

**SYAMA PRASAD MOOKERJEE PORT, KOLKATA
(ERSTWHILE KOLKATA PORT TRUST)
HALDIA DOCK COMPLEX**



ENGINEERING DEPARTMENT INVITE E-TENDER

[Tender No. SDM (P&E)/T/ 62 /2019-2020

&

E-Tender No. 2020_KoPT_552403_1]

FOR

**Supply, Installation, Testing and Commissioning of 11kV/3.3kV/415V
Panel along with allied works for augmentation of GC Berth Sub-
station including construction of sub-station building at GC Berth
area of Haldia Dock Complex, SMP, Kolkata.**

Aug – 2020

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SYAMA PRASAD MOOKERJEE PORT, KOLKATA
(ERSTWHILE KOLKATA PORT TRUST)
HALDIA DOCK COMPLEX
SHORT E-TENDER NOTICE

E-Tender No. 2020_KoPT_552403_1

Online e-tenders are invited for the work of “**Supply, Installation, Testing and Commissioning of 11kV/3.3kV/415V Panel along with allied works for augmentation of GC Berth Sub-station including construction of sub-station building at GC Berth area of Haldia Dock Complex, SMP, Kolkata**”.

Date of Pre-Bid meeting: **24.08.2020**, 11:00 Hrs. onwards.

Closing date & time of online submission of e-tender: **07.09.2020**, 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
SMP, Kolkata

**SYAMA PRASAD MOOKERJEE PORT, KOLKATA
(ERSTWHILE KOLKATA PORT TRUST)**

**HALDIA DOCK COMPLEX
NOTICE INVITING E-TENDER**

**(Tender No. SDM(P&E)/T/ 62 /2019-2020)
E-Tender No. 2020_KoPT_552403_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), Syama Prasad Mookerjee Port, Kolkata (SMP Kolkata), 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 11kV/3.3kV/415V Panel along with allied works for augmentation of GC Berth sub-station including construction of sub-station building at GC Berth area of Haldia Dock Complex, SMP, Kolkata ”**

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 2,63,55,225.00**. 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 bidders 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 3,51,40,300.00** each.
 - Or
 - b) Two similar completed works of contract value not less than **Rs 4,39,25,375.00** each.
 - Or
 - c) One similar completed work of contract value not less than **Rs 7,02,80,600.00**

The term “*similar works*” means –

i) **Firms having experience in “Supply, Installation, Testing & Commissioning of 11kV and above Sub-station including construction of Substation building at Central Govt. /State Govt. /Port sector/PSU or any reputed organization.”**

or

ii) **Firms having experience in “Supply, Installation, Testing & Commissioning of 11kV and above Sub-station & construction of Civil building(value not less than 30% of tendered estimated cost) by contractor having at Central Govt. /State Govt. /Port sector/PSU or any reputed organization.”**

or

iii) **Joint Venture / Consortium having experience in Supply, Installation, Testing &**

Supply, Installation, Testing and Commissioning of 11kV/3.3kV/415V Panel along with allied works for augmentation of GC Berth Sub-station including construction of Sub-station building at GC Berth area of Haldia Dock Complex, SMP, Kolkata.

Commissioning of 11kV and above Sub-station & construction of Substation building 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** a) The Bidder for pre-qualification may be a single entity or a group of entities (Joint Venture / consortium), coming together to implement the Project. However, no bidder applying individually or as a member of a Consortium, as the case may be, can be member of another Bidder. The term Bidder used herein would apply to both a single entity and a Joint Venture / consortium.

- b) **Guidelines for participation of a single entity who had previously participated in any work of similar nature as one of the member of a Joint venture.**

When the bidder is a single entity, who had previously participated in any work of similar nature as one of the member of a Joint venture, uses the credential of that particular work to justify his/her technical eligibility criteria for the instant tender, then the value of the completed work shall be reckoned only to the extent of the concerned member's share in that JV firm for the purpose of satisfying his/her compliance to the technical eligibility criteria in the instant tender.

- 2.1.4** Two or more bidders may form a "Joint Venture / consortium" among themselves or by including some other firms having required expertise/ experience and submit the offer in the name of "Joint Venture / consortium". If the offer is made in the name of "Joint Venture/ consortium" the details and composition shall be clearly spelt out in the Technical bid. If a joint venture firm/ consortium is pre-qualified, the responsibility for execution of works and operations and maintenance shall be in accordance with the Joint Venture/consortium agreement and no deviation from the terms of the JV / consortium agreement will be permitted without prior approval of the Engineer. Tenders submitted by a joint venture / consortium of two or more firms, as partners shall comply with the following requirements:

- a) Companies/contractors may jointly undertake the contract. Each entity would be jointly and severally responsible for completing the task as per the contract, however declaration of Lead member to be indicated by the bidders in their MOU. The firms with at least 26% equity holding each be allowed to jointly meet the eligibility criteria.
- b) The tender, and in case of a successful tender, the Form of Agreement, shall be signed so as to be legally binding on all partners.
- c) One of the partners shall be nominated as being In-charge (Lead Partner); and this authorization shall be evidenced by submitting a Power of Attorney signed by legally authorised signatories of all the partners;
- d) The partner In-charge (Lead Partner) shall be authorised to incur liabilities and receive instructions for and on behalf of any or all of the partners of the joint venture and the entire execution of the contract including payment shall be done exclusively with the partner in charge;
- e) All partners of a joint venture shall be jointly and severally liable for execution of the contract in accordance with the contract terms, and a relevant statement to this effect shall be included in the authorization mentioned under (b) above as well as in the Tender Form and the Form of Agreement (in case of a successful tender);

Supply, Installation, Testing and Commissioning of 11kV/3.3kV/415V Panel along with allied works for augmentation of GC Berth Sub-station including construction of Sub-station building at GC Berth area of Haldia Dock Complex, SMP, Kolkata.

and

- f) A certified copy of the agreement entered into by the members of the joint venture/consortium shall be submitted with the tender.
- g) Value of a completed work done by a Member in an earlier JV Firm shall be reckoned only to the extent of the concerned member's share in that JV firm for the purpose of satisfying his/her compliance to the above mentioned technical eligibility criteria in the tender under consideration, if applied as a JV / consortium for this particular work.

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

In case of JV, Electrical Contractor's License to be issued in the name of Lead Partner.

Note: The bidders upload scanned copy of valid Electrical Contractor's License.

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.**
- 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.

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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 **SMP Kolkata [erstwhile 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
SMP, Kolkata

SCHEDULE OF TENDER (SOT)

(Tender No. SDM(P&E)/T/ 62 /2019-2020)

E-Tender No. 2020_KoPT_552403_1

3.1.	Name of work	::	Supply, Installation, Testing and Commissioning of 11kV/3.3kV/415V Panel along with allied works for augmentation of GC Berth Sub-station including construction of sub-station building at GC Berth area of Haldia Dock Complex, SMP, Kolkata”.
3.2.	Tender Inviting Authority	::	General Manager (Engg.), Haldia Dock Complex, SMP, Kolkata
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 No physical tender is acceptable by Haldia Dock Complex, SMP, Kolkata.
3.4.	Estimated Cost	::	Rs 8, 78, 50,750.00 (excluding GST).
3.5.	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 17,57,015.00 (Indian Rupees: Seventeen lakh fifty seven thousand fifteen) only , as Earnest Money, to Haldia Dock Complex, through DD/Banker Cheque in favour of Syama Prasad Mookerjee Port, Kolkata 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

Supply, Installation, Testing and Commissioning of 11kV/3.3kV/415V Panel along with allied works for augmentation of GC Berth Sub-station including construction of Sub-station building at GC Berth area of Haldia Dock Complex, SMP, Kolkata.

			electronic format.
			<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 Syama Prasad Mookerjee Port, Kolkata payable at Haldia before opening of the tender, as specified in the Tender Document.</p>
3.6.	Completion Period	::	18 months
3.7.	Bid Validity	::	180 days.
3.8.	Performance Bank Guarantee / Security Deposit	::	10 % of the Contract Value (excluding GST) for completion period & guarantee period (24 months) for complete project in the form of Bank Guarantee.
3.9.	Guarantee Period	::	24 months for complete projects.
3.10.	Date, time and venue of Pre-Bid Meeting (off-line).	::	<p>24.08.2020 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>
3.11.	i) Starting date & time of submission of e-Tender at https://eprocure.gov.in/epr ocure/app	::	27.08.2020 from 11:00 Hrs. (IST).
	ii) Closing date & time of submission of e-Tender at https://eprocure.gov.in/epr ocure/app	::	07.09.2020 up to 15:00 Hrs. (IST).
	iii) Date & time of opening of Part-I (Techno-commercial Bid)	::	08.09.2020 up to 15:30 Hrs. (IST) onwards.
	iv) Date & time of opening of Part-II (Price Bid)	::	Shall be informed separately.
3.12.	Address of the Employer	::	<p>Syama Prasad Mookerjee Port, Kolkata (Erstwhile Kolkata Port Trust) 15 Strand Road, Kolkata – 700 001, West Bengal, India.</p>

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

General Manager (Engineering)
Haldia Dock Complex
Syama Prasad Mookerjee Port

SECTION – IV

Important instructions for E-procurement

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) Sri D.Dey,
Designation: Asst. Manager
Mobile No.: + 91 94340 33492
Landline: + 91-3224-252577
e-mail : djdey.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** SMP Kolkata 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.

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- 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, SMP Kolkata. 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, SMP Kolkata. 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, SMP Kolkata 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, SMP Kolkata will form a binding contract, between HDC, SMP Kolkata 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, SMP Kolkata, 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 **SMP Kolkata (erstwhile 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, **SMP Kolkata :**

- (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 SMP Kolkata 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 SMP Kolkata 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 **SMP Kolkata** 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 **SMP Kolkata**, 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 (SMP Kolkata) 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 **SMP Kolkata** 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, SMP Kolkata. 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. **SMP Kolkata'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 **SMP Kolkata'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 **SMP Kolkata'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 **SMP Kolkata**, 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 SMP Kolkata, available at <http://www.kolkataporttrust.gov.in/> of SMP Kolkata

(erstwhile 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 SMP Kolkata against any loss or damage to the property of SMP Kolkata 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, **SMP Kolkata** 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, SMP Kolkata 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 **SMP Kolkata** 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 SMP Kolkata, 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 SMP Kolkata to get due credit against GST paid.

In case of any failure on the above account, GST amount, even if paid by SMP Kolkata, 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 **SMP Kolkata**, treating the same as non-responsive.

- 5.15.2** In exceptional circumstances, prior to the expiration of the bid validity period, **SMP Kolkata** 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 **SMP Kolkata**, 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 (SMP Kolkata), 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 SMP Kolkata 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 **SMP Kolkata** and contract is awarded with them, the **Earnest Money Deposit** of the **successful bidder (Contractor)** shall be retained by **SMP Kolkata** till submission of **Performance Guarantee / Security Deposit** (in accordance with **ITB**) and signing of the **Contract Agreement** by **SMP Kolkata** and the Contractor (in accordance with **ITB**), and shall be refunded thereafter.

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

- 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. SMP Kolkata 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, SMP Kolkata(erstwhile 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 SMP Kolkata, 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 **SMP Kolkata**.

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 **SMP Kolkata** 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 **SMP Kolkata** 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 **SMP Kolkata**.

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 **SMP Kolkata** 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 **SMP Kolkata** 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 (SMP Kolkata) may, at their discretion, ask any bidder for a clarification of their bid. The Employer (SMP Kolkata) 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 (SMP Kolkata), 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 (SMP Kolkata), shall not be considered. The Employer's (SMP Kolkata'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, SMP Kolkata'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 SMP Kolkata 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 (SMP Kolkata) 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 (SMP Kolkata), 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 (SMP Kolkata), shall not be considered. The Employer's (SMP Kolkata's) request for submission of further document(s) shall be in writing.

5.28.2 **SMP Kolkata** 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, **SMP Kolkata** 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 **SMP Kolkata** 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 (SMP Kolkata), 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 **SMP Kolkata**, 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 **SMP Kolkata** 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 **SMP Kolkata** 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 SMP Kolkata’s right to accept any bid and to reject any or all bids

5.33.1 **SMP Kolkata** 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**, **SMP Kolkata** 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**, **SMP Kolkata** 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, **SMP Kolkata** 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 SMP Kolkata** (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 **SMP Kolkata** 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 **SMP Kolkata** & authorized person of the Contractor (Successful Bidder), the same shall be kept under **SMP Kolkata**'s custody, after affixing the Common Seal of **SMP Kolkata**.

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 **SMP Kolkata**, 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 **SMP Kolkata** on the amount of Performance Guarantee / Security Deposit, held by them (as per SCC) at any stage.

SECTION – VI
TECHNICAL SPECIFICATION

Part-I (Civil Works)

1. **GENERAL :** Provided where any provision of the specification is contrary to a provision of the Bill of Quantities unless a different intention appears, provision of the Bill of quantities shall be deemed to override the provision of the specification unless other wise directed by the Engineer and shall prevail to the extent of such contradiction

The materials supplied and the workmanship shall satisfy the Specifications herein below or in the absence of the same, as given in the Govt of West Bengal PWD Schedule Of Rates [Buildings & Roads] (For the latest year alongwith addendum / corrigendum / erratum etc. as effective up to the date one month prior to the date of submission of tender) & CE's Schedule of Rates as applicable and the job specifications contained in the Bill Of quantities of the tender. In absence of the above, relevant Indian Standards (as revised or modified up to the date one month prior to the Tender Date unless otherwise specifically mentioned in the Tender Documents) shall be referred to.

In absence of any Standard / Specification / Code of Practice covering any part of the work related to this tender, instruction / directions of the Engineer will be binding on the contractor.

In case of specialised items of work, specifications for which are not available in the documents listed above, the manufacturer's instructions / manuals shall be followed.

Samples of materials to be supplied and used by the Contractor in the works shall be subject to the prior approval of the Engineer. For this purpose, the contractor shall furnish in advance, representative samples in quantities and in the manner as directed by the Engineer for his approval.

If the Engineer is of the opinion that the materials are not suitable for use on the works; he may reject the consignment, notwithstanding the Manufacturer's certificates (if applicable for such material). The Engineer's decision regarding the suitability of materials brought to site for use in the works shall be final and binding on the contractor, who shall remove the rejected materials from site and replace them with materials of required quality.

In spite of approval of the Engineer of any material brought to the site, he may subsequently reject the same if in his opinion the materials has since deteriorated due to long or defective storage or for any reason whatsoever and is thereby considered unfit for use in the permanent works. Any material thus rejected shall be immediately removed from the site at contractor's cost and expense.

All materials bought to the site shall be properly stored and preserved to ensure their quality and fitness during the course of their use in work. If the storage arrangements are not to the Engineer's satisfaction, he may direct the contractor for arranging proper storage and in case the contractor fails to carry out such instructions properly, the Engineer will reserve the right to make proper arrangements departmentally or through other agencies at the contractor's cost. The materials shall be stored in adequate quantities well in advance to meet the

construction schedule and shall be guarded in the manner directed by the Engineer and to his satisfaction.

2. **SCOPE OF WORK:** The work relates to the construction of one electrical substation at GC Berth adjacent to the existing structural steel building of SKODA generator. The building is a RCC framed structure with pile foundation. The existing rest room of P&E at GC Berth is required to be dismantled for providing road access to the substation building.

The work mainly consists of dismantling all sorts of masonry, concrete works (both RCC & PCC), depositing & stacking of serviceable materials to I&CF's store, construction of cast-in-situ RCC piles, concreting works, brick masonry works, plastering and painting works, etc.

The scope of work also includes all other works as described in the attached "Bill Of quantities" and ancillary and appurtenant works as may be required hereafter for successful completion of the work in accordance with the Trustee's General Conditions Of Contract, attached Special Conditions Of Contract, Particular Specifications, Bill Of Quantities and in accordance with PWD (West Bengal's) Specifications for materials and workmanship.

3. **LOCATION:** Haldia Dock System is located at the confluence of River Haldi and River Hooghly at Latitude 22⁰2' North and Longitude 88⁰6' East, at about 130 Kms upstream from Sand heads and 104 Kms downstream of Kolkata. The port is located on national Waterway No-1; at about 45 Kms upstream from pilot age Station. The berths of Haldia Dock Complex are located inside an Impounded Dock Basin. Berths 2, 3, 4, 4A, 4B and 5 are on the Eastern side of the Basin while Berths 8, 9,10,11,12 and 13 are on its Western side. The Northern side of the basin houses Berths 6 and 7 through a Finger Jetty.

The Location of the site of work for construction of electrical substation at GC Berth inside dock area at HDC, Haldia.

4. **ACCESS TO THE SITE :**

(a) By Road: All-weather hard top road approachable from N.H. 41 and State Highway exist right up to the area of work.

(b) By Rail: S. E. Railway Branch Line connects Haldia with the Panskura Railway Station.

5. **INSPECTION OF SITE:** The Bidder shall inspect the site of work and thoroughly familiarise himself with the nature of work, site conditions, and access to the site and location before submission of the tender. He should contact the Sr. Dy. Manager (Dock), I&CF, Haldia Dock Complex at his office at Chiranjibpur, Haldia for collecting information about the work and site before submission of the tender. No excuse will be entertained afterwards on the above ground. In case any part of the site cannot be handed over to the successful Bidder in time, No compensation for loss of labour or any other cause nor any claim will be entertained by the Trustees. Suitable extension of time shall, however, be granted to the successful Bidder on that ground if applied for.

6. **SITE CONDITIONS & METHOD OF WORK:** The work shall have to be executed at inside dock area, Haldia, HDC.

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The sequence of work shall have to be programmed by the successful Bidder without hampering the existing operational activities in the surrounding areas. The working hours may have to be adjusted as the situation demands. No claim for idle labour on this account shall be entertained.

Proper care should be taken to provide adequate protection to the existing structures, cables (high voltage, telephone, computer etc.), underground pipes and ducts, water lines and all such installations against any damage at the Contractor's risk and expense. Any damage caused to the existing structures / facilities or defect arising during construction shall have to be rectified forthwith as directed to the satisfaction of the Engineer, without charging extra.

The working hours may have to be adjusted as the situation demands but no claim for idle labour on this account shall be entertained. The work may be carried out in Sunday(s) or Holiday(s) or beyond Normal working hour(s), if the situation so demands without any extra cost.

Further, if so required by the Engineer in the interests of Normal working of the Port, it is found necessary to shift / suspend some construction activity for some duration, this shall be done in compliance with the instructions of the Engineer and as per relevant clause of the GCC.

7. EARTH WORK :

7.1. INITIAL MEASUREMENTS AND JOINT RECORDS: Before commencement of excavation or filling, the Contractor shall take initial measurements and spot levels at intervals as ordered by the Engineer and after verification by the Engineer these shall be signed by the Contractor and serve as the initial record for earth work measurement.

7.2 EXCAVATION

7.2.1 SCOPE OF EXCAVATION WORK: Excavation for construction of pavement, trench, drains etc. or other work shall consist of removal of vegetation over the area, cutting, removal and satisfactory disposal of all materials as necessary for the construction of the facilities or other purposes, in accordance with the requirements of these specifications to lines, grades and cross-sections shown in the drawings or as indicated by the Engineer. The work shall also include the hauling and stacking of suitable cut materials as directed, as also the disposal of unsuitable cut materials in specified manner, and trimming and finishing of the excavation to the specified dimensions or as directed by the Engineer.

For purposes of excavation work under this contract, there shall be no classification of soils.

7.2.2 CUTTING GENERAL: All excavations shall be carried out in conformity with the directions laid herein under and in a manner approved by the Engineer.

While planning or executing excavations, the Contractor shall take adequate precautions against collapse of sides, soil erosion, water pollution etc.

All vegetation over the area shall be removed prior to commencement of excavation and disposed at locations approved by the Engineer.

The excavations shall conform to the grades, side slopes and levels shown on the drawings or directed by the Engineer. The Contractor shall not excavate outside the slopes or below the formation level or loosen any material outside or below the limits of excavation.

Foundation pits shall not be excavated to the full depth unless construction is imminent; the last 150 mm of the depth of excavation shall not be removed until just before concreting.

If the bottom of any excavation has been left exposed and in the opinion of the Engineer, has become badly affected by the atmosphere or by water, the contractor shall remove such portions of the deteriorated foundation material as directed by the Engineer and shall make good with lean concrete and/or sand, all at his own cost and expense.

Any excess depth excavated below the specified levels shall be made good with silver sand or lean concrete at the cost of the contractor as per the directions of the Engineer.

7.2.3 ADJACENT STRUCTURES :

Where the excavation is to be carried out below the foundation level of adjacent structures, the contractor shall take precautions such as underpinning, shoring or strutting as directed by the Engineer, before proceeding with the excavation. The cost of such measures shall be borne by the contractor.

7.2.4 STRUTTING AND SHORING :

Any shoring, strutting and planking, close or open required for the execution of the work shall be done as per requirement.

7.2.5 METHODS ,TOOLS AND EQUIPMENT :

Only such methods, tools and equipment as approved by the Engineer, shall be used in the work.

7.3 BACKFILLING:

Back filling around completed foundation or other work shall be commenced only after the relevant work has been inspected and approved by the Engineer. Selected and approved material shall be used for back filling and if the excavated material is not sufficient or suitable, earth of suitable quality shall be imported from sources approved by the Engineer.

The filling shall be done in horizontal layers not exceeding 300 mm in loose thickness with proper ramming, watering and consolidation to obtain the degree of compaction as directed by the Engineer.

7.4 DISPOSAL OF EXCAVATED MATERIALS:

All the excavated materials shall be the property of the Employer and shall be handled as directed by the Engineer. If any thing such as fossils, ancient coins etc. are found while excavating the earth that shall have to be handed over to the employer immediately and shall be the property of the employer.

Unsuitable and surplus materials not intended for use in any filling or otherwise shall be disposed off as directed by the Engineer.

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7.5 CONSTRUCTION OPERATIONS:

7.5.1 Setting out:- After the site has been cleared, the limits of excavation shall be set out true to lines, curves, slopes, grades and sections, as shown in the sketches or as directed by the Engineer's Representative. The contractor shall provide surveyor, all labour, survey instruments and materials such as strings, pegs, nails, bamboos, stones, lime, mortar, concrete etc. required in connection with the setting out of works and establishment of bench marks. The contractor shall be responsible for the maintenance of bench marks and other marks and stakes as long as they required for the work in the opinion of the Engineer's Representative.

7.5.2 Excavation: - All excavations shall be carried out in conformity with the directions laid herein under and in a manner approved by the Engineer's Representative. The work shall be so planned that the suitable materials available from excavation are satisfactorily utilised as directed upon beforehand.

The excavation shall conform to the lines, grades, side slopes and levels shown on the drawings or directed by the Engineer's Representative. The Contractor shall not excavate outside the slopes or below the established grades or loosen any material outside the limits of excavation. Subject to the permitted tolerances, any excess depth excavated below the specified levels on the roadway shall be made good at the cost of the contractor with silver sand or lean concrete and compacted.

7.5.3. All debris and loose materials on the slopes of cutting shall be removed. No back filling shall be allowed to obtain required slopes excepting that when boulders or soft materials are encountered in cut slopes these shall be excavated to approved depth on instructions of the Engineer's Representative and the resulting cavities filled with silver sand or lean concrete, as per direction of the Engineer and at the cost of the contractor.

7.6 SLIDES:

If slides occur in cuttings during the process of construction, they shall be removed at the cost of the contractor as ordered by the Engineer.

7.7 DEWATERING:

If water is met with in the excavated trenches due to springs, seepage, rain or other causes, it shall be removed by suitable diversions, pumping or bailing out and the excavation pit kept dry whenever so required or directed by the Engineer at the cost of the contractor. Care shall be taken to discharge the drained water as not to cause damage to the works, crops or any other property.

However if conditions met are such that conventional methods of dewatering are not adequate and well point or other such methods are necessary, the contractor shall submit details thereof for consideration and approval by the Engineer.

7.8 COMPACTING ORIGINAL GROUND:

In all cases, the original ground shall be consolidated by rolling, as directed by the Engineer's Representative, but with a minimum of ten passes of vibro roller of suitable capacity.

Where so directed by the Engineer's Representative, any unsuitable materials occurring in foundation shall be removed and replaced by approved materials suitably consolidated. Payment for earthwork in excavation shall be made in Cu.Mtr based on the measurement of the volume of the pit or trench with working space as per IS: 1200 and side slopes of stepping as permitted by the Engineer.

8. SAND FILLING:-

The materials for filling shall be brown sand conforming to Zone-III of IS 383, as detailed in the Bill of Quantities.

The materials shall be spread uniformly on the desired area as directed with the help of a Equipment or manually as approved and as permitted by the Engineer's Representative. The thickness of loose layers shall be so regulated that the maximum thickness of the layer after consolidation does not exceed 150 mm.

Sand shall be consolidated by mechanical vibratory plate compactors of suitable capacity.

The surface of any layer of material on completion of compaction shall be well closed, free from movement under equipment and from consolidation planes, ridges, cracks of loose material. All loose segregated or otherwise defective area shall be made good to the full thickness of layer and re-compacted. The effectiveness of consolidation shall be tested with respect to Relative Density measured by Sand Replacement Method using procedures laid down in relevant IS codes.

9. CEMENT CONCRETE WORKS:

9.1 STANDARDS : All connecting work shall be done to IS:456 -2000 – Code of Practice for Plain and Reinforced Concrete and other standards mentioned therein, unless otherwise specified or directed by the Engineer.

9.2 MATERIALS:

9.2.1 AGGREGATES:

Coarse and fine aggregates for concrete shall conform to I.S.383 - Specification for Coarse and Fine aggregates from natural sources for concrete. Testing of aggregates shall be carried out as per IS: 2386 - Methods of Test for Aggregates for concrete, or where a test of the use of the aggregate in concrete is required, as per IS: 516 - Methods of Tests for Strengths of Concrete.

Aggregates from approved sources shall only be used in the Works.

Aggregates shall not contain any harmful material, such as iron pyrites, coal, mica, shale or similar laminated material, clay, alkali, soft fragments, organic impurities etc. in such quantities as to affect the strength or durability of the concrete and in addition shall not contain any material which may attack the reinforcement. No aggregate reactive with alkalis of cement shall be used in the works. Limits of deleterious materials in the aggregate determined in accordance with IS: 2386, shall not exceed the values given in table I of IS: 383 – Limits of Deleterious Materials, unless otherwise directed by the Engineer.

9.2.1.1 COARSE AGGREGATE:

Coarse aggregate shall be crushed or broken from hard stone obtained from Pakur quarries and shall be hard, strong, dense and durable, clean and free from soft, friable, thin, flat, elongated or laminated flaky pieces and shall be roughly cubical in shape. It shall be clean and free from dirt and chemically inert. When required the aggregate shall be washed by the Contractor at his cost, before use in the Works.

9.2.1.1(a) SIZE AND GRADING OF COARSE AGGREGATE:

Coarse aggregate shall be supplied by the Contractor in sizes or grading as specified in IS: 383 or as directed by the Engineer but with a Los Angeles Abrasion Test result not more than 35 %. The maximum size of the coarse aggregate shall not exceed 25 mm & continuously graded & gap graded aggregates may be used, depending on the grading of the fine aggregates. No aggregate, which has water absorption more than 2%, shall be used in the concrete mix. The aggregates shall be tested for soundness in accordance with IS: 2386 (Part-5) After 5 cycles of testing the loss shall not be more than 12 per cent if sodium sulphate solution is used or 18 per cent if magnesium sulphate solution is used.

Table-1

9.2.1.1(b) GRADING LIMITS FOR COARSE AGGREGATES :

IS DESIGNATION	SIEVE	PERCENTAGE PASSING FOR SINGLE SIZED AGGREGATE OF NOMINAL SIZE , MM				
		40	20	16	12.5	10
80 mm						
40 mm		85-100	100			
20 mm		0-20	85-100	100		
16 mm				85-100	100	
12.5 mm					85-100	100
10 mm		0-5	0-20	0-30	0-45	85-100
4.75 mm			0-5	0-5	0-10	0-20
2.36 mm						0-5

Table-2

IS DESIGNATION	SIEVE	PERCENTAGE PASSING FOR GRADED AGGREGATE FOR NOMINAL SIZE , MM				
		40	20	16	12.5	10
80 mm		100				NOT DEFINED
40 mm		95-100	100			
20 mm		30-70	95-100	100	100	
16 mm				95-100		
12.5 mm					90-100	
10 mm		10-35	25-55	30-70	40-85	
4.75 mm		0-5	0-10	0-10	0-10	
2.36 mm						

Dumping and stacking of aggregates shall be done in an approved manner. In case the Engineer considers that the aggregates are not free from dirt, the same may be washed and drained for at least 72 hours before batching as directed by the Engineer.

9.2.1.2 FINE AGGREGATE: Grading of coarse and fine aggregate shall be checked as frequently as possible, frequency being determined by the Engineer's Representative to ensure that the suppliers are maintaining the uniform grading as approved for samples used in the mix design.

The fine aggregate shall consist of clean natural sand conforming and its gradation shall be as directed by the Engineer, as per IS-383. Fine aggregate shall be free from soft particles, clay, shale, loam, cemented particles, mica and organic and other foreign matter. The fine aggregate shall not contain deleterious substances more than the following:

Clay lumps	4.0 per cent
Coal and lignite	1.0 per cent
Material passing IS Sieve No. 75 micron	4.0 per cent

Table-3

9.2.1.2(a) GRADING LIMITS FOR FINE AGGREGATES :

IS SIEVE DESIGNATION	PERCENTAGE PASSING FOR ZONE-I	PERCENTAGE PASSING FOR ZONE-II	PERCENTAGE PASSING FOR ZONE-III	PERCENTAGE PASSING FOR ZONE-IV
10 mm	100	100	100	100
4.75 mm	90-100	90-100	90-100	95-100
2.36 mm	60-95	75-100	85-100	95-100
1.18 mm	30-70	55-90	75-100	90-100
600 micron	15-34	35-59	60-79	80-100
300 micron	5-20	8-30	12-40	15-50
150 micron	0-10	0-10	0-10	0-15
FM (Fineness Modulus) *	4.00-2.71	3.37-2.10	2.78-1.71	2.25-1.35

- FM = The sum of cumulative percentages retained on the sieves divided by 100

9.2.2 CEMENT:

Unless specifically mentioned otherwise the cement to be used in the Works shall be Ordinary Portland Cement Grade 53/43/33 conforming to IS: 12269 / IS: 8112 / IS: 269 or cement conforming to IS: 455 / IS1489 or grades approved by the Engineer. The source of supply shall be subject to prior approval of the Engineer. The Contractor shall endeavour to get approval of at least two makes / sources, so as to have an alternative make / source in hand in case of disruption in supply from the other make / source.

Once the quality and make of cement to be used in the Works is approved the Contractor shall endeavour to obtain further supplies from the same source and make. The Contractor should be prepared to furnish Manufacturer's test certificate as and when required to do so by the Engineer.

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For each delivery of cement to the Site the Contractor shall forward to the Engineer a certificate to the effect that such cement was tested and analysed at the Factory and the results of such tests and analysis satisfactory meet the specifications stipulated in the relevant Indian Standards. The supplier should also furnish the date of manufacture of the lot from which the contractor has drawn the consignment. In addition, the Engineer shall be authorised to draw samples of cement from the site and reject any consignment, which do not pass necessary tests and / or specifications.

Notwithstanding the provisions of certificate as stated above, each consignment of cement may after delivery on site and at the discretion of the Engineer be subjected to part or whole of the tests and analyses required by relevant, IS Codes. Cost of all such tests shall be borne by the Contractor. No cement shall be used in the works until the Engineer has accepted it as satisfactory.

Storage space shall be adequate to store the required quantity of cement to suit the concreting program for the entire work as well as to permit proper storage.

Cement shall be stored in a proper manner in suitable dry and waterproof sheds to prevent damage from weather or improper storage. Where cement in bags are stacked, the stacking shall be at least 10 to 20 cms above the floor with at least a space of 60 cms kept all round between exterior walls and the stacks. The height of the stacks shall not be more than 10 bags. Further safeguards shall be undertaken in monsoon such as covering the stacks with polythene sheets.

The cement storage at site shall be at Contractor's expense and risk. Damage, if any, occurring to cement due to faulty storage, shall be the liability of the Contractor.

Any consignment or part of a consignment of cement which has deteriorated in any way or which does not otherwise comply with the specifications shall not be used in the Works and shall be removed from the Site by the Contractor at no extra cost to the Employer.

Storage of cement shall be such as to permit easy identification of the different consignments stored. Records must be maintained by the Contractor showing the date-wise receipts with consignment numbers, amounts used and the balance.

Removal of cement from storage sheds for use in the Works shall be on "First in, First out" basis.

9.2.3 WATER:

Water used for mortars, grout, concrete, curing and for other purposes on the Works, shall be clean and free from deleterious materials such as acids, alkalis, salts, vegetable or organic matters in injurious quantities. Potable water, in general, shall be used. The water shall satisfy the requirements laid down in IS: 456-2000. The Contractor shall arrange to have the water he proposes to use in the Works, tested at approved laboratories at his own cost. The Engineer may at any time refuse to permit the use of water, which contains sugar, or excess of alkali, acid or salt as shown by tests. River/Dock Basin water shall not, for any reason whatsoever, be permitted to be used in the work.

9.2.4 STEEL:

Steel shall be sound and free from cracks, surface flaws, laminations, splits, jagged or imperfect edges, etc. Steel materials shall be stored in such a manner as to prevent distortion, deterioration or corrosion. Materials of different classification shall be stored separately.

Test certificates must be produced by the Contractor for all steel procured by him. However, the Engineer may order further tests from each consignment to be subjected to all tests (especially tensile, bend, re-bend, percentage of elongation and chemical composition tests with result) required under Indian Standards, which tests shall be carried out by the Contractor at his cost. Notwithstanding certificates produced by the Contractor, the Engineer may reject the consignments, tests results of which are not to specifications and the Contractor shall forthwith remove such material from the site.

All test pieces for such tests shall only be selected by the Engineer or his representative, and shall be removed from the parent stock/material only in the presence of the Engineer or his representative.

MILD STEEL REINFORCEMENT: All mild steel reinforcement shall conform to IS: 432 Grade I.

HIGH STRENGTH DEFORMED STEEL BARS FOR REINFORCEMENT: High strength deformed steel bars for reinforcement shall generally comply with the provisions set out in IS: 1786 - Fe-415 grade. Fe-500 grade steel may be used if approved by the Engineer. Soft iron binding wire shall comply with requirements of IS: 280. The gauge of binding wire shall be 18 & the wire shall be galvanised.

STEEL FOR DOWEL BARS AND TIE BARS: these shall conform to the requirements of IS: 432 and IS: 1786 as relevant. The dowel bars shall conform to Grade S 240 and tie bars to Grade S 415 of the relevant IS Codes.

STEEL WIRES: These shall conform to the requirements of IS: 432 –part- II

9.3 GRADES OF CONCRETE: The grades of concrete shall be as specified in the Schedule of Quantities viz. M 35 for RCC pile. The letter M signifies the mix, the number signifying the characteristic strength (i.e. the strength of material below which not more than 5% of the test results are expected to fall) in N / sq. mm. of the grade of concrete.

9.4 TYPE OF CONCRETE MIX: Design mix in which the proportions of cement, aggregates and water are determined to attain the required strengths by designing the concrete mix and Nominal mix in which the proportions of cement, aggregate and water are determined to attain the required strengths by adopting nominal concrete mix as defined in IS: 456 shall be used.

9.4.1 NOMINAL MIX: Nominal mix concrete of specified grade shall be used by adopting nominal mixes as per IS: 456-2000 without preliminary tests to obtain specified characteristic strength.

9.4.2 DESIGN MIX: The contractor shall carry out the mix design and the mix so designed (not the method of design) shall be approved by the Engineer within the limitations of parameters & other stipulations laid by the specifications and the relevant clauses of IS 456: 2000.

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Preferably, the mix design shall be one as per IS: 10262. The target mean strength for the design mix shall be equal to the characteristic strength plus 1.65 times the standard deviation.

Minimum cement content for M-35 grade concrete shall be 425 Kg / Cu. M for Piles & 400 Kg/Cu.M for other structural works.

The aggregate/cement and water/cement ratios shall produce a workability, which shall enable concrete to be properly compacted to its full depth and finished to the surface tolerances specified.

Exposure condition for concrete in this work is considered "Severe", as in Table 3 of IS 456-2000.

No concrete shall be used for the work nor any payment made thereof unless the concrete mix design is obtained by the contractor and got approved from the Engineer in writing. This mix design shall be provisional and subject to obtaining satisfactory results with trial mixes.

- 9.5 PROPORTIONING OF CONCRETE:** Proportioning shall mean the determination of proportion of various ingredients to be used to produce concrete of the required strength, workability, durability and other properties.

Preliminary mix designs shall be established well ahead of the start of concreting work. The Engineer shall verify the strength of the concrete mix before sanctioning its use. Any such verification and / or sanction by the Engineer shall not absolve the Contractor of his responsibility to achieve the prescribed strength and other requirements of the mix.

If during the execution of the Work cube tests show less than the required strength, the Engineer shall order fresh trial mixes to be made by the Contractor and these shall be at Contractor's cost. No claim shall be entertained for such changes in mix.

Variation in cement consumption shall be taken into consideration for material reconciliation.

- 9.6 DENSITY:** For each grade of concrete, suitable proportions of sand and sizes of coarse aggregates shall be selected to obtain the maximum density as practicable. This is to be determined by mathematical means, laboratory tests, field trials and changes in gradation of aggregate.
- 9.7 WATER CEMENT RATIO:** Water cement ratio of a mix which is specified and approved by Engineer for use shall be maintained. The water content of the aggregates shall be determined frequently during the progress of the Work, and the amount of mixing water entered at the mixer adjusted as directed by the Engineer so as to maintain the specified water cement ratio. Maximum water cement ratio of the concrete shall be governed by figures given in Table 5 of IS: 456- 2000.
- 9.8 CONSISTENCY:** The Concrete shall have a consistency such that the workability of the fresh concrete is suitable for the conditions of handling and placing, so that after compaction it surrounds all reinforcements and completely fills the formwork.
- 9.9 SLUMP:** The slump as determined according to IS: 1199 shall be within the following limits:

Table-4

Degree of Workability	Slump in mm.		Type of Construction
	Min.	Max.	
Medium	40	80	Reinforced Foundation, walls and footings
Medium	25	75	Plain footings, Substructure, Walls, concrete pavement etc.
Medium	50	100	Reinforced Beams, columns walls, etc.
High	150	180	Cast-in-Situ Bored panel pile & diaphragm wall.

Concrete having a slump outside the limits specified shall not be placed without the approval of the Engineer.

9.10 EXPOSURE: Exposure condition for concrete in this work is considered “SEVERE” as per Table-3 of I.S. 456-2000.

9.11 BATCHING & MIXING : Batching and mixing for the M-35 grade controlled concrete or of any other grade as specified in Bill of Quantities shall be done at a central batching and mixing plant preferably with automatic controls, located at a suitable place which takes into account sufficient space for stockpiling of cement, aggregates and stationary water tanks. This shall be, however, situated at an approved distance, duly considering the properties of the mix and the transporting arrangements available with the Contractor. Ready-mixed concrete supplied from mechanised batching Plants and transported to the site of work by Transit Mixers each having capacity around 6 Cu.M, may preferably be used if with due approval of the Engineer. Batching plant used shall conform to IS: 4925.

The batching plant shall be capable of proportioning the materials by weight, each type of material being weighed separately.

Except where expressed otherwise by the Engineer, batching and mixing shall be followed as per Clauses 10.2 and 10.3 of IS 456-2000.

In proportioning concrete, the quantity of both cement and aggregate should be determined by weight. Where the weight of cement is determined on the basis of weight of cement per bag, a reasonable number of bags should be weighed separately from the aggregates.

The type and capacity of the plant shall be got approved by the Engineer before commencement of the work. The weighing balances shall be calibrated. All measuring equipment should be maintained in a clean serviceable condition, and their accuracy periodically checked.

Except where it can be shown to the satisfaction of the Engineer that supply of properly graded aggregate of uniform quality can be maintained over the period of work, the grading of aggregate should be controlled by obtaining the coarse aggregate in different sizes and blending them in the right proportions when required, the different sizes being stocked in separate stock piles. The grading of coarse and fine aggregate should be checked frequently as specified by the Engineer to ensure that the specified grading is maintained.

The water cement ratio for any particular mix shall be maintained constant at its specified and approved value. Depending upon the weather conditions, the moisture contents in fine

and coarse aggregates shall be determined (in accordance with IS: 2386) at intervals specified by the Engineer and amount of water added adjusted to compensate for any observed variations in the moisture content of the aggregates. Suitable adjustments in the weight of aggregates shall be made to allow for variation in weight due to variation in moisture content. For nominal mixes only, the amount of surface water may be estimated from values given in Table 10 of IS: 456-2000 in the absence of exact data.

No substitutions in materials use on the work or alterations in the established proportions, except as permitted in the above paragraph shall be made without additional tests to show that the quality and strength of concrete are satisfactory.

- 9.11.1 CONCRETE MIXERS:** Concrete mixers for M 35 grade will be batching plant as per IS: 4925. For M10, M15 and M 20 grades of concrete, if approved by the Engineer, stationery mixers of the tilting or non-tilting type (to IS: 1791), truck mixers or of approved make and design may be used. The mixing equipment shall be capable of combining the aggregates, cement and water into a thoroughly mixed and uniform mass within the specified time and of discharging the mixture without segregation. The plant assembly shall include provisions to facilitate inspection at all times.

The mixers shall be maintained in a satisfactory operating condition and mixer drums kept free of hardened concrete. Mixers shall be properly cleaned before and after every mixing operation.

Mixer blades shall be replaced when worn down more than ten percent (10%) of their depth. Use of mixers which do not function satisfactorily and have leaking drums or other defects shall be discontinued and they shall be repaired or replaced to the Engineer's satisfaction.

- 9.11.2 MIXING TIME:** Mixing shall be continued until there is a uniform distribution of the materials and the mass is uniform in colour and consistency. There shall be no segregation while or after unloading the mix. The mixing time shall be about 1.5 to 2 minutes or as decided by the Engineer.

All records and charts for mixing operations shall be prepared as directed by the Engineer and shall be submitted to him.

Each batch shall be discharged before charging the next batch. Mixing periods shall be measured from the time when all of the solid materials are in the mixer drum, provided that all of the mixing mortar shall be introduced before a quarter of the mixing time has elapsed.

- 9.12 ADMIXTURES:** Admixtures may be used but only with the prior approval of the Engineer of the type, brand and conditions of use of the admixture.

- 9.13 SHUTTERING, FORMWORK AND STAGING:** Wherever necessary, shuttering and staging must be provided. Unless otherwise stated in the BOQ, no payment will be made for such shuttering or staging and the cost thereof will be deemed to have been covered by the rate for relevant finished item of work.

Formwork shall comply with clause 11 of IS 456 –2000.

Shuttering must be MS shuttering or ply board shuttering true to line as approved by the Engineer. Surface in contact with concrete are to be smooth except where otherwise stated.

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Joints of the shuttering are to be such as to prevent the loss of liquid from the concrete. In timber shuttering, joints shall therefore, be either tongued or grooved or the joints must be perfectly closed and lined with craft paper or other types of approved materials. In case of steel shuttering also, the joints are to be similarly lined.

All shuttering and framing must adequately be stayed and braced to the satisfaction of the Engineer for properly supporting the concrete during the period of hardening. It shall be so constructed that it may be removed without shock or vibration to the concrete. **The formwork shall be properly designed by the contractor to carry all the loads & vibration and the centering shall be true and rigid and adequately braced.**

Before the concrete is placed, the shuttering shall, if considered necessary, be coated with an approved lubricant for preventing the adhesion of the concrete to the moulds and it is to be of such a nature and so applied that the surface of the finished concrete is not stained. Care shall also be taken that such approved preparation shall be kept out of contact with reinforcement.

All formwork shall be removed without shock or vibration before the formwork is stripped, the concrete surface shall be exposed where necessary in order to ascertain that the concrete has hardened sufficiently. Before stripping the shuttering of structural members, the contractor shall take previous permission of the Engineer or his representative

The use of bend, twisted or worn out forms shall not be permitted. Support to the forms shall be sufficiently rigid to hold them in position during the entire operation of compacting and finishing and that they shall not at any time deviate more than 3 mm from straight edge 3 metres in length. Forms, which show a variation from the required rigidity of the alignment and levels shown on the plans, shall be reset or removed as directed.

Chamfers, fillets, bevelled edges and mouldings where required in the concrete, shall be made in the formwork itself. The diagonal faces shall be planed and surfaced to the same texture as the rest of the forms. Unit rates shall include provisions of the chamfers, fillets, bevelled edges and mouldings as required or specified.

Joints in forms shall be horizontal or vertical unless otherwise specified and shall be tight to prevent any leakage. Adjacent edges shall be held in accurate alignment so that no mark is left on the concrete face.

Re-Use Of Forms :- Forms shall be surface cleaned of all adhering mortar, concrete and other foreign matter, all damages due to previous use repaired to restore the original condition, cracks and gaps closed to prevent loss of mortar, surface restored and treated with permitted composition. Forms, which in the opinion of the Engineer, are not in a condition to be re-used, shall be removed from the site forthwith.

The supply of forms shall be sufficient to permit their remaining in place for at least 12 hrs. after the concrete has been placed or longer, if in the opinion of the Engineer's Representative, it is necessary. Forms shall not be removed until at least 12 hrs. of placing of the concrete or longer if in the opinion of the Engineer's Representative, it is necessary.

9.13.1 INSPECTION OF SHUTTERING & FORM WORK: Contractor shall give the Engineer adequate notice before placement of concrete, to enable the Engineer to inspect the forms. All forms will be inspected to ensure that they are properly made, placed, sufficiently braced

proposed and otherwise supported, lined and levelled, with junctions to correct profile, thoroughly free of all foreign material, cleaned and treated.

If, in the opinion of the Engineer, the forms are unsuitable or unsatisfactory in any way, either before or during placement of concrete, he may order all work stopped until all the defects are rectified to his satisfaction.

Inspection of the formwork by the Engineer will not in any way relieve the Contractor of his responsibility for safety of men and materials, proper construction and removal of formwork and for constructing the concrete to line, level, position and dimensions as per drawings.

9.14 TRANSPORTATION, PLACING AND COMPACTION:

9.14.1 APPROVAL OF PROCEDURES, METHODS AND MEANS : The Engineer's approval of concreting programme, the methods, equipment and procedures to be adopted etc. in full detail, shall be obtained at least 24 hours before the actual operation. No concrete shall be placed without the approval of the Engineer. The Contractor shall prepare a pour card with all details as required by the Engineer. The approval of the concreting operations for any particular pour, shall be taken as granted when the pour card is signed. Further, the Contractor shall ensure to the Engineer's satisfaction that the concrete pour operations once commenced will be carried out and completed smoothly and without interruption or break of any kind.

9.14.2 TRANSPORTATION: Concrete shall be transported from the mixer to the place of deposition as rapidly as possible by methods, which will prevent the segregation or loss of any of the ingredients maintaining the required workability. The duration of the transport should be such that none of the properties for which the concrete mix has been designed is lost on account of the elapsed time.

During hot or cold weather, concrete shall be transported in deep containers. Other suitable methods to reduce the loss of water by evaporation in hot weather and heat loss in cold weather may also be adopted.

All equipment used for transportation and placing shall be maintained in a clean and neat condition. All such equipment shall be cleaned thoroughly before and after each concreting pour.

For mass concrete, like diaphragm walls, piles, beams, roads, WMM etc. transit mixer shall be used.

9.14.3 CHUTES, Etc: Chutes, long troughs and pipes for conveying concrete from the mixer to the forms shall be used only on written permission from the Engineer. If, in the opinion of the Engineer, the use of any such equipment affects the quality of concrete adversely, he may order discontinuance of the equipment and a satisfactory means of placement. Open troughs and chutes shall be equipped with baffles. The addition of water at any point in the system of transportation to facilitate the movement of concrete shall not be permitted under any circumstances. All chutes troughs and pipes shall be kept clean and free from coatings of hardened concrete by thoroughly flushing them with water after each operation. Water used for flushing shall be discharged clear of the structure under construction.

9.14.4 PLACING: The concrete shall be deposited as nearly as practicable in its final position to avoid rehandling. Concrete shall be placed and compacted within the initial setting time for the particular cement used, and shall not be subsequently disturbed. Under conditions that contribute towards quick stiffening of concrete, the Engineer may reduce the placing and compacting time so allowed.

Concrete that has been left standing and which has become stiffened so that it cannot be placed satisfactorily, shall not be used in the Works and shall be removed from the site.

Concrete placement shall commence when the formwork to receive it has been completed with necessary bracing, strutting and propping, and has been thoroughly cleaned of all dirt, debris and water. All reinforcement, embedment and inserts shall be in proper position as per drawings and as directed by the Engineer, before placement of concrete. Care shall be taken to avoid displacement of reinforcement or movement of formwork during placing operations.

Where concrete is placed on or against soil surface, the surface shall be free of mud, debris or standing water and shall be compacted. Soft or yielding soils shall be removed and replaced with silver sand or concrete and compacted to the proper density to the satisfaction of the Engineer. The surface of absorptive soil against which concrete is to be placed shall, where required, be moistened so that water will not be drawn from the freshly placed concrete.

Concrete shall be placed so as to avoid segregation of the materials and the displacement of the reinforcements and embedment.

In very hot weather precaution shall be taken to see that the temperature of wet concrete does not exceed 38 degree Celsius while placing.

Concrete placed by any means, shall not be permitted to fall freely from a height of more than 1.5 m nor to strike the form at an angle.

Concrete shall be placed in successive horizontal layers of thickness not exceeding 500 mm or as directed by the Engineer. The individual units of deposit shall be dispersed with such overlaps along the face of the layer that will facilitate spreading the layer of uniform depth and texture with a minimum of hand shoveling. Bedding planes shall be approximately horizontal. Any tendency to segregation shall be corrected by shoveling stones into mortar and not vice versa and mix redesigned, process changed or other means adopted as directed by the Engineer, to correct such a tendency.

9.14.5 COMPACTION: Each layer of concrete shall be thorough compacted and duly worked around the reinforcement, inserts and embedments into the corners of the form with suitable type of equipment until the concrete has been consolidated to the maximum practicable density.

Concrete shall be compacted with mechanical vibrating equipment supplemented, if necessary to obtain consolidation, by hand spreading and tamping. The vibrators shall be the internal or immersion type (IS: 2505) of high frequency with speeds not less than 7000 RPM when immersed. Vibrators in sufficient numbers of adequate power shall be used to properly consolidate all concrete.

Vibrators shall be inserted in a vertical position at intervals of about 600 mm depending on the mix and other conditions. The spacing shall provide some overlapping of the area

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vibrated at each insertion. Vibrators shall in no case be used to transport concrete inside the forms. After each operation, the vibrators shall be withdrawn slowly. Over or under vibration shall not be permitted.

In placing concrete in layers, which are advancing horizontally as the work progresses, great care shall be exercised to ensure adequate vibration and bonding of concrete of successive batches or depositions. The vibrator shall penetrate the layer being placed and also penetrate the layer below while the under layer is still plastic to ensure good bond and homogeneity between the two layers and prevent the formation of cold joints.

Care shall be taken to prevent the contact of vibrators against reinforcement. Vibrators shall not come in contact with forms of finished surfaces.

Form or surface vibrators shall not be used without the Engineer's permission. When form vibrators are used the design of formwork and disposition of vibrators shall receive special attention to ensure efficient compaction.

The formation of stone pockets or mortar bondage in corners and against face forms shall not be permitted. Should these occur, they shall be dug out and refilled to sufficient depth and shape for thorough bonding as directed by the Engineer.

9.15 EXPANSION JOINTS: Permanent expansion joints in structures, if required, shall be formed in the positions and to the spaces shown in the relevant drawings or as directed. When joints are filled with joint filling materials as stipulated in the drawings, the permanently exposed edges of the joints shall be sealed with an approved sealing compound.

9.16 CONCRETING DURING RAINS: To prevent damage to freshly laid concrete during monsoon, or sudden rains, the contractor shall provide an adequate supply of tarpaulins or other waterproof covering material. The contractor may require to use make-shift tent like structures with water proof claddings to carry out the work during light drizzles/mild shower, if directed by the Engineer. Any concrete damaged by rain shall be removed and replaced by the contractor at his own cost as directed by the Engineer.

9.17 PROTECTION & CURING: The contractor shall adequately protect freshly laid concrete after its laying, from too rapid drying due to sunshine, drying winds etc. and also from running or surface water and shocks. Curing shall start after 8 hrs of placement and in hot weather within 4 hours of placement for exposed surfaces. During the first 24 hours concrete shall be cured by use of wet burlap or such other means to cover the concrete surfaces.

After 24 hours of laying of concrete, the surface shall be cured by flooding with water of minimum 25 mm depth or by covering with wet absorbent materials.

Curing of concrete shall be carried out in accordance with IS: 456-2000. All equipments and materials required for curing shall be available and ready for use before concrete is placed. Curing shall be done for a minimum period of 10 days or for a period as directed by the Engineer.

Concrete curing compounds may be used in lieu of moist curing with the permission of the Engineer.

Such compounds shall be applied to all exposed surfaces of the concrete as soon as possible after the concrete has set.

9.18 SAMPLING & STRENGTH OF DESIGNED CONCRETE MIX : Samples from fresh concrete shall be taken as per IS 1199 and cubes shall be made, cured & tested at 28 days in accordance with IS 516. In this regard all provisions of clause 15 of IS 456-2000 shall apply.

9.19 TESTING OF CONCRETE INGREDIENTS: Frequency & tests for cement, aggregates, water, admixture, curing compounds etc. will be as specified in the following table or as approved by the Engineer.

Table-5

1. Quality of materials & concrete:-			
1. Cement	Physical & chemical tests	IS: 269 IS:455 IS:1489 IS:8112 IS:12269	Once for each source/batch of supply and occasionally when called for in case of long/improper storage. Also, the contractor also will submit test data on cement released by the manufacturer, if asked for by the Engineer.
2. Coarse & Fine aggregates	(i) Gradation	IS-2386 (Part-I)	Initially one test for alternate days of work for coarse aggregate and fine aggregate used. May be relaxed later at the discretion of the Engineer.
	(ii) Deleterious constituents	IS-2386 (Part-II)	As directed by the Engineer.
	(iii) Water absorption	IS-2386 (Part-III)	Regularly as required subject to a minimum of one test per week for coarse aggregate & two test per week for fine aggregates and also after rains. This data shall be used for correcting water demand of the mix.
3. Coarse aggregates	(i) Los Angeles Abrasion value or Aggregate Impact Test.	IS-2386 (Part-IV)	Once for each source of supply/batch & subsequently on monthly basis.
	(ii) Soundness	IS-2386 (Part-V)	Before approving the aggregate & every month subsequently.
	(iii) Alkali Aggregate reactivity	IS-2386 (Part-VI)	-----do-----
4. Water	Chemical tests.	IS-456	Once for approval of source of supply & subsequently only in case of change of source.
5. Concrete	(i) Strength Of Concrete	IS-516	As specified in contract.
	(ii) Core strength of hardened concrete.	IS-516	As per the direction of the Engineer.
	(iii) Workability of fresh concrete, Slump test.	IS-1199	One test from each Transit Mixer load at both at batching plant site & paving site initially

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			when works starts. Subsequently, sampling may be done from alternate Transit Mixer.
	(iv) Thickness determination.	As specified in contract.	
6. Reinforcement	Physical & Chemical properties	As specified in relevant IS codes/ as directed by the Engineer.	

9.20 INSPECTION AND TESTING OF STRUCTURES:

9.20.1 INSPECTION: Immediately after the stripping of formwork, all concrete shall be carefully inspected and any defective work or small defects either removed or made good before the concrete has thoroughly hardened.

In case of doubt regarding the grade of concrete used, either due to poor workmanship or based on results of cube strength tests, compressive strength tests of concrete on the basis of following paragraph and / or load test as described hereafter may be carried out.

9.20.2 CORE TEST: The points from which cores are to be taken and the number of cores required shall be at the discretion of the Engineer and shall be representative of the whole of concrete concerned. In no case, however, shall fewer than three cores be tested.

Cores shall be prepared and tested as described in IS: 516.

Concrete in the member represented by a core test shall be considered acceptable if the average equivalent cube strength of the cores is equal to at least 85 percent of the cube strength of the grade of concrete specified for the corresponding age and no individual core has a strength less than 75 percent.

In case the core test results do not satisfy the requirements given in the above paragraph, or where such tests have not been done, load test may be resorted to.

9.20.3 FAILURE TO MEET STRENGTH REQUIREMENT: In the event that concrete tested in accordance with the requirements of clause (ii) above fails to meet the requirement, the Engineer shall have the right to require any one or all of the following, which shall be carried out by the Contractor at his own expense.

a) Curing and load testing of the concrete member concerned represented by the tests which failed. The method and manner of load test shall be as given in (iv) hereafter.

b) Replacement of any such portions of the structure. No payment for the dismantled concrete, relevant formwork and reinforcement shall be made. Embedded fixtures and reinforcement or adjoining structures damaged during dismantling shall be made good by the Contractor at his own expense.

c) Extended curing of the concrete represented by the specimen.

9.20.4 LOAD TESTS ON PARTS OF STRUCTURES: The Engineer may order a load test to be carried out on any structure if in his opinion such a test is necessary for any of the following reasons:

- a) the concrete test cube taken at site for the structure under review fails to attain the specified strength.
- b) suspected over loading of the structure under review during construction.
- c) improper curing of the concrete in the structure.
- d) there being in the opinion of the Engineer, a reasonable doubt as to the adequacy of the strength of the structure solely on account of workmanship.

If the results of the load test be unsatisfactory, the Engineer may instruct the Contractor to demolish and reconstruct the structure or part thereof and the Contractor shall do so at his own cost and expense without any liability whatsoever to the Engineer.

Load tests should be carried out as soon as possible after expiry of 28 days from the time of placing of concrete.

The structure should be subjected to a load equal to full dead load of the structure plus 1.25 times the imposed load for a period of 24 hours and then the imposed load shall be removed.

Note: Dead load includes self-weight of the structural members plus weight of finishes and walls or partitions, if any, as considered in the design.

The deflection due to imposed load only shall be recorded. If within 24 hours of removal of the imposed load, the structure does not recover at least 75 percent of the deflection under superimposed load, the test may be repeated after a lapse of 72 hours. If the recovery is less than 80 percent, the structure shall be deemed unacceptable.

If the maximum deflection in mm, shown during 24 hours under load is less than $40 L^2/D$, where L is the effective span in m and D, the overall depth of the section in mm, it is not necessary for the recovery to be measured and the recovery provisions in the foregoing paragraph will not apply.

Other non-destructive test methods may be adopted, in which case the acceptance criteria shall be agreed between the Engineer and the Contractor and the tests shall be done under expert guidance.

9.21 FINISHING OF CONCRETE: On striking the formwork, all blowholes, honey combing or any such imperfection observed shall be brought to the notice of the Engineer. The Engineer may at his discretion allow such honey combing or blow holes to be rectified by necessary chipping and packing with concrete or grouting with cement mortar. The proportion of concrete or mortar used for rectification shall be as specified by the Engineer. However, if honeycombing or blow holes are of such extent as being undesirable, the Engineer may reject the work totally and require it to be redone properly and his decision shall be final and binding on the Contractor. No extra payment shall be made for rectification of defects or for rebuilding the structure.

All burrs and uneven faces shall be rubbed smooth with carborundum stone.

The surface of non- shuttered faces shall be smoothened to give a finish equal to that of the rubbed down shuttered face. Concealed concrete faces shall be left as from shuttering except

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that honey combed surfaces shall be made good as detailed above. The top faces not intended to be surfaces shall be levelled and floated to a smooth finish at the levels and falls shown on the drawings or as directed by the Engineer. The floating shall not be executed to the extent of bringing excess fine materials to the surface.

- 9.22 REPAIR AND REPLACEMENT OF UNSATISFACTORY CONCRETE:** Concrete which is unsatisfactory shall be repaired by cutting out the unsatisfactory materials and by replacing it with new concrete. Voids to be so filled shall be provided with anchors, keys or dovetail slots whenever necessary to attach the new materials security in place. Surface of prepared voids shall be wetted for 24 hours immediately before the patching material is placed. Repair of concrete shall be made by skilled workmen. Repairs shall be made as soon as practicable after removal of forms and in a manner to meet the requirements for the finish specified for the particular location.

Epoxy adhesives may be employed for bonding fresh concrete used for repairs, if permitted by the Engineer. Epoxies shall be used strictly in accordance with the manufacturer's specifications.

- 9.22.1 METHOD OF REPAIR :** For small size holes having surface dimension nearly equal to the depth, for holes left after removal of form ties, grout insert holes and slots cut for repair of cracks, dry pack filling shall be used. Mortar filling by cement gun shall be used for repair of areas and holes too large for dry pack, and too shallow for concrete filling. For holes extending entirely through the concrete section, for areas greater than 0.1 sq.m. and deeper than 100 mm and holes in reinforced concrete which are greater in area than 0.5 sq.m. and which extend beyond the reinforcement, the repair shall be made by making a complete filling of the void with broken stone and liquid Portland cement grout shall be placed through filler pipes under pressure. Pipe nipples shall be placed through forms at bottom of voids so that the grout rises upward through the aggregate to spill through a vent at the top edge of the void.

- 9.22.2 PATCH SURFACES:** Filling material used in repair of surfaces which will be exposed after completion of the project shall be made with cement from the same source as that used in concrete and blended with a sufficient amount of white Portland cement to produce the same colour as the adjoining concrete. Patched surfaces shall be given a final treatment as required to make the texture of the patch match that of the surrounding material.

- 9.22.3 CURING OF REPAIRED WORK :** Immediately after patchwork repair is completed, the repaired areas shall be covered with an approved non-staining water saturated material, which shall be kept wet and protected against sun and wind for a period of 12 hours. Thereafter the patched areas shall be kept continuously wet by fine spray or sprinkling for not less than 10 days.

All materials, procedures and operations used in the repair of concrete and also the finished work shall be subject to the approval of the Engineer. All filling shall be tightly bonded to the concrete and shall be sound, free from shrinkage cracks, or dummy areas after fillings have been cured and are dry.

- 9.23 UNDER WATER CONCRETING:** Underwater concreting shall be done only with the approval of the Engineer. The methods, equipment, materials and proportions of the mix to

be used shall be submitted to and approved by the Engineer before commencement of such work.

Use of tremies - The top section of the tremie shall be enough to hold one entire batch of the mix or the full contents of transporting bucket if any. The tremie pipe shall not be less than 200 mm in dia. and shall be large enough to allow a free flow of concrete and strong enough to withstand the external pressure of water even if a partial vacuum develops inside the pipe. A separate lifting device shall be provided for the tremie with the hopper at the upper end. Approved means shall be used to ensure a continuous flow of concrete through the tremie. The tremie shall be raised gradually so that the flow of concrete is uniform ensuring at the same time that water does not enter the pipe. At all times after placing of concrete is started and until all concrete is placed, the lower end of the tremie pipe shall be below the top surface of the plastic concrete.

It shall be ensured that water under which concreting is done is as still as practicable and in any case the speed of flow of water is reduced to less than 3 m per minute through the space through which concrete is to be deposited. Dewatering by pumps shall not be done while concrete is being placed or until 24 hours thereafter.

Bottom opening buckets: The bottom doors shall open freely downward and outward when tripped. The bucket shall be filled completely and lowered slowly to avoid backwash or swirling. The bottom doors shall not be opened until the bucket rests on the surface upon which concrete is to be deposited and when discharged, shall be withdrawn slowly until well above concrete.

To minimise the formation of laitance, great care shall be exercised not to disturb the concrete as far as possible while it is being deposited.

9.24 REINFORCEMENT: Prior to use in the works, reinforcements shall be clean of all mill scales, loose rust, paint and other adherent coatings or materials to the satisfaction of the Engineer.

The Contractor shall be responsible for the preparation and checking of all bar bending schedules against the drawings before commencement of cutting and bending of reinforcement. The rates quoted against reinforcement shall cover preparation of bar bending schedules and order lists and no extra payment will be admissible for such work. Bar bending schedules and bar order lists shall be subject to the approval of the Engineer, which will not absolve the Contractor of any responsibility for reinforcement work to specifications and drawings.

Bending and fixing of reinforcements shall be governed by relevant provisions IS: 2502 and SP: 34 (Latest Revision). Reinforcement works shall comply with provisions of clause No.5.6 and clause 12 of IS: 456 – 2000.

All reinforcement shall be bent and placed in full lengths shown in the drawings. Splicing shall be permitted where shown on the drawings or if approved by the Engineer. Where provided, splices shall, as far as possible, be away from the sections of maximum stress.

Cover to reinforcement shall be strictly as indicated in the drawing or as approved by the Engineer. Field welding of reinforcement shall not be permitted without the consent of the

Engineer. Welding where permitted shall be done in accordance with the provisions of IS: 2751 only to main and distribution steel.

9.24.1 WELDING OF REINFORCEMENT: Field welding of reinforcement bars shall not be permitted without the consent of the Engineer. Where welding is permitted it must be at suitable staggered locations. Tests to ensure that the joints are of the full strength of the bars connected shall be made to the satisfaction of the Engineer. Welding, where permitted, shall be done in accordance with the provisions of IS: 2751. This clause is applicable to main and distribution steel only.

9.25 PAYMENT:

9.25.1 PLAIN AND REINFORCED CONCRETE : Payment for plain and reinforced cement concrete cast in situ, shall be made on the basis of volume in cubic metres of the actual finished concrete done or as per approved drawings for the work whichever is less and the payment shall be inclusive of all labour, materials, machinery hire, transportation, all leads, lifts and descents, cost of leaving pockets, making channels or grooves as necessary, supply and application of cement slurry as required for commencement or continuation of concreting or otherwise, making, fixing and removal of stop-ends including materials thereof, all cost for trial mixes and tests thereof for establishment of all design mixes, all other testing of constituents as well as concrete and other testing as required under specifications or as ordered by the Engineer and except irretrievable shuttering, all shuttering (which shall be inclusive of all materials with all type of fasteners used, making of the formwork with all struts, braces, all necessary supports, staging, scaffolding, surface finish and treatment, erection to line and level as drawings and to the Engineers satisfaction, cleaning, attendance during concreting, retaining in position for the specified time, removal after the specified duration after concreting etc.) and other work of every description connected with any or all aspects of concreting excepting only the following which will be paid for separately.

Payments for reinforcements, inserts, irretrievable shuttering where involved, provision and fixing of water bars, provision and fixing of expansion joints and construction joints shall be made under the respective work items.

9.25.2 CLASSIFICATION OF GRADES OF CONCRETE FOR PAYMENT: Where the strength of the concrete (whether of nominal mix or design mix) as indicated by testing as per specifications lies between the strength of two grades mentioned in above and it is accepted by the Engineer, such concrete shall be classified as a grade belonging to the lower of the two grades between which it lies. In case the cube strengths show higher results than specified for the particular grade of the concrete, it shall not be placed in the higher grade nor shall the contractor be entitled to any extra payment on that account.

Any concrete rejected by the Employer shall be dismantled at contractor's cost and no payment will be made for the concrete so rejected or for the formwork and reinforcement used for such rejected concrete.

Deduction for pockets etc. shall be as specified in the relevant Indian Standard.

9.25.3 IRRETRIEVABLE FORMWORK: Classification of shuttering as irretrievable will be as decided by the Engineer.

Payment for irretrievable formwork shall be on the basis of area in sq. m. of the actual area in contact with the concrete cast. The rates shall be inclusive of all materials with all type of fasteners used, making of the formwork with all struts, braces all necessary supports, finish, treatment, erection to line and level as per drawings and to the Engineers satisfaction, cleaning, attendance during concreting etc.

9.25.4 REINFORCEMENT: Payment of reinforcement shall be on the basis of weight. The weight shall be calculated on the basis of length of bars of different diameters calculated from the approved bar bending schedules and lengths used in approved splices, laps, chairs, spacer bars etc. using unit weights for various sizes as given in the Bureau of Indian Standards handbook. Binding wire shall not be measured or be paid for in any manner and is deemed to be included in the rate. The rate shall include straightening, decoiling where necessary, cleaning as specified, cutting, bending, placing in position as per drawings and specifications with all leads, lifts and descents, supplying and binding with binding wire, and all welding where permitted.

10 SHORING:

(i) For loose earth and when the depth of excavation exceeds 3 metres, poling boards (vertical members) of 50 to 75 mm. in thickness and 175 to 225 mm. in width preferably of Sal-wood to be placed close together and to be driven about 300 mm. in ground below the bottom of the trench with intermediate salbullah piling of diameter not less than 100 mm. at the rate of 900 to 1000 mm. centre to centre to be placed in between the vertical surface of trench and the poling boards and double struts of sal-bullah of not less than 100 mm. in diameter between two wallings (horizontal member) of 250 mm. in width and 75 mm. in thickness held horizontally between them.

(ii) For medium clay and when the depth of excavation exceeds 2 metres but not exceeds 3 metres single struts will be provided and sal-bullah piling may not be placed. Other requirements are to be satisfied as (i) above.

(iii) For stiff clay or dry clay and when the excavation is within 2 metres, vertical poling boards will be placed at the rate of 600 to 1000 mm. apart with or without walling pieces; but single or double strutting will be provided. Other requirements are to be satisfied as per (i) above.

11 PROVIDING & LAYING PRE-CAST CONCRETE PAVING BLOCK PAVEMENT:-

11.1 SCOPE OF WORK : The scope of work includes providing from source as approved by the Engineer / manufacturing by approved means machine made pre-cast concrete paving blocks, laying true to line, level and slope for laying on floor as per provisions of the specifications detailed herein below and as directed by the Engineer.

11.2 PARAMETERS FOR CONCRETE PAVING BLOCKS:

Parameter	Value	Reference Test Procedure and Sampling Frequency & Tolerance
Width	100 mm	As per IS 15658: 2006 with Amendment nos 1&2
Length	200 mm	-do-
Thickness	100 mm	-do-
Arris/Chamfer	5 to 7 mm	-do-

Supply, Installation, Testing and Commissioning of 11kV/3.3kV/415V Panel along with allied works for augmentation of GC Berth Sub-station including construction of Sub-station building at GC Berth area of Haldia Dock Complex, SMP, Kolkata.

Parameter	Value	Reference Test Procedure and Sampling Frequency &Tolerance
Squareness		-do-
Water Absorption	Average of 3 units shall not be more than 6% by mass. In individual samples, water absorption shall not be more than 7%.	-do-
Minimum Average Compressive Strength	54.5 Mpa (N/Sq.mm)	-do-
Minimum Compressive Strength of Individual paver block	42.5 Mpa(N/Sq.mm)	-do-
Flexural Strength/ Breaking Load	7 KN (Minimum)	-do-

11.3 CEMENT: Cement used in the manufacture of concrete paving blocks shall comply with the requirements relevant Indian Standards and the cement shall be ISI marked. The supplier or the contractor shall do testing of cement, if directed by the Engineer.

11.4 AGGREGATES: As per relevant IS Codes.

11.5 WATER: The water shall be clean and free from any deleterious material. It shall meet the requirements as stipulated in IS456-2000 as well as IS 15658: 2006.

11.6 MANUFACTURE OF PAVING BLOCKS: All paver blocks shall be machine made. Handmade paving blocks shall not be accepted. The blocks shall be obtained from source as approved by Sr. Dy. Manager (I&CF). If approved by the Engineer, the contractor will be allowed to manufacture paving blocks at site using approved machineries and methods till such time the approval is not withdrawn.

11.7 TECHNICAL SPECIFICATIONS FOR LAYING CONCRETE PAVING BLOCKS:

(i) Base: - The Finished surface of the base shall match the design profile of the concrete blocks within + 10 mm.

(ii) Sand Bedding: - Paving blocks shall be placed on a bed of 50 mm compacted thickness of Zone – III brown sand, obtained either from a single source or blended to achieve grading as approved by Engineer.

Single sized, gap-graded sands or those containing an excessive amount of fines will not be used. The sand particles should preferably be angular type. Preferably, the sand shall be slightly moist.

(iii) Laying the Paving Unit: - Wherever possible, laying shall commence adjacent to or against an edge and proceed towards inner side. The first few square meters should be carefully placed and checked to ensure that large gaps between paving units do not occur. Close checking of paving unit alignment at this stage will assist subsequent paving. The laying pattern and face should be established to permit first easy laying such that it is never necessary to force a paving unit between units already placed. The blocks will be placed to

different bonds or patterns. e.g.:- Stretcher or running bond, Herringbone bond and basket weave or parquet bond etc.

To commence, only full units should be used, cutting and infilling at edges should follow. Laying shall proceed in one direction only, along the entire width of the area to be paved. On a sloping site, laying shall start from the lowest point and proceed uphill on a continuous basis, to avoid downhill creep in incomplete areas. Paving units must be lightly butted. Units, which are butted, may be subject to spalling and even fracture and will result in loss of uniformity in the laying pattern. Nominal joint widths of 4 mm (maximum 5 mm) will be maintained using the normal practice of holding a paving unit lightly against the face of an adjacent unit and allowing it to slide into position. Cutting paving units for infilling against edge restraint etc. should be deferred until sufficient work has been completed to allow a reasonably continuous operation. Hydraulic splitter or mechanical guillotine block cutters or power saws shall be used for this purpose. Generally use of cut units less than about 25% of a full unit is prohibited. Where space does not permit the use of a larger segment, premixed concrete as directed by the Engineer shall be used.

(iv) Compaction: - For compaction of the bedding sand and the blocks laid over it, vibratory plate compactors shall be used over the laid paving units and at least two passes of the vibratory plate compactor are needed. Such vibratory compaction shall be continued till the top of each paving block is level with its adjacent blocks. It will not be allowed to leave compaction till end of the day, as some blocks may move under construction load. There should be minimal delay in compaction after laying of the paving blocks to achieve uniformity of compaction and retention of the pattern of laying. However, compaction shall not proceed closer than 1mtr from the laying face, except after completion of laying blocks.

Good compactors, having larger plate area shall be used for compaction. Vibratory plate compactors shall be used for compaction of bedding sand and joint filling.

(v) Filling the Joints: - Following completion of the bedding compaction, the joints between paving units shall be completely filled with Zone-III brown sand obtained either from a single source or blended to achieve grading as approved by Engineer.

The content of fines (silt and / or clay) shall be restricted to 10 %. If directed, the joint filling sand shall be washed to overcome the problem of efflorescence on the surface of paving block layer.

Both the sand and the paving units should be as dry as possible when sand is spread. Due to the narrowness of the joints, damp sand may bridge across them, and resist compaction.

The sand should be broomed or spread over the surface with a small surcharge and a rate to keep up with the paving. However, where appearance is a major consideration any sand surcharge may need to be swept clear prior to using the plate compactor. If the weather does not allow sand and blocks to be dry, the joint filling sand shall be washed in by light sprinkling of water. Sufficient passes of the plate compactor are required to vibrate the sand down into the joints and to completely fill them. There should be minimum delay in joint filling; the process shall in any case be completed by the end of the day's work.

Once the entire area has been laid, final compaction shall be achieved by not less than ten passes of a vibratory plate compactors. Areas which deform by more than 8 mm over a 2 Mtr

section during final compaction shall be taken out and reconstructed to the satisfaction of the Engineer.

(vi) Opening to users: -As soon as the joint-filling operations have been completed the area can normally be opened to service load. However, until the joints have been filled, movement over the area should be restricted to man or vehicles involved in construction of the area. The entire area shall be inspected frequently to ensure that any incomplete filled joints, exposed by public movement / machines / and / or weather are promptly filled. Such frequent inspection shall be continued till dust and detritus from the surroundings tightens the surface of the joints.

11.8 MEASUREMENT: The measurement shall be done on the area covered in square meter correct up to two decimal places. The rate shall be inclusive supply of precast paving blocks as specified, preparation and providing 50 mm compacted Zone-III sand cushion as levelling course, laying and compacting paving blocks, providing sand for joint and joint filling, sampling and testing all as per specification and as directed by Engineer. The solid concrete guard walls / edge restraint beams, if any, shall be measured in cubic meter and be payable separately.

12 REINFORCEMENT: Unless specifically mentioned otherwise the reinforcement to be used in the works shall conform to IS: 1786:2008. All the testing procedures & frequency of testing shall be as per latest revision of relevant IS codes.

12.1 PAYMENT: Payment for reinforcement used in the cement concrete shall be made on the basis of weight in metric tonne, actual use in the finished work considering Lap Length.

13 PILE FOUNDATION : This work shall consist of construction of RCC bored cast-in-situ piles for the electrical substation building at different locations in accordance with the details shown on the drawings and to the requirements of the specifications and as per BOQ.

The length of boring and volume of concrete, reinforcement of piles mentioned in the schedule of quantities in this contract is based on required load taking capacities of piles and the basic length of pile and its diameter is shown in the drawings. The final length shall be decided by the Engineer on the basis of the actual boring data observed on site for individual piles.

13.1 SPECIFICATIONS: The execution of pile foundation shall conform to IS: 2911 (Part-I/Sec-2) with latest amendments.

The specifications for safe allowable load, test load, total settlement, total deformations, net settlements, would be as per IS: 2911 (Part-I/Sec-2) provisions.

13.2 CONTRACTOR TO PROVIDE DETAILS: The drawings and specifications are enumerated for the general guidance of the Contractor. Complete details of proprietary or other system of piling proposed to be adopted for the work along with details of equipment proposed to be deployed with detailed and step by step methodology shall be submitted in four copies along with Tender.

13.3 FOUNDING LEVEL OF PILES: The founding levels of piles have been tentatively shown on the drawings. However depending actual conditions met at site during pile boring operations, the Engineer will decide the exact founding levels, which shall be final and binding on the Contractor.

13.4 BORING: The ground level shall be taken at the location of each pile before commencement of boring operations. Boring may be done by either rotary or percussion equipment or grabbing equipment using reverse or direct mud circulation method. In case of unstable soils, the boring tools used should be such that suction efforts are minimised. Stabilisation of the sides of the borehole, shall be done by the use of bentonite slurry or casing. The size of cutting tool/ trenching equipment shall conform to the dimensions of the pile and is to be approved by the Engineer.

Removal of obstruction if any met with during pile driving or boring shall also be done by the Contractor. No extra payment will be made for this work.

The spoils arising out of boring shall be disposed off as directed by the Engineer within the quoted rates.

13.5 DRILLING MUD (BENTONITE): Use of drilling mud (Bentonite) in stabilising the sides of the boreholes is permitted wherever necessary. The properties of drilling mud shall comply with those given in Appendix A of [Clause 4.3] of IS 2911 [Part I / Sec. 2]. The permissible values for various tests that should be carried out on the drilling mud, are given below:

Type of test	Method of test	Permissible value
Density	Mud balance or Hydrometer	1.04 to 1.10 grams/m. Litre.
PH value	PH indicator paper Strips	9.5 to 12
Viscosity	Marsh cone method	30 to 90 seconds.
10 min. gel strength	Shearometer or vane shear apparatus	1.4 to 10 N/Sq.mm.

The relationship between concentration C of bentonite slurry expressed as a percentage by mass and the density Ys is given below:-

$$Y_s = 1.0 + 0.006 C$$

Note: - The above relation is valid for Indian Bentonite and represents an average sample. There may be some variations of bentonite. Laboratory calibration may be prepared for the Bentonite samples actually used.

The drilling mud shall be kept at least for a height of one metre above subsoil water and the excavation shall be always kept almost full with mud, which should preferably be kept in motion. The density and composition of the fluid shall be such as to suit the requirements of the condition and to maintain the fine materials from the excavation in suspension. The density of the drilling mud shall be tested at suitable intervals as decided by the Engineer.

In the event of a sudden loss of drilling mud, the trench shall be back filled and further work shall continue after ascertaining the reasons for the loss of mud, and after remedial measures to prevent a recurrence after approval of the Engineer.

- 13.6 CASING :** In case of boring with casing, the casing shall be used from the working ground level. The casing shall be of sufficient thickness and strength to hold its original bore and show no harmful distortion.

Where the soil is loose and liable to flow, the bottom of the casing shall be kept enough in advance of the boring tool to prevent the entry of the soil into the casing, thus preventing the formation of cavities and settlements in the adjoining ground.

The water level in the tube shall be maintained at this natural ground water level till the tube is sealed so that no boiling of the bottom of the hole occurs due to difference in hydrostatic head.

- 13.7 CLEANING OF BOREHOLE BOTTOM:** The bottom of the hole shall be cleaned very carefully before concreting work is taken up. The cleaning of the hole shall be ensured by careful operation either by flushing with the fresh drilling mud through the bottom of the hole or by airlifting process. To lift the spoil at founding level before concreting, borehole shall be agitated by jetting with fresh drilling mud with relatively higher pressure than that used during boring or air through tremie pipe. While boring by use of drilling mud, the specific gravity of the mud suspension in the vicinity of the bottom of borehole shall be monitored. Consistency of the drilling mud suspension shall be controlled throughout the boring as well as concreting operation in order to keep the hole stabilized as well as to avoid suspension of the mud.

Concreting shall **on no account** be taken up if the specific gravity of bottom slurry is more than 1.2.

- 13.8 CONCRETING:** The pile shall be RCC bored cast in situ type with concrete of grade M35.

The quantity of concrete required for the depth of the particular pile shall be calculated on the spot and checked with the actual quantity of concrete used. The quantity of concrete used in each pile should also be recorded and signed by the contractor and the Engineer's representative, and this record will form the basis for calculating the cement actually used. The concrete will be from batching plant or ready mixed concrete, approved beforehand by the Engineer.

The minimum cement content should be 425 kg / Cu.Mtr of concrete. Under water concreting shall be done as per para 14.2 of IS 456 – 2000. Concrete is to be placed in the pile only by tremie method ensuring that tip of the tremie is at least 500 mm below the top of concrete at any time. The top of concrete in the pile shall be brought above the cut-off level to permit removal of all laitance and weak concrete before capping and to ensure good concrete of the specified grade at the cut-off level for proper embedment into the superstructure elements. The cement required for providing overflow concrete or scum concrete beyond cut-off level will be decided by the Engineer.

Concreting of boreholes shall start as soon as possible after its completion and in any case should not be longer than four hours. If concreting in a borehole is delayed more than two hours, it shall be cleaned thoroughly as directed by the Engineer before placing concrete. Concreting under water shall be done in one operation. It shall, however, be ensured that concrete entering the tremie pipe does not get mixed up with the slurry.

In the circumstances where cut-off level is below ground water level, the need to maintain a pressure on the concrete equal to or greater than water pressure shall be observed and accordingly length of extra concrete above cut-off level shall be determined and allowed in works

13.9 TREMIE CONCRETE IN PILES: The following procedures shall be used for tremie concrete in piles:

- a) The concreting of a pile shall be completed in one continuous operation.
- b) The hopper and tremie shall be closed system embedded in the placed concrete, through which water can not pass.
- c) The hopper shall be large enough to hold a complete batch of concrete mix or content of the concrete bucket, if any. The diameter of the tremie pipe shall not be less than 200 mm.
- d) The first charge of concrete shall be placed with a sliding plug pushed down the tube ahead of it or with a steel plate of adequate charge to prevent mixing of concrete and water. However, the plug shall not be left in the concrete as a lump.
- e) The tremie pipe shall always penetrate well into the concrete with adequate margin of safety against withdrawal of the pipe.
- f) All tremie pipes should be scrupulously cleaned after use.

Normally, concreting of the piles shall be uninterrupted till completion of pile. In the exceptional case of interruption of concreting which shall not be more than 1 hour under any circumstances, the tremie shall not be taken out of the concrete. Instead it shall be raised and lowered slowly, from time to time to prevent the concrete around the tremie from setting. Concreting should be resumed by introducing a little richer concrete with a higher slump for easy displacement of the partly set concrete.

If the concreting cannot be resumed before final setting up of concrete already placed, the pile so cast may be rejected or accepted with modifications at the sole discretion of the Engineer-in-Charge.

In case of withdrawal of tremie out of the concrete, either accidentally or to remove a choke in the tremie, the tremie may be reintroduced in the following manner to prevent impregnation of laitance or scum lying on the top of the concrete already deposited in the bore.

The tremie shall be gently lowered on to the old concrete with very little penetration initially. A vermiculite plug shall be introduced in the tremie. Fresh Concrete of slump between 150 mm and 175 mm shall be filled in the tremie which will push the plug forward and will emerge out of the tremie displacing laitance/scum. The tremie will be pushed further in steps making fresh concrete sweep away laitance/scum in its way. When tremie is buried by about 60 to 100 cm. concreting may be resumed.

When concrete is placed by tremie method, concrete shall be cast to a minimum height above the cut-off level as given in BOQ to permit removal of all laitance and weak concrete before

capping and to ensure good concrete of the specified grade at the cut-off level for proper embedment into the superstructure elements.

In exceptional cases, if the concreting operation is interrupted for some reason, and the borehole is left un-concreted for a period exceeding four hours, the Engineer may reject the pile and instruct the contractor to re-bore and construct a substitute pile at an alternate location decided by the Engineer. The cost of such additional pile, if required, shall be borne entirely by the Contractor.

In the circumstances where cut-off level is below ground water level, the need to maintain a pressure on the concrete equal to or greater than water pressure shall be observed and accordingly length of extra concrete above cut-off level shall be determined and allowed in works.

13.10 SEQUENCE OF PILING: During installation of piles, the sequence of construction shall be as directed by the Engineer.

Since the piling is to be done in a busy operational area, the successful bidder shall adopt all possible measures to avoid any disruption to the operational activities in the area and care shall be taken to avoid any damage to existing structures, cables, pipelines, installations etc.

13.11 DEFECTIVE PILES: In case, defective piles are formed, they shall be removed or left in place as directed by the Engineer depending on how they affect the performance of the adjacent piles or the group as a whole. Additional piles shall be provided without any cost whatsoever to the employer and in this regard Engineer's decision shall be binding on the Contractor.

Any deviation from the designed location, alignment or load capacity of any pile shall be noted and adequate measures shall be taken well before the concreting of the pile cap if the deviations are beyond the permissible limits.

After concreting the actual quantity of concrete shall be compared with the average obtained from field observations made in the case of a few piles initially cast. If the actual quantity is found to be considerably less, special investigations shall be conducted and appropriate measures taken.

13.12 TOLERANCE: Piles shall be installed as accurately as possible as per the designs and drawings. For the vertical piles, a deviation of 0.5 percent from the vertical line shall not be exceeded, subject, however, the piles shall not deviate more than 75 mm or one-tenth of diameter whichever is more from their designed positions at the cut-off level. In case of single pile in a pile cap, positional tolerance shall not be more than 50 mm.

In case of piles deviating beyond these limits, and to such an extent that the resulting eccentricity cannot be taken care of by a redesign of the pile cap or pile ties, the piles shall be

replaced or supplemented by one or more additional piles by the contractor at his own cost along with any additional cost for pile cap being over size. The decision taken in this regard by the Engineer-in-Charge shall be final and binding on the Contractor. Further the redesign of the pile sub-structure and superstructure associated with the supplemental or additional piles(s) shall be carried out by the Contractor.

13.13 CHIPPING OF PILEHEAD: Manual chipping shall be permitted after three days of pile casting. Pneumatic chipping shall not be started before 7 days.

13.14 PROVIDING M.S. LINERS: This item is for supply and fixing permanent M.S. Liners for the piles from cut off level up to the required depth as directed by the engineer. In case the soil strata is found to be not good in the founding level of the liner, extra depth may be provided as per site condition as may be decided by the Engineer.

The Contractor shall fabricate the liners from M.S. Sheets to suit the diameter of the pile as directed. The required length of the M.S. Liners will be made up by welding each unit at site by the Contractor. M.S. sheets required for manufacture of the liners shall be supplied by the Contractor.

The length of the liner above the cut-off level shall be cut to facilitate chipping the top portion of the pile and for interlacing its reinforcement bars into the capping slab.

The payable depth of the liner shall be measured from the cut-off level to the depth up to which the liner is actually provided, though the liner has been provided right from the level of the working platform from practical considerations.

13.15 REINFORCEMENT FOR PILES: The reinforcement cage shall be fabricated as per drawings and lowered carefully into position in side the cleaned trenches. It shall be ensured that the orientation of cage is as indicated in the drawings. Proper cover for reinforcement, as shown in the drawings shall be provided.

In positioning of reinforcement, longitudinal tolerance of cage head at the top of the guide wall measured along trench wall measured along the trench shall be 75 mm. and vertical tolerance at case head in relation to top of guide wall shall be 50 mm.

13.16 RECORDING OF DATA: During installation of piles, a complete site record shall be made by the contractor, as per IS: 2911 along with any other data as directed by the Engineer. The record shall be submitted to the Engineer in triplicate on completion of installation of each pile.

13.17 CONCRETE STRENGTH TEST: Concrete strength test for piling concrete mix shall be carried out at regular intervals during concreting of each pile or as directed by the Engineer.

Sampling, testing and interpretation of results shall be done as per relevant I.S. Codes. The cost of these tests shall be borne by the Contractor.

13.18 PAYMENT FOR BORED PILES : Payment for boring of circular Bored piles will be made in linear metres and will be reckoned from existing Ground level (either above or under water) up to the specified level shown in drawings or as directed by Engineer.

Rate of Boring shall include supplying all equipments for excavation, all other operations and all materials including drilling mud and its circulation and replacement, all cleaning of trench during boring and before concreting, all testing and all related work of any description.

Payment for concreting shall be made on the volume in Cu.M. of concrete considering specified dimensions of circular bored piles as shown in drawings from the cut off level to the founding levels as mentioned herein above. However, concreting above cut off level as required as per specifications, drawings or good engineering practice will have to be provided by contractor at his own cost.

The rates of concreting for piles shall be deemed to be inclusive of such excess consumption and shall include all equipment, materials, leads, lifts, testing of materials and all related works of any description.

Reinforcement used, however, shall be paid for separately. The reinforcements will be paid for on the basis of weights of bars used calculated using the lengths as per the bar bending schedule and the unit weights as per Indian Standards. The rates shall cover the cost of reinforcements, cleaning, decoiling, cutting, bending to specified shapes, placing in positions as indicated in the drawings, supplying and binding with binding wire 1 mm dia black annealed wire, or welding as required including all equipment consumables etc. and all other related work complete.

No extra payment will be made for interlacing the reinforcements of the piles into the superstructure elements. The actual quantity of cement consumed will be recorded jointly for material accounting.

Payment for liners if required shall be made on the basis of weight of liner calculated on the basis of unit weight of plates as per Indian Standard specifications, theoretical diameter and the actual length of liner plate provided measured from the cut off level to the depth to which the liner has been provided. The rate for the item shall cover the cost of all materials, cost of fabrication of liner by welding or any other means including all consumables, fixing of liner in position and to the depth as decided by the Engineer, cutting of the liner cut of level, wastages in the liner plate, and all other work of any description involved in the provision of liner plate.

No extra payment will be made for cutting and dressing the pile head at specified level, interlacing the reinforcements of the piles into the superstructure elements. The rate shall include cost of all equipment, tools, labour for cutting and dressing of the pile heads at

specified level for proper embedment into the superstructure elements, and for disposing off the debris at places indicated by the Engineer.

13.19 LOAD TESTS AND ACCEPTANCE CRITERIA

13.19.1 STATIC LOAD TEST: In order to determine the load carrying capacity of the piles, static load test shall be carried out by the Contractor as per IS: 2911 (Part IV)-1985 on isolated piles selected by the Engineer-in-Charge. Piles to be tested should be cast-in-place at least 28 days before loading, unless otherwise directed by the Engineer-in-Charge.

The pile head shall be chipped off carefully till sound concrete is met. The projecting dowels should be bent suitably and the top finished smooth and level. A bearing plate shall preferably be placed on the head of the pile for the jacks to rest.

The test load shall be applied in a series of increments by means of a hydraulic jack, with pressure gauge, reacting against a suitable load frame obtaining reaction from anchor piles or other suitable anchors. The reaction to be made available for the test should be 25 percent more than final test load to be applied.

Elastic shortening and settlement shall be recorded with dial gauges of 0.01 mm sensitivity preferably with three gauges.

Before any load test is made, the proposed arrangement of the test set up shall have to be approved by the Engineer-in-Charge. All responsibilities for conducting the test safely and properly shall lie with the contractor.

The axial load test on piles shall be done to confirm that the soil strata into which the piles are founded have the required bearing capacity.

The test loads shall be applied in increments of about 20 per cent of the pile load value. Reading of elastic shortening and, if any, the settlement of pile in rock and rebounds shall be referred to a constant elevation bench marks and shall be recorded to 0.01 mm for each increment or decrement of load. Each state of loading shall remain in place for a maximum of 2 hours. The final test load shall remain in place for 24 hours and settlements, if any, should be observed every hour during this period. The test load on pile may be removed in one stage by releasing the jack steadily after completion of the test and rebound observations made for 2 hours. The loads and readings obtained shall be duly verified and countersigned by the Engineer-in-Charge.

13.19.2 RECORDING OF DATA AND PRESENTATION: All pile test data i.e. load, displacement and time shall be recorded in a suitable form along with the information about the pile as approved by the Engineer.

The data shall also be presented by curves drawn between load displacements and displacement time and safe load shall be indicated on the graphs.

13.20 MEASUREMENT FOR PAYMENT: Payment for load tests shall be on the basis of numbers of pile tested as per specifications, with the provision that tests which do not show satisfactory results shall not be paid for.

13.20.1 RATES FOR TESTING: Payment for testing shall be made on the basis of number of tests carried out providing the test is successful and results are satisfactory and pile acceptable as per codal provisions.

Rates for lateral load tests on working piles shall cover earth excavation, supplying and transporting all equipment and kentledge etc., all necessary work for making arrangements for loading, supplying and fixing of testing instruments, recording the results, and making all arrangements for unloading, dismantling and clearing the site. The rates shall also cover all materials and labour necessary for all connected work and submission of test results as specified, and all other work or any other description connected with the test.

Payment for testing of piles shall be made to the Contractor only when the test is found to be satisfactory. For tests which are found unsatisfactory no payment shall be made to the Contractor. The pile will then be considered defective and will not be paid for. No payment shall be made for test, which are incomplete for any reason whatsoever. Additional tests required by the Engineer shall be carried out at the same quoted rates.

The Contractor shall also indemnify the employer against any claim or obligations arising out of any damage to structure or out of any injury to any person / persons due to piling work done by him.

13.20.2 DEFLECTION MEASUREMENTS: The settlement of the pile shall be recorded by three dial gauges recording to 0.02 mm. and placed at equal distance around test pile. The dial gauges shall be fixed to datum bars whose ends rest upon non-movable supports. The supports for datum bars with reference to which the settlement of the pile would be measured shall be at least “5d” away, clear from the test piles – where “d” is the diameter of the circular pile subjected to a minimum of 2 m for good sandy soil and 5 m for loose soil.

13.20.3 CAPACITY OF TESTING EQUIPMENT: The testing equipment shall be capable of loading a pile to twice the design loading.

13.20.4 PREPARATION OF PILE HEAD: The pile head shall be chipped off carefully till sound concrete is met. The projecting reinforcement shall be bent suitably and the top finished smooth and level with plaster of Paris, when required or as directed by the Engineer.

13.20.5 METHOD OF LOADING AND ASSESSMENT OF SAFE LOAD: The Contractor shall perform routine test on working piles as directed and selected by the Engineer and results must satisfy requirements of the test as indicated hereafter.

13.21 VARIATION TO THE ANTICIPATED DEPTH: Any additional length of pile over the approximate length shown in the drawings or mentioned elsewhere shall be carried out at the rate quoted against the items of work for piles.

The Contractor shall carry out the work at the accepted rate without variation in case of any increase or decrease in the number of piles.

14. MATERIALS: The Contractor shall make his own arrangements for procuring and supplying all materials of best and approved quality at site.

- 15. TESTING OF MATERIALS:** The Contractor shall undertake all field tests and laboratory tests for all such materials and workmanships as directed by the Engineer or his representative at his own cost.

The samples shall be taken for test jointly by the representatives of the Engineer and the contractor at the worksite and tested /sent to a Govt. registered laboratory or Institutional laboratory as may be decided by the Engineer for testing. In case of field test, the contractor shall undertake the test by his own testing equipments or by any approved agency in presence of the representatives of the Engineer and the contractor at the worksite. All the testing charges and all incidental charges like packaging and transporting the test samples, equipments etc. shall be borne by the Contractor.

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Part-II (Electrical Works)

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 items of work shall be executed as per detailed technical specifications and scheme. In case of contradiction between schedule of work with its Additional Specification and the General Specification, the former shall prevail.
3. 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.
4. 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.
5. 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.
6. Equipment will be duly inspected in the manufacturer's works / premises by TPI Agency before despatch to the site.
7. 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.
8. 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.
9. 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.
10. 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.

11. All concealed work and earthing shall be done in the presence of the Engineer or his authorized representative.
12. The schematic diagram/dimensional drawings of the various electrical cubical panels shall be got approved from the Engineer before fabrication and shall comply with specifications and Indian Electricity Rules. The panels shall conform to IS: 8623/1993.
13. All panels/DB shall be suitable for 45°C ambient temperature.
14. The MCB shall be of the same make as that of MCB DB's. Contractor shall obtain approval of the Engineer before procurement of MCB DB's. All DB's shall be double door type confirming to minimum IP-54 degree of protection.
15. 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).
16. 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.
17. 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.
18. 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.
19. 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.
20. 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.
21. MCCB's shall be used with rotary handle and terminal spreaders and all terminals shall be shrouded to avoid direct contact.
22. 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.

23. 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.
24. All measuring and indicating instruments shall be protected through MCB's of 0.5 Amps rating.
25. General arrangement drawing of the switchboard, LT/HT switchgear shall be got approved by the Engineer before commencement of manufacturing.
26. 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.
27. Ratings, sizes and quantities shall be checked and considered for satisfactory operation of electrical system complete in all respect.
28. Conduits, Switchboards, Sockets to be provided on walls shall be open type unless specifically approved by Engineer.
29. Conduits on ceiling in existing system may be provided on surface and in new construction shall be open type.
30. All measuring and indicating instruments shall be protected through MCB's and isolating switches.
31. Breaker shall have LCD display to show the metering and protection parameters.
32. 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.
33. 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.
34. It is important that every equipment is tested fully before dispatch.
35. 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 or his authorized representative.
36. 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.
37. All fees payable to concerned authorities and other local bodies if any shall be paid by the contractors.

38. 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.
39. 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.
40. Contractor shall have a valid “A” class electrical contract licence with HT installation issued by appropriate authorities.
41. Test certificates both type test and routine tests wherever required shall be furnished along with supply for all Electrical/Mechanical items.
42. Inspection / acceptance, in no way shall absolve the contractor from supplying material as per standards / codes and warranty or other obligations under the contract.
43. 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.
44. All electrical works shall be tested by the contractor in the presence of TPI Agency and to the entire satisfaction as per IE Rules.
45. Data to be furnished by the bidder after award of order
- a) The contractor shall submit detail shop/fabrication/layout drawings for equipments.
 - 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

GC BERTH SUB-STATION.

Equipments, as mentioned hereunder, shall be erected / installed inside newly built sub-station building as per approved layout plan.

(a) Electrical Works (Supply, Delivery, Installation Testing & Commissioning) at GC Berth Sub-station.

- 1) 1 No. 33/3.3 kV, 6 MVA Oil type Transformer.
- 2) 1 No. 33/11 kV, 6 MVA Oil type Transformer.
- 3) 11 kV, 630A, VCB Panels (14 Sets).
- 4) 2 Nos. 11/0.433 kV, 1 MVA Oil type Transformer.
- 5) 1 No. 3.3/0.433 kV, 1 MVA Oil type Transformer.
- 6) 3.3 kV, 1250A, VCB Panels (12 Sets).
- 7) 33kV (E) XLPE, 3C X 120Sq.mm. Screened, Aluminium, armoured cables along with heat shrinkable cable end terminations.
- 8) 11kV (UE) XLPE, 1C X 1000Sq.mm. Screened, Aluminium, armoured cables along with heat shrinkable cable end terminations.
 - i) From newly supplied 11kV VCB Panel to newly supplied 33/11kV, 6MVA transformer as mentioned above (4 Run of 1C x 1000 Sq.mm.).
 - ii) From newly supplied 11kV VCB Panel to newly supplied 11/0.433kV, 1MVA transformers as mentioned above (4 Run of 1C x 1000 Sq.mm. each).
- 9) 3.3kV (UE) XLPE, 1C X 1000 Sq.mm., Screened, Aluminium, armoured cables along with heat shrinkable cable end terminations.
 - i) From newly supplied 3.3kV VCB Panel to newly supplied 33/3.3kV, 6MVA transformer as mentioned above (4 Run of 1C x 1000 Sq.mm.).
 - ii) From newly supplied 3.3kV VCB Panel to existing 33/3.3kV, 6MVA transformer (4 Run of 1C x 1000 Sq.mm).
- 10) 2 Nos. LT Panel, 1600A (PCC-1 & PCC-2).
- 11) 2 sets of 1.1 kV insulated, 1600A, Copper bus ducts, from newly supplied 11/0.433 KV, 1 MVA Oil type Transformers (02 Nos.) to PCC-1 Panel (both incomers) as mentioned above.
- 12) 1 set of 1.1 kV insulated, 1600A, Copper bus ducts, from newly supplied 3.3/0.433 kV, 1 MVA Oil type Transformer (01 No.) to PCC-2 Panel (incomer-1) as mentioned above.
- 13) 1.1 kV aluminium armoured XLPE cables along with cable end terminations from

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- newly supplied LT panel, 1600A PCC-2 Panel (incomer-2) as mentioned above to existing Transformers (1No.) 3.3/0.433 kV, 500 kVA (4 Run of 1C x 630 Sq.mm).
- 14) 2 Nos. LT APFC (Microprocessor Based) capacitor panels with capacitor bank of 200 kVAR rating each.
 - 15) 1.1 kV aluminium armoured XLPE cables along with cable end terminations from newly supplied LT panel, 1600A as mentioned above to newly supplied LT APFC (Microprocessor Based) capacitor panel (Single Core 4 Run of 630 Sq.mm.).
 - 16) 1.1 kV aluminium armoured XLPE cables along with cable end terminations from newly supplied LT panel, 1600A as mentioned above to newly supplied LT APFC (Microprocessor Based) capacitor panel (Single Core 4 Run of 630 Sq.mm.).
 - 17) Dismantling of existing HT and LT switchgear/Panels, LT Cables etc.
 - 18) Re-location of existing 3.3 kV HT VCB Panels (09 Sets).
 - 19) Supply of additional length of 3 Core, 400 sqmm. 3.3 kV, XLPE Cable, St. through jointing and end terminations in new 3.3kV, HT VCB panel (12 sets).
 - 20) St. through & End terminations of existing LT cables in LT panels, 1600A as mentioned above.
 - 21) 30V Battery Bank and battery chargers for Control supply of HT Panel and LT Panels.
 - 22) Re-location of existing 33/3.3kV, 6 MVA, Oil type Transformer (01 Set).
 - 23) Indoor/outdoor illumination by LED fittings.
 - 24) Ceiling fans/pedestal fans/exhaust fans.
 - 25) Emergency lights.
 - 26) Plate Earthing of all Electrical Installations and Electrical Equipment.
 - 27) Fixing of GI cable trays of suitable size.
 - 28) Wiring, cabling work at sub-station.

(b) Civil Works

Following civil works are in the scope of the contractor.

1. Supply of Panel mounting channels of 75mm x 40mm x 6mm as per approved drgs.
2. Chequered Plate for covering cable trench.

(c) Salient Points.

- a. Equipment installation layout shall be submitted by the contractor before erection of equipment at site after approval by HDC, SMP Kolkata. Contractor shall arrange for all necessary means for erection / installation equipments as per manufacturer's guidelines.
- b. 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.
- c. For the purpose of application (by HDC, SMP Kolkata) 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, SMP Kolkata. 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.

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- d. The contractor should clearly understand that though the application would be made by HDC, SMP Kolkata 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 **HT & LT CABLE.**

3.1 **Scope**

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

3.2 **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.

3.3 **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. 3 Core, 120 Sqmm., HT Cable, 33 kV (E) grade, XLPE, U.G. Alu. Screened Cable, Strip armoured, PVC inner sheathed and PVC ST2 type outer sheathed, FR cable.
- ii. 3.5 Core, 400 Sqmm LT Cable, 1.1 kV grade, XLPE U.G. Alu. Cable, PVC inner sheathed and PVC ST2 type outer sheathed, armoured, FR cables.
- iii. 1 Core, 630 Sqmm LT Cable, 1.1 kV grade, XLPE U.G. Alu. Cable, PVC inner sheathed and PVC ST2 type outer sheathed, armoured, FR cables.
- iv. 3 Core, 400 Sqmm HT Cable, 3.3 kV (UE) grade, XLPE U.G. Alu. Cable, PVC inner sheathed and PVC ST2 type outer sheathed, armoured, FR cables.
- v. 1 Core, 1000 Sqmm HT Cable, 3.3 kV (UE) grade, XLPE U.G. Alu. Cable, PVC inner sheathed and PVC ST2 type outer sheathed, armoured, FR cables.
- vi. 1 Core, 1000 Sqmm HT Cable, 11kV (E) grade, XLPE U.G. Alu. Screened Cable, PVC inner sheathed and PVC ST2 type outer sheathed, armoured, FR cables.

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 GI 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 GI 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 GI 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 & GI 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.

3.5 **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.

3.6 **Depth of laying**

Sl.No.	Cable	Laying Type	Depth of laying
1	HT Cable	Open cut excavation with brick protection	1500 mm
		Boring through GI pipe	2000 mm
		Open cut excavation through Hume / GI pipe	2000 mm
		Through existing RCC trench / Hume pipe / GI Pipe.	As per available depth.

Note: Road level to be considered as reference level.

3.7 **Bricks**

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

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- i) 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).

3.8 **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.

3.9 **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.

3.10 **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.

3.11 **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.

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
- xiv) Year of Manufacturing

3.12 **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.

4.0 **OIL TYPE TRANSFORMERS**

A Electrical Design

- i) Generally as per IS 2026 – Part 1, 2 & 4 of 1977 and Part 3 of 1981.

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- 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

- 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

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- 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 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-returnable 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
General**

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, gasketted 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 2⁰C. 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 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.
- iii) 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 5MVA, 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:

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

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Sl. No.	Particulars	6000 kVA, 33/3.3kV
	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%
	b) Total tap positions	5
	c) Taps above nominal voltage	2
	d) Taps below nominal voltage	2
	e) Voltage per step variation	2.5 %
	f) Tap change controls	Manual
20.	Impulse test withstand voltage	As per IS 2026, Part III – 1981
21.	One minute dry and wet power frequency withstand voltage	- do -
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	With auto/ manual tap changing facility
33.	Control wiring	From switchgear to transformer

TRANSFORMER, 6 MVA, 33/11 kV

Supply of 6MVA, 33/11 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 particulars:-

Sl. No.	Particulars		6000kVA, 33/11kV
1.	Specification		IS 2026, Part I - 1977 Part II - 1977 Part III - 1981 Part IV - 1977
2.	Type		Three phase, core type, oil filled
3.	Duty		Indoor
4.	Voltage HV/LV		33/11 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		-
	b) LV Neutral bushing CT for standby E/F protection class 10P15.		1
19.	Tap changer		OLTC
	a) Range		±5%
	b) Total tap positions		5

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Sl. No.	Particulars	6000kVA, 33/11kV
	c) Taps above nominal voltage	2
	d) Taps below nominal voltage	2
	e) Voltage per step variation	2.5 %
	f) Tap change controls	Manual
20.	Impulse test withstand voltage	As per IS 2026, Part III – 1981
21.	One minute dry and wet power frequency withstand voltage	- do -
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	With auto/ manual tap changing facility
33.	Control wiring	From switchgear to transformer

TRANSFORMER 1000 kVA, 11 / 0.433 kV

Supply of 1000 kVA, 11 / 0.433 kV Oil type indoor distribution Transformers with tap Links, manufactured as per relevant IS. The transformer shall be designed for the specification given below:

Technical particulars (Distribution Transformer)

Sl. No.	Particulars	1000kVA, 11/0.433kV
1.	Specification	IS 2026, Part I - 1977 Part II - 1977 Part III - 1981 Part IV - 1977
2.	Type	Three phase, core type, oil filled
3.	Duty	Indoor
4.	Voltage HV/LV	11/0.433 kV

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Sl. No.	Particulars		1000kVA, 11/0.433kV
5.	Frequency		50 Hz
6.	No. of phase		3
7.	Continuous rating		1000 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	Solidily earthed
		LV	Solidily earthed
15.	Percentage impedance		6.25%
16.	Termination	HV	Cable end box suitable for termination of 4 no. 1C x 1000 mm ² XLPE cable
		LV	Suitable for Bus duct.
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		-
	b) LV Neutral bushing CT for standby E/F protection class 10P15.		1
19.	Tap changer		Off Circuit (Rotary type)
	a) Range		±5%
	b) Total tap positions		5
	c) Taps above nominal voltage		2
	d) Taps below nominal voltage		2
	e) Voltage per step variation		2.5 %
	f) Tap change controls		Manual
20.	Impulse test withstand voltage		As per IS 2026, Part III – 1981
21.	One minute dry and wet power frequency withstand voltage		- do -
22.	Withstand time without injury for 3		5 Secs.

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Sl. No.	Particulars	1000kVA, 11/0.433kV
	phase short circuit at terminals	
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

TRANSFORMER 1000 kVA, 3.3 / 0.433 kV

Supply of 1000 kVA, 3.3 / 0.433 kV Oil type indoor distribution Transformers with tap Links, manufactured as per relevant IS. The transformer shall be designed for the specification given below:

Technical particulars (Distribution Transformer)

Sl. No.	Particulars	1000kVA, 3.3/0.433kV
1.	Specification	IS 2026, Part I - 1977 Part II - 1977 Part III - 1981 Part IV - 1977
2.	Type	Three phase, core type, oil filled
3.	Duty	Indoor
4.	Voltage HV/LV	3.3/0.433 kV
5.	Frequency	50 Hz
6.	No. of phase	3
7.	Continuous rating	1000 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

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Sl. No.	Particulars		1000kVA, 3.3/0.433kV
14.	System earthing	HV	Solidly earthed
		LV	Solidly earthed
15.	Percentage impedance		4.5%
16.	Termination	HV	Cable end box suitable for termination of 4 no. 1C x 1000 mm ² XLPE cable
		LV	Suitable for Bus duct.
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		-
	b) LV Neutral bushing CT for standby E/F protection class 10P15.		1
19.	Tap changer		Off Circuit (Rotary type)
	a) Range		±5%
	b) Total tap positions		5
	c) Taps above nominal voltage		2
	d) Taps below nominal voltage		2
	e) Voltage per step variation		2.5 %
	f) Tap change controls		Manual
20.	Impulse test withstand voltage		As per IS 2026, Part III – 1981
21.	One minute dry and wet power frequency withstand voltage		- do -
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

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Sl. No.	Particulars	1000kVA, 3.3/0.433kV
30.	Paint shade	Shade 632 as per IS – 5
31.	Short circuit level on HV side	450MVA

5.0

VCB PANEL

i) 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.
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.

ii) 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.

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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.

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

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.

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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.

iv) Earthing Mechanism

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

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

v) 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

vi) 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.

vii) Auxiliary Buses for Control & Protection

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

viii) 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.

ix) 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 signaling condition on individual panels of solid state facia window type. Common audio signaling with Accept, Reset, and Test push buttons for the switchboard where common annunciation panel is not specified. Audio signaling to have distinct tones for warning and emergency.

x) 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
or 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 colour 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.

xi) 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.
- 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.
- *Colour code for control wiring*

<u>AC – Black</u>	Earth wire – Green
DC – Light grey	Trip circuit – Red

- All telemetering signals shall be wired to terminal strips.

xii) 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.

xiii) 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.

xiv) Protection and Measurement

a) 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.

b) 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.

xv) 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.

xvi) 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.

xvii) 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.

xviii) 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.

xix) 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 colour and non trip points white colour.
- 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:
 - 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.

xx) 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.

xxi) 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.

xxii) 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.

xxiii) Push buttons

Contact Rating

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

COLOR:

ACCEPT	BLUE
RESET	BLACK
TEST	YELLOW

xxiv) Control Circuit Fuses:

HRC link type confirming to IS 9224-1979.

xxv) Protective Earthing

- Continuous earth bus of minimum size 50x6 mm of copper or equivalent aluminum/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 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.

xxvi) Test and Maintenance Equipment

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

xxvii) 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 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.

INDOOR 11kV HT VCB PANEL

This includes, Design, fabrication, supply, installation, testing and commissioning of HT panel indoor 12 kV, 630 Amps, 3 phase, 50Hz, 25kA VCB for 3sec.

Supply, Installation, Testing and Commissioning of 11kV/3.3kV/415V Panel along with allied works for augmentation of GC Berth Sub-station including construction of Sub-station building at GC Berth area of Haldia Dock Complex, SMP, Kolkata.

Incoming Feeder with PT:

This includes supply at site, Vacuum Circuit Breaker, suitable for 12kV, 25kA, 630A, 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 11 kV, 50 Hz, 3 phase AC with all equipment fittings and accessories for efficient and trouble free operation.

- a) 11kV, 630A 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 voltage 75 kV peak
 - ii) One minute power frequency withstand voltage 28 kV rms
- d) Rated current
 - i) Continuous
 - Bus bar 630 A
 - Incoming/outgoing circuit breaker 630 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 11000/ $\sqrt{3}$ /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.

Supply, Installation, Testing and Commissioning of 11kV/3.3kV/415V Panel along with allied works for augmentation of GC Berth Sub-station including construction of Sub-station building at GC Berth area of Haldia Dock Complex, SMP, Kolkata.

- 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. All relays shall be SCADA enabled with event/data logging features
- u) Operating handle, spring charging handle & other required accessories shall be supplied.
- v) Cable box suitable for receiving single length of 4Rx 1C x 1000 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 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 and having of CTR 200-100/5-5A.

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 11kV 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 Engineer.

Tentative lay out:-

SP	I/C-1	O/G- Tr-1	CSS- 1	CSS- 2	GEN	Bus- coupler	SP	O/G- Tr-2	SP	CSS- 3	I/C-2
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I/C-Incomer, O/G-Outgoing, SP-Spare, CSS-Package Outdoor Sub-station, GEN-Generator

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.

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) Make : As per the list of makes enclosed herewith.
- g) Shunt trip coil : 30 V DC
- h) Closing coil : 30 V DC
- i) Busbar chamber with Copper busbars, heat shrinkable PVC sleeved/ powder coated with colour code. The busbars shall be of high conductive electrolyte copper.
- j) 230VAC space heaters with ON-OFF switch and thermostat.
- k) 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.
- l) 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.
- m)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.

- n) 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.
- o) Breaker ON-OFF LED indicating lamp.
- p) Circuit trip/healthy indicating LED lamp with pushbutton.
- q) Breaker spring charged LED lamp indication.
- r) TNC (Trip Neutral Close) switch.
- s) Numerical relays consist of IDMTL + Inst 3 O/C + Inst E/F relay+REF.
VAX – 31 Trip circuit supervision.
VAJH – 23 master trip. All relays shall be SCADA enabled with event/data logging features.
- t) Operating handle, spring charging handle and other required accessories shall be supplied.
- u) Cable box suitable for receiving single length of 3C x 400 Sq. mm HT XLPE cable.
- v) Hand held lamps for panel internal illumination shall be provided with 240V AC source.
- w) Hooter for tripping.
- x) 30V DC external supply shall be provided for control circuit of complete breaker operation.
- y) Type of charging: Manual as well as motorized mechanism with 230V AC operated motor.
- 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 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:-

I/C-1	O/G- TR-1	RMQC-1	RMQC-2	Intake Incomer	TMIL	Bus-coupler	RMQC-3	SPARE	Sub- Berth11 station	O/G- TR-2	I/C-2
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I/C-Incomer; O/G-Outgoing

6.0 LT Panel (PCC-1 & 2)

7.3.1 Scope

This specification covers manufacture, assembly factory test, supply, delivery, field test and installation of L.T. distribution board of voltage not exceeding 1000 V AC complete in all respect with all equipment fittings and accessories for efficient and trouble free operation as required herein under.

7.3.2 Codes & Standards

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

Equipment shall conform to the latest applicable Standards as mentioned. In case of conflict between the Standards and this specification, this specification shall govern.

IS: 13947 (Part 2&5), 1993 -Low voltage switchgear & control gears

IS: 2147, 1966-Degree of protection

IS: 13947 (Part 4, Sec.I), 1993

BS: 60947-4-1, 1992: IEC: 158-Contactor for voltage not exceeding 1000V AC.

IS: 375, 1993-Marking and arrangement of bus bars

IS: 694, 1990 & IS: 8130, 1984-PVC Insulated cables and aluminium conductor

IS: 1248, 1991-Direct acting electrical indicating instruments

IS: 13703, 1991 -Low voltage fuses

IS: 13118 (All parts), 1991 -Alternating current circuit breakers

IS: 2705 (Part 1 to 4), 1992-Current transformers

IS: 3156 (Part 1 to 3), 1992-Voltage transformers

7.3.3 Power Supply System

The incomer power supply shall be 415V, 3 phase, 4 wire, 50 Hz, effectively earthed AC system. The fault level for the switchgear shall be as per single line diagram.

Variation of voltage and frequency from their rated values shall be as per IE rules.

Supply, Installation, Testing and Commissioning of 11kV/3.3kV/415V Panel along with allied works for augmentation of GC Berth Sub-station including construction of Sub-station building at GC Berth area of Haldia Dock Complex, SMP, Kolkata.

7.3.4

Ambient Conditions

The following site conditions shall be considered for the design: -

Reference temperature: 50°C

7.3.5

Sheet Metal Work

The switchgear frame shall be fabricated using suitable mild steel structural sections or pressed and shaped cold rolled sheet steel of thickness not less than **2.5 mm**.

Frames shall be enclosed by sheet steel of thickness not less than **2.5 mm** cold rolled, smoothly finished, levelled, and free from flaws. Doors and covers shall be made of sheet steel of thickness not less than **2.0 mm** cold rolled. Stiffeners shall be provided wherever necessary.

All panel edges and door edges shall be reinforced against distortion by rolling, bending or by the addition of welded reinforcement members.

Cut-outs shall be true in shape and avoid of sharp edges.

The complete structure shall be rigid, self-supporting, free from vibration, twists and bends.

7.3.6

Painting

All sheet steel work shall be phosphated in accordance with the following procedure and in accordance with applicable standards.

Oil, grease and dust shall be thoroughly removed by emulsion cleaning.

Rust and scale shall be removed by pickling with dilute acid followed by washing with running water, rinsing with slightly alkaline hot water and drying.

After phosphating, thorough rinsing shall be carried out with clean water, followed by final rinsing with dilute dichromate solution and oven drying.

A smooth coat of powder coating to be provided of approved colour.

Finished painted appearance of equipment shall present an aesthetically pleasing appearance like light grey, free from dents and uneven surfaces.

7.3.7

Constructional Features

Switchgear panel shall be:

- a) of the metal enclosed, indoor, floor mounted modular type
- b) made up of the requisite vertical sections
- c) of dust and vermin proof construction
- d) provided with a degree of protection of IP-52
- e) easily extendable on both sides by the addition of vertical sections after removing the ends covers.

- f) provided with a metal sill frame made of structural steel channel section properly drilled for mounting the Switchgear along with necessary mounting hardware. Hardware shall be zinc plated and passivated.
- g) provided with labels on the front indicating the switchgear designation.
- h) of uniform height of not more than 2450 mm
- i) of single front execution
- j) provided with neoprene gaskets all round the perimeter of adjacent panels, panel and base frame, removable covers and doors.
- k) provided with aluminium bus bars running at the top or bottom, as required, all along the length of the switchgear in a separate sheet steel enclosure.
- l) Feeder pillars/kiosk should be fabricated from 2.5 mm thick CRCA steel and conform to IP: 54 degree of protection.

Operating devices shall be incorporated only in the front of the Switchgear.

The switchgear shall be provided in distinct vertical sections each comprising:

- a) A completely metal enclosed bus bar compartment running horizontally.
- b) Individual feeder modules arranged in multi-tier formation. It is essential that the modules are integral multiples of the basic unit size to provide for flexibility in changes, if any, at site.
- c) Enclosed vertical bus bars serving all modules in the vertical section. For safety isolation of the vertical bus bars, insulating barrier with cut-outs shall be provided to allow the power stab contacts to engage with vertical bus bars
- d) A vertical cable alley covering the entire height. The cable alley shall be minimum 200 mm wide for motor control modules and 500 mm wide for circuit breaker controlled modules.
- e) A horizontal separate enclosure for all auxiliary power and control buses, as required, shall be located so as to enable easy identification, maintenance and segregation from the main power buses. Tap-off connections from these buses shall be arranged separately for each vertical section.
- f) Each outgoing feeder compartment having 3-pole MCCB shall have neutral link of suitable rating at the MCCB compartment.

Each vertical section shall be equipped with space heaters with thermostat, CFL lamp and power socket.

One metal sheet shall be provided between two adjacent vertical sections running to the full height of the switchgear except for the horizontal bus bar compartment. However, each shipping section shall have metal sheets at both ends.

All equipment associated with a single circuit shall be housed in a separate module compartment of the vertical section. The compartment shall be sheet steel enclosed on all sides and the rear, with the withdrawable units in position or removed, except on the cable alley side. A plate cover with a slot to permit wiring connections shall be provided on the side corresponding to the cable alley. The front of the compartment shall be provided with a hinged door.

For draw out type, ACB modules, only the handles of control and selector switches, push buttons, knobs and cut-outs for lamps and meters shall be arranged on the front doors of the respective compartments to permit operation without opening the door. On circuit breaker controlled circuits, protective relays shall be mounted on the front door of the compartment. All other equipment pertaining to a circuit shall be mounted on the withdrawable chassis. All cut-outs shall be provided with gaskets for the purpose of dust-proofing. Control circuit must have separate compartment and separated from power circuit.

Current transformers shall be mounted with suitable base and shall not be directly mounted on the buses. Current transformers on circuit breaker controlled circuits shall be mounted on the fixed portion of the compartment. **The Control cable shall be 2.5 Sq.mm.**

In breaker compartments, suitable barriers shall be placed between circuit breakers and all control, protective and indication circuit equipment including instrument transformers. External cable connections shall be carried out in separate cable compartments for power and control cables.

The withdrawal chassis shall move on suitable guides and plated steel or stainless steel rollers or balls to facilitate easy withdrawal.

Cable alleys shall be provided with suitable hinged doors. Adequate number of slotted cable support arms shall be provided for dressing the cables.

All doors shall be provided with concealed type hinges and captive screws with padlocking arrangement, suitably earthed with 2.5 sq.mm copper conductor flexible cable.

The withdrawal chassis housing circuit breakers shall be of the fully drawout type.

The withdrawal chassis housing feeder control and motor control equipment not incorporating circuit breakers shall be of the fully fixed or *drawout* type.

7.3.8

Interchangeability

All identical equipment and corresponding parts including chassis of draw out modules of the same size shall be fully interchangeable, without having to carry out modifications. For trouble free interchange ability, the draw out arrangements shall be designed such that normal dimensional variations are taken care of by self-aligning feature of the modules.

Components and equipment that are not fully interchangeable are liable for rejection. BIDDER shall replace all such equipment by fully interchangeable equipment at his cost.

The draw-out contacts shall be only between copper/copper alloy faces, which are silver or tinplated. The contact design shall be such that there should be no arcing/deformation under associated peak short circuit currents.

Switchgear shall be designed in such a way that all component equipment and bus-bars operate satisfactorily without exceeding their respective maximum permissible rise in temperature under ambient temperature conditions prevailing within the switchgear cubicle, with reference ambient temperature outside the switchgear cubicles.

All dummy cubicles necessary to meet the requirements of this specification shall be included in the Bidder's scope.

No equipment/devices associated with a particular circuit shall be mounted in any other circuit module.

7.3.9 **Main Buses & Tape**

Switchgear shall be provided with three phase bus bars and neutral.

Bus bars shall be of uniform cross section throughout the length of the switchgear

The bus bars shall be made of high conductivity electrolytic aluminium, suitable to withstand a fault current as specified in BoQ and SLD.

Bus bars shall be provided with at least the minimum clearances in air as per applicable standards for a 500V, 3 phase, 4 wire system.

All bus-bars, bus-taps shall be insulated with close fitting sleeve of hard, smooth, dust and dirt free plastic insulation of high dielectric strength (450 V/mil) to provide a permanent high dielectric non-ageing and non-tracking protection; impervious to water, tropical conditions and fungi. The insulation shall be non-inflammable and self-extinguishing and in fast colours to indicate phases. The joints shall be insulated in such a way as to provide for accessibility of contact bolts for maintenance. The dielectric strength and properties shall hold good for the temperature range of 0°C to 90°C.

Bus bar shall be adequately supported and braced to withstand the stresses due to the specified short circuit currents for the associated switchgear. Bus bar supports shall be made of glass reinforced moulded plastic material (DMC).

Separate supports shall be provided for each phase of the bus bars. If a common support is provided for all three phases, anti-tracking barriers shall be incorporated.

Bus bar joints shall be complete with high tensile steel bolts, washers and nuts. Bus bars shall be thoroughly cleaned at the joint locations and suitable contact grease shall be applied just before making a joint.

Auxiliary Buses

Auxiliary buses for control power supply, space heater power supply or any other specified service shall be provided. These buses shall be insulated, adequately supported and sized to suit specific requirements. The material of control power supply buses shall be electrolytic copper. The material for space heater power supply buses shall be same as that for the main power buses. Supply transformer(s), auxiliary bus bars and necessary connections to the supply transformers and associated circuits shall be in the Bidder's scope.

7.3.10

Air Circuit Breakers (ACBs)

The ACBs shall comply to IEC 60947 Part I & II and IS 13947 II and shall be suitable for operation on 415 Volts, 50 Hz 3 Phase system.

The breaker shall comply with Isolation function requirements of IEC 60947, Part-II, section 7.1.2 and shall be clearly marked as "Suitable for Isolation/ Disconnection" to ensure safety of operating personnel. The ACB shall have rated operational voltage = 440 V, rated insulation voltage = 1000 V and rated impulse withstand voltage = 12/8 KV and utilization category 'B'.

7.3.11

Circuit Breakers

Circuit breaker shall be:

- of the air break type
- of the shunt trip type
- provided with mechanically operated targets to show 'Open', 'Closed', 'Service' and 'Test' positions of the circuit breaker.
- provided with mechanically operated, red 'trip' push button, shrouded to prevent accidental operation.
- provided with locking facilities in the 'Service', 'Test', and 'Isolated', positions. In test position the breaker shall be tested without energising the power circuits. The breaker shall remain fully housed inside the compartment in the test position.
- provided with minimum 6 NO and 6 NC potential free auxiliary contacts, rated 10A at **240V A.C.**
- The cubicle compartment of the ACB in the LT panel shall be provided with 'red', 'green' and 'amber' indicating lamps to show 'closed', 'open' and 'Auto-trip' conditions of the circuit breaker when breaker operation is controlled by a control switch.
- The ACB panel shall be provided with mechanical indicator (ready to close) on the front facia to facilitate safety of the operator before closing the ACB.
- Circuit breakers shall be provided with the following interlocks.

- It shall not be possible to plug-in a closed circuit breaker, or to draw out a circuit breaker in the closed position.
- It shall not be possible to operate a circuit breaker unless it is in the fully plugged-in, test, or fully isolated position.
- Circuit breaker closing and trip coils shall be rated for satisfactory operation on a control supply 30V DC

Operating Mechanism

- The spring charging motor shall be rated at 240V AC.
- The closing action of the circuit breaker shall charge the tripping spring ready for tripping.
- Speed of closing of contacts shall be independent of the speed with which the handle is operated.
- All stored energy mechanisms shall be provided with mechanical indicators to show the 'charged' and 'discharged' conditions of the spring.
- Circuit breakers provided with stored energy operating mechanisms shall be provided with the following interlocks.
- The circuit breaker shall not close unless the spring is fully charged.
- Shocks, vibrations, or failure of springs shall not operate the breaker or prevent intended tripping.
- Mechanical contact wear indicator shall be mounted directly on the moving contacts to indicate the degree of erosion of the contacts.

Protection coordination

The Microprocessor based release shall be an integral part of ACB provided on circuit breaker for short circuit, over load, instantaneous and earth fault protection with adjustable current & time settings along with LCD display for displaying of instantaneous value of 3 phases, neutral currents.

The release shall incorporate microprocessor to offer accurate, faster and versatile protection with complete flexibility and shall offer complete over current protection to the electrical system in the following zones.

- i) Overload or long time protection with adjustable time delay
- ii) Short circuit or short time protection with adjustable time delay.
- iii) Instantaneous protection with no intentional delay.
- iv) Ground fault protection with time delay.
- v) Release shall have facility of online changing of current and overload setting.

The microprocessor based trip units shall be provided with following features also:-

1. Designed to withstand tough industrial environments i.e. high ambient

temperatures, switching surges, electromagnetic interferences.

2. Reliably self-powered by built in current transformers.
3. LED display indication of each of over load, short circuit and earth fault.
4. Testing of release shall be possible without tripping the breaker through integrated test button which shall check the healthiness of trip unit electronics and associated CT circuits without tripping the breakers.
5. LED alarm display for microprocessor fault.

All ACB's must be rated ambient temp 50°C.

7.3.12

Moulded Case Circuit Breaker

The Moulded case circuit breaker (MCCB) shall conform to latest IEC-60 947-2/ IS13947- 2. The circuit breaker shall comply with the isolation function requirement of IEC 60 947-2 section 7.1.2 to marked as suitable for isolation/ disconnection to facilitate safety of operating personnel while the breaker is in use.

Moulded case circuit breakers shall be fixed type, microprocessor release having adjustable O/L & S/C settings with trip-free, manually closing mechanism, accommodated in a Moulded housing of robust and vermin-proof construction matching with switchboards. All MCCBs shall be designed and tested to IS - 13947 Part II to breakers shall be provided with an inverse time delay electronic over current trip device. The trip device shall be direct acting.

The MCCB shall have rated operating voltage = 690V with min. Insulation voltage = 750V and rated impulse withstand voltage = 8kV.

MCCB shall be provided with Class II insulation between front cover & internal power circuits to avoid any accidental contact with live current carrying path with the front cover open.

The tripping devices shall be ambient temperature compensated type. The insulating case and cover shall be made of high strength heat resistant and flame retardant thermosetting insulating material.

They shall have line load reversibility. 3-phase breakers shall be designed to break all the poles simultaneously and they shall have a single mechanism.

They shall have auxiliaries and accessories whenever required for signalling, interlocking, shunt trips, under voltage release, castle lock, etc.

All the circuit breakers used shall have guaranteed breaking capacities sufficient for the maximum short circuit duties that could possibly be imposed on the different breakers. The MCCBs fixed in main switchboard shall have breaking capacity as indicated in BoQ & SLD.

MCCB shall have $I_{cs}=I_{cu}$ for the entire range as per BoQ and rated at ambient 50°C.

MCCB's shall be used with rotary handle and terminal spreaders, phase barrier and all terminals shall be shrouded to avoid direct contact.

7.3.13 **Miniature Circuit Breakers (MCB)**

MCBs shall be hand operated, air break, quick make, quick break type conforming to applicable standards.

MCB shall be provided with overload/short-circuit protective device for protection under overload and short-circuit conditions. The minimum breaking capacity of MCBs shall be 10 kA r.m.s. at 415V AC. It shall comply to Class III energy limiting class. MCB shall comply with IS – 8828 – 1996/IEC 898. MCB shall have minimum power loss (watts) per pole defined as per IS/IEC and the manufacturer shall publish the values.

The MCB housing shall be heat resistant and heavy a high impact strength. The terminal shall be protected against finger contact to IP 20 degree of protection.

7.3.14 **Measuring Instruments, Metering & Protection** **General**

Direct reading electrical instruments shall be in conformity with IS-1248. The accuracy of all measuring instruments shall be as specified in the BoQ. The errors due to variations in temperature shall be limited to a minimum. The meter shall be suitable for continuous operation between -10 degree Centigrade to + 50 degree Centigrade. All meters shall be of flush mounting type of 96mm square pattern. The meter shall be enclosed in a dust tight housing. The housing shall be of steel or phenolic mould. The design and manufacture of the meters shall ensure the prevention of fogging of instruments glass. Instruments meters shall be sealed in such a way that access to the measuring element and to the accessories within the case shall not be possible without removal of the seal.

The specifications herein after laid down shall also cover all the meters, instrument and protective devices required for the electrical work. The ratings type and quantity of meters, instruments and protective devices shall be as per BoQ.

Analog type Ammeters and Voltmeters

Electrical indicating instruments shall be of minimum 96 mm square size, suitable for flush mounting.

Indicating instruments shall have position for zero adjustment outside the cover.

Instrument dials shall be parallex free with black numerals on a white dial.

Ammeters shall be capable of carrying sustained overloads during fault conditions without damage or loss of accuracy.

Ammeters provided on motor circuits shall be provided with a suppressed extended scale to indicate motor starting current.

Voltmeters shall be provided with fuse of suitable capacity.

Multi-Function Meter

It shall be suitable for measuring, saving and supervision of electrical parameters in low and medium voltage mains.

The Meter shall have following Features.

- Clear LCD Display
- Visualization of all the three phase grid parameters along with Min/Max/Measured/average.
- The meter shall have communication port of RS 485 and shall be compatible with SCADA System.
- It shall come along with the software for data acquisition.
- It shall be compatible with PLC.
- The accuracy class shall not be more than 0.5%

Current Transformers

Current transformers shall be in conformity with IS: 2705 (part I, II & III) in all respects. All current transformers used for medium voltage applications shall be rated for 1kv. Current transformers shall have rated primary current, rated burden and class of accuracy as required. However, the rated secondary current shall be 5A unless otherwise specified.

Current transformers shall be capable of withstanding without damage, magnetic and thermal stresses due to short circuit fault of the system. Terminals of the current transformers shall be marked permanently for easy identification of poles. Separate CT shall be provided for measuring instruments and protection relays. Each C.T. shall be provided with rating plate.

Current transformers shall be mounted such that they are easily accessible for inspection, maintenance and replacement. The wiring for CT's shall be done with minimum 2.5 sq. mm copper conductor, ZHFR wires with proper termination lugs and wiring shall be bunched with cable straps and fixed to the panel structure in a neat manner.

7.3.15

Miscellaneous

Control switches shall be of the heavy duty rotary type with escutcheon plates clearly marked to show the operating position. They shall be semi-flush mounting with only the front plate and operating handle projecting.

Indicating lamps shall be of the LED type.

Push buttons shall be of the momentary contact, push to actuate type fitted with self reset contacts & provided with integral escutcheon plates marked with its functions.

7.3.16

Cable Terminations

Cable entries and terminals shall be provided in the Distribution Boards to suit the number, type and size of aluminium conductor power cables and copper conductor control cable specified.

Provision shall be made for top or bottom entry/exit of cables as required. Generous size of cabling chambers shall be provided, with the position of cable gland and terminals such that cables can be easily and safely terminated.

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Barriers or shrouds shall be provided to permit safe working at the terminals of one circuit without accidentally touching that of another live circuit.

Cable risers shall be adequately supported to withstand the effects of rated short circuit currents without damage and without causing secondary faults.

7.3.17

Push Buttons

Push buttons shall be:

- of the momentary contact, push to actuate type rated to carry 10A at 240V AC and 1A (inductive breaking) at 220V DC.
- fitted with self-reset, 2 NO and 2 NC contacts.
- provided with integral escutcheon plates marked with its function.

'Start', 'Open', 'Close' push buttons shall be green in colour.

'Stop' push buttons shall be red in colour.

All other push buttons shall be black in colour.

Emergency stop' push buttons shall be of the lockable in the pushed position type and shall be shrouded to prevent accidental operation. Key shall not be required for the operation of the push button.

7.3.18

Internal wiring

Wiring inside the switchgear/panel shall be carried out with 1.1 kV grade, zero halogen FR stranded conductor wires. Minimum size of conductor for power circuits is 4 sq mm copper. Control circuits shall be wired with copper conductor of at least **2.5 sq. mm for CT circuits /other control circuits.**

Engraved identification ferrules, marked to correspond with the wiring diagrams shall be fitted to each wire. Ferrules shall be of yellow colour with black lettering.

Wires forming part of a tripping circuit of circuit breaker shall be provided with an additional red ferrule marked 'T'.

Spare auxiliary contacts of all equipment forming part of the switchgear shall be wired up to the terminal blocks.

Spare and unassigned modules shall be complete with internal wiring.

Wiring shall be terminated on screw less terminal blocks upto 4 sq. mm size.

Not more than two connections shall be made on any one terminal.

7.3.19

Terminal Blocks

Terminals for circuits with voltage exceeding 125 V shall be shrouded. Terminal blocks shall be grouped depending on circuit voltage. Different voltage groups of terminal blocks shall be segregated.

Terminal blocks shall be adequately rated to carry the current of the associated circuit.

Minimum rating of the terminal block is 10A.

Terminals shall be numbered for identification.

Terminal blocks shall be arranged with at least 100 mm clearance between two sets of terminal blocks.

Screw less, cage clamp type terminal blocks shall be used for cable sizes upto 6 sq. mm. **Bus Bar** type terminal blocks shall be used for cables above 6 sq. mm.

Terminals for CT secondary leads shall be disconnecting link type and shall have provision for shorting.

7.3.20

Earthing

Each Panel shall be provided with an earth bus bar running along the entire length of the board. Material and size of the earth bus bar shall be as per IS. At either end of the earth bus, one (1) clamp type terminal with nuts, bolts and washers shall be provided for bolting the earthing conductor of size and material indicated in data sheets. In case the earth bus is provided near top of the switchgear, one down comer at either end shall be provided for connection to the earthing conductor.

Earth bus bars shall be supported at suitable intervals.

Positive connection between all the frames of equipment mounted in the switchboard and earth bus bar shall be provided by using insulated copper wires/bare bus bars of cross section equal to that of the bus bar, or equal to half the size of circuit load current carrying conductor, whichever is smaller.

All instrument and relay cases shall be connected to the earth bus bar using 650 V grade, 2.5 sq. mm stranded, copper ZHFR, earthing conductor.

7.3.21

Labels

Labels shall be anodised aluminium with white engraving on black background shall be provided for each incoming and outgoing feeder of Distribution Boards. Labels shall be properly secured with fasteners.

DATA SHEET FOR LT PANELS / DISTRIBUTION BOARD

A) SWITCHGEAR PARTICULARS

- | | | | |
|----|------------------|---|-------------|
| 1. | DESIGNATION | : | |
| 2. | BUS BAR MATERIAL | : | ALUMINIUM |
| 3. | FP/TPN | : | 4 POLE/TPN |
| 4. | TYPE | : | INDOOR |
| 5. | CABLE ENTRY | : | FROM BOTTOM |

B) SWITCHGEAR AND BUS BAR RATING

- | | | | |
|----|------------------------------------|---|---|
| 1. | SUPPLY SYSTEM | : | 415V, 3-phase, 4W, 50HZ EFFECTIVELY EARTHED |
| 2. | MAX SYSTEM VOLTAGE | : | 433 ± 10% |
| 3. | BUS BAR RATING | : | 1600A |
| 4. | ONE MINUTE POWER FREQUENCY VOLTAGE | : | |

Supply, Installation, Testing and Commissioning of 11kV/3.3kV/415V Panel along with allied works for augmentation of GC Berth Sub-station including construction of Sub-station building at GC Berth area of Haldia Dock Complex, SMP, Kolkata.

- A) POWER CIRCUITS : 2500 V
- B) CONTROL CIRCUITS: 1500 V
- C) AUX. CIRCUITS : 2000 V
CONNECTED TO
SECONDARY OF CTS
- 5. REFERENCE AMBIENT TEMPERATURE : 50°C
- 6. MAX. TEMPERATURE OF BUS BARS AND DROPPERS : 85°C
- 7. SHORT CIRCUIT WITHSTAND
 - A) SHORT TIME (1 SEC) : 50 kA (RMS)
- 8. FEEDERS DETAIL
 - A) INCOMER AND BUSCOUPLER: 1600A- 03Nos. 4 Pole ACB's.
 - B) OUTGOING: 630A-08Nos. 3Pole ACB's.
 - C) OUTGOING: 400A-06Nos. 3Pole MCCB's

C) SWITCHGEAR CONSTRUCTION REQUIREMENTS

- 1. THICKNESS OF SHEET STEEL (COLD ROLLED)
 - A) FRAME : 2.5 MM
 - B) DOORS : 2.0 MM
 - C) COVERS : 2.0 MM
 - D) GLAND PLATE : 3.0 MM
- 2. DEGREE OF PROTECTION : **IP-52/54** OF IS-2147, 1966
- 3. COLOUR FINISH AS PER IS-5)
 - A) INTERIOR : GLOSSY WHITE
 - B) EXTERIOR : LIGHT GREY, SEMI-GLOSSY, POWDER COATING.
- 4. EARTHING BUS
 - A) MATERIAL : Aluminium
 - B) SIZE : 50 X 6 MM with stainless steel bolts & Nuts.
- 5. CLEARANCES IN AIR OF LIVE PARTS
 - A) PHASE TO PHASE : As per relevant IS
 - B) PHASE TO EARTH : As per relevant IS

5 LT BUSDUCT

A) Electrical Design

- i) Electric power supply
 - 415 V, 3 phase 50 Hz system neutral solidly grounded

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- System short circuit level as specified.
- ii) Insulation level
 - Rated insulation voltage : 1100 V
 - One minute power frequency voltage : 2.5kV
 - * Clearance in air (minimum) -
 - Phase to phase (mm) : 25.4 mm
 - Phase to earth (mm) : 19.0 mm
- iii) Short circuit strength
 - * Rated short time withstand current not less than the system short circuit level duration 1 sec for 415 V.
 - * Rated peak withstand current not less than 2.1 times the system short circuit level.
- iv) Rated current
 - * Rated continuous current as specified while in enclosure and at specified ambient temperature with maximum temperature of bus bars limited to 90 deg. C
 - * Neutral bus where specified with rating not less than half the rating of phase bus.

B) General Arrangement

- LT busduct: Rectangular, Non segregated phase, totally enclosed type.
- Comprising of following sections, as applicable, to make the installation complete and to match with the terminal equipment :
 - ⇒ Switchgear lead-in section with flexible hood.
 - ⇒ Straight section in standard length
 - ⇒ Matching section (length as required)
 - ⇒ Transformer lead-in section
 - ⇒ Corner sections (horizontal and vertical)
 - ⇒ Phase cross-over section
- 240V AC space heater to be provided at suitable intervals and wired to external terminal box with heat resistant cables.
- Silica gel breathers at appropriate locations.
- Horizontal bends to be avoided by positioning the switchboard incomers at appropriate place.

C) Construction Details

- Degree of protection for enclosure IP 52 or better for indoor installation, and IP55 for outdoor part.
- Enclosure material: Aluminium/ steel sheet, as specified of minimum thickness 2.0 mm.
- Enclosure construction rectangular welded construction.
- Maximum temperature of enclosure under rated operating conditions limited to 75 deg. C
- Bolted covers with gaskets for easy inspection and access to insulators and bus bar joints.
- Gasketed (Neoprene) connections between adjacent sections of metallic enclosure.
- Rubber bellows at each end to take care of vibrations.
- Provision for mounting on brackets.

- Supply of painted MS supporting structures with necessary hardware shall be included in the scope of supply.
- Surface treatment.
- Two coats of epoxy paint for outdoor and synthetic enamel paint for indoor application, preceded by de-rusting, cleaning chemically, degreasing, pickling in acid, cold rinsing, phosphating, passivating and spraying with two coats of zinc oxide primer.
- Shade of paint :
 ⇒ Interior : Black
 ⇒ Exterior : Light grey shade 631 of IS-5 (unless otherwise specified)

D) Busbars and connections

- Material EC grade aluminium alloy equivalent to E91E WP conforming to IS 5082, 1981; or high conductivity electrolytic grade copper as per IS-613, 1984.
- Final operating temperature of both bus bars and joints under continuous operation in enclosure limited to 90 deg. C by thermometer method.
- Bus bar arrangement as per IS-375, 1963.
- Phase identification by colour at ends and at regular intervals.
- Busbar joints of bolted type, with zinc bichromated high tensile steel bolts, nuts and spring washers.
- Busbar surfaces to be tinned at joints and coated with oxide inhibiting grease prior to jointing.
- Flexible connections for termination on equipment.
- Expansion joints on straight runs with joints staggered in adjacent phases.
- Bimetallic joints for jointing between dissimilar metals.
- Busbar support insulators of non-hygroscopic material, having high impact and di-electric strength, with an anti-tracking contour.

E) Protective earthing

- Aluminium earth bus of size 50 x 10 mm running throughout the length of the busduct, positively connected to the body of the busduct.
- Provision at each end of busduct for terminating external earth conductor.

F) Technical particulars for Design

1.	Application	Indoor
2.	Rated system voltage and frequency	415 V
3.	System earthing	Solidly earthed
4.	Rated continuous current as specified ambient conditions (in enclosure)	1600A
5.	Rated short time withstand current (kA.rms) and its duration	50 kA for 1Sec
6.	Rated peak withstand current (peak)	105 kA
7.	Temp rise over ambient of 50 deg. C - Busbars - Enclosure	40 deg. C 25 deg. C
8.	Busbar material	Aluminium
9.	Neutral bus	To be provided
10.	Earth bus material	Aluminium
11.	Earth bus size	50 x 10

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12.	Supporting insulators	SMC/ FRP
13.	Busduct enclosure material	Aluminium
14.	Busduct enclosure material thickness	2.5 mm
14.	Busduct support structure	To be provided

7.0 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 :

ii) 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:-

- Should be suitable for Indoor installation and to be supplied with all accessories.
- 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.
- Should have provision for automatic switching to ensure different applications of both 33 kV & 3.3 kV Panels to be installed at the existing GC Berth Substation & newly constructed 3.3 kV Switch-Station. Suitable control arrangement is to be provided to ensure that output DC voltage is always within the limits specified, even if the cell voltage is high.
- 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.

iii) **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.

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

- c) **Type:** Solidstate , both Auto & Manual Control.
- d) **Input Voltage:** 230 V – 250V A.C., Single Phase.
- e) **Input Frequency:** 50 Hz \pm 5%.

iv) **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.

v) **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.

vi) **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.

vii) **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.

viii) **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

ix) **Enclosure** :

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

- x) **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.

8.0 **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.

FRP Cable tray

Pre-fabricated perforated type trays made of FRP shall be used for laying cables. The trays shall have vertical edge of height not less than 50 mm on both sides. The control/power cable shall be clamped by means of suitable PVC straps both for horizontal to vertical direction and vice-versa and further these straps shall be clamped with Aluminium clamp with stainless steel bolts for every one meter.

Insert plates of suitable sizes shall be fixed in trench / wall for fixing of cable trays, at an interval of 1000 mm apart in horizontal run and 500 mm apart in vertical run and also at each bend /turning.

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

9.0 **EXTERNAL AND INTERNAL ELECTRICAL WORKS**

EXTERNAL ELECTRICAL WORKS

Light Fitting and Accessories

a. Scope

This specification covers the design, material specification, manufacture, testing, inspection and delivery to site and installation & commissioning of lighting fittings and their associated accessories.

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b. **Standards**

The light fittings and their associated accessories such as lamps/tubes, reflectors, housings, ballasts, etc. shall comply with the latest applicable standards as specified. Where no standards are available, the supply items shall be backed by test results shall be of good quality and workmanship & any supply items, which are bought out by the Bidder, shall be procured from approved Bidders acceptable to the Employer.

c. **Light Fittings - General Requirements**

Luminaire housing should be completely made of Pressure / High Pressure Die Cast Aluminium (corrosion resistant). Single / multi pc in construction.

Aerodynamic shape with adequate strength to withstand max wind speed.

Precision optical system for tubular lamp, Optical compartment duly brightened and anodized aluminium & Lamp position adjustable from back without use of tools. The optics should be suitable for adjustment of toe-in/throw and spread to suit different road widths and spacing.

LED Flood light Luminaire (120 W) shall be used for outdoor illumination.

Luminaires should be duly chromatised and coated with pure polyester to minimum 45 micron thickness to a shade RAL7035. Alternatively in specific cases Poly Urethane Coating of other decorative shades as recommended.

Toughened heat resistant glass sealed with gasket and SS toggles.

Choice of self-stopping ignites.

Luminaire conforming to IEC60598.

d. **Earthing**

Each lighting fitting shall be provided with an earthing terminal suitable for connection to the earthing conductor.

All metal or metal enclosed parts of the housing shall be bounded and connected to the earthing terminal so as to ensure satisfactory earthing continuity throughout the fixture.

e. **Painting/Finish**

All surfaces of the fittings shall be thoroughly cleaned and degreased. The fittings shall be free from scale, rust, sharp edges and burrs.

When enamel finish is specified, it shall have a minimum thickness of 2 mils for outside surface and 1.5 mils for inside surface. The finish shall be non-porous and free from blemishes, blisters and fading.

The housing shall be stove-enamelled/epoxy stove-enamelled-vitreous enamelled or anodised as indicated on flameproof fittings is prohibited.

The surface shall be scratch resistant and shall show no sign of cracking or flaking when bent through 90° over ½" dia mandrel.

The finish of the fittings shall be such that no bright spots are produced either by direct light source or by reflection.

f. **Reflectors**

The reflectors shall be made of CRCA sheet steel/aluminium/silvered glass/chromium plated sheet copper as indicated for above mentioned fittings, unless otherwise specified.

The thickness of steel/aluminium shall comply with relevant standards specified. Reflectors made of steel shall have stove enamelled/vitreous enamelled/epoxy coating finish. Aluminium used for reflectors shall be anodized/epoxy stove enamelled/mirror polished. The finish for the reflector shall be as indicated for above mentioned fittings.

Aluminium paint on the reflectors of flame-proof lighting fittings is prohibited. Reflectors shall be free from scratches or blisters and shall have a smooth and glossy surface having an optimum light reflection coefficient such as to ensure the overall light output specified by the Bidder.

g. **Lamps**

The lamps shall be capable of withstanding small vibrations and the connections at lead in wires and filaments/electrodes shall not break under such circumstances.

Lamps/LED tubes shall conform to relevant standards and shall be suitable for supply voltage and frequency specified.

INTERNAL ELECTRICAL WORKS

a. **Wiring**

Wiring is to be done in the looping system of wiring without any jointing. Phase wires shall be looped in switch control points and neutral shall be **looped at out-let points**. For **Open** conduit system hot dip **GI** Conduit, Aluminum saddles shall be used.

b. **Point Wiring**

Point wiring shall include all works necessary to complete wiring of a switch circuit of any length from the tapping point on the distribution circuit to the following via the switch.

- a) Ceiling rose and connector (in the case of ceiling/exhaust fan points).
- b) Back plate (in case of fluorescent fitting with down rods, etc.).
- c) Socket outlet (in the case of socket outlet points).
- d) Lamp holder (in case of wall brackets, bulk head and similar fittings).

The following shall be needed to be included in the point wiring.

- a) Switch
- b) Ceiling rose/connector as required.
- c) Any special or suitable round block for neatly housing the ceiling Rose/connector and covering the fan hook in case of fan point.
- d) Wooden box, bushed conduit, porcelain tubing where cable passes through wall etc.
- e) Hot dip GI Conduit covering upto 1.5 m from floor.
- f) Earth wire from three pin socket outlet point/fan regulator to common earth including earth bus except the earth wire from the first tapping point of live wire to the distribution board.
- g) All wood or metal blocks, boards and boxes, sunk on surface type, including those required for mounting fan regulator but excluding those under the main and distribution switchgear.
- h) All fixing accessories such as clips, rails, screws, phil plugs, wooden plugs, etc. as required.

- i) Looping the same switch board and inter connections between points on the same circuit.
 - j) Providing fish wire in conduit while recessed conduit work is undertaken.
- c. **Circuit Wiring**
Circuit wiring shall mean wiring from the distribution board upto the 1st nearest tapping point of that circuit.
- d. **Submain Wiring**
Submains wiring shall mean wiring from the main/distribution switchgear to another main/distribution switch gear.
- e. **Load on Circuit**
Lights, 5 A sockets and exhaust fans/axial flow fan may be wired on a common circuit. Such circuit shall have 10 points of light, exhaust fan and socket outlets or a load of 800 watt, whichever is less. It shall, however, be ensured that in one switch board, wiring of one circuit is only provided.
- f. **Size of Conductor**
All the wires shall be stranded annealed copper conductor PVC insulated. The smallest copper conductor to be used for lighting circuits shall be 1.5 mm² and for main lighting circuits 2.5 mm², for 15 A sockets circuits 4 sqmm copper conductor shall be used. Wiring shall be done in the 'looping system'. Phase or live conductors shall be looped at the switch box and neutral conductor can be looped from the light, exhaust fan or socket outlet, neutral conductor and earth continuity wire shall be brought to each switch board situated in rooms and halls. These shall be terminated inside the switch boards with suitable connectors and the switch board shall be adequate size to accommodate one number 5 amps socket outlet and control switch in future.
- g. **Conduit capacity**
Maximum number of PVC insulated cable conforming to IS: 694-1977 that can be drawn in one conduit shall be follows:

Nominal cross-sectional area of conductor in sq.mm	Size of Conduit											
	20 mm		25 mm		32 mm		38 mm		51 mm		64 mm	
	S	B	S	B	S	B	S	B	S	B	S	B
1.50	5	4	10	8	18	12	-	-	-	-	-	-
2.50	5	3	8	6	12	10	-	-	-	-	-	-
4	3	2	6	3	10	8	-	-	-	-	-	-
6	2	-	5	4	8	7	-	-	-	-	-	-
10	2	-	4	3	6	5	8	6	-	-	-	-
16	-	-	2	2	3	3	6	5	10	7	12	8
25	-	-	-	-	3	2	5	3	8	6	9	7
35	-	-	-	-	-	-	3	2	6	5	8	6
50	-	-	-	-	-	-	-	-	5	3	6	5
70	-	-	-	-	-	-	-	-	4	3	5	4

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- Note : 1. The above table shows the maximum capacity of conduits for a simultaneous drawing of cables.
2. The columns headed 'S' applies to runs to conduit which have distance not exceeding 4.25 m between draw in boxes and which do not deflect from the straight by an angle more than 15 degrees. The columns headed 'B' apply to runs of conduit which deflect from the straight by an angle of more than 15 degrees.

h. Rigid GI Conduit Wiring

In this system of wiring, no bare or twist joints shall be made in through run of cables. If the length of final circuit/submain is more than the length of the standard coil, joints shall be made by means of approved mechanical connectors in suitable and approved junction boxes.

The chase in the wall shall be neatly made and in ample dimensions to permit the conduit to be fixed in the manner desired. In case of buildings under construction, conduits shall be buried in the wall before plastering. These shall be grouted and covered with 1:4 cement and mortar, neatly finished at the plane of the unplastered brick work and scratched for provided key to the plaster and cured. Under no circumstances finished plastered surfaces shall be allowed to be chased for the conduit work. Before taking up chasing of the wall, the routes shall be marked and got approved by the engineer. The horizontal chase shall be avoided as far as possible. In case of exposed brick/rubber masonry work, special care shall be taken to fix the conduit and accessories in position along with the building work.

MS Conduit pipes shall be fixed by heavy gauge saddles secured to suitable wood plug or other approved manner at an interval of not more than one metre but on either side of the coupler of bends or similar fittings. Saddles shall be fixed at a distance of 30cm from the centre of such fittings. The saddles shall not be less than 20 gauge for larger dia.

All conduits after erection shall be tested for electrical continuity.

Fixing of standard bends or elbows in roof slab shall be avoided and all curves maintained by bending the conduit itself with a long radius which will permit easy drawing of conductors.

Suitable junction/inspection boxes according to requirements shall be provided to permit periodical inspections and to facilitate replacement of wires. However, such boxes shall be located and arranged suitably so that they are not in irregular positions. These locations shall also be specifically shown in the conduit layout of the shop drawings and approval shall be obtained before installation.

However, such installations and the number of such boxes shall be minimised. The boxes shall be mounted flush with the wall or ceiling. Minimum 65 mm depth junction boxes shall be used in roof slabs and depth of boxes in other places shall be as per IS:2667-1977. All outlets such as switches, wall sockets, etc. shall be flush mounting type.

i. **Internal Illumination**

a **General**

Illumination system shall consist of lighting switches, power receptacles, distribution boards, sub distribution boards, complete with switch fuses, junction boxes, pull boxes, terminal blocks, glands, conduits and accessories (elbow, tees, crosses, bends, etc.) and supporting and anchoring materials, lighting fixtures complete with fluorescent tubes, incandescent lamps, mercury vapour lamps, sodium vapour lamps and lighting cables. All materials, fittings and appliances used in the electrical installation shall conform to the relevant IS specifications and shall be anticorrosive painted.

b **Illumination Levels**

The following minimum levels of illumination shall be provided in the respective areas:

<u>AREA</u>	<u>ILLUMINATION LEVEL</u>
a) Offices	300 Lux
b) Switchgear Rooms	300 Lux
c) Toilet, Staircase	100 Lux
d) Substation - Transformer Room	200 Lux
e) Generator Room	200 Lux
f) Road	25 Lux

c **Lighting Equipment**

The specification covers distribution board, fittings, poles, switches, receptacles, conduits, wires, cables and miscellaneous hardware necessary for complete lighting work.

d **Light Fittings/Luminaries**

The fixtures/luminaries offered shall conform to IS: 10322 and comply with the following requirement:

- The fixtures shall be suitable for operation on a nominal supply of 240 Volts, single phase, 50 Hz voltage with variation of $\pm 10\%$.
- All other indoor areas shall be illuminated using LED Industrial type fixtures or high bay sodium vapour luminaire complete with reflectors. Office areas shall have LED Industrial type fixtures. The luminaires/fixtures shall conform to IS: 10322.
- Lighting fixture reflector shall generally be manufactured from sheet steel or aluminium. They shall be readily removable from the housing for cleaning and maintenance without disturbing the lamps and without the use of tools.
- Each fixture shall be complete with a four way terminal block for the connection and looping of incoming and outgoing supply cables. Each terminal shall be able to accept two 2.5 sq.mm solid copper conductor and shall be provided with a terminal suitable for earth wire.
- The enamel finish shall be non-porous and free from blemishes, blisters and fading.
- The fixture shall be free from scale, rust, sharp edges and burrs.
- All light reflecting surfaces shall have optimum light reflecting co-efficient such as to ensure the overall light output as specified.

e **Receptacle Units**

Industrial type receptacle units of approved make of 15 A rating with switches conforming to IS: 3854 and sockets conforming to IS: 1293 shall be supplied. The units shall be suitable for mounting flush on stove enamelled sheet steel boxes generally conforming to IS: 5133 (Part I). The approximate quantities of various types of receptacles are given in the Bill of Quantities.

f **Ceiling Fan**

Ceiling fan shall be suitable for 230 V, 1 phase, 50 Hz and shall be completed with standard mounting accessories such as suspension rod top and bottom Canopy, electronic regulator, rubber reel etc. The fan shall conform to IS: 374. The electronic type fan regulator shall conform to IS: 11037. The general and safety requirement for fans and regulators shall conform to IS: 12115.

g **Exhaust Fan**

Impeller shall be with blades of an aerofoil design. Blades shall be mounted on streamlined hub. Impeller shall be mounted directly on motor shaft.

Casing shall be of heavy gauge construction properly reinforced for rigidity. It shall be provided with suitable support.

In case of vane axial fans, guide vanes shall be provided on the discharge side.

Motor shall be totally enclosed. The speed of fan shall not exceed 1500 rpm.

Material of Construction

- | | | |
|----|--------------------|---------------------------|
| a) | Casing | Mild Steel |
| b) | Impeller | Mild Steel/Cast Aluminium |
| c) | Inlet/outlet cones | Mild Steel |

h **Earthing**

Each lighting fitting shall be provided with an earthing terminal suitable for connection to the earthing conductor.

All metal or metal enclosed parts of the housing shall be bounded and connected to the earthing terminal so as to ensure satisfactory earthing continuity through the fixture.

i **Switches and Accessories**

Switches

All switches shall be placed in the live conductor of the circuit and no single pole or fuse shall be inserted in the earth or earthed neutral conductor of the circuit.

Single pole switches (other than for multiple control) carrying not more than 15 Amps may be of the piano type and the switch shall be 'ON' when the knob is down.

Lamp holders for use in brackets and the like shall have not less than 1.3 cm Nipple and all those for use with flexible pendant shall be provided with cord grips. All lamp holders shall be provided with shade carriers.

j **Socket Out-lets**

Each socket outlet 5 A and 15 Amps shall be controlled by a switch. The switch controlling socket outlet shall be on live side of the line. In an earthed system, socket outlets shall be 3 pin type with shutter so that unless earth pin contact is made, live pins

should not be exposed. All switches shall conform to IS: 3854 and socket outlets to IS: 1293.

k Switch Boxes/Regulation Boxes/Laminated Sheets

The switch or regulator box shall be made of metal on all sides, except on the front. In the case of cast boxes, wall thickness shall be at least 3 mm and in case of welded mild steel sheet boxes, the wall thickness shall not be less than 16 gauge for boxes upto a size of 20 cm x 30 cm and above this size, 14 gauge GI boxes shall be used. Except where otherwise stated, 3 mm thick phenolic laminated sheets shall be fixed on the front with aluminium alloy/brass/cadmium plated iron screws as approved by the Purchaser. Clear depth of the box shall be minimum 60 mm and this shall be increased suitably to accommodate mounting of fan regulators in flush pattern.

To facilitate drawing of wires in the conduit, G.I. fish wires of 16 SWG shall be provided with laying of recessed conduit.

10.0 EARTHING SYSTEM

11.1 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.

11.2 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.

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.

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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.

11.3 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.

11.4 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.

11.5 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.

11.6 Plate Earth Electrode

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

- i) GI 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.

11.7 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.

11.8 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.

11.0 DISMANTLING AND REINSTALLATION

HT Panel:-

Existing HT Panel 3.3 kV, VCB Panel (09 Sets) and 3.3kV BOCB Panel (08 sets) at GC Berth sub-station of HDC, SMP Kolkata shall be dismantled after commissioning of new sub-station at GC Berth.

Dismantled 9sets of VCB panel's shall be reinstalled at Phosphate/Berth No. 05 berth sub-station of HDC, SMP Kolkata after dismantling of existing BOCB's(14 sets) in the sub-station.

Shutdown will be provided by HDC. However bidder shall make all necessary arrangements and equipment to minimise shutdown time and re installation of 3.3kV VCB Panel dismantled for GC Berth sub-station. Dismantled 3.3KV BOCB Panel (08 sets) from GC Berth sub-station and 3.3kV BOCB Panel(14 sets) from Phosphate/Berth No. 05 berth sub-station shall be handed over to Sub-store of HDC ,SMP Kolkata as directed by Engineer.

LT Panel:-

Existing LT BOCB Panel (14 sets) at GC Berth sub-station of HDC, SMP Kolkata shall be dismantled after commissioning of new sub-station at GC Berth. Dismantled BOCB Panel (14 sets) from GC Berth sub-station shall be handed over to Sub-store of HDC, SMP Kolkata as directed by Engineer.

Existing outgoing feeders shall be terminated at newly supplied LT PCC 1&2 before dismantling, if required st. through jointing shall also be done, with permission of Engineer.

33/3.3kV, 6MVA Oil type transformer:-

Existing 6MVA outdoor oil type transformer at GC Berth sub-station of HDC, SMP Kolkata shall be shifted to new sub-station as directed by Engineer after commissioning of new sub-station at GC Berth. Contractor shall take extra care while handling the same.

12.0 LIST OF APPROVED MAKES

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

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SL.No.	ITEM	Name of Manufacturers
19	PVC insulated copper conductor single/multi core stranded wires of 650/1100 volt grade	HAVELLS / FINOLEX / RPG /UNIFLEX /NICCO /RR Kables
20	Steel Conduit/PVC Conduit	BEC / AKG / NIC
21	Switches, TV & Telephone Socket outlets, Boxes	MK / CLIPSAL / LEGRAND / NORTH WEST /ANCHOR
22	Light Fixtures(LED)	PHILIPS / BAJAJ / WIPRO / CROMPTON/HAVELLS
23	Ceiling fans/Wall bracket fans / Exhaust Fans	HAVELLS / CROMPTON GREAVES / USHA / ORIENTAL
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	L&T / 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

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SL.No.	ITEM	Name of Manufacturers
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
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	Items not covered above	As per samples approved

13.0 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 for 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 General Manager (Engg.) 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.**

14.1 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.

14.2 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.

14.3 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.

14.4 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.

14.5 6000 kVA, 33 KV / 11 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.

14.6 1000 kVA, 11 kV/3.3KV / 0.433 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 11 KV, 1000 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.

14.7 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 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 Agency or** the representative of Engineer during the above inspection.

14.8 LT Panel:

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: 8623.
- b) Type test certificate for similar type & Rating of LT Panels be submitted by successful tenderer.
- c) Manufacturer's Certificate for **Type Test** (as per IS: 8623), for similar type equipments, should be made available to **the TPI Agency or** the representative of Engineer during the above inspection.

14.9 LT Bus Duct:

The Bus Ducts will be inspected at site, after delivery, by **the TPI Agency or** the representative of Engineer, based on Manufacturer's Internal Test Certificate and fitment certificate.

14.10 LT Cables:

The LT Cables 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.

14.11 APFC Panel:

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

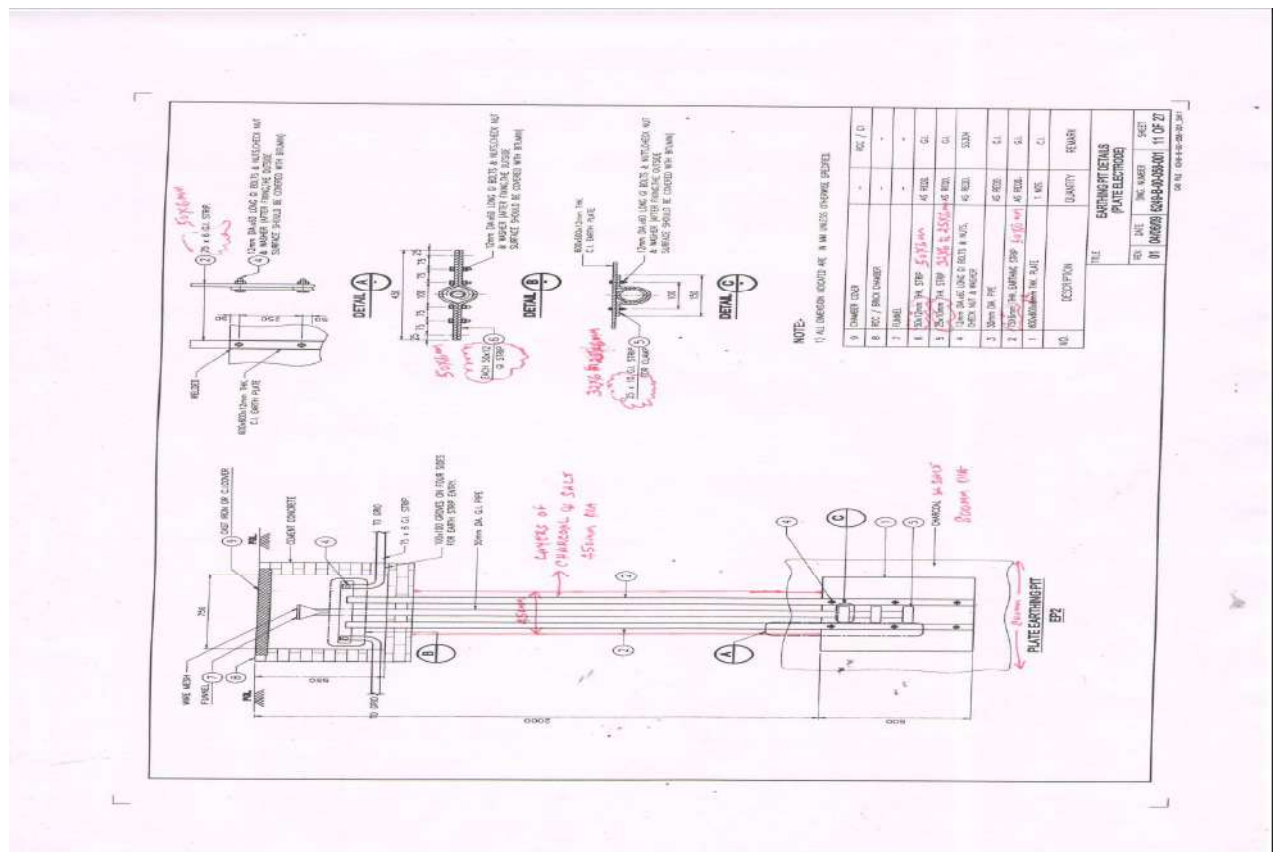
a) **Routine Tests** as per IS.

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

14.12 St. through and end termination jointing kits:

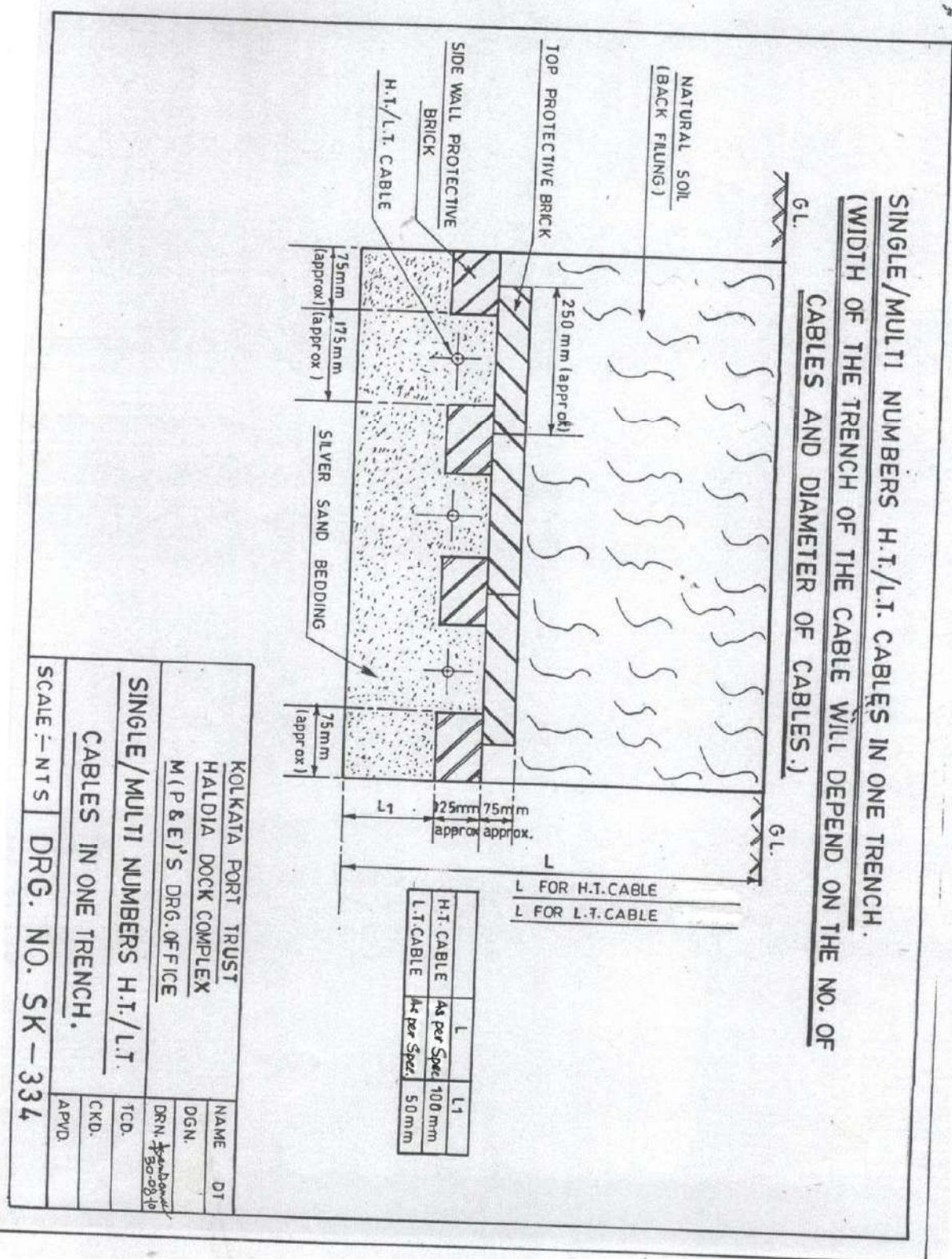
The kits will be inspected at site, after delivery, by **the TPI Agency** or the representative of Engineer, based on Manufacturer's Internal routine Test Certificate as per IS: 7098-I.

14.0 DRAWINGS.



EARTH PIT

Supply, Installation, Testing and Commissioning of 11kV/3.3kV/415V Panel along with allied works for augmentation of GC Berth Sub-station including construction of Sub-station building at GC Berth area of Haldia Dock Complex, SMP, Kolkata.



CABLE LAYING

Supply, Installation, Testing and Commissioning of 11kV/3.3kV/415V Panel along with allied works for augmentation of GC Berth Sub-station including construction of Sub-station building at GC Berth area of Haldia Dock Complex, SMP, Kolkata.

Bill of Quantity with estimated cost

Part-I Civil Works

Sl. No.	Description Of Item	Quantity		Rate [In Rs]	Amount [In Rs]
1	Dismantle cement brick work by carefully chiseling out as directed. Include for cleaning the serviceable bricks including stacking for reusing and disposal of unserviceable materials, all serviceable bricks should be deposited to departmental store all complete and as directed. Wooden and steel door and window frames should be carefully taken out and transported to I&CF store as directed within a lead of 5 Km. No separate payment will be made for taking out and transporting door and window frames to store.	150	CuM	419.87	62,980.50
2	Dismantling plain cement concrete (of any type & any thickness) by carefully chiseling out. Include for removing the debris within a lead of 75 metres, all complete and as directed.	25	CuM	882	22,050.00
3	Dismantle the R.C.C (of any type & any thickness) including cutting rods and stacking serviceable materials at site and removing the debris within a lead of 75 metres, all steel material should be deposited to departmental store all complete and as directed.	25	CuM	1837.27	45,931.75
4	Removal of building rubbish, earth etc. from the working site and disposal of the same beyond the compound upto a distance of 5 Km, including loading and unloading into truck and cleaning the site in all respect as per direction of Engineer-in-charge.	250	CuM	174.71	43,677.50
5	Construct & Provide 600 mm Dia vertical Bore cast-in Situ piles. Bore drill / bail out in all types of soil including gravels, clay, sand, soft rock, wood boulders etc. from the existing bed level up to the specified levels in the drawings and as directed by the Engineer. Include for efficient disposal of excavated soil/much/mud/bentonite mixer soil through static and mobile system to designated places within 5 kms as directed by Engineer-in-Charge. Payment will be made on boring depth measured from existing ground level by sounding or any other method approved by the Engineer).	430	Mtr.	1387.61	596,672.30

Supply, Installation, Testing and Commissioning of 11kV/3.3kV/415V Panel along with allied works for augmentation of GC Berth Sub-station including construction of Sub-station building at GC Berth area of Haldia Dock Complex, SMP, Kolkata.

Sl. No.	Description Of Item	Quantity		Rate [In Rs]	Amount [In Rs]
6	Providing 8 mm thick M.S. liner plate for piles with stiffeners. Rate shall include for bending, cutting, welding, installation in position and driving the liner plate upto the specified level as directed by the Engineer. Also include for providing minimum 1 Mtr. extra length of liner plate above cut-off level which will have to be cut after concreting of bored pile. (Payment will be made on the basis weight of liner plate from the bottom level up to the cut-off level).	20.00	MT	69,862.72	1,397,254.40
7	Provide & place M-35 grade concrete laid in situ by tremie pipe method including cutting concrete and their liner up to the cut off level at all depths up to founding level with 20 mm maximum size of graded coarse aggregate of Pakur variety and 400 kg./Cu.M minimum cement content & maximum W/C ration of 0.45, super plasticizer conforming to IS-9103 etc. including all labour, materials, tools, plants & equipment etc complete in all respected as specified and as directed by the Engineer. Reinforcements are to be measured and paid separately. Include for scum concrete upto 1 mtr above the cut off level and dismantling after casting to ensure fresh concrete at cut off level) [Volume of concrete from cut off level to founding level as shown in the drawings or as directed by the Engineer will be considered for payment.]	120	Cu.M	11,160.00	1,339,200.00
8	Conducting routine load test on piles for a vertical test load of 150 Ton on selected piles as per relevant provision of IS-2911 (latest revision) including submission of report as specified.	1	one set.	81,184.55	81,184.55
9	Earth work in excavation of foundation trenches in all sorts of soil including removing, spreading or stacking the spoils within a lead of 2000 m. as directed. The item includes necessary trimming the sides of trenches, levelling, dressing and ramming the bottom as required complete. Depth of excavation not exceeding 1.50 m.	1700	CuM	112.03	190,451.00
10	Earthwork in filling (with earth/sand obtained from excavation of foundation/road) in foundation trenches/roads with good earth/sand in layers not exceeding 150mm. Including carrying filling materials from a lead of 200m, watering, ramming etc. layer by layer complete and as directed. (Payment to be made on the basis of measurement of finished quantity of work)	340	Cu.M.	11.4	3,876.00

Supply, Installation, Testing and Commissioning of 11kV/3.3kV/415V Panel along with allied works for augmentation of GC Berth Sub-station including construction of Sub-station building at GC Berth area of Haldia Dock Complex, SMP, Kolkata.

Sl. No.	Description Of Item	Quantity		Rate [In Rs]	Amount [In Rs]
11	Provide, spread & fill the excavated area with silver sand, in layers of thickness not exceeding 150 mm including consolidation by sprinkling of water and rolling by mechanically operated Vibro- Rammer of appropriate capacity to achieve the desired degree of compaction, all inclusive as directed by the Engineer. (Payment to be made on volume derived from pre-post level).	1225	Cu.M.	510.52	625,387.00
12	Provide, spread & fill the excavated area with Zone III sand, in layers of thickness not exceeding 150 mm including consolidation by sprinkling of water and rolling by mechanically operated Vibro-Rammer of appropriate capacity to achieve the desired degree of compaction, all inclusive as directed by the Engineer. (Payment to be made on volume derived from pre-post level).	760	CuM	1099.85	835,886.00
13	Bailing or pumping out water from foundation trenches. (Payment will be made based on the difference between initial and final water level measured before starting and completion of each day's work).	2000	CuM	21.58	43,160.00
14	Hire and labour charges for shoring work (including necessary close plank walling, framing, Eucalyptus/Jhou bulla piling, strutting etc) complete as per direction of the Engineer-in-charge for foundation excavation (vertical surface are in contact with supported earth is to be measured.) Depth of shoring not exceeding 3.0 m.	1100	SqM	402.02	442,222.00
15	Providing and laying cement concrete (1:3:6) with graded stone aggregate (20 mm size) Pakur variety excluding shuttering but including necessary polythene sheet in ground floor and foundation.	58	Cu.M.	4802.45	278,542.10
16	Provide, mix, transport and place in position to lines and levels M-35 grade in-situ reinforced cement concrete with graded stone chips of 6 mm - 20 mm. nominal size in pile cap, lintel, chajja, beam, column, roof slab etc. except cost of shuttering & reinforcement.	670	Cum	8383.02	5,616,623.40
17	Supply,fit and fix HYSD Reinforcement (Fe-415) (TATA/SAIL/RINL) for reinforced concrete work in all sorts of structures like beams, pile,pile caps, slabs etc including distribution bars,stirrups,binders etc. initial straightening and removal of loose rust	99	M.T.	59626.02	5,902,975.98

Supply, Installation, Testing and Commissioning of 11kV/3.3kV/415V Panel along with allied works for augmentation of GC Berth Sub-station including construction of Sub-station building at GC Berth area of Haldia Dock Complex, SMP, Kolkata.

Sl. No.	Description Of Item	Quantity		Rate [In Rs]	Amount [In Rs]
18	Hire and labour charges for shuttering with centering and necessary staging up to 8m. using approved stout props and steel shuttering or 9to 12mm thick approved quality ply board shuttering with required bracing for concrete of slabs, beams, columns, lintels curved or straight including fitting, fixing and striking out after completion of works as per direction of Engineer-in-charge.	5079	Sq.M.	370.93	1,883,953.47
19	Provide and build brick work in foundation and plinth in cement and sand mortar 1:6 (1 cement : 6 coarse sand) with 1st class bricks with necessary staging, curing etc. all complete as directed.	100	Cu.M	5329.40	532,940.00
20	Provide and build brick work in superstructure etc. in cement and sand mortar 1:6 (1 cement : 6 coarse sand) with 1st class bricks with necessary staging, curing etc. all complete as directed.	185	Cu.M	5559.81	1,028,564.85
21	Provide and build 125 mm thick brick work in cement and sand mortar 1:4 (1 cement : 4 coarse sand) with 1st class bricks with necessary staging, curing etc. all complete as directed.	830	Sq.M	730.49	606,306.70
22	40 mm thick damp proof course with cement concrete with stone chips (1:1.5:3) [with graded stone aggregate 20 mm nominal size] and admixture of water proofing compound of approved brand @ 0.20% weight of cement followed by two coat of polymer based paint as per direction of Engineer-In-Charge.	40	Sq.M	501.12	20,044.80
23	Provide and lay 35 mm. thick cement concrete flooring 1:2:4 (1 cement : 2 coarse sand : 4 graded stone chips of 12.5 mm nominal size), laid in panels as directed with ordinary or white cement (as necessary) and marble dust in proportion (1:2) including smooth finishing and rounding off corners including racking out joints or roughening of concrete surface and application of cement slurry before flooring works using cement @ 1.75 kg/sq.m. all complete including all materials and labour.	580	Sq.M	331.67	192,368.60
24	Supplying, fitting & fixing 1st quality decorative Ceramic tiles(area of each tile upto 0.09 Sq.m) in walls with sand cement mortar (1:3) 20mm thick & 2 mm thick cement slurry at back side of tiles using @ 2.91 kg/sqm & joint filling using white cement slurry @ 0.20kg/Sq.m. mixed with colouring pigment if required to match the colour of tiles, including roughening/chipping of concrete/plastered surface as directed.	15	Sq.M	715	10,725.00

Supply, Installation, Testing and Commissioning of 11kV/3.3kV/415V Panel along with allied works for augmentation of GC Berth Sub-station including construction of Sub-station building at GC Berth area of Haldia Dock Complex, SMP, Kolkata.

Sl. No.	Description Of Item	Quantity		Rate [In Rs]	Amount [In Rs]
25	Supplying and laying true to line and level vitrified tiles of light coloured and approved brand (size not less than 600 mm X 600 mm X 10 mm thick) in floor, skirting etc. set in 20 mm sand cement mortar (1:4) and 2 mm thick cement slurry back side of tiles using cement @ 2.91Kg./sqM laid after proper chipping the existing surfaces and apply cement slurry using 1.75 Kg of cement per sqm. below mortar only, joints grouted with admixture of white cement and colouring pigment to match with colour of tiles / epoxy grout materials of approved make as directed and removal of wax coating of top surface of tiles with warm water and polishing the tiles using soft and dry cloth upto mirror finish complete including the cost of materials, labour and all other incidental charges complete true to the manufacturer's specification and direction of Engineer-in-Charge.(White cement,synthetic adhesive and grout material to be supplied by the contractor.)	30	Sq.M	1304.97	39,149.10
26	Provide and lay 20 mm. thick cement plaster (1:6) with medium coarse sand to interior surfaces of walls and columns etc. Including scaffolding/staging with necessary curing etc. all complete and as directed.	2550	Sq.M	161.18	411,009.00
27	Provide and lay 15 mm. thick cement plaster (1:4) with medium coarse sand to exterior surfaces of walls and columns etc. Including scaffolding/staging with necessary curing etc. all complete and as directed.	1950	SqM	158.08	308,256.00
28	Provide and lay 10 mm. thick cement plaster (1:3) with medium coarse sand at the ceiling surface Include for necessary scaffolding & curing etc. all complete as directed.	2550	Sq.M	134.32	342,516.00
29	Provide and lay neat cement punning over the plastered surfaces of dado, skirting and floor surfaces etc. all complete and as directed.	501	Sq.M	35.13	17,582.57
30	Supplying, fitting & fixing Gusset plate, bracket, insert plates, etc. with MS plate, angle, channel, ISMB, etc., and M.S. work in grill/gate/railing and covered plates with flats, angles, chequered plates of suitable sizes, pipes, plates and other structural sections conforming to IS:226, IS:808 & SP(6)-1964 and made of hot deep galvanised steel materials conforming to IS 2629:1985 and IS 4759:1996 or latest revision of average minimum mass of coating will be 610 gm/m2 including gas	16300	Kg	86	1,401,800.00

Supply, Installation, Testing and Commissioning of 11kV/3.3kV/415V Panel along with allied works for augmentation of GC Berth Sub-station including construction of Sub-station building at GC Berth area of Haldia Dock Complex, SMP, Kolkata.

Sl. No.	Description Of Item	Quantity		Rate [In Rs]	Amount [In Rs]
	cutting to requisite shape, size and length, fabrication with necessary bolting, metal arc welding, drilling holes for fixing bolts and nuts etc. all complete and as directed. Payment shall be made on the basis of calculated weight of structural members only in finished work as per IS specified weight.				
31	Wood work in door and window frame fitted and fixed complete including a protective coat of painting at the contact surface of the frame. (Local Sal wood).	0.40	Cu.M.	75378.26	30,151.30
32	Supplying, fitting and fixing M.S. clamps for fixing door and window frame made of flat bent bar, end bifurcated with necessary screws etc by cement concrete (1:2:4) as per direction (Cost of cement concrete will be paid separately) with 40mm. X 6mm. 200	50	Each.	25.83	1,291.50
33	Provide & fix 125 mm long wooden buffer block with Malayasian sal.	8	each	52.69	421.52
34	Provide & fix approved quality 100mmx75mmx3.5mm Mowje make butt hinges as per requirement.	32	Each	68.19	2,182.08
35	Supply,fitting and fixing of 225 mm long x 10mm dia anodised aluminum tower bolt of approved quality manufactured from extruded section confirming to IS 204/74 fitted and fixed with cadmium plated screws.	16	each	86.79	1,388.64
36	Supply fitting and fixing of iron hasp bolt of approved quality complete 250 mm long 16 mm dia rod with centre bolt and round fitting.	8	each	164.28	1,314.24
37	Provide and fit hinged cleat (Local Sal) with new 50 mm iron but hinge and new screws.	8	each	41.33	330.64
38	Supply,fit & fix 125 mm grip,12 mm dia rod anodised aluminium D-type handle with continuous base plate of approved quality conforming to IS - 230/72 all complete as directed.	16	Each	106.42	1,702.72

Supply, Installation, Testing and Commissioning of 11kV/3.3kV/415V Panel along with allied works for augmentation of GC Berth Sub-station including construction of Sub-station building at GC Berth area of Haldia Dock Complex, SMP, Kolkata.

Sl. No.	Description Of Item	Quantity		Rate [In Rs]	Amount [In Rs]
39	Supplying, fitting and fixing foam P.V.C. factory made door frame(finished weight of 2.73 kg/mtr.) of size 100 mm X 45mm made off with 5 mm thick extruded foam pvc sheet ,mitre cut at junction of horizontal and vertical member and jointed them by heat weilding.Entire door frame profiles to be reinforced with steel primer coated 19 SWG 40 mm X 20 mm MS Tube.And additional 5 mm PVC sheet with desire colour(plain)/shade to be provided at the exposed surface and 3 nos 5 mm thick PVC Sheet to be provided as gap insert.The door frame to be fixed with wall by using 8 mm dia & 100 mm long stainless steel screws & PVC Fasteners.A minimum of 4 nos of screws to be provided for each vertical member and 2 nos for horizontal member all complete as directed by E.I.C.	6.0	M	533.15	3,198.90
40	Supplying, fitting and fixing 30 mm thick factory made single piece non decorative solid PVC door shutter extruded solid pvc profile.The style & rails shall be of size 75 x 30 mm having wall thickness of 5 mm.The style & top bottom rail shall have one side thickness of 15 mm integrally extruded on the hinge side of the profile for better screw holding power.15 mm thickness shall be of single piece extruded solid pvc profile whereas it shall not be made of sheet pated profile.The styles & rails shall be reinforced with MS tube of size 18 mm(+/-) 1 mm x 18 mm (+/-)1 mm x 1 mm painted with primer all four corners of reinforcement to be welded or sealed.solid pvc extruded bidding (push fit type) will be set inside the styles & rails with a cavity to receive single piece extruded 5 mm sheet as panel.The styles & rails will be metered cut and join with the pvc solvent cement ,self tapping screw & bracket of size200 x 75 mm /welded at each corner.Single piece extruded solid pvc lock rail of size 100 x 30 mm with a wall thickness 5 mm & 15 mm integrally extruded in the middle of the lock rail & fixed with style with the help of PVC solvent cement & self driven self tapping screws of size 100 mm x 8 mm complete as per manufacture specifications & direction of Engineer-in-charge.	2.00	Sq.M.	2426.02	4,852.04
41	Supplying, fitting and fixing Panel shutters of door, as per design (each panel consisting of single plank with out joint), including fitting and fixing the same in position but excluding the cost of hinge and other fittings. 35mm. thick shutters with 19 mm. thick panel with champ, gamar, sishu etc. wood.	20	Sq.M.	2881.68	57,633.60

Supply, Installation, Testing and Commissioning of 11kV/3.3kV/415V Panel along with allied works for augmentation of GC Berth Sub-station including construction of Sub-station building at GC Berth area of Haldia Dock Complex, SMP, Kolkata.

Sl. No.	Description Of Item	Quantity		Rate [In Rs]	Amount [In Rs]
42	Supplying, fitting and fixing 3-Track fully glazed Aluminium sliding window made up of aluminium alloy extrusions conforming to IS 733-1983 & IS 1285-1975, anodised conforming to IS 1868-1983, Membe fitted with all other accessories viz. PVC roller, EPDM gasket, maruti lock, screws etc. including fixing of glass (excluding cost of glass) all complete as directed by E.I.C.	720	Kg	462.89	333,280.80
43	Supplying best Indian 4mm. Thick glass panes set in putty and fitted and fixed with nails and putty complete in all floors as directed by E.I.C.	110	Sq.M.	553.81	60,919.10
44	One coat cement washing including cleaning and smoothening surface thoroughly (cement to be used @15kg/100 sq.m. of surface for one coat) as directed by E.I.C.	1950	Sq.M.	9.45	18,427.50
45	Provide and apply two coats white washing including cleaning and smoothening surface thoroughly as directed by E.I.C.	5100	Sq.M.	18.74	95,574.00
46	Provide and lay white cement base water proof wall putty 1.5 mm thick approximate to smooth finish include for removing damaged plaster of paris where necessary etc all complete as directed.	80	Sq.M	126.05	10,084.00
47	Provide and apply one coat of Asian / Berger / Nerolac / ICI paint make primer suitable for interior acrylic emulsion paint on old / new concrete / plastered surfaces to receive Asian / Berger / Nerolac / ICI paint interior acrylic emulsion paint including scraping etc.as directed.	80	SqM	31.82	2,545.60
48	Provide and apply protective Decorative interior premium 100% acrylic emulsion paint two coats of Asian / Berger / Nerolac / ICI paint make on old / new concrete / plastered surfaces including scaffolding, scraping, wire brushing and preparing the surfaces as directed by E.I.C.	80	SqM	64.06	5,124.80
49	Provide and apply one coat of Asian / Berger / Nerolac / ICI make primer suitable for exterior acrylic emulsion paint on old / new concrete / plastered surfaces to receive Asian / Berger / Nerolac / ICI paint exterior acrylic emulsion paint including scraping etc.as directed.	1950	SqM	32.44	63,258.00

Supply, Installation, Testing and Commissioning of 11kV/3.3kV/415V Panel along with allied works for augmentation of GC Berth Sub-station including construction of Sub-station building at GC Berth area of Haldia Dock Complex, SMP, Kolkata.

Sl. No.	Description Of Item	Quantity		Rate [In Rs]	Amount [In Rs]
50	Provide and apply polyurethane based protective Decorative exterior premium 100% acrylic emulsion paint two coats of Asian / Berger / Nerolac / ICI make paint on old / new concrete / plastered surfaces including scaffolding, scraping, wire brushing and preparing the surfaces as directed by E.I.C.	1950	SqM	86.79	169,240.50
51	Priming one coat on timber with synthetic oil bound primer of approved quality including smoothening surfaces by sand papering etc. as directed by E.I.C.	45	Sq.M.	39.26	1,766.70
52	Painting on timber or plastered surface with hi-gloss best quality synthetic enamel paint of approved make and brand including smoothening surface by sand papering etc. including using of approved putty etc. on the surface, if necessary. (Two coats with any shade except white) as directed by E.I.C.	45	Sq.M.	83.69	3,766.05
53	Supplying, fitting and fixing PVC pipes of approved make of Schedule 80 (medium duty) conforming to ASTM D - 1785 and threaded to match with GI Pipes as per IS : 1239 (Part - I). with all necessary accessories, specials viz. socket, bend, tee, union, cross, elbo, nipple, long screw, reducing socket, reducing tee, short piece etc. fitted with holder bats clamps, including cutting pipes, making threads, fitting, fixing etc. complete in all respect including cost of all necessary fittings as required, jointing materials and including making chase, mending good where necessary. (Payment will be made on the centre line measurements of total pipe line including all specials. (No separate payment will be made for accessories, specials. Payment for painting will be made separately).				
	b) For exposed work				
	i) 25 MM dia.	50	Mtr	166.26	8,313.00
	ii) 40 MM dia.	12	Mtr	274.28	3,291.36
	For Concealed Work				
	i) 15 MM dia.	12	Mtr	128.68	1,544.16
	ii) 20 MM dia.	12	Mtr	148.41	1,780.92
54	Supplying, fitting and fixing gunmetal wheel valve of approved brand and make bearing ISI mark, tested to 21 kg per sq. cm. as directed by E.I.C.				
	a) 20 mm dia.	1	Each	617.12	617.12
	b) 25 mm dia.	2	Each	856.64	1,713.28
	c) 40 mm dia.	1	Each	1546.09	1,546.09

Supply, Installation, Testing and Commissioning of 11kV/3.3kV/415V Panel along with allied works for augmentation of GC Berth Sub-station including construction of Sub-station building at GC Berth area of Haldia Dock Complex, SMP, Kolkata.

Sl. No.	Description Of Item	Quantity		Rate [In Rs]	Amount [In Rs]
55	Supply & fix in position 580 mm.long white vitreous china ware Indian type W.C.Pan (approved make & brand) (Excluding the cost of concrete for fixing).	1	Each	913.94	913.94
56	Supplying, fitting & fixing Cast Iron 100 mm. Dia. 'S' trap conforming to I:S 1729/2002 including Lead caulked joints & painting Coal tar two coats to the exposed surface.	1	Each	754.26	754.26
57	Supplying, fitting & fixing Cast Iron 75 mm. Dia. 'P' trap conforming to I:S 3989/2009 including Lead caulked joints & painting Coal tar two coats to the exposed surface.	1	Each	565.46	565.46
58	Supply, fit and fix white vitreous china best quality approved make wash basin of size-550mm x 400mm with C.I. / G.I. pipe Brackets of required dia. on 75mm. x 75 mm. wooden blocks or inside wall ,C.P. waste fittings of 32 mm. dia. one approved quality brass C.P. pillar cock of 15 mm. dia, C.P. chain with rubber plug of 30 mm dia, approved quality PVC connector pipe with heavy brass CP nut of required length including mending good all damages and painting the brackets with two coats of approved paint all complete as directed.	1	each	2073.97	2,073.97
			-	-	
59	Provide and fix 75mm.round PTMT overhead shower (Prayag or equivalent) all complete as directed.	1	each	168.13	168.13
			-	-	
60	Provide, fit and fix best quality Aluminium towel rail of size 25 mm dia. and 600 mm long with two brackets complete.	2	Each	154.05	308.10
			-	-	
61	Supply fit and fix approved brand and make white and flexible type PVC connector of length 600 mm. as required at stie of as directed with both ends coupling with heavy brass C.P. nut 15 mm. Dia. all complete and as directed.	2	each	100.51	201.02
62	Provide and fix Chromium plated 15mm. Dia. bib cock / Concealed stop cock approved quality in position all complete as directed.				
	a) Bib cock	3	each	506.28	1,518.84
	b) Concealed stop cock	3	each	633.09	1,899.27
			-	-	

Supply, Installation, Testing and Commissioning of 11kV/3.3kV/415V Panel along with allied works for augmentation of GC Berth Sub-station including construction of Sub-station building at GC Berth area of Haldia Dock Complex, SMP, Kolkata.

Sl. No.	Description Of Item	Quantity		Rate [In Rs]	Amount [In Rs]
63	Supply, fit and fix 10 litre P.V.C low-down cistern with P.V.C fittings complete, CI brackets including two coats of painting to bracket etc.	1	each	953.39	953.39
64	Supply, fit and fix approved brand amd make PVC waste pipe of length 600 mm or as required length at site of as directed with one end coupling with P.V.C. nut, 32 mm. Dia. all complete and as directed.	5	each	44.15	220.75
65	Supplying , fitting & fixing best quality Indian make beveled edged mirror 5.5mm. thick with silver red as per IS3438/1965 specification with C.P. hinges. size 600mm. X 450mm.	1	each	454.62	454.62
66	Supplying and providing in position 1500 litre capacity 4 stage multilayer P.V.C. water storage tank of approved quality with closed top with lid.	1	Each	7364.11	7,364.11
67	Provide , fit and fix CI gratings (heavy type)125 mm dia.	3	Each	52.6	157.80
68	Provide, fit and fix high pressure polythene ball cock of size 25 mm dia. Of approved make and brand with ball and liver.	1	Each	112.72	112.72
69	Supplying, fitting and fixing 110 mm dia. UPVC pipes A-type conforming to IS 13592-1992 for rainwater & soil pipes and fitted with all necessary clamps nails including making holes in walls,floors, etc. and cutting trenches in any soil, through masonry concrete structures etc. if necessary and mending good damages including joining with jointing materials like spun yarn, valamoid/bitumen M seal etc. complete.	200	M	259.34	51,868.00
70	Supplying, fitting and fixing down UPVC specials and fittings A-type as specified in IS 13592-1992 and fitted with all necessary clamps nails including making holes in walls,floors, etc. and cutting trenches in any soil, through masonry concrete structures etc. if necessary and mending good damages including joining with jointing materials like spun yarn, valamoid/bitumen M seal etc. complete.				
	a) 110 mm dia. Bend	14	Each	165.32	2,314.48
	b)110 mm dia. Tee	10	Each	177.72	1,777.20
	c)110 mm dia.Shoe	14	Each	114.69	1,605.66

Supply, Installation, Testing and Commissioning of 11kV/3.3kV/415V Panel along with allied works for augmentation of GC Berth Sub-station including construction of Sub-station building at GC Berth area of Haldia Dock Complex, SMP, Kolkata.

Sl. No.	Description Of Item	Quantity		Rate [In Rs]	Amount [In Rs]
71	Supplying, fitting and fixing 75 mm dia. UPVC pipes A-type conforming to IS 13592-1992 for rainwater & soil pipes and fitted with all necessary clamps nails including making holes in walls,floors, etc. and cutting trenches in any soil, through masonry concrete structures etc. if necessary and mending good damages including joining with jointing materials like spun yarn, valamoid/bitumen M seal etc. complete.	50	M	194.25	9,712.50
72	Supplying, fitting and fixing down UPVC specials and fittings A-type as specified in IS 13592-1992 and fitted with all necessary clamps nails including making holes in walls,floors, etc. and cutting trenches in any soil, through masonry concrete structures etc. if necessary and mending good damages including joining with jointing materials like spun yarn, valamoid/bitumen M seal etc. complete.				
	a) 75 mm dia. Bend	10	Each	98.16	981.60
73	Provide, supply & fix in position machine made precast concrete Paver block (M50) of size 200mm(L) X 100mm (B) and 100mm thickness over a layer of 50mm thick (ave) brown coarse sand(Zone III) cushion as levelling course as specified. The blocks must be cast and cured in a factory of reputed and approved manufacturer of paver blocks. Include for transportation, loading, unloading, dressing, sand cushioning, compacting the sand layer suitably, laying the blocks in position in proper level and grade, filling interstices between blocks with sand by vibrating with heavy duty plate vibrators, cutting paver blocks where ever required with hydraulic splitter including cost of all materials, labour, tools, plants etc. all complete as directed by Engineer and as per manufacturers specification. [Payment will be made on the basis of actual finished area of paver blocks laid at site.]	600	Sq.M	941.93	565,158.00
74	Provide and lay specially formulated Acrylic polymer modified cementitious elastic seamless water proofing treatment with good crack binding properties and UV resistant such as Dr. Fixit Pidifin 2K or approved equivalent over the damaged roof after cleaning and roughening of roof surface,filling of cracks / repair of any damages with polymer modified mortar and apply approved primer coat. Pidifin 2K shall have to be applied in 2 coats, polypropylene fibre net shall have to be provided on 1st coat of Pidifin 2K so that the fibre net remains sandwiched in between two layers of Pidifin 2K. Application of each layer of chemicals shall be guided by the technical specification of manufacturer or as directed by the Engineer-in-charge.	570	SqM	335.20	191,064.00

Supply, Installation, Testing and Commissioning of 11kV/3.3kV/415V Panel along with allied works for augmentation of GC Berth Sub-station including construction of Sub-station building at GC Berth area of Haldia Dock Complex, SMP, Kolkata.

Sl. No.	Description Of Item	Quantity		Rate [In Rs]	Amount [In Rs]
75	Provide and lay ordinary cement concrete of proportion 1:1.5:3 with graded stone chips (20 mm nominal size) for slope correction over roof with water proofing compound (Sika Latex Power should be used @1kg per 16 Sq.m. in cement slurry before and after laying concrete and plastocrete super should be used in concrete mix @ 0.20 % by weight of cement) including cleaning and roughening of the roof surface properly.	40	Cum.	7325.49	293,019.60
76	Supplying,fitting & fixing steel rolling shutter profile with 18 BG of approved type steel latche section 75 mm wide, fitted with coil wire spring to necessiate the fitting of required nos. of CI pulleys on heavy type solid drawn seamless steel tube complete with locking arrangments both inside & outside specially built up side guide channels including providing a hood for the steel rolling shutter in the room all complete and as directed. Shutter profiles should be made of hot deep galvanised steel materials conforming to IS 2629:1985 and IS 4759:1996 or latest revision of average minimum mass of coating will be 610 gm/m2 (measurment will be made on the area of opening covered by the rolling shutter)	200	Sq.M.	2578.43	515,686.00
77	Supplying,fitting & fixing Collapsible gate with 40mm x 40mm x 6mm Tee as top and bottom guide rail, 20mm x 10mm x 2mm vertical channels 100mm apart in fully streched position 20mm x 5mm M.s flats as collapsible bracings properly riveted and washered including 38mm steel rollers including locking arrangements, fitted and fixed in position with lugs set in cement concrete and including cutting necessary holes, chasing etc. in walls,floors etc. and making good damages all complete and as directed. All steel sections should be made of hot deep galvanised steel materials conforming to IS 2629:1985 and IS 4759:1996 or latest revision of average minimum mass of coating will be 610 gm/m2.	15	Sq.M.	4042.31	60,634.65
78	Construction of circular soak well 1.00m inside dia.,2.5 metre deep in all types of soils with 250 mm thick dry brick work upto 1.6 metre from the bottom having 150 mm intermediate cement brick work (1:4) band all round and 250 mm thick cement brick work (1:4) upto 0.90 metre from top with 20mm thick cement plastering (1:4) to inside face	1	Each	15126.49	15,126.49

Supply, Installation, Testing and Commissioning of 11kV/3.3kV/415V Panel along with allied works for augmentation of GC Berth Sub-station including construction of Sub-station building at GC Berth area of Haldia Dock Complex, SMP, Kolkata.

Sl. No.	Description Of Item	Quantity	Rate [In Rs]	Amount [In Rs]
	upto the depth of cement brick work, 15mm thick cement plaster (1:4) on outer face from top of the well upto G.I. and 6 mm thick cement plaster (1:4) on top of the R.C.C. cover slab including filling bottom 1.00 metre of inside of the well with brick metal (50 mm to 63 mm size) including R.C.C cover slab of 100 mm thick with cement conc (1:1.5:3) with stone chips with necessary reinforcement and shuttering including one 560 mm dia. R.C.C. manhole cover (heavy type) of approved make supplied, fitted and fixed in the cover slab with necessary fittings, making necessary arrangements for pipe connections, excavation of well including shoring dewatering and removing the excess earth from the premises as per direction complete in all respect with all costs of labour and materials.			
		Total (Civil Works)=		2,69,37,165

Supply, Installation, Testing and Commissioning of 11kV/3.3kV/415V Panel along with allied works for augmentation of GC Berth Sub-station including construction of Sub-station building at GC Berth area of Haldia Dock Complex, SMP, Kolkata.

Part-II Electrical Works

SL.NO	DESCRIPTION	UNIT	QTY	RATE PER UNIT (IN Rs.)	AMOUNT (IN RS.)
				Excluding GST	
PART A- ELECTRICAL INSTALLATION AT GC BERTH SUB-STATION.:					
1	33KV(E) XLPE, HT Cable:-				-
	Supply and laying of 3 C x 120 Sq.mm. HT Aluminum XLPE cable as per Technical Specification.				
(i)	Supply	Mtr	250	1,422.00	355,500.00
(ii)	Laying through existing RCC trench/Hume Pipe/ GI Pipe.	Mtr	250	117.00	29,250.00
2	33KV XLPE, HT Cable end termination and straight through:-				-
	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.	10	32,500.00	325,000.00
(ii)	Installation of indoor/outdoor end termination kit and testing and commissioning.	No.	10	2,600.00	26,000.00
3	HT 11KV VCB Panel:-				
	Design, fabricate, supply, installation, testing and commissioning of indoor HT 11KV VCB Panel 630A, 3 phase, 50HZ, 25KA for 3sec. as per the Technical Specification(14 panel).				
(i)	Supply	Set	1	7,020,000.00	7,020,000.00
(ii)	Installation, testing and commissioning	Set	1	312,000.00	312,000.00
4	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(12Panel).				
(i)	Supply	Set	1	6,370,000.00	6,370,000.00
(ii)	Installation, testing and commissioning	Set	1	273,000.00	273,000.00
5	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.				
(i)	Supply of 33/3.3 KV, 6MVA Power Transformer	No.	1	7,500,000.00	7,500,000.00
(ii)	Installation, testing and commissioning	No.	1	65,000.00	65,000.00

Supply, Installation, Testing and Commissioning of 11kV/3.3kV/415V Panel along with allied works for augmentation of GC Berth Sub-station including construction of Sub-station building at GC Berth area of Haldia Dock Complex, SMP, Kolkata.

SL.NO	DESCRIPTION	UNIT	QTY	RATE PER UNIT (IN Rs.)	AMOUNT (IN RS.)
				Excluding GST	
6	1MVA Distribution Transformer:-				
	Design, Manufacture, supply, installation, testing and commissioning of following 11/0.433 KV Oil type transformers with off circuit tap changer & marshalling box of make as per the Technical Specification.				
(i)	Supply of 11/0.433 KV, 1MVA Distribution Transformer	No.	2	1,300,000.00	2,600,000.00
(ii)	Installation, testing and commissioning	No.	2	19,500.00	39,000.00
7	6MVA Power Transformer:-				
	Design, Manufacture, supply, installation, testing and commissioning of following 33/11 KV oil filled indoor type transformers with On Load tap changer, RTCC Panel & marshalling box of make as per the Technical Specification.				
(i)	Supply of 33/11 KV, 6MVA Power Transformer	No.	1	7,500,000.00	7,500,000.00
(ii)	Installation, testing and commissioning	No.	1	65,000.00	65,000.00
8	1MVA Distribution Transformer:-				
	Design, Manufacture, supply, installation, testing and commissioning of following 3.3/0.433 KV Oil type transformers with off circuit tap changer & marshalling box of make as per the Technical Specification.				
(i)	Supply of 3.3/0.433 KV, 1MVA Distribution Transformer	No.	1	1,300,000.00	1,300,000.00
(ii)	Installation, testing and commissioning	No.	1	19,500.00	19,500.00
9	1600A, LT Panel(PCC-1&2):-				
	Design, Manufacture, Supply, installation ,testing and commissioning of 1600A, 17ways, LT distribution panel as per Technical Specifications.(1600A-3Nos. ACB's, 630A-8Nos. ACB's & 400A-06Nos.MCCB's)				
(i)	Supply	sets.	2	7,150,000.00	14,300,000.00
(ii)	Installation, testing and commissioning	sets.	2	92,950.00	185,900.00
10	11KV(UE),XLPE, HT Cable :-				
	Supply and laying of Single Core 1000 Sq.mm. HT Aluminum XLPE cable including end terminations as per Technical Specification.				
(i)	Supply	Mtr	600	1,933.00	1,159,800.00
(ii)	Laying through RCC trench	Mtr	600	163.00	97,800.00
11	11KV XLPE, HT Cable end termination:-				
	Supply of heat Shrinkable type end termination kit for 1C x 1000 Sq.mm. HT Aluminum XLPE cable.				

Supply, Installation, Testing and Commissioning of 11kV/3.3kV/415V Panel along with allied works for augmentation of GC Berth Sub-station including construction of Sub-station building at GC Berth area of Haldia Dock Complex, SMP, Kolkata.

SL.NO	DESCRIPTION	UNIT	QTY	RATE PER UNIT (IN Rs.)	AMOUNT (IN RS.)
				Excluding GST	
(i)	Supply of Indoor kit	No.	32	32,500.00	1,040,000.00
(ii)	Installation, testing and commissioning	No.	32	2,600.00	83,200.00
12	3.3KV(UE) XLPE, HT Cable:-				
	Supply and laying of 3C x 400 Sq.mm. HT Aluminum XLPE cable including end terminations as per Technical Specification				
(i)	Supply	Mtr	250	1,934.00	483,500.00
(ii)	Laying through existing RCC trench/Hume Pipe/ GI Pipe.	Mtr	160	130.00	20,800.00
(iii)	Laying by excavating trench.	Mtrs.	50	163.00	8,150.00
(iv)	Laying through 150mm dia. Hume pipe to be laid after excavating including supply of Hume pipe.	Mtrs.	20	650.00	13,000.00
(v)	Laying through 150NB GI Pipe to be laid after excavating, including supply of Pipe	Mtrs.	20	975.00	19,500.00
13	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	1,595.00	382,800.00
(ii)	Laying through RCC trench	Mtr	240	104.00	24,960.00
14	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	9,750.00	156,000.00
(ii)	Installation, testing and commissioning	No.	16	1,950.00	31,200.00
15	1600Amps,1.1KVgrade Copper Bus duct:-				
	Supply of 1600Amps,1.1KV grade, Copper Bus duct with IP55 Enclosure.				
(i)	Supply of Bus duct	Sets.	3	71,500.00	214,500.00
(ii)	Installation, testing and commissioning	Sets.	3	4,550.00	13,650.00
16	3.3KV XLPE, HT Cable end termination and straight through:-				
	Supply of straight through and heat Shrinkable type end termination kit for 3C x 400 Sq.mm. HT Aluminum XLPE cable.				
(i)	Supply of Indoor end termination kit	No.	24	26,000.00	624,000.00
(ii)	Supply of straight through jointing kit	No.	16	58,500.00	936,000.00
(iii)	Installation of indoor end termination kit and testing and commissioning	No.	24	2,600.00	62,400.00
(iv)	Installation of straight through jointing kit and testing and commissioning	No.	16	3,250.00	52,000.00
17	1.1KV XLPE, LT Cable Supply and end termination:-				
	Supply and laying of 3.5C x 400Sq.mm. LT Aluminum XLPE cable including supply of Heat shrinkable st. through and end terminations as per Technical Specification.				

Supply, Installation, Testing and Commissioning of 11kV/3.3kV/415V Panel along with allied works for augmentation of GC Berth Sub-station including construction of Sub-station building at GC Berth area of Haldia Dock Complex, SMP, Kolkata.

SL.NO	DESCRIPTION	UNIT	QTY	RATE PER UNIT (IN Rs.)	AMOUNT (IN RS.)
				Excluding GST	
(i)	Supply	Mtr	350	1,700.00	595,000.00
(ii)	Laying through existing RCC trench	Mtr	350	130.00	45,500.00
(iii)	Supply of end Termination material.	No.	20	3,250.00	65,000.00
(iv)	Supply of jointing kit & Termination material.	No.	20	1,000.00	20,000.00
(v)	Installation, testing and commissioning	No.	40	390.00	15,600.00
18	LT Aluminum XLPE cable:-				
	Supply, laying and termination of 1C x 630Sq.mm. LT Aluminum XLPE cable including end terminations as per Technical Specification.				
(i)	Supply of 1C x 630Sqmm.	Mtr	200	1,050.00	210,000.00
(ii)	Laying and termination through existing RCC trench and cable.	Mtr	200	117.00	23,400.00
19	Indoor APFC Panel:-				
	Design, Supply, installation, testing and commissioning of 200 KVAR, 440V rated indoor APFC Panel as per Technical Specification.				
(i)	Supply	No.	2	520,000.00	1,040,000.00
(ii)	Installation, testing and commissioning	No.	2	20,280.00	40,560.00
20	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	2	234,000.00	468,000.00
(ii)	Installation, testing and commissioning	set	2	6,500.00	13,000.00
22	Dismantling of existing 3.3kV/0.433kV switchgear Panel:-				
(i)	HT Panel-(31No. Breakers)	LS	1	403,000.00	403,000.00
(ii)	LT Panel-(14Nos. Breakers)	LS	1	182,000.00	182,000.00
21	Re-Location of existing 3.3KV VCB and LT Panel:- Relocation includes				
(i)	Supply of necessary material for commissioning of VCB Panel.	LS	1	65,000.00	65,000.00
(ii)	Installation, testing and commissioning of VCB Panel.	LS	1	32,500.00	32,500.00
(iii)	Supply of necessary material for commissioning of LT Panel.	LS	1	650,000.00	650,000.00
(iv)	Installation, testing and commissioning of LT Panel.	LS	1	65,000.00	65,000.00
22	Cable Tray and support structure:-				
(i)	Supply of GI ladder type Cable tray 450mm	Mtrs.	350	845.00	295,750.00
(ii)	Supply of GI Support structure	T	2	71,500.00	143,000.00
(iii)	Supply of GI perforated type Cable tray 100mm	Mtrs.	250	455.00	113,750.00
(iv)	Installation, fixing of GI Support Structure and GI Cable tray.	LS	1	32,500.00	32,500.00

Supply, Installation, Testing and Commissioning of 11kV/3.3kV/415V Panel along with allied works for augmentation of GC Berth Sub-station including construction of Sub-station building at GC Berth area of Haldia Dock Complex, SMP, Kolkata.

SL.NO	DESCRIPTION	UNIT	QTY	RATE PER UNIT (IN Rs.)	AMOUNT (IN RS.)
				Excluding GST	
(v)	Supply, fixing of aluminium clamps for laying of cable through Cable tray.	LS	1	27,300.00	27,300.00
23	Providing Earthing System with plate Earthing in accordance with BIS 3043 or latest amendment as per Technical Specification.				
(i)	Supply	No.	40	22,100.00	884,000.00
(ii)	Installation, testing and commissioning	No.	40	2,600.00	104,000.00
26	Supply and laying of 50 mm x 6 mm Hot dip galvanized Earthing flat / strip as per Technical specification.				
(i)	Supply	Mtr	500	203.00	101,500.00
(ii)	Laying	Mtr	500	65.00	32,500.00
25	Supply of following electrical materials and accessories as per IER:-				
(i)	11 KV grade rubber hand gloves	Pair	3	1,235.00	3,705.00
(ii)	Rubber insulating mat as per IS:15652 for Class of insulating mat-B, Size 1Meter x 2Meter, colour-Black	Nos.	35	2,860.00	100,100.00
(iii)	First aid box	Set	2	2,860.00	5,720.00
(iv)	Shock treatment chart and safety rules mounted on acrylic sheet with suspension clamp and front clear plastic sheet lamination.	Set	2	1,365.00	2,730.00
(v)	Fire extinguisher (Mech foam extinguisher-50Ltrs.each -02Nos. and CO2(6.8Kg. each)-02Nos.) and Fire bucket 4 Nos. with pedestal stand	Set	1	63,050.00	63,050.00
(vi)	5000V hand Operated Megger (Range-0-20000Ohms.)	No.	2	19,500.00	39,000.00
(vii)	Box spanner set (Make: TAPARIA) with complete accessories with box	Set	1	32,500.00	32,500.00
27	Re-Location of existing 33/3.3kV,6MVA Outdoor Oil type Transformer:-				
(i)	Re-Location of existing 33/3.3kV, 6MVA Outdoor Oil type Transformer to sub-station building in HDC and installation of the same on foundation.	LS	1	52,000.00	52,000.00
(ii)	Re-Laying of existing cables	LS	1	97,500.00	97,500.00
(iii)	Re-Laying of existing control wiring and commissioning of Transformer	LS	1	45,500.00	45,500.00
28	<u>Structural items:</u>				
(i)	Supply of GI Chequered Plates 8mm thick	T	3	84,500.00	253,500.00
(ii)	Supply of GI Angles (65x65x6)mm	T	1	84,500.00	84,500.00
(iii)	Supply of GI Channels (75x40x6)mm	T	1	84,500.00	84,500.00
(iv)	Fabrication, Installation and commissioning of above structural items	T	5	32,500.00	162,500.00
Sub-Total Part A-					

Supply, Installation, Testing and Commissioning of 11kV/3.3kV/415V Panel along with allied works for augmentation of GC Berth Sub-station including construction of Sub-station building at GC Berth area of Haldia Dock Complex, SMP, Kolkata.

SL.NO	DESCRIPTION	UNIT	QTY	RATE PER UNIT (IN Rs.)	AMOUNT (IN RS.)
				Excluding GST	
					60,403,075.00
PART B- WIRING AND ELECTRIFICATION OF SUB-STATION.:					
1	GC Berth Sub-Station Building				
	Building dimension (35x12x8) Mtrs Ground floor (35x12x6) Mtrs. 1st Floor.				
(i)	Supply	LS	1	360,360.00	360,360.00
(ii)	Installation, testing and commissioning	LS	1	150,150.00	150,150.00
Sub-Total Part B-					510,510.00
Electrical Works (Part A + Part B)=Rs.					6,09,13,585.00
Civil Works=Rs.					2,69,37,165.00
Total(Civil works + Electrical works)=Rs.					8,78,50,750.00

Supply, Installation, Testing and Commissioning of 11kV/3.3kV/415V Panel along with allied works for augmentation of GC Berth Sub-station including construction of Sub-station building at GC Berth area of Haldia Dock Complex, SMP, Kolkata.

SECTION VII
GENERAL CONDITIONS OF CONTRACT (GCC)

General Conditions of Contract (GCC), Part –I Civil works

**Sanctioned by the Trustees under Resolution No. 92 of the 6th Meeting held on 27th
May, 1993**

**Including Addendum Sanctioned by the Trustees under Resolution No. 80 of the
Meeting held on 25th August, 2009**

KOLKATA PORT TRUST
KOLKATA DOCK SYSTEM
& HALDIA DOCK COMPLEX
AUGUST , 2009

Supply, Installation, Testing and Commissioning of 11kV/3.3kV/415V Panel along with allied works for augmentation of GC Berth Sub-station including construction of Sub-station building at GC Berth area of Haldia Dock Complex, SMP, Kolkata.

GENERAL CONDITIONS OF CONTRACT

	CLAUSE		PAGES
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2.	DEFINITION	...	GC 2 – GC 3
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4.	THE TENDER/OFFER AND ITS PRE-REQUISITES	...	GC 5 – GC 9
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GC - 1

AMENDMENT
TO
GENERAL CONDITIONS OF CONTRACT

❖ *Cl-3.4 THE TENDER /OFFER & ITS PRE-REQUISITES*

Table under sub-clause (a)

PREVIOUS			AS AMENDED		
Estimated Value of Work	Amount of Earnest Money		Estimated Value of Work	Amount of Earnest Money	
	For Works Contract	For Contract of Supplying Materials or Equipment only		For Works Contract	For Contract of Supplying Materials or Equipment only
Up to Rs. 1,00,000=00	5% of the estimated value of work	1% of the estimated value of work	Up to Rs. 10 Crore	2% of the estimated value of work	1% of the estimated value of work
Over Rs. 1,00,000.00	2% of the estimated value of work subject to a maximum of Rs. 20,000/- and minimum of Rs. 5,000/-.	½% of the estimated value of work subject to a maximum of Rs. 10,000/- and minimum of Rs. 1,000/-.	Over Rs. 10 Crore	2% on first Rs. 10 Crore + 1% on the balance	½% of the estimated value of work subject to a maximum of Rs. 10,000/- and minimum of Rs. 1,000/-.

[AMENDMENT SANCTIONED BY THE BOARD OF TRUSTEES VIDE RESOLUTION NO 210 OF THE TRUSTEES' MEETING HELD ON 26.02.2013]

Table under sub-clause (d)

PREVIOUS			AS AMENDED		
Class of Registration	Amount Of Fixed Security	Financial Limit Of Each Tender	Class of Registration	Amount Of Fixed Security	Financial Limit Of Each Tender
A	Rs 10,000/-	Any tender priced upto Rs 2,00,000/-	A	Rs 50,000/-	Any tender priced up to Rs 10,00,000/-
B	Rs 5,000/-	Any tender priced upto Rs 1,00,000/-	B	Rs 25,000/-	Any tender priced upto Rs 5,00,000/-
C	Rs 2,500/-	Any tender priced upto Rs 50,000/-	C	Rs 15,000/-	Any tender priced upto Rs 3,00,000/-

[AMENDMENT SANCTIONED BY THE BOARD OF TRUSTEES VIDE RESOLUTION NO 82 OF THE TRUSTEES' MEETING HELD ON 12.10.2012]

Supply, Installation, Testing and Commissioning of 11kV/3.3kV/415V Panel along with allied works for augmentation of GC Berth Sub-station including construction of Sub-station building at GC Berth area of Haldia Dock Complex, SMP, Kolkata.

GC - 2

1. DEFINITIONS

- 1.0 In the contract, as here in after defined, the following words and expressions shall have the meaning herein assigned to them, except where the context otherwise required.
- 1.1 “Employer” or “Board” or “Trustees” means of the Board of Trustees for the Port of Calcutta, a body corporate under Section 3 of the Major Port Trusts Act, 1963, including their successors, representatives and assigns. *Employer*
- 1.2 “Chairman” means the Chairman of the Board and includes the person appointed to act in his place under Sections 14 and 14A of the Major Port Trusts Act, 1963. *Chairman*
- 1.3 “Contractor” means the person or persons, Firm or Company whose tender/offer has been accepted by the Trustees and includes the Contractor’s representatives, heirs, successor and assigns, if any, permitted by the Board/Chairman. *Contractor*
- 1.4 “Engineer” means the Board’s official who has invited the tender on its behalf and includes the Manager (Infrastructure & Civic Facilities) or other official as may be appointed from time to time by the Employer, with written notification to the Contractor, to act as Engineer for the purpose of the Contract, in place of the “Engineer” so designated. *Engineer*
- 1.5 “Engineer’s Representative” means any subordinate or Assistant to the Engineer or any other official appointed from time to time by the Engineer to perform the duties set forth in Clauses 2.4 to 2.6 hereof. *Engineer’s Representative*
- 1.6 “Work” means the work to be executed in accordance with the Contract and includes authorised “Extra Works” and ‘Excess Works” and “Temporary Works”. *Works*
- 1.7 “Temporary Works” means all temporary works of every kind required in or about the execution, completion or maintenance of the works 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. *Temporary works*
- 1.8 “Extra Works” means those works required by the Engineer for completion of the Contract which were not specifically and separately included in the schedule of items of the works i.e. (Bill of Quantities) of the tender. “Excess Works” means the required quantities of work in excess of the provision made against any item of the bill of Quantities. *Extra works and Excess works*
- 1.9 “Specifications” means the relevant and appropriate Bureau of Indian Standard’s specifications / International Standard’s Specifications (latest revisions) for materials and workmanship unless stated otherwise in the Tender. *Specification*

1.10	“Drawings” means the drawings referred to in the Tender and specification and any modification of such drawings approved in writing by the Engineer and such other drawings as may from time to time be furnished or approved in writing by the Engineer.	<i>Drawings</i>
1.11	“Contract” means and includes the General and Special Conditions of Contract, Specifications, Drawings, priced Bill of Quantities, the Tender / Offer, the letter of acceptance of the Tender/Offer, the Contract Agreement, if separately entered into and the Schedule of Rates and Price, if any, adopted by the Trustees at their discretion.	<i>Contract</i>
1.12	“Constructional Plant” means all appliances or things of whatsoever nature required or about the execution, completion or maintenance of the works or temporary works 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 works.	<i>Constructional Plant</i>
1.13	“Site” means the land, waterways and other places, on, under, in or through which the works are to be executed by the Trustees for the purpose of the Contract.	<i>Site</i>
1.14	“Contract Price” means the sum named in the letter of acceptance of the Tender/Offer of the Contractor, subject to such additions thereto and deductions therefrom as may be made by the Engineer under the provisions here in after contained.	<i>Contract Price</i>
1.15	“Month” means English Calendar Month.	<i>Month</i>
1.16	“Excepted Risks” are 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).	<i>Excepted Risks</i>
1.17	Word importing the singular only, also includes the plural and vice-versa where the context so requires.	<i>Singular/ Plural</i>
1.18	The heading and marginal notes in these General Conditions of Contract shall not be deemed to be part thereof or be taken into consideration in the interpretation or construction thereof or of the contract.	<i>Headings/ Marginal Notes.</i>
1.19	Unless otherwise stipulated the work “Cost” shall be deemed to include overhead costs of the Contractor, whether on or off the site.	<i>Cost</i>
2.0	DUTIES & POWERS OF ENGINEER & ENGINEER’S REPRESENTATIVE.	
2.1	The Contractor shall execute, compete 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.	<i>Engineer’s Authority</i>

- 2.2 The Contractor shall take instructions from the Engineer and subject to limitation of Clause 2.5 hereof, from the Engineer's Representative. *Authority of Engineer's Representative*
- 2.3 *The Engineer shall have full power and authority:* *Engineer's Power*
- (a) 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.
 - (b) to alter or modify the specification of any material and workmanship and to inspect the work at any time.
 - (c) to order for any variation, alteration and modification of the work and for extra works.
 - (d) to issue certificates as per contract.
 - (e) to settle the claims & disputes of the Contractor and Trustees, as the first referee.
 - (f) To grant extension of completion time.
- 2.4 *The Engineer's Representative shall :* *Power of Engineer's Representative.*
- (i) watch and supervise the works.
 - (ii) test and examine any material to be used or workmanship employed in connection with the work.
 - (iii) 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.
 - (iv) take measurements of work done by the contractor for the purpose of payment or otherwise.
 - (v) order demolition of defectively done work for its reconstruction all by the Contractor at his own expense.
 - (vi) have powers to issue alteration order not implying modification of design and extension of completion time of the work and
 - (vii) 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.

2.5 *Provided always that the Engineer's Representative shall have no power:**Limitation of
Engineer's
Representative's
Power*

- (a) to order any work involving delay or any extra payment by the Trustees,
- (b) to make variation of or in the works; and
- (c) to relieve the Contractor of any of his duties or obligations under the Contract.

2.6 Provided also as follows:

*Engineer's
Overriding Power*

- (a) 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 if any sustained by him.
- (b) If the contractor shall be dissatisfied by reason of any decision of the Engineer's Representative, he shall be entitled to refer the matter to the Engineer who shall thereupon confirm, reverse or vary such decision.
- (c) 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.

3.0 THE TENDER/OFFER AND ITS PRE-REQUISITES

3.1 The Contractor shall, before making out and submitting his tender/offer, be deemed to have inspected and examined the site, fully considered all factors, risks and contingencies, which will have direct and indirect impact on his expenses and profit from the work and shall be specifically deemed to have taken the following aspects into consideration:

*The tender must
encompass all
relevant aspects/
issues.*

- (a) The form and nature of the site and its surroundings including their sub-surface, hydrological, tidal and climatic conditions, the means of access to the site and all other local conditions, including the likely charges and costs for temporary way-leave, if any, required for the work.
- (b) The drawings, specifications, the nature and extent of work to be executed and the quality, quantity and availability of the required materials and labour for the work and the need to execute the work to the entire satisfaction of the Engineer, and also by complying with the General and Special Conditions of Contract.

*Site & Local
condition.**Drawing/
Specification/
Nature &
extent of
work to be
done.*

- (c) The accommodation required for the workmen and site office, mobilisation/demobilisation and storage of all plant, equipment and Construction materials. *Accommodation for Contractor's men/materials.*
- (d) The sources and means of procurement of water for drinking, washing and execution of work, and source and availability of electrical power, all at Contractor's cost. *Water for drinking etc. /Electrical power.*
- (e) Payment of taxes and duties and compliance of all applicable statutes, ordinances and law together with the rules made thereunder, the rules, regulations and bye-laws of public bodies or any local or other authority by the Contractor, keeping the Trustees indemnified against penalties and liabilities of every kind arising from the Contractor's failure in such compliance. *Payment of Taxes/duties and observance of all statutes.*
- (f) Payment of all kinds of stamp-duty for executing the agreement or for any legal instrument including Bank Guarantees and Indemnity Bonds. *Payment of Stamp Duty by the Contractor.*
- 3.2 The Contractor's tender shall be in ink on the Tender Forms supplied by the Trustees, unless stipulated otherwise in the Notice Inviting the Tender and shall be faultless in figures and free from erasing. Corrections, if any, shall only be made by scoring out and initialling of the revised figure.
- 3.3 If required by the Engineer or the Trustees, the Contractors in their tender or subsequently, shall disclose the names of their owners/partners/share holders at the required points of time. The failure in this regard shall be treated as a breach and a contract, if entered into, shall be liable to be cancelled. *Disclosure of Owner's name.*
- 3.4 (a) Unless otherwise stipulated in the Notice Inviting Tender / Offer, every tender must be submitted with Earnest Money of the amount calculated as per the following scale. *Earnest Money and Security Deposit.*

Estimated Value of Work	Amount of Earnest Money	
	For Works Contract	For Contract of Supplying Materials or Equipment only
Up to Rs. 1,00,000=00	5% of the estimated value of work	1% of the estimated value of work
Over Rs. 1,00,000=00	2% of the estimated value of work subject to a maximum of Rs. 20,000/- and minimum of Rs. 5,000/-.	½% of the estimated value of work subject to a maximum of Rs. 10,000/- and minimum of Rs. 1,000/-.

- (b) Earnest Money shall be deposited with the Trustees' treasurer in cash or by Banker's Cheque of any Calcutta Branch of a Nationalised Bank of India drawn in favour of Calcutta Port Trust or in the form of any "Account Payee" Draft of any Nationalised Bank of India drawn in favour of "Calcutta Port Trust" and payable at Calcutta/Haldia, as the case may be, and the receipt granted therefor be kept attached to the Tender/Offer in the Sealed Cover.

*Method of
Paying E.M.*

- (c) Earnest Money of unaccepted tender shall be refunded without any interest through A/c. Payee Cheque drawn on a Nationalised Bank of Calcutta / Haldia.

Refund of E.M.

- (d) The enlisted (registered) Contractors of the Trustees who have deposited fixed Security with the Trustees' FA & CAO / Manager (Finance) according to his Class of Registration, shall be exempt from depositing the Earnest Money, as per the following scale:

*Exemption from
E.M. to Regd.
Firms*

Class of Registration	Amount of Fixed Security	Financial Limit of Each Tender
A	Rs. 25,000/-	Any tender priced up to Rs.5,00,000/-
B	Rs. 10,000/-	Any tender priced up to Rs.2,00,000/-
C	Rs. 5,000/-	Any tender priced up to Rs.1,00,000/-

- (e) (i) Tender submitted without requisite Earnest Money may be liable to rejection.

*Tender with-
out EM liable to
rejection.*

- (ii) If before expiry of the validity period of his Tender/Offer, the tenderer amends his quoted rates or tender/offer making them unacceptable to the Trustees and/or withdraws his tender/offer, the Earnest Money deposited shall be liable to forfeiture at the option of the Trustees.

*Forfeiture of
E.M. before
Acceptance of
offer.*

- (f) The Earnest Money of accepted tender/offer shall be retained by the Trustees as part of the Security Deposit, for which a separate Treasury Receipt shall be issued to the Contractor after cancellation of the previous Receipt of Earnest Money.

*E.M. to be
converted to
part S.D.*

- (g) Balance security for works contract shall be recovered by deduction from all progressive Bill (including final Bill, if necessary) @ 10% of the gross value of work in each such bill, so that the total recovery may not exceed the quantum computed as per the under noted percentages of the total value of work actually done up to the stage of completion.

*Mode of
recovery of
balance S.D.*

Value of Work	% of Security Deposit for works contract.	% of Security Deposit For contract of supply-ing materials & equipment only.
For works up to Rs.10,00,000/-.	10% (Ten percent)	1% (One percent)
For works costing more than Rs.10,00,000/- and up to Rs.20,00,000/-	10% on first Rs.10,00,000/- + 7½% on the balance.	1% on first Rs.10,00,000/- + ½% on the balance.
For works costing more than Rs.20,00,000/-	10% on first Rs.10,00,000/- + 7 ½% on the next Rs.10,00,000/- + 5% on the balance.	1% on first Rs.10,00,000/- + ½% on the next Rs.10,00,000/- + ¼% on the balance.

Scale of S.D. recovery.

- (h) Balance Security for Contract of supplying materials and equipment computed in terms of the percentages given above, shall have to be deposited with the Trustees' Treasurer in advance and within 30 days from the date of placement of supply order, either in cash or by A/c. Payee Draft of a Nationalised Bank of India drawn in favour of Calcutta Port Trust and payable at Calcutta/Haldia, as the case may be.

S.D. for supply contracts to be deposited in advance.

- (i) No interest shall be paid by the Trustees to the Tenderer/Contractor on the amount of Earnest Money/Security Deposit held by the Trustees, at any stage.

No interest payable on E.M./S.D.

- 3.5 (i) The Security Deposit shall refunded to the Contractor in terms of Clause 9.3 hereinafter and subject to deduction, if any, under the provision of Sub-clause 3.5 (ii) herein below. Id, however, the Contract provides for any maintenance period. 50% of the Security Deposit may be refunded against any of the treasury Receipt for that amount on expiry of half of the maintenance period and the balance deposit on the expiry of the said maintenance period and after the Engineer has certified the final completion of work in Form G.C.2 and the Contractor has submitted his "No Claim" Certificate in Form G.C.3.

Mode of refund of S.D.

- (ii) The Security Deposit/Earnest Money may be liable to forfeiture at the option of the Trustees, if the Contractor fails to carry out the work or to perform/observe any of the conditions of the Contract. The Trustees shall also be at liberty to deduct any of their dues from the Security Deposit, fixed Security, Earnest Money or from any sum due or to become due to the Contractor under any other contract.

Forfeiture of S.D.

3.6 If stipulated in the contract as a Special Condition, the contractor shall have to submit to the Engineer a performance Bond in the form of an irrevocable guarantee from Calcutta/Haldia Branch, as the case may be, of any Nationalised Bank of India in the proforma annexed hereto and for the sum and period as mentioned in the letter of acceptance of the Tender/Offer, within 15 days from the date of such letter, failing which the Contract shall be liable to be terminated and the earnest money shall be liable to forfeiture; all at the discretion of the Engineer. The cost of obtaining this or any other Bank Guarantee and/or the revalidation thereof, wherever required, has to be borne by the Contractor and it shall be his 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 Trustees shall be at liberty to raise claim against the Guarantee and/or enforce the same unilaterally.

***Bank Guarantee
in lieu of Cash
S.D. in certain
cases***

3.7 “Every Tenderer/ Bidder shall submit, in respect of a tender value of more than Rs 5 Crore, along with their tender comprising Special Conditions of Contract, General Conditions of Contract, BOQ, Earnest Money, etc. a document called Integrity Pact Agreement duly signed by their authorized representative. The Proforma of the Integrity Pact Agreement shall as specified in the GCC. In case of tender value more than Rs 5 Crore, the Integrity Pact Agreement is an essential part and parcel of bid document to be submitted by each tenderer, without which the tender shall not be considered.”

4.0 THE CONTRACT & GENERAL OBLIGATIONS OF CONTRACTOR

4.1 (a) The contract documents shall be drawn-up in English language.

***English language
to be used***

(b) The contract shall be governed by all relevant Indian Acts. As applicable only within the jurisdiction of the High Court at Calcutta, India, including the following Acts:

***Applicability of
laws on the
contract***

1. The Contract Act (India), 1872.
2. The Major Port Trusts Act, 1963.
3. The Workmen’s Compensation Act, 1923.
4. The Minimum Wages Act, 1948.
5. The Contract Labour (Regulation & Abolition) Act, 1970.
6. The Dock Workers’ Act, 1948.
7. The Arbitration and Conciliation Act (1996) (in the case of a definite Arbitration Agreement only).

4.2 After acceptance of his Tender/Offer and when called on to do so by the engineer or his representative, the contractor shall, at his own expense, enter into and execute a Contract Agreement to be prepared by him in the form annexed hereto. Until such Contract Agreement is executed, the other documents referred to in the definition of the term ‘Contract’ here-in-before, shall collectively be the Contract.

***Contractor to
Execute Contract
Agreement.***

4.3 Several documents forming the contract are to be taken as mutually explanatory of one another. Should there be any discrepancy, ambiguity, omission or error in the various contract documents, the Engineer shall have the power to correct the same and his decision shall be final and binding on the parties to the Contract.

***Interpretation of
contract
documents –
Engineers’ Power***

- 4.4 Two copies of the Drawings referred to in the general and special Conditions of Contract and in the Bill of Quantities, shall be furnished by the Engineer to the Contractors 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. *All Drawings are Trustees' property.*
- 4.5 The Contractor shall prove 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. *Contractor to prepare working / progress drawings*
- 4.6 The Contractor shall not directly or indirectly transfer, assign or sublet the Contract or any part thereof without the written permission of the Engineer. Even if such permission be granted, the Contractor shall remain responsible (a) for the acts, defaults and neglect of any sub-contractor, his agents, servants or workmen as fully as if these were the acts, defaults or neglects of the Contractor himself or his agents, servants or workmen and (b) for his full and entire responsibility of the contract and for active superintendence of the works by him despite being sublet, provided always that the provision of labourers on a "piece rate" basis shall not be deemed to be sub-letting under this clause. *Contractor cannot sub-let the work*
- 4.7 Unless otherwise specified, the Contractor shall be deemed to have included in his Tender/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. *Contractors' price is inclusive of all costs*
- 4.8 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. *Contractor is responsible for all construction process, except for correctness of design and specification formulated by the Engineer*
- 4.9 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, (c) 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. *Contractor to submit his programme of work*

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.

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|------|---|---|
| 4.10 | 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 maintenance period. 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 Clause 2.5 hereof. The Contractor shall inform the Engineer or his representative in writing about such representative/agent of him at site. | <i>Contractor to supervise the works</i> |
| 4.11 | The Contractor shall employ in execution of the Contract only qualified careful and experienced persons and the Engineer shall be at liberty to direct the Contractor to stop deployment of any of its staff, workmen or official at site and the Contractor shall within 48 hours comply with such instruction without any demur whenever the Engineer shall feel that the deployment of the person concerned will not be conducive to the proper and timely completion of the work. | <i>Contractor to deploy qualified men and Engineer's power to remove Contractor's men</i> |
| 4.12 | 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. | <i>Contractor is responsible for line, level, setting out etc.</i> |
| 4.13 | From the commencement of the works till issue of the completion certificate in Form G.C.1, vide Clause 5.12 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 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 Maintenance period (Guarantee 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 in the maintenance period. | <i>Contractor is responsible to protect the work</i> |

- 4.14 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.
- Contractor is responsible for all damages to other structures / persons caused by him in executing the work.*
- 4.15 The Contractor shall immediately inform the Engineer's Representatives 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.
- Fossils, Treasure trawois, etc. are Trustees' property*
- 4.16 The Contractor shall be deemed to have indemnified and shall indemnify the Trustees against all claims, demands, actions and proceedings and all costs arising therefrom on account of :
- Contractor to Indemnify the Trustees against all claims for loss, damage, etc.*
- (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 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.
- 4.17 Debris and materials, if obtained by demolishing any property, building or structure in terms of the Contract shall remain the property of the Trustees.
- Dismantled materials Trustees' property*

4.18 The Contractor's quoted rates shall be deemed to have been inclusive of the following:

*Contractor's
quoted rates/price
must be all
inclusive*

- (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 labourer 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 local authority or the Engineer or his Representative for preventing (i) spread of any infectious disease like smallpox, cholera, plague or malaria 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 years.

4.19 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 tender or to the Contractor's Site Office 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.

*Notice to
Contractor.*

4.20 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.

*Contractor not to
publish
photograph or
particulars of work*

- 4.21 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. *Contractor to provide facilities to outsiders*
- 4.22 The work has to be carried out by the Contractor causing the minimum of hindrance for any maritime traffic or surface traffic. *Work to cause minimum possible hindrance to traffic movement*
- 4.23 All constructional plants, temporary works and materials when brought to the site by the Contractor shall be deemed to be the property of the Trustees 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. *Trustees' lien on Contractor's Plant & Equipment.*
- 5.0 COMMENCEMENT, EXECUTION AND COMPLETION OF WORK.
- 5.1 The Contractor shall commence the work within 7 days of the receipt of Engineer's letter informing acceptance of the Contractor's tender/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 Representatives, time being deemed the essence of the contract on the part of the contractor. *Preliminary time to commence work an maintenance of steady rate of progress*
- 5.2 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. *Contractor's site office*
- 5.3 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. *Contractor to observe Trustees' working hours*

- 5.4 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. *Contractor to supply all materials as per requirement of the Engineer or his representative*
- 5.5 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. *Materials & Works*
- 5.6 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. *Contractor to submit samples for approval*
- Unless stipulated otherwise in the contract, the cost of any test required by the Engineer or his representative in respect of materials and workmanship deployed on the work, shall be borne by the Contractor. *Contractor to arrange all testing at his own cost.*
- 5.8 Regarding the 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' Stores, 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. *The Contractor shall account for and look after the Trustees' materials*
- (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 in writing. *Contractor to compensate for loss and damage to Trustees' materials*
- (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. *Delay in supply of Trustees' materials will only entitle the Contractor for extension of completion time of work*

(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 tender/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.

Recovery from Contractor for Trustees' materials under normal circumstances

(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 ¼% extra over the higher one of the followings -

Recovery from Contractor for Trustees' materials under other circumstances.

(1) The issue rate of the materials at the Trustees' Stores and

(2) The market price of the material on the date of issue as would be determined by the Engineer.

5.9 The Engineer or his Representative shall have the power to inspect any material and work at any time and to order at any time – (I) 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, (ii) for the substitution of the proper and suitable materials, or (iii) 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 days.

Contractor to replace materials/work not acceptable to the Engineer or his Representative

5.10 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.

Contractor to seek approval of Engineer or his Representative before covering up any portion of work

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.

- 5.11 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 –

*Contractor to
suspend work on
Order from
Engineer or his
Representative*

- (a) otherwise provided for in the contract, or
- (b) necessary by reason of some default on the part of the contractor, or
- (c) necessary by reason of climatic conditions on the site, or
- (d) necessary for proper execution of the works or for the safety of the works or any part thereof.

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, and the same shall be final and binding on the Contractor.

- 5.11.1 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.

- 5.12 When the whole of the work has been completed to the satisfaction of the Engineer and has passed any final test prescribed in the contract, the contractor shall, within 21 days of submission of his application to the Engineer, be entitled to receive from him a certificate for completion of work in Form G.C.1, annexed hereto. If any part of the total work having been completed to the satisfaction of the Engineer, be taken over and/or used by the Trustees, the Contractor shall on application be entitled to partial completion certificate in the Form G.C.1 indicating the portion of the work covered by it, so that the Contractor's liability during maintenance period of the contract, if any, shall commence from the date mentioned in such certificate so far as the completed portion of the work is concerned.

*Completion
Certificate G.C.1.*

6.0 TERMS OF PAYMENT:

- 6.1 No sum shall be considered as earned by or due to the Contractor in respect of the work till final and satisfactory completion thereof and until a certificate of final completion in Form G.C.2 has been given by the Engineer.

All interim payments are advances till issue of Certificate in Form G.C.2

On account payments, if any, made prior to issue of the certificate in Form G.C.2, shall all be treated as mere advance, which shall stand recoverable in full or in part, if the Engineer so decides in the context of Contractor's unfulfilled contract condition, if any.

- 6.2 All payments shall be made to the Contractor only on the basis of measurements of actual work done, as recorded in the Trustees' measurement books and at accepted tendered or at agreed rates, as the case may be, except as otherwise provided in the contract and when the Engineer decides any other rate for change in the scope of work or omission, if any, on the part of the Contractor.

Payment on the basis of measurements at agreed rates.

- 6.3 For work of sanctioned tender value more than Rs.50,000/- or having an initially stipulated completion period of 4 months or more, on account payments may be made at the discretion of the Engineer or his Representative at intervals deemed suitable and justified by him. Provided always that subject to execution of work of substantial value in the context of the contract price, the interval of such on account payments shall be decided by the Engineer or his Representative, which shall ordinarily not be less than 1 month in between two payments for on account bill and/or advance.

Limitation for on account payment

- 6.4 Measurement for works done shall be progressively taken by the Engineer's Representative and entered in the Trustees' Measurement Book, at intervals deemed suitable and proper by him and/or the Engineer. The Contractor or his duly accredited Representative or Agent shall remain present at the time of such measurement and assist the engineer's Representative in every manner required by him. After the measurements taken have been entered in the Measurement Book, the Contractor or his Agent shall sign the Measurement Book at the end of such Measurements over the Contractor's Rubber Stamp as a token of acceptance of all such measurements, recorded above and prior to such signature. If the Contractor or his Agent fails to participate even after 3 days written notice from the Engineer's Representative, the measurement shall be taken ex-parte by the Engineer's Representative and those shall be accepted by the Contractor.

Recording of measurements

6.5 Based on the quantum of work and the value thereof computed in the Measurement Book, the Contractor shall type out his bill in the proforma approved by the Engineer and submit the same to the Engineer's Representative in quadruplicate, duly signed by him or his accredited Agent over his Rubber Stamp. The Engineer or his Representative may in his absolute discretion, allow advance payment against such bill to the extent of an amount not exceeding 75% of the "net payable" sum of the said bill, subject to adjustment thereof against the bill at the time of checking and auditing the bill at the Trustees' end. The measurement Book will not be handed over to the Contractor; but he will obtain the abstracts of quantities, amounts and recoveries to type out the bill.

*Contractor to
prepare and
submit his bills*

6.6 At the discretion of the Engineer or his Representative and only in respect of accepted offers/where estimated amount put to tender would be Rs.2,00,000/- or more, advance payment may be made to the extent of 75% of the value of any material purchased and brought to the site by the Contractor. Provided always that –

- (i) the materials shall, in the opinion of the Engineer or his Representative be of imperishable nature,
- (ii) the value of such materials shall be assessed by the engineer or his Representative at their own discretion,
- (iii) a formal agreement has been drawn up with the contractor, under which the Trustees secure a lien on the contractor's materials,
- (iv) the materials are safe-guarded by the contractor against losses, shortage and misuse due to the contractor postponing the execution of the work or otherwise,
- (v) in the event of storage of such materials within the Trustees' protected areas in the Docks, the contractor shall submit an Indemnity Bond in the proforma and manner acceptable to Trustees' whereby the contractor shall indemnify the Trustees against all financial loss/damage, on account of loss/damage to such materials for whatever reasons,

*Advance payment
against Non-
perishable
materials*

- (vi) in the event of storage of such materials outside the Trustees' protected areas the Contractor shall submit to the Engineer an irrevocable Bank Guarantee favouring the Trustees and for the same sum as is being advance, in the proforma and manner acceptable to the Trustees. The Guarantee shall be of a Calcutta/Haldia Branch of any Nationalised Bank or a Schedule Commercial Bank, as the case may be, acceptable to the Trustees and shall remain valid till the anticipated period of consumption of such materials in the work. The Bank Guarantee must bear an undertaking by the issuing Bank guaranteeing automatic payment of the guaranteed sum to the Trustees by the Bank on the date of expiry of the validity of the Guarantee, unless with the prior written approval of the Engineer on behalf of the Trustees, the Bank has extended the validity of the Guarantee.
- (vii) The amount of advance shall be recoverable from the contractor's bills or any other dues, progressively with the consumption of the materials on the basis of quantity consumed. Consequent on full recovery of the advance the Indemnity Bond/Bank Guarantee, vide Sub-clause (v) & (vi) above, shall be returned to the Contractor duly discharged by the Engineer on behalf of the Trustees.
- 6.7 No certificate of the Engineer or his representative shall protect the Contractor against or prevent the Trustees from obtaining repayment from the Contractor, in case the Engineer or his representative should overcertify for payment or the Trustees should over-pay the Contractor on any account. *Recovery for wrong and over payment*
- 6.8 No claim for interest shall be admissible or payable to the Contractor at any stage and in respect of any money or balance or Bank Guarantee, which may be due to the Contractor from the Trustees, owing to dispute or otherwise or for any delay on the part of the Trustees in making interim or final payment or otherwise. *Interest not admissible to Contractor*
- 7.0 VARIATION AND ITS VALUATION:
- 7.1 The Quantities set out in the Bill of Quantities of the tender shall be treated as estimated quantities of the work and shall never be deemed as actual or correct quantities of the works to be executed by the contractor in fulfilment of his obligation under the contract. *Quantities in Bill of Quantities of Tender*
- 7.2 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: *Engineer's power to vary the works*

- 7.2 (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

- 7.3 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.

*Variation by
engineer do not
vitate the
contract*

- 7.4 Provided always that written order of the Engineer shall not be required for increase or decrease in the quantity of any work upto 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 bill of quantities. Provided also that verbal order of variation from the Engineer shall be complied with by the Contractor and the Engineer" subsequent written confirmation of such verbal order shall be deemed to be an order in writing within the meaning of this clause.

*Where written
order for
variation is not
needed*

- 7.5 (a) 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.

*Payment for
extra or
additional, or
omitted work or
substituted work,
Engineer's
powers*

- (b) 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.

- (c) 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 tender), 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.

- (d) 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 sub-clauses (b) and (c) of this clause, 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.

8.0 DELAY / EXTENSION OF COMPLETION TIME / LIQUIDATED DAMAGE / TERMINATION OF CONTRACT

- 8.1 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 exceptionally adverse climatic conditions and natural phenomenon or strikes, lock-outs, civil commotion or other special circumstances of any kind beyond the control of the Contractor, cause delay in completing the work, the contractor shall apply to the Engineer in writing for suitable extension of completion time within 7 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" Clause (No.8.3 hereof) on the Contractor and his decision shall be final and binding on the Contractor. If an extension of completion time is granted by the Engineer without imposition of liquidated damage, from the Clause No.8.3 of the Liquidated damage 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. *Extension of completion time*
- 8.2 (a) If the Contractor fails to complete the work within the stipulated dates 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, ½% (half percent) of the total value of work (contract piece) as mentioned in the letter of acceptance of the tender/offer, for every week or part thereof the work remains unfinished. Provided always that the amount of such compensation shall not exceed 10% of the said value of work. The amount of Liquidated damages shall be determined by the Engineer, which shall be final and binding. *'Liquidated Damage' and other compensation due to Trustees*

- (b) Without prejudice to any of their legal rights, the Trustees shall have the power to recover the said amount of compensation/damage in Sub-clause (a) of this clause, 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 three days notice in writing has been given to the Contractor by the Engineer or his Representative.

- 8.3 Without being liable for any compensation to the Contractor, the Trustees may, in their absolute discretion, terminate the contract and enter upon the site and works and expel the Contractor there from after giving him a minimum 3 days' notice in writing, due to occurrence of any of the following reasons and decision of the Trustees in this respect, as communicated by the Engineer shall be final and conclusive:

*Default of the
Contractors
remedies &
powers/Termination of
Contract.*

- (i) The Contractor has abandoned the contract.
- (ii) In the opinion of the Engineer, either the progress of work is not satisfactory or the work is not likely to be completed within the agreed period on account of Contractor's lapses.
- (iii) The Contractor has failed to commence the works or has without any lawful excuse under these conditions has kept the work suspended for at least 15 days despite receiving the Engineer's or his Representative's written notice to proceed with the work.
- (iv) The Contractor has failed to remove materials from site or to dismantle or demolish and replace work for 7 days after receiving from the Engineer or his representative the written notice stating that the said materials or work were condemned and rejected by him under these conditions.
- (v) The Contractor is not executing the works in accordance with the contract or is persistently or flagrantly neglecting to carry out his obligations under the contract.
- (vi) Any bribe, commission, gift or advantage is given, promised or offered by or on behalf of the contractor to any officer, servant or representative of the Trustees or to any person on his or their behalf in relation to the obtaining or to the execution of the contract.
- (vii) The Contractor is adjusted insolvent or enters into composition with his creditors or being a company goes into liquidation either compulsory or voluntary.

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- 8.3.1 Upon receipt of the letter of termination of work, which may be issued by the Engineer on behalf of the Trustees, the Contractor shall hand over all the Trustees' tools, plant and materials issued to him at the place to be ascertained from the Engineer, within 7 days of receipt of such letter.

- 8.3.2 In all such cases of Termination of work, the Trustees shall have the power to complete the work through any other agency at the Contractor's risk and 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 he duly completed the work of the work in accordance with the contract.
- 8.3.3 Upon termination of contract, the Contractor shall be entitled to receipt payment of only 90% of the value of work actually done or materials actually supplied by him and subject to recoveries as per contract, provided the work done and materials conform to specifications at the time of taking over by the Trustees. The payment for work shall be based on measurements of actual work done and priced at approved contract rates or other rates, as decided by the Engineer. The payment for materials supplied shall be at the rates as decided by the Engineer, which shall in no case be more than market rates prevailing at the time of taking over by the Trustees. The Engineer's decision in all such case shall be final, binding and conclusive.
- 8.3.4 The Trustees shall have the power to retain all moneys due to the Contractor until the work is completed by other agency and the Contractor's liabilities to the Trustees are known in all respect.

9.0 MAINTENANCE AND REFUND OF SECURITY DEPOSIT

- 9.1 On completion of execution of the work the Contractor shall maintain the same for a period, as may be specified in the form of a Special Condition of the Contract, from the date mentioned in the Initial Completion Certificate in Form G.C.1. Any defect/fault, which may appear in the work during 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 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.

Contractor's obligation for maintenance of work.

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- 9.2 The Contractor shall not be considered completed and the work shall not be treated as finally accepted by the Trustees, until a Final Completion Certificate in Form G.C.2 annexed hereto shall have been signed and issued by the Engineer to the contractor after all obligations under the Contract including that in the maintenance period, 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.

Certificate of final completion

- 9.3 On completion of the contract in the manner aforesaid, the Contractor may apply for the refund of his Security Deposit by submitting to the Engineer (I) The Treasury Receipts granted for the amount of Security held by the Trustees, and (ii) his “No further claim” Certificate in Form G.C.3 annexed hereto (in original), where upon the Engineer shall issue Certificate in Form G.C.2 and within two months of the Engineer’s recommendation, the Trustees shall refund the balance due against the Security Deposit to the Contractor, after making deduction there from in respect of any sum due to the Trustees from the Contractor. *Refund of Security Deposit*
- 10.0 INTERPRETATION OF CONTRACT DOCUMENTS, DISPUTES AND ARBITRATION
- 10.1 In all disputes, matters, claims, demands or questions arising out of or connected with the interpretation of the Contract including the meaning of Specifications, drawings, designs and instructions or as to the quality of workmanship or as to the materials used in the work or the execution of the work whether during the progress of the works or after the completion and whether before or after the determination, abandonment or breach of the contract the decision of the Engineer shall be final and binding on all parties to the contract and shall forthwith be given effect to by the Contractor. *Engineer’s decision*
- 10.2 If the Contractor be dissatisfied with any such decision of the Engineer, he shall within 15 days after receiving notice of such decision require that the matter shall be referred to Chairman, who shall thereupon consider and give a decision. *Chairman’s award.*
- 10.3 If, however, the Contractor be still dissatisfied with the decision of the Chairman, he shall within 15 days after receiving notice of such decision require that within 60 days from his written notice, the Chairman shall refer the matter to an Arbitrator of the panel of Arbitrators to be maintained by the Trustees for the purpose and any such reference shall be deemed to be a submission to arbitration within the meaning of Indian Arbitration Act, 1940 or any statutory modification thereof. *Arbitration.*
- 10.3.1 If the Arbitrator so appointed is unable or unwilling to act or resigns his appointment or vacates his office due to any reason whatsoever, another person from panel shall be appointed as Sole Arbitrator and he shall proceed from the stage at which his predecessor left it.

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- 10.3.2 The Arbitrator shall be deemed to have entered on reference on the date he issues notice to both the parties fixing the date of first hearing.
- 10.3.3 The time limit within which the Arbitrator shall submit his award shall normally be 4 months as provided in Indian Arbitration Act, 1940 or any amendment thereof. The Arbitrator may, if found necessary, enlarge the time for making and publishing the award, with the consent of the parties..

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- 10.3.4 The venue of the arbitration shall be either Calcutta or Haldia as may be fixed by the Arbitrator in his sole discretion. Upon every or any such reference the cost of any incidental to the reference and award respectively shall be in the discretion of the Arbitrator who may determine, the amount thereof or by whom and to whom and in what manner the same shall be borne and paid.
- 10.3.5 The Award of the Arbitrator shall be final and binding on all parties subject to the provisions of the Indian Arbitration Act 1940 or any amendment thereof. The Arbitrator shall give a separate award in respect of each item of disputes and respective claim referred to him by each party and give reason for the award.
- 10.3.6 The Arbitrator shall consider the claims of all the parties to the contract – within only the parameters of scope and conditions of the contract in question.
- 10.3.7 Save as otherwise provided in the contract the provisions of the Arbitration Act, 1940 and rules made thereunder, for the time being in force, shall apply to the arbitration proceedings under this Clause.
- 10.4 The Contractor shall not suspend or delay the work and proceed with the work with due diligence in accordance with Engineer's decision. The Engineer also shall not withhold any payment, which, according to him, is due or payable to the Contractor, on the ground that certain disputes have cropped up and are likely to be referred to arbitration.
- 10.5 Provided always as follows:
- [a] Nothing of the provisions in paragraphs 10.3 to 10.3.7 hereinabove would apply in the cases of contracts, where tendered amount appearing in the letter of acceptance of the tender / offer is less than Rs.40,00,000/-.
 - [b] The Contractor shall have to raise disputes or differences of any kind whatsoever in relation to the execution of the work to the Engineer within 30 days from the date of occurrence of the cause of dispute and before the preparation of the final bill, giving detailed justifications, in the context of contract conditions.

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- [c] Contractor's dispute if any arising only during the maintenance period, if any, stipulated in the contract, must be submitted to the Engineer, with detailed justification in the context of contract conditions, before the issuance of final completion certificate in Form G.C.-2 *ibid*.
No dispute or difference on any matters whatsoever, the Contractor can raise pertaining to the Contract after submission of certificate in form G.C.3 by him.

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- [d] Contractor's claim / dispute raised beyond the time limits prescribed in sub-clauses 10.5[b] and 10.5 [c] hereinabove, shall not be entertained by the Engineer and / or by any Arbitrator subsequently.
- [e] The Chairman / Trustees shall have the right to alter the panel of Arbitrators, vide Clause 10.3 hereinabove, on their sole discretion, by adding the names of new Arbitrators and / or by deleting the names of existing Arbitrators, without making any reference to the Contractor.

General Conditions of Contract (GCC), Part –II Electrical works

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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), 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

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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 **“SMP Kolkata”** 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 SMP Kolkata, 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 SMP Kolkata 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 SMP Kolkata is required or called upon to pay or reimburse on behalf of the Contractor.
- 7.7.4 The Contractor shall indemnify SMP Kolkata 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 SMP Kolkata 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 SMP Kolkata 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 SMP Kolkata 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 SMP Kolkata 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 SMP Kolkata such security, as shall from time to time, be reasonably required by SMP Kolkata 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 SMP Kolkata 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 SMP Kolkata 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 SMP Kolkata 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 SMP Kolkata 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, SMP Kolkata 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 SMP Kolkata).
- In the event of disagreement, SMP Kolkata 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:

Supply, Installation, Testing and Commissioning of 11kV/3.3kV/415V Panel along with allied works for augmentation of GC Berth Sub-station including construction of Sub-station building at GC Berth area of Haldia Dock Complex, SMP, Kolkata.

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 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),

Supply, Installation, Testing and Commissioning of 11kV/3.3kV/415V Panel along with allied works for augmentation of GC Berth Sub-station including construction of Sub-station building at GC Berth area of Haldia Dock Complex, SMP, Kolkata.

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 SMP Kolkata 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 (SMP Kolkata)** 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 SMP Kolkata, 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, SMP Kolkata, 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 SMP Kolkata, 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.

SMP Kolkata 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 SMP Kolkata, 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 SMP Kolkata, 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.

SMP Kolkata 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 SMP Kolkata, 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 SMP Kolkata 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 SMP Kolkata, 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, SMP Kolkata'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 SMP Kolkata 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 SMP Kolkata, to be allotted to the Contractor, shall have to be paid by the Contractor, as per the 'Schedule of Rent of SMP Kolkata, 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 SMP Kolkata 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 SMP Kolkata'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, **SMP Kolkata shall have no liability,**

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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 SMP Kolkata, in the event of SMP Kolkata 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 SMP Kolkata 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

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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 SMP Kolkata 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 SMP Kolkata, 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, SMP Kolkata 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 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 SMP Kolkata]**, 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
- 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,
 - for the substitution of proper and suitable materials, or
 - 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 SMP Kolkata**
- 7.66.1 The **Contract job** will be taken over by HDC, SMP Kolkata 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, SMP Kolkata.
- 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

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(Taking over of the Contract job by SMP Kolkata)] 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, SMP Kolkata may proceed to do the work at the Contractor's risk and expense, but without prejudice to any other rights which HDC, SMP Kolkata 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, SMP Kolkata 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 SMP Kolkata with respect to any delay on the part of SMP Kolkata 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 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 SMP Kolkata'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**

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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

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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 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

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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

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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)

1.0 PREFACE:

These provisions though given in a separate section are part of the tender documents which must be read as a whole, the various sections being complementary to one another and are to be taken as mutually explanatory. These provisions shall be read in conjunction with the other parts of the tender documents viz. General Conditions of Contract, Notice Inviting E-Tenderers, instructions to Bidder, Particular Specifications, Drawings, Bill of Quantities and other documents forming part of the Contract. In case of any discrepancy or ambiguity in the documents, the order of precedence of the documents as stated below will apply. In particular, these provisions will over ride those in the General Conditions provided there is discrepancy between them.

1.1 CORRELATION AND ORDER OF PRECEDENCE OF TENDER DOCUMENTS:

If the stipulations in the various tender documents be found to be at variance in any respect, one will override others (but only to the extent these are at variance) in the order of precedence as given in the list below, i.e. any particular item in the list will take precedence over all those placed lower down in the list.

- Order letter.
- Bill of Quantities.
- Drawings.
- Particular Specifications of work.
- Special Conditions of Contract.
- General Conditions of Contract.

In case of any dispute, question or difference either during the execution of the work or any other time as to any matter or thing connected with or arising out of this Contract, the decision of the Sr. Dy. Manager (I&CF), Haldia Dock Complex, thereon shall be final and binding upon all parties.

1.2 LOCATION:

Haldia Dock System is located at the confluence of River Haldi and River Hooghly at Latitude 22°2' North and Longitude 88°6' East, at about 130 Kms upstream from Sand heads and 104 Kms downstream of Kolkata. The port is located on national Waterway No-1; at about 45 Kms upstream from pilot age Station. The berths of Haldia Dock Complex are located inside an Impounded Dock Basin. Berths 2,3,4, 4A, 4B and 5 are on the Eastern side of the Basin while Berths 8,9,10,11,12 and 13 are on its Western side. The Northern side of the basin houses Berths 6 and 7 through a Finger Jetty.

The Location of the site of work for widening of road is from phosphate gate to berth no. 2 in dock area at HDC, Haldia.

1.3 ACCESS TO THE SITE:

(a) By Road:

All-weather hard top road approachable from N.H. 41 and State Highway exist right up to the area of work.

(b) By Rail:

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S. E. Railway Branch Line connects Haldia with the Panskura Railway Station.

1.4 INSPECTION OF SITE:

The Bidder shall inspect the site of work and thoroughly familiarise himself with the nature of work, site conditions, and access to the site and location before submission of the tender. He should contact the Sr. Dy. Manager (Dock), I&CF, Haldia Dock Complex at his office at Chiranjibpur, Haldia for collecting information about the work and site before submission of the tender. No excuse will be entertained afterwards on the above ground. In case any part of the site cannot be handed over to the successful Bidder in time, No compensation for loss of labour or any other cause nor any claim will be entertained by the Trustees. Suitable extension of time shall, however, be granted to the successful Bidder on that ground if applied for.

1.5 PARTICULARS OF EXISTING WORKS:

Such information as maybe given in the specification as to the existing features and works other than those now under construction as part of the present Haldia Dock Complex given without warranty of accuracy and neither the Trustees nor the Engineer will be liable for any discrepancies therein.

1.6 SAFETY MEASURES:

The contractor shall adhere to safe construction practice, guard against hazardous and unsafe working conditions and follow all safety precautions for prevention of injury or accidents and safeguarding life and property. The contractor shall comply with relevant provisions of Dock Workers (Safety, Health and Welfare) Act – 1986 and Dock Workers (Safety, Health and Welfare) Regulation – 1990 and Safety Officer of the Trustees or Safety Inspectors shall be afforded all facilities for inspection of the works, tools, plant, machineries, equipments etc. wherever so required. The contractor shall further comply with any instruction issued by the Engineer, Trustees' Safety Officer, Safety Inspector in regards to safety which may relate to temporary, enabling or permanent works, working of tools, plants, machineries, equipments, means of access or any other aspect.

The contractor shall provide all necessary first aid measures, rescue and life saving equipment to be available in proper condition.

The contractor shall provide PPE's (Personal Protective Equipments) such as, helmet, safety shoe etc. to all workers and shall also provide job specific PPE's e.g. safety belts for working at heights; protective face and eye shield, goggles, hand gloves for welding / gas cutting works; protective foot wear and gloves for hot works; facemasks, gloves and overalls for painting works, mixing and handling materials etc, as directed by the Engineer.

All safety rules shall be strictly followed while working on live electrical systems or installations as stipulated in the relevant safety codes.

Use of hoisting machines and tackles including their attachments, construction tools, machineries and equipments shall comply to the relevant safety codes.

Before allowing workers in sewers, manholes, any duct or covered channel etc, the manhole covers shall have to be kept open and ventilated at least one hour in advance and necessary safety torches / lamps should be inserted first before allowing entry to the worker. Suitable hand gloves and other

safety gear will be provided to the worker during handling / removing of slushes / sludge etc. without any extra cost. The contractor shall adopt all the above safety measures at his own cost.

The successful bidder shall also ensure that –

- (i) No damage is caused to plants and vegetations unless the same is required for execution of the project proper.
- (ii) The work shall not pollute any source of water / land / air surrounding the work site so as to affect adversely the quality or appearance thereof or cause injury or death to animal and plant life.
- (iii) His office & labour hutment etc. shall be maintained in a clean and hygienic condition through out the period of their use and different effluents of the labour hutment shall have to be disposed off suitably.

1.7 HOLIDAY OR SUNDAY WORK:

Subject to provisions in local Acts and any statutes of the State, the Contractor shall arrange for working on Holidays and Sundays whenever so desired by the Engineer to expedite progress and complete the works in time.

The Contractor shall not be entitled to any additional payment for taking up works on Holidays and Sundays. The Contractor should be prepared to resort to round-the-clock working by following shift timings for labour.

1.8 KEEPING THE SITE AND WORKING AREA CLEAR:

The Contractor shall at all times keep the site and working areas free from all surplus materials, rubbish and offensive matter all of which shall be disposed off in a manner to be approved by the Engineer's Representative. As the works will be carried out mainly inside of operational buildings of HDC, the Contractor has to make necessary arrangement to clear the rubbishes etc. from the buildings, at the end of day's work at his own cost & risk.

1.9 CONSTRUCTION OF SITE OFFICE, STORE ETC.:

On an application from the Contractor, land near to the site of work will be allotted by the Trustees for the construction of Site Office, Store etc. For such allotment a rent will be recovered from Contractor's bill at prevailing rates of HDC plus applicable GST. The Contractor shall hand over vacant possession of the land free from all encumbrances within two months from actual date of completion of work (as stated in G.C.-I). In case the contractor does not remove the site offices, store etc. within two months from the actual date of completion, the contractor will have to pay compensation equivalent to **three times** the applicable licence fee for the plot of land allotted to him temporarily for site offices, store etc. as per Schedule of Rent of Ko.PT's land and buildings at Haldia and to be recovered from his final bill / Security Deposit. The Contractor shall build office, sheds etc. on the land allotted to him as approved by the Engineer or his representative and shall maintain a clean hygienic condition throughout the period of their use.

The Contractor shall maintain a Site Order Book at his site office and all orders and instructions issued to him from time to time by the Engineer or his representative will be recorded in the Site

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Order Book. The Contractor shall promptly sign each entry as a token of having received such orders.

1.10 LABOUR, TOOLS & PLANTS:

The Contractor shall supply all necessary labour, tools and plants required for satisfactory execution of the work.

1.11 ESCALATION / VARIATION ON PRICES:

No Escalation / Variation on the prices on any account will be considered for adjustment / payment.

1.12 CONTRACT LABOUR LAWS:

The Contractor must comply with the provisions of Contract labour (Regulation & Abolition) Act 1970 and Contract Labour (Regulation & Abolition) Central Rules 1971 and the rules framed there under with all modifications/amendments being enforced from time to time.

The Contractor shall indicate maximum number of workmen to be engaged on any day for execution of the work in the appropriate place in the ABSTRACT FORM OF TENDER & he shall have to obtain a regular /permanent license as per sec12(1) of the Contract Labour Act.

Further , whenever a contract work has commenced or completed , the contractor has to intimate the same to the Assistant Labour Commissioner(Central) /labour Enforcement Officer (Central) in Form IV-A , within 15 days of such commencement or completion.

The contractor has to obtain a certificate of registration under “Building & Other Construction Workers (Regulation of Employment & Conditions of Service) Act-1996 and Central Rule 1998 and his rate shall include a cess payable @ 1 % of the cost of construction as applicable under “Building & Other Construction Workers Welfare Cess Act -1996 & Welfare Cess Rules 1998.

The contractor has to arrange for displaying the name of the Regional Labour Commissioner (Central), Asst. Labour Commissioner (Central) & Labour Enforcement Officer (Central) at his worksite(s).

The contractor shall inform the Principal Employer the date, time & venue of disbursement to be made by him to his workers.

The successful bidder shall also be required to put up a notice at the site of work mentioning the date, time & venue of disbursement to be made by him to his workers and he or his authorized representative shall have to be present during period of disbursement.

1.13 COMPLIANCE WITH E.P.F & M. P. ACT:

The successful contractor will have to comply with provision of EPF & MP Act –1952 (along with amendments, if any), issued from time to time.

If asked for by the Employer, the contractor will be required to submit photocopy of all payment challans and produce the original for verification to the representative of the principal employer, i.e. Sr. Dy. Manager (P&E).

1.14 INDEMNIFICATION:

The successful bidder shall be deemed to indemnify and keep indemnified the Trustees from and against all actions, claims, demands and liabilities whatsoever under and in respect of the breach of any of the provisions of any law, rules or regulations having the force of law, including but not limited to –

- a) The Minimum Wages Act, 1948.
- b) The Dock Workers (Regulation Of Employment) Act, 1948
- c) The Building And Other Construction Workers (Regulation of Employment & Conditions of Service) Act, 1996
- d) The Dock Workers' Safety, Health & Welfare Act , 1986
- e) The Payment of Wages Act, 1936.
- f) The Workmen's Compensation Act, 1923.
- g) The Employees Provident Fund Act, 1952.
- h) The Contract Labour (Regulation and Abolition) Act, 1970; Rules 1971.
- i) The Payment of Bonus Act, 1965.
- j) The Payment of Gratuity Act, 1972.
- k) The Equal Remuneration Act, 1976.
- l) The Employees State Insurance Act, 1948 & Employees State Insurance (Amendment) Act ,1989
- m) Child Labour (Prohibition and Regulation) Act, 1986.
- n) The Maternity Benefits Act 1961
- o) Interstate Migrant Workmen (Regulation of Employment & Conditions Of Service) Act, 1979.
- p) Motor Vehicle Act, latest revision.

1.15 DOCK PERMIT:

Dock permits which may be necessary for any purpose related to the work shall be issued against payment at the prevailing rate of HDC.

1.16 TAXES:

The quoted rates should include all other Taxes excluding GST. GST as applicable shall be paid extra against proper invoice submitted by the successful contractor.

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

In case of any failure on the above account, GST amount even if paid by SMP Kolkata shall be recoverable from the contractor, along with applicable interest if any.

1.17 PROVISIONS FOR SITE STAFF OF ENGINEER:

After the issue of Engineer's notice to commence, the contractor shall as soon as possible make available of the following facilities for the staff of the Engineer at the Site of Work, all in accordance

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with the approval of the Engineer or his Representative and the Contract Price shall be deemed to be inclusive of the provision for all these facilities.

- (a) Office Facilities :- Throughout the period of Contract, office accommodation at site for two rooms with electricity and water supply and adequate ventilation for the sole use of Engineer's Representative and his staff. The room shall be provided and maintained with suitable furniture, peon facility as directed by the Engineer. An independent toilet facility shall have to be provided solely for the use of the client.
- (b) Equipment Facilities: - Provide and maintain all necessary equipments in working condition for use of Engineer's staff such survey, testing of materials and any other instruments, equipment and apparatus as they may require for carrying out the contractual obligations.
- (c) Transport facilities: - Shall make available, maintain and operate one good 4 wheeler vehicle (Jeep/Maruti/Ambassador etc.) having a minimum sitting capacity for 4 persons with driver, fuel, etc for the use of the Engineer or his representative for survey, testing, inspection, measurement etc related to the work on working days from 8:00 A.M to 10:00 P.M during currency of contract. The vehicle shall not be more than 3 [Three] years old. Any failure in supply / sudden withdrawal / stoppage will attract deduction from bills @ HDC's similar operating transport contract. In case of exigency and work during night hours, the car shall be made available for the entire night. The supply of vehicle shall start on 15 th day from the date of work order and shall finish on the date of completion of work including extension of date of completion, if any

Electrical works

The following **Special Conditions of Contract (SCC)** shall supplement the **General Conditions of Contract (GCC)** of **Electrical works**. 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 SMP Kolkata, 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).

For supply of water by Trustees to the Contractor, an amount equivalent of **1% (one percent)** of the gross bill value for cementitious items only shall be progressively recovered from the running bill including final bill as applicable

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 SMP Kolkata 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 SMP Kolkata" 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 SMP Kolkata, in a tidy and clean condition. **The Rent of such open space will be as per SMP Kolkata'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, SMP Kolkata's "Schedule of Rent" will be applicable for the period beyond that.

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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 SMP Kolkata]**, 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 SMP Kolkata**], 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 SMP Kolkata)** 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

Completion Period

Clause No. 7.65.1

All the jobs (including submission of As Built Drawings), as per contract, are to be completed within 18 (**Eighteen**) months from the date of issue of Letter of Acceptance (LOA) [i.e. **award of contract**].

Clause No. 7.67

Defect Liability Period (DLP)

Clause No. 7.67.1

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 SMP Kolkata)] 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, SMP Kolkata.

Clause No. 7.68

Defects after taking over

Clause No. 7.68.1

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
(Electrical works)

Clause No. 7.71.2

Payment to the Successful Bidder will be made stage-wise as indicated below :-

a) **Against Supply & Delivery :**

- i) Payment for 70% amount of **major items 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.
- ii) Payment for 20% amount of **all items of all groups** will be made against installation **all items of all groups** and submission of bills along with Installation Certificate.
- iii) Payment for 10 % amount will be made against Testing, successful commissioning, taking over the commissioned job by SMP Kolkata and submission of bills, along with Job Completion Certificate.

b) **Against Installation and Commissioning :**

- i) Payment for 90% amount of **all items of all groups** will be made against installation of the respective item and submission of bills along with Installation Certificate.
- ii) Payment for 10 % amount will be made against Testing, successful commissioning, taking over the commissioned job by SMP Kolkata and submission of bills, along with Job Completion Certificate.

Clause No. 6.0

Page:157
(Civil Works)

Clause No. 6.9 On account payment:

On account payment to the Contractor shall be arranged as and when required at the discretion of the Sr. Dy. Manager (P&E) on the basis of measurements of completed works at the quoted rates in the Bill of Quantities. The terms of payment shall be in accordance with Clause-6 of the General Conditions of Contract. The Bills should be submitted by the contractor in quadruplicate to the Sr. Dy. Manager (P&E)'s Office with necessary documents in original.

Subject to the availability and feasibility of system, HDC may make payment directly to the contractor's designated bank account. For this purpose, the contractor will have to indicate (i) name of bank (ii) branch name (iii) branch code and (iv) designated account number in the "Abstract Form of Tender ". In case payment is made directly through bank, the contractor may be required to submit a pre-receipt as per instruction of HDC.

Clause No 7.86

Force Majeure

In the event of either party rendered unable by Force Majeure to perform any obligation required to be performed by them under the Contract, relevant obligation of the party affected by such Force Majeure shall upon notification to the other party be suspended for the period which Force Majeure events lasts. The cost and loss sustained by the either party shall be borne by the respective parties.

The term "Force Majeure" as employed shall mean the events as below:

Supply, Installation, Testing and Commissioning of 11kV/3.3kV/415V Panel along with allied works for augmentation of GC Berth Sub-station including construction of Sub-station building at GC Berth area of Haldia Dock Complex, SMP, Kolkata.

(i) riot (unless solely restricted to or perpetuated by employees of the Contractor or his subcontractors / suppliers or occurring outside India) so far as it is uninsurable;

(ii) war, hostilities (whether war be declared or not), invasion, directed to or by India or act of foreign enemies, directed to India;

(iii) rebellion, revolutions, insurrection, or military or usurped power, or civil war in India;

(iv) Fire , flood , cyclone , hurricane and acts of God.

Time of performance shall be extended by the period of delay, which is directly caused by the Force Majeure. Upon the occurrence of such cause and upon its termination, the party alleging that it has been rendered unable as aforesaid shall notify the other party in writing immediately but not later than forty eight hours of the alleged beginning and ending thereof, giving full particulars and satisfactory evidence in support of his claim.

Time of performance of the relative obligation suspended by the Force Majeure shall stand extended by the period for which such event lasts and affects the relative obligation directly. Such extension of time shall be without prejudice to the provision that time is essence of the Contract and any other terms and conditions related to time of completion as may provided elsewhere in the Contract

If the work is affected by Force Majeure lasting for more than 60 days at a stretch, the parties to the Contract shall settle the issue mutually.

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

Supply, Installation, Testing and Commissioning of 11kV/3.3kV/415V Panel along with allied works for augmentation of GC Berth Sub-station including construction of Sub-station building at GC Berth area of Haldia Dock Complex, SMP, Kolkata.

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 11kV/3.3kV/415V Panel along with allied works for augmentation of GC Berth Sub-station including construction of Sub-station building at GC Berth area of Haldia Dock Complex, SMP, Kolkata.

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) <u>OR</u> Profession Tax Payment Challan (PTPC)	<input type="text"/> If submitted, Page Number(s):	
		<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 11kV/3.3kV/415V Panel along with allied works for augmentation of GC Berth Sub-station including construction of Sub-station building at GC Berth area of Haldia Dock Complex, SMP, Kolkata.

	Requirement	Submitted/Not submitted [Put √ if submitted & X if not submitted]		Validity/ For the month of
i)	Registration Certificate of ESI Authority.	<input type="checkbox"/>	If submitted, Code No.: Page Number(s):	Not applicable.
ii)	Affidavit, Declaration and Indemnity Certificate.	<input type="checkbox"/>	If submitted, Page Number(s):	Not applicable.
e)	PAN Card	<input type="checkbox"/>	If submitted, PAN No.: Page Number(s):	Not applicable.
f)	MSME / MSE / DIC / SSI / NSIC certificate	<input type="checkbox"/>	If submitted, Page Number(s):	
g)	Power of Attorney	<input type="checkbox"/>	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)	

Supply, Installation, Testing and Commissioning of 11kV/3.3kV/415V Panel along with allied works for augmentation of GC Berth Sub-station including construction of Sub-station building at GC Berth area of Haldia Dock Complex, SMP, Kolkata.

	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		

Supply, Installation, Testing and Commissioning of 11kV/3.3kV/415V Panel along with allied works for augmentation of GC Berth Sub-station including construction of Sub-station building at GC Berth area of Haldia Dock Complex, SMP, Kolkata.

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 11kV/3.3kV/415V Panel along with allied works for augmentation of GC Berth Sub-station including construction of Sub-station building at GC Berth area of Haldia Dock Complex, SMP, Kolkata.

Tender No. SDM(P&E)/T/62/2019-2020

E-Tender No. 2020_KoPT_552403_1

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 <https://eprocure.gov.in/eprocure/app> 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.

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 11kV/3.3kV/415V Panel along with allied works for augmentation of GC Berth Sub-station including construction of Sub-station building at GC Berth area of Haldia Dock Complex, SMP Kolkata.

Tender No. : Tender No. SDM(P&E)/T/42/2019-2020

E-Tender No.: **E-Tender No. 2020_KoPTSMP Kolkata_552403_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 11kV/3.3kV/415V Panel along with allied
works for augmentation of GC Berth Sub-station including construction of Sub-station building at
GC Berth area of Haldia Dock Complex, SMP Kolkata**”, 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 <https://eprocure.gov.in/eprocure/app>*], 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 17,57,015.00 (Indian Rupees: Seventeen lakh fifty seven thousand
fifteen)** only, as Earnest Money, to Haldia Dock Complex, through DD/Banker Cheque in favour

Supply, Installation, Testing and Commissioning of 11kV/3.3kV/415V Panel along with allied works for augmentation of
GC Berth Sub-station including construction of Sub-station building at GC Berth area of Haldia Dock Complex, SMP,
Kolkata.

of **Kolkata Port Trust** on any Scheduled/Nationalized Bank payable at **Haldia**.

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 (in Rs.)	Applicable % of GST		
			SGST	CGST	IGST
1.	Supply, Installation, Testing and Commissioning of 11kV /3.3kV / 415V Panel along with allied works for augmentation of GC Berth Sub-station including construction of Sub-station building at GC Berth area of Haldia Dock Complex, SMP, Kolkata . As per Bill of Quantity of Civil Works & Electrical works	8,78,50,750.00			

Supply, Installation, Testing and Commissioning of 11kV/3.3kV/415V Panel along with allied works for augmentation of GC Berth Sub-station including construction of Sub-station building at GC Berth area of Haldia Dock Complex, SMP, Kolkata.

Integrity Pact

Between

Kolkata Port Trust (SMP Kolkata) hereinafter referred to as “**The Principal/ Employer**”.

And

..... hereinafter referred to as “**The Bidder/Contractor**”

Preamble

The Principal intends to award, under laid down organizational procedures, contract/s for The Principal values full compliance with all relevant laws of the land, rules, regulations, economic use of resources and of fairness/transparency in its relations with its Bidder(s) and/or Contractor(s).

In order to achieve these goals, an Independent External Monitor (IEM) appointed by the principal, will monitor the tender process and the execution of the contract for compliance with the principles mentioned above.

NOW, THEREFORE,

To avoid all forms of corruption by following a system that is fair, transparent and free from any influence/prejudiced dealings prior to, during and subsequent to the currency of the contract to be entered into with a view to:-

Enabling the PRINCIPAL/EMPLOYER to get the contractual work executed and/or to obtain/dispose the desired said stores/ equipment at a competitive price in conformity with the defined specifications/ scope of work by avoiding the high cost and the distortionary impact of corruption on such work /procurement/ disposal and Enabling BIDDERS/ CONTRACTORS to abstain from bribing or indulging in any corrupt practice in order to secure the contract by providing assurance to them that their competitors will also abstain from bribing and other corrupt practices and the PRINCIPAL/EMPLOYER will commit to prevent corruption, in any form, by its officials by following transparent procedures.

Section 1 – Commitments of the Principal/ Employer.

- (1) The Principal commits itself to take all measures necessary to prevent corruption and to observe the following principles:
 - a. No employee of the Principal, personally or through family members, will in connection with the tender for, or the execution of a contract, demand, take a promise for or accept, for self or third person, any material or immaterial benefit which the person is not legally entitled to.
 - b. The Principal will, during the tender process treat all Bidder(s) with equity and reason. The Principal will, in particular, before and during the tender process, provide to all Bidder(s) the same information and will not provide to any Bidder(s) confidential/ additional information through which the Bidder(s) could obtain an advantage in relation to the tender process or the contract execution.
 - c. The Principal will exclude from the process all known prejudiced persons.

Supply, Installation, Testing and Commissioning of 11kV/3.3kV/415V Panel along with allied works for augmentation of GC Berth Sub-station including construction of Sub-station building at GC Berth area of Haldia Dock Complex, SMP, Kolkata.

- (2). If the Principal obtains information on the conduct of any of its employees which is a criminal offence under the Indian Penal Code (IPC)/Prevention of Corruption (PC) Act, or if there be a substantive suspicion in this regard, the Principal will inform the Chief Vigilance Officer and in addition can initiate disciplinary actions.

Section-2 –Commitments of the Bidder(s) / Contractor(s)

- (1) The Bidder(s)/Contractor(s) commit himself to take all measures necessary to prevent corruption. He commits himself to observe the following principles during his participation in the tender process and during the contract execution.
- a. The Bidder(s) /Contractor(s) will not directly or through any other person or firm, offer, promise or give to any of the Principal's employees involved in the tender process or the execution of the contract or to any third person any material or other benefit which he/she is not legally entitled to, in order to obtain in exchange any advantage of any kind whatsoever during the tender process or during the execution of the contract.
 - b. The Bidder(s)/Contractor(s) will not enter with other Bidders into any undisclosed agreement or understanding, whether formal or informal. This applies in particular to prices, specifications, certifications, subsidiary contract, submission or non-submission of bids or any other actions to restrict competitiveness or to introduce cartelization in the bidding process.
 - c. The Bidder(s)/Contractor(s) will not commit any offence under the relevant IPC/PC Act; further the Bidder(s)/Contractor(s) will not use improperly, for purposes of competition or personal gain, or pass on to others, any information or document provided by the Principal as part of the business relationship, regarding plans, technical proposals and business details, including information contained or transmitted electronically.
 - d. The Bidder(s)/Contractor(s) of foreign origin shall disclose the name and address of the Agents/representatives in India, if any. Similarly the Bidder(s)/Contractor(s) of Indian Nationality shall furnish the name and address of the foreign principles, if any. Further details as mentioned in the "Guidelines on Indian Agents of Foreign Suppliers" shall be disclosed by the Bidder(s)/Contractor(s). Further, as mentioned in the Guidelines, all the payments made to the Indian agent/representative have to be in Indian Rupees only. Copy of the "Guidelines on Indian Agents of Foreign Suppliers" is annexed and marked as Annex-A.
 - e. The Bidder(s)/Contractor(s) will when presenting his bid, disclose any and all payments he has made, is committed to or intends to make to agents, brokers or any other intermediaries in connection with the award of the contract.
- (2). The Bidder(s)/Contractor(s) will not instigate third persons to commit offences outlined above or be an accessory to such offences.

Section-3-Disqualification from tender process and exclusion from future contracts

If the Bidder(s)/Contractor(s) before award or during execution has committed a transgression through a violation of Section 2 above, or in any other form such as to put his reliability or

Supply, Installation, Testing and Commissioning of 11kV/3.3kV/415V Panel along with allied works for augmentation of GC Berth Sub-station including construction of Sub-station building at GC Berth area of Haldia Dock Complex, SMP, Kolkata.

credibility in question, the Principal is entitled to disqualify the Bidder(s)/Contractor(s) from the tender process or take action as considered appropriate.

Section 4-Compensation for damages

- (1) If the Principal has disqualified the Bidder(s) from the tender process prior to the award according to Section 3, the Principal is entitled to demand and recover the damages equivalent to Earnest Money Deposit/Bid Security.
- (2) If the Principal has terminated the contract according to Section 3 or if the Principal is entitled to terminate the contract according to Section 3, the Principal shall be entitled to demand and recover from the Contractor liquidated damages of the contract value or the amount equivalent to Performance Bank Guarantee.

Section 5-Previous transgression

- (1) The Bidder declares that no previous transgressions occurred in the last 3 years from the date of signing the Integrity pact with any other Company in any country conforming to the anti corruption approach or with any other Public Sector Undertaking / Enterprise in India, Major Ports/ Govt. Departments of India that could justify his exclusion from the tender process.
- (2) If the Bidder makes incorrect statement on this subject, he can be disqualified from the tender process or action can be taken as considered appropriate.

Section 6- Equal treatment of all Bidders/Contractors/Sub-Contractors

- (1) The Bidder(s)/Contractor(s) undertake(s) to demand from all subcontractors a commitment in conformity with this Integrity Pact, and to submit it to the Principal before contract signing.
- (2) The Principal, will enter into agreements with identical conditions as this one with all Bidders, Contractors and Sub-contractors.
- (3) The Principal will disqualify from the tender process all bidders who do not sign this Pact or violate its provisions.

Section 7- Other Legal actions against violating Bidder(s)/ Contractor(s)/ Sub Contractor(s)

The actions stipulated in this Integrity pact are without prejudice to any other legal action that may follow in accordance with provisions of the extant law in force relating to any civil or criminal proceedings. .

Section 8 – Role of Independent External Monitor (IEM):

- (a) The task of the Monitors shall be to review independently and objectively, whether and to what extent the parties comply with the obligations under this pact.
- (b) The Monitors shall not be subject to instructions by the representatives of the parties and shall perform their functions neutrally and independently.
- (c) Both the parties accept that the Monitors have the right to access all the documents relating to the contract.

Supply, Installation, Testing and Commissioning of 11kV/3.3kV/415V Panel along with allied works for augmentation of GC Berth Sub-station including construction of Sub-station building at GC Berth area of Haldia Dock Complex, SMP, Kolkata.

(d) As soon as the Monitor notices, or has reason to believe, a violation of this pact, he will so inform the authority designated by the Principal and the Chief Vigilance Officer of Kolkata Port Trust.

(e) The BIDDER/ CONTRACTOR(s) accepts that the Monitor has the right to access without restriction to all contract documentation of the PRINCIPAL including that provided by the BIDDER/ CONTRACTOR. The BIDDER/ CONTRACTOR will also grant the Monitor, upon his request and demonstration of a valid interest, unrestricted and unconditional access to his contract documentation, if any. The same is applicable to sub-contractors. The Monitor shall be under contractual obligation to treat the information and documents of the Bidder/Contractor/ Sub-contractor(s) with confidentiality.

(f) The Principal/ Employer will provide to the Monitor sufficient information about all meetings among the parties related to the contract provided such meetings could have an impact on the contractual relations between the Principal and the Contractor. The parties offer to the Monitor, the option to participate in such meetings.

(g) The Monitor will submit a written report to the designated Authority of Principal/ Employer/ Chief Vigilance Officer of Kolkata Port Trust within 8 to 10 weeks from the date of reference or intimation to him by the Principal/ Employer/ Bidder/ Contractor and should the occasion arise, submit proposals for correcting problematic situation. BIDDER/ CONTRACTOR can approach the Independent External Monitor (s) appointed for the purposes of this Pact.

(h) As soon as the Monitor notices, or believes to notice, a violation of this agreement, he will so inform the Management of the Principal and request the Management to discontinue or to take corrective action, or to take other relevant action. The Monitor can in this regard submit non-binding recommendations. Beyond this, the Monitor has no right to demand from the parties that they act in a specific manner, refrain from action or tolerate action.

(i) If the Monitor has reported to the Principal substantiated suspicion of an offence under the relevant IPC/PCA, and the Principal/ Employer has not, within reasonable time, taken visible action to proceed against such offence or reported to the Chief Vigilance Officer, the Monitor may also transmit this information directly to the Central Vigilance Commissioner, Government of India.

(j) The word 'Monitor' would include both singular and plural.

Section 9 – Facilitation of Investigation:

In case of any allegation of violation of any provisions of this Pact or payment of commission, the PRINCIPAL/EMPLOYER or its agencies shall be entitled to examine all the documents including the Books of Accounts of the BIDDER/CONTRACTORS and the BIDDER/CONTRACTOR shall provide necessary information and documents **in English** and shall extend all possible help for the purpose of such examination.

Section 10 – Pact Duration:

The pact beings with when both parties have legally signed it and will extend upto 2 years or the complete execution of the contract including warranty period whichever is later. In case bidder/contractor is unsuccessful this Integrity Pact shall expire after 6 months from the date of signing of the contract.

If any claim is made/lodged during this time, the same shall be binding and continue to be valid despite the lapse of this pact as specified above, unless it is discharged/determined by Chairman, SMP Kolkata.

Supply, Installation, Testing and Commissioning of 11kV/3.3kV/415V Panel along with allied works for augmentation of GC Berth Sub-station including construction of Sub-station building at GC Berth area of Haldia Dock Complex, SMP, Kolkata.

Section 11 – Other Provisions:

- (1) This agreement is subject to Indian Law. Place of performance and jurisdiction is the Registered Office of the Principal in Kolkata.
- (2) Changes and supplements as well as termination notices need to be made in writing in English.
- (3) If the Contractor is a partnership or a consortium, this agreement must be signed by all partners or consortium members.
- (4) Should one or several provisions of this agreement turn out to be invalid, the reminder of this agreement remains valid. In this case, the parties will strive to come to an agreement to their original intentions.

(For & on behalf of the Principal)

(For & on behalf of Bidder/Contractor).

(Office Seal)

(Office Seal)

Place :

Date :

Witness 1:

(Name & Address)

.....

.....

Witness 2:

(Name & Address)

.....

.....

GUIDELINES FOR INDIAN AGENTS OF FOREIGN SUPPLIERS

- 1.1 There shall be compulsory registration of Indian agents of Foreign suppliers for all Tenders. An agent who is not registered with SMP Kolkata shall apply for registration in the prescribed Application-Form.
- 1.2 Registered agents will file an authenticated Photostat copy (duly attested by a Notary Public)/Original certificate of the principal confirming the agency agreement and giving the status being enjoyed by the agent and the commission/ remuneration/salary/retainer ship being paid by the principal to the agent before the placement of order by SMP Kolkata.
- 1.3 Wherever the Indian representatives have communicated on behalf of their principals and the foreign parties have stated that they are not paying any commission to the Indian agents, and the Indian representative is working on the basis of salary or as retainer, a written declaration to this effect should be submitted by the party (i.e. Principal) before finalizing the order.

2.0 DISCLOSURE OF PARTICULARS OF AGENTS/REPRESENTATIVES IN INDIA. IF ANY.

- 2.1 Tenderers of Foreign nationality shall furnish the following details in their offer:
 - 2.1.1 The name and address of the agents/representatives in India, if any and the extent of authorization and authority given to commit the Principals. In case the agent/representative be a foreign Company, it is to be conformed whether it is real substantial Company and details of the same shall be furnished.
 - 2.1.2 The amount of commission/ remuneration included in the quoted price(s) for such agents/ representatives in India.
 - 2.1.3 Confirmation of the Tenderer that the commission/remuneration if any, payable to his agents/ representatives in India, is to be paid by SMP Kolkata in Indian Rupees only.

2.2 Tenderers of Indian Nationality shall furnish the following details in their offers:

- 2.2.1 The name and address of the foreign principals indicating their nationality as well as their status, i.e. whether manufacturer or agents of manufacturer holding the Letter of Authority of the Principal specifically authorizing the agent to make an offer in India in response to tender either directly or through the agents /representatives.
 - 2.2.2 The amount of commission/remuneration included in the price(s) quoted by the Tenderer for himself.
 - 2.2.3 Confirmation of the foreign principals of the Tenderer that the commission/remunerations, if any, reserved for the Tenderer in the quoted price(s), is to be paid by SMP Kolkata in India in equivalent Indian Rupees.
- 2.3 In either case, in the event of contract materializing, the terms of payment will provide for payment of the commission/remuneration, if any payable to the agents/representatives in

India in Indian Rupees on expiry of 90 days after the discharge of the obligations under the contract.

- 2.4 Failure to furnish correct and detailed information as called for in paragraph-2.0 above will render the concerned tender liable for rejection or in the event of a contract materializing, the same liable to termination by SMP Kolkata. Besides this there would be a penalty of banning business dealings with SMP Kolkata or damage or payment of a named sum.

Format For Power Of Attorney For Lead Member Of Consortium

(To be executed before Notary Public on a Non-Judicial Stamp Paper of at least Rs 10)

POWER OF ATTORNEY

Whereas Haldia Dock Complex, Kolkata Port Trust (“the Authority”) has invited tenders from interested parties for “.....” (Tender No.).

Whereas,,, And (collectively the “ Consortium”) being members of the Consortium are interested in bidding for the Tender in accordance with the terms and conditions of the Tender Document and other connected documents in respect of the said tender, and

Whereas, it is necessary under the Tender Document for the members of the Consortium to designate one of them as the Lead Member with all necessary power and authority to do for and on behalf of the Consortium, all acts, deeds and things as may be necessary in connection with the Consortium’s bid for the Tender and its execution.

NOW THEREFORE KNOW ALL MEN BY THESE PRESENTS

We, M/s. having our registered office at, M/s..... having our registered office at, M/s. Having our registered office at, and M/s. having our registered office at, [the respective names and addresses of the registered office] (hereinafter collectively referred to as the “Principals”) do hereby designate, nominate, constitute, appoint and authorize M/s. Having its registered office at, being one of the members of the Consortium, as the Lead Member and true and lawful attorney of the Consortium (hereinafter referred to as the “Attorney”). We hereby irrevocably authorize the Attorney to conduct all business for and on behalf of the Consortium and any one of us during the bidding process and, in the event the Consortium is awarded the Contract, during the execution of the contract, and in this regard, to do on our behalf and on behalf of the Consortium, all or any of such acts, deeds or things as are necessary or required or incidental to the pre-qualification of the Consortium and submission of its bid(s) for the tender, including but not limited to signing and submission of all applications, bids and other documents and writings, participate in Pre Bid and other conferences/meetings, respond to queries, submit information/ documents, sign and execute contracts and undertakings consequent to acceptance of bid(s) of the Consortium and generally to represent the Consortium in all its dealings with the Authority, and/or any other Government Agency or any person, in all matters in connection with or relating to or arising out of the Consortium’s bid(s) for the tender and/or upon award thereof till the Agreement is entered into with the Authority.

AND hereby agree to ratify and confirm and do hereby ratify and confirm all acts, deeds and things lawfully done or caused to be done by our said Attorney pursuant to and in exercise of the powers conferred by this Power of Attorney and that all acts, deeds and things done by our said Attorney in exercise of the powers hereby conferred shall and shall always be deemed to have been done by us / Consortium.

Supply, Installation, Testing and Commissioning of 11kV/3.3kV/415V Panel along with allied works for augmentation of GC Berth Sub-station including construction of Sub-station building at GC Berth area of Haldia Dock Complex, SMP, Kolkata.

IN WITNESS WHEREOF WE HAVE EXECUTED THIS POWER OF ATTORNEY ON THIS
..... DAY OF20**

For

(Name & Title)

For

.....

(Name & Title)

For

.....

(Name & Title)

Witnesses:

1.

2.

.....

(To be executed by all the members of the Consortium)

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 <input type="checkbox"/> if submitted and put <input type="checkbox"/> 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"/>

Supply, Installation, Testing and Commissioning of 11kV/3.3kV/415V Panel along with allied works for augmentation of GC Berth Sub-station including construction of Sub-station building at GC Berth area of Haldia Dock Complex, SMP, Kolkata.

Sl. No.	Particulars		Submitted/ Not submitted [Put \checkmark if submitted and <u>put X if not submitted</u>]	If submitted, <u>page numbers</u>
	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"/>
	vii)	Bidding Form - VII		
			<input type="checkbox"/>	<input type="checkbox"/>
	viii)	Bidding Form - VIII		
			<input type="checkbox"/>	<input type="checkbox"/>

Supply, Installation, Testing and Commissioning of 11kV/3.3kV/415V Panel along with allied works for augmentation of GC Berth Sub-station including construction of Sub-station building at GC Berth area of Haldia Dock Complex, SMP, Kolkata.

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/ 62 /2019-2020

E-Tender No. 2020_KoPT_552403_1

Supply, Installation, Testing and Commissioning of 11kV/3.3kV/415V Panel along with allied works for augmentation of GC Berth Sub-station including construction of Sub-station building at GC Berth area of Haldia Dock Complex, SMP, Kolkata”

ORDER REFERENCE: / /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 11kV/3.3kV/415V Panel along with allied works for augmentation of GC Berth Sub-station including construction of Sub-station building at GC Berth area of Haldia Dock Complex, SMP, Kolkata**” 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 11kV/3.3kV/415V Panel along with allied works for augmentation of GC Berth Sub-station including construction of Sub-station building at GC Berth area of Haldia Dock Complex, SMP, Kolkata.

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./...../O-... dated]
 - c) The Conditions of Contract and **Technical Specification** [all terms and conditions of Tender No. SDM (P&E)/T/62/2019-2020].
 - d) Addenda [Please insert Addenda Nos.]
 - e) “Price Comparative Statement”, showing the prices quoted (electronically, through the website <https://eprocure.gov.in/eprocure/app>) 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 11kV/3.3kV/415V Panel along with allied works for augmentation of GC Berth Sub-station including construction of Sub-station building at GC Berth area of Haldia Dock Complex, SMP Kolkata**

**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, SMP, Kolkata** , Dist.: Purba Medinipur, West Bengal (hereinafter call “the **Engineer**”) has placed an order, bearing no. /...../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 11kV/3.3kV/415V Panel along with allied works for augmentation of GC Berth Sub-station including construction of Sub-station building at GC Berth area of Haldia Dock Complex, SMP, Kolkata.

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 (hereinafter 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 11KV/3.3KV/415V Panel along with allied works for augmentation of GC Berth Sub-station including construction of Sub-station building at GC Berth area of Haldia Dock Complex, SMP Kolkata**” 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 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

Supply, Installation, Testing and Commissioning of 11KV/3.3KV/415V Panel along with allied works for augmentation of GC Berth Sub-station including construction of Sub-station building at GC Berth area of Haldia Dock Complex, SMP, Kolkata.

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, Kolkata .. /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 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 forbearance, 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 us Branch, 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)

Syama Prasad Mookerjee Port, Kolkata

Haldia Dock Complex

CERTIFICATE OF COMPLETION OF WORK

Contractor : _____

Address : _____

Date of completion : _____

Dear Sir,

Subject : Supply, Installation, Testing and Commissioning of 11kV/3.3kV/415V Panel along with allied works for augmentation of GC Berth Sub-station including construction of Sub-station building at GC Berth area of Haldia Dock Complex, SMP Kolkata ”.

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 11kV/3.3kV/415V Panel along with allied works for augmentation of GC Berth Sub-station including construction of Sub-station building at GC Berth area of Haldia Dock Complex, SMP, Kolkata.

(“NO CLAIM CERTIFICATE” FROM CONTRACTOR)

[To be submitted on Bidder's Letter Head]

General Manager (Engineering),

Haldia Dock Complex ,

SMP Kolkata.

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 11kV/3.3kV/415V Panel along with allied works for augmentation of GC Berth Sub-station including construction of Sub-station building at GC Berth area of Haldia Dock Complex, SMP Kolkata”

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, SMP Kolkata, 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 11kV/3.3kV/415V Panel along with allied works for augmentation of GC Berth Sub-station including construction of Sub-station building at GC Berth area of Haldia Dock Complex, SMP, Kolkata.

Syama Prasad Mookerjee Port, Kolkata

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 11kV/3.3kV/415V Panel along with allied works for augmentation of GC Berth Sub-station including construction of Sub-station building at GC Berth area of Haldia Dock Complex, SMP Kolkata ”

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)

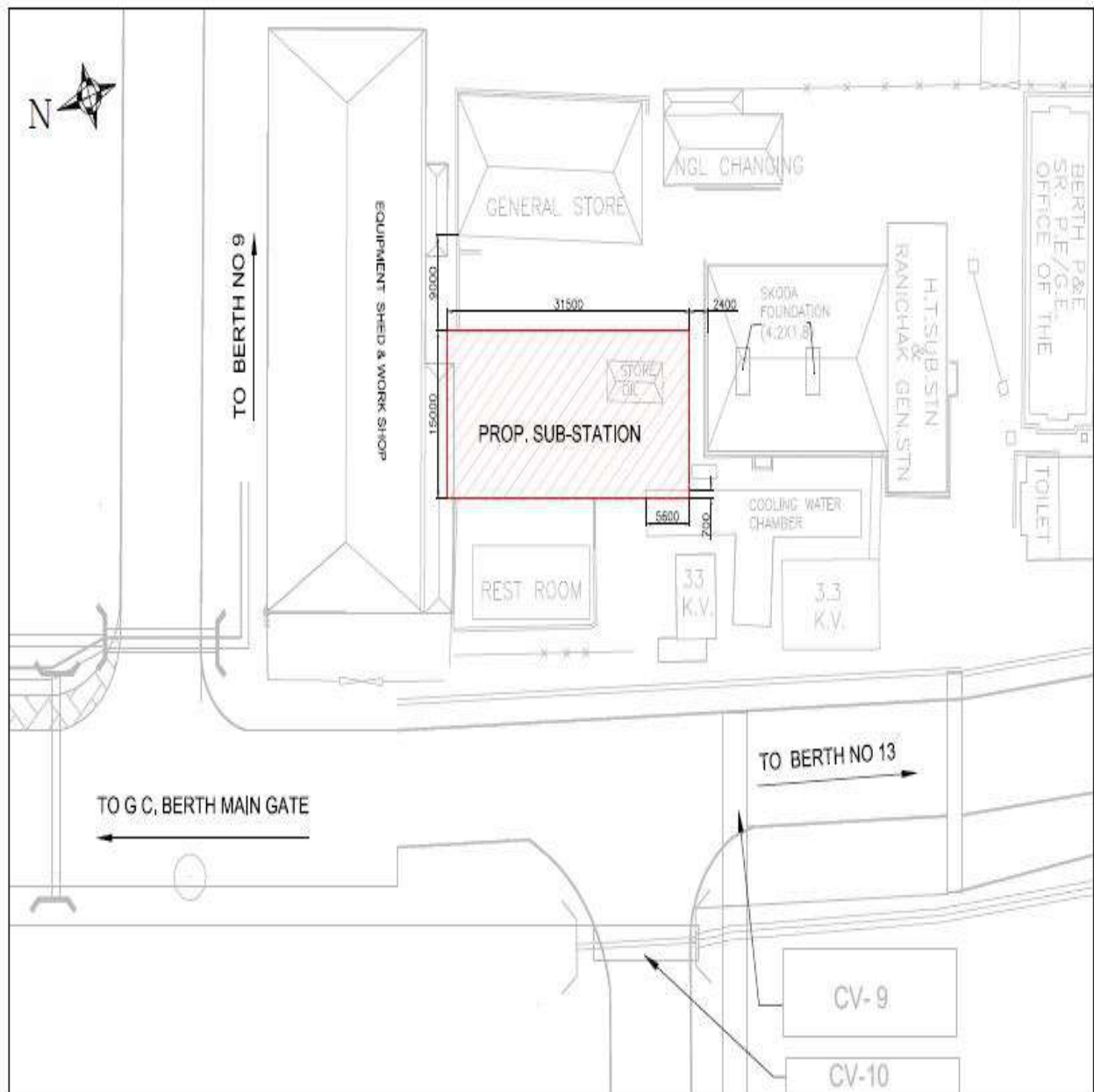
Name:

Designation:

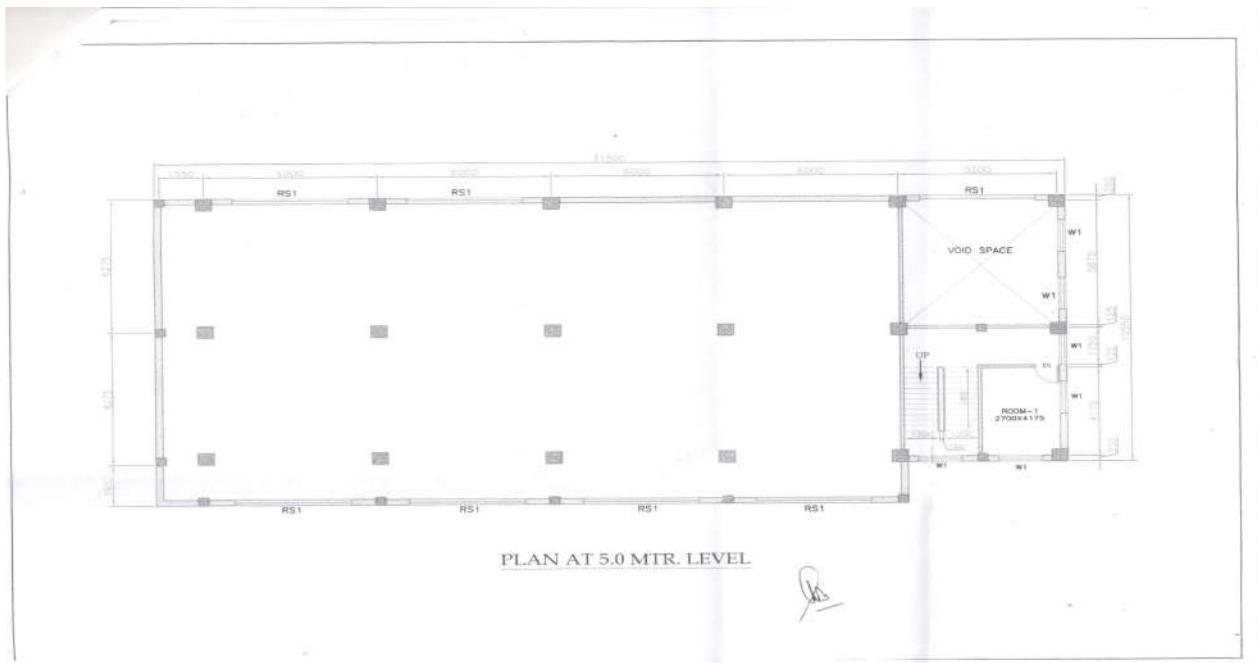
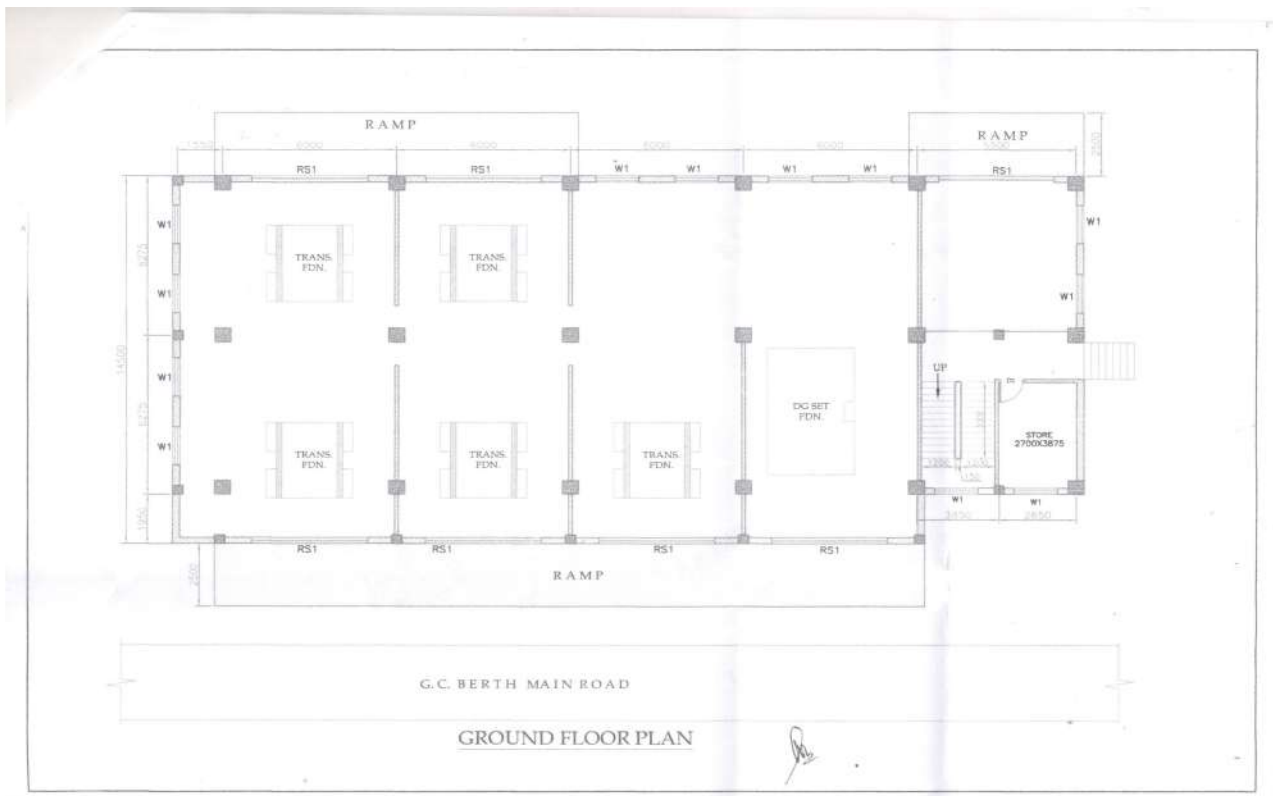
Date:

(OFFICIAL SEAL)

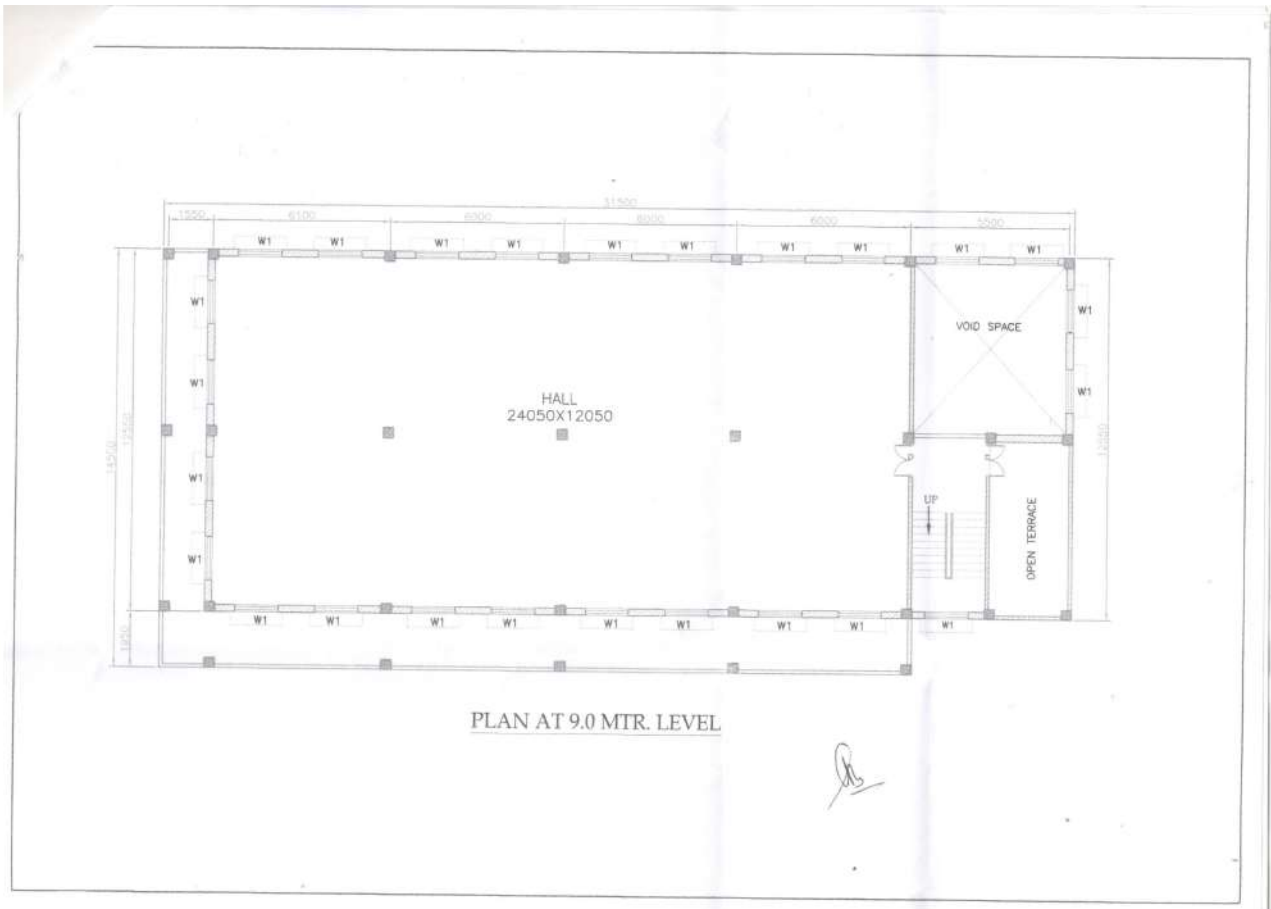
Supply, Installation, Testing and Commissioning of 11kV/3.3kV/415V Panel along with allied works for augmentation of GC Berth Sub-station including construction of Sub-station building at GC Berth area of Haldia Dock Complex, SMP, Kolkata.



Supply, Installation, Testing and Commissioning of 11kV/3.3kV/415V Panel along with allied works for augmentation of GC Berth Sub-station including construction of Sub-station building at GC Berth area of Haldia Dock Complex, SMP, Kolkata.



Supply, Installation, Testing and Commissioning of 11kV/3.3kV/415V Panel along with allied works for augmentation of GC Berth Sub-station including construction of Sub-station building at GC Berth area of Haldia Dock Complex, SMP, Kolkata.



Supply, Installation, Testing and Commissioning of 11kV/3.3kV/415V Panel along with allied works for augmentation of GC Berth Sub-station including construction of Sub-station building at GC Berth area of Haldia Dock Complex, SMP, Kolkata.