Hz
Type	Outdoor station type, double break, triple pole double throw with turn and twist mechanism. Off load, horizontal rotating, with earth switch.
Rated continuous current	800A
Short time current rating (3 secs)	31.5kA
Symmetrical short circuit withstand capacity	78.75kA
Minimum creep age distance	25mm/kV
Operating mechanism	Gang operated, manual.
Termination	ACSR conductor / 2.5" Al. tubular bus on both sides
Auxiliary contacts	6 NO + 6 NC for isolator 6 NO + 6 NC for earth switch
Installation	Outdoor or Pole structure with Padlocking facility
Castel key interlock	With 33kV CB.
Hardware	Hardware for isolator mounting and mechanical operation shall be hot dip galvanized.
Electrical interlock	i. With upstream circuit breaker / isolator.
Control voltage	30V D.C.
Spares required	One insulator column.
Temperature rise above 50°C	Not to exceed 55°C above ambient temp. of 50°C.
Support Structure	Hot dip Galvanized
Arcing horns	To be provided
Creepage distance	

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- insulator stack	>900
- mechanical forces withstand capacity (minimum)	500

3.7 Busbars and Busbar Connections

A Bus Work

- The overhead bus bars shall be tubular type comprising tubular aluminium conductor. Aluminium tubes shall comprise of hard drawn aluminium with aluminium 61% IACS conductivity at 20 deg C.
- The temperature of tubular bus conductor shall not exceed 75 deg. C when carrying the specified full load current.
- The jointing sleeves shall be six times the nominal size of the tubes and inner diameter of the sleeve shall fit snugly in the main tube.
- The sizes of the conductors shall be adequate to carry the required continuous current and withstand the thermal and dynamic stresses due to the specified short circuit currents.
- The inside diameter shall have no positive tolerances and outside diameter shall have no negative tolerances.
- Provision shall be provided to take care of expansion & contraction of the bus bars.
- The bus bar system shall be supported with fully insulated supports and fastened as to withstand forces likely to develop by the specified short circuit currents.
- Necessary bus supports, jumpers, connectors, insulators, structural work and other hardware as required shall be supplied with the bus bars to make the installation complete in all respects.

B Technical Particulars:

Item Description	Technical Particulars
Nominal system voltage	33kV
Highest system voltage	36kV
BIL	170kVp
Power Frequency withstand voltage	70 kV rms
Rated frequency	50Hz
Short time current rating (3 secs)	31.5kA
Symmetrical short circuit withstand capacity	78.75kA
Bus conductor	2.5" Al. tube
Minimum Clearances	
a) Between Phases	915 mm
b) Between one phase and earth for rigid connection	610 mm
c) Minimum height of any bus bar above ground level of platform where personnel may stand with the gear alive.	To meet site requirements.

3.8 Insulators, Clamps & connectors

- Supporting insulators of circuit breakers, disconnecting switches and lighting arresters, bushing insulators for instrument transformers as well as all post type insulators & string insulator assemblies for supporting bus work shall be made of assemblies for supporting bus work shall be made of best quality porcelain and shall be brown glazed.
- Porcelain shall be homogeneous, free from any limitation, cavities, flaws and other imperfections that might affect the mechanical or dielectric quality and shall be thoroughly vitrified tough and impervious to moisture.
- The glaze shall be uniform shade, smooth, hard and shall completely cover all exposed parts of insulators.

- All insulators shall be suitable for heavily polluted atmosphere and shall be able to withstand the duty requirements of the associated equipment.
- When operating at normal rated voltage, there shall 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 insulators / bushings when operating at the normal rated voltage.
- All iron parts shall be hot dip galvanized and all joints shall be air tight. The zinc used for galvanizing shall be grade Zn.99.5
- All current carrying contact surfaces shall be silver-plated. Silver plating shall not be less than 25microns in thickness.
- The strain insulators shall be of ball and socket type. The socket shall be of malleable cast iron and the pin shall be of steel.
- After machining is completed, the balls and sockets shall be hot dip galvanized.
- Ball and socket connections shall be provided with adequately strong retaining pins of locking devices of suitable material.
- Individual units of each string shall be identical and interchangeable and shall be suitable for forming either suspension or strain strings and shall be so designed as to prevent formation of any defect due to expansion or contraction in porcelain or metal fittings.
- Porcelain shall not engage directly with metal but shall be mounted with suitable non-deteriorating interposing material.
- Tension string assembly as mentioned below shall be supplied along with suitable turnbuckles at one turn buckle per string.

A Technical Particulars

Post insulators

• Standard	:	IS 2544 (1973)
• Rated voltage	:	33kV
• Minimum creepage distance		
- Total (mm)	:	25mm/kV
- Protected (mm)	:	50% of the total creepage distance
• Rated voltage, kV (rms)	:	33kV
• Impulse withstand voltage, kV (peak)	:	170kV
• Power frequency withstand dry test, kV (rms)	:	75kV (rms)
• Power frequency withstand wet test, kV (rms)	:	75kV (rms)
• Power frequency withstand puncture test on units	:	1.3 time the actual dry flash Over voltage of the unit)
• Visible discharge test, kV(rms)	:	27kV

Disc Insulators

• Standard	:	IS 731 (1993)
• Type	:	Fog type insulator
• Minimum creepage distance		
- Total (mm)	:	25mm/kV
- Protected (mm)	:	50% of the total creepage distance
• Power frequency withstand Test voltage		

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- Dry (kV) : 75 kV (rms)
- Wet (kV) : 75 kV (rms)
- 1.2/50 micro sec. impulse flash over : 170kV(peak)
- Puncture voltage (kV) : 1.3 times the actual dry flash over voltage of the unit
- Visible discharge test kV(rms) : 27 kV

4.0 **33KV DOUBLE CIRCUIT ACSR CONDUCTOR OVERHEAD LINE.**

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 unless otherwise indicated. Other internationally accepted standards which ensure equal or better performance than those specified shall also be accepted, subject to prior approval by the owner. In case no reference is given for any item in these Specifications, latest REC specification & Construction Standards shall be referred to.

The span should be as near as possible to the basic design span so that the minimum ground clearance should not less than 7.5 Mtrs. in cross country at maximum sag condition. In case of Rail/Road crossing same shall be 8.5 Mtrs. by reducing span length.

The stringing of the conductors and earth wire has been done as per the approved sag and tension charts and desired clearances as clearly available.

All other requirements for completion of works such as fixing of danger plate and anti-climbing device have been fulfilled.

The contractor shall provide & install “cradle type” protective guarding for 33 kV line, The guarding shall be provided at all the crossing i.e. road, telecommunication & power lines, railway line, nallaha etc.

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 these specifications Trimming of tree branches or cutting of a few trees en-route during survey is within the scope of survey to be done by the contractor.

During erection of the line, compensation for tree cutting, damage caused to crops, actual cutting and falling of the trees shall be arranged by the contractor at his cost. The contractor will identify the number of trees and detail of obstructions to be removed for erection of the line and intimate the employer well in advance in case of any help.

A) TECHNICAL SPECIFICATION FOR HARDWARE FITTINGS TO BE USED FOR 33KV DOUBLE CIRCUIT ACSR 100Sq.mm. CONDUCTOR LINE.

The Combined units shall conform to the provisions of Indian Standards relevant to each individual component except where specified otherwise The following I.S. amended up to date shall be the guideline for manufacture & testing.

i)	IS 2486 (Part 1) : 1993	:	Specification for metal fittings of insulators for overhead power lines with nominal voltage greater than 1000 V.
ii)	IS 2486 (Part 2) : 1989 IS : 2486 (Part III) – 1989	:	Specification for Insulator fittings for overhead power lines with nominal voltage greater than 1000 V.
iii)	IS 4759 : 1996	:	Specification for hot-dip zinc coatings on structural steel and other

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			allied products.
iv)	IS : 6745 – 1872	:	Determination of mass of zinc coating on zinc coated iron and steel articles.
v)	IS : 2633 – 1986	:	Method for testing uniformity of coating on zinc coated.
vi)	IS:1573 – 1986	:	Specification for electroplated coatings of zinc on iron and steel.

General Requirements.:

- i) Ball diameter should be 16 mm.
- ii) Hardware Fittings with ultimate tensile strength of 70KN should be used for ASCR Dog conductors.
- iii) The Fittings shall be free from defects, corrosion protected and shall meet the requirements of) Galvanizing Test etc as per IS.
- iv) All forging and casting shall be of good finish and free from flaws and other defects. The edges of the fittings such as the tongue, clevis and holes shall be rounded.
- v) All parts of different fittings which provide the interconnection shall be made such that sufficient clearance is provided at the connection point to ensure free movement. All tongue and clevis connection shall be free in this manner but care shall be taken that too much clearance for the tongue & clevis is avoided.
- vi) Spring washer should be electro galvanized- Coating thickness as per IS: 1573-1986.

U bolt, Hexagonal Bolt, Nut, Plain Washer and all other ferrous parts shall be Hot dip Galvanized. In case of Hot Dip Galvanization, minimum Value of Mass of zinc coating should be 610 g/m².

The split pin to be used on the cotter pin shall be of Humpback type & shall be made of Stainless Steel conforming to IS: 5522-1992 with a minimum hardness of 160 HV.

Locking devices (R Type) for ball and socket lockers shall be of Stainless Steel conforming to IS: 6603-1972 with minimum hardness of 160 HV. The dimension shall conform to IS: 2486 (Part 3)-1974.

Tongue and Clevis:

All forgings shall be of good finish and free from any flaws and any other defects which may cause decrement of efficiency while in operation. Connection/attachment with other component of the unit shall provide reasonable clearance/ensure free movement at the connecting/attaching point. **Care should be taken to avoid too much clearance while used with insulators.**

Drg. Enclosed for reference.

Cross-arm Straps:

Cross-arm straps shall be manufactured from MS Flat hot dip galvanized and to connect the cross-arm/bracket of the structure at one end and the Ball Clevis at the other end. It should be complete with hexagonal bolts, nuts, spring washers and Cotter pin at the threaded end to lock the unit. Minimum Threaded portion of the bolt shall be 30mm. CROSS-ARM STRAPS to be used for Minimum Ultimate strength (Tensile strength) ACSR Dog Conductor 70 KN Dimensions shall be in accordance with IS: 2486 (Part-2) unless otherwise specified. Drg. Enclosed for reference.

Ball and Clevis & Socket and Tongue:

All forgings shall be of good finish and free from any flaws and any other defects which may cause decrement of efficiency while in operation. Connection/attachment with other component of the unit shall provide reasonable clearance/ensure free movement at the connecting/attaching point. Care should be taken to avoid too much clearance while used with insulators. Materials for Ball Clevis & Socket Tongue should be as stated below:-

Ball clevis – Forged Steel and hot dipped galvanised.

Socket Tongue – Forged Steel and hot dipped galvanised.

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BALL CLEVIS & SOCKET TONGUE to be used for Minimum Ultimate strength (Tensile strength) of 70 KN.

All dimensions of Ball Clevis & Socket Tongue shall be in accordance with IS:2486 (Part-2) unless otherwise specified.

Drg. Enclosed for reference.

Bolted type Tension Clamp:

All forgings & castings shall be of good finish and free from flaws or any other defects which may cause decrement of efficiency while in operation. The edges on the outside of the fittings and the grooves shall be smooth & rounded. Sharp radius of curvature, ridges etc. which may lead to localised pressure or cause damage to the conductors in service shall be avoided. The clamp shall permit the conductor to slip before the failure of conductor occurs. Tension clamps for ACSR Dog conductor shall be three bolted type with minimum one no. keeper. Ultimate tensile strength of Tension clamps should not be less than 70 KN .The materials for Tension clamps & keeper should be high strength Aluminium Alloy.

The slip strength should not be less than 95% UTS of the respective conductor. Tension clamps shall be fitted with rivet, flat washer, cotter pin, 'U' bolts & nuts, flat washers & spring washers.

Drg. Enclosed for reference.

Suspension Clamp:

All forgings & castings shall be of good finish and free from flaws or any other defects which may cause decrement of efficiency while in operation. The edges on the outside of the fittings and the grooves shall be smooth & rounded. Sharp radius of curvature, ridges etc. which may lead to localised pressure or cause damage to the conductors in service shall be avoided. The clamp shall permit the conductor to slip before the failure of conductor occurs. Envelope type, Suspension clamps for ACSR Dog conductor shall be minimum two bolted type, with minimum one no. keeper.

Suspension clamps shall have minimum failing load of 70 kN. The material for suspension clamps & keeper should be high strength Aluminium Alloy. The suspension clamp shall have slip strength not exceeding 20% of conductor rated strength. The conductor shall not slip at loads less than 12.5% of rated strength of conductor.

As per enclosed drg

Parallel Groove Clamp:

The fittings used on the overhead conductors for electrical continuity which are not subjected to tension are classified as non-tension joints. Such fittings include parallel groove clamps.

Non-tension joints shall be designed so that they meet the requirements of the normal service conditions. A rated current shall be assigned to every joint. Fittings intended to connect conductors of two dis-similar materials shall be so designed that harmful bimetallic corrosion when erected in exposed atmospheric condition is minimised.

Fittings for non-tension joints shall be manufactured and finished so as to avoid sharp radius of curvature, ridges which may lead to the localised pressure or damage to the conductor in service.

Non-tension joints are made of Aluminium alloy. Three bolted design, suitable for conductor size 100mm².Drg. enclosed for reference.

Inspection

The following tests shall be carried out by TPI /representative of General Manager (Engg) before acceptance of any materials at site.

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1. Visual check.
2. Verification of dimensions.

Test reports to be submitted:

1. Galvanizing test report as per the relevant IS shall be submitted.
2. Dimension checking will be carried out on 1% of the offered lot up to a maximum of 5 nos.
3. Routine Tests certificate shall be submitted according to IS: 2486 (Part-I).

Tolerance:

Tolerance shall be as per IS: 2486 (Part-I).

B) TECHNICAL SPECIFICATION FOR 33KV PIN INSULATOR

The pin shall be a single piece obtained preferably by the process of forging. They shall not be made by joining, welding, shrink-fitting or any other process from more than one piece of material. They shall be of good finish, free from flaws and other defects. The finish of the collar shall be such that a sharp angle between the collar and the shank is avoided and the collar or the seating surface shall bed down correctly on to the cross arm when fixed to that through a hole and the diameter of which is 2 mm. greater than the diameter of the shank.

All parts of metal fittings for insulator shall be inherently resistant to the atmosphere, corrosion or be suitably protected against corrosion, both during storage and in service. All ferrous metal parts except those made of stainless steel/nuts shall be protected by hot dip galvanizing.

The pins shall be complete with spring washers and hexagonal nuts.

33 KV G.I. PIN			
1.	Minimum total weight	:	3000 gm.
2.	Minimum failing load	:	10 KN
3.	Stalk diameter	:	a) Just below head: 27 mm b) Near Collar : 44 mm.
4.	Stalk length	:	300 mm.
5.	Shank length	:	150 mm. (with 100mm. thread)
6.	Collar diameter	:	67 mm.
7.	Shank diameter	:	24 mm.
8.	Collar thickness	:	6 mm.

Technical Particulars:-

Environment			Moderately Polluted atmospheres	heavily polluted atmospheres
1.	Nominal system Voltage		33 KV	33 KV
2.	Highest system Voltage	:	36 KV	36 KV
3.	Minimum Specific Creepage Distance	:	580 mm	840 mm
4.	Minimum failing load	:	10 KN	10 KN
5.	P.F Visible Discharge	:	27 KVrms	27 KVrms

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	Voltage			
6.	P.F Minimum flash over voltage			
	a) Dry	:	130KVrms	130KVrms
	b) Wet	:	90KVrms	90KVrms
7.	Impulse flashover voltage 1.2/50 micro second wave :			
	a)Positive	:	210KVp	210KVp
	b)Negative	:	230KVp	230KVp
8.	P.F. Withstand Voltage :			
	a)Dry	:	95KVrms	95KVrms
	b)Wet	:	75KVrms	75KVrms
9.	Impulse withstand voltage 1.2/50 micro second wave :			
	a) Positive	:	170KVp	170KVp
	b) Negative	:	180 KVp	180 KVp
10.	Power Frequency puncture withstand voltage	:	180KVrms	180KVrms

Inspection

The following tests will be carried out by TPI /representative of Engineer-in-charge before acceptance of any materials at site.

1. Dimension checking carried out on 1% of the offered lot up to a maximum of 5 nos.
2. Visual Check.

Test reports to be submitted:

1. Galvanizing test report as per the relevant IS shall be submitted
2. Dimension checking will be carried out on 1% of the offered lot up to a maximum of 5 nos.
3. Routine Tests certificate shall be submitted according to IS: 2486 (Part-I).

Tolerance:

Tolerance shall be as per IS: 2486 (Part-I).

C) TECHNICAL SPECIFICATION FOR 33 KV POST INSULATORS & DISC INSULATORS

The Insulators covered by this specification should conform to the latest editions of Indian Standard Specification IS: 731, IS: 2544 and IS: 5350 or any other authoritative standard.

The Porcelain shall be sound, free from defect, thoroughly vitrified and smoothly glazed. The Insulators shall be brown in colour. The glaze shall cover all the Porcelain parts of the Insulators except those areas which Serve as support during fixing or left un-glaze for the purpose of assembly.

Cement used in construction of insulators shall not cause fraction by expansion or loosening by construction and propose care must be taken in "Curing". The cement used shall not give rise to Chemical Reaction with the metal Fittings and its thickness shall be uniform as possible.

33KV POST INSULATORS:

- i) The Post Insulator shall be sound, free from defects, thoroughly verified, smoothly glazed and type of Post Insulator shall be stack type. The glaze shall be brown in colour. The glaze shall cover the exposed Porcelain parts of the Insulator.
- ii) The Post Insulator shall be designed and manufactured to avoid stresses due to expansion and contraction which may lead to deterioration, stress concentration due to direct engagement of Porcelain with metal fittings and shapes which do not facilitate cleaning by normal methods.

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- iii) Cement used in the construction of post insulator shall not cause fracture by expansion or loosening by contraction and shall not give rise to chemical reaction with the metal fittings and its thickness shall be uniform.
- iv) All ferrous metal parts except those of stainless steel shall be hot dip galvanised and uniform zinc coating shall satisfy the requirement of IS:2633. The parts shall be galvanised after machining and the galvanised surface shall be smooth.
- v) The tapped holes suitable for bolts with threads shall have anti-corrosion protection. The effective length of the thread shall not be less than the nominal diameter of the Bolt.
- vi) The electrical and mechanical characteristics of Post Insulator shall conform to the specific technical parameters of this specification.
- vii) Post Insulator shall be suitable for upright mounting on steel structures & the Cap & Pedestal of Post Insulators shall be of Malleable Cast Iron. Diameter of Cap & Base will be 108 mm.

DISC INSULATORS:

- i) The Insulator discs shall be Cap and Ball Pin type with Ball and Socket coupling suitable for use in suspension or tension strings.
- ii) The porcelain shall be brown colour, non porous having high dielectric mechanical and thermal strength, free from internal stresses, blisters, laminations, voids, foreign matters, imperfections or other defects, which might in any way render it unsuitable as insulator shells. Porcelain shall be smoothly glazed to remain unaffected by climatic condition, ozone, acids, alkalis, zinc or dust. The glaze shall have bright luster, smooth surface, a good performance under extreme weather condition of tropical climate and dust resistant. The glaze shall not crack or chip due to aging under normal service condition or while handling during transit or erection.
- iii) Cement used in the construction of Insulators shall not cause fracture by expansion or loosening by contraction and must have high compressive and shearing strength and be free from change in volume due to aging and temperature change. The cement shall not give rise to chemical reaction with metal fittings. Rapid hardening cement with special sand shall be used for assembly of metal parts.
- iv) The Caps and Ball Pins of Disc Insulator shall be hot dip galvanised and mechanically strong. The Ball Pins shall move freely in the Cap Socket, but shall be so designed that they do not disengage while in service. The Caps shall be made of heat treated malleable cast iron. These shall be free from cracks, shrinks, air holes, burrs and rough edges. All load bearing surfaces shall be smooth and uniform so as to distribute loading stress evenly
- v) The Ball Pins shall be of forged steel and so designed that they will not yield or distract under loaded conditions. The ball and socket insulators shall be provided with „R“ /“W“ clip to prevent uncoupling of insulator units from each other. The „R“ /“W“ clip shall be made of phosphor bronze or stainless steel to safe guard against corrosion.

The electrical and mechanical characteristics of the Disc. Insulator shall conform to IS: 2544.

Note:

The disc insulators shall be of Ball & Socket type.

The cap of disc insulators shall be of Malleable Cast Iron whereas the ball pins shall be of Forged steel.

All metal parts shall be of Hot dip galvanized as per IS: 2633.

Technical Particulars:-

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Sl. No.	Description	Rating	
		11 KV (BALL & SOCKET TYPE – 70 KN)	
1	Nominal system voltage	:	11 kV
2	Highest system voltage	:	12 kV
3	Total Creepage distance	:	320 mm
4	Spacing	:	145mm
5	Minimum Failing Load	:	70kN
6	P.F. visible discharge voltage	:	9kV rms
7	P.F. Minimum flash over voltage		
a) Dry		:	75 kV rms
b) Wet		:	45 kV rms
8	Impulse flashover voaltage 1.2/50 micro second wave :		
a) Positive		:	115 kVp
b) Negative		:	120 kVp
9	P.F. withstand voltage		
a) Dry		:	60 kV rms
b) Wet		:	35 kV rms
10	Impulse withstand voltage 1.2/50 micro second wave :		
a) Positive		:	75 kVp
b) Negative		:	80 kVp
11	P.F. puncture withstand voltage	:	1.3 times the actual dry flashover voltage of the unit
12	Ball pin, Socket & Security Cap	:	As per IS
13	Nominal Dia of Ball	:	16 mm
14	Porcelain Diameter	:	255 mm

Inspection

The following tests will be carried out by TPI /representative of Engineer before acceptance of any materials at site.

1. Dimension checking carried out on 1% of the offered lot up to a maximum of 5 nos.
2. Visual Check.

Test reports to be submitted:

1. Routine Tests certificate shall be submitted according to IS: 2486 (Part-I).
2. Verification of dimensions.
3. Temperature cycle test.
4. Mechanical strength test.
5. P.F. Puncture test.
6. Porosity test
7. Galvanizing test
8. Electromechanical failing load test. (for Disc. Insulator String only).

Tolerance:

Tolerance shall be as per IS: 2486 (Part-I).

D) TECHNICAL SPECIFICATION FOR G.I. EARTHING ROD

This specification covers the technical details of G.I. Earthing Rod complete with the necessary fittings.

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1. The earthing rod should be 1853 mm (i.e. 25 + 1752 + 76) long fabricated from 20mm dia. M.S. Rod, the bottom of which is to be cut of the same rod in the shape of a cone – 76 mm long and the forged head made out of the same rod with 30 mm (dia)= 25 mm (height). The earthing arrangements should consist of G.I. Bolt/nut and washers. The earthing rod will be as per enclosed drg.
2. The raw materials, as required for manufacture, shall comply with the relevant latest Indian Standard with all amendments, additions and alternation, for obtaining the required strength.
3. The rod including the head portion should be smoothly and continuously hot dip galvanized as per relevant I.S.S. Other portion i.e. Bolts, nuts and washers should be hot dip galvanized.
4. No crack should develop and deformation in the top head and/or bending of rod should not be appreciable while the rods will be driven into the ground by the application of heavy intermittent block not less than 7.5 Kg. Hammer and in a manner as is usual for driving rods into the grounds.

Inspection

The following tests will be carried out by TPI /representative of Engineer before acceptance of any materials at site.

- B By hammering (8 times) the rods into the normal soil by a hammer (not less than 7.5 Kg) on 1% of the offered lot up to the maximum of 2 nos. No failure will be accepted.

Test reports to be submitted:

1. Galvanizing test report as per the relevant IS will be submitted.
2. Dimension checking will be carried out on 1% of the offered lot up to a maximum of 5 nos.

Tolerance:

½% on total length. (-) 5% on other dimensions.
 (-) 10% 25 mm of small forged portion.
 Any tolerance on the positive side will be accepted.

E) TECHNICAL SPECIFICATION FOR GALVANISED STAY SET:

This specification covers the details of the Galvanized stay set both in HT complete with stay rod, stay plate, Bow, Cross Head, Ratchet Nut and a Thimble

1. The sizes of stay rods are stated below, dimensions for other parts like bow plate etc. are not stated in details here and shall be as per enclosed drawing.
 2. Length = 1830mm, Dia=20 mm, Length of the threaded portion=300mm.
- The raw materials as required for manufacture shall comply with the relevant latest Indian Standard with all amendments, additions and alternation, for obtaining the required strength.
3. The complete 1830 mm long stay sets, should with stand minimum breaking loads of 7900 Kg.
 4. The rods, cylindrical portion of the bow, plates, nuts and thimble shall be of steel to comply with the requirements as stated in class-2 of this specification.
 5. The cross-head of the bow shall be made of sound, strong iron casting.
 6. The rods shall be well forged and free from flaws and other defects and the heads shall not fail when the rods are tested to fracture at their full strength by tensile stress. Threads shall have square neck.

7. The sides of each bow shall be well riveted into the cross head and shall not come out from the cross head when the bow is tested to fracture by tensile stress.
8. The ratchet nuts and ratchet face of cross heads shall be well from to match each other.
9. The screw thread design of the stay rod and nut should be as follows:
M 16 x 2 -7H/8g for 16 mm dia. Stay rods and Y 20 x 2.5-7H/8g for 20 mm rod and the sizes of the threads should be as per IS: 4218 (Part-VI) 1967 (tables for coarse pinch series). The screw threads of rods and nuts shall be properly lubricated at the time of supply.
10. The stay plate shall be freely cut off and punched and shall be free from cracks after punching.
11. The rods cross heads, bows, ratchet nuts, thimbles and plates shall be smoothly and continuously hot dip galvanized. The galvanizing shall be heavy. The screw threads of the rods, ratchet nuts shall be cut after galvanizing. The nuts shall be well finished before galvanizing.
12. The Thimbles shall be made from 2.64 mm (12 SWG) thick M.S. Fit. The size of the thimbles shall be as follows:
Length- 70mm, Breadth-47mm, Width-20mm.

Inspection

The following tests will be carried out by TPI /representative of Engineer-in-charge before acceptance of any materials at site.

1. Dimensional check up on 1% of the offered lot up to a maximum of 10 nos.
2. Visual check.

Test reports to be submitted:

1. Galvanizing test report as per the relevant IS will be submitted.
2. Dimension checking will be carried out on 1% of the offered lot up to a maximum of 5 nos.
3. Tensile strength test for a breaking load on 1% of the offered lot up to a maximum of 5 nos.

Tolerance:

The following tolerance will be allowed in case of stay set.

- a) – 5% tolerance on individual portion except rod length.
 - b) – ½ % tolerance on total length of the stay rod.
- Any tolerance on positive side will be acceptable.

F) TECHNICAL SPECIFICATIONS FOR G.I STRANDED WIRES FOR STAY AND EARTHING (SHIELD WIRE).

- I. Application Standards The G.I Stay Stranded Wires shall comply with the specific requirements of IS: 2141- 1979. IS: 4826-1979 & IS: 6594-1974 or the latest versions thereof.
- II. Application and Sizes The G.I. stranded wires covered in this Specification are intended for use on the overhead power line poles, The G.I stranded wires shall be of 7/10SWG (7/3.15 mm) for stay supports and 7/12 SWG (7/2.5 mm) for earthing /shield wire.
- III. Materials The wires shall be drawn from steel made by the open hearth basic oxygen or electric furnace process. The individual wires shall be of uniform quality and have the properties and characteristics as specified in this specification. The wires shall not contain sulphur and phosphorus exceeding 0.060% each. Tensile Grade The wires shall be of tensile grade 4, having

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minimum tensile strength of 700 N/mm² conforming to IS:2141. General Requirements The outer wire of strands shall have a right hand lay. The lay length of wire strands shall be 12 to 18 times the strand diameter. Minimum Breaking Load The minimum breaking load of the wires before and after stranding shall be as follows:

No. of Wires & Const.	Wire Dia (mm)	Min. breaking load of the Single wire before stranding (KN)	Min. breaking load of the standard wire (KN)
7 (6/1)	2.5	3.44	21.40
7 (6/1)	3.15	5.46	34.00.

- IV. Construction The galvanized stay wire shall be of 7-wire construction. The wires shall be so stranded together that when an evenly distributed pull is applied at the ends of completed strand, each wire shall take an equal share of the pull. Joints are permitted in the individual wires during stranding but such joints shall not be less than 15 meters apart in the finished strands. The wire shall be circular and free from scale, irregularities, imperfection, flaws, splits and other defects.
- V. Tolerances A tolerance of (+) 2.5% on the diameter of wires before stranding shall be permitted.
- VI. Sampling Criteria The sampling criteria shall be in accordance with IS: 2141.

Tests on Completed Strand.

The completed strand shall be tested for the following tests in accordance with IS: 2141. Tensile and Elongation Test: The percentage elongation of the stranded wire shall not be less than 6%. Chemical analysis Galvanizing Test. The Zinc Coating shall conform to “Heavy Coating” as laid down in IS:4826

- VII. Marking Each coil shall carry a metallic tag, securely attached to the inner part of the coil bearing the following information:
- Manufacturers name or trade mark
 - Lot number and coil number
 - Size
 - Construction
 - Tensile Designation
 - Lay
 - Coating
 - Length
 - Mass
 - ISI certification mark, if any
- VIII. Packing- The wires shall be supplied in 75-100 Kg. coils. The packing should be done in accordance with the provisions of IS:6594

G) TECHNICAL SPECIFICATION FOR ACSR CONDUCTORS

The conductors shall comply with the Indian Standard Specification IS: 398 (Part I & II) of 1996 with latest amendments.

The material shall be of best quality and workmanship. The stranded steel re-enforced conductors shall be manufactured from hard-drawn aluminium wires and galvanized steel wires, which have the mechanical and electrical properties specified in enclosed drawings. The coating of the galvanized steel wires shall be applied by the hot process or electrolysis process in accordance with IS: 4826–1968 or latest amendment there of. The wires shall be smooth and free from all imperfections such as soils and splits.

The sizes of stranded steel re-enforced aluminium conductors shall be as per enclosed drg. Which also indicate the values of resistance and strengths etc.

The values of the final modulus of elasticity and Co-efficient of linear expansion for ACSR shall be as given hereunder.

No. of Wires expansion/0c.	Final Modulus of Elasticity GN/m2 (Practical)	Co-efficient of linear
ACSR 6/1	79	19.1 x 10-6
ACSR 6/7	75	19.8 x 10-6
ACSR 30/7	80	17.8 x 10-6

JOINTS IN WIRES:

Aluminium Conductor Steel Re-enforced: No two joints shall occur in the aluminium wires closer than 15 meters. No joints shall be permitted in galvanized steel wire unless the core consists of seven or more steel wires. In the later case, joints in individual wires are permitted, but no two such adjacent joints shall be less than 15meters.

STRANDING:

The wires used in manufacturing of stranded conductors shall satisfy all requirements of IS: 398/ 1996 (Part-I & II) before stranding. For ACSR, the lay ratio of the different layers shall be within the limit given below.

In all constructions, the successive layers shall have opposite directions of lay and the outer most layers being right handed. The wires in each layer shall be evenly and closely stranded.

In conductor having multiple layers of aluminium wires, the lay ratio of any aluminium layers shall be not greater than the lay ratio of the aluminium layer immediately beneath it.

LAY RATIO:

The lay ratio (Ratio of the Arial length of a complete turn of the helix formed by an individual wire in a stranded conductor to the external diameter of the helix) shall be within the limits given below:

Aluminium conductor steel re-enforced.

No. of wires.		Lay ratio for steel Core		Lay ratio for Outside layer		Al. wire inner most layer	
Al.	Steel	Max.	Min.	Max.	Min.	Max.	Min.
6	1	--	--	14	10	--	--
6	7	28	13	14	10	--	--
30	7	28	13	14	10	16	10

GROSS WEIGHT:

The gross weight of each wooden drum containing conductor of all sizes shall not exceed 900 kg. with a tolerance limit of ± 10 %.

STANDARD LENGTH:

Minimum length of ACSR DOG should be 1(one) Km. Longer lengths are also acceptable provided they are within gross weight limit. The conductor shall be supplied in standard lengths of not less than 95% of the total quantity. The quantity of the conductor in lengths shorter than standard ones shall not exceed 5% of the total quantity to be supplied. Further, single conductor length in respect of such 5 % (maximum) shall be supplied

in random length of not less than 50% of the standard length and shall be supplied in individual drum. Such random length shall be acceptable to the maximum extent of 5% of the offered quantity.

PACKING & MARKING

I) The conductor shall be wound on non-returnable drum strong enough and provided within lagging of adequate strength, constructed to protect the conductor against all displacement during transit, storage and subsequent handling and stringing operation in the field. The drum shall conform to IS: 1778-1980 as amended upto date and the dimensions shall be as per drum under column 9 of Table- 2 of the IS.

II) The drum shall be suitable for wheel mounting.

III) The general construction of drum shall be as shown in IS: 1778-1980. However, the drum shall be suitable for letting off the conductor under controlled tension of the order of 300 kg minimum.

IV) After application of bituminized and plastic paper protective lagging or circumferential batten of minimum 50mm. thickness shall be provided suitably, in order to protect conductor from damage during transit in the event of breakage/detachment of the external protective lagging. The thickness of the external protective lagging or circumferential batten shall be sufficient to nail across grains as far as possible to the flange edges with at least one nail per end. The length of the nails shall be not less than twice the thickness of the battens. The nails shall not protrude above general surface and shall not expose sharp edges or allow the battens to be released due to correction.

V) Outside the protective lagging, there shall be minimum two binders consisting of hoop iron or galvanized steel wire. Each protective lagging shall have recesses to accommodate hoop binders.

VI) The conductor ends shall be properly sealed and secured with the hoop of “B” nails or bolts on the side of one of the flanges to avoid loosening of the conductor layers during transit and handling.

TOLERANCE IN QUANTITY:

A manufacturing tolerance upto (-)5% subject to maximum one standard drum length against each item of the order, for the last offered lot, will be allowed.

MARKING:

Each drum shall have the following information aluminium on it in indelible ink along with other essential details:

- a) Purchase Order number.
- b) Name and address of the consignee
- c) Manufacturer's name or trade mark.
- d) Drum number
- e) Code name and size of the conductor.
- f) Length of the conductor.
- g) Gross weight of the drum.
- h) Weight of empty drum with protective lagging.
- i) Net weight of the conductor
- j) Arrow marking for unwinding
- k) Position of the conductor end.
- l) Lot number.

Before dispatch, property identification mark 'HDC' shall be engraved in each drum.

CONSTRUCTION OF DRUMS

(a) 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 preservative of such a quality which is not harmful to the conductor.

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(b) FLANGES

- (i) The flanges shall be of two ply construction with such ply at right angle of the other and nailed together. The nails shall be driven from the inside face of flanges, punched and then cleaned on the outer face. There shall be at least 3nail per plank of ply with maximum nail spacing 70- 75 mm.
- (ii) There will be a slot in the flange to receive the inner end of the conductor; the entrance shall be in line with the periphery of the barrel.

(c) Spindle hole shall be provided at the center of the middle planks of the plies and spindle planets with 100 mm diameter holes shall be fitted on either side of both the flanges.

(d) DRUM AND SUPPORTS:

The end supports shall be securely fixed by nailing and may be disc or segmental type. The middle barrel support of the two ply construction of disc type with a 100 mm diameter concentric with the holes in flanges shall be provided at the centers of the barrel supports.

(e) DRUM:

The wooden batons used for making the barrel of the conductor shall be segmental type. These shall be nailed to the barrel supports with at least two nails. The batons shall be closely butted and shall provide a round barrel with smooth surface. The edges of the batons shall be rounded or compared to avoid damage to the conductor.

(f) DRUM STUDS:

Barrel studs shall be used for the construction of drum. 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 at the required spacing.

(g) IRON COMPONENTS

Normally, the nuts on the studs shall stand pound of the flange. All the nails used on the inner surface of the flanges and the drum barrel shall be counter sunk at least 5 mm. deep. The ends of barrel shall generally be flushed with the top of the nuts.

(h) PROTECTIVE ARRANGEMENT:

- i) The inner side of the flanges and drum barrel surfaces shall be painted with bitumen based paint.
- ii) Before reeling, cardboard of double corrugated or thick bituminised water proof bamboo paper shall be secured to the drum barrel and inside the flanges of drum by means of suitable adhesive materials. These protective wrappings and the adhesive material used shall be of a quality which is not harmful to the conductor.

After reeling the conductor, the exposed surface of the outer layer of the conductor shall be wrapped with water proof, thick, bituminised bamboo paper and also with thick plastic sheet to prevent the conductor from dirt, grit and damage during transport and handling.

TOLERANCES:

The following tolerances shall be permitted:

- a. Tolerance on nominal diameter of aluminium wires: ± 1 (one) percent.
- b. Tolerance on nominal diameter of galvanized steel wires: ± 2 (two) percent.

Inspection

The following tests will be carried out by TPI /representative of Engineer-in-charge before acceptance of any materials at site.

- 1. Dimensional check up on 10% of the offered lot
- 2. Visual check.

Test reports to be submitted:

1. Routine test as per IS:398-II
2. Acceptance test as per IS:398-II
3. Type test as per IS: 398-II.

H) TECHNICAL SPECIFICATION ALUMINIUM BINDING WIRE

Scope covers supply and fixing of 3.53 mm dia. Aluminium Binding Wire as per IS 398.

The material comprising the wire shall have the following chemical composition:

Aluminium 99.5% minimum. Copper, silicon and iron 0.5% maximum.

The surface of the wire shall be smooth and free from all irregularities and imperfections.

Its cross sections shall closely approximate that of true circle.

Characteristics of Aluminium Binding wire :-

Diameter of wire (mm)			Cross sectional area of nominal dia. Wires	Weight of wire	Breaking Load
Minimum	Nominal	Maximum	(mm ²)	kg/km	(kN)
3.15	3.53	3.55	9.787	26.45	1.57

Inspection and Tests

The following routine checks and tests shall be carried out on 10% of the coils of aluminium binding wire. If anyone sample fails to pass any one of the test nominated for that wire, then samples shall be taken from every coil in the consignment and any coil from which a sample proves defective shall be rejected. On no account shall any rejected material be presented for test again unless with the written approval of, and under conditions determined by the Purchaser.

Physical properties

The surface of the finished wires shall be checked to ensure that it is smooth , free from all irregularities, imperfections and inclusions and that its cross section approximates closely that of true circle. The wire shall be checked to ensure that its diameter and weight are within the values given I the table above characteristic of aluminium binding wire.

Ultimate tensile strength

When tested on a standard tensile testing machine, the value obtained for the ultimate tensile stress shall not be less than 1.57KN.

Wrapping test

The wire shall withstand one cycle of a wrapping test as follows:

The wire shall be closely wrapped round a wire of its own diameter form a close helix of eight turns. Six turns shall then be unwrapped and again closely rewrapped in the same direction as the first wrapping. The wire shall not break or crack when subjected to this test.

Packing & Delivery

The aluminium binding wire shall be delivered in 30m coils, with a permitted tolerance of +5%.

Random or non standard lengths shall not be permitted. Each coil shall be adequately guarded against damage due to transportation and handling and shall have an outer layer of tightly wound polythene tape or be contained in a suitable, transparent plastic bag.

The internal diameter of the wound coil shall not be such as to result in a permanent set in the conductor. The coils shall be contained in non returnable wooden cases, with a gross weight not in excess of 300 kg.

The number of coils contained shall be marked on the outside of each case.

I) TECHNICAL SPECIFICATION OF DANGER NOTICE PLATE:

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- a) The danger plate shall be affixed in a permanent manner on operating side of the panel, Substations, Distribution Boards, Electric poles etc..
- b) The danger notice plate shall indicate danger notice both in English & Hindi and with a sign of skull and bones.
- c) The danger notice plate in general shall meet to requirements of local inspecting authorities.
- d) Dimension of the danger notice
 - I) For display at 415 V installations – 200x150mm
 - II) For display at 11 KV / 33KV (or higher voltages) installations – 250x200mm
 - III) The corners of the plate shall be rounded off.
- e) The danger notice plate shall be made from minimum 1.6 mm thick mild steel sheet and after due pre-treatment to the plate, the same shall be painted white with vitreous enamel paint on both front and rear surface of the plate.
- f) The letter, the figure, the conventional skull and bones shall etc. shall be positioned on the plate as per recommendations of IS : 2551-1982.
- g) The said letter, the figure and the sign of skull and bones be painted in single red colour as per IS : 5-1978.
- h) Standards of Danger Plate: The Danger Notice Plates shall comply with IS:2551-1982 or the latest amendment.
- i) The danger notice plate, if possible, be of ISI certification mark.
- j) The danger plate should be as per drawing enclosed or better look.
- k) Tests of Danger Plate: The following tests shall be carried out:
 - I) Visual examination as per IS: 2551-1982
 - II) Dimensional check as per IS: 2551-1982
 - III) Test for weather proofness as per IS: 8709-1977 (or its latest version)

J) TECHNICAL SPECIFICATION FOR G.I. BARBED WIRE

Unless otherwise specified elsewhere in this specification, the rating as well as performance and testing of the G.I. Barbed wire shall conform to the latest revisions available at the time of placement of order of all the relevant standards but not limited to as listed below.

IS: 280:1978 Mild steel wire for general engineering purposes (third revision)

IS: 1340:1977 Code of practice for chromate conversion coating of zinc and cadmium coated articles and zinc base alloys (first revision)

IS: 1521:1972 Method for tensile testing of steel wire (first revision)

IS: 1755:1983 Method for wrapping test for metallic wire (first revision)

IS: 2633:1986 Method for testing uniformity of coating of zinc coated articles (second revision)

IS: 4826:1979 Hot dipped galvanized coating on round steel wires (first revision)

IS: 12753:1989 Electro galvanized coatings on round steel wire – Specification

GENERAL TECHNICAL REQUIREMENTS:

GI Barbed wire shall be 2 PLY with a 2.5mm diameter. The barbs shall have a 2mm diameter and be 12.5mm in length. The barbs shall have four points and shall be formed by twisting two point wires, each two turns, tightly around both line wires making altogether four complete. G.I. Barbed wire shall be of type IOWA with size and dimensions as under:-

Line wire – 2.5 mm

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Point wire – 2.0 mm

Distance between two bars shall be 75 mm (+ 12 mm). Wire shall be medium.

ERECTION OF RAIL POLE:

11/12/13Mtrs. Old and used rail pole will be provided to the contractor from the site store of HDC, KoPT on free of cost basis for erection of transmission line towers (Double Pole / Four Pole structure).

Transportation of 13Mtrs. old and used rail to the work site is in the scope of the contractor.

Erection of DP/ FP rail pole structure shall be as per approved drg.

All rail pole FP structure shall be supported by 1/2/3 Nos. rail pole based strut poles for structural stability.

All rail pole DP structure shall be supported by suitable numbers of stay wires for structural stability.

As a thumb rule 1/6th of the erected rail shall be used in the plinth / foundation.

Foundation details for Rail Pole.

Earth Excavation:- 600mm x 600mm x 2200mm.

PCC Base-100mm.

After erection of rail Pole concreting work-600mm x600mmx 2400mm.

Plastering work above Ground level-300mm.

Black Bituminous Painting at Bottom of rail Pole -300mm from finished concrete foundation level.

Erected Rail pole shall be painted 2coats of primer and 2coats of silver paint.

GI ANGLE, CHANNEL, “V” CLAMPS, FLATS, NUTS, BOLTS, WASHERS TO BE USED ON ERECTED RAIL POLE STRUCTURE:

Scope covers supply, fabrication, galvanisation and fixing of angle, Channels, Clamps, Flats, Nuts, Bolts and washers required for commissioning of rail pole structure.

Old and Used 11/12/13Mtrs. Rail Pole in required quantity as per approved drg. will be provided to the contractor on free of cost basis for execution of work.

Transportation of rail pole from sub-store to work site shall be the responsibility of the contractor.

Following are the sizes of Angle and channels to be used for fabrication and fixing, on erected rail pole DP and FP structures.

- a. 100mm x 50mm x 6mm GI Channel – For holding insulator strings and ACSR Conductors.
- b. 100mm x 50mm x 6mm GI Channel – For Four Pole structural supports.
- c. 75mm x 40mm x 6mm GI Channel- For cable raising arrangements, pin insulator mounting.
- d. 65mm x 65mm x 6mm GI Angle- for cross braising in DP and FP structures.
- e. 50mm x 50mm x 5mm GI Angle- for shield wire laying and termination.
- f. 65mm x 6mm GI Flats-For making rail clamps,”v” clamps, support clamps etc.
- g. 50mm x 6mm GI Flats for LA earthing, Cable earthing, interconnections between earthing stations and earth spike connection etc.

The material as above shall confirm to IS: 2062.

Upon fabrication of angles, channels, clamps and flats shall be hot dip galvanised to achieve thickness of zinc coating 100micron (min.).

Nuts, Bolts and washers shall be electro galvanized.

The galvanized surface shall be smooth and free from all irregularities and imperfections.

5.0 33(E) KV, HT CABLE.

5.1 Scope

Supply, Installation, Testing and Commissioning of 33 kV Over Head Line & Under Ground Cable from Intake Substation to GC Berth Substation for strengthening of power supply arrangement of RMQC-3 of HDC, KoPT.

Supply, laying, inspection, testing, commissioning and making terminations of 33 KV(E) grade XLPE insulated power cables.

5.2 Codes & Standards

The design, construction, manufacture and performance of cables shall comply with all currently applicable statutes, regulations and safety codes of the locality where cables shall be installed. Nothing in this specification shall be construed to relieve the successful BIDDER of his responsibility.

All the cables shall conform to the latest applicable IS/IEC standards.

5.3 Power Cable

Power cables should be multicore earthed 33 kV grade aluminium stranded conductor colour coded, extruded XLPE insulated, extruded semi-conducting screened over each core and insulation, extruded inner sheathed, common extruded inner sheathed for multi core cable, galvanised steel strip armoured and overall extruded black sheath conforming to IS-7098 Part II. Armouring of multicore cable shall be of single layer, galvanised steel round wire or flat strip. The Cables shall be suitably designed for variation in power supply as follows:

The voltage variation $\pm 10\%$

Freq. variation $\pm 5\%$

Following cable size shall be supplied by the bidder:

- i. **3Core, 120 Sqmm., HT Cable, 33kV (E) grade, XLPE, U.G. Alu. Screened Cable, Strip armoured, PVC inner sheathed and PVC ST2 type outer sheathed, FR cable.**
- ii. **1Core, 1000Sqmm HT Cable, 3.3kV(UE) grade, XLPE U.G. Alu. Cable, PVC inner sheathed and PVC ST2 type outer sheathed, armoured, FR cables.**

5.4 Laying of Cables.

For laying cables along building steel structures and technological structures the cable shall be taken by clamping with **Aluminium** saddles screwed to the GI flats welded to the structure. **The** flats are of **hot** dip galvanised after fabrication.

For laying cables along concrete walls, ceilings etc. the cables shall be taken by clamping with **Aluminium** saddles screwed to the **hot dip GI** flat welded on to the inserts. Where inserts are not available the saddles shall be directly fixed in the walls using metallic anchor fasteners and **GI** flat spacers of minimum 6 mm thick.

The **Aluminium** saddles shall be placed at an interval of not less than 500 mm both for horizontal and vertical runs. However, at the bends it shall be placed within 300 mm and where terminating to the equipment/junction box the cable shall be clamped immediately before such termination.

Cable Net Work shall include Power Cables, which shall be laid in buried trenches/ cable trays / through G.I. Pipes & Hume Pipes, rising main etc. whichever is applicable.

Cable routing shall be checked in the field to avoid interference with structures, heat sources, drains, piping etc. as far as possible and minor adjustments shall be done to suit the field conditions, wherever deemed necessary without any extra cost.

The HT cables while laying will have to be separated from existing HT, LT, Telecommunication, OFC Cables by adequate spacing or running through independent pipes, trenches or cable trays, as applicable.

All cable routes shall be carefully measured and cables cut to the required lengths leaving sufficient lengths for the final connections of the cables to the terminal of the equipments.

The various cable lengths cut-off from the cable reels shall be carefully selected to prevent undue wastage of cables. The quantity indicated in the Bill of Quantity is only approximate. The Contractor shall ascertain the exact requirement of cable for a particular feeder by measuring at site and avoiding interference with structure, foundation, pipelines or any other works as far as possible. Before starting Cable Laying, Cable Drum Schedule shall be prepared by contractor and get that approved by competent authority.

Cable as far as possible shall be laid in complete, uncut lengths from one termination to other. Cable shall be neatly arranged in the trenches/ trays/ pipes in such a manner so that crisscrossing is avoided and final take-off to the equipment/switch gears is facilitated.

Arrangement of cables within the trenches/ trays/ pipes shall be the responsibility of the contractor.

Removal of concrete covers for purposes of cable laying and reinstalling them in their proper positions after the cables are laid shall be done by the contractor at no extra cost. Cable shall be handled carefully during installation to prevent mechanical injury to the cables. During laying of cables, Cable Drum Lifting Jacks, sufficient numbers of Cable Rollers and other materials etc. as necessary must be used to avoid any mechanical injury to the cables. Directly buried cable shall be laid underground in Cable Trenches duly excavated by the contractor as shown in the enclosed Drawing No.: SK- 334.

The width of the trench shall vary depending upon the number of cables and diameter of each cable. Width of the Cable Trench should be such that all cables should be correctly spaced and arranged. The cables shall be laid in trenches as shown in the enclosed sketch. Before cables are placed, the bottom of the trench shall be leveled and filled with a layer of silver sand as shown in the Drawing No.: SK- 334. This sand shall be leveled and the cables shall be laid over it. Bricks are to be placed at both sides of the cable. Then the cable inside the brick walls to be covered with sand up to the height of walls and sand shall be pressed lightly. A protective covering of Bricks shall be placed on top of protective Bricks placed at both sides of Cable. The remainder of the trench shall then be back filled with soil rammed and leveled. After laying of the cables in the trench and before placement of protective covering by brick, every cable shall be given an insulation test in presence of site engineer/ authorized representative. Also after back filling the trench with soil, rammed and leveled, insulation test of the cable shall be carried out in presence of Site Engineer/Authorized representative.

All wall openings/Pipe Sleeves shall be effectively sealed after installation of cables to avoid seepage of water inside buildings/lined trench. At road/drain/pavements crossing, suitable sizes of G.I. Pipes are to be used. After the cables are installed and all testing is complete, the conduit/pipe sleeve ends shall be plugged with a suitable weatherproof plastic compound/PUTTI, for sealing purpose. The cost of the same shall be deemed to have been included in the installation of cable laying through pipe sleeves/conduits and no separate payment shall be made. When cables pass through foundation walls, or other underground structures, if necessary, ducts or opening shall have to be provided by the contractor.

However, shall it become necessary to cut holes in the existing foundations or structures, the contractor shall determine their locations and obtain approval from competent authority before cutting is done. Cutting, if necessary and mending good of any cut portion should be done by contractor without any extra cost. At Road Crossing and other places where cables enter pipe sleeves, adequate bed of sand shall be given so that the cables do not stack and get damaged by pipe ends. Drum number of each cable from which it is taken shall be recorded against the cable number in the cable schedule. All G.I. Pipes shall be laid as per site requirements. The open ends of the pipes shall be suitably plugged after they are laid in final

position. Laying of the cable will be as per the enclosed Drawing No. SK- 334. The contractor will have to submit the detailed cable route diagram, with detailing of the Hume Pipes & G.I. Pipes used, position of the straight through cable joints etc. for checking at our end and subsequent approval of the same. As built drawing (in triplicate) of the above cable route will have to be submitted after completion of the above work.

MEASUREMENT:

Cable length should be measured jointly prior to giving clearance for earth back filling etc. Distance between Socket of one end and Socket of other end of the laid cable to be considered for payment against both supply & laying of cable.

5.5 Laying of Cables in Exposed/Embedded GI Pipes/Hume pipe Road Crossing, Railway Crossing, Drains, Culverts or any similar concrete structure etc.

GI Pipes /Hume pipe for drawing cables in plant buildings shall be of **Heavy Duty**, galvanised, electric resistance welded, screwed type conforming to IS: 1239 (Part-I). GI Pipe/Hume pipe of the following sizes shall be used:

- a) 150 mm nominal bore GI pipe
- b) 150 mm dia. Heavy duty NP-4 Hume pipe.

For installation of cables in GI Pipe /Hume pipe. Complete system shall be installed first without cables but having suitable pull wires laid in the pipes to facilitate cable pulling.

Insulated type end bushings shall be used where conductors enter or leave GI pipe.

Ends of GI pipe shall be cut square and the threads out in the field shall have the same effective length and the same dimensions and taper as specified for factory out threads. Ends of pipe shall be reamed to remove burrs and sharp edge after threads are cut.

Exposed GI pipes shall run parallel or perpendicular to column lines or building lines so as to match with the architectural arrangement of the building. Concealed GI pipes shall run in direct lines with minimum bends.

Laying of Reinforced Concrete Pipe and Galvanized Mild Steel Tubes should be done wherever necessary, such as at Road Crossing, Railway Crossing, Drains, Culverts or any similar concrete structure etc. The scope includes cutting of road, Railway Crossing, Excavating of Trenches, etc. including mending good work. The depth of laying of the pipes should have to be matched with the underground cable trench, as far as possible and practicable. Making jointing between collars and pipes, with cement mortar (1 cement: 2 medium sand) and cutting the Reinforced Concrete Pipe to the required length, if necessary, to be done by the contractor at their own cost and arrangement. Cutting of Galvanized Pipe to required length and threading, bending, jointing by Socket as required, supply and fixing of support clamps/ brackets should be under the scope of contractor. Re-filling of the trench after laying the reinforced concrete pipes and galvanized mild steel tubes are also to be done by the contractor.

Rates are to be quoted accordingly.

5.6 Depth of laying

Sl. No.	Cable	Laying Type	Depth of Laying
1.	HT Cable	Open cut excavation with brick protection	1500mm
		Boring through GI pipe (HDD/Manual)	2500mm

Sl. No.	Cable	Laying Type	Depth of Laying
		Open cut excavation through Hume / GI pipe	1500mm
		Through existing RCC trench / Hume pipe / GI Pipe.	As per available depth.

Note: 1..Road level to be considered as reference level.

2.However depth of Boring(HDD/Manual) in the region under National Highway Authority of India (NHAI)/Haldia Development Authority (I)/ South Eastern Railway (SER)/ Indian Oil Corporation Ltd. (IOC Ltd) shall be as per clearance/permission obtained for Road Crossing/ Railway Track Line Crossing/Utility crossing of respective firms/Agencies.

5.7 Bricks

Crushing strength, efflorescence shall conform to class designation 10 (as per IS 1077, 1986) and as per the specification, given below:

The brick shall have clear ringing sound.

ii) The average size of the bricks shall be in the range of 250 mm (± 4 mm) x 125 mm (± 2 mm) x 75 mm (± 2 mm).

5.8 Cable Termination (Heat Shrinkable type)

Termination of aluminium conductor power cables shall be by means of compression method using compression type lugs.

The **End** termination for use on the cables shall be suitable for the type of cables offered.

The accessories shall be supplied in kit form and each component of the kit shall carry manufacturer's mark of origin.

The kit shall include all stress grading, insulating and sealing materials apart from conductor fittings and consumable items. The instruction pamphlet shall also be included in each kit.

The contents of the kits shall be suitable for storage without deterioration under the climatic conditions given in the specification with shelf life exceeding 5 yrs.

5.9 Cable Straight through Jointing. (Heat Shrinkable type)

The contractor shall submit cable route plan and tentative location of straight through joints for approval to Competent authority.No straight through joints are allowed in RCC Cable trench.

Additional length (Loop) of 5 mtrs. (approx.) cable should be kept at each end of the cables near the straight through cable joints. It is required to measure the insulation resistances of the cables before and after straight through cable jointing. This scope includes supply of all required materials including complete straight through cable jointing kits, with ferrules and all other accessories.

The accessories shall be supplied in kit form and each component of the kit shall carry manufacturer's mark of origin.

The kit shall include all stress grading, insulating and sealing materials apart from conductor fittings and consumable items. The instruction pamphlet shall also be included in each kit.

The contents of the kits shall be suitable for storage without deterioration under the climatic conditions given in the specification with shelf life exceeding 5 yrs.

5.10 Cable Tags

All cables will be identified close to their termination points by cable nos. Cable numbers will be punched on Aluminium strip/ PVC Strip {2mm. thick (approx.)} securely fastened to the cable and wrapped around it. Alternatively Cable Tags shall be circular in construction to which cable number can be conveniently punched.

Cable designations are to be punched with letter/number punches and the tags are to be tied to cables with piano wires of approved quality and size. Tags shall be tied inside the panels beyond the glanding as well as below the glands at cable entries. Along trays tags are to be tied at all bends.

Each underground cable shall be provided with Identification Tags (made of PVC) securely fastened at every 30 Mtrs. Distance if the continuous length is more than 50 Mtrs. Of its underground length. At least one tag at each end before the cable enters the ground will have to be provided. In unpaved areas, Cable Trenches shall be identified (by means of cable markers). These shall be placed at location of changes in the direction of cables and at intervals of not more than 30 Mtrs. And at Cable Joint Locations.

5.11 Packing and Markings

The cable shall be wound on a steel drum conforming to relevant BIS standard and packed. The ends of the cable shall be sealed by means of non-hygroscopic sealing material.

Cables to be supplied in returnable steel drums only.

The cable drum shall carry the following information stencilled on the drum:

- i) Manufacturer's Name and Trademark
- ii) Type of cable and voltage grade.
- iii) No. of cores
- iv) Nominal cross-sectional areas of conductor
- v) Cable code
- vi) Length of cable on drum
- vii) No. of lengths on the drum if more than one
- viii) Direction of rotation of Drum
- ix) Gross weight
- x) Weight of Drum with Ballens (if any)
- xi) Weight of cable
- xii) Reference of any Indian standard
- xiii) ISI Marking on the drum
- i) Year of Manufacturing

5.12 Tests & Test Reports

Type test certificate for similar type & Rating of Cables be submitted by successful bidder.

The Routine and acceptance tests specified in the applicable standards shall be arranged by the Contractor and carried out on **Cables** as per latest relevant IS Standards in presence of **Third Party Inspection(TPI) Agency appointed by HDC at the manufacturer's works & at site respectively. The cost of the TPI Agency is borne by Port.** The Certified copies of test certificates shall be submitted before despatch.

6.0 GCBERTH SUB-STATION.

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Equipments mentioned as under shall be erected / installed in side newly build sub-station as per approved layout plan. Civil building of the sub-station is not in the scope of the contractor.

6.1

OIL TYPE TRANSFORMERS

A Electrical Design

- i) Generally as per IS 2026 – Part 1, 2 & 4 of 1977 and Part 3 of 1981.
- ii) 3 phase, core type, oil filled
- iii) Rated output, voltage ratio, vector group shall be provided as specified in technical particulars for design.
- iv) Rated frequency 50 Hz, + 3%, -3%.
- v) Insulation level shall be designed according to the voltages specified below.

Sl. No.	Description	33kV System	11kV System	3.3kV System
1.	Nominal system voltage (kV)	33	11	3.3
2.	Max. system voltage (kV)	36	12	3.6
3.	One minute power frequency withstand voltage (kV)	70	28	10
4.	Peak impulse test withstand voltage (kV)	170	75	---

- vi) Transformers shall be capable of delivering rated current at an applied voltage up to 105% rated voltage without exceeding the temperature limits.
- vii) Overload capacity of the transformer shall be as per IS 6600 – 1972 unless specified otherwise.
- viii) Shall be operable at its rated capacity at any tap with voltage variation of $\pm 10\%$ of corresponding to voltage of the particular tap.
- ix) Permissible maximum temperature at rated output and principal tap at the ambient temperature of 50°C

Top oil (by thermometer)	85°C
Windings (by resistance method)	95°C
Maximum Hot Spot Temperature	105°C

- x) Transformers shall be designed to withstand the thermal and dynamic stresses due to short circuits at its terminals or symmetrical/asymmetrical faults on any winding. Short circuits withstand capacity for the bolted fault at the terminals shall not be less than 5 second duration with respect to fault level specified. Design calculation to be submitted for concurrence.
- xi) The maximum temperature at the end of the specified duration shall not be more than 250°C with the temperature prior to short circuit corresponding to maximum permissible overload.
- xii) Transformer shall be designed for minimum no-load and load losses within the economic limit.
- xiii) Designed for suppression of harmonics especially 3rd and 5th.

B Magnetic Circuit

Supply, Installation, Testing and Commissioning of 33 kV Over Head Line & Under Ground Cable from Intake Substation to GC Berth Substation for strengthening of power supply arrangement of RMQC-3 of HDC, KoPT.

- i) Low loss CRGO silicon steel shall be used.
- ii) Laminations shall be annealed in a non-oxidizing atmosphere to relieve stresses and restore the original magnetic properties of CRGO sheets after the cutting and punching operations.
- iii) CRGO sheets shall be coated with insulation varnish compatible with the sealing liquid.
- iv) Insulation to withstand annealing temperature as high as 850 Deg. C and shall reduce eddy current to minimum
- v) Ducts to be provided to ensure adequate cooling.
- vi) Core, framework and clamps arranged and tightened to securely hold laminations in order to prevent any settling or displacement in case of heavy shocks during transport, handling or short circuits.
- vii) Flux density under specified over voltage or frequency conditions shall be within the maximum permissible for the laminations. However it shall not exceed 1.6 tesla at rated voltage & rated frequency.
- viii) Transformers shall be designed to withstand 110% over fluxing corresponding to rated voltage.
- ix) Magnetising current shall be maximum 1% of the rated current.

C Windings

- i) Material shall be electrolytic grade work hardened copper of high proof stress with more numbers of radial support.
- ii) Shall be pre-compressed, press board, pre-stabilization of coil & shall be subjected to shrinkage treatment.
- iii) Completed core and winding to be vacuum dried in full vacuum and impregnated immediately.
- iv) Shall be braced to withstand shocks due to rough handling, and forces due to short circuit, switching or other transients.
- v) Permanent current carrying joints in winding and leads shall be brazed. Connections to bushings & OLTC shall be crimped.
- vi) Coils shall be supported using dried and high-pressure compressed wedge type insulation spacers, blocks & cylinders.
- vii) Insulating materials shall be compatible with transformer liquid under all service conditions.
- viii) Leads to the terminal board and bushings shall be rigidly supported.

D Insulation

Inter turn and inter coil insulation shall be designed such that dielectric stress is uniformly distributed throughout the windings under all operating conditions.

E Tank

- i) Welded thick gauge low carbon steel grade plates stiffened and reinforced to withstand without deformation all stresses applied during transport and operation or short circuit conditions.
- ii) Oil tight welds and joints shall be provided.
- iii) Fully assembled transformer with its radiators, conservator and other fittings shall withstand for one hour a pressure corresponding to twice the normal head of liquid or to the normal pressure plus 35 kN/sq.m, whichever is lower, measured of the base of the tank.
- iv) Plates shall be protected internally against corrosion due to insulating liquid.
- v) Provided with inspection opening and cover/with handling equipment) to provide access to bushing connections.
- vi) Form of cover shall be such as to prevent any stagnant water deposit and to drain gas bubbles towards the buchholz relay
- vii) Tank (with radiators when welded to tank) shall be capable of withstanding of 250 mm of mercury vacuum.
- viii) Tank shall be suitably designed to suppress harmonics available in the system as well as generated by transformer.

F Conservator And Breather

- i) Conservator mounted on frame, integral with tank in such a manner that under all conditions and the lowest oil level the bushings remain under the head of liquid.
- ii) Conservator volume shall be sufficient to maintain oil seal from ambient to oil temperature of 90°C
- iii) Oil filling hole with cap and a drain valve to drain the oil completely shall be provided. One end of the conservator shall be bolted into position so that it can be removed for cleaning purposes.
- iv) Silica gel breather with inspection window and oil seal shall be mounted at 1.4 m from ground level and connected to conservator.
- v) Prismatic type oil level gauge with maximum and minimum levels marked.
- vi) One no. 150 mm dia dial type magnetic oil level gauge with alarm & trip contacts shall also be provided.

G Oil

- i) The oil shall be as specified in IS: 335 and shall be suitably treated, free from moisture and have uniform quality throughout.
- ii) Oil shall be supplied for the first fill of oil and 10% excess in non-retunable drums.

H Pressure release device

- i) Adequate number of Pressure release device shall be provided on tank at suitable locations. This shall operate at static pressure less than hydraulic test pressure of tank. This should have one potential free contact for alarm/trip and should be wired to Marshalling box.
- ii) Discharge of Pressure release device shall be taken through pipes away from transformer and prevented from spraying on tank.

I Buchholz Relay

- i) Double float relay as per IS 3677 – 1985.
- ii) Shut off valves on either sides of the buchholz relay
- iii) Pot cocks at the top and bottom of relay drain plug, inspection window, calibrated scale, terminal box with oil tight double compression type brass gland.
- iv) Potential free, self reset independent alarm and trip contacts, rated to make, break and carry minimum 2 amps at 30 V DC. No auxiliary relay shall be used to multiply the contacts. Contacts are to be wired to the marshalling box.

J Cooling

The cooling system provided is as follows.

ONAN - Oil Natural, Air Natural

K Radiators

Radiators shall be detachable type directly mounted or separately mounted. Flanged, gasketed and bolted connections shall be used for connecting the radiators to the tank.

The following accessories shall be provided for each radiator/radiator bank

- I. Top and bottom shut off valves and blanking plates.
- II. Bottom drain plug and top filling plug.
- III. Lifting lugs
- IV. Thermometer pockets with thermometers in the inlet and outlet pipes (for separately mounted radiator banks).
- V. Top and bottom filter valves (for each separately mounted radiator bank).
- VI. Air release devices.
- VII. Provision for earthing

L Valves And Connections

- i) Valves of sluice type with hand wheels
- ii) All valves including radiator valves shall be made of gun metal only.
- iii) Clear indication of open and closed position
- iv) Provided with blanking plates or screwed plugs
- v) Padlocking facility to lock in closed/open position.

M Terminations

It shall be possible to withdraw the transformer easily after disconnecting the connections without disturbing the cable terminations.

- i) For cable termination
 - a) Air insulated cable end box suitable for the type and number of cables specified.
 - b) Air insulated disconnection chamber with inspection opening
 - c) Compressed type brass cable glands with tinned copper lugs.
 - d) Bolted type gland plates (non-magnetic material wherever specified).
 - e) Sealing kits with associated accessories like stress relieving cones, insulating tape, trifurcating boot, HT insulating tape.
- ii) For bus duct termination

- a) When bus duct termination is specified, flanged throat shall be provided to suit termination of bus duct. Flange ends and inspection openings shall have weatherproof gaskets.

N Bushings

- i) Conforming to IS 3347 and IS 2099 for HT and IS 7421 for LT system.
- ii) Minimum rated current of line and bushings shall be 1.5 times rated current of the corresponding windings
- iii) Clamps and fittings made of steel or malleable iron shall be hot dip galvanized.
- iv) Bushings rated 400 Amps and above shall have non-magnetic clamps and fittings only.
- v) Bushing shall be solid porcelain type for LT system, solid porcelain / oil communicating type for voltage class upto 36 kV .
- vi) Porcelain shall be homogenous and free from cavities
- vii) Oil filled condenser type bushings should have the following:
 - Oil level gauge
 - Oil filling pipe and drain valve (if not hermetically sealed)
 - Tap for capacitance and tan delta test.
- viii) All clamps and fittings shall be hot dip galvanized.
- ix) No arcing horns should be provided on bushings
- x) Neutral bushings shall be provided as required for earthing of neutral point. This shall be connected to brass / tinned copper bar and brought to ground level through porcelain insulators.

O Bushing Current Transformers (Where Applicable)

- i) CTs for back up earth fault shall be provided on the neutral end.
- ii) Removable at site without opening transformer tank cover/active parts.
- iii) Secondary leads shall be brought to a weatherproof terminal box and from there to the marshalling box with 4 sq.mm copper armoured cable.

P Oil Temperature Indicator

150 mm dial type thermometer with manual reset maximum reading pointer. There shall also be two potential free contacts for alarm and trip signals. The alarm and trip settings shall be independently adjustable. The temperature-sensing element mounted in a pocket of oil, shall be connected to the indicator through capillary tubing. Contact rating at DC shall be minimum 0.5 amps.

Temperature indicator dials shall have linear gradations to clearly read at least every 2°C. Accuracy shall be better than +/- 1.5%.

Q Winding Temperature Indicator

- i. Local winding temperature indicator (WTI) for each winding, shall have a 150-mm diameter dial type indicator with a manual reset maximum reading pointer. There shall be two potential free contacts for alarm and trip signals. For transformers with forced cooling, another set of contacts shall be provided to start/stop the forced cooling system automatically. The settings for closing/opening of each contact shall be independently

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adjustable. Contact rating at DC11, 30 V DC shall be minimum 0.5 amps. The device shall be complete with lamp, sensing element, image coil, calibration device, auxiliary CTs etc. as required.

- ii. Temperature indicator dials shall have linear gradations to clearly read atleast every 2⁰C. Accuracy shall be better than +/- 1.5%.
- iii. Remote winding temperature indicator with resistance type temperature detector shall be provided additionally.

R Marshalling Box

- i) All outgoing connections from the transformer i.e buchholz relay, temperature indicators, level indicators, CT secondary, fault contacts for annunciation etc. shall be wired to a marshalling box.
- ii) Degree of protection of enclosure shall be IP 55.

S Off-Circuit Tap Switch

- i) Externally hand operated with easily accessible links.
- ii) Designed for sustained over current of at least 150% of the rated current of the winding.
- iii) Shall not occupy any intermediate position between clearly marked tap positions.
- iv) Capable of repeated operation and withstanding short circuit forces.
- v) Tap position indication diagram
- iv) Inspection and/or repair shall not require removal of transformer core from tank.

A solid state facia window type annunciation system shall be provided for this purpose, with the following features:

- i) On incidence of fault – A hooter comes ON & window lamp starts flashing.
- ii) On acceptance of fault – Hooter stops, Lamp becomes ready.

On pressing RESET button – Lamp goes OFF if fault is removed.

Lamp continues to glow if fault persists.

The required alarm / trip contacts shall be wired to the marshalling box for connection to the annunciation system.

T Earthing

- i) All metal parts of the transformer with the exception of individual core laminations, core bolts, and clamping plates shall be maintained at fixed potential by earthing.
- ii) Two tinned copper earthing terminals with nuts, washers etc. to be provided at diagonally opposite corners suitable to connect 75x12 GI strip.
- iii) One end of bushing CTs shall be earthed.

U List Of Fittings And Accessories

- i) Identification plate
- ii) Rating and diagram plates.
- iii) Valve schedule plate (For Power transformers)
- iv) First fill of oil as per IS-335, 1993 with 10% excess in non-returnable drums
- v) Cooling system complete with accessories (as specified)

- vi) Off-circuit tap switch (as specified)
- vii) OLTC (as specified)
- viii) Conservator with oil level gauge and drain plug.
- ix) Oil filling pipes with flange and dummy cover on conservator for filling/ topping up of oil.
- x) Suitable number of Dehydrating breathers.
- xi) Double float Buchholz relay with alarm and trip contact and shut off valves on either sides.
- xii) Oil filter valves at top and bottom of tank
- xiii) Drain off valve at lowest location to allow complete draining
- xiv) Oil sampling device at top and bottom
- xv) Explosion vent with double diaphragm and oil level gauge between 1st & 2nd diaphragm (for distribution transformers).
- xvi) Pockets for thermometers for oil temperature and winding temperature indicators.
- xvii) Dial type magnetic oil level gauge with low level alarm contacts.
- xviii) HV, LV and neutral bushings.
- xix) Dial type winding temperature indicator with maximum reading pointer and alarm and trip contacts
- xx) Dial type oil temperature indicator with maximum reading pointer and alarm and trip contacts
- xxi) Lifting lugs and jacking pads. For transformers with bell tank design, lifting lugs shall be provided on core and winding also.
- xxii) Earthing terminals and lugs
- xxiii) Inspection cover
- xxiv) By-directional rollers with locking arrangement (for distribution transformers)
- xxv) Marshalling box.
- xxvi) Haulage holes.
- xxvii) Bushing CTs as specified.
- xxviii) Flat base & foundation bolts.

TRANSFORMER, 6MVA, 33/3.3 kV

Supply of Transformer:-

Supply of 6MVA, 33/3.3 kV Oil type indoor distribution Transformers with OLTC and RTCC Panel, manufactured as per relevant IS. The transformer shall be designed for the specification given below:

Technical Details:

Technical particulars:-

Sl. No.	Particulars	6000 kVA, 33/3.3kV
1.	Specification	IS 2026, Part I - 1977 Part II - 1977 Part III – 1981

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Sl. No.	Particulars		6000 kVA, 33/3.3kV
			Part IV - 1977
2.	Type		Three phase, core type, oil filled
3.	Duty		Indoor
4.	Voltage HV/LV		33/3.3 kV
5.	Frequency		50 Hz
6.	No. of phase		3
7.	Continuous rating		6000 kVA
8.	Conductor		Copper
9.	Insulation class		Class A
10.	Cooling		ONAN
11.	Winding connection		Delta / Star
12.	Vector group		Dyn 11
13.	Neutral grounding		Solidly earthed
14.	System earthing	HV	Solidly earthed
		LV	Solidly earthed
15.	Percentage impedance		6.9%
16.	Termination	HV	Cable end box suitable for termination of 4 no. 3C x 120 mm ² XLPE cable
		LV	Suitable for Bus duct or cable connection
17.	Temperature rise over 50°C ambient temp		
	a) Top oil (measured by Thermometer)		35°C
	b) In winding (measured by Resistance method)		45°C
	c) Hot Spot temp		55°C
18.	Bushing mounted CT's		
	a) LV Neutral bushing CT for EF class PS		1
	b) LV Neutral bushing CT for standby E/F protection class 10P15.		1
19.	Tap changer		OLTC
	a) Range		+5% to -15%
	b) Total tap positions		5
	c) Taps above nominal voltage		2
	d) Taps below nominal voltage		2
	e) Voltage per step variation		1.25 % [16 step/17 position]
	f) Tap change controls		Manual
20.	Impulse test withstand voltage		As per IS 2026, Part III – 1981
21.	One minute dry and wet power		- do -

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Sl. No.	Particulars	6000 kVA, 33/3.3kV
	frequency withstand voltage	
22.	Withstand time without injury for 3 phase short circuit at terminals	5 Secs.
23.	Auxiliary supply voltage	240 V AC/220V DC
24.	Parallel operation	Suitable for parallel operation with transformers of similar ratings
25.	Overload capacity	As per IS 6600 –1972
26.	Radiators	Detachable type on the tank
27.	Flux Density	1.6 tesla (Max.)
28.	Magnetizing current	1% of rated current
29.	Paint	Epoxy
30.	Paint shade	Shade 632 as per IS – 5
31.	Short circuit level on HV side	450MVA
32.	RTCC Panel	

Installation of Transformer.

The 6000 kVA, 33/3.3 KV transformers shall be installed on the RCC foundation of size 3000mm x 3000mm. The transformer shall be properly luminium on foundation, including providing suitable stoppers for the transformer wheels. Adequate provision shall be made to enable proper heat shrink type cable terminations at the HT and LT side of the transformer. Before charging the Transformer all the tests shall be carried out as per relevant IS specifications.

6.2 VCB PANEL

Codes and Standards:

The switchboards and the mounted equipment shall conform to the latest revisions of the following Indian standards:

IS:12729	General requirements for switchgear and control gear for voltages exceeding 1000 V.
IS:13118	General requirement for circuit breakers for voltages above 1000 V.
IS:3427	Metal-enclosed switchgear and control gear for voltages above 1000 V but not exceeding 11000 V.
IS:5082	Material for data for aluminium bus bars.
IS:9920	Switches and switch isolators for voltages above 1000V.
IS:9921	AC disconnectors (isolators) and earthing switches for voltage above 1000 V.
IS:9046	AC contractors of voltage above 1000 V upto and including 1100 V.
IS:12661	HV motor starters.
IS:13703	Low voltage fuses.
IS:2705	Current transformers.
IS:3156	Voltage transformers.
IS:1248	Electrical indicating instruments.
IS:722	Integrating meters.
IS:3231	Electrical relays for power system protection.
IS:6875	Control switches and push buttons.
IS:694	PVC-insulated cables for working voltages voltage upto and including 1100 V.
IS:2544	Porcelain post-insulators for systems with nominal voltage greater than 1000 V.

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IS:11353	Guide for uniform system of marking and identification of conductors & apparatus terminals.
IS:5578	Guide for marking of insulated conductors.
IS:3618	Phosphate treatment of iron and steel for protection against corrosion.
IS:6005	Code of practice of phosphating of iron and steel.
IS:5	Colours for ready mixed paints and enamels.

Wherever Indian Standards are not available, relevant IEC standards shall be applicable.

General Requirement

The switchgear shall be of metal clad, single bus bar/Double bus bar as applicable, self standing, dust proof construction, indoor cubicle type fitted with vacuum circuit breakers in fully draw out execution.

The VCB shall be horizontally isolated, horizontally drawn-out type, truck mounted and ground operated.

The circuit breakers shall be suitable for following duties

- ⇒ To withstand inrush magnetizing currents of transformers and capacitor bank 'ON' and 'OFF' operation.
- ⇒ Transient surge produced by one CB due to severe chopping during rapid interruptions of inductive current e.g motors, shall be within limits allowable for overhauled motors according to IEC34 part 1 otherwise suitable surge absorber shall be provided.
- The controls, indicating lamps, relays and meters shall be mounted on separate control & relay panel.
- Operation counter, close/open mechanical indications spring charged/ discharged indication shall be provided.
- All circuit breakers shall have motor operated spring charged mechanism for closing and shunt tripping coil (30V DC). Closing coil shall be suitable to operate between 85% to 110% of rated voltage and tripping coil between 70-110% of rated voltage. Spring charging motor shall operate between 85-110% of rated AC. Voltage.
- Jumpers in the cubicle also shall be of same current rating as that of the breaker. Only the jumpers connected to CT shall be rated according to CT rating.
- A manually operated device to enable charging of closing springs.
- Manual / Mechanical tripping arrangement for emergency tripping of CBs.
- All circuit breaker truck shall have service, test and draw out positions. Test position shall engage only the auxiliary (control) contacts to close the CB during testing.
- Panel door switch shall be provided for illumination inside panel.
- Anti pumping feature shall be provided.
- All live parts shall be insulated by heat shrinkable sleeve only.
- The cubicle shall be provided with a position changing gear arrangement in such a way that by engaging detachable device from outside the front door, it shall be possible to move the breaker truck and change position without opening the cubicle door. Facilities for pad locking in each position shall be provided.
- Each cubicle shall have mimic diagram with metal strip.
- Each cubicle shall be of compartmentalized construction and shall have separate compartments for bus bars, CTs and outgoing cables, metering and protection devices.
- All circuit breaker trucks of same rating shall be identical in all respects (except metering and protective devices) and shall be interchangeable with similar breaker panel.
- Continuous earth bus shall be provided throughout the board.
- The position of various control switches, push buttons, and levers, etc. requiring manual operation shall be at a height not less than 450 mm and shall not exceed 1850 mm from the finished floor level.

In the design of the switchgear the following positive interlocking shall be provided.

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1. It shall not be possible to move the truck from the isolated to the Service Position unless low voltage plug and socket connections have been made.
2. It shall not be possible to disconnect the low voltage plug and socket as long as the circuit breaker truck is in service position.
3. It shall not be possible to withdraw the truck without disconnecting the low voltage plug and socket.
4. It shall not be possible to move the truck from the service to the isolated position or vice-versa with the circuit breaker in the 'ON' position.
5. It shall not be possible to switch on the circuit breaker when the truck is in between the isolated and the service positions (except in test position).
6. It shall be possible to switch on the earthing switch only when the truck is in the isolated position, wherever an integral earth switch is provided.
7. It shall not be possible to open the circuit breaker enclosure when the breaker is ON or to have access to any part of the draw out assembly which is live when the circuit breaker is in the service position.
8. Shutters shall be lockable in closed position.
9. Where local/remote selector switches are called for , it shall be ensured that:
 - * The breaker can be closed locally only if the breaker truck is in the test position and the local/remote selector switch is in local position.
 - * The breaker can be operated from remote panel (in shop) only when the breaker truck is in service position and the local/remote selector switch is in remote position.
 - * The breaker can be tripped locally regardless of the position of the breaker truck.
 - *

Earthing Mechanism

The operating mechanism parts shall be designed to give longer life, trouble free operation and require minimum maintenance.

The material and components us shall have chopping current limited to minimum.

Insulation Levels

Insulation levels corresponding to the rated voltage shall be as follows:

Nominal voltage (kV)	33
Highest system voltage (kV)	36
One minute power frequency withstand voltage (kV)	70
1.2/50 micro sec impulse withstand voltage (kV)	170
Clearance in air	As per IEC

Short Circuit Strength

- Rated short time withstand current shall not be less than the system short circuit level specified for the stipulated duration.
- Rated peak withstand current shall not be less than 2.5 times the system short circuit level.

Auxiliary Buses for Control & Protection

1. Control supply buses for AC & DC.
2. Signaling supply.
3. PT secondary voltage.
4. Spare buses.

Provision of surge suppressor

In case of breakers like VCB that give rise to over voltage surges due to current chopping phenomenon, surge suppressors to be provided at the load side terminals of the breakers to limit the switching surges to value limited for as per IEC.

Annunciation Schemes

- Flag indications for all faults for which individual protective relays have been specified.
- Warning signalling (as applicable) on individual panels:
 - a) All transformer warning / signalling conditions (group signal from corresponding transformer control panel / sub-station
 - b) Loss of trip circuit supply
 - c) Earth fault.
 - d) Control supply failure
 - e) PT fuse failure / MCB tripping
- Emergency signalling for tripping of HT breakers on fault
- One common signal for warning and one signal for emergency from each panel to be wired to a common annunciation panel of the switchboard, where specified.
- Annunciators for warning and emergency aluminium condition on individual panels of solid state facia window type. Common audio aluminium with Accept, Reset, and Test push buttons for the switchboard where common annunciation panel is not specified. Audio aluminium to have distinct tones for warning and emergency.

Bus Bar and Connections

- Power buses shall be of EC grade aluminium alloy equivalent to E91E WP as per IS-5082-1981 or Copper. Both rectangular and Round busbar are acceptable .The busbars shall be tinned /silver plated at joints.
- The continuous rating of the main horizontal bus shall not be less than the rating of the incomer specified.
- The vertical bus rating shall be as follows:-

incomer	:	Not less than that of horizontal bus
For outgoing	:	Not less than that of the outgoing breaker, irrespective of relay setting.

- Design ambient temperature shall be 50⁰C & final operating temperature under continuous operation in enclosure limited to 90⁰C by thermometer method.
- Both horizontal and vertical bus bars to be designed and supported to withstand the thermal and dynamic stress corresponding to rated short time and peak withstand current specified.
- Cross-section of main horizontal bus to be uniform throughout the switchboard and continuous in one transport unit.
- Bus bar arrangement as per IS 375.
- Phase identification by color in each panel.
- Bus bars (horizontal as well as vertical) shall be provided with heat shrinkable, non tracking, low absorption type sleeving conforming to international standards for full voltage for 33 kV, 11kV& 3.3kV switchboards.
- Bus bar support insulators of non-hygroscopic material having high impact and dielectric strength with an anti tracking contour.

Internal Control Wiring

- Control wiring shall be carried out by 1100V grade PVC insulated; single core multi stranded copper wire of minimum cross section 2.5 sq. mm. Similarly for CT circuits minimum cross section of 2.5 sq. mm shall be used.
- Flexible wire of 2.5 sq.mm shall be used from CT chamber to relay chamber and shall have protection against heat and mechanical damage due to flash over. Use of heatproof sleeves and rigid conduit shall be made to run the control wires from back to front.
- Wiring and terminal arrangement for all panels shall be carried out as per approved scheme.
- Flexible wires protected against mechanical damage for wiring to door mounted devices.

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- Wires identified at each end in accordance with schematic diagrams by interlocked type ferrules. These shall be firmly located so that these do not move.
- Color code for control wiring

AC – Black	Earth wire – Green
DC – Light grey	Trip circuit – Red
- All telemetering signals shall be wired to terminal strips.

External Terminations

Control Terminations

- 650V grade multi-way open type terminal blocks of non-tracking moulded plastic complete with insulated barriers, stud type terminals, washers, nuts and lock nuts and identification strips.
- All terminals going out of the switchboard shall be brought to a separate terminal board marked “External Termination”. These will be easily accessible.
- External terminal block shall be provided in the relay chamber with proper clamping facilities for cable dressing.
- Control terminals shall be suitable to receive two numbers 2.5 sq. mm copper conductor.
- 20% spare terminals in each control terminal block. Terminal blocks in separate groups shall be provided for DCS/PLC, remote control panels, transformer marshalling boxes, local push button stations, etc.
- Gland plate for control cables shall be of adequate size to accommodate and to facilitate glanding of all the control cables coming from external equipment.
- Terminal blocks shall be placed separately for internal looping and external looping.

Power Terminations

- Suitable for accepting cable/bus trunking as specified.
- Sufficient space and support arrangement inside each panel to accommodate HT cable termination kits and sealing kits suitable for the size and number of XLPE cables. Dummy panels to be provided adjacent to the switch panel, where the required number cable terminations cannot be accommodated in the cabling chamber of the main panel. Rear extension not acceptable.
- Where more than one cable has to be terminated per unit, the arrangement shall permit connection and disconnection of cables separately without disturbing other cables.
- Push – ON type/Heat-shrinkable type cable end terminations / straight-through jointing kits shall be used wherever required.
- Where specified the following cable termination accessories, suitable for the type, size and number of cables to be terminated, to be supplied with switchboard.
 - ⇒ Cable sockets with all HT terminals (sockets set at such an angle that cable tails can be brought up for termination with minimum bending and setting)
 - ⇒ HT cable termination and sealing kits
 - ⇒ Power cable termination facilities shall be designed to facilitate easy approach to CTs.
 - ⇒ Double compression type brass cable glands and crimping type tinned heavy duty copper lugs for HT, LT power and control cables.

Protection and Measurement

Electrical Protection

Selection of protective scheme will be based mainly on reliability, sensitivity, selectivity. All main protections shall be fast acting type in order to clear the faulty system from the healthy system in earliest possible time to minimise damage to equipment and ensure continuity of power supply.

Protective scheme requirement

- All the main protective relays shall be microprocessor based numerical and communicable type.
- Auxiliary relays, timers switches, etc. required to make the scheme complete shall be considered as part of the scope of work.
- All CT-PT shall be suitable for the relay-meter requirement – lead burden
- All CT-PT wires shall be brought to test terminal blocks before connecting to circuits.
- The circuits of various protections (coming from other panels) shall be connected to master trip relays through auxiliary relays (flag indicated).
- VAA type auxiliary relays shall be provided for each transformer fault. Connection of the relay shall be through links to facilitate maintenance.
- Relay ranges and scale of meters shall be finalized during drawing approval stage.
- Contact arrangement, number of poles/ways in control/selector switches shall be as per the requirement/approved scheme.
- ICTs whenever considered necessary shall be included in the scope
- For control supply distribution, panel to panel separate set of terminal blocks shall be provided at top of the panel. All items / accessories required for above in each panel and in incoming panels shall be provided by the supplier.
- All relays shall be hand/self-reset type with flag indication. NO/NC contacts for relays shall be as per the requirement of approved protection, annunciation and interlock schemes. Wherever required supplier shall provide auxiliary relays for contact multiplication.
- Annunciation facia shall be mounted on Incomer switchgear panels and details shall be finalized during drawing approval stage.
- Centre line of switches, lamps, meters shall be matched to give uniform appearance and mounting height of switches shall be between 1.1 to 1.8 m.

Current Transformer (Panel Mounted)

- Separate sets of current transformers shall be used for differential protection and separate cores shall be used for, over current protection and measurement purposes. CT's on incomer side shall be mounted before incomer breaker and CT's for outgoing feeder shall be mounted after the breaker.
- Short time ratings and insulation level of CT's shall be similar to rating of associated breaker.
- CT ratios specified are provisional. Where outputs and accuracy are not specified, these shall be such as may be required by the circuits in which they are used. Generally the protection CT's and metering CT's shall have 5P20 and 0.5 class respectively.
- CT's shall be bar/ window primary type.
- CT's shall have shorting link on secondary side to facilitate insertion of meters on secondary side without opening CT circuits.
- CT Ratio shall be as marked on the Single Line Diagram attached with this Specification.

Potential Transformers

- Fixed type line PT mounted in separate panel shall be acceptable. However, if line PT is located in incomer breaker panel, draw out type PT shall be considered.
- High voltage side of PTs shall have fuses and MCCB's on low voltage side
- Low voltage star winding shall have all three phase and neutral connections brought out to terminals and one phase shall be earthed.
- Insulation levels shall be similar to rating of associated board.
- Accuracy class 1.0 shall be used.
- VA burden shall be selected based on meters and relays connected with the PT.

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Relays

- Relays shall be Microprocessor based numerical and communicable type. Protocol for communication shall be IEC 61850.
- All relays shall be flush mounted in dust proof cases and shall be mounted on front side of cubicle.
- Major relays are as indicated in the specification or single line diagram.
- Master trip relay shall be hand reset and shall have 3 NO and 3 NC contacts in addition to those required by the protection/control scheme.
- All timers and protection relays shall have flag indicators.
- Relay ranges, exact type, number of aux. relays, timers shall be finalized during drawing approval stage.
- All instantaneous current protection relays shall be of 3 pole type.

Indicating Instruments

- All indicating instruments shall conform to IS: 1248-1983 and IS – 2419-1979.
- Shall be capable of withstanding system fault current taking into account CT saturation.
- Shall be back connected.
- Shall be located in the upper part of the panel.
- Shall have 96 sq. mm square flush case, non-reflecting type, clearly divided and indelibly marked scales, sharply out lined pointers and zero adjusting device.
- The minimum scale reading shall not be more than 10%. Maximum reading shall be 150% full load for transformers panels.
- Each voltmeter shall be calibrated with coil hot. The scale shall be open between 60% to 125% of normal volts and shall be suppressed below 60% of normal volts.
- Class of accuracy shall be 1.0 or better.
- The full load reading of each ammeter shall occur at the most prominent part of the scale. The minimum scale reading shall not be more than 10%. Maximum reading shall be 150% full load for transformer panels and 600% full load for motor panels.

Annunciators

- Shall be of static type.
- Hooter and bell for trip and alarm indication respectively.
- Shall be suitable to work on DC supply as specified.
- Test, accept and reset facilities (with push button) shall be provided on each panel.
- Suitable audio – visual indication shall be provided on DC failure. Audio alarm with reset facility shall be provided. Visual indication shall be panel- wise.
- Spare annunciation points shall be wired upto terminal blocks. 20% spare facias shall be provided.
- Each point shall have two bunch LEDs in parallel.
- All trip points facia shall have red color and non trip points white color.
- The cover plate of facia shall be flush with panel
- Shall be capable to receive simultaneous signals
- Shall be capable to receive signal during testing mode
- Scope of supply includes all interconnections, bell hooter, buzzer, alarm facility, push button etc. required to achieve complete function of above scheme.
- Sequence shall be as follows:

	Visual	Audio
On occurrence of fault	Lamp flashing	on
On acceptance	Lamp steady “on”	off
On reset	Off	off
On test	Lamp flashing	on

- Annunciation in the switchboard shall have following provisions:

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- Each transformer & other feeder shall have 12-way uniform facia.
- Each bus PT shall have 12-way uniform facia.
- Bus coupler or tie shall have sufficient facia (for each feeder to indicate tripping +20% spare)
- One common point shall be provided to indicate operation of annunciation system of the complete board (in case of any trouble in the board in tie feeder, bus coupler, incomer etc.)
- All auxiliary relays of transformer feeders shall have 4 NO contacts all master trip relays shall have 2 NO contacts for remote/DCS/PLC indication for repeat annunciation in addition to contacts required for scheme under scope of works.

Control supply

- Control supply buses shall run throughout the switchgear.
- Two DC feeders shall be taken in each board controlled by MCCB's.
- In each panel for controlling of its DC supply MCCB (DC duty) shall be used. DC auto changeover and manual changeover facility shall be provided. Failure of DC supply shall be monitored in the switchboard as well as at remote.
- 240V AC shall be taken from station aux. board.
- Each section shall have separate feed with automatic change over scheme.
- Each panel shall have one MCB for controlling its AC supply.
- Sub circuits shall be protected with HRC fuses/ MCB in each panel for indication lamps, closing & tripping circuits.

Earthing Devices

- Either integral earthing switch or a separate earthing switch shall be provided to facilitate earthing of busbars and any feeder circuit.
- Earthing truck (if included) shall have PT and alarm provision. (Separate trucks shall be provided for feeder and bus earthing through bus PT panel in each switchboard). One no. earthing truck for feeder earthing and one no. for busbar earthing shall be provided for each board. It shall not be possible to use bus-earthing truck for feeder earthing and vice-versa.
- Rating of earthing device shall be in line with associated board.
- Interlock provision shall be there so that incomer cannot be closed if bus-earthing device is connected.
- In case feeders are having integral earth switch, earthing trucks may not be required.

Control and Selector Switches

- Control switches for circuit breaker ON/OFF control – 3 position spring return to neutral with lost motion device and pistol grip handle.
- Other control and selector switches – stay put type with wing type knobs.
- Ammeter selector Switches- 4 position, make before break.
- Voltmeter selector switches- 7 positions as required.
- Colour : Black
- Contact Rating:

Continuous	10 amps
AC11	4 amps, 240V
DC11	0.5A, 30V, L/R- 40ms.

Push buttons

Contact Rating

Continuous	10 amps
AC11	4 amps, 240V
DC11	0.5A, 30V, L/R- 40ms.

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COLOR:

ACCEPT	BLUE
RESET	BLACK
TEST	YELLOW

Control Circuit Fuses:

HRC link type confirming to IS 9224-1979.

Protective Earthing

- Continuous earth bus of minimum size 50x6 mm of copper or equivalent aluminium/galvanized steel section, designed to carry the peak short circuit and short time fault current as specified.
- Provided at the bottom extending throughout the length of the board, bolted/brazed to the frame work of each panel with an earthing terminal at each end for terminating external earth conductor.
- Vertical earth bus for earthing individual functional units.
- Hinged doors earthed through flexible earthing braid.
- Looping of earth connection resulting in loss of earth connection to other devices when the loop is broken not permitted.
- Withdrawable units provided with self aligning, spring loaded, silver plated copper scrapping earth contacts of make before/break after type, ensuring earth continuity from service to the test position.

Test and Maintenance Equipment

Each board to be supplied with 1 set of test plugs.

Constructional Features**Mechanical Design**

- Sheet steel clad, compartmentalized, floor mounted, free standing design.
- Minimum sheet steel thickness: doors and covers – 2 mm cold rolled, other load bearing members – 2.5 mm
- Doors shall be provided with lock and key arrangement
- Degree of protection shall be IP5X.
- Assembled on base channel of structural steel ISMC 75 painted black.
- Operating height shall be between 450 to 1800 mm. Switchboard height not to exceed 2500 mm.
- Earthed metallic barriers between compartments and between vertical sections.
- Seal off bushings wherever bus bars pass through metallic partition.
- Lockable front doors with concealed hinges with door not forming part of the draw-out truck.
- Panels shall be extensible on both sides.
- Removable sheet steel covers shall be provided at rear.
- Explosion vent for each chamber
- Control cables entry shall be from front side.
- CTs shall be located in such a way that they are easily accessible.
- Panel door switch shall be provided for illumination inside the panel.
- All live parts shall be insulated by taping, supported by suitably designed insulators. Proper insulation of bus bars, upper and lower contacts of breakers and sealing of opening of bushings shall be provided to eliminate accidental contacts.
- Screw wire mesh in the power cable chamber of incoming feeder is to be provided.

A) INDOOR 33KV HT VCB PANEL

Supply, Installation, Testing and Commissioning of 33 kV Over Head Line & Under Ground Cable from Intake Substation to GC Berth Substation for strengthening of power supply arrangement of RMQC-3 of HDC, KoPT.

This includes, Design, fabrication, supply, installation, testing and commissioning of HT panel indoor 33KV, 1250Amps, 3phase, 50Hz, 25KA VCB for 3sec.

Incoming Feeder with PT:

This includes supply at site, Vacuum Circuit Breaker, suitable for 33KV, 25KA, 1250A, 500MVA, 3 Phase, 50 HZ effectively earthed, neutral system comprising of proper housing of breaker, safety shutters, isolating plugs and socket and VCB trolley with 3 nos. Vacuum Interrupters with safe aligning finger type, isolating contacts suitable for vertical/horizontal isolation and horizontal draw out. Necessary control Protection and metering circuits are completely assembled, wired and enclosed in a weather and dust proof cubicle.

The HT Panel shall be made of sheet steel enclosure, dust and vermin proof, suitable for indoor use. This shall be suitable to receive power at 33 KV, 50 Hz, 3 phase AC with all equipment fittings and accessories for efficient and trouble free operation.

- a) 33KV, 1250A VCB The self-tripping mechanism with numerical relay with IDMT, over current, earth fault and Instantaneous protection including TVM, MFM and all others panel's indications lamps.
- b) Incoming cable entry box shall be provided for the required cable entry.
- c) Insulation level
 - i) 1.2/50 microsecond Impulse withstand 170 kV peak voltage
 - ii) One minute power frequency withstand 70 kV rms voltage
- d) Rated current
 - i) Continuous

- Bus bar	1250 A
- Incoming/outgoing circuit breaker	1250 A
 - ii) Short time current for 3 seconds 25 kA rms
- e) Circuit breaker
 - i) Rated breaking capacity Symmetrical. 25 KA / 3 Sec.
 - ii) Rated making capacity 62.5 KA
 - iii) Total breaking time 7 cycles maximum
 - iv) Operating sequence As per IS/IEC
- f) Type of charging: Manual as well as motorized mechanism with 230V AC operated motor.
- g) Make : As per the list of makes enclosed herewith.
- h) Shunt trip coil : 30 V DC
- i) Closing coil : 30 V DC
- j) Busbar chamber with Copper busbars, heat shrinkable PVC sleeved/ powder coated with colour code. The busbars shall be of high conductive electrolyte copper.
- k) 230VAC space heaters with ON-OFF switch and thermostat.

- l) 1phase, resin cast with fuse unit, draw out, line connected PT ratio of $33000/\sqrt{3}/110/\sqrt{3}$ Volts of 100VA burden to meet with auxiliary power requirement of metering and protection. Having accuracy of 0.5/3P.
- m) Epoxy cast resin CTs with 15VA burden, STR of 25 KA for 1 sec., metering accuracy class 0.5 and protection accuracy 5P20 and having of CTR 400-200/5-5A.
- n) The Trivector meters shall be digital type of approved make and it should display Amps, Volts, KVA, KW, KWHr, KVAR, PF and MD etc. The meter shall provide with external port for remote monitoring.
- o) The Multi-Function Meter (MFM) shall be digital type of approved make and it should display Amps, Volts, KVA, KW, KWHr, KVAR, PF, Frequency and etc. The meter shall provide with external port for remote monitoring.
- p) Breaker ON-OFF LED indicating lamp.
- q) Circuit trip/healthy indicating LED lamp with pushbutton.
- r) Breaker spring charged LED lamp indication.
- s) TNC (Trip Neutral Close) switch.
- t) Numerical relays consist of IDMTL + Inst 3 O/C + Inst E/F relay.

VAX – 31 Trip circuit supervision.

VAJH – 23 master trip.

Numerical relay shall be compatible with SCADA and shall have event logging features.

- u) Operating handle, spring charging handle and other required accessories shall be supplied.
- v) Cable box suitable for receiving single length of 2Runs of 3C x 120 Sq. mm HT XLPE cable.
- w) Hand held lamps for panel internal illumination shall be provided with 240V AC source.
- x) Hooter for tripping.
- y) 30V DC external supply shall be provided for control circuit of complete breaker operation.
- z) Bus bar support insulator:-Non hygroscopic, track resistant, high strength insulator. (Calculation for validating dynamic force withstands capability to be submitted during drg. Approval)

Outgoing Feeder (Without PT):

Technical Specification shall be similar to Incoming feeder, but without PT. The electro-mechanical type auxiliary relay for transformer shall be provided.

Numerical type Differential relay for all transformer feeders shall be provided.

The VCB shall be complete with necessary interconnection with fine feruled wiring, foundation bolts, earthing, etc. The VCB shall be supplied to conform to relevant IS, amended up to date, along with

Supply, Installation, Testing and Commissioning of 33 kV Over Head Line & Under Ground Cable from Intake Substation to GC Berth Substation for strengthening of power supply arrangement of RMQC-3 of HDC, KoPT.

manufacturers test certificate. Required no. of Danger board /Stickers of HT voltage in two languages English/Hindi is to be provided on the panel.

Epoxy cast resin CTs with 15VA burden, STR of 25 KA for 1 sec., metering accuracy class 0.5 and protection accuracy 5P20/PS and having of CTR 200-100/5-5-5A.

The necessary approval of the drawing of VCB panel shall be obtained from HDC before fabrication. Panel shall be connected with earthing as per IER.

INSTALLATION OF INDOOR HT VCB PANEL:

This includes installations, testing and commissioning of VCBs at 33KV sub-station VCB with P.T. as incomer and without PT as outgoing feeder.

All the VCB's shall be erected by using suitable size of M.S. channel, foundation bolts including grouting of the bolts of each VCB panel. Each panel shall be connected with separate and distinct Earthing. After installation of VCB panel, necessary test and trial are to be carried out for proper functioning of safety, devices, relay etc. and before charging VCB all the tests required under relevant ISS and IEC – Rules 1956 shall be carried out and the result shall be in conformity with specifications and copies of test results shall be furnished to EIC. The work includes all Labour & materials required for installation & commissioning of VCB and shall be done as directed by E.I.C.

Tentative lay out:-

I/C-1	O/G- Tr-1 33/3.3, 6MVA	O/G- Tr-2 33/11, 6MVA	BC	O/G- Tr-3 spare	O/G- Tr-4 33/3.3, 6MVA	O/G- spare	I/C-2
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I/C-Incomer

O/G-Outgoing

BC – Bus Coupler

B) INDOOR 3.3KV HT VCB PANEL

This includes, Design, fabrication, supply, installation, testing and commissioning of HT panel indoor 3.3kV, 1250Amps, 3phase, 50Hz, 25kA VCB for 3sec.

- Incoming Feeder With PT:**

This includes supply at site, Vacuum Circuit Breaker, suitable for 3.3kV, 25kA, 1250A, 500MVA, 3 Phase, 50 HZ effectively earthed, neutral system comprising of proper housing of breaker, safety shutters, isolating plugs and socket and VCB trolley with 3 nos. Vacuum Interrupters with safe aligning finger type, isolating contacts suitable for vertical/horizontal isolation and horizontal draw out. Necessary control Protection and metering circuits are completely assembled, wired and enclosed in a weather and dust proof cubicle.

Supply, Installation, Testing and Commissioning of 33 kV Over Head Line & Under Ground Cable from Intake Substation to GC Berth Substation for strengthening of power supply arrangement of RMQC-3 of HDC, KoPT.

The HT Panel shall be made of sheet steel enclosure, dust and vermin proof, suitable for indoor use. This shall be suitable to receive power at 3.3 kV, 50 Hz, 3 phase AC with all equipment fittings and accessories for efficient and trouble free operation.

- a) 3.3kV, 1250A VCB The self-tripping mechanism with numerical relay with IDMT, over current, earth fault and Instantaneous protection including TVM, MFM and all others panel's indications lamps.
- b) Incoming cable entry box shall be provided for the required cable entry.
- c) Insulation level
 - i) 1.2/50 microsecond Impulse withstand 75 kV peak voltage
 - ii) One minute power frequency withstand 28 kV rms voltage
- d) Rated current
 - i) Continuous

- Bus bar	1250 A
- Incoming/outgoing circuit breaker	1250 A
 - ii) Short time current for 3 seconds 25 kA rms
- e) Circuit breaker
 - i) Rated breaking capacity Symmetrical. 25kA / 3 Sec.
 - ii) Rated making capacity 62.5 kA
 - iii) Total breaking time 7 cycles maximum
 - iv) Operating sequence As per IS/IEC
- f) Type of charging : Manual as well as motorized mechanism with 230V AC operated motor
- g) Make : As per the list of makes enclosed herewith.
- h) Shunt trip coil : 30 V DC
- i) Closing coil : 30 V DC
- j) Busbar chamber with Copper busbars, heat shrinkable PVC sleeved/ powder coated with colour code. The busbars shall be of high conductive electrolyte copper.
- k) 230VAC space heaters with ON-OFF switch and thermostat.
- l) 1phase, resin cast with fuse unit, draw out, line connected PT ratio of 3300/ $\sqrt{3}$ /110 / $\sqrt{3}$ Volts of 100VA burden to meet with auxiliary power requirement of metering and protection. Having accuracy of 0.5/3P.
- m) Epoxy cast resin CTs with 15VA burden, STR of 25 kA for 1 sec., metering accuracy class 0.5 and protection accuracy 5P20/PS and having of CTR 1250-800/5-5-5A.
- n) The Trivector meters shall be digital type of approved make and it should display Amps, Volts, kVA, kW, kWhr, kVAR, PF and MD etc. The meter shall provide with external port for remote monitoring.

- o) The Multi-Function Meter (MFM) shall be digital type of approved make and it should display Amps, Volts, kVA, kW, kWhr, kVAR, PF, Frequency and etc. The meter shall provide with external port for remote monitoring.
- p) Breaker ON-OFF LED indicating lamp.
- q) Circuit trip/healthy indicating LED lamp with pushbutton.
- r) Breaker spring charged LED lamp indication.
- s) TNC (Trip Neutral Close) switch.
- t) Numerical relays consist of IDMTL + Inst 3 O/C + Inst E/F relay +REF.

VAX – 31 Trip circuit supervision.

VAJH – 23 master trip.

Numerical relay shall be compatible with SCADA and shall have event logging features.

- u) Operating handle, spring charging handle and other required accessories shall be supplied.
- v) Cable box suitable for receiving single length of 3C x 400 Sq. mm HT XLPE cable.
- w) Hand held lamps for panel internal illumination shall be provided with 240V AC source.
- x) Hooter for tripping.
- y) 30V DC external supply shall be provided for control circuit of complete breaker operation.
- z) Type of charging : Manual as well as motorized mechanism with 230V AC operated motor.
- aa) Bus bar support insulator:-Non hygroscopic, track resistant, high strength insulator.(Calculation for validating dynamic force withstand capability to be submitted during drg. Approval).

- **Outgoing Feeder (Without PT):**

Technical Specification same as Incoming feeder but without PT. The auxiliary relay for transformer shall be provided.

The VCB shall be complete with necessary interconnection with fine feruled wiring, foundation bolts, earthing, etc. The VCB shall be supplied to conform to relevant IS, amended up to date, along with manufacturers test certificate. Required no. of Danger board /Stickers of HT voltage in two languages English/Hindi is to be provided on the panel.

Epoxy cast resin CTs with 15VA burden, STR of 25 kA for 1 sec., metering accuracy class 0.5 and protection accuracy 5P20/PS and having of CTR 400-200/5-5-5A.

The necessary approval of the drawing of VCB panel shall be obtained from HDC before fabrication. Panel shall be connected with earthing as per IER.

INSTALLATION OF INDOOR HT VCB PANEL:

This includes installations, testing and commissioning of VCBs at 3.3kV sub-station VCB with P.T. as incomer and without PT as outgoing feeder.

All the VCB's shall be erected by using suitable size of M.S. channel foundation bolts including grouting of the bolts of each VCB panel. Each panel shall be connected with separate and distinct Earthing. After installation of VCB panel, necessary test and trial are to be carried out for proper functioning of safety, devices, relay etc. and before charging VCB all the tests required under relevant ISS and IEC – Rules 1956 shall be carried out and the result shall be in conformity with specifications and copies of test results shall be furnished to EIC. The work includes all Labour & materials required for installation & commissioning of VCB and shall be done as directed by E.I.C.

Tentative lay out:-

EXISTING PANEL	EXISTING PANEL	EXISTING PANEL	EXISTING PANEL	EXISTING PANEL	EXISTING PANEL	EXISTING PANEL	EXISTING PANEL	EXISTING PANEL	DUMMY PANEL	I/C-Incomer	O/G-Outgoing
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I/C-Incomer O/G-Outgoing

6.3 BATTERY BANK AND BATTERY CHARGER

➤ TECHNICAL SPECIFICATIONS OF BATTERY

The 30 V DC Battery Bank should be consisted of 15 Nos., 2 V, 60 AH (at 10 Hour Rate) Cells (Maintenance free, Lead Acid type). The **Battery Bank** should be complete in all respect and equipped with all necessary accessories like, **Inter-cell Connectors (Copper)**, **Connecting Leads**, etc. The spares / attachments, which are meant necessary for the smooth functioning of the equipment and specially are not mentioned here shall be assumed to be included in the scope of supply.

Battery racks suitable for accommodating 15 cells should be supplied & installed by the Contractor. The racks should be made of wood and to be so designed and placed as to permit easy handling of the cells while in operation.

The wooden battery racks should have acid resisting and flame proof coating.

➤ TECHNICAL SPECIFICATIONS OF BATTERY CHARGER :

- i) The **Battery Charger**, to be used for charging **30 V, 60 AH Battery Bank** , should be of **Float-cum-Boost Charger** Type , having provision for **auto Changeover** from **Boost to Float & vice-versa** and following Technical features:-
 - a) Should be suitable for Indoor installation and to be supplied with all accessories.

- b) Should have facility to regulate the Battery Charging current and output voltage as per requirement (to be indicated by the Manufacturer of the Battery Bank) and limiting the total current within the maximum capacity of the charger.
- c) Should have provision for automatic switching to ensure different applications of both 33 kV & 3.3 kV Panels to be installed at the existing G.C. Berth Substation & newly constructed 3.3 kV Switch-Station. Suitable control arrangement is to be provided to ensure that output D.C. voltage is always within the limits specified, even if the cell voltage is high.
- d) Should be suitable for operation in **Manual Mode**, besides the **Auto Mode**. Suitable device is to be provided for adjusting charging current and voltage when the charger is to be operated in Manual Mode.

ii) **Other Technical Particulars :**

a) **Output Voltage:**

Nominal: 30 V DC
Maximum: 36 V DC
Minimum: 24 V DC

b) **Charging Current :**

Maximum continuous output current: 16 Amps

Maximum continuous D.C. Load: as per requirement.

Maximum Battery Charging Current: to be indicated by the manufacturer of the Battery Bank.

c) **Type:** Solid-state, both Auto & Manual Control.

d) **Input Voltage:** 230 V – 250V A.C., Single Phase.

e) **Input Frequency:** 50 Hz \pm 5%.

iii) **Protection :**

- a) The charger shall be protected against following conditions with provision of delayed protective and / or indicative action as per scheme requirement.
- b) Input Voltage Surge.
- c) Input over / under voltage.
- d) Output over / under voltage / short circuit / over load.
- e) Earth fault in + ve and – ve D.C. output.
- f) Battery reverse polarity.

iv) **The Charger shall incorporate the followings :**

- a) M.C.B. for incoming / outgoing supply
- b) H.R.C. / glass cartridge / semi conductor fuses for different circuits. All fuses shall be properly labelled for proper identification.
- c) Surge Arrestors.

v) **Indication :**

The charger shall be provided with following L.E.D. indications to identify abnormalities through incorporation of suitable scheme.

- a) Mains ON
- b) Output ON
- c) Input over / under voltage and power supply fail.
- d) Output over / under voltage.
- e) Earth Fault
- f) Battery reverse polarity

All indicating LED lamps, switches, control knobs, terminal blocks, etc., shall be properly labelled for easy identification.

vi) **Meters** :

Following meters with selector switches shall be provided to measure the following:

- a) Analogue Ammeter. Of appropriate scales with Selector Switch for measuring battery float / boost charging current and output current.
- b) Analogue Voltmeter of appropriate scales with Selector Switch for measuring battery and output voltage.
- c) Analog Voltmeter for measuring input AC Voltage.

vii) **Control** :

Following controlling arrangement shall be provided for different functions of battery charger:

- a) AUTO/MANUAL Selector Switch
- b) Manual operation controlling device
- c) Mains ON
- d) Output ON
- e) Voltmeter Selector Switch
- f) Ammeter Selector Switch

viii) **Enclosure** :

The chargers shall be enclosed in floor mounted type enclosure with provision for proper ventilation.

- ix) **Two sets of Instruction Manuals for Erection, Operation & Maintenance, two sets of Drawings for Equipment Details and two sets of Circuit Diagram** should be submitted along with the above Battery Charger unit.

6.4 CABLE TRAY

GI Cable tray

Cable tray shall be prefabricated Trays should be made of M.S Angle of size 50 mm. x 50 mm. x 6 mm. for both side runner with Spans Limited to 2.5 meter(approx.). Cross Support should be of M.S Flats of size 450 mm. x 32 mm. x 6 mm. (approx.) welded to Runner Angle at 300 mm. (approx.) apart. After fabrication the same shall be Hot dip galvanised to achieve thickness of galvanisation shall be as per IS.

Perforated cable trays for control wiring shall also be Hot dip galvanised to achieve thickness of galvanisation shall be as per IS.

Suitable covers shall be provided on cable trays to be fixed outside trenches.

7.0 EARTHING SYSTEM

7.1 General

Only Plate Earthing shall be adopted. The earthing and lightning protective systems shall comply with all currently applicable standards, regulations and safety codes of the locality where the installation is to be carried out. Nothing in this specification shall be construed to relieve the Bidder of this responsibility. Wherever the word GI is used it means that hot Dip GI.

Earthing Strip shall be of **hot dip GI** of size **50mmx6mm for Body & of Copper 50mmx6mm for Neutral** protected against corrosion and readily accessible. The strip shall be connected to earthing terminals with Stainless Steel nut – bolts. **The strip shall be clamped with Aluminum saddles and stainless steel nut-bolts. The Cost of Strip and required accessories, labour shall be included in the overall cost (offer).**

The installation work shall conform to the latest applicable Electricity Rules, standards (IS:3043) and codes of practices.

- After award of the Contract, the Contractor shall, carry out soil resistivity measurements at the site. A detailed earthing design shall be submitted for approval based upon the results of these tests.
- The total resistance of the earth grid shall be less than 1 ohm.
- The earthing & lightning conductors and electrodes shall be supplied. Conductors shall be free from rust, scale and other electrical and mechanical defects and all materials used shall conform to relevant standards or approved by the Employer. The sizes, materials and quantity shall be as listed.
- Copper earthing stranded conductors shall be annealed soft drawn type. Copper earthing rods and flats shall be hard drawn type. Lead coating shall be provided on copper conductors to prevent its corrosion in aggressive environments.
- Steel earthing conductors above ground shall be hot-dip galvanized, unless otherwise stated, to prevent atmospheric corrosion. If painted steel conductors are required they shall be painted with two coats of approved anti-corrosive paint.
- Flexible braids of sizes & materials shall be supplied for earthing of operating handles of isolators and earthing of equipment on moving platforms.
- The links in suitable enclosures shall be supplied for connection between each lightning conductor down comer and earth electrode.
- Cad welding type jointing equipment shall be supplied whenever specifically indicated.

7.2 Scope of Installation Work

The successful Bidder shall install bare/insulated, copper/aluminium conductors, braids, etc., required for system and individual equipment earthing. All work such as cutting, bending, supporting, painting/coating drilling, brazing/soldering/welding, clamping, bolting and connecting onto structures, equipment frames, terminals, rails or other devices shall be in the scope of work. All incidental hardware and consumable such as fixing cleats/clamps, anchor fasteners, lugs, bolts, nuts, washers, bitumastic compound, anti-corrosive paint as required for the complete work shall be deemed to be included as part of the installation work.

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The scope of installation of earth conductors in outdoor areas, buried in ground shall include excavation in earth upto 600 mm deep and 450 mm wide, laying of conductor at 600 mm depth (unless stated otherwise), brazing/welding/ cadwelding as reburied of main grid conductor joints as well as risers of 500 mm length above ground at required locations and backfilling. Backfilling material to be placed over buried conductor shall be free from stones and other harmful mixtures. If the excavated soil is found unsuitable for backfilling, the Bidder shall arrange for suitable soil from outside.

The scope of installation of earth connection leads to equipment and risers on steel structures/walls shall include laying the conductors, welding/cleating at specified intervals, welding/brazing to the main earth grids' risers, bolting at equipment terminals and coating welded/brazed joints by bitumastic paint. Galvanized conductors shall be touched up with zinc rich paint where holds are drilled at site for bolting to equipment/structure.

The scope of installation of electrodes shall include installation of these electrodes such as (a) directly in earth, (b) in constructed earth pits, and connecting to main buried earth grid, as per enclosed drawings/relevant standards. The scope of work shall include excavation, construction of the earth pits including all materials required for construction of the earth pits and connecting to main earth grid conductors.

The scope of installation of lightning conductors on the roofs of buildings shall include laying, anchoring, fastening and cleating of horizontal conductors, grouting of vertical rods where necessary, laying, and fastening/cleating/welding of the down comers on the wall/columns of the building and connection to the test links above ground level.

Normally an earth electrode shall not be situated less than 2m from any building. Care shall be taken that the excavations for earth electrodes may not affect the column footing or foundation of the building. In such cases, electrodes may be further away from the building.

The location of the earth electrodes shall be such that the soil has reasonable chances of remaining moist, as far as possible. Entrances, pavements and roadways are definitely avoided for locating the earth electrodes.

The scope of installation of the test links shall include mounting of the same at specified height on wall/column by suitable brackets and connections of the test link to the earth electrode.

7.3 Work Details

Earthing conductors along their run on walls and columns shall be supported by cleating/welding at intervals of 750 mm and 1000 mm respectively.

Wherever earthing conductors cross underground service ducts and pipes, it shall be laid 300 mm below; the earthing conductor shall be bounded to such service ducts/pipes.

Wherever main earthing conductor crosses cable trenches, they shall be buried below the trench floor.

Suitable earth risers approved by the Engineer-in-Charge shall be provided above finished floor/ground level, if the equipment is not available at time of laying of the main earth conductors. The minimum length of such riser inside the building shall be 200 mm and outdoors shall be 500 mm above ground level. The risers to be provided shall be marked in project drawings.

Earth leads and risers between equipment earthing terminals and the earthing grid shall follow as direct and short a path as possible.

Neutral connection shall never be used for the equipment earthing.

Each neutral point of a transformer shall be earthed to two separate earth electrodes for connection with earthing system.

Shield wire in sub-stations shall be connected to the earthing grid through test links at every alternate switchyard portal tower.

A separate earth electrode bed shall be provided adjacent to structures supporting lightning arrestors and coupling capacitors. Earth connections shall be as short and as straight as practicable. For arrestors mounted near transformers, earth conductors shall be located clear of the tank and coolers.

Wherever earthing conductor passes through walls, galvanized iron sleeves shall be provided for the passage of earthing conductor. The pipe ends shall be sealed by the Bidder by suitable water proof compound. Water stops shall be provided wherever earthing conductor enters the building from outside below grade level. Water stops and above mentioned sleeves shall be provided by the Bidder.

7.4 Earthing Connections

All connections in the main earth conductors buried in earth/concrete shall be welded/brazed type. Connection between main earthing conductor and earth leads shall also be of welded/brazed type. Cadwelding type connections shall be done if specifically indicated.

Connection between earth leads and equipment shall be of bolted type, unless specified otherwise or shown in the drawings. Equipment Bidders shall provide earthing terminals on their equipment.

Welding and brazing operations and fluxes/alloys shall be of approved standards.

All connections shall be of low resistance. Contact resistances also shall be minimum.

All bimetallic connections shall be treated with suitable compound to prevent moisture ingress.

Metallic conduits and pipes shall be connected to the earthing system unless specified otherwise.

7.5 Earth Electrode

Electrodes shall as far as practicable, be embedded below permanent moisture level.

Electrodes shall be housed in test pits with concrete covers for periodic testing of earth resistivity. Installation of rod/pipe/plate electrodes in test pits shall be convenient for inspection, testing and watering wherever required.

7.6 Plate Earth Electrode

For plate electrode minimum dimension of the electrode shall be as under:-

- Copper plate electrode 60 cm x 60 cm x 10 mm thick

Heavy duty cast iron frame with cover shall be suitably embedded in the masonry.

Soil, salt and charcoal placed around the electrode shall be finely graded, free from stones and other harmful mixtures. Backfill shall be placed in the layers of 250 mm thick uniformly spread and compacted. If excavated soil is found unsuitable for backfilling, the Bidder shall arrange for a suitable soil from outside.

7.7 Method of Connecting Earthing Lead to Earth Electrode

In the case of plate earth electrodes, the earthing lead shall be securely bolted to the plate with two bolts, nuts, check-nuts and washers.

All materials used for connecting the earth lead with electrodes shall be GI in case of GI pipe and GI plate earth electrodes and of copper in case of copper pipe / plate electrodes.

The earthing lead shall be securely connected at the other end to the main board.

7.8 Size of Earthing Conductor

The earthing system shall be designed in such a way that over all earth resistance is less than one ohm. The soil resistivity shall be measured at site by the Bidder. If required, number of earth electrodes to be increased by the Bidder to achieve the required earth resistance.

8.0 LIST OF APPROVED MAKES

SL.No.	ITEM	Name of Manufacturers
1	Transformer	ABB/VOLTAMP / BHARAT BIJLEE/CGL/ SIEMENS/ SCHNEIDER
2	VCB Panel	SIEMENS / ABB / SCHNEIDER /
3	HT Cable	RPG / APAR INDUSTRIES / TORRENT / HAVELLS / UNISTAR/POLYCAB
4	LT Cable (XLPE)	UNISTAR / HAVELLS / RPG / APAR INDUSTRIES/ TORRENT/POLYCAB
5	Outdoor CT	SCHNEIDER / JYOTI / KAPPA / PRAGATHI
6	Outdoor PT	SCHNEIDER / JYOTI / KAPPA / PRAGATHI
7	Volt meter and Ammeter	AE / MECO / YOKINS / NIPPEN
8	PCVCB	SCHNEIDER / SIEMENS / ABB / CGL
9	Gang Isolator	A BOND STAND/ Any reputed make.
10	LA	OBLUM / LAMCO / ELEKTROLITES
11	LT Panels	SIEMENS / L&T / SCHNEIDER / ABB
12	Cable St.through jointing / end Termination Kit	3M / RAYCHEM /DENSON
13	Battery	HBL/EXIDE/AMARON/ AMCO
14	Selector switches, Push buttons, Emergency Switches	KAYCEE / L & T / GE / BCH / LEGRAND
15	HRC Fuses	L & T / GE / SIEMENS / ABB / INDO KOPP
16	Indicating light	AE / KAYCEE / VAISHNAV / L & T /SIEMENS
17	MCB	L & T / LEGRAND / SIEMENS / ABB / SCHNEIDER
18	Sub Distribution Board	L & T / LEGRAND / SIEMENS / SCHNEIDER /

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SL.No.	ITEM	Name of Manufacturers
		HENSEL
19	EL MCB	L & T / SCHNEIDER / LEGRAND / SIEMENS / ABB
20	PVC insulated copper conductor single/multi core stranded wires of 650/1100 volt grade	HAVELLS / FINOLEX / RPG / UNIFLEX / NICCO / RR Kables
21	Steel Conduit/PVC Conduit	BEC / AKG / NIC
22	Switches, TV & Telephone Socket outlets, Boxes	MK / CLIPSAL / LEGRAND / NORTH WEST / ANCHOR
23	Light Fixtures(LED)	PHILIPS / BAJAJ / WIPRO / CROMPTON/HAVELLS
24	Cable lug & Cable Gland	DOWELLS / JHONSON / RAYCHEM
25	Terminal Blocks	WAGO & CONTROLS / PHOENIX CONTACTS / OBO BETTERMANN
26	Lightning Protection	DUVAL MESSIEN / SOUTH ASIAN ENTERPRISE LTD. / OBO BETTERMANN
27	Multi-function Meter	ABB / SIEMENS / L&T / HPL SOCOMECON/CONZERVE (ENERCON)
28	DWC HDPE Pipe	DURA LINE / CARLON / EMTELLE
29	Contactors	L&T / SCHNEIDER / SIEMENS/ABB / BCH
30	MCCB	L&T / SIEMENS / SCHNEIDER / ABB
31	Push Buttons	SIEMENS / ABB / TELEMECANIQUE / L&T / SCHNEIDER
32	Relays(Numerical/electro-magnetic)	ABB / SIEMENS / SCHNEIDER/AREVA
33	Timers	L&T / SIEMENS / TELEMECANIQUE/ABB
34	Indicating Light	L&T / SIEMENS / TELEMECANIQUE / ABB / GE
35	Indicating Instruments	AE / MECO / CONZERVE / L&T
36	Panel CTs	L&T / AREVA / JYOTI / KAPPA / PRAGATHI
37	Panel PTs	AREVA / KAPPA / PRAGATHI
38	ACB	SCHNEIDER / SIEMENS / ABB / L&T
39	Selector Switch	KAYCEE / L&T / SIEMENS / BCH / GE / SALZAR
40	Capacitor Banks	EPCOS / L&T / UNIVERSAL/ABB

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SL.No.	ITEM	Name of Manufacturers
41	Trivector Meter (Digital)	L&T / SCHNEIDER / SIEMENS / HPL SOCOMEC
42	Capacitor Panels	ABB / L&T / EPCOS / SCHNEIDER
43	Power Factor Correction Relay	EPCOS / L & T / ABB
44	Elastomeric Mat	PREMIER POLYFILM LTD / POLYELECTROSAFE / CHALLENGER
45	Structure	JINDAL/ SAIL / TISCO
46	MS & GI Conduits Accessories	STEEL MARK / NIC
47	Insulator	Aditya Birla/APAR Industries
48	ACSR	APAR Industries/Sterlite Power/Lumino Industries/ Gupta Power/Alcon
49	Hardware fitting	Reputed make as per sample approved by the Engineer
50	Items not covered above	As per samples approved

9.0

INSPECTION AND TESTING.

Equipment will be duly inspected in the manufacturer's works / premises **by TPI Agency** before dispatch to the site. **Cost of TPI Agency will be borne by the Port.**

Inspection of the items to be supplied by the contractor will be carried out **by the TPI Agency or representative of Engineer prior to despatch**, as per the procedure mentioned in the relevant Item. Such inspection will be carried out within 10 days from the date of receipt of Inspection Call from the contractor.

The Engineer of the Contract reserves the right to waive inspection at Manufacturer's premises (witnessing tests) and to inspect (physically) the materials at site, after delivery, against Manufacturer's Internal Test Certificate.

The job of installation and commissioning will be inspected by the **representative of Engineer in different stages** and also after completion of the job. For this, the contractor shall have to submit a **Field Quality Assurance Plan (FQAP)**, which will be subsequently approved by the Engineer and the inspection will be carried out in accordance with the approved FQAP.

Inspection and Testing by the representative of **Engineer** shall not relieve the successful bidder of their obligation for supplying the items and execution of the entire work in accordance with the **Contract Condition** and relevant **Acts, Rules and Codes of Practice**.

9.1 33kV Porcelain Clad Vacuum Circuit Breaker :

- Routine Tests** (as per IS: 13118) will be witnessed by the representative of Engineer at Manufacturer's works before despatch.
- Manufacturer's Certificate for **Type Test** (as per IS: 13118), for similar type equipments, should be made available to **the TPI Agency or** the representative of Engineer during the above inspection.

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9.2 33kV Outdoor Current Transformer :

Following tests will be witnessed by **the TPI Agency or** the representative of Engineer at Manufacturer's works before despatch:-

- a) **Routine Tests** as per IS: 2705.
- b) **Verification of Terminal Markings and Polarity** as per IS:2705

Manufacturer's Certificate for **Type Test** (as per IS: 2705), for similar type equipments, should be made available to **the TPI Agency or** the representative of Engineer during the above inspection.

9.3 33kV Outdoor Potential Transformer :

Following tests will be witnessed by **the TPI Agency or** the representative of Engineer at Manufacturer's works before despatch:

- a) **Routine Tests** as per IS:3156
- b) **Verification of Terminal Markings and Polarity** as per IS:3156

Manufacturer's Certificate for **Type Test** (as per IS: 3156), for similar type equipments, should be made available to **the TPI Agency or** the representative of Engineer during the above inspection.

9.4 33kV LA :

Following tests will be witnessed by **the TPI Agency or** the representative of Engineer at Manufacturer's works before despatch:

- a) **Routine Tests** as per IS:3156
- b) **Verification of Terminal Markings and Polarity** as per IS:3156

Manufacturer's Certificate for **Type Test** (as per IS: 3156), for similar type equipments, should be made available to **the TPI or** the representative of Engineer during the above inspection.

9.5 Indoor Control and Relay Panel :

Inspection will be carried out by **the TPI Agency or** the representative of Engineer before despatch. Manufacturers' Test Certificates for the components like **Relays, Ammeter, Voltmeter, Static kWH Meter & Maximum Demand Meter, Static TRIVECTOR Meter and Static Power Factor Meter** should be made available to the representative of Engineer during the above inspection.

9.6 30 V DC Battery Bank:

The Battery Bank will be inspected at site, after delivery, by **the TPI Agency or** the representative of Engineer, based on Manufacturer's Internal Test Certificate.

9.7 Battery Charger:

The Battery Chargers will be inspected at site, after delivery, by **the TPI Agency or** the representative of Engineer, based on Manufacturer's Internal Test Certificate.

9.8 33 kV Outdoor Isolator :

Routine Tests (as per IS: 9921) will be witnessed by **the TPI Agency or** the representative of Engineer at Manufacturer's works before despatch

9.9 33 kV ACSR Dog Conductor :

Routine Tests (as per IS: 398) will be witnessed by **the TPI Agency or** the representative of Engineer at Manufacturer's works before despatch

9.10 HT XLPE Cables :

Following tests will be witnessed by **the TPI Agency or** the representative of Engineer at Manufacturer's works before despatch:

- a) **Routine Tests** as per IS:7098-II
- b) **Acceptance Tests** as per IS:7098-II

Manufacturer's Certificate for **Type Test** (as per IS: 7098), for similar type cable, should be made available to **the TPI Agency or** the representative of Engineer during the above inspection.

9.11 6000 kVA, 33 kV / 3.3 KV, 3 Phase, 50 Hz Transformer :

- a) **Routine Tests and Temperature Rise Test** (as per IS:2026) will be witnessed by **the TPI Agency or** the representative of Engineer at Manufacturer's works before despatch
- b) Manufacturer's Certificate for **Type Test** (as per IS: 2026), for any Transformer of at least 33 kV, 6000 kVA rating, should be made available to **the TPI Agency or** the representative of Engineer during the above inspection. In addition to the above, Radiator Banks, Pressure and Vacuum test of the Transformer tank to be tested as per CBIP Manual during manufacturing and test reports shall be submitted during final inspection.

9.12 Vacuum Circuit Breaker Panel

Vacuum Circuit Breaker units:

- a) **Routine Tests** (as per IS: 13118) will be witnessed by **the TPI Agency or** the representative of Engineer-in-charge at Manufacturer's works before despatch.
- b) Manufacturer's Certificate for **Type Test** (as per IS: 13118), for similar type equipments, should be made available to **the TPI Agency or** the representative of Engineer during the above inspection.

Current Transformers:

Following tests will be witnessed by **the TPI Agency or** the representative of Engineer at Manufacturer's works before despatch:-

- a) **Routine Tests** as per IS: 2705.
- b) **Verification of Terminal Markings and Polarity** as per IS:2705

Manufacturer's Certificate for **Type Test** (as per IS: 2705), for similar type equipments, should be made available to **the TPI Agency or** the representative of Engineer during the above inspection.

Potential Transformer:

Following tests will be witnessed by **the TPI Agency or** the representative of Engineer at Manufacturer's works before despatch:

- a) **Routine Tests** as per IS:3156
- b) **Verification of Terminal Markings and Polarity** as per IS:3156

Manufacturer's Certificate for **Type Test** (as per IS: 3156), for similar type equipments, should be made available to **the TPI Agency or** the representative of Engineer during the above inspection.

Complete VCB Panel:

Inspection will be carried out by **the TPI Agency or** the representative of Engineer before despatch. Manufacturers' Test Certificates for the components like **Relays, Ammeter, Voltmeter, Static kWh Meter & Maximum Demand Meter**, should be made available to **the TPI or** the representative of Engineer-in-charge during the above inspection.

9.13 **St. through and end termination jointing kits:**

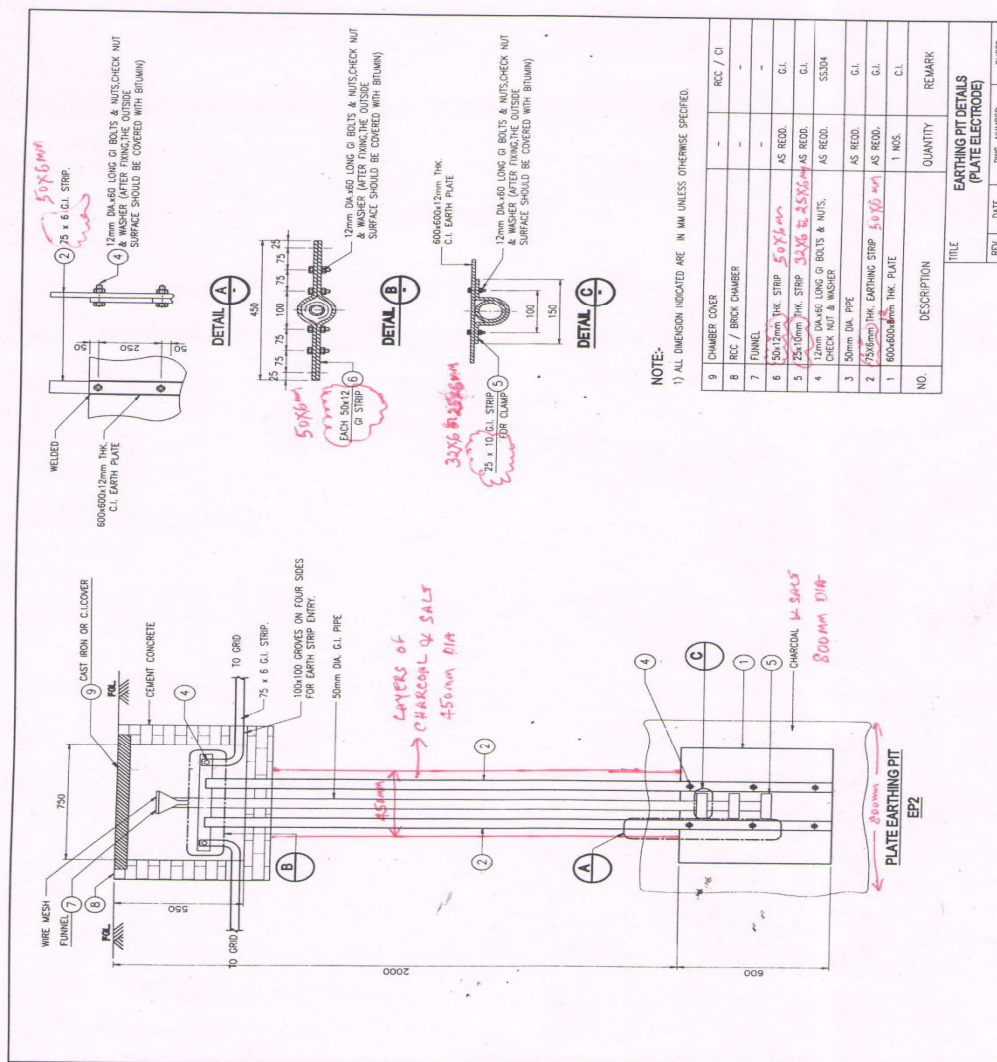
The kits will be inspected at site, after delivery, by **the TPI Agency or** the representative of Engineer, based on Manufacturer's Internal routine Test Certificate as per IS: 7098-I.

10.0 **CIVIL WORKS**

Following civil works are in the scope of the contractor.

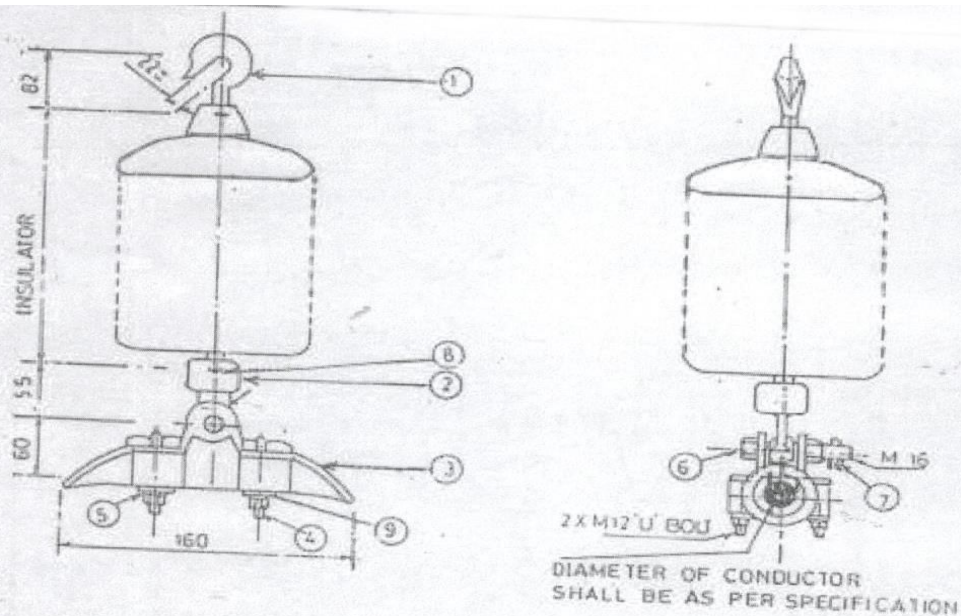
1. Civil Foundation for Switchgears and control gear installed at Intake sub-station.
2. **RCC Cable trench** from 33Kv Gang isolator at Intake sub-station to out going cable trench with in sub-station premises.
3. PCC Foundation of Rail pole structures for double circuit Line.
4. Supply of Panel mounting channels of 75mm x 40mm x 6mm as per approved drgs.
5. Chequered Plate for covering cable trench.
6. RCC foundation of 33/3.3KV, 6MVA transformer at GC Berth sub-station.

11.0 **DRAWINGS.**



EARTH PIT

Supply, Installation, Testing and Commissioning of 33 kV Over Head Line & Under Ground Cable from Intake Substation to GC Berth Substation for strengthening of power supply arrangement of RMQC-3 of HDC, KoPT.



NOTES :-

- 1 ALL DIMENSIONS ARE IN mm
- 2 TOLERANCE $\pm 3\%$
- 3 BALL AND SOCKET SIZE 16 mm AS PER IS.2486
4. MIN. BR. LOAD - 30kN

5 CLAMP SLIP STRENGTH BETWEEN 10 % & 20 % OF COND. U.T.S.

9.	PLAIN WASHER	3 mm M.S. H.D.G.	2
8	R-CLIP	NON MAGNETIC STAINLESS STEEL	1
7	SPLIT PIN.	NON MAGNETIC STAINLESS STEEL	1
6	BOLT NUT	M.S. H.D.G.	1
5	SPRING WASHER	SPRING STEEL E.G.	4
4	U-BOLT, NUT, WASHER	NON MAGNETIC S. S.	2
3	SUSPENSION CLAMP	ALU ALLOY.	1
2	SOCKET EYE	FORGED STEEL H.D.G.	1
1	BALL HOOK	FORGED STEEL H.D.G.	1
NO.	DESCRIPTION	MATERIAL	QTY.

SUSPENSION HARDWARE SUITABLE FOR ACSR DOG CONDUCTOR

Supply, Installation, Testing and Commissioning of 33 kV Over Head Line & Under Ground Cable from Intake Substation to GC Berth Substation for strengthening of power supply arrangement of RMQC-3 of HDC, KoPT.

ACSR Dog

SIZES & PROPERTIES OF ALUMINIUM CONDUCTOR GALVANISED STEEL REINFORCED

NOMINAL ALUMINIUM AREA (mm ²)	STRANDING AND WIRE DIAMETER (mm)		SECTIONAL AREA OF ALUMINIUM (mm ²)	TOTAL SECTIONAL AREA (mm ²)	APPROXIMATE OVER-ALL DIAMETER (mm)	APPROXIMATE MASS (KG/KM)	CALCULATED RESISTANCE AT 20°C MAX (OHM/KM)	APPROXIMATE CALCULATED BREAKING LOAD (KN)
	ALUMINIUM	STEEL						
20	6/2.11	1/2.11	20.98	24.48	6.33	85	1.394	7.61
30	6/2.59	1/2.59	31.61	36.88	7.77	128	0.9289	11.12
50	6/3.35	1/3.35	52.88	61.70	10.05	214	0.5524	18.25
100	6/4.72	7/1.57	105.00	118.5	14.15	394	0.2792	32.41
150	30/2.59	7/2.59	158.1	194.9	18.13	726	0.1871	67.34

PROPERTIES OF ALUMINIUM WIRES USED IN THE CONSTRUCTION OF ALUMINIUM CONDUCTORS GALVANISED STEEL REINFORCED

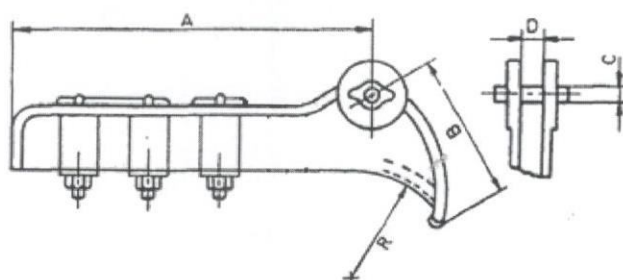
DIAMETER (mm)			CROSS SECTIONAL AREA OF NOMINAL DIAMETER WIRE (mm ²)	MASS (KG/KM)	RESISTANCE AT 20°C (MAX) (OHM/KM)	BREAKING LOAD (KN)	BREAKING LOAD AFTER STRANDING (KN)
NOMINAL	MIN	MAX					
2.59	2.56	2.62	5.269	14.24	5.490	0.89	0.85
2.11	2.09	2.13	3.497	9.45	8.237	0.63	0.60
3.00	2.97	3.03	7.069	19.11	4.079	1.17	1.11
3.35	3.32	3.38	8.814	23.82	3.265	1.43	1.36
4.72	4.67	4.77	17.50	47.30	1.650	2.78	2.64

PROPERTIES OF STEEL WIRES USED IN THE CONSTRUCTION OF ALUMINIUM CONDUCTOR STEEL REINFORCED

NOMINAL DIAMETER (mm)	DIAMETER (mm)		CROSS SECTIONAL AREA OF NOMINAL DIAMETER WIRE (mm ²)	MASS KG/KM	BREAKING LOAD (MIN) (in KN)	
	MIN	MAX			BEFORE STRANDING	AFTER STRANDING
1.57	1.54	1.60	1.936	15.10	2.70	2.57
2.11	2.07	2.15	3.497	27.27	4.60	4.37
2.59	2.54	2.64	5.269	41.09	6.92	6.57
3.00	2.94	3.06	7.069	55.13	9.29	8.83
3.35	3.28	3.42	8.814	68.75	11.58	11.00

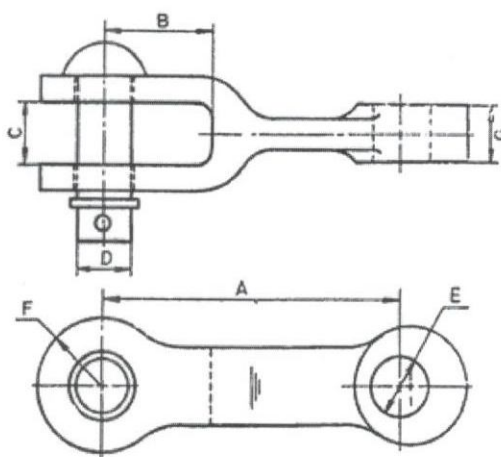
Supply, Installation, Testing and Commissioning of 33 kV Over Head Line & Under Ground Cable from Intake Substation to GC Berth Substation for strengthening of power supply arrangement of RMQC-3 of HDC, KoPT.

BOLTED TYPE TENSION CLAMP



Material	Conductor Diameter		Dimensions					Number of U-Bolts
	Min	Max	A	B	C	D	R	
Aluminium alloy	7.6	17.8	222.2	107.6	22.2	16	76.2	3

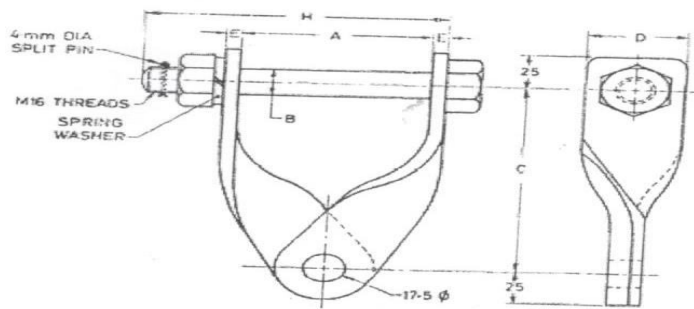
TONGUE AND CLEVIS



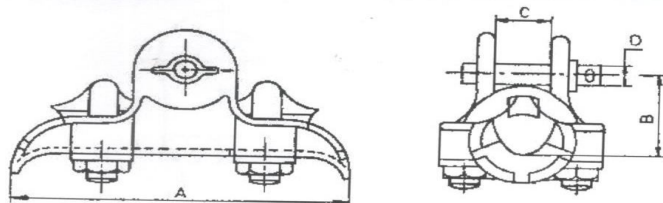
Dimensions, mm						
A	B	C	D	E	F	G
89	32	19	16	17.5	19	16
102	35	19	16	17.5	22	19
102	35	19	16	17.5	22	25
140	54	22	19	21	25	29
140	54	22	19	21	25	32
140	54	22	19	21	25	35
140	54	22	19	21	25	38

Supply, Installation, Testing and Commissioning of 33 kV Over Head Line & Under Ground Cable from Intake Substation to GC Berth Substation for strengthening of power supply arrangement of RMQC-3 of HDC, KoPT.

CROSS ARM STRAP

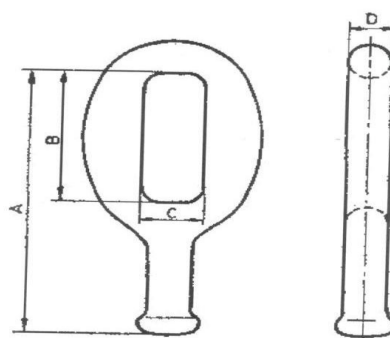


A	B (Dia)	C	D	E	H
100	16	140	35	6	145



Conductor Dia, mm		Dimensions, mm				Socket Size
Min	Max	A	B	C	D	
7.6	17.8	181	60.5	19	16	See Fig. 9 for size 16 mm Alternative B
12.7	21.1	190	63.5	22	16	
20.3	29.2	203	70.0	32	16	
25.4	38.9	228	85.5	42	16	
30.0	41.9	241	82.5	45	16	
38.1	50.8	254	101.5	54	16	
43.2	57.2	280	101.5	60	16	
50.8	63.5	279	108.0	67	16	See Fig 9 for size 20 mm/16 mm Alternative B
12.7	25.9	203	66.5	27	16	
22.9	35.6	222	71.5	37	16	
27.9	41.1	241	85.5	44	16	
31.8	47.0	254	89.0	48	16	
35.6	50.8	267	92.0	54	16	
44.4	57.2	279	101.5	60	16	
50.8	64.8	305	111.0	70	16	

SUSPENSION CLAMP

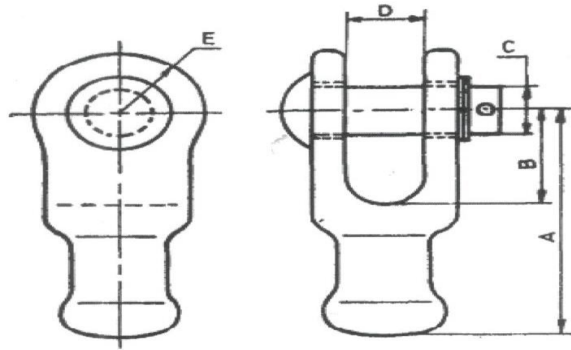


Dimensions, mm				Pin Ball Designation*
A	B	C	D	
102	51	19	12.7	20 mm/16 mm
114	63.5	22	16.0	20 mm/16 mm
114	63.5	25	19.0	20 mm/16 mm

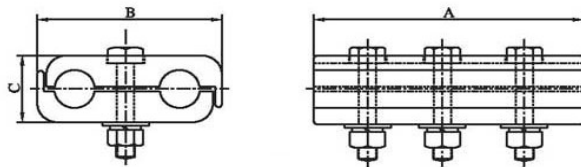
*See Fig. 8

BALL EYE

BALL CLEVIS



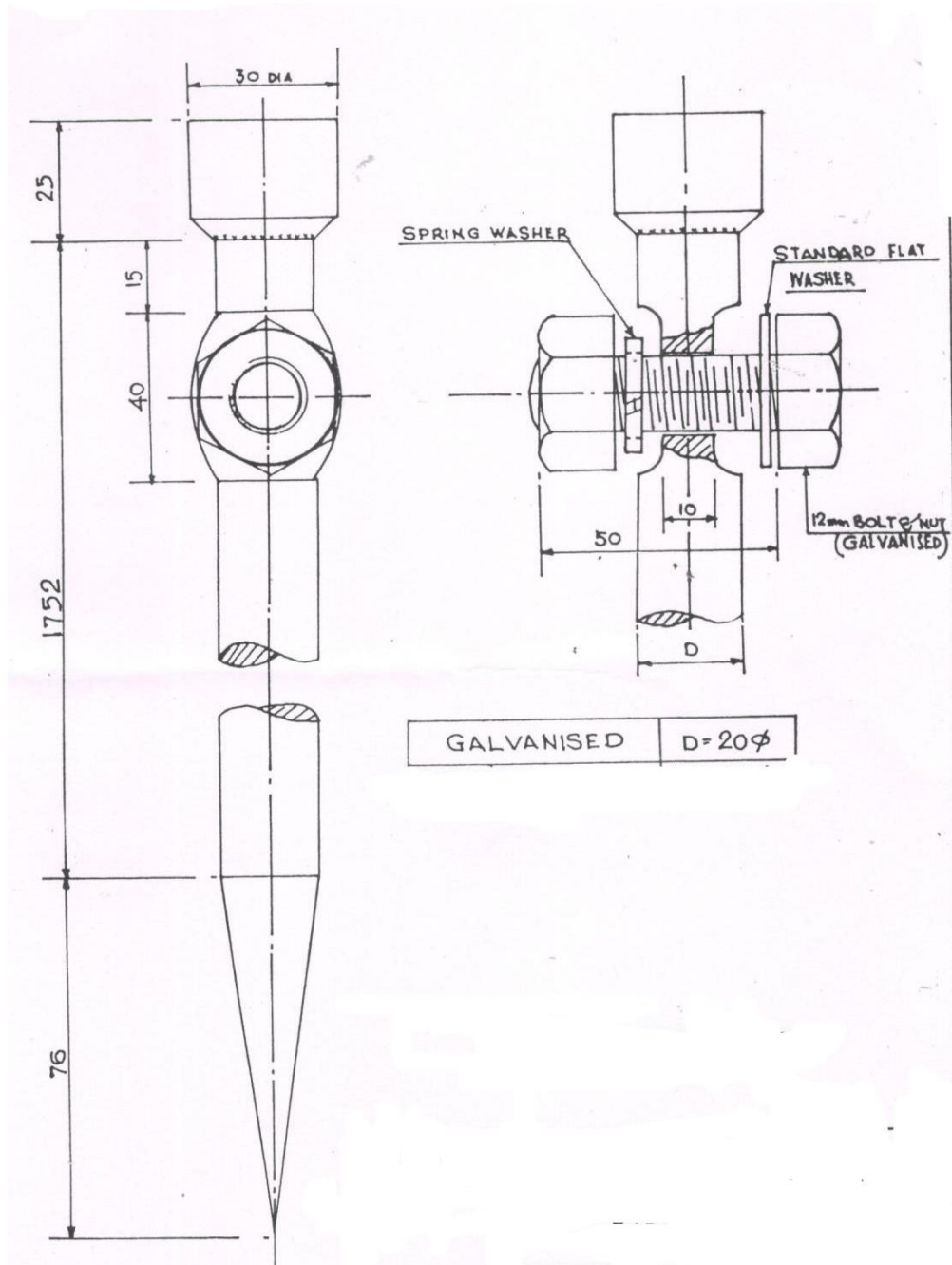
A	B	C	Pin Ball Designation
76	32	16	16 mm



PARALLEL GROOVE CLAMP

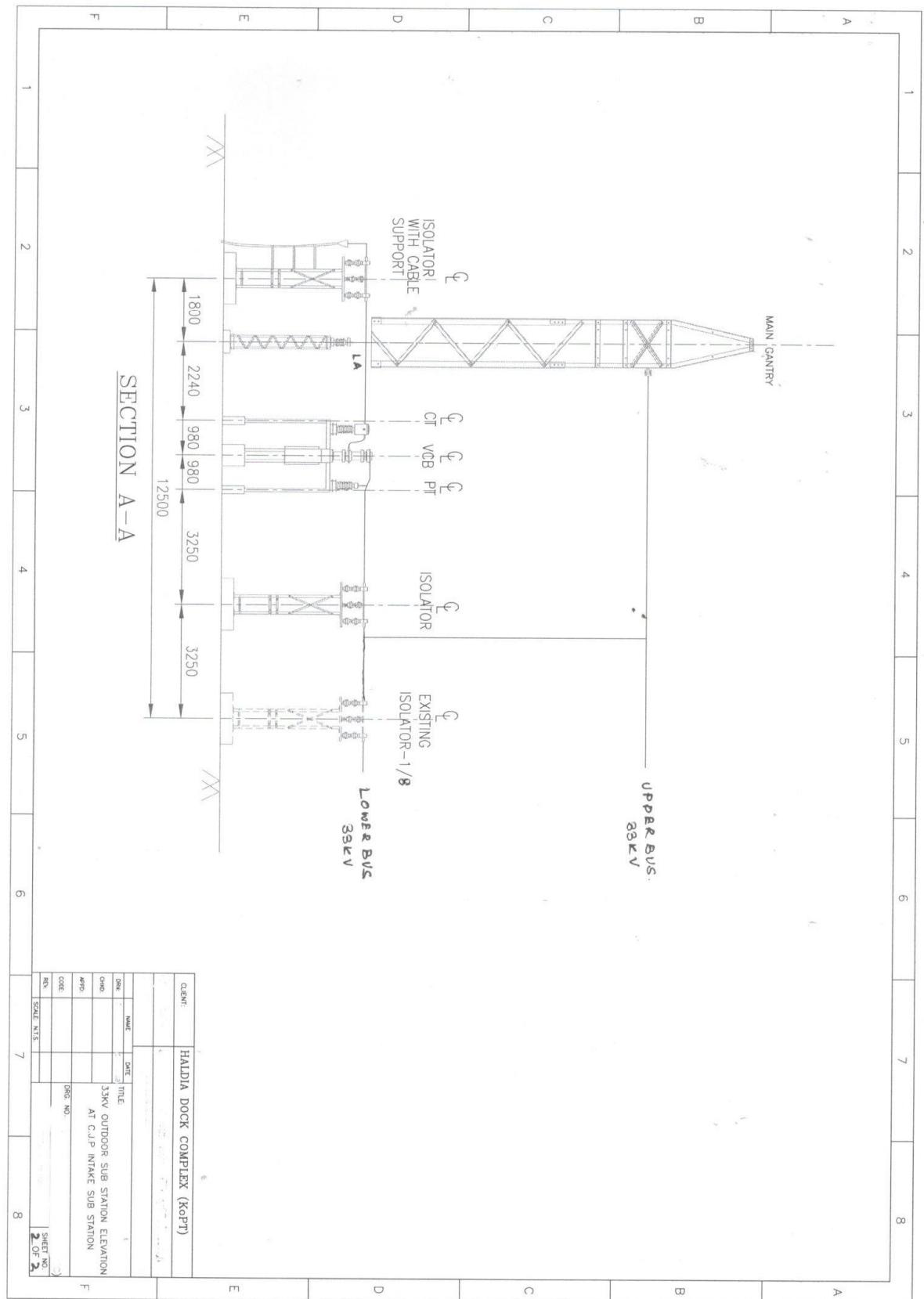
Conductor Dia. (Max.)	A	B	C	No. of Bolts	Bolts Size
06.50	65	45	16	2	M-12
10.11	79	48	22	2	M-12
14.45	95	57	28	2	M-12
17.60	127	65	36	3	M-12
20.78	125	65	33	3	M-12

EARTH SPIKE

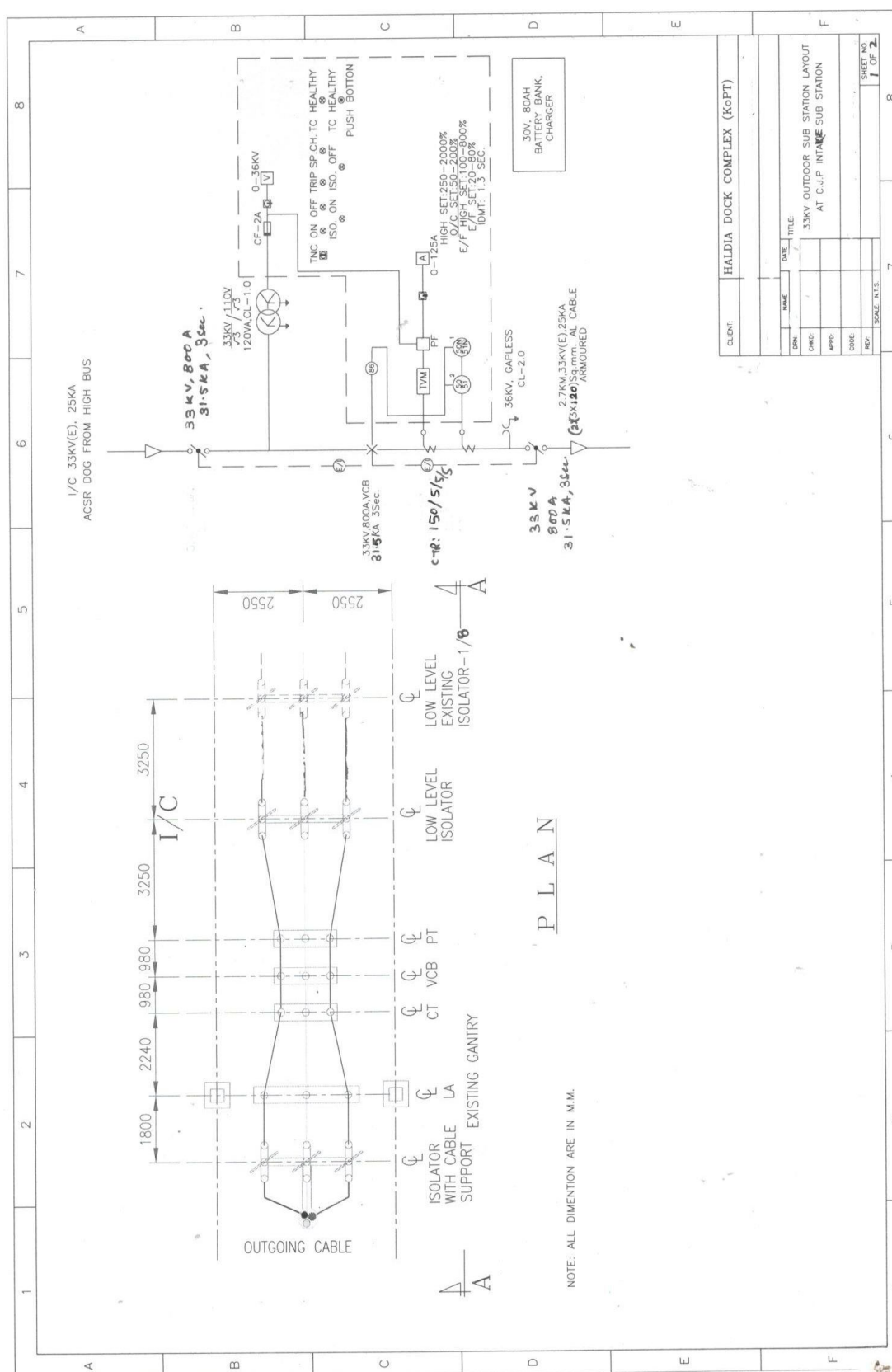


Supply, Installation, Testing and Commissioning of 33 kV Over Head Line & Under Ground Cable from Intake Substation to GC Berth Substation for strengthening of power supply arrangement of RMQC-3 of HDC, KoPT.

INTAKE SUB-STATION SWITCHYARD EQUIPMENT LAYOUT

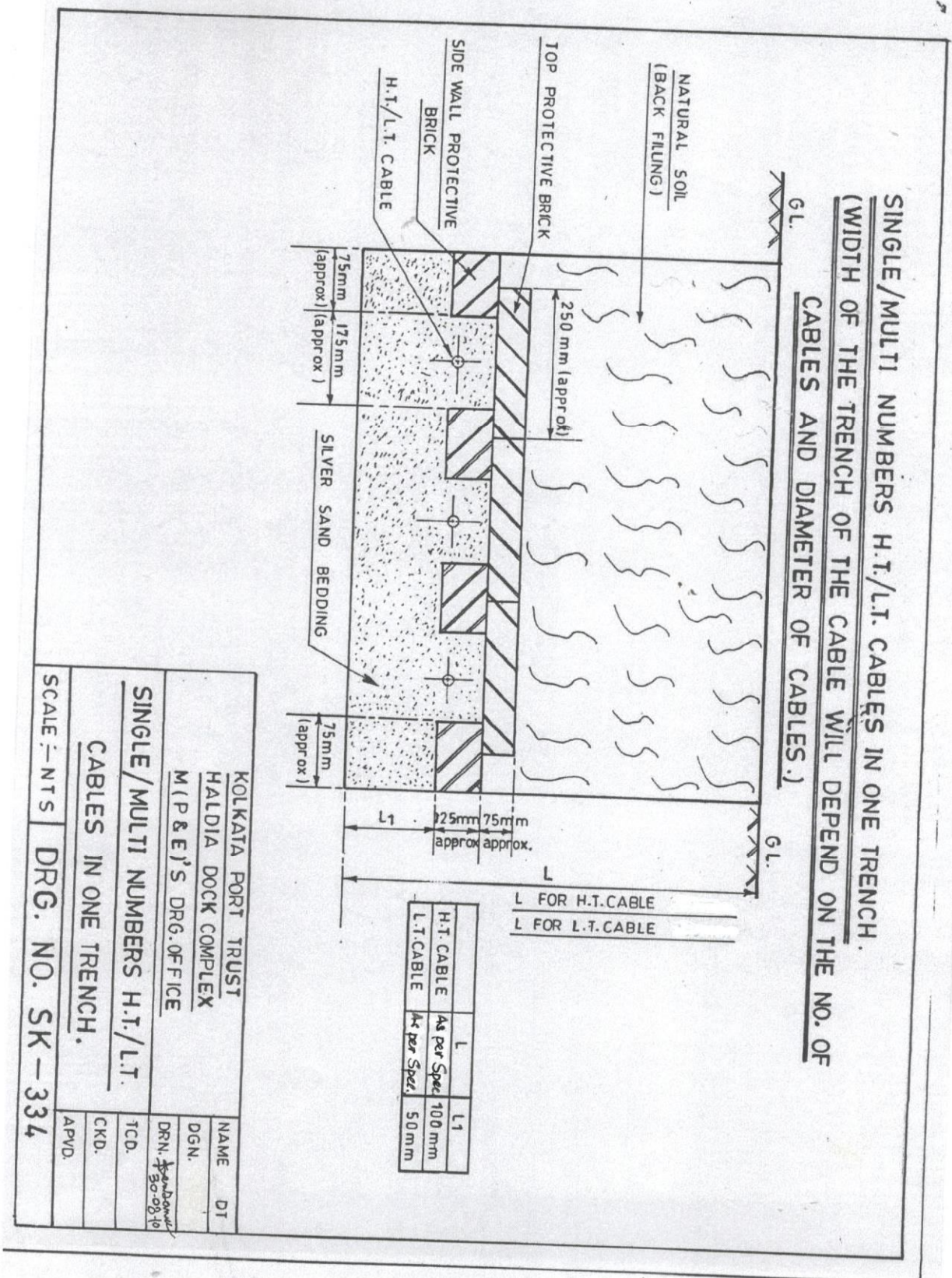


Supply, Installation, Testing and Commissioning of 33 kV Over Head Line & Under Ground Cable from Intake Substation to GC Berth Substation for strengthening of power supply arrangement of RMQC-3 of HDC, KoPT.

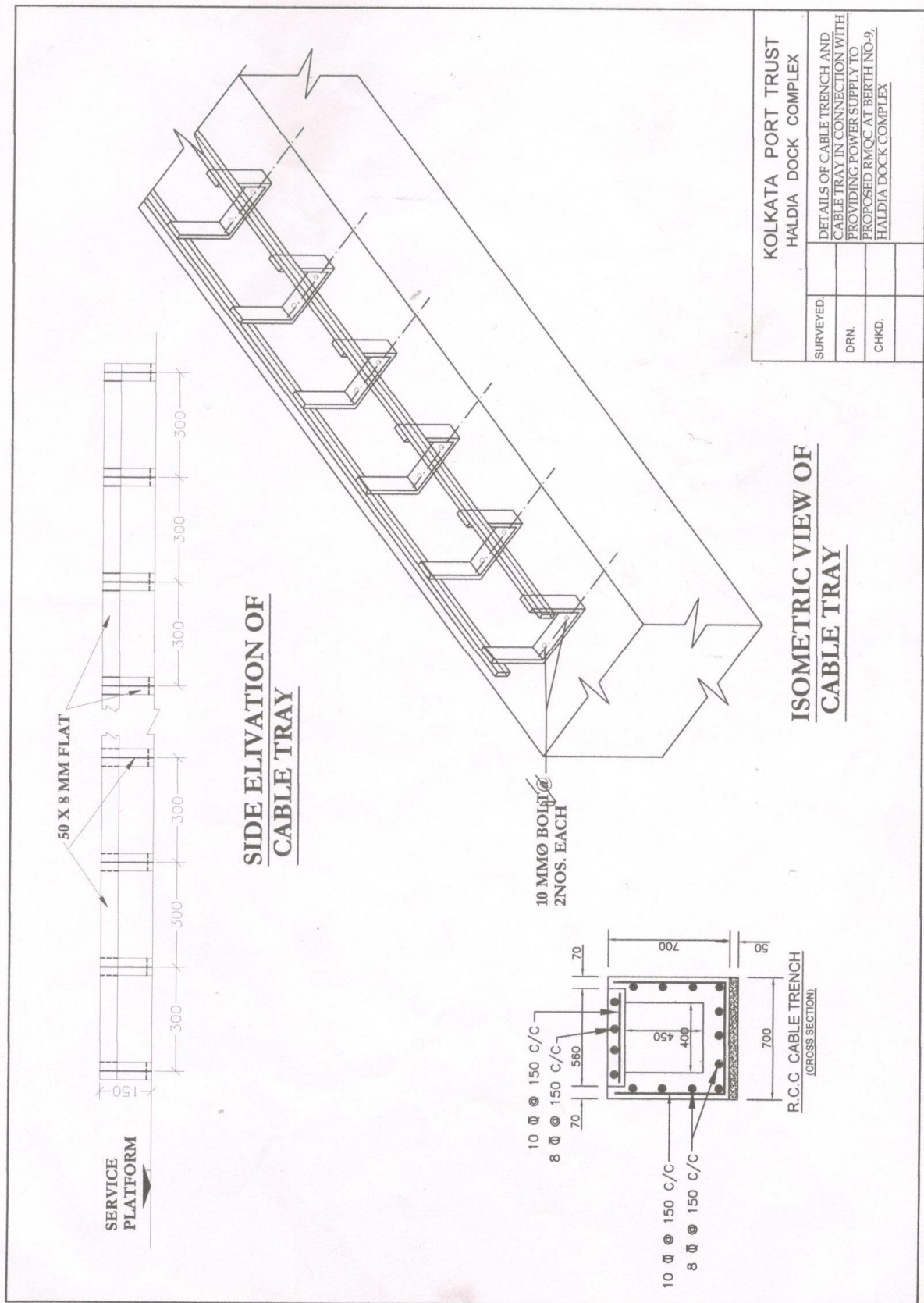


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CABLE LAYING



Supply, Installation, Testing and Commissioning of 33 kV Over Head Line & Under Ground Cable from Intake Substation to GC Berth Substation for strengthening of power supply arrangement of RMQC-3 of HDC, KoPT.



Supply, Installation, Testing and Commissioning of 33 kV Over Head Line & Under Ground Cable from Intake Substation to GC Berth Substation for strengthening of power supply arrangement of RMQC-3 of HDC, KoPT.

Bill of Quantity and Estimated Cost

Sl. No.	Item Description	Unit	Qty.	Unit Rate excluding GST (in Rs.)	Amount excluding GST (in Rs.)
Part A-Electrical Installations at Intake Sub-station.					
1	<u>HT 33 KV Outdoor PCVCB with control and relay Panel:-</u> Design, fabricate, supply, installation, testing and commissioning of Outdoor 33 KV PCVCB, 800A, 3 phase, 50HZ, 31.5 kA for 3sec.along with control and relay Panel as per the Technical Specification.				
(i)	Supply	Set.	1	9,10,000	9,10,000
(ii)	Installation, testing and commissioning	Set.	1	32,500	32,500
2	<u>HT 33KV Outdoor PT:-</u> Design, fabricate, supply, installation, testing and commissioning of outdoor Oil filled hermitically sealed HT PT 33KV/ $\sqrt{3}$ / 110/ $\sqrt{3}$ V 100VA,1 phase, 50HZ, 31.5KA for 3sec. as per the Technical Specification.				
(i)	Supply	No.	3	84,500	2,53,500
(ii)	Installation, testing and commissioning	No.	3	13,000	39,000
3	<u>HT 33KV Outdoor CT:-</u> Design, fabricate, supply, installation, testing and commissioning of outdoor Oil filled hermitically sealed HT CT 150/5/5/5Amps. 1 phase, 50HZ, 31.5KA for 3sec. For metering and protection as per the Technical Specification.				
(i)	Supply	No.	3	91,000	2,73,000
(ii)	Installation, testing and commissioning	No.	3	13,000	39,000
4	<u>HT 33KV Outdoor gantry Isolator:-</u> Design, fabricate, supply, installation, testing and commissioning of outdoor Gantry Isolator 800Amps. 3 phase, 50HZ, 31.5KA for 3sec. as per the Technical Specification.				
(i)	Supply	No.	2	58,500	1,17,000
(ii)	Installation, testing and commissioning	No.	2	6500	13,000
5	<u>HT 33KV Outdoor Lighting Arrestor:-</u> Design, fabricate, supply, installation, testing and commissioning of outdoor Lighting Arrestor Metal Oxide Gapless, 33KV, 10KA, 1 phase, 50HZ, as per the Technical Specification.				
(i)	Supply	No.	9	13,000	11,7000

Supply, Installation, Testing and Commissioning of 33 kV Over Head Line & Under Ground Cable from Intake Substation to GC Berth Substation for strengthening of power supply arrangement of RMQC-3 of HDC, KoPT.

Sl. No.	Item Description	Unit	Qty.	Unit Rate excluding GST (in Rs.)	Amount excluding GST (in Rs.)
(ii)	Installation, testing and commissioning	No.	9	1690	15,210
6	<u>2.5" IPS Aluminium Tube:-</u> Supply, installation, testing and commissioning of 2.5" IPS Aluminium Tube, as per the Technical Specification.				
(i)	Supply	LS	1	1,30,000	1,30,000
(ii)	Installation, testing and commissioning	LS	1	16900	16900
7	<u>Lattice Type hot dip GI Gantry structure:-</u> Supply, installation, lattice type hot dip GI gantry structures for installation of PCVCB, CT, PT, Isolator, Cable etc. as per the Technical Specification				
(i)	Supply of material	LS	1	3,90,000	3,90,000
(ii)	civil foundation, Installation, testing and commissioning	LS	1	50,600	50600
8	<u>Battery Charger with batteries:-</u> Supply and Installation of Maintenance Free Lead Acid battery of 15Nos. of 2Volts each for 30V, 60AH Battery Bank along with Float cum-Boast Charger as per Technical specifications.				
(i)	Supply	Set	1	2,60,000	2,60,000
(ii)	Installation, testing and commissioning	Set	1	6500	6500
9	<u>33KV(E) XLPE, HT Cable:-</u> Supply and laying of 3C x 120 Sq.mm. HT Aluminum XLPE cable as per Technical Specification.				
(i)	Supply	Mtr	2060	1422	29,29,320
(ii)	Laying through existing RCC trench/Hume Pipe/ GI Pipe.	Mtr	200	117	23,400
(iii)	Laying by excavating trench.	Mtr.	1475	723.30	10,66,867.50
(iv)	Laying by excavating trench after removal of paver blocks and refixing of the same after laying.	Mtr.	50	163.75	8187.50
(v)	Laying through 150mm dia. Hume pipe to be laid after excavating including supply of Hume pipe.	Mtr.	50	455	22,750
(vi)	Laying through 150NB GI Pipe to be laid after excavating, including supply of Pipe	Mtr.	100	715	71,500
(vii)	By 150NB GI Pipe to be laid after Boring including supply of Pipe	Mtr.	125	975	121,875
(viii)	Construction of RCC Cable trench as per drg.	Mtr.	60	3500	210,000

Supply, Installation, Testing and Commissioning of 33 kV Over Head Line & Under Ground Cable from Intake Substation to GC Berth Substation for strengthening of power supply arrangement of RMQC-3 of HDC, KoPT.

Sl. No.	Item Description	Unit	Qty.	Unit Rate excluding GST (in Rs.)	Amount excluding GST (in Rs.)
10	<u>33KV XLPE, HT Cable end termination and straight through:-</u> Supply of straight through and heat Shrinkable type end termination kit for three Core 120 Sq.mm. HT Aluminum XLPE cable.				
(i)	Supply of Indoor/Outdoor end termination kit	No.	14	32,500	4,55,000
(ii)	Supply of st. through jointing kit	No.	4	71,500	2,86,000
(iii)	Installation of indoor/outdoor end termination kit and testing and commissioning	No.	14	2600	36,400
(iv)	Installation of straight through jointing kit and testing and commissioning	No.	4	3250	13,000
11	<u>33KV Double circuit Overhead ACSR DOG Line between Finger Jetty road to GC berth Main Gate.</u>				
(i)	Transportation of old used 11/12/13 Mtr. Rail Pole from store/ site of HDC to work site (old and used rail pole of 11/12/13 Mtr each to be supplied by HDC <u>on free of cost basis</u>). [Job also includes dismantling and transportation of existing items i.e. Rail poles, ACSR Conductors, Insulators etc. to site store of HDC. (300 Mtrs. Span consisting 20 Nos. 11/12/13Mtrs. Rail poles approx) from 11KV Overhead Line (Single circuit Panther Conductor)]	No.	101	3900	3,93,900
(ii)	<u>Erection of 11/12/13 Mtr. Rail Pole structure:-</u> a) Erection of 11/12/13 Mtr. Rail Pole (4 Pole) structure complete with out Fitting (Channel, Angle & Clamp) without any insulator etc.	Set	7	3,20,000	22,40,000
	b) Erection of 11/12/13 Mtr. Rail Pole [Double Pole (D.P.)] for strut pole for strengthening of 4 pole structure without fittings.	Set	7	67,600	4,73,200
	c) Erection of 11/12/13 Mtr. Rail Pole [Double Pole (D.P.)] 2 pole structure with out fitting.	Set	19	45,500	8,64,500
	d) Erection of 11/12/13 Mtr. Rail Pole [Single Pole (S.P.)] for strut pole for strengthening of 4/2 pole structure without fittings.	Nos.	21	12,000	2,52,000

Supply, Installation, Testing and Commissioning of 33 kV Over Head Line & Under Ground Cable from Intake Substation to GC Berth Substation for strengthening of power supply arrangement of RMQC-3 of HDC, KoPT.

Sl. No.	Item Description	Unit	Qty.	Unit Rate excluding GST (in Rs.)	Amount excluding GST (in Rs.)
(iii)	Supply of GI Channels and angles for Rail Pole structures:-				
	a) Supply of GI Channel (100 x 50 x 6 mm)	Kgs.	3000	72	2,16,000
	b) Supply of GI Channel (75 x 40 x 6 mm)	Kgs.	900	72	64,800
	c) Supply of GI Angle (65 x 65 x 6 mm.)	Kgs.	2200	72	1,58,400
	d) Supply of GI Angle (50 x 50 x 6 mm.)	Kgs.	800	72	57,600
(iv)	Fixing & fabrication of GI Channel and angles for 11/12/13Mtr. Rail Pole structure:-				
	a) Fixing & fabrication of GI Channel (100 x 50 x 6 mm) for 13 Mtr. Rail Pole [4 Pole/ DP] structure For insulator string holding.	Kgs.	3000	33	99,000
	b) Fixing & fabrication of GI Channel (75 x 40 x 6 mm) for 13 Mtr. Rail Pole [4 Pole] structure for cable raising arrangement and structure holding of 4 Pole.	Kgs.	900	33	29,700
	c) Fixing & fabrication of GI Angle (65 x 65 x 6 mm.) on 13 Mtr. Rail Pole [4 Pole] structure as horizontal bracing & cross bracing.	Kgs.	2200	33	72,600
	d) Fixing & fabrication of GI Angle (50 x 50 x 6 mm.) inverted V Bracket on 13 Mtr. Rail Pole structure for shield wire earthing.	Kgs.	800	33	26,400
(v)	Supply fixing and fabrication of GI Clamps:-				
	a) Supply, fixing & fabrication of GI Clamp (65 x 6 mm.), as 'V' Clamps,	LS	1	6,50,000	6,50,000
	b) Supply, fixing & fabrication of GI Clamp (65 x 6 mm.), as Support Clamps, for 13 Mtr. Rail Pole structure.	LS	1	9,75,000	9,75,000
	c) Supply, fixing & fabrication of GI Clamp (65 x 6 mm., Commander Patti) for 13.0 Mtr. Rail Pole structure	LS	1	13,00,000	13,00,000
(vi)	Supply & fixing of G.I. Nut Bolt 5/8", 8", 3.5", 2.5" & 2" for 13 Mtr. Rail Pole structure	Kgs.	600	85	51,000
(vii)	Supply & fixing of 33 kV Hardware fittings for ACSR 100 Sqmm. conductor.	LS	1	6,17,500	6,17,500
(viii)	Supply & fixing of Insulators:-				
	a) Supply & fixing of 33 kV G.I. Pin with Insulator	Sets.	64	1300	8,32,00
	b) Supply & fixing of Disc Insulator each	Sets.	216	3900	8,42,400

Supply, Installation, Testing and Commissioning of 33 kV Over Head Line & Under Ground Cable from Intake Substation to GC Berth Substation for strengthening of power supply arrangement of RMQC-3 of HDC, KoPT.

Sl. No.	Item Description	Unit	Qty.	Unit Rate excluding GST (in Rs.)	Amount excluding GST (in Rs.)
	string.				
(ix)	Supply & fixing Al. Binding wire	Kgs.	200	429	85,800
(x)	Supply of ACSR 100 Sqmm. conductor.	Mtr.	7500	650	48,75,000
(xi)	Stringing & sagging of ACSR 100Sqmm. conductor of span of about 50 Mtrs.	Sets.	156	1625	2,53,500
(xii)	Civil work for concrete, plaster, net cement on Rail pole bottom portion.	Nos.	101	2600	2,62,600
(xiii)	Painting of Rail Pole structure with all iron parts with 2 coats of red oxide primer & 2 coats of Aluminium paints:-				
	a) Painting of Rail 4 Pole structure with all iron parts with 2 coats of red oxide primer & 2 coats of Aluminium paints	Sets.	7	13,000	91,000
	b) Painting of Rail (D.P) for strut pole with all iron parts with 2 coats of red oxide primer & 2 coats of Aluminium paints	Sets.	7	10,400	72,800
	c) Painting of Rail (D.P) with all iron parts with 2 coats of red oxide primer & 2 coats of Aluminium paints	Sets.	19	9100	1,72,900
	d)Painting of Rail (S.P) for strut pole with all iron parts with 2 coats of red oxide primer & 2 coats of Aluminium paints	Nos.	21	6500	1,36,500
(xiv)	Supply & fixing of Barbed wire on 4&2 pole structures and supply & fixing of Danger Boards	Sets.	26	650	1,69,00
(xv)	Raising arrangement of 33 kV grade, 3 Core x 120 sq. mm. XLPE insulated cable up to 6 Mtr. Height (approx.) through 4 Mtr. Long (approx.) GI pipe of 150 mm. diameter and fixing with the terminal structures, with supply of GI clamp, Nuts, Bolts & Washers with brick protection in between the said pipe & cable etc., including proper earthing connection. (Including supply of pipe).	Sets.	2	13,000	26,000
(xvi)	GI shield wire 7/3.15mm dia.:-				
	a) Supply of GI shield wire.	Kgs.	750	85	63,750
	b) Stringing & sagging of GI Shield wire of span of about 50 Mtrs.	Sets.	26	1300	33,800
(xvii)	GI stay wire 7/2.5mm dia. with Guy insulator:-				
	a) Supply of stranded GI stay wire with Guy insulator.	sets.	24	650	15,600

Supply, Installation, Testing and Commissioning of 33 kV Over Head Line & Under Ground Cable from Intake Substation to GC Berth Substation for strengthening of power supply arrangement of RMQC-3 of HDC, KoPT.

Sl. No.	Item Description	Unit	Qty.	Unit Rate excluding GST (in Rs.)	Amount excluding GST (in Rs.)
	b) Installation and fixing of stranded GI stay wire with Guy insulator.	sets.	24	85	2040
(xviii)	Earthing of Rail Pole structure:-				
	a) Supply of 50 x 6 mm G.I. strip	Mtr.	600	203	1,21,800
	b) laying of 50 x 6 mm G.I. strip for earth electrode station to Rail Pole cable structure [4/2 Pole structure] bottom portion & Lightning Arrestor (LA) top portion, by welding & connection, with commissioning of the system	Mtr.	600	130	78,000
(xix)	Earthing stations:-				
	a) Construction of Earth Electrode Station including supply and delivery of 50 mm. diameter 3 Mtr. long G.I. perforated pipe Earth Electrode as IS: 3043.	Sets.	14	10,400	1,45,600
	b) Construction of Spike Earthing Station including supply and delivery of GI Spike of 2150mm Length diameter 16mm Earth Electrode.	Nos.	22	7,222	1,58,884
(xx)	Supply and fixing of Cradle guard	Sets.	2	13000	26,000
			Sub-Total Part A:-		2,40,13,184.00
Part B-Electrical Installation at GC berth sub-station					
1	HT 33KV VCB Panel:- Design, fabricate, supply, installation, testing and commissioning of indoor HT 33kV VCB Panel 1250A, 3 phase, 50HZ, 25kA for 3sec. as per the Technical Specification(08 panel).				
(i)	Supply	Set	1	31,20,000	31,20,000
(ii)	Installation, testing and commissioning	Set	1	1,30,000	1,30,000
2	HT 3.3KV VCB Panel:- Design, fabricate, supply, installation, testing and commissioning of indoor HT 3.3kV VCB Panel 1250A, 3 phase, 50HZ, 25kA for 3sec. as per the Technical Specification(02 panel).				
(i)	Supply	Set	1	9,10,000	9,10,000
(ii)	Installation, testing and commissioning	Set	1	39,000	39,000
3	6MVA Power Transformer:- Design, Manufacture, supply, installation, testing and commissioning of following 33/3.3 kV oil filled indoor type transformers with On Load tap changer, RTCC Panel & marshalling box of make as per the Technical Specification.				

Supply, Installation, Testing and Commissioning of 33 kV Over Head Line & Under Ground Cable from Intake Substation to GC Berth Substation for strengthening of power supply arrangement of RMQC-3 of HDC, KoPT.

Sl. No.	Item Description	Unit	Qty.	Unit Rate excluding GST (in Rs.)	Amount excluding GST (in Rs.)
(i)	Supply of 33/3.3 kV, 6MVA Power Transformer	No.	1	75,00,000	75,00,000
(ii)	Civil foundation	No.	1	50,000	50,000
(iii)	Installation, testing and commissioning	No.	1	65,000	65,000
4	3.3kV(UE) XLPE, HT Cable :- Supply and laying of 1C x 1000 Sq.mm. HT Aluminum XLPE armoured cable as per Technical Specification.				
(i)	Supply	Mtr	240	1595	3,82,800
(ii)	Laying through RCC trench	Mtr	240	104	24960
5	3.3kV XLPE, HT Cable end termination:- Supply of end termination kit for 1C x 1000 Sq.mm. HT Aluminum XLPE cable.				
(i)	Supply of Indoor end termination kit	No.	16	9750	1,56,000
(ii)	Installation, testing and commissioning	No.	16	1950	31,200
6	Battery Charger with batteries:- Supply and Installation of Maintenance Free Lead Acid battery of 15Nos. Of 2Volts each for 30V, 60AH Battery Bank with Float cum-Boast Charger as per Technical specifications.				
(i)	Supply	set	1	2,34,000	2,34,000
(ii)	Installation, testing and commissioning	set	1	6500	6500
7	Providing Earthing System with plate Earthing in accordance with BIS 3043 or latest amendment as per Technical Specification.				
(i)	Supply	No.	10	2,2100	2,21,000
(ii)	Installation, testing and commissioning	No.	10	2600	26,000
8	Supply and laying of 50 mm x 6 mm Hot dip galvanized Earthing flat / strip as per Technical specification.				
(i)	Supply	Mtr	200	203	40,600
(ii)	Laying	Mtr	200	65	13,000
9	Structural items:				
(i)	Supply of GI Chequered Plates 8mm thick	T	1	84500	84,500
(ii)	Supply of GI Angles (65x65x6)mm	T	1	84500	84,500
(iii)	Supply of GI Channels (75x40x6)mm	T	1	84500	84,500
(iv)	Fabrication, Installation and commissioning of above structural items	T	3	32500	97,500
	Sub-Total Part B:-				1,33,01,060.00
	Total (Part A+ Part B):-				3,73,14,244.00

Supply, Installation, Testing and Commissioning of 33 kV Over Head Line & Under Ground Cable from Intake Substation to GC Berth Substation for strengthening of power supply arrangement of RMQC-3 of HDC, KoPT.

SECTION VII
GENERAL CONDITIONS OF CONTRACT (GCC)

Table of Clauses

A.	GENERAL PROVISIONS
1)	Definitions
2)	Contract documents
3)	Interpretations
4)	All Drawings are Trustees' property
5)	Language
6)	Notices
7)	Governing Law
8)	Patent Rights
9)	Stamp duty & other expenses
10)	Indemnity
11)	Employer's lien
12)	Additions and alterations
B.	THE ENGINEER
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28)	Existing services
29)	Contractor to prepare working / progress drawings
30)	Contractor's price is inclusive of all costs
31)	Contractor is responsible for all construction process, except for correctness of design and specification formulated by the Engineer
32)	Contractor to submit his programme of work
33)	Contractor to supervise the works
34)	Contractor is responsible for line, level, setting out, etc.
35)	Contractor is responsible to protect the work
36)	Contractor is responsible for all damages to other structures / persons caused by him in executing the work
37)	Fossils, Treasure troves, etc. are Trustees' property
38)	Contractor to indemnify the Trustees against all claims for loss, damage, etc.
39)	Dismantled materials Trustees' property
40)	Contractor's quoted rates / price must be all inclusive
41)	Notice to Contractor
42)	Contractor not to publish photograph or particulars of work
43)	Contractor to provide facilities to outsiders
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General Conditions of Contract (GCC)

A. GENERAL PROVISIONS

7.1 Definitions

In the conditions of contract ("these conditions"), which includes particular conditions and these general conditions, the following words and expressions shall have the meanings stated. Words indicating persons or parties include corporations and other legal entities, except where the context requires otherwise.

7.1.1 The Contract:

"Contract" means and includes these **bidding documents** in entirety (including all Addenda and Corrigenda, if any), the **specification**, the **drawings**, the **PRICE SCHEDULE**, the **bid / offer**, the **Letter Of Acceptance**, the **Contract Agreement** (when Contract Agreement would be completed in all respect) and such further documents as may be expressly incorporated in the **Letter Of Acceptance** or **Contract Agreement** (when Contract Agreement would be completed in all respect).

- b) **"Contract Agreement"** means the executed Contract Agreement referred to in **ITB Clause No. 5.37 [Signing of Contract Agreement]**.
- c) **"Contract documents"** means the documents listed in the Contract Agreement, including any amendments thereto.
- d) **"Letter Of Acceptance (LOA)"** or **"Work order"** or **"Order letter"** means the formal acceptance of the bid (and placement of order with the successful bidder), issued by or on behalf of the Employer, including any adjustments or variation to the bid agreed between the Employer and the successful bidder and includes its enclosure(s),

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annexure(s), etc., if any.

- e) **“Specification”** means the specification of the work included in the contract and any modification thereof or addition thereto made under **GCC Clause No. 7.12 [Additions and alterations]** or submitted by the Contractor and approved by the Engineer, in writing.
- f) **“Drawings”** means **all drawings, calculations and technical information**, etc., provided by the Engineer to the Contractor under the contract and all **drawings, calculations, samples, patterns, models**, etc., including modification, if any, and other **technical information & manuals** of a like nature, submitted by the Contractor and approved by the Engineer.
- g) **“Tender”** or **“Bid”** means the proposal (priced offer), along with all supporting documents, submitted by the bidder to the Employer for consideration.
- h) **“Price Schedule”** means the priced schedule of items, forming part of the bid.
- i) **“Tenderer”** or **“Bidder”** means the individual firm, who submits the bid, duly filled up and signed, along with all the required documents and payment instruments, in strict compliance of the conditions / requirements stipulated in these bidding documents.
- j) **“Contract data”** means the pages completed by the Employer entitled **CONTRACT DATA**.

7.1.2 Parties and persons :

- a) **“Party”** means the **Employer** or the **Contractor**, as the context requires.
- b) **“Employer”** or **“Board”** or **“Trustees”** or **“Kolkata Port Trust”** or **“KoPT”** means the Board of Trustees for the Port of Kolkata (Calcutta), a body corporate under **Section 3** of the **Major Port Trusts Act, 1963** (as amended from time to time), including their successors, representatives and assigns.
- c) **“Contractor”** or **“Successful bidder”** or **“Successful tenderer”** means the person or persons, firm or company, whose bid / offer has been accepted by the Employer and is named as such in the Contract Agreement or his representative(s), who is/are duly authorised to deal the contract.
- d) **“Contractor’s representative”** means the person(s) named by the Contractor in the contract or appointed from time to time by the Contractor, under **GCC Clause No. 7.21 [Contractor’s personnel and Contractor’s representative]**, who acts on behalf of the Contractor.
- e) **“Sub-contractor”** shall mean a person or persons, firm or company to whom a part of the work has been sub-contracted by the Contractor, with prior consent of the Employer.

- f) “Contractor’s personnel” means the Contractor’s representative and all personnel whom the Contractor utilises on site, who may include staff, labour and other employees of the Contractor and of each Sub-contractor, and any other personnel assisting the Contractor in the execution of the work.
- g) “**Engineer**” means the person appointed by the Employer to act as the Engineer for the purposes of the contract and named in the **Contract data**, or other person appointed from time to time by the Employer and notified to the Contractor under **GCC Clause No. 7.18 [Replacement of the Engineer]**.
- h) “**Engineer’s Representative**” means any sub-ordinate Engineer or assistant to the Engineer or any other official appointed from time to time by the Engineer to perform the duties set forth in **GCC Clause Nos. 7.13 to 7.15** hereof.
- i) “**Engineer-in-charge**” means employee of KoPT, authorised by the Engineer to look after the physical execution of the contract, at site level.
- j) “**Haldia Dock Complex**” or “**HDC**” means a Dock Complex situated at Haldia, under **Kolkata Port Trust**.
- k) “**Chairman**” means the Chairman of the Board of Trustees for the Port of Kolkata (Kolkata Port Trust) and includes the person appointed to act in his place under Sections 14 and 14A of the Major Port Trusts Act, 1963.
- l) “**Deputy Chairman**” means the Deputy Chairman, Haldia Dock Complex and includes the person appointed to act in his place.
- m) “**General Manager (Engineering)**” means the Officer appointed to take charge of Plant & Equipment Division, Infrastructure & Civic Facilities Division and Materials Management Division of HDC, under the supervision of the Deputy Chairman, HDC.
- n) “**Senior Deputy Manager (P&E)**” means the Officer of Plant & Equipment Division of HDC, reporting to the General Manager (Engineering).

7.1.3 Dates and periods:

“**Completion period**” means the time of completion/period of execution notified under 7.65 [Completion period].

“**Month**”, for the purpose of this contract, shall mean the period starting from the date of commencement in any month to the previous date of the following month, as per English Calendar.

“**Week**”, for the purpose of this contract, shall mean any period of 7 (seven) consecutive English Calendar Days.

“**Day**”, for the purpose of this contract, means English Calendar Day.

7.1.4 Money and payments:

“**Contract price**” or “**Contract value**” means the sum named in the “**Letter of Acceptance (LOA)**” [excluding GST] of the bid /offer of the Contractor, subject to such additions thereto and deductions therefrom, as may be made by the Engineer, under the provisions contained in this bidding document.

“**Cost**” means all expenditure reasonably incurred (or to be incurred), by the Contractor, whether on or off the site, including overhead and similar charges, but does not include profit.

“**Foreign Currency**” means the currency other than Indian Currency.

7.1.5 Work:

“**Work**” means the work to be executed in accordance with the contract and includes authorised “**Extra work**”, “**Excess work**” and “**Temporary work**”.

“**Temporary work**” means all temporary work of every kind required in or about the execution, completion or maintenance of the work and includes (without thereby limiting the foregoing definitions) all temporary erections, scaffolding, ladders, timbering soaking vats, site offices, cement and other godowns, platforms and bins for stacking building materials, gantries, temporary tracks and roads, temporary culverts and mixing platforms.

“**Excess work**” means the required quantities of work, in excess of the provision made in the contract, against any item of the “Price Schedule”.

“**Extra work**” means those work, required by the Engineer for completion of the contract, which were not specifically and separately included in the schedule of items of the work (i.e. “Price Schedule”) of the bidding document.

“**Related Services**” means the services incidental to the supply of goods / contract job, such as insurance, installation, training, initial maintenance and other obligations of the Contractor, under the contract.

7.1.6 Other definitions

“**Constructional plant**” means all appliances or things, of whatsoever nature, required in or about the execution, completion or maintenance of the work or temporary work and includes (without thereby limiting the foregoing definition) all machinery and tools, but does not include materials or other things intended to form or forming part of the permanent work.

“**Site**” means the land and other places, on, under, in or through which the contract is to be executed or carried out and any other lands or places provided by the Employer for the purpose of the contract.

“**Excepted Risks**” means riot, in so far as it is uninsurable, war,

invasion, act of foreign enemies, hostilities (whether war be declared or not), Civil War, rebellion, revolution, insurrection or military or usurped power or use or occupation by the Trustees of any portion of the works in respect of which a certificate of completion has been issued (all of which are herein collectively referred to as the excepted risks).

“Approved / approval” means approval in writing.

“Test on Completion” means such tests, prescribed by the applicable Design Standard, codes and described in the bidding document, to be performed by the Contractor before the equipment / items / installations are supplied, delivered and taken over by the Employer.

“Defect Liability Period (DLP)” means the period defined in the GCC Clause No. 7.67.

“Force Majeure” is defined in GCC Clause No. 7.86 [Definition of Force Majeure].

7.2 Contract documents

- 7.2.1 The several documents forming the contract are to be taken as mutually explanatory of one another and should anything appear in one, which is not described in the other, no advantage shall be taken of any such omission.
- 7.2.2 In case, any discrepancies or inconsistencies however appear or should any misunderstandings arise as to the meaning and of the specifications or drawings or as to the dimensions or the quality of the materials or the due and proper execution of the work or as to the measurement or quality and valuation of the work executed under this contract or as extra thereupon, the same shall be explained by the Engineer or his authorised representative.
- 7.2.3 The explanation of Engineer or his authorised representative shall be final and binding upon the Contractor and the Contractor shall execute the work according to such explanations, and without extra charge or deductions and do all such work and things as may be necessary for the proper execution of the contract as implied by the specification and drawings, even though such work and things are not specifically shown and described therein.

7.3 Interpretations

- 7.3.1 In the contract, except where the context requires otherwise:

words indicating one gender include all genders;

words indicating the singular also include the plural and words indicating the plural also include the singular;

provisions including the word “agree”, “agreed” or “agreement” require the agreement to be recorded in writing;

“written” or **“in writing”** means hand-written (manuscript), type-written, printed or Electronically made, and resulting in a permanent record, under or over signature and seal, as the case may be;

and

the word “tender” is synonymous with “bid”, and “tenderer” with “bidder” and the words “tender documents” with “bidding documents”.

7.4 All Drawings are Trustees’ property

- 7.4.1 The Drawings, referred to in the Special Conditions of Contract / Technical Specification / Price Schedule, if and as applicable, shall be furnished by the Engineer to the Contractor, free of cost, for his use on the work, but these shall remain the property of the Trustees and hence, the Contractor shall return them to the Engineer or his Representative on completion of the work, if not torn or mutilated on being regularly used at site.

7.5 Language

- 7.5.1 The contract as well as all correspondence and documents relating to the contract, exchanged between the Contractor and the Employer/Engineer, shall be written in **English Language only**. If any documents/manuals/printed literature/drawings is submitted by the Contractor in other language(s), the same should be accompanied by an accurate translation of the relevant pages in the English language. In that case, for the purposes of interpretation of the contract, such translation shall govern.
- 7.5.2 The Contractor shall have to bear all costs of translation to the English Language and all risk of the accuracy of such translation, for documents provided by the Contractor.

7.6 Notices

- 7.6.1 Any notice, given by one party to the other, pursuant to the contract, shall be in writing, to the address specified in the **Contract data**. The term “in writing” means communicated in written form, with proof of receipt.
- 7.6.2 A notice shall be effective when delivered or on the notice’s effective date, whichever is later.

7.7 Governing Law

- 7.7.1 The contract shall be governed by and interpreted in accordance with the relevant Indian Acts [considering latest amendment thereof], as applicable, within the jurisdiction of the Honourable High Court of Kolkata [Calcutta High Court] , India, including the following Acts:
- i) The Indian Contract Act, 1872.
 - ii) The Major Port Trust Act, 1963.
 - iii) The Workmen’s Compensation Act, 1923.
 - iv) The Minimum Wages Act, 1948.
 - v) The Payment of Wages Act, 1936.
 - vi) The Payment of Bonus Act, 1965.
 - vii) The Payment of Gratuity Act, 1972.
 - viii) The Equal Remuneration Act, 1976.

- ix) The Employees Provident Fund Act, 1952.
 - x) The Employees State Insurance Act, 1948 & The Employees State Insurance (Amendment) Act, 1989.
 - xi) The Contract Labour (Regulation & Abolition) Act, 1970; Rules 1971.
 - xii) Child Labour (Prohibition & Regulation) Act, 1986.
 - xiii) The Maternity Benefits Act, 1961.
 - xiv) Interstate Migrant Workmen (Regulation of Employment & Conditions of Service) Act, 1979.
 - xv) The Dock Workers (Regulation of Employment) Act, 1948.
 - xvi) The Dock Workers (Safety, Health & Welfare) Act, 1986.
 - xvii) The Indian Arbitration and Conciliation Act, 1996 [considering its latest amendment in 2015].
- 7.7.2 Unless otherwise specified, all the laws / rules / acts, etc., mentioned in different clauses of this bidding document, should be considered as laws / rules / acts, etc. applicable in India.
- 7.7.3 The Contractor shall indemnify KoPT for any proceeding taken or commenced by any authority against the Employer for any contravention of any of such laws, bye laws, rules, regulations, orders, etc., by the Contractor or their personnel / workmen / agent / supplier, etc. If, as a result of the Contractor's failure, negligence, omission, default or non-observance of any provisions of any law, bye law, rule, regulation, order, etc., the Employer is called upon by any authority to pay or reimburse or is required to pay or reimburse any amount, the Employer shall be entitled to deduct the same from any amount due or that may become due to the Contractor under this contract or any other contract or by any other means or may otherwise recover from the Contractor any sum which KoPT is required or called upon to pay or reimburse on behalf of the Contractor.
- 7.7.4 The Contractor shall indemnify KoPT for any proceeding taken or commenced by any authority against the Employer for any contravention of any of such laws, bye laws, rules, regulations, orders, etc., by the Contractor or their personnel/workmen/agent/supplier, etc. If, as a result of the Contractor's failure, negligence, omission, default or non-observance of any provisions of any law, bye law, rule, regulation, order, etc., the Employer is called upon by any authority to pay or reimburse or is required to pay or reimburse any amount, the Employer shall be entitled to deduct the same from any amount due or that may become due to the Contractor under this contract or any other contract or by any other means or may otherwise recover from the Contractor any sum which KoPT is required or called upon to pay or reimburse on behalf of the Contractor.

7.8 Patent Rights

- 7.8.1 The Contractor shall fully indemnify KoPT against any action, claim or demand, costs or expenses arising from or incurred by reason of any infringement or alleged infringements of letters, patents, design, trademark or

name, copyright or other protected rights in respect of any machine, plant, work, materials or things, system or methods of using, fixing working or arrangement used for fixed or supplied by the Contractor in India, or elsewhere.

7.8.2 All payments, or otherwise shall be deemed to be included by the Contractor in the prices named in the bid and shall be paid by them to whom they may be payable.

7.8.3 In the event of any claim being made or action brought against KoPT in respect of any such matter as aforesaid, the Contractor shall be immediately notified thereof and they shall with the assistance, if they so require, of KoPT but at the sole expense of the Contractor conduct all negotiations for the settlement of the same or any litigation that may arise there from, provided that the conduct of such negotiations or litigations shall be conditional upon the Contractor giving to KoPT such security, as shall from time to time, by reasonably required by KoPT to recover the ascertained or agreed amount, as the case may be, of any compensation, damages, expenses and cost, which might be payable by the Trustees in respect of or as a result of any such negotiation or litigation.

7.9 Stamp duty & other expenses

7.9.1 All the costs, charges and expenses to be incurred in connection with **Contract Agreement, Indemnity Bond, Bank Guarantees, Integrity Pact**, etc., including stamp duty, shall be borne by the Contractor.

7.10 Indemnity

7.10.1 Notwithstanding that all reasonable and proper precautions may have been taken by the Contractor, at all times during the progress of the work, the Contractor shall, nevertheless, be wholly responsible for all damages, whether to the works themselves or to any other property of KoPT or to the lives, persons, property of others during the progress of the work.

7.10.2 In case any damage occurs to the existing structure due to the Contractor's operation, the same shall be made good by the Contractor, at their own risk and cost. The areas, which are likely to be unsafe for use, shall be barricaded and all necessary precautionary measures, like displaying notices, shall be taken by the Contractor, during the contract period.

7.10.3 In case any material, spare parts, components, sub-assemblies, accessories, etc., related to the work (under the scope of the Contractor), is required to be taken out of the Dock premises by the Contractor, for some specialised servicing, repairs, overhauling, etc. or for any other reason whatsoever, the Contractor shall have to obtain permission from the Employer. For this the Contractor shall have to submit an “**Indemnity Bond**” [in the form furnished in **Section-XI**].

7.11 Employer's lien

7.11.1 All constructional plant, temporary work and materials, when brought to the site by the Contractor, shall be deemed to be the property of the Employer, who will have lien on the same, until the satisfactory completion of the work and shall only be removed from the site, in part or in full, with the written

permission of the Engineer or his Representative.

- 7.11.2 The Employer shall have a lien on and over all or any money that may become due and payable to the Contractor under this contract or any other contract or from any amount lying with them or under their control and in respect of any debt or sum that may become due and payable by the Employer to the Contractor, either alone or jointly with another or other and either under this contract or under any other contracts or transaction of any nature whatsoever between the Employer and the Contractor.

7.12 **Additions and alterations**

- 7.12.1 KoPT shall have power and authority, from time to time and at all times, to make amendments or additions or alterations or changes in the **Technical Specification** and give such further instructions and directions, as may appear necessary and proper to KoPT for the guidance of the Contractor and good & efficient execution of the work.

- 7.12.2 The Contractor shall receive, obey and be bound by the same, according to the true intent and meaning thereof, as if the same had been mentioned or referred to in the **Technical Specification**.

- 7.12.3 KoPT may also vary or alter the levels or positions of any of the work contemplated by approved specification or may order any of the work contemplated thereby to be omitted, with or without substitution of any other works in lieu thereof, or may order any work or any portion of works executed or partially executed, to be removed, changed or altered, if required.

In this connection, KoPT may increase or decrease or split the quantity of work included in the contract or execute additional work of any kind necessary for good & efficient execution of the work.

- 7.12.4 The Engineer shall have the power to order for the above amendments (additions/alterations/changes, etc.) and any difference in the cost occasioned by any such diminution or alteration so ordered and directed shall be added to or deducted from the amount accepted under the contract based on the rate(s) available in the contract. Where the rate(s) is/are not available in the contract, such difference in the cost shall be determined by the Engineer, taking into account the market rate and labour cost at site for similar work, backed up by rate analysis, (to be submitted by the Contractor and agreed upon between the Contractor and KoPT).

In the event of disagreement, KoPT shall fix such rates or prices as shall, in their opinion, be reasonable and proper having regard to the circumstances.

B. THE ENGINEER

7.13 **Instructions of the Engineer or Engineer's Representative**

- 7.13.1 The Contractor shall execute, complete and maintain the works in terms of the contract to the entire satisfaction of the Engineer and shall comply with the Engineer's direction on any matter whatsoever. However, the Engineer shall exercise his discretion impartially, within the terms of the contract and have regard to all the circumstances.

The Contractor shall take instructions from the Engineer and subject to

limitation indicated in **GCC Clause No. 7.16.1** hereof, from the Engineer's Representative.

7.14 Engineer's power and authority

7.14.1 The Engineer shall have full power and authority:

to supply to the Contractor, from time to time, during the progress of the works, such further drawings and instructions as shall be necessary for the purpose of proper and adequate execution and maintenance of the works and the Contractor shall carry out and be bound by the same.

to alter or modify the specification of any material and workmanship and to inspect the work at any time.

to order for any variation, alteration and modification of the work and for extra works.

to issue certificates as per contract.

to settle the claims & disputes of the Contractor.

to grant extension of completion time.

7.15 Power of Engineer's Representative

7.15.1 The Engineer's Representative shall:

watch and supervise the work.

test and examine any material to be used or workmanship employed in connection with the work.

have power to disapprove any material and workmanship not in accordance with the contract and the Contractor shall comply with his direction in this regard.

take measurements of work done by the Contractor for the purpose of payment or otherwise.

order demolition of defectively done work for its reconstruction all by the Contractor at his own expense

have powers to issue alteration order not implying modification of design and extension of completion time of the work.

And

have such other powers and authorities vested in the Engineer, which have been delegated to him, in writing, by the Engineer under intimation to the Contractor.

7.16 Limitation of Engineer's Representative's power

7.16.1 Provided always that the Engineer's Representative shall have no power:

a) to order any work involving delay or any extra payment by the

- Trustees,
- b) to make variation of or in the work,
- And
- c) to relieve the Contractor of any of his duties or obligations under the contract.

7.17 Engineer's over-riding power

7.17.1 Provided also as follows:

Failure of Engineer's Representative to disapprove any work or materials shall not prejudice the power of the Engineer thereafter to disapprove such work or materials and to order the pulling down, removal, breaking-up thereof and re-constructing at the Contractor's cost and the Contractor shall have no claim to compensation for the loss sustained by them.

If the Contractor shall be dissatisfied by reason of any decision of the Engineer's Representative, they shall be entitled to refer the matter to the Engineer, who shall thereupon confirm, reverse or vary such decision which will be final, conclusive and binding on the parties.

Any written instructions or written approval given by the Engineer's Representative to the Contractor, within the terms of delegation of power and authority vested in the Engineer to his representative, in writing, shall bind the Contractor and the Trustees as though it had been given by the Engineer, who may, from time to time, make such delegation.

7.18 Replacement of the Engineer

- 7.18.1 If the Employer intends to replace the Engineer, the Employer shall give notice to the Contractor in this respect.

7.19 Determinations

- 7.19.1 Whenever these conditions provide that the Engineer shall proceed, in accordance with this clause, to agree or determine any matter, the Engineer shall consult with each party, in an endeavour to reach agreement. If agreement is not achieved, the Engineer shall make a fair determination, in accordance with the contract, taking due regard of all relevant circumstances.

The Engineer shall give notice to both parties of each agreement or determination, with supporting particulars **within 28 (twenty-eight) days** from the receipt of the corresponding claim or request, except when otherwise specified. Each party shall give effect to each agreement or determination, unless and until revised under **GCC Clause Nos. 7.94 to 7.98 [Claims, Disputes and Arbitration]**.

C. THE CONTRACTOR

7.20 Performance Guarantee / Security Deposit

- 7.20.1 As specified in the SCC, the Contractor shall have to provide **Performance Guarantee / Security Deposit** towards guaranteeing the performance of the

Supply, Installation, Testing and Commissioning of 33 kV Over Head Line & Under Ground Cable from Intake Substation to GC Berth Substation for strengthening of power supply arrangement of RMQC-3 of HDC, KoPT.

Contractor in execution of the contract.

7.20.2 The **Performance Bank Guarantee(s)** shall be denominated in the currency (ies) of payment in the contract, and shall be in the **form** furnished in **Section-XI**.

7.20.3 The original Bank Guarantee should be sent by the issuing Branch of the Bank, directly to the Employer, under Registered Post (A.D), at the following address:

General Manager (Finance),
Haldia Dock Complex (HDC),
Jawahar Tower Complex,
P.O. Haldia Township,
Dist. Purba Medinipur,
PIN – 721 607,
West Bengal, India.

A photocopy of the Bank Guarantee should also be sent to the Engineer, by the Contractor, for record.

The General Manager (Finance), HDC may require Bank's confirmation for having issued the Guarantee. In that case, the issuing Branch of the Bank should send a confirmation letter, directly to the Employer, under Registered Post (A.D), at the above address.

7.20.4 Failure of the Contractor to submit the required Performance Bank Guarantee, as mentioned in **GCC Clause No. 7.20.1** and in the manner stated in the **SCC**, shall constitute sufficient grounds for termination of the contract and forfeiting the Earnest Money Deposit.

7.20.5 The proceeds of **Performance Guarantee / Security Deposit** shall be payable to the Employer, as compensation, for any loss resulting from the Contractor's failure to complete its obligations under the contract.

7.20.6 **Performance Guarantee/Security Deposit** shall be liable to be forfeited, at the option of the Employer, if the Contractor fails to carry out the work or to perform / observe any of the conditions of the contract.

7.20.7 The Employer shall be at liberty to deduct/recover any of their dues from **Security Deposit/Performance Guarantee**.

In that case, if **Security Deposit / Performance Guarantee** is reduced by reason of any such deduction or encashment, the Contractor shall have to, **within 15 (fifteen) days thereafter**, make good the amount so reduced.

7.20.8 The cost of obtaining **Performance Bank Guarantee** or any other Bank Guarantee and / or revalidation thereof, whenever required, has to be borne by the Contractor and it shall be their sole responsibility to arrange for timely revalidation of such Bank Guarantee, failing which and for non-fulfilment of any contractual obligation by the Contractor, the Engineer and/or the Employer shall be at liberty to raise claim / demand under Performance Guarantee and/or enforce the same unilaterally.

No interest/charge, of whatsoever nature, shall be paid by the Employer on the amount of **Security Deposit / Performance Guarantee** held by the Employer, at any stage.

- 7.20.9 On completion of execution of the work, the Contractor shall maintain the same during the “**Defect Liability Period**” (i.e. **10 years comprehensive operation & maintenance period**), as specified in **GCC Clause No. 7.67**, from the date mentioned in the “**Certificate of Completion of Work**” [as per the form furnished in **Section-XI**]. Any defect / fault, which may appear in the work during the aforesaid maintenance period, arising, in the sole opinion of the Engineer or his Representative, from materials or workmanship not in accordance with the contract or the instruction of the Engineer or his Representative, shall, upon the written notice of the Engineer or his Representative, be amended and made good by the Contractor, at his own cost, within 7 (seven) days of the date of such notice, to the satisfaction of the Engineer or his Representative, failing which, the Engineer or his Representative shall have the defects amended and made good through other agency at the Contractor’s risk and cost and all expenses, consequent thereon or incidental thereto, shall be recoverable from the Contractor in any manner deemed suitable by the Engineer.
- 7.20.10 The contract shall not be considered completed and the work shall not be treated as finally accepted by the Trustees, until a “**Certificate of Final Completion**” [as per the form furnished in **Section-XI**] shall have been signed and issued by the Engineer, after all obligations under the contract, including that in the Defect Liability Period (DLP), if any, have been fulfilled by the Contractor. Previous entry on the works or taking possession, working or using thereof by the Trustees shall not relieve the Contractor of his obligations under the contract for full and final completion of the work.
- 7.20.11 Refund of **Performance Guarantee / Security Deposit** would be guided by the procedure detailed in the **SCC**.

7.21 Contractor’s personnel and Contractor’s representative

- 7.21.1 The Contractor’s personnel shall be appropriately qualified, skilled and experienced in their respective trades or occupations. The Engineer may require the Contractor to remove (or cause to be removed) any person employed on the site of work, including the Contractor’s representative, if applicable, who:
- persists in any misconduct or lack of care,
 - carries out duties incompetently or negligently,
 - fails to conform with any provisions of the contract, or
 - persists in any conduct, which is prejudicial to safety, health or protection of the environment.
- If appropriate, the Contractor shall then appoint (or cause to be appointed) a suitable replacement person.
- 7.21.2 The Contractor shall have to communicate the names of their officials/representatives, authorized by them through **Power of Attorney** (specimen signature of such authorized representative should be attested), to make all correspondences and sign all documents/papers in relation to this contract.

Written orders or instructions, which the Employer may issue to such

authorized officials/ representatives of the Contractor, shall be deemed to have been given to the Contractor.

- 7.21.3 In case any of such authorised persons fails to act as Contractor's representative, the Contractor shall similarly communicate the name and particulars of another suitable person for such authorization.

The Contractor shall have to notify the Engineer, immediately after revoking the appointment of the Contractor's representative and appointment of a replacement.

- 7.21.4 If any of the Contractor's representatives/officials is required to be temporarily replaced during the period of contract, the name of the person temporarily authorised [by any one of the authorised officials/representatives, authorized earlier through **Power of Attorney**], shall have to be notified. Specimen signature of such temporarily authorised representative(s) should be attested [by the said authorised official/representative].

7.22 Assignment and sub-contracting

- 7.22.1 The Contractor shall not, directly or indirectly, transfer, assign, sublet or sub-contract the whole of the work.

Unless otherwise stated in the contract, the Contractor shall not, directly or indirectly, transfer, assign, sublet or sub-contract any part of the work without prior consent of the Engineer. Any such consent shall not relieve the Contractor from any of their liabilities or obligations under the contract and they shall be responsible for :

- a) the acts, defaults and neglect of any Sub-contractor, their agents, servants or workmen as fully as if these were the acts, defaults or neglects of the Contractor, their agents, servants or workmen,
- b) their full and entire responsibility of the contract and active superintendence of the work by them despite being sublet.

Provided that the Contractor shall not be required to obtain such permission for:

- i) the provision of labour engaged on piece-work basis/daily rate basis,
 - ii) the purchase of materials/services which are in accordance with the standards specified in the contract,
- Or
- iii) the sub-contracting of any part of the work, for which the Sub-contractor is named in the contract.

The Contractor shall be responsible for observance, by all Sub-contractors, of labour laws applicable in India (for the portion of work that would be executed in India) and all other provisions of the contract.

- 7.22.2 No **participating bidder** [in connection with the instant tender] will be allowed to act as a **Sub-contractor** of the successful bidder (Contractor).
- 7.22.3 In the event of the Contractor contravening aforesaid condition [**GCC Clause No. 7.22.2**], the Employer shall be entitled to terminate the contract forthwith

and award a fresh contract to some other parties at **risk and cost of the Contractor**, who shall be liable for any loss or damage, which KoPT may sustain in consequence to arising out of such replacement of the Contractor.

- 7.22.4 The Contractor shall not assign their right and interest in these presents nor assume a fresh partner or partners, dissolve the partnership existing between them in reference to this contract, without the prior written permission of the Employer.

7.23 Access to site

- 7.23.1 The Contractor shall have to abide by the **rules and regulations of Kolkata Port Trust (KoPT)** in respect of entry / exit and movement in the dock premises.

- 7.23.2 Necessary **Gate Pass / Dock Entry Permit**, for entering into the Dock area, will be issued to the personnel of the Contractor [including that of approved Sub-contractor(s)] directly connected with the work, **on chargeable basis** [as per the extant “**Scale of Rates**” of KoPT, available at <http://www.kolkataporttrust.gov.in/> of **Kolkata Port Trust**], on receipt of a formal written request.

However, for issuing such Gate Pass, the following would be required:

- i) **For Indian nationals:** A photocopy of the Voter’s Identity Card/any other Photo Identity Card.
- ii) **For foreign nationals (excluding from Nepal and Bhutan):** **Permission in the form of “No objection” for entering Haldia Dock**, from the office of the **Superintendent of Police, Purba Medinipur, West Bengal, India**, which acts as the **District Registration Office for foreigners**.

Dock Entry Permits shall not be issued to the mentioned foreign nationals without the aforesaid permission. The aforesaid “No objection”, along with photocopies of Passport and Visa of the foreign national, has to be submitted to the Administration Division of HDC, KoPT, with an application for obtaining Dock Entry Permit(s).

- 7.23.3 The Contractor will be fully responsible for any injury (whether fatal or otherwise) to their personnel [including that of approved Sub-contractor(s)], for any loss or damage to property or for any other loss, damage, costs and expenses, whatsoever caused, which, but for the granting of such permission, would not have arisen.
- 7.23.4 The Contractor will be liable to indemnify the Employer against any loss or damage to the property of the Employer or neighbouring property, which may be caused due to any act of the Contractor or their personnel [including that of approved Sub-contractor(s)].
- 7.23.5 **No photograph within the Dock Area** shall be taken by the Contractor, without prior permission of the Engineer.

7.24 Transportation of materials

- 7.24.1 All materials, spare parts, tools, tackles, service equipment, including consumables, required under this contract, will have to be packed, securely

placed and protected by the Contractor during transportation. The Contractor will be held responsible for the inefficient packing, storing and protection of the materials.

7.25 Contractor's equipment

- 7.25.1 The Contractor shall be responsible for all the equipment of the Contractor. When brought on to the site, the Contractor's equipment shall be deemed to be exclusively intended for the execution of the work. The Contractor shall not remove from the site any major items or Contractor's equipment without the consent of the Engineer. However, consent shall not be required for vehicle(s) transporting goods or Contractor's personnel off site.

7.26 Supply of water and Electricity

7.26.1 Supply of water:

Drinking water supply at the **Contractor's site office, store, workshop, assembly/erection yard, etc.** will be given **on chargeable basis**. For this, the Contractor shall have to make **all arrangements, including installation of Water Meter and laying of pipelines from the source(s) identified by KoPT, at their cost**. The Contractor will be responsible for maintenance and calibration of such water meter also. Billing against water supply will be done in line with SCC.

KoPT do not guarantee uninterrupted supply of water and the Contractor shall not be compensated for any delay or irregularity in supplying water. The Contractor shall have to arrange for the supply of water at his own cost during such periods.

However, water supply, if required for the **actual work (including erection, commissioning & cleaning work) at the site only** and / or **maintenance, repair & cleaning work** (required to be carried out at site during the "Defect Liability Period") will be provided free of cost. The Contractor shall have to make **all arrangements for laying of pipelines from the source(s) identified by KoPT, at their cost**.

7.26.2 Supply of Electricity:

Supply of Electricity at the **Contractor's site office, store, workshop, assembly / erection yard, etc.** will be on **chargeable basis**. The Contractor shall have to make all arrangements, including **installation of Energy Meter and laying of Cables from the source(s) identified by KoPT, at their cost**. The Contractor will be responsible for maintenance and calibration of such Energy Meter also. Billing against **electricity charges** will be done in line with SCC.

KoPT do not guarantee uninterrupted supply of Electricity and the Contractor shall not be compensated for any delay or irregularity in supplying Electricity. The Contractor shall have to arrange for Electricity at his own cost during such periods.

However, Power supply, required for the **actual work (including erection and commissioning) at the site only** and/or **maintenance and repair** (required to be carried out at site during the "Defect Liability Period") will be provided free of cost. The Contractor shall have to make all arrangements for

laying of Cables from the source(s) identified by KoPT, at their cost.

7.27 Use of ground and land/covered space for Contractor's establishment

- 7.27.1 The Contractor shall be allowed to use a suitable land (open space), which in the opinion of KoPT may be absolutely necessary for the proper and efficient execution of works. For this, a token lump sum licence fee of **₹ 10.00 per month or part thereof** will be charged during pendency of the contract and extension thereof, if any.
- 7.27.2 On completion of work or termination of the contract, the Contractor shall have to clear away all their tools, plants, rubbish and other materials, **within a fortnight** and hand over vacant and peaceful possession of the same to KoPT, in a tidy and clean condition. The same license fee (₹ 10.00 per month or part thereof) will be applicable for this additional period (if any) for clearing the space. If the Contractor fails to clear the space and handover the same to the Employer in a clean and tidy condition, within the period mentioned above, KoPT's "Schedule of Rate" will be applicable for the period beyond that.
- 7.27.3 The Contractor shall be allowed to erect any temporary structures on this land [as stated in **GCC Clause No. 7.27.1**] for **office and / or store and / or workshop**, etc. and make all suitable arrangement for water supply, Electricity supply and sanitary arrangements for the same, at their own cost.
- 7.27.4 In case the Contractor is interested in taking **covered space, office room**, etc. of KoPT for the purpose of making a site office and store in the Dock area, the same may also be allotted subject to availability. The rents for such covered spaces or office room of KoPT, to be allotted to the Contractor, shall have to be paid by the Contractor, as per the 'Schedule of Rent of KoPT, prevailing at that time. In addition to the rent, **water consumption charges** [as per **GCC Clause Nos. 7.26.1**] and **Electricity consumption charges** [as per **GCC Clause No. 7.26.2**] (if Electricity / water is supplied from KoPT sources) and other applicable charges, as per the notifications of **Tariff Authority of Major Ports (TAMP)**, have to be paid by the Contractor. The Contractor will be responsible for installation, maintenance and calibration of Water Meter and / or Energy Meter also.

7.28 Existing services

- 7.28.1 Drains, Pipes, Cables, overhead wires and similar services, whether above or below the ground, which may be encountered in the course of the work, shall be saved and kept harmless from injury and/or loss or damages by the Contractor, at their own costs and expenses, so that they continue to be in full and uninterrupted use to the Employer.
- 7.28.2 The Contractor shall not store any materials or otherwise occupy any part of the site in a manner likely to hinder the operation of such services. The Contractor shall, at their own costs and expenses and without any delay, repair and make good, to the satisfaction of the Employer, any injury and/or loss or damage caused by the Contractor to the same.

7.29 Contractor to prepare working/ progress drawings

- 7.29.1 The Contractor shall provide and make, at his own expense, any working or progress drawings, required by him or necessary for the proper execution of

the works, and shall, when required, furnish copies of the same, free of cost, to the Engineer for his information and/or approval, without meaning thereby the shifting of Contractor's responsibility on the Engineer, in any way, whatsoever.

7.30 Contractor's price is inclusive of all costs

7.30.1 Unless otherwise specified, the Contractor shall be deemed to have included in his bid / offer all his cost for supplying and providing all constructional plant, temporary work, materials (both for temporary and permanent works), labour (including supervision thereof), transporting to and from the site and in and about the work, including loading, unloading, fencing, watching, lighting, payment of fees, taxes and duties to the appropriate authorities and other things of every kind required for the construction, erection, completion and maintenance of the work.

7.31 Contractor is responsible for all construction process, except for correctness of design and specification formulated by the Engineer

7.31.1 The Contractor shall be solely responsible for the adequacy, stability and safety of all site operations and methods of construction, even if any prior approval thereto has been taken from the Engineer or his Representative. The Contractor shall not be responsible for the correctness of the design or specification of the temporary and permanent works formulated by the Engineer, but the Contractor shall be fully responsible for the correct implementation thereof, as also for any design and specification prepared/proposed/used by the Contractor.

7.32 Contractor to submit his programme of work

7.32.1 Whenever required by the Engineer or his Representative, the Contractor shall submit to him the details of his

- (a) programme for execution of the work,
- (b) proposed procedure and methods of work,

I proposed deployment of plant, equipment, labour, materials and temporary works.

The submission to and/or any approval by the Engineer or his Representative to any such programme or particulars shall not relieve the Contractor of any of his obligations under the contract.

7.32.2 If, for any reason, the Contractor be unable to adhere to his earlier programme, he shall submit his revised programme for completion of work within the stipulated time, whenever asked to do so.

7.33 Contractor to supervise the works

7.33.1 Necessary and adequate supervision shall be provided by the Contractor during execution of the works and as long thereafter as the Engineer or his Representative shall consider necessary during the Defect Liability Period (DLP). The Contractor, or his competent and authorised agent or representative, shall be constantly at site and instructions given to him by the Engineer or his Representative, in writing, shall be binding upon the Contractor subject to limitation in **GCC Clause No. 7.16** hereof. The Contractor shall inform the Engineer or his Representative in writing about

such representative/agent of him at site.

7.34 Contractor is responsible for line, level, setting out, etc.

7.34.1 The Contractor shall be responsible for the true and proper setting out of the works, in relation to reference points / lines / levels given by the Engineer, in writing. The checking of any setting out or of any alignment or level by the Engineer or his Representative shall not, in any way, relieve the Contractor of his responsibility for the correctness thereof and he shall fully provide, protect and preserve all stakes, templates, bench marks, sight rails, pegs, level marks, profile marks and other things used in setting out the works.

7.35 Contractor is responsible to protect the work

7.35.1 From the commencement of the works till issue of the “Certificate of Completion of Work”, vide **GCC Clause No. 9.65** hereof, the Contractor shall take full responsibility for the care thereof. Save for the excepted risks, any damage, loss or injury to the work, or any part thereof, shall be made good by the Contractor, at his own cost, as per instruction and to the satisfaction of the Engineer, failing which, the Engineer or his Representative may cause the same to be made good by any other agency and the expenses, incurred and certified by the Engineer, shall be recoverable from the Contractor, in whatever manner the Engineer shall deem proper. This clause will not apply to that part of the work, which might have been taken over by the Trustees on partial completion of the work and in such case, the Contractor’s obligation will be limited to repairs and replacement for manufacturing or construction defects during the Defect Liability Period, as per the directions of the Engineer, as also for defects/damages, if any, caused to the work by the Contractor during such repairs and replacement during the Defect Liability Period.

7.36 Contractor is responsible for all damages to other structures / persons caused by him in executing the work

7.36.1 The Contractor shall, at his own cost, protect, support and take all precautions in regard to the personnel or structure or services or properties belonging to the Trustees or not, which may be interfered with or affected or disturbed or endangered and shall indemnify and keep indemnified the Trustees against claim for injury, loss or damage caused by the Contractor in connection with the execution and maintenance of the work to the aforesaid properties, structures and services and / or to any person, including the Contractor’s workmen. Cost of Insurance Cover, if any, taken by the Contractor, shall not be reimbursed by the Trustees, unless otherwise stipulated in the contract.

7.37 Fossils, Treasure troves, etc. are Trustees’ property

7.37.1 The Contractor shall immediately inform the Engineer’s Representative if any fossil, coins, articles of value or antiquity and structures and other remains or things of geological or archaeological importance be discovered at site, which shall remain the property of the Trustees, and protect them from being damaged by his workmen and arrange for disposal of them, at the Trustees’ expense, as per the instruction of the Engineer’s Representative.

7.38 Contractor to indemnify the Trustees against all claims for loss, damage, etc.

7.38.1 The Contractor shall be deemed to have indemnified the Trustees against all claims, demands, actions and proceedings and all costs arising there from on account of:

- (a) Infringement of any patent right, design, trademark or name or other protected right, in connection with the works or temporary work.
- (b) Payment of all royalties, rent, toll charges, local taxes, other payments or compensation, if any, for getting all materials and equipment required for the work.
- (c) Unauthorised obstruction or nuisance caused by the Contractor in respect of Public or Private road, railway tracks, footpaths, crane tracks, waterways, quays and other properties belonging to the Trustees or any other person.
- (d) Damage/injury caused to any highway and bridge on account of the movement of Contractor's plants and materials in connection with the work.
- (e) Pollution of waterway and damage caused to river, lock, sea-wall or other structure related to waterway, in transporting Contractor's plants and materials.
- (f) The Contractor's default in affording all reasonable facilities and accommodation, as per the direction of the Engineer or his Representative, to the workmen of the Trustees and other agencies employed by or with the permission and/or knowledge of the Trustees on or near the site of work.

7.39 Dismantled materials Trustees' property

7.39.1 Debris and materials, if obtained by demolishing any property, building or structure, in terms of the contract, shall remain the property of the Trustees.

7.40 Contractor's quoted rates / price must be all inclusive

7.40.1 The Contractor's quoted rates shall be deemed to have been inclusive of the following:

- (a) Keeping the site free of unnecessary obstruction and removal from site of constructional plant wreckage, rubbish, surplus earth or temporary works no longer required.
- (b) Cleaning and removal from site all the surplus materials, of every kind, to leave the site clean and tidy after completion of the work, without which payment against final bill may be liable to be withheld.
- (c) Precautionary measures to secure efficient protection of Docks, the River Hooghly and other waterways against pollution, of whatever nature, during execution and maintenance of the works and to prevent rubbish, refuse and other materials from being thrown into the water by the Contractor's men or those of his agency.
- (d) Making arrangements for deployment of all labourers and workers, local or otherwise, including payment for their wages, transport, accommodation, medical and all other statutory benefits and entry

permits, wherever necessary.

- (e) Making arrangements, in or around the site, as per the requirements of Calcutta Municipality Corporation or other local authority or the Engineer or his Representative, for preventing
 - (i) spread of any infectious disease like smallpox, cholera, plague, malaria or dengue, by taking effective actions for destruction of rats, mice, vermin, mosquitoes, etc. and by maintaining healthy and sanitary condition,
 - (ii) illegal storage and distribution of Drugs, Narcotics, Alcoholic liquor, Arms and Ammunitions,
 - (iii) unlawful, riotous or disorderly conduct of the Contractor's or his Sub-contractor's workmen,
 - (iv) deployment of workmen of age less than 16 (sixteen) years.

7.41 Notice to Contractor

- 7.41.1 Every direction or notice to be given to the Contractor shall be deemed to have been duly served on or received by the Contractor, if the same is posted or sent by hand to the address given in the bid or to the Contractor's Site Office or, in case of Trustee's enlisted Contractor, to the address as appearing in the Trustee's Register or to the Registered Office of the Contractor. The time mentioned in these conditions for doing any act after direction or notice shall be reckoned from the time of such posting or despatch.

7.42 Contractor not to publish photograph or particulars of work

- 7.42.1 The Contractor and his Sub-contractor or their agents and men and any firm, supplying plant, materials and equipment, shall not publish or caused to be published any photographs or description of the works, without the prior authority of the Engineer in writing.

7.43 Contractor to provide facilities to outsiders

- 7.43.1 The Contractor shall, at the Trustees' cost to be decided by the Engineer, render all reasonable facilities and co-operation, as per direction of the Engineer or his Representative, to any other Contractor engaged by the Trustees and their workmen, to the Trustees' own staff and to the men of other Public Body, on or near the site of work, and in default, the Contractor shall be liable to the Trustees for any delay or expense incurred by reason of such default.

7.44 Work to cause minimum possible hindrance to traffic movement

- 7.44.1 The work has to be carried out by the Contractor causing minimum hindrance for any maritime traffic or surface traffic.

D. STAFF AND LABOUR

7.45 Engagement of staff and labour

- 7.45.1 The labour, as mentioned in the respective clauses, shall include all labourers of the approved sub-contractor(s), with respect to this contract.

- 7.45.2 The Contractor shall have to make their own arrangements for the engagement of all staff and labour, for doing the work at site or in respect of or in connection with the execution of work, as also for the transport, housing, feeding. They shall have to ensure making payment to the above staff and labours, to be engaged by them (including the labours, to be engaged by the approved Sub-contractor, if any).
- 7.45.3 KoPT's store shall mean any store of Haldia Dock Complex, situated at Haldia.
- 7.45.4 It is expressly made clear that both before and after the completion of the work or termination of the contract, **KoPT shall have no liability, whatsoever, for the personnel to be engaged by the Contractor [or by the approved Sub-contractor(s)] for the work under this contract.**

7.46 Labour Laws

- 7.46.1 The Contractor shall, at all times, during the pendency of the contract [including the period of making good/rectification of deficiencies/defects, if any], have to comply fully with all existing **Acts, Regulations and Byelaws**, including all **statutory amendments** and re-enactment of **State or Central Government** and other **Local Authorities** and any other enactments and acts that may be passed in future either by the **State** or the **Central Government** or **Local Authority**, including **Workmen's Compensation Act, Labour Laws and Equal Remuneration Act, Factories Act, Minimum Wages Act, Contract Labour (Regulation & Abolition) Act**, etc., if applicable and/or as applicable.
- 7.46.2 If, as a result of the Contractor's failure, negligence, omission, default or non-observance of any provisions of any laws, the Employer is called upon by any authority to pay or reimburse or required to pay or reimburse any amount, the Employer shall be entitled to deduct the same from any moneys due or that become due to the Contractor under this contract or any other contract or otherwise recover from the Contractor any sums, which the Employer is required or called upon to pay or reimburse on behalf of the Contractor.
- All **registration and statutory inspection fees**, in connection with labour engagement, with respect to this contract, shall have to be paid by the Contractor, if applicable and/or as applicable.
- 7.46.3 The Contractor shall have to, immediately after the occurrence of any accident, at or near the site or in connection with the execution of the work under the contract, report (over phone or otherwise) to the Engineer or his representative(s) and shall make every arrangement to render all possible assistance to the victim(s) of such accident.
- The Contractor shall also have to report such accident to the Engineer, in writing (giving reference to the earlier communication made). Based on such report, necessary communication with the competent authority would be made whenever such a report is required by law.
- 7.46.4 For any accident occurred within the entire operational area covered under the contract, the Contractor shall have to arrange prompt investigation into the matter through recording of statement of the personnel witnessing the accident. Such "Accident Report", containing the findings, along with the

statements so recorded, shall have to be forwarded by the Contractor to the Engineer at the earliest.

- 7.46.5 The Contractor shall have to provide full medical treatment to their staff & labourers, in case of “**Accident on Duty**”, which will inter alia include their obligations under the **Workmen’s Compensation Act, 1923**, including all amendments thereof.

The Employer shall in no manner be liable to the Contractor or any person engaged/employed by them [including that of Sub-contractor] or any other person, for injuries or death caused as a result of accidents occurred, either within or outside the site of work, under the contract. The Contractor shall be responsible for such contingencies and will make good all claims for compensation, claim by their personnel/workmen or the families of the sufferer(s), as the case may be, or as per the decision of the appropriate authority/tribunal or other involved persons.

- 7.46.6 The Contractor shall have to indemnify KoPT, in the event of KoPT being held liable to pay compensation for injury to any Contractor’s servants or workmen [including that of Sub-contractor] under the **Workmen’s Compensation Act, 1923**, as amended from time to time.

- 7.46.7 Whenever the contract comes to an end with the efflux of time or otherwise or is terminated, the Contractor shall be required to fulfil all their obligations towards their workmen in terms of applicable labour laws and submit necessary documents towards such effect, to the Employer in support of the same. Any deposit, which may be lying with KoPT to their credit, will be liable to be applied for this purpose, if the Contractor fails to comply with the same. In case such documents are not furnished by the Contractor, the Employer will not release the **Performance Guarantee/ Security Deposit** and any other amount as may remain due to the Contractor

7.47 **Health and safety**

- 7.47.1 In the event of any outbreak of illness or an epidemic nature, the Contractor shall have to comply with and carry out such regulations, orders & requirements, as may be made by the Government, or the local medical or sanitary authorities, for the purpose of dealing with and overcoming the same.

- 7.47.2 The Contractor shall have to ensure safety of all their working personnel to the fullest compliance of the provisions of **general safety rules/regulations**, including **Dock Workers’ (Safety, Health & Welfare) Regulations, 1986**.

The Contractor shall be solely responsible for consequences arising out of non-compliance or violation of safety rules/ regulations.

- 7.47.3 The Contractor [including approved Sub-contractor(s)] shall have to provide (at their own expenses) all required **Personal Protection Equipment (PPE)** [such as **Helmets, Nose Masks, Hand Gloves**, etc.] & **Safety Gears** for all personnel and labourers engaged during the work and in case of their failing to do so, the Employer shall provide the same and recover the cost thereof from any amount due, or which may become due to the Contractor or from any amount lying with them or under their control.

7.48 **Labour licence**

- 7.48.1 Within 7 (seven) days from the date of issuance of the order, the Contractor shall have to apply for **labour licence** for the maximum number of workers proposed to be deployed for this work. Necessary certificate shall be issued by the Engineer against a request from the Contractor.

Photocopy of the application shall have to be furnished to the Engineer, immediately. However, payment will be released only on furnishing the copy of the **Labour Licence** to the Engineer. However, such license should be kept valid throughout the actual duration of contract.

7.49 Employees' Provident Fund & Employees' State Insurance

- 7.49.1 The Contractor should have their establishment (with respect to this contract) registered with the concerned authorities under the provision of **Employees' Provident Fund & Miscellaneous Provision Act, 1952** and **Employees' State Insurance Act, 1948**. The Contractor shall have to submit the proof of registration as mentioned above immediately after commencement of work.

- 7.49.2 As per the above mentioned Act, the Contractor is liable for remittance of monthly subscription contribution in respect of **Employees' Provident Fund (EPF)** and **Employees' State Insurance (ESI)** for the workers engaged by them, wherever applicable. The Contractor shall have to submit the authenticated copy of the challans with respect to subscription / contribution of **Employees' Provident Fund** and **Employees' State Insurance** (against their respective Code Numbers issued by the **Employees' Provident Fund** and **Employees' State Insurance Authorities**) by 7th day of every English Calendar Month (during the currency of the contract) along with the list of labourers for whom such deposits have been made.

Payment will be held up if the up-to-date **Employees' Provident Fund** and **Employees' State Insurance** remittance challan is not submitted in time.

- 7.49.3 In case, registration with the EPF and ESI Authorities is not applicable for the employees of the Contractor [or for the employees of the Sub-contractor(s)], documentary evidence to establish non-applicability to be submitted by the Contractor.
- 7.49.4 In case of sub-contracting any part of the work, above requirements should also be fulfilled by the approved Sub-contractor and necessary documents shall have to be submitted in time, as indicated above.

E. PLANT, MATERIALS AND WORKMANSHIP

7.50 Materials to be supplied by the Employer

- 7.50.1 Regarding supply of any materials by the Trustees to the Contractor, in accordance with the contract, the following conditions shall apply:
- a) The Contractor shall, at his own expense, arrange for transporting the materials from the Trustees' Store [store of Haldia Dock Complex, situated at Haldia], watching, storing and keeping them in his safe custody, furnishing of statement of consumption thereof in the manner required by the Engineer or his Representative, return of surplus and empty container to the Trustees' Stores, as per the direction of the Engineer or his Representative.

- b) Being the custodian of the Trustees' materials, the Contractor shall remain solely responsible for any such materials issued to him and for any loss or damage thereof for any reason other than "Excepted Risks", the Contractor shall compensate the Trustees', in the manner decided by the Engineer, and shall, at no stage, remove or cause to be removed any such material from the site, without his permission.
- c) The Trustees' materials will generally be supplied in stages and in accordance with the rate of progress of work, but, except for grant of suitable extension of completion time of work as decided by the Engineer, the Contractor shall not be entitled to any other compensation, monetary or otherwise, for any delay in the supply of Trustees' materials to him. The Contractor shall, however, communicate his requirement of such materials to the Engineer from time to time.
- d) Unless stipulated otherwise in the contract, the value of the Trustees' materials issued to the Contractor shall be recovered from the Contractor's bills and/or any of his other dues, progressively, according to the consumption thereof on the work and/or in the manner decided by the Engineer or his Representative and at the rate(s) stipulated in the contract. These rates shall only be considered by the Contractor in the preparation of his bid/offer and these will form the basis of escalation/variation, if in future the Contractor is required to procure and provide any such material on the written order of the Engineer, consequent on the Trustees' failure to effect timely supply thereof.
- e) If the Engineer decides that due to the Contractor's negligence, any of the Trustees' materials, issued to the Contractor, has been – (i) lost or damaged, (ii) consumed in excess of requirement and (iii) wasted by the Contractor in excess of normal wastage, then the value thereof shall be recovered from the Contractor's bills, or from any of his other dues, after adding 19.25 % extra over the higher one of the followings:
 - i) The issue rate of the materials at the Trustees' Stores, and
 - ii) The market price of the material on the date of issue, as would be determined by the Engineer.

7.51 Contractor's arrangement for execution of the work

- 7.51.1 The Contractor will have to arrange and provide all types of materials, etc. [in line with the Technical Specification] throughout the execution of the contract.
- 7.51.2 KoPT will not take any responsibility regarding **non-availability** of any such materials for which Contractor is responsible as per contract. The Contractor shall have to assess the requirement of such materials and keep sufficient stock.
- 7.51.3 The Contractor shall have to provide all equipment, including tools, tackles, lifting machineries, air compressor, scaffolding arrangement, different vehicular transport, etc., necessary to execute the work.

- 7.51.4 All tools & machineries to be used by the Contractor should be suitable for the particular requirement (i.e. capacity should be adequate) and the same should be checked for fitness before use. They should maintain the said equipment properly to ensure their efficient working.
- 7.51.5 The Contractor shall, at their own costs and expenses, have to provide all labour, plant, haulage, transportation of plant and equipment to be used for executing the contract, all materials, stores, etc. (except the equipments & materials to be provided by KoPT, as per contract) required for efficiently carrying out the work to the satisfaction of the Employer.
- 7.51.6 The Contractor should use calibrated measuring & testing instruments and should also ensure revalidation of such calibration as and when required. In this regard, initially the Contractor shall have to submit a list of **measuring and testing instruments** (mentioning the period of validity of Calibration Certificates) to be used. The photocopies of the Calibration Certificates (including the revalidations) of the said measuring and testing instruments, shall have to be submitted to the Engineer.

7.52 Inspection and testing

- 7.52.1 The Engineer or his authorised Representative shall have, at all reasonable time, access to the Contractor's premises or work site or other premises [if a part of the work is being executed there or some **maintenance repair** work (during **Defect Liability Period**) is being done there] and shall have the power, at all reasonable time, to **inspect, examine and test the materials and workmanship**, as well as the **documents, equipment, tools, measuring & testing instruments**, as applicable, in connection with the instant contract (including **Defect Liability Period**).
- 7.52.2 The Engineer or his authorised Representative, on giving 7 (seven) days' notice, in writing, to the Contractor, setting out any ground of objections, in respect of the work, shall be at liberty to reject all or any material and/or workmanship in the subject of any of the said grounds of objection, which are not in accordance with the contract.
- 7.52.3 Quality of materials, to be provided by the Contractor under this contract, should be as per the satisfaction of the Engineer. Whenever asked, the Contractor shall have to provide free sample for testing.
- 7.52.4 If found necessary, KoPT reserves the rights to get the materials inspected from a **Government or Government recognized Laboratory/Test House**.
- 7.52.5 In case of sub-letting to other Contractors or manufacturers or suppliers by the Contractor, the Engineer will reserve the right as follows:
 - i) that inspection and / or testing will be carried at the Sub-contractor's works; or
 - ii) that inspection will be carried out at site; or
 - iii) that inspection will be waived, subject to the Contractor furnishing a certificate of compliance with specification by a competent authority recognised by national/international institutes.
- 7.52.6 The Employer may appoint a **Third Party Inspection Agency**, as detailed at SCC, at the cost of the Employer, for stage-wise technical inspection and

Supply, Installation, Testing and Commissioning of 33 kV Over Head Line & Under Ground Cable from Intake Substation to GC Berth Substation for strengthening of power supply arrangement of RMQC-3 of HDC, KoPT.

certification of **materials** & workmanship, including **painting, erection, commissioning**, etc. [in connection with the contract job, in part or as a whole]. In that case The relevant Certificates shall be produced by the **Third Party Inspection Agency** to the Engineer or his authorised Representative.

- 7.52.7 The stage-wise technical inspection will be carried out by the representative of the Engineer [or **Third Party Inspection Agency**] based on the approved **Quality Assurance Plan (QAP) & Field Quality Assurance Plan (FQAP)** [considering the Technical Specification of the bidding documents].
- 7.52.8 The Contractor shall have to submit a **Quality Assurance Plan (QAP)** and a **Field Quality Assurance Plan (FQAP)**, based on the Technical Specification and other terms & conditions stipulated in the bidding documents. The **QAP & FQAP** shall be approved by the “**Engineer**”.
- 7.52.9 In all cases where tests are required, within the purview of QAP & FQAP, whether at the premises of the Contractor or any Sub-contractor or elsewhere, the Contractor, except where otherwise specified, shall provide free of charges such labour, materials, electricity, fuel, water, stores, apparatus and instruments, as may reasonably be demanded, to carry out sufficiently such tests and shall, at all times, facilitate the Engineer or his Representative [and / or the Third Party Inspection Agency] , to accomplish such testing.
- 7.52.10 The cost of all tests and / or analyses, within the purview of QAP & FQAP, effected at the Contractor’s or Sub-contractor’s works and on the site, shall be borne by the Contractor. The Contractor will be called upon to pay all expenses incurred by the Employer in respect of any work found to be defective or of inferior quality, adulterated or otherwise unacceptable.
- 7.52.11 If, during inspection by the **Third Party Inspection Agency [if appointed by KoPT]**, any material or test [within the purview of QAP & FQAP] fails to fulfil the contract conditions for **more than 2 (two) times, any additional amount charged by the Third Party Inspection Agency towards inspection of the same from the 3rd time onwards shall have to be borne by the Contractor**. If the Contractor fails to make such payment to the **Third Party Inspection Agency**, the same shall be deducted from the bill(s) of the Contractor and paid to the **Third Party Inspection Agency**
- 7.52.12 **Tests on completion:**
On **completion of installation**, the contractor with give a **7 (seven) days’** notice to the Engineer, in writing (informing the date on which they will be ready to make the tests), before carrying out such tests, in accordance with and in the manner prescribed in the specifications. The procedure specified in SCC shall be followed in this respect.
- 7.52.13 Notwithstanding the fact that the materials or installations have passed the inspection, the Contractor is not relieved from his obligations to conform to the quality, workmanship, guaranteeing the performance, etc., as per the contract.
- 7.53 **Contractor to replace materials/work not acceptable to the Engineer or his Representative**
- 7.53.1 The Engineer or his Representative shall have the power to inspect any material and work at any time and to order at any time

- a) for removal from the site of any material, which, in his opinion, is not in accordance with the contract or the instruction of the Engineer or his Representative,
- b) for the substitution of proper and suitable materials, or
- c) the removal and proper re-execution of any work, which, in respect of material and workmanship, is not in accordance with the contract or the instructions of the Engineer.

The Contractor shall comply with such order at his own expense and within the time specified in the order. If the Contractor fails to comply, the Engineer shall be at liberty to dispose any such materials and re-do any work in the manner convenient to the Trustees by engaging any outside agency, at the risk and expense of the Contractor and after giving him a written prior notice of 7 (seven) days.

7.54 Removal of materials on completion

- 7.54.1 The Contractor shall, on completion of the contract or when directed by the Employer, shall have to remove all plant, equipment, tools, materials, temporary constructions, etc. and rubbish garbage, waste, which may have accumulated during the execution of the contract, other than those permanently used into the work, at Employer's site.

7.55 Workmanship and secrecy

- 7.55.1 The Contractor shall carry out the services in conformity with generally accepted norms and sound standards of Engineering. The Contractor shall be responsible for the technical soundness of the services rendered. In the event of any deficiency in those services, the Contractor shall promptly re-do the same, at no additional cost to the Employer.
- 7.55.2 The Contractor shall use all the documents, drawings and other data & information, of proprietary nature, received from the Employer, solely for the purpose of performing and carrying out the obligations on his part under the Agreement in the performance of the works for the project and maintain utmost secrecy, in this regard. The documents, drawings and other data & information, received from the Employer, shall not be used by the Contractor for any other purpose.

F. COMMENCEMENT, EXECUTION & COMPLETION OF WORK, HANDING OVER AND TAKING OVER

7.56 Preliminary time to commence work and maintenance of steady rate of progress

- 7.56.1 The Contractor shall commence the work within 7 (seven) days of the receipt of Engineer's letter informing acceptance of the Contractor's bid / offer by the Trustees or within such preliminary time as mentioned by the Contractor in the "Form of Tender" or the time accepted by the Trustees. The Contractor shall then proceed with the work with due expedition and without delay, except as may be expressly sanctioned or ordered by the Engineer or his Representative, time being deemed the essence of the contract on the part of the Contractor.

7.57 Contractor's site office

- 7.57.1 The Contractor shall provide and maintain a suitable office at or near the site to which the Engineer's Representative may send communications and instructions for use of the Contractor.

7.58 Contractor to observe Trustees' working hours

- 7.58.1 Unless specified otherwise in the contract or prior permission of the Engineer has been taken, the Contractor shall not execute the work beyond the working hours observed by the Engineer's Representative and on Sundays and Holidays observed in the Trustees' system, except in so far as it becomes essential on account of tidal work or for safety of the work. If the progress of the work lags behind schedule or the work has been endangered by any act or neglect on the part of the Contractor, then the Engineer or his Representative shall order and the Contractor, at his own expense, shall work by day and by night and on Sundays and Public Holidays. Any failure of the Engineer or his Representative to pass such an order shall not relieve the Contractor from any of his obligations. The Engineer's decision, in this regard, shall be final, binding and conclusive.

7.59 Contractor to supply all materials as per requirement of the Engineer or his Representative

- 7.59.1 Unless stipulated otherwise in the contract, all materials required for the work shall be procured and supplied by the Contractor with the approval of the Engineer or his Representative and subject to subsequent testing, as may be required by the Engineer or his Representative. The Engineer shall exercise his sole discretion to accept any such materials

7.60 Materials and works

- 7.60.1 Unless stipulated otherwise in the contract, all materials, workmanship and method of measurement shall be in accordance with the relevant Codes (Latest Revision) of the Bureau of Indian Standards and the written instructions of the Engineer or his Representative. Where no specific reference is available in the contract, the material and workmanship shall be of the best of their respective kinds to the satisfaction of the Engineer.

7.61 Contractor to submit samples for approval

- 7.61.1 Samples shall be prepared and submitted for approval of the Engineer or his Representative, whenever required to do so, all at the Contractor's cost.

7.62 Contractor to seek approval of Engineer or his Representative before covering up any portion of work

- 7.62.1 No work shall be covered up and put out of view by the Contractor without approval of the Engineer or his Representative and whenever required by him, the Contractor shall uncover any part or parts of the work or make openings in or through the same as may be directed by the Engineer or his Representative from time to time and shall reinstate or make good those part of works thus affected, to the satisfaction of the Engineer, all at the cost of the Contractor.
- 7.62.2 The Trustees shall reimburse such cost, as determined by the Engineer, if the initial covering up was with prior written order of the Engineer or his

Representative.

7.63 Contractor to suspend work on order from Engineer or his Representative

- 7.63.1 On a written order of the Engineer or his Representative, the Contractor shall delay or suspend the progress of the work, till such time the written order to resume the execution is received by him. During such suspension, the Contractor shall protect and secure the work to the satisfaction of the Engineer or his Representative. All extra expenses, in giving effect to such order, shall be considered by the Trustees, unless such suspension is:
- a) for removal from the site of any material, which, in his opinion, is not in accordance with the contract or the instruction of the Engineer or his Representative,
 - b) otherwise provided for in the contract, or
 - c) necessary by reason of some default on the part of the Contractor, or
 - d) necessary by reason of climatic conditions on the site, or
 - e) necessary for proper execution of the works or for the safety of the works or any part thereof.
- 7.63.2 The Engineer shall settle and determine such extra payment and/or extension of completion time to be allowed to the Contractor, as shall, in the opinion of the Engineer, be fair and reasonable.
- 7.63.3 If at any time, before or after commencement of the work, the Trustees do not require the whole of the work tendered for, the Engineer shall notify the same to the Contractor in writing and the Contractor shall stop further works in compliance of the same. The Contractor shall not be entitled to any claim for compensation for underived profit or for such premature stoppage of work or on account of curtailment of the originally intended work by reason of alteration made by the Engineer in the original specifications, drawings, designs and instructions.

7.64 Completion Certificate

- 7.64.1 When the whole of the work [as detailed in **GCC Clause No. 7.65 (Completion period)**] has been completed to the satisfaction of the Engineer, the Contractor shall, within 21 (twenty one) days of submission of his application to the Engineer, be entitled to receive from him a certificate for completion of work as per the form furnished in **Section – XI**.

7.65 Completion period

- 7.65.1 All the jobs, as per contract, are to be completed within the period stipulated in the SCC.

7.66 Taking over of the Contract job by KoPT

- 7.66.1 The **Contract job** will be taken over by HDC, KoPT after completion of the works in accordance with the contract, having passed all the tests under “Tests on completion”.

- 7.66.2 However, the actual date of completion of the contract will be considered as per **GCC Clause No. 7.65 [Completion period]**.

7.67 Defect Liability Period (DLP)

- 7.67.1 “**Defect Liability Period**” shall mean the **Guarantee Period**, as specified in SCC.
- 7.67.2 During “**Defect Liability Period**” [as specified in SCC], the Contractor shall nominate 2 (Two) competent, experienced and responsible technical person, to co-ordinate and execute all works to be attended by the Contractor, as per contractual obligations, without any extra cost to HDC, KoPT.
- 7.67.3 The Contractor shall be responsible for making good (including replacement of defective items, if required), with all possible speed, at their expense, any defect in or damage to any portion of the work, which may appear or occur after the Contract job has been taken over [as per GCC Clause No. 7.66 (Taking over of the Contract job by KoPT)] and before expiry of Defect Liability Period [as specified in SCC] and which arises either:
- a) from any defective materials, workmanship or design, or
 - b) from any act or omission of the Contractor done or omitted during the said period.

7.68 Defects after taking over

- 7.68.1 If any such defects shall appear or damage occur (as detailed in **7.67.3**), the Engineer shall forthwith inform the Contractor thereof, stating in writing the nature of defect or damage.
- The provision of this clause shall apply to all replacements or renewals carried out by the Contractor to remedy defects and damage as if the said replacements and renewals had been taken over on the date they were completed to the satisfaction of Engineer. After the taking over, if the Contract job cannot be used (for the purpose for which it is intended), during any period, by the reason of a defect or damage, the **Defect Liability Period** shall be extended accordingly, as specified in SCC.
- 7.68.2 If any such defect or damage be not remedied by the Contractor within a reasonable time, HDC, KoPT may proceed to do the work at the Contractor’s risk and expense, but without prejudice to any other rights which HDC, KoPT may have against the Contractor in respect of such defects.
- 7.68.3 All inspection, adjustments, replacement or renewal carried out by the Contractor during the period referred in this clause shall be subject to the conditions of this contract, which shall be binding on the contractor in all respects during the **Defect Liability Period** and its extension, if any.

7.69 Extension of completion period and liquidated damage

7.69.1 Extension of completion period:

Should the quantum of extra or additional work of any kind or delayed availability of the Trustees’ materials to be supplied as per contract or **Force Majeure** condition (as per **GCC Clause No. 7.86**) or other special circumstances, of any kind, beyond the control of the Contractor or any other

reason not attributable to the Contractor [including hindrance at site of work, causes indicated as “**Excepted Risks**”, etc.] cause delay in completing the work, the Contractor shall apply to the Engineer, in writing, for suitable extension of completion period, within **7 (seven) days** from the date of occurrence of the reason and the Engineer shall thereupon consider the stated reasons in the manner deemed necessary and shall either reject the application or determine and allow, in writing, the extension period as he would deem proper for completion of the work, with or without the imposition of “**Liquidated Damage**” (GCC Clause No. 7.69.2 hereof) on the Contractor and his decision shall be binding on the Contractor. If an extension of completion period is granted by the Engineer, “**Liquidated Damage**” (GCC Clause No. 7.69.2 hereof) shall apply from its date of expiry, if the work be not completed within the extended time, unless stated otherwise in the decision communicated by the Engineer, as aforesaid.

7.69.2 **Liquidated Damage:**

If the Contractor fails to complete the work within the stipulated dates [as per **GCC Clause No. 7.65 (Completion period)**] or such extension thereof, as communicated by the Engineer, in writing, the Contractor shall pay as compensation (**Liquidated Damage**) to the Trustees and not as a penalty, as per the following:

In case of handing over the Contract Job after the scheduled completion period, **Liquidated Damage @ ½% of the Contract Price [excluding GST]**, for every week or part thereof, beyond the scheduled date of completion, will be deducted from the Contractor’s bill. Provided always the amount of such compensation shall not exceed **10%** of the cost the Contract Price [excluding GST].

- 7.69.3 Without prejudice to any of their legal rights, the Trustees shall have the power to recover the said amount of compensation/damage, as per **GCC Clause No. 7.69.2** from any money due or likely to become due to the Contractor. The payment or deduction of such compensation/damage shall not relieve the Contractor from his obligation to complete the work or from any of his other obligations/liabilities under the contract and in case of the Contractor’s failure and at the absolute discretion of the Engineer, the work may be ordered to be completed by some other agency, at the risk and expense of the Contractor, after a minimum **3 (three) days** notice, in writing, has been given to the Contractor by the Engineer or his Representative.

G. CONTRACT PRICE , PAYMENT AND DEDUCTIONS

7.70 Contract Price

- 7.70.1 Price charged by the Contractor for the related services performed under the contract shall not vary from the rates accepted by the Employer, based on the bid/offer of the successful bidder and stated in the “Letter Of Acceptance”, with the exception of any price adjustment, if provided for in the contract.
- 7.70.2 Changes **in statutory taxes & duties will be adjusted** time to time.
- 7.70.3 No claim whatsoever of the Contractor for their man & material resources remaining idle for any reason or for any other expenses incurred by them due to the flow of work not being continuous or for stoppage of work, will be

entertained by the Employer.

7.71 Terms of payment

7.71.1 **Payment of Goods & Services Tax (GST):**

Amount of GST will be borne by HDC, KoPT on production of suitable document(s) by the Contractor.

7.71.2 **Time of payment:**

The Contractor shall have to submit **bills in triplicate** to the Engineer, in accordance with the stage-wise payments specified in **SCC**. In normal circumstances, payment of the bills, accompanied by **Inspection Certificates** & other relevant documents, duly recommended by the Engineer, will be passed within 30 (thirty) days from the date of receipt of such bills, if found in order.

7.71.3 **Income Tax deduction:**

Income Tax, if any, as per the relevant provision of the Income Tax Act, shall be **deducted at source** from amount payable to the Contractor.

7.71.4 **No interest on account of delayed payments:**

Any claim for interest will not be entertained by KoPT with respect to any delay on the part of KoPT for making payment, or for any dispute. The decision of the Engineer is final in such matters.

7.72 Extra expenses incurred by the Employer

7.72.1 Any extra expenses incurred in connection to the work by the Employer in the performance of the work owing to the neglect or omission on the part of the Contractor in any of the case mentioned in this contract shall be deducted from any sum due or which may thereafter become due to the Contractor or from any amount lying with them or under their control or they may be called upon to pay the amount of such extra expense to such person or persons as the Employer may appoint to receive the same and in the event of the Contractor failing to make such payment, the said amount shall be recoverable from them in such manner as the Employer may determine,

7.73 Recovery of deducted amount

7.73.1 Without prejudice to any of their legal rights, the Trustees shall have the power to recover the amount of **DEDUCTION**, from any money due or likely to become due to the Contractor. Such payment or deduction shall not relieve the Contractor from their obligation to complete the work or from any of their other obligations / liabilities under the contract.

7.74 Variation and its valuation

7.74.1 The Engineer shall have the power to order the Contractor, in writing, to make any variation of the quantity, quality or form of the works or any part thereof that may, in his opinion, be necessary and the Contractor upon receipt of such an order shall act as follows:

a) Increase or decrease the quantity of any work included in the contract.

- b) Omit any work included in the contract.
 - c) Change the character or quality or kind of any work included in the contract.
 - d) Change the levels, lines, position and dimensions of any part of the work, and
 - e) Execute extra and additional work, of any kind, necessary for completion of the works.
- 7.74.2 No such variation shall, in any way, vitiate or invalidate the contract or be treated as revocation of the contract, but the value (if any) of all such variations, evaluated in accordance with the Engineer's sole decision, shall be taken into account and the contract price shall be varied accordingly.
- 7.74.3 Provided always that written order of the Engineer shall not be required for increase or decrease in the quantity of any work up to 15%, where such increase or decrease is not the result of any variation order given under this clause but is the result of the quantities exceeding or being less than those stated in the "Price Schedule". Provided also that verbal order of variation from the Engineer shall be complied with by the Contractor and the Engineer's subsequent written confirmation of such verbal order shall be deemed to be an order in writing within the meaning of this clause.
- 7.74.4 The Contractor shall not be entitled to any claim of extra or additional work, unless they have been carried out under the written orders of the Engineer.
- 7.74.5 The Engineer shall solely determine the amount (if any) to be added to or deducted from the sum named in the tender in respect of any extra work done or work omitted by his order.
- 7.74.6 All extra, additional or substituted work done or work omitted by order of the Engineer shall be valued on the basis of the rates and prices set out in the contract, if in the opinion of the Engineer, the same shall be applicable. If the contract does not contain any rates or prices directly applicable to the extra, additional or substituted work, then the Engineer may decide the suitable rates on the basis of "Schedule of Rates" (including surcharge in force at the time of acceptance of bid), if any, adopted by the Trustees with due regard to the accepted contractual percentage, if any thereon. In all other cases, the Engineer shall solely determine suitable rates in the manner deemed by him as fair and reasonable and his decision shall be final, binding and conclusive.
- 7.74.7 If the nature or amount of any omission or addition relative to the nature or amount of the whole of the contract work or to any part thereof shall be such that, in the opinion of the Engineer, the rate of prices contained in the contract for any item of the works or the rate as evaluated under **GCC Clause Nos. 7.74.5 & 7.74.6**, is by reason of such omission or addition rendered unreasonable or in-applicable, the Engineer shall fix such other rate or price as he deems proper and the Engineer's decision shall be final, binding and conclusive.

H. TERMINATION BY EMPLOYER

7.75 Notice to correct

- 7.75.1 If the Contractor fails to carry out any of their obligations under the contract, the Engineer may give notice to the Contractor, requiring them to make good

Supply, Installation, Testing and Commissioning of 33 kV Over Head Line & Under Ground Cable from Intake Substation to GC Berth Substation for strengthening of power supply arrangement of RMQC-3 of HDC, KoPT.

the failure and to remedy the same within a specified reasonable time.

7.76 Termination by Employer

7.76.1 The Employer shall be entitled to terminate the contract if:

- a) the Contractor fails to comply with **GCC Clause No. 7.20 [Performance Guarantee / Security Deposit]**
or
with a notice under **GCC Clause No. 7.75 [Notice to correct]**,
- b) the Contractor **abandons** the work, or **repudiates** the contract, or otherwise plainly demonstrates the intention not to continue performance of their obligations under the contract,
- c) the Contractor, without reasonable or lawful excuse under this contract,
 - i) fails to proceed with the work, **within 14 days** from the scheduled date for commencement of work, in accordance with **GCC Clause No. 7.56 [Preliminary time to commence work and maintenance of steady rate of progress]**,
 - ii) keeps the work suspended for **at least 14 days**, despite receiving Engineer's written notice to proceed with the work,
or
 - iii) fails to comply with a notice issued regarding rejection of material(s)/work and/or remedial work, **within 28 days** after receiving it,
- d) the Contractor **assigns/sub-contracts the whole of the work**
Or
sub-contracts any portion of the work, without the required consent, in line with **GCC Clause No. 7.22**.
- e) the Contractor becomes **bankrupt** or **insolvent**, goes into liquidation, have a receiving or administrative order made against them, compounds with their creditors, or carries on business under a receiver, trustees or manager for the benefit of their creditors, or if any act is done or event occurs which (under applicable laws) has a similar effect to any of these acts or events,
- f) the Contractor gives or offers to give (directly or indirectly) to any person any bribe, gift, gratuity, commission or other thing of value, as an inducement or reward,
 - i) for doing or forbearing to do any action in relation to the contract,
or
 - ii) for showing or forbearing to show favour or disfavour to any person in relation to the contract,
or, if any of the Contractor's personnel, Agents or Sub-contractors gives or offers to give (directly or in directly) to any person any

such inducement or reward as is described in this **sub-paragraph (f)**. However, lawful inducement and reward to the Contractor's personnel shall not entitle termination

- g) the Contractor fails to execute the work in accordance with the contract
or
persistently or flagrantly neglects to carry out their obligations under the contract.
- h) the Contractor fail to make payment of wages to their personnel in relation to this contract,
- i) the Contractor fails to carry out the work satisfactorily (as stated in these bidding documents or otherwise decided by the Engineer) or may not be able to complete the work within the agreed period on account of Contractor's lapses.
- j) any accident occurs due to improper way of working by the Contractor's personnel, or
- k) any misconduct done by Contractor's personnel (including that of Agents or Sub-contractors) to KoPT's employees.

In any of these event or circumstances, the Employer may, upon giving a **minimum 14 days' notice** [communicated by the Engineer] to the Contractor, **terminate the contract** and expel the Contractor from the site, without being liable for any compensation to the Contractor. However, in case of **sub-paragraph (e) or (f)**, the Employer may, by notice [communicated by the Engineer], terminate the contract immediately.

The Employer's election to terminate the contract shall not prejudice any other rights of the Employer, under the contract or otherwise.

- 7.76.2 Upon receipt of the letter of termination of work, which may be issued by the Engineer on behalf of the Employer, the Contractor shall have to leave the site of work and deliver any **required goods**, all **Contractor's documents**, and other **design documents**, made by or for them, all the **Trustees' tools, plant and materials** issued to them, at the place to be ascertained by the Engineer, **within 7 days** of receipt of such letter. However, the Contractor shall use their best efforts to comply immediately with any reasonable instructions included in the notice

- i) for the assignment of any Sub-contractor,
and
- ii) for the protection of life or property or for the safety of the equipment/work.

The Contractor shall not be released from any of their obligations or liability under the contract and the rights & authorities conferred on the Employer and Engineer, by the contract, shall not be affected.

- 7.76.3 Upon such termination of work, the Employer shall have the power to complete the work by **themselves** and/or through **any other agency** at the **Contractor's risk & expense** and the Contractor shall be debited **any sum or sums that may be expended in completing the work beyond the amount**

that would have been due to the Contractor, had they duly completed the whole of the work in accordance with the contract.

The Employer or such other agency may use, for such completion, so much of the Contractor's documents, other design documents, made by or on behalf of the Contractor, Contractor's equipment, temporary work, plant & materials, as they think proper.

Upon completion of the work, or at such earlier date, as the Engineer shall give notice that the Contractor's equipment and temporary work will be released to the Contractor at or near the site, the Contractor shall remove or arrange removal of the same from such place without delay and at their risk & cost. However, if by this time the Contractor has failed to make a payment due to the Employer, these items may be sold by the Employer in order to recover this payment. Any balance of the proceeds shall be paid to the Contractor.

7.77 Valuation at date of termination

- 7.77.1 As soon as practicable after a notice of termination under **GCC Clause No. 7.76 [Termination by Employer]**, has taken effect, the Engineer shall proceed in accordance with **GCC Clause No. 7.19 [Determinations]** to agree or determine the value of the work, goods & Contractor's documents, and any other sums due to the Contractor for work executed, in accordance with the contract. The value of such work (executed in accordance to the Contract) shall be determined based on measurements of actual work done and approved rate(s), as per contract or other rates, as decided by the Engineer. The Engineer's decision, in such case, shall be final, binding and conclusive.

7.78 Payment after termination

- 7.78.1 After a Notice of termination, under **GCC Clause No. 7.76 [Termination by Employer]** has taken effect, the Employer may
- a) give notice to the Contractor, indicating the particulars, for which Employer is entitled to any payment under any Clause or otherwise in connection with the contract, and or any extension of the **Defect Notification Period**.

However , Notice is not required for payments due under **GCC Clause No. 7.26 [Supply of water and Electricity]**, under **GCC Clause No. 7.27 [Use of ground and land/covered space for Contractor's establishment]**, or for other services requested by the Contractor,
 - b) withhold further payments to the Contractor until the cost of execution, completion and remedying of any defects, damage, and all other costs incurred by the Employer, have been established, and / or
 - c) recover from the Contractor any losses and damages incurred by the Employer and any extra costs of completing the work, after allowing for any sum due to the Contractor under **GCC Clause No. 7.77 [Valuation at date of termination]**. After recovering any such losses, damages and extra costs, the Employer shall pay any balance to the Contractor.

7.79 **Employer's entitlement to termination for convenience**

7.79.1 The Employer, by notice [communicated by the Engineer] sent to the Contractor, may terminate the Contract, in whole or in part, at any time **for Employer's convenience**. Such termination shall take effect **28 days** after the date on which the Contractor receives this notice or the Employer returns the Performance Guarantee. The notice of such termination shall specify that termination is for **Employer's convenience**, the extent to which performance of the Contractor under the contract is terminated, and the date upon which such termination become effective.

The Employer shall not terminate the contract under this Sub-clause in order to execute the work exclusively by themselves or to arrange for work to be executed exclusively by another Contractor or to avoid a termination of the contract by the Contractor under **GCC Clause No. 7.82 [Termination by Contractor]**.

After such termination, the Contractor shall proceed in accordance with **GCC Clause No. 7.83 [Cessation of work and removal of Contractor's equipment]** and shall be paid in accordance with **GCC Clause No. 7.90 [Optional termination, payment and release]**.

7.80 **Corrupt or fraudulent practices**

7.80.1 If the Employer determines that the Contractor has engaged in **corrupt, fraudulent, collusive, coercive, or obstructive** practices, in competing for or in executing the Contract, then the Employer may, after giving **14 days notice** to the Contractor, terminate the Contractor's employment under the Contract and expel them from the Site, and the provisions of **GCC Clause Nos. 7.75 to 7.78** shall apply as if such expulsion had been made under **GCC Clause No. 7.76 [Termination by Employer]**.

Should any employee of the Contractor be determined to have engaged in corrupt, fraudulent, collusive, coercive, or obstructive practice during the execution of the work, then that employee shall be removed in accordance with **GCC Clause No. 9.21 [Contractor's personnel and Contractor's representative]**.

For the purposes of this clause:

- i) "corrupt practice" is the offering, giving, receiving or soliciting, directly or indirectly, of anything of value to influence improperly the actions of another party;
- ii) "fraudulent practice" is any act or omission, including a misrepresentation, that knowingly or recklessly misleads, or attempts to mislead, a party to obtain a financial or other benefit or to avoid an obligation;
- iii) "collusive practice" is an arrangement between two or more parties designed to achieve an improper purpose, including to influence improperly the actions of another party;
- iv) "coercive practice" is impairing or harming, or threatening to impair or harm, directly or indirectly, any party or the property of the party to

influence improperly the actions of a party;

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

I. SUSPENSION AND TERMINATION BY CONTRACTOR

7.81 Contractor’s entitlement to suspend work

- 7.81.1 The Contractor may, if the Employer fails to pay the Contractor the amount due under any certificate of the Engineer **within 28 days** after the expiry of the time stated in **GCC Clause No. 7.71 [Terms of payment]** within which payment is to be made, subject to any deduction that the Employer is entitled to make under the Contract, after giving 28 days’ prior notice to the Employer, with a copy to the Engineer, suspended work or reduce the rate of work.
- 7.81.2 If the Contractor subsequently receives the due payment (as described in the relevant Clause and in the above notice) before giving a notice of termination, the Contractor shall resume normal working as soon as is reasonably practicable.
- 7.81.3 If the Contractor suspends work or reduces the rate of work in accordance with the provisions of this Clause and thereby suffers delay, the Engineer shall, after due consultation with the Contractor, determine any extension of time or minimum criteria for satisfactory performance, to which the Contractor is entitled and shall notify the Contractor accordingly.

7.82 Termination by Contractor

- 7.82.1 The Contractor will be entitled to terminate the Contract if:
 - a) the Contractor does not receive the reasonable evidence within **42 days after** giving notice under **GCC Clause No. 7.81 [Contractor’s entitlement to suspend work]** in respect of a failure of the Employer to pay the Contractor the amount due,
 - b) the Employer obstruct or refuse any required approval to the issue of any such certificate, which is essentially required for further progress of the work without notifying any reason for such obstruction or refusal for a unreasonably long period of time, or
 - c) the Employer become bankrupt or insolvent, go into liquidation, or enter into composition with the creditors,

or

 - d) the Employer give notice to the Contractor that for unforeseen reasons, due to economic dislocation, it is impossible for them to continue to meet their contractual obligations.

In any of these events or circumstances, the Contractor may, upon giving **28 days' notice** to the Employer (with a copy to the Engineer), terminate the Contract.

The Contractor's election to terminate the Contract shall not prejudice any other rights of the Contractor, under the Contract or otherwise.

7.83 Cessation of work and removal of Contractor's equipment

7.83.1 After a notice of termination under **GCC Clause No. 7.79 [Employer's entitlement to termination for convenience]**, **GCC Clause No. 7.82 [Termination by Contractor]** or **GCC Clause No. 7.90 [Optional termination, payment and release]** has taken effect, the Contractor shall promptly:

- a) cease all further work, except for such work as may be necessary and instructed by the Engineer for the purpose of making safe or protecting those parts of the work already executed and any work required to leave the site in a clean and safe condition.
- b) hand over all construction documents, Plant and Materials for which the Contractor has received payment.
- c) hand over those other parts of the Works executed by the Contractor up to the date of termination
- d) remove all Contractor's equipment, which is on the site and repatriate all their staff and labour from the site.

And

- e) remove all other goods from the site, except as necessary for safety, and leave the site.

Any such termination shall be without prejudice to any other right of the Contractor under the contract.

7.84 Payment on termination

7.84.1 After a notice of termination under **GCC Clause No. 7.82 [Termination by Contractor]** has taken effect, the Employer shall promptly:

- a) return the Performance Guarantee / Security Deposit to the Contractor
- b) pay the Contractor in accordance with **GCC Clause No. 7.90 [Optional termination, payment and release]** ,
and
- c) pay to the Contractor the amount of any loss or damage sustained by the Contractor as a result of this termination.

J. INSURANCE

7.85 General requirements for insurances

7.85.1 The contractor during the contract period shall provide for insurance of 110% of the contract value including manning upto the commissioning and taking

Supply, Installation, Testing and Commissioning of 33 kV Over Head Line & Under Ground Cable from Intake Substation to GC Berth Substation for strengthening of power supply arrangement of RMQC-3 of HDC, KoPT.

over of the installation.

K. FORCE MAJEURE

7.86 Definition of Force Majeure

7.86.1 In this clause “**Force Majeure** “ means an exceptional event or circumstance

- a) which is beyond the control of the Employer and the Contractor,
- b) which such party (Employer / Contractor) could not reasonably have provided against before entering into the contract,
- c) which, having arisen, such party could not reasonably have avoided or overcome,
and
- d) which is not attributable to other party.

Force Majeure may include, but not limited to, exceptional events or circumstances of the kind listed below, so long as conditions a) to d) above are satisfied:

- i) **war, hostilities** (whether war be declared or not) , **invasion, act of foreign enemies;**
- ii) **rebellion, terrorism, sabotage by persons other than the Contractor’s personnel, revolution, insurrection , military or usurped power, or Civil War;**
- iii) **riot, commotion, disorder, strike or lockout by persons other than the Contractor’s personnel;**
- iv) **munitions of war, explosive materials, ionisation radiation or contamination by radio-activity**, except as may be attributable to the Contractor’s use of such munitions, explosives, radiations or radio-activity;
- v) **natural catastrophes** such as **earthquake, tsunami** (caused by earthquake at the ocean bed),**fire, floods, hurricane, cyclone, typhoon or volcanic activity**,
and
- vi) **pressure waves** caused by air craft or other aerial devices travelling at sonic or supersonic speed at the site of the work.

7.87 Notice of Force Majeure

7.87.1 If a party is or will be prevented from performing its obligations under the Contract by Force Majeure, then it shall give notice to the other party of the event or circumstances constituting the Force Majeure and shall specify the obligations, the performance of which is or will be prevented. The notice shall be given **within 48 (forty eight) hours** of the alleged beginning of the relevant event or circumstance constituting Force Majeure, giving full particulars and satisfactory evidence.

The party shall, having given notice, be excused performance of its obligations for so long as such Force Majeure prevents it from performing them.

Notwithstanding any other provision of this clause, Force Majeure shall not apply to obligations of either party to make payments to the other party under the contract.

7.88 Duty to minimise delay

7.88.1 Each party shall at all times use all reasonable endeavours to minimise any delay in the performance of the contract as a result of Force Majeure.

A Party shall give notice to the other party when it ceases to be affected by the Force Majeure, **within 48 (forty eight) hours** of such ending.

7.89 Consequences of Force Majeure

7.89.1 If the Contractor is prevented from performing its substantial obligations under the Contract by Force Majeure of which notice has been given under **GCC Clause No. 7.87 [Notice of Force Majeure]**, and suffers delay and/or non-performance as per the contractual obligations, by reason of such Force Majeure, the Contractor shall be entitled, subject to **GCC Clause No. 7.91 [Engineer's decision]**, to:

a) an extension of time for any such delay, if completion is or will be delayed, under **GCC Clause No. 7.69 [Extension of completion period and liquidated damage]**,
and

b) non-imposition of penalty due to non-performance as per the contractual obligations.

After receiving this notice, the Engineer shall proceed in accordance with **GCC Clause No. 7.19 [Determinations]** to agree or determine these matters.

7.90 Optional termination, payment and release

7.90.1 If the execution of all the work in progress is prevented for a **continuous period of 84 days** by reason of **Force Majeure** of which notice has been given under **GCC Clause No. 7.87 [Notice of Force Majeure]**, or for **multiple periods which total more than 140 days** due to the same notified Force Majeure, then either party may give to the other party a notice of termination of the contract. In this event, the **termination shall take effect 7 days after the notice is given**, and the Contractor shall proceed in accordance with **GCC Clause No. 7.83 [Cessation of work and removal of Contractor's equipment]**.

Upon such termination, the Engineer shall determine the value of the work done and issue a payment certificate which shall include:

a) The amounts payable for any work carried out for which a price is stated in the Contract;

b) the cost of plant and materials ordered for the work which have been delivered to the Contractor, or of which the Contractor is liable to accept delivery. Such Plant and Materials shall become the property of (and be

at the risk of) the Employer when paid for by the Employer and the Contractor shall place the same at the Employer's disposal;

- c) any other cost or liability, which in the circumstances was reasonably incurred by the Contractor in the expectation of completing the Works;
- d) the **reasonable Cost** of removal of temporary work and Contractor's equipment from the site and the return of such items to the Contractor's premises,

and

- e) the reasonable cost of repatriation of the Contractor's staff and labour employed wholly in connection with the work at the date of such termination.

L. CLAIMS, DISPUTES AND ARBITRATION

7.91 Engineer's decision

- 7.91.1 If a dispute of any kind whatsoever arises between the Employer and the Contractor in connection with, or arising out of, the contract or the execution of the works, whether during the execution of the works or after their completion and whether before or after repudiation or other termination of the contract, including any dispute as to any opinion, instruction, determination certificate or valuation of the Engineer, the matter in dispute shall, in the first place, be referred, in writing, to the Engineer within **30 (thirty) days**, with a copy to the other party. Such reference shall state that it is made pursuant to this clause. No later than the **thirtieth day** after the day on which he received such reference, the Engineer shall give notice of his decision to the Employer and the Contractor. Such decision shall state that it is made pursuant to this clause.

Unless the contract has already been repudiated or terminated, the Contractor shall, in every case, continue to proceed with the works with all due diligence and the Contractor and the Employer shall give effect forthwith to every such decision of the Engineer unless and until the same shall be revised, as hereinafter provided, in an amicable settlement or an arbitral award.

If either the Employer or the Contractor be dissatisfied with any decision of the Engineer, or if the Engineer fails to give notice of his decision on or before the **thirtieth day** after the day on which he received the reference, then either the Employer or the Contractor may, on or before the **seventieth day** after the day on which he received notice of such decision, or on or before the seventieth day after the day on which the said period of thirty days expires, as the case may be, give notice to the other party, with a copy for information to the Engineer, of his intention to commence arbitration, as hereinafter provided, as to the matter in dispute. Such notice shall establish the entitlement of the party giving the same to commence arbitration, as hereinafter provided, as to such dispute and, subject to **GCC Clause No. 7.94 (Failure to comply with Engineer's decision)**, no arbitration in respect thereof may be commenced unless such notice is given.

If the Engineer has given notice of his decision as to a matter in dispute to the Employer and the Contractor and no notice of intention to commence

arbitration as to such dispute has been given by either the Employer or the Contractor on or before the **seventieth day** after the day on which the parties received notice as to such decision from the Engineer, the said decision shall become final and binding upon the Employer and the Contractor.

7.92 Amicable settlement

- 7.92.1 Where notice of intention to commence arbitration as to a dispute has been given in accordance with **GCC Clause No. 7.91 (Engineer's decision)** above, both parties shall attempt to settle the dispute amicably before the commencement of arbitration. However, unless both parties agree otherwise, arbitration may be commenced on or **after the fifty-sixth day after the day on which a notice of intention to commence arbitration of such dispute was given**, even if no attempt at amicable settlement thereof has been made.

7.93 Arbitration

- 7.93.1 Any dispute in respect of which

- a) the decision, if any, of the Engineer, has not become final and binding pursuant to **GCC Clause No. 7.91 (Engineer's decision)** and
- b) amicable settlement has not been reached within the period stated in **GCC Clause No. 7.92 (Amicable settlement)**,

shall be finally settled by arbitration, in accordance with the **Arbitration and Conciliation Act, 1996 (considering its amendment in 2015)** or any statutory modification or re-enactment thereof and rules made there under and for the time being in force. The **Arbitration Tribunal** shall be composed as per provision of the **Arbitration and Conciliation Act, 1996 (considering its amendment in 2015)** or any statutory modification or re-enactment thereof and rules made there under and for the time being in force.

- 7.93.2 In connection with the instant contract:

- a) the place of arbitration shall be **Kolkata** or **Haldia**, West Bengal, India,
- b) the arbitration shall be conducted in **English language**,
and
- c) the fees, if any, of the Arbitrators, if required to be paid before the award of work in respect to disputes is made and published, shall be shared equally by each of the parties

- 7.93.3 The Arbitrators shall have full power to open up, review and revise any certificate, determination, instruction, opinion, valuation or decision of the Engineer, relevant to the dispute. Nothing shall disqualify representatives of the parties and the Engineer from being called as a witness and giving evidence before the Arbitrators on any matter, whatsoever, relevant to the dispute.

- 7.93.4 Neither party shall be limited in the proceedings before such Arbitrators to the evidence or arguments put before the Engineer for the purpose of obtaining his said decision pursuant to **GCC Clause No. 7.91 (Engineer's decision)**. No such decision shall disqualify the Engineer from being called as a witness and giving evidence before the Arbitrators on any matter whatsoever relevant

to the dispute.

- 7.93.5 Arbitration may be commenced prior to or after completion of the works, provided that the obligations of the Employer, the Engineer and the Contractor shall not be altered by reason of the arbitration being conducted during the progress of the works.

7.94 Failure to comply with Engineer's decisions

- 7.94.1 Whether neither the Employer nor the Contractor has given notice of intention to commence arbitration of dispute within the period stated in **GCC Clause No. 7.91 (Engineer's decision)** and the related decision has become final and binding, either party may, if the other party fails to comply with such decisions, and without prejudice to any other rights it may have, refer the failure to arbitration, in accordance with **GCC Clause No. 7.93 (Arbitration)**. The provision of **GCC Clause No. 7.91 (Engineer's decision)** and **GCC Clause No. 7.92 (Amicable settlement)** shall not apply to any such reference.

7.95 Progress of work not to be interrupted

- 7.95.1 The Contractor must, at all the times, fulfil their obligations under the contract and shall not slow down or stop the progress of work during the period any dispute is under settlement either through reference to the Engineer or through arbitration, pursuant to the preceding clauses. Even if the works to be carried out during such a period involve matters under dispute, the Contractor shall nevertheless proceed with the works as per direction of the Engineer, pending settlement of the dispute. Failure of the Contractor, in this respect, shall constitute default on their part and render them liable to actions under the provisions of **GCC Clause No. 7.76 [Termination by Employer]**.

SECTION – VIII

SPECIAL CONDITIONS OF CONTRACT (SCC)

The following **Special Conditions of Contract (SCC)** shall supplement the **General Conditions of Contract (GCC)**. Whenever there is a conflict, the provisions herein shall prevail over those in the **GCC**.

Clause No. 7.20

Clause No. 7.20.1

Performance

Guarantee /

Security Deposit

i)

Performance Guarantee / Security Deposit for the materials, installations & workmanship, with respect to the instant work, as a whole:

Within **28 (twenty-eight) days** of issuance of “Letter of Acceptance (LOA)”, the Contractor shall have to provide an irrevocable and unconditional Bank Guarantee, from a Nationalized Bank/Scheduled Bank in India, in the amount, **10 %** of the contract value excluding GST .

This Performance Bank Guarantee should be kept valid and enforceable till a date, covering **at least 3 (three) months** beyond the date of expiry of the Defect Liability Period of the Contract job [for the materials, installations & workmanship, with respect to the instant work, as a whole] (as specified in **SCC Clause No. 7.67.1**). In case the actual duration of the aforesaid Defect Liability Period is required to be extended, the validity of this Bank Guarantee shall have to be extended till a date, covering at least 3 (three) months beyond the date of expiry of such extended duration of the Defect Liability Period.

Failure of the Contractor to submit the aforesaid Performance Bank Guarantee and in the manner stated above, shall constitute sufficient grounds for termination of the contract and forfeiting the Earnest Money Deposit.

Clause No. 7.20.11

The procedure of release / refund of Performance Guarantee / Security Deposit would be as follows:

i) Performance Guarantee / Security Deposit for the materials, installations & workmanship, with respect to the instant work , as a whole:

On submission of Performance Guarantee/Security Deposit [as stated in **SCC Clause No. 7.20.1 ii)**] and on successful completion of the ‘Defect liability period’ (considering extension, if any) of the Contract job [for the materials, installations & workmanship, with respect to the instant work, as a whole] (as specified in **SCC Clause No. 7.67.1**), the Contractor may apply for release / refund of his Performance Guarantee/Security Deposit [as stated in **SCC Clause No. 7.20.1 i)**] by submitting an application to the Engineer, in this regard, whereupon the Engineer shall issue necessary recommendation for release of the said Performance Guarantee/Security Deposit [as stated in **SCC Clause No. 7.20.1 i)**] or refund the balance due against the Performance Guarantee/Security Deposit [as stated in **SCC Clause No. 7.20.1 i)**] to the Contractor, after making deduction there from in respect of any sum due to the Trustees from the Contractor.

Clause No. 7.26

Supply of water and Electricity

Clause No. 7.26.1

Supply of water:

Billing against supply of water will be done on the basis of actual consumption recorded through water meter at the rate **INR 38.65 (including overhead charges @ 19.25%) per KL of Fresh Water** [As directed by **TAMP (Tariff Authority for Major Ports)**], **with escalation @ 5% per annum**.

The **water consumption charges** [based on the prevalent rates of KoPT, as may be amended from time to time] shall have to be paid by the Contractor immediately, on receipt of the bill from the office of the Finance Division, Haldia Dock Complex. All payment on this account should be updated, otherwise the pending bill amount, along with late payment surcharge, will be recovered from the Contractor's bill(s).

Clause No. 7.26.2

Supply of Electricity:

Electricity charges will be determined on the basis of **Chargeable Unit (kWh)** [actual **Unit (kWh) consumed** (recorded through Energy Meter) **plus 3%** on actual Unit consumed] and applicable rate of **West Bengal State Electricity Distribution Company Limited (WBSEDCL)**. Billing will be done on the basis of **Electricity charges** and overhead charges @ 19.25% [on the aforesaid **Electricity charges**] as per the notifications of **Tariff Authority of Major Ports (TAMP)**.

The **Electricity consumption charges** [based on the prevalent rates of **WBSEDCL**, as may be amended from time to time] shall have to be paid by the Contractor immediately, on receipt of the bill from the office of Finance Division, Haldia Dock Complex. All payment on this account should be updated, otherwise the pending bill amount, along with late payment surcharge, will be recovered from the Contractor's bill(s).

Clause No. 7.27

Use of ground and land / covered space for Contractor's establishment

Clause No. 7.27.1

The Contractor shall be allowed to use a suitable land (open space), which in the opinion of KoPT may be absolutely necessary for the proper and efficient execution of works. **Rent of such open space shall have to be paid by the Contractor as per "Schedule of Rent of KoPT" prevailing at that time will be charged during pendency of the contract and extension thereof, if any.**

Clause No. 7.27.2

On completion of work or termination of the contract, the Contractor shall have to clear away all their tools, plants, rubbish and other materials, **within a fortnight** and hand over vacant and peaceful possession of the same to KoPT, in a tidy and clean condition. **The Rent of such open space will be as per KoPT's "Schedule of Rent"** will be applicable for this additional period (if any) for clearing the space. If the Contractor fails to clear the space and handover the same to the Employer in a clean and tidy condition, within the period mentioned above, KoPT's "Schedule of Rent" will be applicable for the period beyond that.

Clause No. 7.52

Inspection and testing

Clause No. 7.52.1

The Employer shall appoint a **Third Party Inspection Agency**, at the cost of the Employer, for stage-wise technical inspection and certification of **materials & workmanship**, including **painting, erection, commissioning**, etc. [in connection with the contract job, as a whole]. The relevant Certificates shall be produced by the **Third Party Inspection Agency** to the Engineer or his authorised Representative.

The stage-wise technical inspection will be carried out by the **Third Party Inspection Agency** based on the approved **Quality Assurance Plan (QAP) & Field Quality Assurance Plan (FQAP)** [considering the Technical Specification of the bidding documents].

The Contractor shall have to submit a **Quality Assurance Plan (QAP)** and a **Field Quality Assurance Plan (FQAP)**, based on the Technical Specification and other terms & conditions stipulated in the bidding documents. The **QAP & FQAP** shall be approved by the “**Engineer**”, after the same are duly recommended by the **Third Party Inspection Agency**. The **Technical Inspection & Certification** will be carried out by the **Third Party Inspection Agency**, in accordance with approved **QAP & FQAP**.

In all cases where tests are required, within the purview of QAP & FQAP, whether at the premises of the Contractor or any Sub-contractor or elsewhere, the Contractor, except where otherwise specified, shall provide free of charges such labour, materials, electricity, fuel, water, stores, apparatus and instruments, as may reasonably be demanded, to carry out sufficiently such tests and shall, at all times, facilitate the Engineer or his Representative and the Third Party Inspection Agency, to accomplish such testing.

The cost of all tests and/or analyses, within the purview of QAP & FQAP, effected at the Contractor’s or Sub-contractor’s works and on the site, shall be borne by the Contractor. The Contractor will be called upon to pay all expenses incurred by the Employer in respect of any work found to be defective or of inferior quality, adulterated or otherwise unacceptable.

If, during inspection by the **Third Party Inspection Agency [appointed by KoPT]**, any material or test [within the purview of QAP & FQAP] fails to fulfil the contract conditions for **more than 2 (two) times**, any **additional amount charged by the Third Party Inspection Agency towards inspection of the same from the 3rd time onwards shall have to be borne by the Contractor**. If the Contractor fails to make such payment to the **Third Party Inspection Agency**, the same shall be deducted from the bill(s) of the Contractor and paid to the **Third Party Inspection Agency**.

Clause No. 7.52.12

Tests on completion:

On **completion of installation**, the contractor shall give a **7 (seven) days’** notice to the Engineer [with a copy to the **Third Party Inspection Agency, appointed by KoPT**], in writing (informing the date on which they will be ready to make the tests), before carrying out such tests, in accordance with and in the manner prescribed in the specifications.

If any portion of work fails under the tests to fulfil the contract conditions, tests of the faulty portion shall, if required by the **Third Party Inspection Agency (appointed by KoPT)** or the Engineer or by the Contractor, be repeated within reasonable time, upon the same terms and conditions.

If such “**Tests on completion**” cannot be carried out successfully by the Contractor within 1 (one) month after the time fixed by the Contractor and if, in opinion of the Engineer, the tests are being unduly delayed, the Engineer may, in writing, call upon the Contractor, with 7 (seven) days’ notice, to make such tests, failing which the Engineer may proceed to make such tests himself, at the Contractor’s risk and expense. In the above eventuality, the Employer shall, nevertheless, have the right of using the installations at the Contractor’s risk until the “**Tests on completion**” are successfully carried out.

Clause No. 7.65

Clause No. 7.65.1

Completion Period

All the jobs (including submission of As Built Drawings), as per contract, are to be completed within 12 (**Twelve**) months from the date of issue of Letter of Acceptance (LOA) [i.e. **award of contract**].

Clause No. 7.67

Clause No. 7.67.1

Defect Liability Period (DLP)

i) “**Defect Liability Period**” of the **Contract job**:

“Defect Liability Period” of the Contract job [for the materials, installations & workmanship, with respect to the instant job, as a whole] shall mean the Guarantee Period, which starts from the date of taking over the Contract job [as per **GCC Clause No. 7.66** (Taking over of the Contract job by KoPT)] and will continue till expiry of 24 (twenty four) months, calculated from the date of taking over the Contract job.

Clause No. 7.67.2

During “**Defect Liability Period**” of the **Contract job** [as specified in **SCC Clause No. 7.67.1 i)**], the Contractor shall nominate 1 (one) competent, experienced and responsible technical person, to co-ordinate and execute all works to be attended by the Contractor, as per contractual obligations, without any extra cost to HDC, KoPT.

Clause No. 7.68

Clause No. 7.68.1

Defects after taking over

After the taking over of the Contract job, if the same cannot be used (for the purpose for which it is intended), during any period, by the reason of a defect or damage, the **Defect Liability Period** shall be extended accordingly. If only a **portion** of the **Contract job** is affected, the **Defect Liability Period** shall be extended [in case the defects is not rectified or defective materials is not replaced within 12 (twelve) hours of its occurrence] only for that portion, provided the other portions of the **Contract job** remains in order, fulfilling contract conditions. In neither case shall the **Defect Liability Period** be extended beyond 36 (**thirty six**) months [from the date of taking over the **Contract job**] for the materials, installations & workmanship, with respect to the instant job, as a whole.

Clause No 7.71

Terms of payment

Clause No. 7.71.2

Payment to the Successful Bidder will be made stage-wise as indicated below :-

a) Against Supply & Delivery :

Payment for 70% amount of each item will be made against supply of respective item at site and submission of bills along with Custodian Certificate and other relevant documents like Inspection Reports, Challans, etc.

Payment for 20% amount of each item will be made against installation of the respective item and submission of bills along with Installation Certificate.

Payment for 10 % amount will be made against Testing, successful commissioning, taking over the commissioned job by KoPT and submission of bills, along with Job Completion Certificate.

b) Against Installation and Commissioning :

Payment for 90% amount of each item will be made against installation of the respective item and submission of bills along with Installation Certificate.

Payment for 10 % amount will be made against Testing, successful commissioning, taking over the commissioned job by KoPT and submission of bills, along with Job Completion Certificate.

SECTION – IX
BIDDING FORMS

BIDDING FORM – I

MINIMUM ELIGIBILITY CRITERIA

[To be filled up and uploaded, duly signed & stamped]

(I) ANNUAL TURNOVER STATEMENT

The annual turnover of(name of the bidding firm), **for the years 2016-17, 2017-18 and 2018-19** , based on the **Balance Sheets and Profit & Loss Accounts**, are given below:

Financial years	Turnover (as per Auditor's Report / Balance Sheet) [in Rs]
2016-2017	
2017-2018	
2018-2019	
<i>Total</i>	
<i>Average Annual Turnover</i>	

SIGNATURE OF CHARTERED ACCOUNTANT ::

NAME OF CHARTERED ACCOUNTANT ::

(COMPANY SEAL)

NOTE: Copy of Balance Sheets and Profit & Loss Accounts enclosed with sealed & signed.

(II) TECHNICAL EXPERIENCE

Sl. No.	Contract No. / Order No. and date	Name of the Employer and Place of work	Contract value [in Rs.]	Date of completion of work	Page number(s) of reference / supporting document (s), uploaded.

Supply, Installation, Testing and Commissioning of 33 kV Over Head Line & Under Ground Cable from Intake Substation to GC Berth Substation for strengthening of power supply arrangement of RMQC-3 of HDC, KoPT.

BIDDING FORM-II**OTHER DOCUMENTS**

[To be filled up and uploaded, duly signed & stamped]

	Requirement	Submitted/Not submitted [Put √ if submitted & X if not submitted]	Validity/ For the month of
a)			
i)	GST Registration Certificate.	<input type="text"/> If submitted, Page Number(s):	Not applicable.
ii)	Document in support of non-applicability.	<input type="text"/> If submitted, Page Number(s):	Not applicable.
b)			
i)	Profession Tax Clearance Certificate (PTCC)	<input type="text"/> If submitted, Page Number(s):	
	<u>OR</u> Profession Tax Payment Challan (PTPC)	<input type="text"/> If submitted, Page Number(s):	
ii)	Document in support of non-applicability.	<input type="text"/> If submitted, Page Number(s):	Not applicable.
c)			
i)	Certificate for allotment of EPF Code No.	<input type="text"/> If submitted, Code No.: Page Number(s):	Not applicable.
ii)	Latest EPF Payment Challan.	<input type="text"/> If submitted, Page Number(s):	
iii)	Document in support of non-applicability.	<input type="text"/> If submitted, Page Number(s):	Not applicable.
d)			

Supply, Installation, Testing and Commissioning of 33 kV Over Head Line & Under Ground Cable from Intake Substation to GC Berth Substation for strengthening of power supply arrangement of RMQC-3 of HDC, KoPT.

	Requirement	Submitted/Not submitted [Put √ if submitted & X if not submitted]		Validity/ For the month of
i)	Registration Certificate of ESI Authority.	<input type="text"/>	If submitted, Code No.: Page Number(s):	Not applicable.
ii)	Affidavit, Declaration and Indemnity Certificate.	<input type="text"/>	If submitted, Page Number(s):	Not applicable.
e)	PAN Card	<input type="text"/>	If submitted, PAN No.: Page Number(s):	Not applicable.
f)	MSME / MSE / DIC / SSI / NSIC certificate	<input type="text"/>	If submitted, Page Number(s):	
g)	Power of Attorney	<input type="text"/>	If submitted, Page Number(s):	Not applicable.

GENERAL INFORMATION OF THE BIDDER

[To be filled up and uploaded, duly signed & stamped]

1.	Bidder's Legal Name (IN CAPITAL LETTERS)		
2.	a)	Country of registration.	
	b)	Year of registration.	
	c)	Legal address in country of registration.	
	d)	URL of the bidder.	
3.	Information regarding bidder's authorised representative(s) / contact person(s)		
	a)	Name(s)	
	b)	Address(es)	
	c)	Telephone number(s)	
	d)	Facsimile number(s)	
	e)	Electronic mail address	
4.	a)	Address of the branch office, if any	
	b)	Name of the contact person at branch office	
	c)	Telephone number(s)	

	d)	Facsimile number(s)	
	e)	Electronic mail address	
5.	Whether the bidder is a Proprietorship Firm or Partnership Firm or Limited Company .		
6.	Details of the Banker(s) :		
	a)	Name of the Banker(s) in full.	
	b)	Address(es) of the Banker(s)	
	c)	Telephone number(s)	
	d)	Facsimile number(s)	
	e)	Electronic mail address	
	f)	Name(s) of the contact person(s)	
7.	Bank details for ECS payment :		
	a)	Bank Account number.	
	b)	Name of the bank.	
	c)	Name of the branch.	
	d)	Address of the branch.	
	e)	RTGS code of the branch.	
	f)	MICR code of the branch.	
8.	Income Tax and Goods & Services Tax (GST) details (if applicable):		
	a)	Permanent Account Number (PAN)	
	b)	GST Registration Number (GSTIN)	
9.	Employees' Provident Fund (EPF) Code No.		
10.	Employees' State Insurance (ESI) Code No.		
11.	Mainlines of business		

FORMAT FOR DECLARATION

[To be printed on the bidder's Letter Head and uploaded after signing]

To,
General Manager (Engg.)
Haldia Dock Complex ;
Kolkata Port Trust

Name of Work: Supply, Installation, Testing and Commissioning of 33 kV Over Head Line & Under Ground Cable from Intake Substation to GC Berth Substation for strengthening of power supply arrangement of RMQC-3 of HDC, KoPT.

Tender No. **SDM(P&E)/T/65/2020-2021**
E-Tender No. ...

I, the authorized signatory of the (Name of the Company /Firm) do hereby declare / confirm that :

* I / We have not been **debarred, banned** or **delisted** by any Government or Quasi-Government Agencies or Public Sector Undertakings in India.

I / we have not made any **addition / modification / alteration** in the **Bidding Documents** (including Bidding Forms & Contract Forms) hosted in the websites.

The prices have been quoted in the Price Bid, electronically, through the website of MSTC Ltd. only and no direct or indirect mention of the prices has been made by me / us anywhere else in my / our bid.

No extraneous conditions (like "Not Applicable", conditional rebate, etc.), regarding the Price Bid, have been mentioned anywhere in our bid.

**Signature of authorised person of the bidder
(with office seal)**

- In case the **firm** has been debarred or banned or delisted by any Government or Quasi-Government Agencies or Public Sector Undertaking in India, then the same should be declared properly, after modifying the sentence, suitably.

Supply, Installation, Testing and Commissioning of 33 kV Over Head Line & Under Ground Cable from Intake Substation to GC Berth Substation for strengthening of power supply arrangement of RMQC-3 of HDC, KoPT.

FORM OF TENDER

[To be printed on the bidder's Letter Head and uploaded after signing]

To,
General Manager (Engg.)
Haldia Dock Complex
Kolkata Port Trust

Name of Work: Supply, Installation, Testing and Commissioning of 33 kV Over Head Line & Under Ground Cable from Intake Substation to GC Berth Substation for strengthening of power supply arrangement of RMQC-3 of HDC, KoPT

Tender No. : **SDM(P&E)/T/65/2020-2021**

E-Tender No.: **E-Tender No. 2020_KoPT_561722_1**

I/We (Name of the bidder)of
.....(Address of the bidder) Having
examined the site of work, inspected the drawings and read the **bidding documents** [including
all addenda / corrigenda, issued i.e. {insert Addendum / Corrigendum
/ Extension No(s)}], hereby bid and undertake to execute & complete all the work related to
“**Supply, Installation, Testing and Commissioning of 33 kV Over Head Line & Under Ground Cable
from Intake Substation to GC Berth Substation for strengthening of power supply arrangement of
RMQC-3 of HDC, KoPT**”, required to be performed in accordance with the **Technical
Specification, General Conditions of Contract (GCC), Special Conditions of Contract
(SCC)**, etc., at the **rates & prices** quoted in the **Price Bid** [*submitted electronically, through the
website of CPPP.*], withinmonth from the date of order to commence the work ,
in the event of our bid being accepted.

I/we also undertake to enter into a **Contract Agreement** in the form hereto annexed [**Section XI**]
with such alterations or additions thereto, which may be necessary to give effect to the acceptance
of the bid and incorporating such **Technical Specification, General Conditions of Contract
(GCC), Special Conditions of Contract (SCC)**, etc. and I/we hereby agree that until such
contract agreement is executed, the said **Technical Specification, General Conditions of
Contract (GCC), Special Conditions of Contract (SCC)**, etc. and the bid, together with the
acceptance thereof in writing, by or on behalf of the Employer, shall be the contract.

I / We requiredays preliminary time to arrange and procure the
materials, tools & tackles, etc. required by the work, from the date of acceptance of bid, before
I/we could commence the work.

**I / We have deposited Rs 7, 47,285.00 (Indian Rupees: seven lakh forty seven thousand and
two hundred eighty five) only, as Earnest Money, to Haldia Dock Complex, through**

Supply, Installation, Testing and Commissioning of 33 kV Over Head Line & Under Ground Cable from Intake
Substation to GC Berth Substation for strengthening of power supply arrangement of RMQC-3 of HDC, KoPT.

DD/Banker Cheque in favour of Kolkata Port Trust on any Scheduled/Nationalized Bank payable at Haldia as Earnest Money Deposit.

I/We agree that the period for which the bid shall remain open for acceptance, shall not be less than **Days**, from the last date of submission of bid.

(Signature of authorised person of the bidder)

WITNESS:

Signature:

Name : _____

Name:

(In Block Letters)

Designation : _____

Address:

Date : _____

Occupation:

(Office Seal)

PRICE SCHEDULE

[To be filled up and uploaded, duly signed & stamped]

Sl. No.	Item Description	Estimated Cost	Applicable % of GST		
			SGST	CGST	IGST
1.	Supply, Installation, Testing and Commissioning of 33 kV Over Head Line & Under Ground Cable from Intake Substation to GC Berth Substation for strengthening of power supply arrangement of RMQC-3 of HDC, KoPT.	Rs 3, 73, 64,244.00 (excluding GST).			

Supply, Installation, Testing and Commissioning of 33 kV Over Head Line & Under Ground Cable from Intake Substation to GC Berth Substation for strengthening of power supply arrangement of RMQC-3 of HDC, KoPT.

SECTION - X

CHECKLIST

Before scanning and upload the following required documents, all pages are to be signed by a person duly authorised to sign on behalf of the bidder, and are to be embossed with their official seal, owing responsibility for their correctness / authenticity. All pages of the aforesaid documents should be serially marked.

*The offered prices would be given in the “**Price Bid (Part-II)**” electronically, through the website of **CPPP** only.*

Sl. No.	Particulars	Submitted/ Not submitted [Put √ if submitted and put X if not submitted]	If submitted, page numbers
1.	Filled up checklist.	<input type="checkbox"/>	<input type="checkbox"/>
2.	Proof of Bid Document Fee .	<input type="checkbox"/>	<input type="checkbox"/>
3.	Proof of Earnest Money Deposit (EMD) .	<input type="checkbox"/>	<input type="checkbox"/>
4.	Certificate of getting benefit by MSME / SSI / NSIC for exemption of Bid Document Fee and Earnest Money ,	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>
5.	Bidding Forms		
	i) Bidding Form – I	<input type="checkbox"/>	<input type="checkbox"/>
	ii) Bidding Form - II	<input type="checkbox"/>	<input type="checkbox"/>

Sl. No.	Particulars	Submitted/ Not submitted [Put √ if submitted and <u>put X if not submitted</u>]	If submitted, <u>page numbers</u>
		<input type="checkbox"/>	<input type="checkbox"/>
iii)	Bidding Form – III	<input type="checkbox"/>	<input type="checkbox"/>
iv)	Bidding Form - IV	<input type="checkbox"/>	<input type="checkbox"/>
v)	Bidding Form – V	<input type="checkbox"/>	<input type="checkbox"/>
vi)	Bidding Form - VI	<input type="checkbox"/>	<input type="checkbox"/>

SECTION – XI
CONTRACT FORMS

FORM OF AGREEMENT

(To be submitted on Non- Stamp Paper of worth not less than INR 50.00)

CONTRACT NO. : GM(E)/...../ /AGMT/...../.....

TENDER REFERENCE:

Tender No. SDM(P&E)/T/65/2020-2021

E-Tender No. 2020_KoPT_561722_1

for

“Supply, Installation, Testing and Commissioning of 33 kV Over Head Line & Under Ground Cable from Intake Substation to GC Berth Substation for strengthening of power supply arrangement of RMQC-3 of HDC, KoPT”.

ORDER REFERENCE: /997/ /O-... dated

This agreement made this day of, Two thousand,

BETWEEN

The Board of Trustees for the Port of Kolkata, a body corporate -- constituted by the Major Port Trust Act, 1963 (hereinafter called the ‘**Trustees**’, which expression shall unless excluded by or repugnant to the context be deemed to include their successors in office) of the one part

AND

..... (hereinafter called the ‘**Contractor**’, which expression shall unless excluded by or repugnant to the context be deemed to include its heirs, executors, administrators, representatives and assignees or successors in office) of the other part

[Together hereinafter the “Parties”]

WHEREAS

The Trustees are desirous that certain works should be executed by the Contractor, viz. **“Supply, Installation, Testing and Commissioning of 33 kV Over Head Line & Under Ground Cable from Intake Substation to GC Berth Substation for strengthening of power supply arrangement of RMQC-3 of HDC, KoPT.”** and have accepted a Bid / offer by the Contractor for execution, completion and maintenance of such works, including remedying any defects therein, during the Defect Liability Period.

NOW THIS AGREEMENT WITNESSETH as follows:

1. In this agreement words expressions shall

Supply, Installation, Testing and Commissioning of 33 kV Over Head Line & Under Ground Cable from Intake Substation to GC Berth Substation for strengthening of power supply arrangement of RMQC-3 of HDC, KoPT.

NOW THIS AGREEMENT WITNESSETH as follows:

1. In this agreement words and expression shall have the same meanings as are respectively assigned to them in **Conditions of Contract** hereinafter referred to.
2. The following documents shall be deemed to form and be read and construed as part of this agreement :
 - a) The said bid / offer.
 - b) The Letter of Acceptance of the bid /offer [vide Order No./997/...../O-... dated]
 - c) The Conditions of Contract and **Technical Specification** [all terms and conditions of Tender No.].
 - d) Addenda [Please insert Addenda Nos.]
 - e) “Price Comparative Statement”, showing the prices quoted (electronically, through the website of CPPP.) by the Successful Bidder, in the Price Bid.
 - f) All correspondence, by which the contract is added, amended, varied or modified, in any way, by mutual consent.
3. In Consideration of the payments to be made by the Trustees to the Contractor as hereinafter mentioned, the Contractor hereby covenant with the Trustees to execute, complete & maintain the work, including remedy any defects therein (during the Defect Liability Period”), in conformity with the provisions of the Contract, in all respects.

IN WITNESS whereof the parties hereto have caused this Agreement to be executed the day and year first before written.

The parties hereunto affixed their respective Common Seals (or have hereunto set their respective hands and seals).

For and on behalf of

For and on behalf of

HALDIA DOCK COMPLEX
KOLKATA PORT TRUST

(CONTRACTOR)

(**TRUSTEES**)

SEAL

SEAL

In presence of

In presence of

INDEMNITY BOND

[To be submitted on Non-judicial Stamp Paper of worth not less than INR 50.00, **duly notarised**]

Reference:

Order No.:/...../...../O-... dated for **Supply, Installation, Testing and Commissioning of 33 kV Over Head Line & Under Ground Cable from Intake Substation to GC Berth Substation for strengthening of power supply arrangement of RMQC-3 of HDC, KoPT.**

**Senior Deputy Manager (P&E),
Haldia Dock Complex,
Operational Administrative Building (1st Floor),
Chiranjibpur, P.O. Haldia ,
Dist. Purba Medinipur ,
West Bengal, India
PIN : -721 604**

This deed of **Indemnity Bond** made on by having their office at (hereinafter called “the **Contractor**”).

Whereas the General Manager (Engineering), **Haldia Dock Complex, Kolkata Port Trust**, Dist.: Purba Medinipur, West Bengal (hereinafter call “the **Engineer**”) has placed an order, bearing no. 997/...../O-... dated and some materials, spare parts, components, sub-assemblies, etc. are required to be taken **outside of Haldia Dock Complex** premises for some specialized servicing, repairing, overhauling, etc. or **fault diagnosis & remedial measures** by the Contractor, as per the terms & conditions mentioned in the said order, and which have been mutually agreed upon by the parties hereto,

AND

Whereas in consideration of the said contract, the Contractor has agreed to execute an **Indemnity Bond** for the safe custody on receipt of the said materials, spare parts, components, sub-assemblies, etc., from the **Engineer** until the **completion of servicing / overhauling / repairing / remedial work** and returning back to the Engineer as hereinafter appearing.

Now this deed witnessed that in pursuance of the said agreement and in the premises, the Contractor agrees to indemnify Engineer and at all the terms, to hold themselves liable for all the **damages, loss** due to **pilferage / fire** or negligence on the part of the Contractor or their employees, agents and representatives or from whatever cause, with all losses, interest charges and expenses incurred by the said Engineer on account of the material(s) issued to the Contractor,

AND

It is in terms of the said contract and this **Deed of Indemnity**, the material(s) issued free to the Contractor for servicing / overhauling / repairing / **fault diagnosis & remedial work**, thereon shall be deemed to be the **property of the Engineer**.

Supply, Installation, Testing and Commissioning of 33 kV Over Head Line & Under Ground Cable from Intake Substation to GC Berth Substation for strengthening of power supply arrangement of RMQC-3 of HDC, KoPT.

It is hereby agreed that the Contractor shall be liable for all injury, losses and damages that may be caused to the, from whatever cause and further that the Contractor shall not part with or delivery possession of the said material(s) to any other party or person, save in compliance with and in performance & provision of contract in respect of which this **Indemnity Bond** is executed, the Contractor having undertaken to delivery the said material (s) in all respect in compliance with the terms of the contract.

This bond and the trust hereby created shall remain valid and binding on the Contractor till such time as the above said order has been fully and finally executed and Contractor has delivered the complete thereon to the Engineer under the terms of the contract.

For and on behalf of (name of the Contractor), under the common seal of the company.

WITNESS

(Signature of the authorised person on behalf of the Contractor)

(Signature)

Name :

Name :

Designation

Designation

Signed in my presence and identified by me

BANK GUARANTEE FOR PERFORMANCE GUARANTEE

[To be submitted on Non-judicial Stamp Paper of worth not less than INR 50.00]

To
The Board of Trustees,
for the Port of Kolkata.

BANK GUARANTEE NO..... DATE.....

Name of Issuing Bank.....

Name of Branch.....

Address.....

In consideration of the **Board of Trustees for the Port of Kolkata**, a body corporate – duly constituted under the Major Port Trusts Act, 1963 (Act 38 of 1963), (hereinafter referred to as “**The Trustees**”) having awarded to Shri / Messrs a Proprietary/ Partnership/Limited / Registered Company, having its Registered Office at (herein after referred to as “**The Contractor**”, which expression shall unless repugnant to the context or meaning thereof include its successors, administrators, executors and assigns), a **CONTRACT** by issue of Trustees’ Work Order No. //...../O-..... dated for “**Supply, Installation, Testing and Commissioning of 33 kV Over Head Line & Under Ground Cable from Intake Substation to GC Berth Substation for strengthening of power supply arrangement of RMQC-3 of HDC, KoPT**” and the same having been unequivocally accepted by the Contractor resulting in a **CONTRACT** bearing No. **GM (E)/997/ /AGMT/...../.....** and the Contractor having agreed to provide a **BANK GUARANTEE** from a Nationalized / Scheduled Bank of India, in prescribed format for **Rs. (Indian Rupees)** only, for the faithful and satisfactory performance of the entire contract.

We, ... Branch, Kolkata/Haldia, do, on the advice of the Contractor, hereby undertake to indemnify and keep indemnified the Trustees to the extent of the said sum of **Rs (Indian Rupees)** only. We, Branch, Kolkata .../Haldia, further agree that if a written demand is made by the Trustees through any of its officials for honouring the Bank Guarantee constituted by these presents, we, Branch, Kolkata/Haldia, shall have no right to decline to cash the same for any reason whatsoever and shall cash the same and pay the sum so demanded to the Trustees within a week from the date of such demand by an A/c Payee Banker's Cheque drawn in favour of "Kolkata Port Trust", without any demur. Even if there be any

Supply, Installation, Testing and Commissioning of 33 kV Over Head Line & Under Ground Cable from Intake Substation to GC Berth Substation for strengthening of power supply arrangement of RMQC-3 of HDC, KoPT.

dispute between the Contractor and the Trustees, this would be no ground for us, (Name of Bank), Branch, Kolkata/Haldia, to decline to honour the Bank Guarantee in the manner aforesaid. The very fact that we,Branch, Kolkata...../Haldia, decline or fail or neglect to honour the Bank Guarantee in the manner aforesaid, shall constitute sufficient reason for the Trustees to enforce the Bank Guarantee unconditionally without any reference, whatsoever, to the Contractor.

2. We, ' Branch, Kolkata
.../Haldia, further agree that a mere demand by the Trustees at anytime and in the manner aforesaid, is sufficient for us,Branch, Kolkata/Haldia, to pay the amount covered by this Bank Guarantee in full and in the manner aforesaid and within the time aforesaid without reference to the Contractor and no protest by the Contractor, made either directly or indirectly or through court, can be valid ground for us, Branch, Kolkata/Haldia, to decline or fail or neglect to make payment to the Trustees in the manner and within the time aforesaid.
3. We,... .. Branch, Kolkata
...../Haldia, further agree that the Bank Guarantee herein contained shall remain in full force and effect, during the period that is taken for the due performance of the said contract by the Contractor and that it shall continue to be enforceable till all the dues of the Trustees under and/or by virtue of the terms and conditions of the said contract, have been fully paid and its claim satisfied and/or discharged in full and/or till the Trustees certify that the terms and conditions of the said contract have been fully and properly observed/fulfilled by the Contractor and accordingly, the Trustees have discharged the Bank Guarantee, subject however, that this guarantee shall remain valid upto and inclusive ofday of.....and subject all so that the provision that the Trustees shall have no right to demand payment against this guarantee after the expiry of 6 (six) calendar months from the expiry of the aforesaid validity period upto.....or any extension thereof made by us,Branch, Kolkata...../Haldia, in further extending the said validity period of this Bank Guarantee on Non-judicial Stamp Paper of appropriate value, as required / determined by the Trustees, only on a written request by the Trustees to the Contractor for such extension of validity of this Bank Guarantee.
4. We,Branch, Kolakta
...../Haldia, further agree that, without our consent and without affecting in any manner our obligations hereunder, the Trustees shall have the fullest liberty to vary from time to time any of the terms and conditions of the said contract or to extend the time for full performance of the said contract including fulfilling all obligations under the said contract by the Contractor or to postpone for any time or from time to time any

Supply, Installation, Testing and Commissioning of 33 kV Over Head Line & Under Ground Cable from Intake Substation to GC Berth Substation for strengthening of power supply arrangement of RMQC-3 of HDC, KoPT.

of the powers exercisable by the Trustees against the Contractor and to forebear or enforce any of terms and conditions relating to the said contract and We,
Branch, Kolkata... .. /Haldia, shall not be relieved from our liability by reason of any such variation or extension being granted to the Contractor or for any fore-bearance, act or commission on the part of the Trustees or any indulgence by the Trustees to the Contractor or by any such matter or thing of whatsoever nature, which under the law relating to sureties would, but for this provision, have effect of so relieving us,Branch, Kolkata
 /Haldia.

5. We, Branch, Kolkata /Haldia do also agree that the Trustees at their option shall be entitled to enforce this Guarantee against usBranch, Kolkata /Haldia as principal debtor in the first instance without producing against the Contractor and notwithstanding any security or other guarantee that the Trustees may have in relation to the Contractor's liabilities.
6. We,Branch, Kolkata... .. /Haldia, lastly undertake not to revoke this Bank Guarantee during its currency except with the previous consent of the Trustees in writing.

SIGNATURE... ..

NAME.....

DESIGNATION.....

(Duly constituted attorney for and on behalf of)

BANK. ,

BRANCH.....

KOLKATA... .. /HALDIA

(OFFICIAL SEAL OF THE BANK)

Kolkata Port Trust
Haldia Dock Complex
CERTIFICATE OF COMPLETION OF WORK

Contractor : _____

Address : _____

Date of completion : _____

Dear Sir,

Subject : Supply, Installation, Testing and Commissioning of 33 kV Over Head Line & Under Ground Cable from Intake Substation to GC Berth Substation for strengthening of power supply arrangement of RMQC-3 of HDC, KoPT.

Reference : i) **Work Order No.:**/...../...../O-... dated
.....
ii) **Contract No./ Agreement No. :**/...../...../
AGMT //

This is to certify that the above work which was carried out by you is, in the opinion of the undersigned, complete in every respect on the _____ day of _____ 20____, in accordance with terms of the contract and you are required to maintain the work in accordance with **GCC Clause No. 7.67** of the General Conditions of Contract and under provisions of the contract.

(Signature of the Engineer/Engineer's Representative)

Name:

Designation:

Date:

(OFFICIAL SEAL)

Supply, Installation, Testing and Commissioning of 33 kV Over Head Line & Under Ground Cable from Intake Substation to GC Berth Substation for strengthening of power supply arrangement of RMQC-3 of HDC, KoPT.

(“NO CLAIM CERTIFICATE” FROM CONTRACTOR)

[To be submitted on Bidder's Letter Head]

General Manager (Engineering),

Haldia Dock Complex ,

Kolkata Port Trust,

Engineering Department

Jawahar Tower Complex ;

P.O. Haldia Township;

Dist.: Purba Medinipur ;

PIN: -721607

West Bengal, India.

Dear Sir,

Subject : Supply, Installation, Testing and Commissioning of 33 kV Over Head Line & Under Ground Cable from Intake Substation to GC Berth Substation for strengthening of power supply arrangement of RMQC-3 of HDC, KoPT.

Reference : i) **Work Order No.:**/...../...../O-... dated
.....

ii) **Contract No./ Agreement No. :**/...../...../
AGMT //

I/We do hereby declare that I/we have received full and final payment from Haldia Dock Complex, Kolkata Port Trust, for the execution of the subject work, and I/we have no further claim against Haldia Dock Complex, Kolkata Port Trust in respect of the above mentioned job.

Yours faithfully,

(Signature of Contractor)

Date :

Name of Contractor :

Address :

(OFFICIAL SEAL OF THE CONTRACTOR)

Supply, Installation, Testing and Commissioning of 33 kV Over Head Line & Under Ground Cable from Intake Substation to GC Berth Substation for strengthening of power supply arrangement of RMQC-3 of HDC, KoPT.

**Kolkata Port Trust
Haldia Dock Complex**

CERTIFICATE OF FINAL COMPLETION

**General Manager (Finance),
Haldia Dock Complex (HDC),
Jawahar Tower Complex,
P.O: Haldia Township,
Dist.: Purba Medinipur,
PIN – 721 607,
West Bengal, India.**

Subject : Supply, Installation, Testing and Commissioning of 33 kV Over Head Line & Under Ground Cable from Intake Substation to GC Berth Substation for strengthening of power supply arrangement of RMQC-3 of HDC, KoPT.

Reference : i) **Work Order No.:**/...../...../O-... dated
.....
ii) **Contract No./ Agreement No. :**/...../...../
AGMT //

This is to certify that the above work, which was carried out by is now complete in every respect, in accordance with the terms of the contract and that all obligations under the contract have been fulfilled by the Contractor including non-comprehensive and comprehensive maintenance contract period.

(Signature of the Engineer/Engineer's Representative)

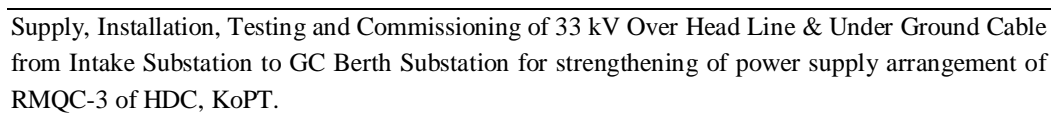
Name:

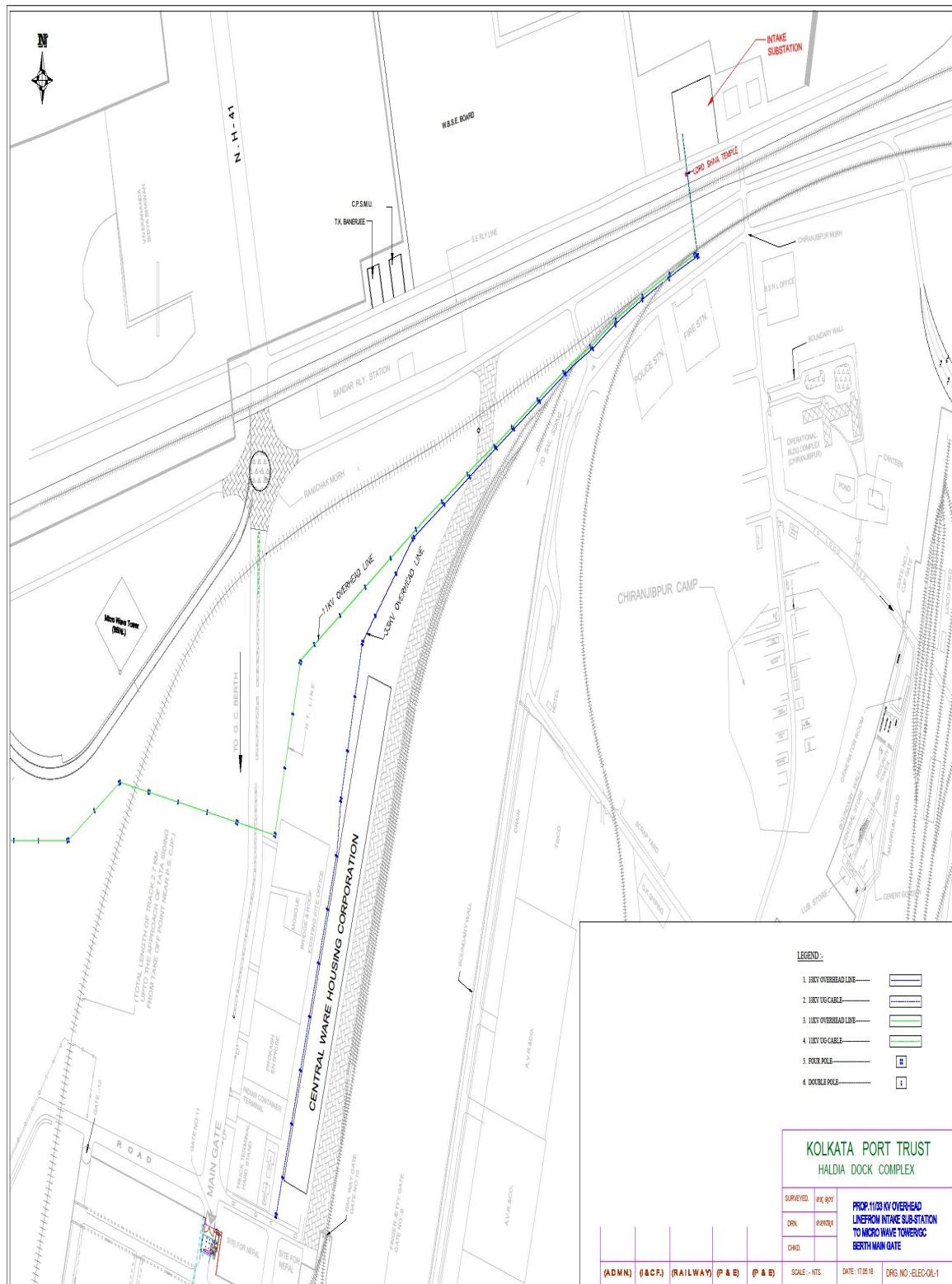
Designation:

Date:

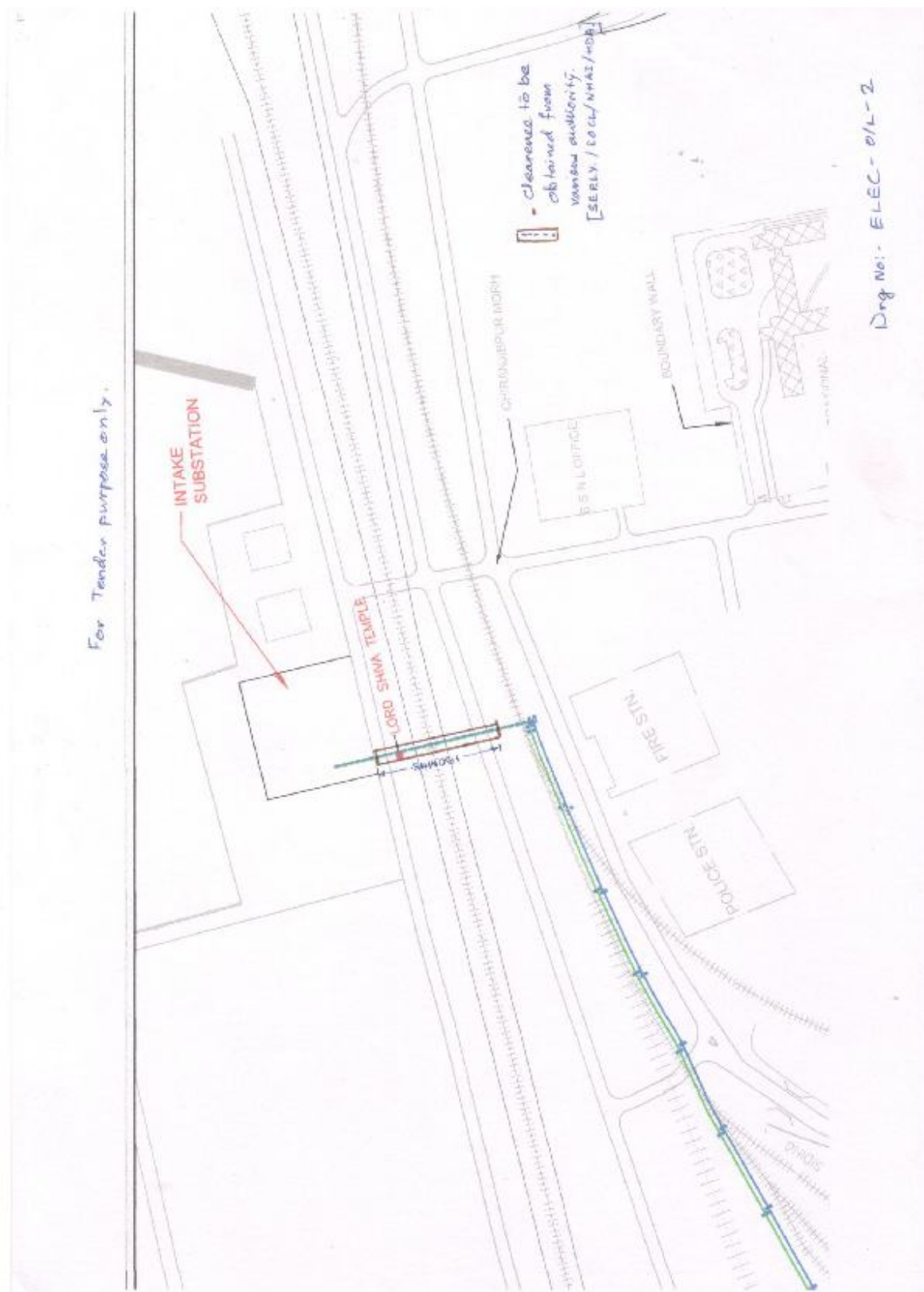
(OFFICIAL SEAL)

Supply, Installation, Testing and Commissioning of 33 kV Over Head Line & Under Ground Cable from Intake Substation to GC Berth Substation for strengthening of power supply arrangement of RMQC-3 of HDC, KoPT.





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