श्यामा प्रसाद मुखर्जी पोर्ट,कोलकाता

Syama Prasad Mookerjee Port, Kolkata

(Formerly Kolkata Port Trust)

(AN AUTONOMOUS BODY UNDER THE MINISTRY OF PORTS, SHIPPING AND WATERWAYS, GOVERNMENT OF INDIA)

हल्दिया गोदी परिसर

HALDIA DOCK COMPLEX

श्यामा प्रसाद मुखर्जी पोर्ट, कोलकाता
SYAMA PRASAD MOOKERJEE PORT, KOLKATA
Formerly Kolkata Port Trust

PLANT AND EQUIPMENT DIVISION
under
ENGINEERING DEPARTMENT
INVITE E-TENDER

[Tender No.: DM-PE/T/ 06 /2024-2025]

E-Tender No. 2024_KoPT_814085_1

FOR

Design, Engineering, Supply, Construction, Erection, Testing & Commissioning of 2 MW (AC) Solar PV Grid Interactive Power Plant at Haldia Dock Complex, SMPK, under EPC mode, including Comprehensive Operation & Maintenance (O&M) for 10 years.

[Under Two Part System]

June - 2024

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E-Tender No. 2024_KoPT_814085_1

SYAMA PRASAD MOOKERJEE PORT, KOLKATA
(FORMERLY KOLKATA PORT TRUST)

HALDIA DOCK COMPLEX

SHORT E-TENDER NOTICE

[Tender No.: DM-PE/T/06/2024-2025]

E-Tender No. 2024_KoPT_814085_1

Online e-tenders are invited for the work of "***Design, Engineering, Supply, Construction, Erection, Testing & Commissioning of 2 MW (AC) Solar PV Grid Interactive Power Plant at Haldia Dock Complex, SMPK, under EPC mode, including Comprehensive Operation & Maintenance (O&M) for 10 years***".

Date of Pre-bid Conference **15.07.2024** 11:00 Hrs. onwards (off-line).

Closing date & time of online submission of e-Tender: 30.07.2024, up to 15:00 Hrs. (IST).

Estimated Cost: ₹ 16,81,77,715.00 (excluding GST).

For details related to Bidding Document, including Corrigendum / Addendum (if any), please visit

https://eprocure.gov.in/eprocure/app of **Central Public Procurement Portal, Government of India.**

or

https://smportkolkata.shipping.gov.in of **Syama Prasad Mookerjee Port, Kolkata (Formerly Kolkata Port Trust)**.

However, intending Bidder shall have to participate in bidding process through https://eprocure.gov.in/eprocure/app only.

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

Date: 28.06.2024

SYAMA PRASAD MOOKERJEE PORT, KOLKATA
(FORMERLY KOLKATA PORT TRUST)
HALDIA DOCK COMPLEX
NOTICE INVITING E-TENDER
[Tender No.: DM-PE/T/06/2024-2025, issued on 28.06.2024, *E-Tender No. 2024_KoPT_814085_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 (SMPK), from the intending bidders, fulfilling the "Minimum Eligibility Criteria (MEC)" and possessing the required documents (mentioned below), for the work of "***Design, Engineering, Supply, Construction, Erection, Testing & Commissioning of 2 MW (AC) Solar PV Grid Interactive Power Plant at Haldia Dock Complex, SMPK, under EPC mode, including Comprehensive Operation & Maintenance (O&M) for 10 years***".

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, 2024, must be at least **₹ 5,04,53,315.00** (excluding GST). Auditor's Report of the bidding Firm, certified by Chartered Accountant (CA) with valid UDIN, for the years 2021-2022 , 2022-23 & 2023-2024, including relevant Audited Balance Sheets and Profit & Loss Accounts, should be made available.

Note: The bidder should upload the scanned copies of Annual Financial Turnover Statement (certified by CA) for the years 2021-2022 , 2022-23 & 2023-2024, along with Audited Balance Sheets and Profit & Loss Accounts.

2.1.2 The bidder must have experience of having successfully completed "Similar Work" [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 work of contract value not less than **₹ 6,72,71,086.00** (excluding GST) each.

Or

b) Two similar completed work of contract value not less than **₹ 8,40,88,858.00** (excluding GST) each.

Or

c) One similar completed work of contract value not less than **₹ 13,45,42,172.00** (excluding GST).

The term "***Similar Work***" means –

"Design, Engineering, Supply, Construction, Erection, Testing & Commissioning of Ground Mounted Solar PV Power Plant [capacity of at least one Plant should be 1 MWp or above], at Port Sector / Central Govt. / State Govt. / PSU / Other Reputed Organisation".

Note:

(i) *In case the Maintenance Work or Operation & Maintenance Work is included in the same Work Order , value of executed work [i.e. Cost involved till commissioning of the Solar Plant, along with Cost of Maintenance Work or Operation & Maintenance Work] will be considered for ascertaining fulfilment of MEC criteria.*

If Maintenance Work or Operation & Maintenance Work is in progress, after commissioning of the Plant, the same will also be considered. In that case , the value of executed work [i.e. Cost involved till commissioning of the Solar Plant, along with Cost of Maintenance Work or Operation & Maintenance Work, till last day of month previous to the one in which tenders are invited, for ascertaining fulfilment of MEC criteria.

(ii) *The Bidder should upload the scanned copies of work order(s) for similar work, successful completion certificates (with performance) from clients, indicating the date of completion, value of work done, etc.*

(iii) *Work Experience as a Sub-contractor or supply Contractor shall not be considered as requisite qualification.*

2.2 DOCUMENTS TO BE UPLOADED:

2.2.1 ESSENTIAL DOCUMENTS:

i) Scanned copies of Annual Financial Turnover Statement (certified by CA) for the years 2021-2022 , 2022-23 & 2023-2024, along with Audited Balance Sheets and Profit & Loss Accounts, in support of MEC, as per **Clause No. 2.1.1**.

ii) Scanned copies of work order(s) for similar work, successful Completion Certificates (with performance) from clients, indicating the date of completion, value of work done, etc., in support of MEC, as per **Clause No. 2.1.2**.

iii) Scanned copy of Power of Attorney / Authorisation / Partnership Deed (as applicable).

Note: *In case the Bid is signed by a Proprietor of a Proprietorship Firm or any one of the Partners of a Partnership Firm, Power Of Attorney / Authorisation would not be required.*

2.2.2 OTHER DOCUMENTS

i) Goods and Services Tax (GST) Registration Certificate, issued by Government of India.

ii) Form-26AS, for the relevant period showing receipt of payment against the credential submitted.

iii) 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.

iv) 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 line with the enclosed Format (Bidding Form)], in this regard.

v) Registration certificate of **Employees' State Insurance** (**ESI)** authority, if applicable.

If this is not applicable, necessary document(s) [to establish non-applicability], along with **affidavit** [Format enclosed (BIDDING FORM -VII)] **, 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 [as per the Format enclosed (BIDDING FORM-VIII)], confirming that they will obtain registration certificate of ESI authority, if required , and they will indemnify **Syama Prasad Mookerjee Port, Kolkata (Formerly 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 [Format if Indemnity Bond enclosed (Contract Form)].

vi) PAN Card, issued by Income Tax Department, Government of India.

vii) **Udyam Registration Certificate** [issued before the deadline for submission of the Bid]**,** with the Udyam Registration Number, of **Micro & Small Enterprises** (MSEs), to get benefit in this regard.

viii Integrity Pact Agreement [as per **BIDDING FORM-X**] duly signed by the authorized representative of the Bidder, in respect of a tender, having estimated cost more than ₹ 5 Crore.

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 is not submitted by the Bidder. Essential documents include documents mentioned in **Clause no. 2.2.1**, Bid Document fee and Earnest Money Deposit or Document(s) for availing exemption of Bid Document Fee & Earnest Money Deposit (including Bid-securing Declaration), as applicable.

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 **CPPP, Government of India.**
- **https://smportkolkata.shipping.gov.in** of **Syama Prasad Mookerjee Port, Kolkata (Formerly Kolkata Port Trust)**.

Corrigenda, Addenda, 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 of CPPP**, Government of India (**https://eprocure.gov.in/eprocure/app **)] *only.***

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

SCHEDULE OF TENDER (SOT)

[Tender No.: DM-PE/T/ 06/2024-2025 ,

E-Tender No. 2024_KoPT_814085_1]

3.1.	**Name of work**	::	Design, Engineering, Supply, Construction, Erection, Testing & Commissioning of 2 MW (AC) Solar PV Grid Interactive Power Plant at Haldia Dock Complex, SMPK under EPC mode, including Comprehensive Operation & Maintenance (O&M) for 10 years.
3.2.	**Tender Inviting Authority**	::	**General Manager (Engg.)** Haldia Dock Complex, Syama Prasad Mookerjee Port, 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 C**entral Public Procurement Portal, Government of India.** ***No physical tender is acceptable by Haldia Dock Complex, Syama Prasad Mookerjee Port, Kolkata.***
3.4.	**Estimated Cost**	::	**₹ 16,81,77,715.00 (excluding GST).**
3.5.	**Fees & Deposits**		
	i) **Bid Document Fee** **(Cost of Bidding Documents)** **(Non- refundable)**	::	The intending bidders should deposit **₹ 2,950.00** (**Indian Rupees: Two thousand nine hundred fifty) only [including GST @ 18%]**, as **Bid Document Fee** (*non-refundable*), to Haldia Dock Complex. **Mode of Payment:** DD/Banker Cheque in favour of Syama Prasad Mookerjee Port, Kolkata, Haldia Dock Complex on any Scheduled/Nationalized Bank payable at Haldia. For exemption of Bid Document Fee *[applicable for Micro & Small Enterprises (MSEs) only]*, the Bidders shall have to upload the scanned copy of the **Udyam Registration Certificate** with the Udyam Registration Number as proof of their being registered Udyam Registration Portal **in electronic format.**

	ii) **Earnest Money Deposit (EMD)**		The intending bidders must deposit **₹ 26,81,777.00 (Indian Rupees: Twenty-six lakh eighty-one thousand seven hundred and seventy-seven)** only, as **Earnest Money**, to Haldia Dock Complex. **Mode of Payment:** - DD/Banker Cheque in favour of Syama Prasad Mookerjee Port, Kolkata, Haldia Dock Complex on any Scheduled/Nationalized Bank payable at Haldia.
			Earnest Money Deposit (EMD) may also be deposited in the form of an irrevocable and unconditional Bank Guarantee (BG) as per the format enclosed, from any Kolkata / Haldia Branch of a Nationalized / Scheduled Bank of India. In such case, an amount of ₹ 10.00 Lakh (Indian Rupees: Ten lakh) is to be deposited through through DD/Banker's Cheque and the balance amount may be submitted in the form of BG. The original Bank Guarantee (if applicable) should reach the office of Sr. Dy. Manager (P&E), Operational Administrative Building, Chiranjibpur, Haldia-721604, within the closing date & time mentioned in the Schedule of Tender (SOT). The EMBG should be kept valid and enforceable till a date, covering at least 3 (three) months beyond the date of expiry of the validity period of the bid. In case a bidder agrees to any extension of the bid validity period, asked by HDC, the validity of the corresponding EMBG shall have to be extended till a date, covering at least 3 (three) months beyond the date of expiry of such extended bid validity period. In all cases, any dispute regarding Bank Guarantee will be adjudicated under the jurisdiction of The Calcutta High Court. Scanned copy of such EMBG (if applicable) must be uploaded by the bidders, along with the Pre-qualification & Techno-commercial Bid. Scanned copy of DD/Banker's Cheque / Bank Guarantee (if applicable) 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. For exemption of Earnest Money Deposit (EMD) *[applicable for Micro & Small Enterprises (MSEs) only]*, the Bidders shall have to upload the scanned copy of the **Udyam Registration Certificate,** with the Udyam Registration Number as proof of their being registered Udyam Registration Portal **in electronic format.**
			Bidders claiming exemption of EMD are however required to submit (scanned copy shall have to be uploaded) a signed Bid-securing Declaration, as per format attached [**Bidding Form-II**]. Original Demand Draft /Banker's Cheque/ Bank Guarantee against Earnest money should be physically submitted at the office of Tendering Authority [Sr. Dy. Manager (P&E), Operational Administrative Building (1st floor), Chiranjibpour, Haldia Dock Complex, Haldia, PIN 721604], separately in a single sealed envelope, mentioning Tender no. with proper marking, before opening of the Bid, as specified in the Bidding Document.
3.6.	**Bid Validity**	::	180 days.
3.7.	**Completion Period**	::	14 months for EPC work.
3.8.	**Defect Liability Period (DLP) / Guarantee Period / Comprehensive Operation & Maintenance (COMC) period**	::	120 months.
3.9.	**Security Deposit / Performance Guarantee**	::	10 % of the Contract Value [EPC+COMC] (excluding GST) , till date of completion and during **DLP / COMC Period of 120 months.**
3.10.	**Date, time and venue of Pre-Bid Meeting (off-line).**	::	15.07.2024 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.
3.11.	i) **Publish date of e-Tender** at **https://eprocure.gov.in**	::	28.06.2024

	ii) **Starting date & time of submission of e-Tender at** https://eprocure.gov.in/eprocure/app		22.07.2024, up to 15:00 Hrs. (IST).
	iii) **Closing date & time of submission of e-Tender Tender**	::	30.07.2024, up to 15:00 Hrs. (IST).
	iv) **Date & time of opening of Part-I (Pre-qualification & Techno-commercial Bid)**	::	31.07.2024, 15:30 Hrs. (IST) onwards.
	v) **Date & time of opening of Part-II (Price Bid)**	::	**Shall be informed separately**.
3.12.	**Address of the Employer**	::	**Syama Prasad Mookerjee Port, Kolkata [SMPK] (Formerly Kolkata Port Trust)**. 15 Strand Road, Kolkata – 700 001, West Bengal, India.
3.13.	**Address of Engineer**	::	**Address:** Engineering Department Jawahar Tower Complex; P.O.: Haldia Township; Dist.: Purba Medinipur; PIN: –721607, West Bengal, India. **e-mail : gm-engg.hdc@kolkataporttrust.gov.in**
3.14.	**Address of the Engineer's representative**	::	**Shri D. Mallik** **Dy. Manager (P&E),** Haldia Dock Complex, Operational Administrative Building (1st floor), Chiranjibpur; P.O. Haldia, Dist. Purba Medinipur; PIN: 721 604; West Bengal, India. Telephone no. : + 91-3224-252663 Mobile no. : + 91 94340 31335 **e-mail : dmullick.hdc@kolkataporttrust.gov.in**

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

Date: 28.06.2024

SECTION - IV

INSTRUCTIONS FOR ONLINE BID SUBMISSION

4.1 Introduction:

4.1.1 **Bidders are requested to use internet Browsers Firefox version below 50 / Internet Explorer version 8 or above/Google Chrome and latest updated Java.**

4.1.2 **Further, bidders are requested to go through the following information and instructions available on the CPPP** http://eprocure.gov.in/eprocure/app **before respondingto this e-tender:**

Bidders Manual Kit
Help for Contractors
FAQ

Contact person (Haldia Dock Complex):

(i) Shri D. Mallik
Designation: Deputy Manager (P&E)
Mobile No.: + 91 94340 31335
Landline: + 91-3224-252663
E-mail : dmullick.hdc@ kolkataporttrust.gov.in

(ii) Shri D. Dey
Designation: Asst. Manager (P&E)
Mobile No.: + 91 94340 33492
Landline: + 91-3224-252577
E-mail : djdey.hdc@kolkataporttrust.gov.in

Contact persons (CPPP Portal):

Shri Nazmush
Mobile No.: + 91 95632 51950
E-mail : webhelpdesk@gmail.com

4.2 Bidding in e-tender:

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. The process involves Electronic Bidding for submission of Bid Document Fee, EMD, Techno- Commercial Bid as well as Price Bid

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. Price bid must be filled-up in EXCEL Sheet through CPPP PORTAL (which is uploaded by SMP, Kolkata)..

4.2.8 Bidder has fully read and understood the entire Tender Document, GCC, Corrigendum and Addenda, if any downloaded from under the instant e-tender and no other source, and will comply to the said document, GCC, Corrigendum and Addenda" .
A declaration in this regard is to be made by the bidder.

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

(B)Necessary addendum/corrigendum (if any) of the tender would only be hoistedin the CPPP portal.

(C) Bid Document Fee (Cost of bidding documents) and Earnest Money Deposit (EMD) should reach this office physically before opening of Tender document, failing which techno-commercial bid will not be opened.

(D)Bid Document Fee (Cost of bidding documents) and Earnest Money Deposit (EMD) are to be treated as essential documents, should upload with the other essential documents.

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

4.3.1 Since MSME / Micro & Small Enterprises (MSEs) / National Small Industries Corporation (NSIC) under single point registration / DIC / SSI / Aadhar Udyog or any empowered Central / State Govt. authority are exempted from paying Bid

Document Fee (Cost of bidding documents), Earnest Money Deposit (EMD), submission of necessary documents by such bidders in this regard is also imperative. But all MSEs registered with NSIC /DIC are not exempted from depositing cost of tender document. Only those firms, having documents of such exemption for the whole tender work (as per Scope of Work) will be exempted. Documentary evidence must be submitted in techno-commercial partof Tender for claim of such exemption, failing which their tender would be summarily rejected

4.3.2 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

4.4 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 beaccepted 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 thatof 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 contractor 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 Bid [Pre-qualification & Techno-commercial Bid and Price Bid] :

4.5.1 The Bids (Pre-qualification & Techno-commercial Bid and Price 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).

SECTION - V

INSTRUCTIONS TO BIDDERS (ITB)

A. THE BIDDING DOCUMENT

5.1. Basic Tender Details

This 'BIDDING Document' details the terms and conditions for entering a Contract for execution of the work described in ***Section VI:*** *Technical Specification & Scope of Work.* Tenders are invited exclusively from the intending Bidder, fulfilling the "Minimum Eligibility Criteria (MEC)" , as mentioned in the 'Notice Inviting e-Tender' [Section II].

5.2. Interpretations, Definitions, Abbreviations and Document Conventions

5.2.1. Details tenets of Interpretation, Definitions, Document Conventions and Abbreviations, as given in **Section VIII:** General Conditions of Contract (GCC) and **Section IX:** Special Conditions of Contract (SCC), shall also apply to the rest of the Bidding Document.

5.2.2. *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 & Scope of Work'**.

5.2.3. *Fraud and corruption*

It is the policy of Syama Prasad Mookerjee Port, Kolkata [SMPK] (Formerly Kolkata Port Trust) 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:

"**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;

"fraudulent practice" means a misrepresentation or omission of

facts, in order to influence a public procurement process or the execution of a contract;

"**collusive practice**" means a scheme or arrangement between two or more bidders, designed to establish Bid Prices at artificial, non-competitive levels;

and

"**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 SMPK 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 SMPK to inspect their accounts and records and other documents relating to the bid submission and contract performance.

5.2.4. 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 Participation 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.5.2.3**, 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.**

In case the Bid is signed by a **Proprietorship Firm**, Power Of Attorney would not be required.

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 by the partner(s), authorised through **Partnership Deed** or other person(s), holding valid **authorisation** from such Power Of Attorney holder(s) / Authorised Person, subject to approval of the partner(s) in the matter of giving such authorization, in connection with this bidding process. The signature of such **Power Of Attorney holder(s)** / **Authorised Person(s)** should be attested by the **Partner(s)** or **Power Of Attorney holder or Authorised Person**(s), as the case may be. Such **Power Of Attorney** / **Authorisation** should be uploaded along with **Techno-commercial Bid**.

In case the Proposal is signed by any one of the Partners of a **Partnership Firm**, Power Of Attorney would not be required.

5.4.3 In case the Bid is submitted by a **Limited Company / Corporation**, the same should be signed by the person(s) holding valid **Power Of Attorney** / **Authorisation,** executed in his / their favour (in connection with this bidding process) 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**.

5.4.4 In case the Bid is submitted by a **the Lead Member of a Joint Venture / Consortium**, the same should be signed by the person(s) holding valid **Power Of Attorney** / **Authorisation,** executed in his / their favour (in connection with this bidding process) and the signature of such **Power Of Attorney holder(s) /**

Authorised Person(s) should also be attested, in accordance with the constitution of the **Lead Member of a Joint Venture / Consortium**. Such **Power Of Attorney** / **Authorisation** should be uploaded along with **Techno-commercial Bid**.

5.4.5 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.

A copy of the Power of Attorney (if applicable), certified under the hands of a partner or director of the Bidding Firm and notarised by a Notary Public, shall accompany the Bid.

B. CONTENTS OF BIDDING DOCUMENTS

5.5. Overview of Contents

5.5.1. The Sections, (including Forms & Formats), comprising this Bidding Document, are described at "TABLE OF CONTENTS". A separate 'Price Schedule', for quoting the percentage (%) [above / below / at par] in the Price Bid, on the e-Procurement Portal, is also part of this Bidding Document. Any generic reference to Bidding Document shall also imply a reference to any/ all the Sections, Forms, Formats & the 'Price Schedule' or other files that comprise this Bidding Document. The Bidders must submit the Proposal in the Forms & Formats mentioned herein.

5.6. Sections of Bidding Documents

5.6.1. 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. 5.14.**

5.6.2. 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.

5.6.3. 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.

C. CLARIFICATIONS, SITEVISIT, INFORMATION, ETC. FOR BIDDING

5.7. Location of Haldia Dock Complex

Haldia Dock Complex is located at the confluence of River Haldi & River Hooghly at Latitude 22°2′ North & Longitude 88°6′ East, at about 130 km upstream from Sandheads and 104 km downstream of Kolkata.

5.8. The location of the Site of Work

Dock Zone & Industrial Zone of Haldia Dock Complex [including Intake Sub-station & Switch Yard, Power House Sub-station and G. M. Yard Sub-station Area], Chiranjibpur, Dist.: Purba Medinipur, West Bengal, Haldia-721604.

5.9. Access to the Site of Work

a) By Road:

National Highway (N.H.-116) connect Haldia with Kolaghat and State Highway connect Haldia with Mecheda.

b) By Rail:

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

c) All-weather hard top roads, approachable from National Highway (N.H.-116), State Highway & Haldia Railway Station, exist right up to the area of Work.

5.10. A prospective Bidder requiring any clarification of the instant Bidding Documents shall contact **Sr. Dy. Manager (P&E), HDC**, in writing, or raise their queries 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.

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/ her identity through other means.

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.

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 within 03 days from 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.**

5.11. 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.

5.12. Particulars of Existing Work

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

5.13. 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 **https://smportkolkata.shipping.gov.in** of **Syama Prasad Mookerjee Port, Kolkata (Formerly 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.

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).

5.14. Amendment of Bidding Documents

5.14.1. 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**.

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.

5.14.2. 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.

D. PREPARATION OF BIDS

5.15. 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.

5.16. 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.

5.17. Documents comprising the Bid

5.17.1. 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 **Central Public Procurement Portal, Government of India**

[(https://eprocure.gov.in)] only.

5.18. 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 [as per Bidding Form-I], and no **substitutes shall be accepted. All blank spaces shall be filled in** with the information requested. Such **duly filled in "FORM OF TENDER**", duly signed by the authorised person, should be uploaded.

5.19. Price Schedule

5.19.1. The Bidder shall quote (**through Central Public Procurement Portal only**) a percentage (%) above / below {Less (-) or Excess (+)} / at per with the estimated amount (as a whole) shown in the 'Price Schedule' [**Section – VII**], without any condition or deviation. Price indicated anywhere else, in any other form or manner, will not be considered for evaluation.

5.19.2. The Bidder should submit (upload) the **PRICE SCHEDULE (including the estimated rates & amounts mentioned therein**) [**Section – VII**] of the instant Bidding Documents, duly signed & stamped as token of acceptance.

5.20. Bid Prices

5.20.1. The percentage (%) [above / below / at par] is to be quoted by the Bidder **through Central Public Procurement Portal**, considering the work requirements, as detailed in **Section VI** (**Technical Specification & Scope of Work)** and other terms & conditions of the Bidding Documents (considering all addenda / corrigenda issued).

5.20.2. 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.

The Contractor shall make available, maintain and operate one vehicle (Four wheeler, having a minimum sitting capacity for 4 persons plus driver), in Good condition, with Driver & Fuel, for the use of the 'Engineer' or his representative(s), during survey, testing, inspection, measurement, etc., related to the instant work.

5.20.3. The percentage (%) [above / below / at par] entered (electronically through e-Nivida Portal) by the Bidder**,** shall be based on the Price Schedule, which 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 & Scope of Work' (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) Arrangement for Site Office and vehicular transport , during survey, testing, inspection, measurement, etc. by the 'Engineer' or his representative(s) .

(d) The provisions & maintenance of all their staff & labour and their payment, accommodation, transport, fares and other requirements.

(e) All required first aid, welfare and safety requirements.

(f) Damage caused to the work and /or construction, plant, materials and consumable stores caused by weather.

5.20.4. 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.

5.20.5. Rates & amounts, shown in the "**PRICE SCHEDULE**" [**Section – VII**], include all taxes & duties of Central/ State/ Local bodies [excluding Goods and Services Tax (GST)], as applicable, all incidental charges 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 these Bidding Documents.

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.

5.20.6. All price(s), based on the quoted percentage, 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.

5.20.7. 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.

5.20.8. While this Bidding Documents have been prepared in good faith, neither Employer or its authorized representatives nor their employees or advisors make any representation or warranty, express or implied, or accept any responsibility or liability, whatsoever, in respect of any statements or omissions herein, or the accuracy, completeness or reliability of information, and shall incur no liability under any law, statute, rules or regulations as to the accuracy, reliability or completeness of this Bidding Document, even if any loss or damage is caused by any act or omission on their part.

5.21. Currencies of Bid

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

5.22. Period of validity of bids

5.22.1. Bids shall remain valid for the period of **180 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.

5.22.2. 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) or without considering their Bid-securing Declaration (if any)**.** 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.

5.23. Bid Security / Earnest Money Deposit (EMD)

5.23.1. The intending Bidders should deposit an amount & submit Bank Guarantee (as applicable) specified in the **Schedule of Tender (SoT)**, as **Bid Security / Earnest Money Deposit (EMD)**, in accordance with the procedure mentioned therein.

The intending bidders, claiming exemption of EMD, should upload Bid-securing Declaration (BSD), in lieu of EMD, as specified in the **Schedule of Tender (SoT)**.

5.23.2. Scanned copies of the filled up BIDDING FORM-III, having information

related to deposition of Amount / submission of Bank Guarantee (if applicable) against Bid Security Earnest Money Deposit, and Document(s) for availing exemption of Bid Security / Earnest Money Deposit [including Bid-securing Declaration] (if applicable) are to be uploaded during submission of the e-Tender.

5.23.3. Failing to deposit the Earnest Money/ submission of Bank Guarantee / Document(s) for availing exemption of Bid Security / Earnest Money Deposit [including Bid-securing Declaration], in accordance with ITB, shall make the respective bid rejected by the Employer (SMPK), treating the same as non-responsive.

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

5.23.5. *Refund of Earnest Money Deposit (Expiry of BSD):*

Earnest Money Deposit of the successful Bidder shall be retained by SMPK and Earnest Money Deposit of the unsuccessful Bidders shall be refunded, without interest, (or if BSD is permitted, it shall stand expired) within 2 (two) months from the date of opening of Price Bids or not later than thirty days after finalization / acceptance of tender, whichever is earlier.

In case the bid of the **Successful Bidder** is found acceptable to **SMPK** and contract is awarded with them, the **Earnest Money Deposit** of the **successful bidder** (**Contractor**) shall be retained by **SMPK** till submission of "**Security Deposit / Performance Guarantee"** (in accordance with **ITB**) and signing of the **Contract Agreement** by **SMPK** and **the Contractor** (in accordance with **ITB),** and shall be refunded thereafter, without interest, (or if BSD is permitted, it shall stand expired).

In case, the successful bid is not found acceptable to SMPK, Earnest Money Deposit of the Successful Bidder shall be refunded, without interest, (or if BSD is permitted, it shall stand expired), after the decision, in this regard, is finalised by SMPK.

5.23.6. *Forfeiture of Earnest Money Deposit (Enforcement of BSD)::*

The EMD shall be forfeited (or in case BSD is permitted, the declaration shall be enforced from the date of such decision)-

(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 Haldia Dock Complex, SMPK in writing) making it unacceptable to Haldia Dock Complex, SMPK;

or,

(b) if the Successful Bidder,

i) fails to submit the Security Deposit / Performance Guarantee (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. SMPK 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 Security Deposit / Performance Guarantee (as per SCC), the same shall be dealt with in accordance with the relevant provisions of contract, including forfeiture of Earnest Money Deposit (Enforcement of BSD).

E. SUBMISSION AND OPENING OF BIDS (EXCEPTING PRICE BIDS)

5.24. Submission of bids

5.24.1. Bidders shall have to submit their bids [both **Pre-qualification & Techno-commercial Bid** and **Price Bid]** on-line **through Central Public Procurement Portal only**.

5.24.2. 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 **Pre-qualification Criteria** and **Techno-commercial Bid**.

5.24.3. The Bidder should submit (upload) the scanned copy of Integrity Pact Agreement Format [as per **BIDDING FORM-X**] duly signed by the authorized representative of the Bidder, in respect of a tender value of more than ₹ 5 Crore.

5.24.4. 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.

5.24.5. 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.

5.24.6. The Bidder will have to produce the original documents or any additional documents, if asked for, to satisfy **Haldia Dock Complex, Syama Prasad Mookerjee Port, Kolkata.**

5.24.7. The **Price Bid** comprised the prices only and the same are to be submitted electronically, through the website of **Central Public Procurement Portal Portal [(https://eprocure.gov.in)]** only. ***No hardcopy of Price Bid is required to be uploaded.***

5.25. Techno-commercial offer

5.25.1. 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.

5.25.2. 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.

5.26. Priced offer

The Bidder should quote the percentage appropriately in the PRICE BID, electronically, through the website of **Central Public Procurement Portal [(https://eprocure.gov.in)]** only. *Price indicated anywhere else, in any other form or manner, would not be considered for evaluation.*

5.27. Deadline for submission of bids

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

5.27.2. 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.

5.28. 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.

5.29. Withdrawal of bids

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

5.29.2. 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 in the "**FORM OF TENDER**" or any extension thereof. Modification / Withdrawal of the bid sent through any other means shall not be considered by SMP, Kolkata**.**

5.29.3. Withdrawal of bid during the interval between such closing time on due date and expiring of the bid validity period, may result in

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 or disqualification from bidding for any contract with HDC, SMPK for a period of three years from the date of notification [in line with 'Bid-securing Declaration'], in accordance with ITB.

5.30. Bid opening [excepting Price Bid]

5.30.1. The bids **[excepting Price Bids]**, will be opened at the date & time,

indicated in the **Schedule Of Tender (SOT)**.

5.30.2. The on-line bid-opening event may be viewed by the bidders at their remote end, by logging on to the **Central Public Procurement Portal**.

F. EVALUATION OF BIDS

5.31. Confidentiality

5.31.1. 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.

5.31.2. 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, if any.

5.31.3. Notwithstanding **ITB Clause No. 5.31.2**, 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.

5.32. 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 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.

5.33. 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.

5.34. Responsiveness of bids

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

5.34.2. 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.

5.34.3. 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.**

5.34.4. 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.

5.35. Nonconformities, errors and omissions

5.35.1. 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 request for submission of further document(s) shall be in writing.

5.35.2. 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.

5.35.3. 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.

5.36. Examination of Pre-qualification Criteria

5.36.1. 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.

5.36.2. 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.

5.36.3. 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.

5.37. Examination of Techno-commercial offer

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

5.37.2. SMP, Kolkata shall examine the bid to confirm that all terms and conditions specified in the '**Technical Specification & Scope of Work' (Section VI)**, **General Conditions of Contract (Section VIII)** and **Special Conditions of Contract (Section IX)** have been accepted by the bidder without any material deviation or reservation or omission.

5.37.3. 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 considered. Decision of SMP, Kolkata on this matter shall be final.

5.37.4. The evaluation is also subject to compliance of revised 'Public Procurement (Preference to Make in India), Order 2017' dated 16.09.2020, issued by Government of India, Ministry of Commerce and Industry, Department of Promotion of Industry and Internal Trade (Public Procurement Section), vide No. P – 45021/2/2017-PP (BE– II) dated September 16, 2020, pursuant to Rule 153 (iii) of the General Financial Rules 2017 [as amended upto date].

Bidders are, accordingly, advised to go through the same including subsequent amendment, if any, thereof to appreciate its implication in the instant tender and act accordingly. In case the aforesaid 'Preference to Make in India' order is found applicable, necessary documents, in this regard, shall

be submitted by the concerned Bidder.

5.38. Opening of Price Bid

PRICE BIDs of the bidders, who qualify in the "Pre-qualification & Techno-commercial Bid", will only be considered for evaluation. Such **PRICE BID**s will be opened on a later date, upon due intimation to the participating 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.

5.39. Comparison & Evaluation of Price-Bid and selection of Successful Bidder

5.39.1. While evaluating the Price Bids, the percentage (%) [above / below/ at par] quoted by the bidders shall be taken into account and accordingly 'TOTAL PRICE' [considering all items of the "Price Schedule"], will be arrived at. Selection of the successful bidder will be made on the basis of overall lowest offer, thus arrived, subject to acceptance of all terms & conditions of the instant Bidding Documents.

Evaluation will be done based on the quoted percentage (%) only and no GST will be added, during evaluation.

No additional amount [except applicable GST] would be paid by SMPK to the Contractor.

5.39.2. In case it is found that the quoted **percentage (%) [above / below/ at par]** 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 revised "**TOTAL PRICE** [considering all items of the "**Price Schedule"**] arrived, considering the fresh **percentage (%) [above / below / at par]**, must be less than the "**TOTAL PRICE**" arrived earlier.

5.39.3. The MSE's registered with NSIC / DIC shall not be eligible to get any benefit other than exemption from payment of EMD & Cost of Bidding Document as per New Public Procurement Policy as notified by the Govt. of India, Ministry of Micro Small & Medium Enterprises (MSME) in the Gazette of India vide no. 503, dated 26.03.2012, as splitting of the work can not be done, it being a composite work.

5.39.4. It is not obligatory on the part of SMP, Kolkata to accept the lowest bid. They reserve the right to accept a tender in full or in part and / or reject a tender without assigning any reason thereof.

5.39.5. In the event of acceptance of tender in part, the rate(s) against each of the item(s) constituting the order shall be identical to the rate(s) for the corresponding item(s), based on the percentage quoted in the Price Bid and tender terms & conditions shall also remain unaltered. Irrespective of whether order is placed on part or, on the whole, no plea for subsequent

withdrawal or the amendment will be entertained.

5.40. SMPK's right to accept any bid and to reject any or all bids

5.40.1. 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.

G. INTEGRITY PACT

5.41. Syama Prasad Mookerjee Port, Kolkata (SMPK) values full compliances 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, Integrity Pact would be implemented through a panel of Independent External Monitors (IEM), appointed by SMPK, who will monitor the tender process and the execution of the contract for compliance with the principles mentioned above.

5.42. The names & contact details of the Independent External Monitors (IEM), presently empanelled by SMPK, are given hereunder:

(i) Shri Bipin Behari Mallick, IAS (Retd.)
Mobile No.: + 91 96430 02222 / + 91 99681 50900
E-mail: bipinmallick@gmail.com

(ii) Shri Anand Deep, IRS (Retd.)
Mobile No.: +91 90447 96181
E-mail: anand.deep117@gmail.com

However, SMPK reserves the right to change the Independent External Monitor(s) (IEM) which will be intimated to the Bidder(s) and / or Contractor(s) accordingly.

H. AWARD OF CONTRACT

5.43. Subject to **ITB Clause No. 5.40.1**, 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. 5.39**] and is substantially responsive to the Bidding Documents.

5.44. 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. 9.4.4 a).**

5.45. Signing of contract agreement

5.45.1. After issuance of Letter of Acceptance (LoA), **Contract Agreement** [as per the form furnished in **Section- XII]** should be executed between **Syama Prasad Mookerjee Port, Kolkata** 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 **₹50.00**] & **dummy papers**.

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

5.45.3. Two sets of executed **Contract Agreement**, duly signed by authorised person of SMP, Kolkata & authorized person of the Contractor (Successful Bidder), will be kept under SMP, Kolkata's custody, for affixing the Common Seal of SMP, Kolkata.

One set of such **executed Contract Agreement** will be handed over to the Contractor for their record & future reference.

5.45.4. Total process of executing contract agreement should be completed within 21 days of issuance of "Letter of Acceptance" by SMP, Kolkata. Until such contract agreement is executed, the other documents referred to the definition of the term "Contract" [**SCC Clause No. 9.4.1 a)**], shall collectively be the contract.

5.46. Signing of Integrity Pact Agreement

5.46.1. After issuance of Letter of Acceptance (LoA), **Integrity Pact Agreement** [as per the form furnished in **Section- XII]** should be executed between **Syama Prasad Mookerjee Port, Kolkata** 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 **₹50.00**] & **dummy papers**.

5.47. Security Deposit and / Performance Guarantee

5.47.1. Within 28 (**twenty-eight) days** of issuance of "**Letter of Acceptance**" by SMP, Kolkata, the Successful Bidder shall provide the **Security Deposit / Performance Guarantee** in accordance with the **Special Conditions of Contract (SCC).**

5.47.2. Failure of the Successful Bidder to submit the above-mentioned **Security Deposit / Performance Guarantee** or sign the Contract Agreement shall constitute sufficient grounds for the annulment of the award, including forfeiture of the **EMD**, if any or taking action in line with Bid-securing Declaration, if submitted by the Bidder.

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

5.47.4. No interest / charge, of whatsoever nature, shall be paid by SMP, Kolkata on the amount of **Security Deposit / Performance Guarantee**, held by them, at any stage.

SECTION - VI

PART-I (Electrical works)

TECHNICAL SPECIFICATION & SCOPE OF WORK

A. INTRODUCTION:

6.1. Site Description

6.1.1. The proposed project of 2 MW(AC) Solar PV Power Plant will be implemented on HDC's land, located at Haldia , Purba Medinipur , West Bengal. The land is well connected with Road and the Site of Work is accessible by Road & Rail, as detailed below:

(a) By Road:

National Highway (N.H.-116) connect Haldia with Kolaghat and State Highway connect Haldia with Mecheda.

(b) By Rail:

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

(c) All-weather hard top roads, approachable from National Highway (N.H.-116), State Highway & Haldia Railway Station, exist right up to the area of Work.

6.2. Basic Information

Sl. No.	Particulars	Description
1	Location of Land	
	Village	Haldia
	District	Purba Medinipur
	State	West Bengal
2	Nearest Urban Area	Haldia Township
3	Nearest Highway	NH 116 (approx.. 500 m)
4	Nearest Railway Station	Haldia Railway Station (approx.. 2.5 km)
5	Nearest Domestic Airport	Kolkata Airport (Approx. 125 km)
6	Proposed capacity of the Solar Power Plant	2 MW (AC) Solar Photovoltaic (SPV) Power Plant
7	Estimated life of PV Power plant	25 Years
8	Minimum values of Performance	PR : 0.75

	Ratio (PR) of the plant after netting off the auxiliary consumption.	[against installed DC capacity at Standard Test Condition (STC)]
9	Minimum Guaranteed Net Generation	28,00,000 kWh per annum.
10	Capacity Utilization Factor (CUF)	16.00%
11	Nearest Sub-station Details	11 kV Sub-stations of Haldia Dock Complex, namely Sub-station No. 3 (SS-3, at Haldia Township) and GC Berth Sub-station (inside Dock).
12	Location of Power Evacuation arrangement.	Nearby 11 kV overhead line, to be connected through underground cable (approx.. 500 m).
13	Water and Power for Construction	Water & Power for construction would be arranged by the Contractor at their own risk & cost.

B. SYSTEM DESIGN AND PHILOSOPHY:

6.3. The main objective of the design philosophy is to construct the plant with appropriate redundancy to achieve high availability & reliability, with minimum maintenance efforts. In order to achieve this, the following principles shall be adopted while designing system:

6.3.1. Technology: Solar Mono / Multi Crystalline Photovoltaic Modules (>16 Multi, >18% mono) of high efficiency and the cells/ modules of 545Wp minimum.

6.3.2. Adequate capacity of Solar Photovoltaic (SPV) Module, Solar Power Conditioning Units (PCUs), Junction Boxes, etc. are to be considered for ensuring generation of Solar Energy as per design estimates. This is to be done by applying liberal de-rating factors for the array and recognizing the efficiency parameters of PCUs, Transformers, Conductor Loss, etc.

6.3.3. Use of equipment & systems, with proven design & performance, that have a high availability track record, under similar service conditions.

6.3.4. Selection of the equipment and adoption of a Plant Layout, to ensure ease of maintenance.

6.3.5. Strict compliance with the proven Quality Assurance systems & procedures, duly approved, during the different stages of the Project, starting from sizing, selection of make, shipment, storage (at site) , during erection, testing & commissioning.

6.3.6. Proper monitoring in the synchronizations which ensures the availability of power to the grid.

6.3.7. The Plant instrumentation & control system should be designed to ensure high availability & reliability of the plant and to assist the operators in the safe & efficient

operation of the plant, with minimum effort.

6.3.8. It should also provide required information for the analysis of the historical data and to help the plant maintenance people to take up the plant & equipment on Predictive Maintenance (PdM).

6.3.9. Inverter output voltage of 230 ~ 415V is to be stepped up to 11 kV, for connecting it to the Grid, at the point of interconnection.

6.3.10. The Power Plant has to operate in parallel with the Grid system which is infinite electrical system. Any fault not taken care will result in damage of only SPV Power Plant, without affecting State Utility infinite system. Suitable protective measure is to be inbuilt so that any disturbance of the Grid will not effect the Solar Power Plant.

6.3.11. Very fast responsive, microprocessor based, Directional and Reverse Power Flow Protection [or/and any additional suitable protection] should be provided to ensure isolation of the solar power plant from the Grid at the time of any fault.

6.4. The basic & detailed Engineering of the Plant shall aim at achieving high standards of operational performance, especially considering following:

6.4.1. Plant layout, to ensure optimum availability for generation during the day time, without any shading.

6.4.2. High DC System Voltage and low Current handling requirements.

6.4.3. Selection of PCUs with proven reliability and minimum downtime. Ready availability of requisite spares.

6.4.4. Based on the SOLAR INSOLATION data from reliable sources, the solar PV system should be so designed that it shall take into account the mean energy output after allowing for various losses, temperature corrections, on an average day for each month of the year, etc..

6.4.5. Careful logging of operational data / historical information from the Data Monitoring Systems, and periodically processing it to determine abnormal or slowly deteriorating conditions.

6.4.6. SPV Power Plant should be designed to operate satisfactorily in parallel with the Grid, within permissible limits of High Voltage and Frequency fluctuation conditions, so as to export the maximum possible units generated to the Grid. It is also extremely important to safeguard the system during major disturbances, like tripping / pulling out of big generating stations and sudden overloading during falling of portion of the Grid loads on the Power Plant unit, in island mode, under fault / feeder tripping conditions. The Grid-tied Solar Power System should have a in-built anti-islanding solar inverter, that shuts off the system during power outage.

6.4.7. Flat plate SPV arrays which are held fixed at an optimum tilted angle and faced towards the equator, are most common. The angle of tilt should be approximately equal to the angle of latitude for the site. It should be arranged in such a manner that optimum generation is achieved.

6.5. The specifications provided with this Bidding Document are for guidance only. The Bidder must submit a proposal, after site visit, based upon their own design for Solar Photovoltaic (SPV) system, optimizing with proven technology, so that it shall best meet guaranteed performance parameters.

6.6. The minimum array capacity at Standard Test Condition (STC) shall be determined to have 2.2 MWp output at the time of installation. If the Bidder anticipates any degradation of the modules more than 0.75% of the module output during the first year, it shall be taken care of to meet guaranteed generation to avoid compensation on account of Generation Performance Guarantee.

6.7. This Bidding Document covers the requirements for Grid Connected 2 M W (AC) capacity Solar Power Plant, along with their associated equipment. The capacity of the plant shall be determined to attain minimum of 2 MW (AC) capacity at the point of evacuation.

6.8. Component & equipment reliability: Each component offered by the bidder shall be of established reliability. The minimum target reliability of each equipment shall be established by the bidder considering its failure, mean time between failures and mean time to restore, so that the availability of complete system is assured. The *Guaranteed Annual System Availability* shall not be less than 99%. Bidder recommendation of the spares shall be on the basis of established reliability.

6.9. Bidder shall design the equipment and plant in order to have sustained life of 25 years, with minimum maintenance efforts.

C. SCOPE OF WORK:

6.10. Scope of Work, for the Contractor, includes-

6.10.1. Design & Engineering, Procurement & Supply of Equipment & Materials, Testing at Manufacturers Works, Inspection, Packing & Forwarding, Supply, Receipt, Unloading & Storage at Site, Preparation of Site, Reclamation Work, associated Civil Work, Services, Permits, Licences, Installation & Incidentals, Insurance at all stages, Erection, Testing & Commissioning (including Performance demonstration) of 2 MW (AC) Grid Interactive Solar PV Power Plant, with associated equipment & materials, on turnkey basis at Haldia, near Ranichak crossing under Haldia Dock Complex, Syama Prasad Mookerjee Port, Kolkata.

The Contractor shall arrange deployment of qualified & suitable manpower and required necessary consumables & spares during, commissioning.

6.10.2. Comprehensive Operation & Maintenance of Solar Photovoltaic Power Plant , for 10 (ten) years, from the date of Commissioning or Operational Acceptance, whichever is later. This includes deployment of engineering personnel, technicians and security personnel after commissioning.

6.11. All approvals, equipment, items & work, which are not specifically mentioned in this Bidding Document, but are required for completion of work, including construction, commissioning, O&M of Solar PV Power Plant ,in every respect and for safe & efficient construction & erection, operation & guaranteed performance, are included in the scope of the Contractor.

6.12. The equipment and materials for the 2 MW (AC) Grid Interactive Solar PV Power Plant, with associated system (Typical), shall include but not be limited to the receipt, unloading, storage, erection, testing and commissioning of all supplied material for the following:

6.12.1. Solar PV modules of **545Wp** minimum rating, in array totalling minimum of the said DC capacity including mounting frames, structures, fasteners, array foundation and module interconnection.

6.12.2. Array Junction Boxes, Distribution Boxes , Fuse Boxes, MCBs, Surge Arrestors with string monitoring capabilities and with proper lugs, glands, ferrules, terminations and mounting structures.

6.12.3. DC and AC cables of appropriate sizes with adequate safety and insulation.

6.12.4. Power Conditioning Units (PCU) with SCADA compatibility, common AC power evacuation panel with bus bars and circuit breakers LT & HT Power Interfacing Panels, Plant Monitoring Desk, AC & DC Distribution Boards.

6.12.5. 230 ~ 433V/ 11kV step up Transformers in relevance with HDC's Grid code and inverter manufacturer requirements.

6.12.6. 11 kV / 433 V Auxiliary Transformer(s).

6.12.7. Metering and Protection system, along with adequate battery system.

6.12.8. LT Power and Control Cables, including end terminations and other required accessories for both AC & DC power.

6.12.9. Internal 433V interconnection & Indoor feeder panels to cater auxiliary needs of plant.

6.12.10. 11 kV indoor panels having incoming and outgoing feeders with VCBs, CTs, PTs, Bus bars, cables terminals kits and Bus coupler having Main & Transfer Bus. Each bay shall consist of VCB, CT, Isolators with earth switch, LAs , PTs, etc.

6.12.11. Availability-Based Tariff (ABT) energy meter(s) [including CT, PT, Isolators , etc., as required], as per 'Central Electricity Authority (Installation and Operation of Meters) (Amendment) Regulations, 2019', amended up-to-date, and state

metering code, at Solar plant and also at Intake Sub-station of HDC.

6.12.12. Data acquisition system with remote monitoring facilities, with internet connectivity, for transmitting Plant generation data from solar site to Intake sub-station / SS-3 sub-station of HDC.

6.12.13. Lightning protection for entire Plant Area.

6.12.14. Earth pits as required confirming to IS:3043.

6.12.15. PVC pipes, cable conduits, cable trays and accessories / trenches.

6.12.16. Earthing of the entire plant as per relevant standards.

6.12.17. Control room equipment related to solar system etc.

6.12.18. Testing, maintenance and monitoring of equipment.

6.12.19. Spares & consumables, as required or recommended, for 10 years O&M period.

6.12.20. PTZ type CCTV cameras mounted on 10 m high GI Poles, to cover entire Plant including , Main Entrance and Main Control Room.

6.12.21. Fire protection system in MCR (Main Control Room) buildings, including Fire Extinguishers , as required.

6.12.22. All safety gadgets during Construction and O&M period, including but not limited to,Rubber Mats of appropriate grade, PPE, Rubber Gloves , Safety Shoes, etc.

6.12.23. One Solar Observatory including testing facilities. The Solar Observatory with associated systems shall include, but not be limited to, the following:

- Pyranometers for horizontal and tilted plane.
- Ultrasonic Anemometer (wind speed and direction).
- Temperature Sensor (Ambient and module surface).
- Power source to the all sensors.
- Data Logger
- Desktop & Printer.

6.12.24. Construction of suitable infrastructures for power evacuation to nearby 11 kV overhead lines (Domestic & Industrial) of Haldia Dock Complex, connecting Sub-station No.3 with 33 kV main Intake Sub-station of Haldia Dock Complex, at Chiranjibpur, situated at around 4 km away from the project site.

6.12.25. Design, Supply & underground laying of 2000 m (approx.) of 11kV cable, in between the plant and the above mentioned 11 kV overhead lines, for evacuation of power generated.

6.12.26. Perimeter Lighting : GI Street Light poles ,with LED luminaire, along with required GI Junction Boxes, Support, Brackets and Accessories, as required.

6.12.27. HDPE conduits and its accessories to be used for DC cable laying in PV array area.

6.12.28. Ferrules, Lugs, Glands, Terminal Blocks, Galvanized Sheet Steel Junction Boxes (with powder coating paint) for internal fixtures, cable fixing clamps, nuts , bolts, etc. of appropriate sizes, as required in the plant.

6.12.29. Power Cables, laying underground / over ground with proper cable tray arrangements.

6.12.30. GI Cable Tray with proper support and accessories inside equipment Room & Control Room building and other locations as required.

6.12.31. Laying of 11 kV Underground cable for power evacuation from project site to nearby 11 kV overhead line of Haldia Dock Complex.

6.12.32. Estimation and determination of the plant generation on daily basis in form of look ahead scheduling of power output.

6.12.33. Any other equipment / material, not mentioned but essentially required to complete the 2 MW (AC) Solar Power Plant in all respect.

6.13. Design of 2 MW (AC) Grid Interactive Solar Power Plant and its associated civil, structural, electrical & mechanical auxiliary systems, includes preparation of single line diagrams and installation drawings, manuals, electrical layouts, erection key diagrams, electrical & physical clearance diagrams, design calculations for Earth- mat, Bus Bar & Spacers, indoor & outdoor lighting / illumination, etc. Design Memorandum, GTP & GA drawings for the major equipment, design basis & calculation sheets, and other relevant drawings and documents required for engineering of all facilities, within the fencing to be provided under this contract, are covered under Contractor's scope of work.

6.14. In addition to above, the Contractor is required to measure the Solar Radiation and other climatic conditions relevant to measure the plant performance. This is necessary to study Solar Level and Guaranteed Performance of the Solar Power Plant. The satellite based analysis is to be combined with direct ground based measurement equipment in order to achieve the necessary accuracy and level of detail in the assessment of solar levels and climatic conditions.

6.15. During the O&M period, the Contractor shall keep the measured daily data at regular interval and provide the same to Employer in electronic form compatible in CSV format. The right to use the data shall remain with Employer.

6.16. Materials and accessories, which are necessary or usual for satisfactory and trouble -free

operation and maintenance of the above equipment.

6.17. The Contractor shall design suitable power evacuation system including design and construction of a suitable underground cabling infrastructure from power plant boundary to inject power from Solar Photovoltaic Power Plant to HDC's 11 kV overhead lines.

6.18. The items of civil design and construction work shall include all works required for solar PV project and should be performed specifically with respect to following, but not limited to:

6.18.1. Conducting contour survey of the total area identified for 2 MW (AC) solar PV Plant and complete soil investigation, with bore hole details.

6.18.2. Earthwork for site grading, cutting, filling, levelling & compaction of land at solar Plant site.

6.18.3. Filling soil within a lead distance of 5km from solar site would be provided by HDC, SMPK on FOC(free of cost basis) to the contractor. However, reclamation and transportation of soil to Solar Plant site is in the scope of contractor.

6.18.4. Construction and erection of GI Chain link perimeter fencing and main / security gate(s) for entire area.

6.18.5. Construction of foundation for mounting structures for SPV Panels.

6.18.6. Civil foundation work of Transformers, Switchgears, etc.

6.18.7. Construction of Main Roads of 4 m & Internal Roads of 2.5 m wide having well compacted soil, 400 mm (min.) thick DLC, 200 mm (minimum) sand filling and 100 mm thick, M50 grade Paver Block on top, with RCC guard walls on sides and 1.0 m wide well compacted shoulders on each side to carry safe & easy transportation of equipment & material, at the project site during & after construction.

RCC peripheral road of 2.5 m wide along the plant boundary is also required to be constructed.

Construction of Road from Main Gate to Control Room, for easy approach to Control Room.

6.18.8. Construction of Equipment Room with necessary illumination and finishing , as required.

6.18.9. Office-cum-stores-cum-control room Building, with Supervisor's Room, Pantry, Wash Room, Conference Room, etc., along with requisite furniture, workstations, Air-conditioning, internal & external illumination, other equipment, as per the specifications.

6.18.10. Security Cabin at strategic locations inside the boundary of the Plant.

6.18.11. RO based water treatment system of suitable capacity for catering drinking water requirement of deployed manpower of contractor(10 Persons).

6.18.12. Module cleaning to be done by providing automatic water sprinkler system.

6.18.13. Suitable Communication System for SCADA, with remote monitoring capabilities, including internet facilities.

6.18.14. Construction of RCC Storm water drainage & sewage network for the entire site area.

6.19. Obtaining statutory approvals / clearances [including renewals, if any, during O&M period] on behalf of the Employer, from various Government Departments, in addition to Central / State Electricity Authorities and including, but not limited to, the following-

6.19.1. Clearance from Pollution Control Board, if required.

6.19.2. Clearance from Power Department, if required.

6.19.3. Clearance from Forest Department, if required.

6.19.4. All other approvals, as necessary for setting up of a Solar Power Plant, connectivity, power evacuation, including approval from Central Electricity Authority (CEA), Railways, Power and Telecommunication Coordination Committee (PTCC), etc., as per the existing guidelines.

6.19.5. All other statutory approvals and permissions, not mentioned specifically but are required to carry out hassle free Construction and O&M of the Solar Plant prevailing at Site.

6.20. Following documents, drawings, design data, and engineering information are to be submitted to the 'Engineer' or his/ her authorized representative or Consultant (to be appointed by HDC,SMPK), for review & approval, from time to time, as per project schedule:

6.20.1. Contour plan and soil investigation data for the entire area.

6.20.2. General Arrangement (GA) drawings of the entire project, including Roads, Drains, Storm Water Drainage, Sewage Networks, Equipment Rooms, Office-Cum-Control Room, Security Gate, Fire Protection System , etc.

6.20.3. Design basis criteria along with relevant standards (list of standards and respective clause description only).

6.20.4. Solar insolation data and basis for generation data.

6.20.5. Design calculations, design software files and design excel sheets with all formulas.

6.20.6. Detailed technical specifications of all the equipment.

6.20.7. General Arrangement and Assembly Drawings of all major equipment.

6.20.8. Schematic diagram for entire electrical system.

6.20.9. GTP & G.A. drawings for all types of structures / components, 11 kV switchgears & other interfacing panels. Detailed design drawing of all structures.

6.20.10. Relay setting charts.

6.20.11. Quality Assurance Plans for manufacturing and field activities.

6.20.12. Detailed site Environmental, Health, and Safety (EHS) plan, Fire Safety & Evacuation Plan and Disaster Management Plan.

6.20.13. Detailed risk assessment and mitigation plan.

6.20.14. Test reports (For Type, Acceptance, and Routine Tests).

6.20.15. O&M Instruction and its drawings.

6.20.16. As-built drawings / documents and deviation list from good for construction (GFC).

6.20.17. Daily/ Weekly site work progress report with catch-up plan(s), as necessary to monitor actual timelines of the project during construction period along with the real time snap shots during the time of construction.

6.20.18. O&M plans, schedules and operational manuals for all equipment etc.

6.20.19. Weekly/ Monthly O&M reports after commissioning of the project.

6.21. The contractor shall forward the following to Employer within two weeks from issue of LOI:

6.21.1. Schedule for various activities in the form of PERT Chart.

6.21.2. Detailed engineering calculations, Design Basis Report and complete layout of the Plant.

6.21.3. Equipment Data Sheets, Guaranteed Technical Particular of equipment and GA drawings of major equipment like, Inverter, Mounting Structure And Transformer.

6.22. Scope of Work also includes following related work:

6.22.1. In connection with the work, transportation, lifting, shifting & handling of all materials & consumables should be done by the Contractor at their own risk, cost and arrangement. The responsibility for preventing damage / deterioration to the materials during loading, transit, delivery & unloading at the designated point shall rest with the Contractor. All transit risk will be to Contractor's account.

6.22.2. All materials ,equipment, accessories, etc. will be under the custody of the Contractor till installation / fixing / laying, testing & commissioning (as applicable) of the same.

6.22.3. Watch & ward of materials, installations, equipment, etc., till handing over the same to HDC, SMPK [after conclusion of O&M Period] , is under the scope of Contractor.

6.22.4. If excavated site/ cable trench /site of installation, etc., gets inundated, evacuation of water (through Electrical or Diesel Pump Set, including fuel) from site, making it workable for the work, lies within the scope of Contractor.

6.22.5. Providing a detailed training plan for all operation, maintenance procedures, which shall after approval by Employer form the basis of the training program. The Contractor, shall also provide training to nominated staff.

6.22.6. Employ & coordinate the training of contractor's personnel, who shall be qualified & experienced to operate and monitor the facility and to coordinate operations of the facility with the Grid system.

6.22.7. Adequate and seamless insurance coverage during EPC and O&M period to cater all risks related to construction and O&M of plant to indemnify the Employer.

6.22.8. Maintain at the facility accurate and up-to-date operating logs, records and monthly reports regarding the Operation & Maintenance of facility.

6.22.9. Periodic overhauls or maintenance required for the facility in accordance with the recommendations of the Original Equipment Manufacturer (OEM).

6.22.10. Procurement for spares parts, overhaul parts, tools, equipment, consumables, etc. required to operate and maintain the project in accordance with the prudent utility practices and having regarded to warranty recommendations during entire O&M period.

6.22.11. Handover the system to maintain an inventory of spare parts, tools, equipment, consumable-with required details of recommended spares list & all associated information regarding replacement records, supplier details, tentative cost, storage details, specifications on the basis of replacement frequency and mean time between failures and mean time to restore at the culmination of penultimate year under O&M period.

6.22.12. Maintain and keep all administrative offices, roads, tool room, stores room, equipment, clean, green and in workable conditions.

6.22.13. Discharge obligations relating to retirement/ Superannuating benefits to employees or any other benefit accruing to them in the nature of compensation, profit in lieu / in addition to salary, etc. for the period of service with the Contractor, irrespective continuance of employees with the project as employees of Contractor, after conclusion of O&M period.

6.23. Successful Bidder (Contractor) shall prepare the detailed project report & design basis report and submit a copy to Employer for evaluation within 2 weeks from the date of issue of LOI.

6.24. The supply, erection, commissioning and all other allied works for said (AC) capacity SPV Power Plant shall be completed as per timelines specified in the Bidding Document.

D. GENERAL REQUIREMENTS:

6.25. In connection with the instant work, the site & working areas need to be kept free from surplus materials, rubbish, offensive materials, etc. and the same are to be disposed of by the

Contractor.

6.26. The electrical work will be executed to comply with the General Specifications for Electrical work and conforming to the Indian Electricity Act & rules, BIS and direction of the 'Engineer'.

6.27. The electrical work shall be carried out by a Contractor, having **valid Electrical Contractor's Licence** issued by the competent authority [under relevant rules of the Central Electricity Authority (Measures relating to Safety and Electric Supply) Regulations, 2023, as amended up to date], under the direct supervision of a person having a valid **Supervisor's Certificate of Competency** (SCC), issued by the appropriate statutory authority, against the relevant parts, for carrying out such type of job .

6.28. The skilled workmen engaged by the Contractor for the electrical work must possess a valid Workman Permit (W.P.), issued or recognised by the competent authority [under relevant rules of the Central Electricity Authority (Measures relating to Safety and Electric Supply) Regulations, 2023, as amended up to date], against the relevant parts, for carrying out such work.

6.29. The skilled workmen engaged by the Contractor for cable laying related electrical work [cable laying and cable jointing] must possess a valid Workman Permit (W.P.), issued or recognised by the competent authority [under relevant rules of the Central Electricity Authority (Measures relating to Safety and Electric Supply) Regulations, 2023, as amended up to date], against the relevant parts, for carrying out such work

6.30. The Contractor shall be liable to submit the list of aforesaid Licence/ Workman Permit, along with the attested copies of the of the Licence / Workman Permit, during execution.

6.31. The entire job should be executed in accordance with the requirements of following Acts and rules, amended up-to-date:

a) Indian Electricity Rules – 1956

b) Electricity Laws (Amendment) Ordinance, 1997

c) Central Electricity Authority Rules, 1977

d) Central Electricity Authority Regulations, 1979

e) Indian Electricity Act, 2003

f) Central Electricity Authority (Measures relating to Safety and Electric Supply) Regulations, 2023

6.32. Supply, installation and commissioning of all items required for the subject work should be complied with the above Acts & Rules and relevant Code of Practice of the **Bureau of Indian Standard**, including **National Electrical Code (NEC)** and **National Building Code (NBC)** of India, if not specified otherwise.

6.33. The Contractor shall engage qualified / experienced / skilled personnel to carry out the works in all respects at their own cost. The Contractor will engage suitable qualified / experienced &

licensed engineering supervisor for the electrical work and suitable skilled personnel, with required permit, for doing the erection work.

6.34. All materials required [to be supplied by the Contractor] for the subject work and apparatus used by the Contractor therein, shall conform to relevant specifications of the Bureau of Indian Standard (BIS) or International Electrotechnical Commission (IEC), as applicable, if not specified otherwise in this Bidding Document.

All materials should be inspected before installation. Only accepted materials will be allowed for installation. Necessary consent should be obtained from the 'Engineer' or his representative, before using any material / equipment/ apparatus.

Nothing in this specification shall be construed to relieve the Contractor of their responsibility for providing the equipment, with all accessories, in accordance with applicable statutory regulations and safety codes in force, from the safety angle.

6.35. The Contractor holds responsibility for executing 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 shall have to carry out the items as extra / substituted item.

6.36. The Contractor should use calibrated measuring & testing instruments [having Valid Calibration Certificate] 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'.

Calibration Certificate of instruments / equipment, used for testing purpose, should be issued by an NABL accredited Laboratory. For testing equipment where NABL accreditation is not available, calibration certificate from educational institutions like IITs, NITs, J.U., C.U., B.H.U. only can be accepted, provided they demonstrate traceability.

6.37. The Contractor shall arrange all necessary labour, tools, tackles, lifting machineries, scaffolding, temporary lighting, different vehicular transport, equipment (with fuel & operator), etc., required for satisfactory execution of the entire work, at their own risk, cost and expense. Special tools, which would be required during execution of the work, shall also have to be arranged by the Contractor, at their own risk, cost and expense.

6.38. The Contractor shall have to make arrangements, at their own risk & cost, for transportation of materials from the point of issue i.e., stores to site of work, if any.

6.39. Construction Power & Construction Water, as required for construction and completion of the Solar Plant, are to be arranged by the Bidder, at their risk & cost.

Drinking water supply at the Contractor's site office, store, workshop, assembly / erection yard, etc., during 10 years' O&M Period, will be provided by HDC, on chargeable basis.

However, Water Supply, required for cleaning of Modules, during 10 years' O&M Period, will be provided free of cost.

6.40. All practical steps shall be taken to prevent danger to persons employed from the risk of fire or explosion or flooding. No floor, roof or other part of the building shall be so overloaded with debris of materials as to render it unsafe.

6.41. The Contractor shall provide necessary barriers, warning signals and other safety measures, to avoid accidents. They shall also indemnify HDC, SMPK against claims for compensation arising out of negligence in this respect.

6.42. All necessary personnel safety equipment, as per relevant statutory provisions, should be kept available for the use of the persons employed (directly or indirectly on the instant work) on the site and the Contractor should take adequate steps to ensure proper use of safety equipment by those concerned.

6.43. The ordinary business and work of HDC, SMPK & others, as being carried out on & in the vicinity of the site, shall be continued during installation, testing & commissioning and maintenance. The execution of the work shall be conducted in such a way as to avoid interference with traffic of every kind by land and with any other work in progress in the vicinity.

6.44. Inspection / acceptance, in no way shall absolve the Contractor from supplying material as per standards / codes and other obligations under the contract.

6.45. Any materials brought for work which is not matching with the relevant specification will be rejected and the rejected materials shall be removed from site on the same day.

6.46. A register (Site Work Register with Hindrance Record) is required to be maintained by the Contractor on daily basis with details of works carried out on that particular day, where details regarding engagement of labourers, equipment, receipt of materials and cause of hindrance, if any, shall be recorded jointly [by the representatives of the 'Engineer' & the Contractor].

Representative(s) of the Contractor shall have to check the register for any instructions of 'Engineer' or his authorized representative and sign the same for compliance with the instructions recorded therein.

Any instruction issued by the 'Engineer' or his authorized representative, which has been entered in the Site Work Register, shall be deemed to have been legally issued.

This Site Work Register (s) shall be the property of HDC, SMPK and shall be returned to the representative of the 'Engineer' in good condition, after the completion of the work.

6.47. The Contractor shall maintain a Site Order Book at their site office. All orders and instructions issued to them from time to time by the 'Engineer' or his representative will be recorded in the Site Order Book. The authorized representative of the Contractor shall promptly sign each entry as token of having received such orders.

Any order or instruction issued by the 'Engineer' or his authorized representative, which has been entered in the Site Order Book, shall be deemed to have been legally issued.

This Site Order Book(s) shall be the property of HDC, SMPK and shall be returned to the representative of the 'Engineer' in good condition, after the completion of the work. Photocopy of the same may be retained by the Contractor, for their record.

6.48. Relevant aspects of following Rules / Code of Practices should also be followed and complied with:

a) Indian Factories Act

b) Dock Workers (Safety, Health & Welfare) Act, 1987

c) The Workmen's Compensation Act, 1923

d) The Minimum Wages Act, 1948

e) The Contract Labour (Regulation & Abolition) Act, 1970

f) Other Local Regulations.

6.49. If during execution of work any damage takes place in the property of HDC, 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, along with overhead charges @19.25%.**

6.50. No project surplus material will be taken over by HDC after completion of the work.

6.51. For the purpose of application (by HDC, SMPK) for obtaining necessary approval/ clearance/renewal 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, SMPK. 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.

The contractor should clearly understand that though the application would be made by HDC, SMPK to the Regional Inspectorial Organization, Central Electricity Authority / Statutory Authority, for obtaining necessary approval/ clearance/ renewal 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.

6.52. The Contractor shall make available, maintain and operate one vehicle (Four-wheeler, having a minimum sitting capacity for 4 persons plus driver), in Good condition, with Driver & Fuel, for the use of the 'Engineer' or his representative(s), during survey, testing, inspection, measurement, etc., related to the instant work. The vehicle shall be made available on all

working days [mainly from 8:00 hrs. to 20:00 hrs.]. In case of exigency and work during night, the vehicle shall be made available beyond the normal working hour, mentioned above.

The Vehicle should be available within 15th day from the date of placement of order and shall continue till the date handing over the contract job, by the Contractor. The vehicle shall not be more than 3 [three] years old.

E. BILL OF MATERIAL:

6.53. The equipment and material for the 2 MW (AC) Grid Interactive Solar Photovoltaic Power Plant ,with associate system (typical), shall include, but not limited to, the following:

Sl. No.	Item Details	Unit of Measurement
1)	PV Modules	No.
2)	Module Mounting Structures including fasteners and clamps	Set
3)	Main Junction Boxes with monitoring capabilities	Set
4)	Solar Module Array to Junction Box interconnection Cable (Cu)	RM
5)	Junction Box to Inverter interconnection Cable (Cu/ Al)	RM
6)	Connection accessories- lugs, ferrules, glands, terminations, etc	Lot
7)	AC Cable (LT) of appropriate sizes	RM
8)	Power Conditioning Units / Inverters	No.
9)	String Level Monitoring System (SCADA) and ancillaries	Set
10)	Transformers (Power and Auxiliary)	No.
11)	HT VCB Panels	Set
12)	11 kV XLPE cable and supports	RM
13)	11 kV outdoor bay complete in all respect with Isolators, CT, PT, Bus post Insulator, etc.	Lot
14)	AC & DC distribution panels / boards, PCC, LDB, etc.	Lot
15)	Lightning Arresters of suitable ratings	Set
16)	Earth mat for switch yard, DC field array and equipment	Lot
17)	Earth cables, flats and earthing pits	Lot
18)	Rubber Mats for specific kV ratings and safety gadgets, PPE, Fire extinguisher - Foam type, CO_2 type, ABC type, etc., as applicable, Sand Bucket, Discharge Rods	Lot
19)	Lighting arrangement for the plant safety and Fire Alarm system and signboards in Buildings.	Lot
20)	Solar Observatory with remote monitoring assistance & Meteorological station with sensors and Data Logger.	Set
21)	Automatic Module Cleaning System	Lot
22)	PTZ CCTV cameras and GI poles	Lot

Sl. No.	Item Details	Unit of Measurement
23)	Danger Sign Plates, anti-climbing, bird protection, fencing of Metering bay, etc.	Lot

6.54. All the information shown here is indicative only and may vary as per design and planning by the Contractor. The Contractor must provide the Bill Of Material (BOM) of the Plant, as per the design, during detailed engineering. The technical features of major equipment are described hereunder.

F. TECHNICAL SPECIFICATION:

6.55. ***Technical Specification of Solar power plant***

6.55.1. Total capacity of PV Modules, to be supplied for the 2 MW (AC) project, shall be 2.2 MWp (minimum) , which is the cumulative rated capacity of all solar PV module, under supply, as per relevant IEC Standards & under Standard Test Conditions (STC).
The Project shall consist of Mono / Multi Crystalline Photovoltaic Modules as per the specifications given below:

(i) The solar photovoltaic modules with efficiency more, 18% for mono-crystalline silicon based modules with positive tolerance only.

(ii) The glass used to make the crystalline silicon modules shall be toughened low iron glass with minimum thickness of 4.0 mm for 72 cell module and 3.2 mm for 60 cell module. The glass used shall have transmittance of above 90% and with bending of less than 0.3% to meet the specifications.

(iii) The back sheet used in the crystalline silicon based modules shall be of 3 layered structure. Outer layer of fluoropolymer, middle layer of Polyester (PET) based and Inner layer of fluoropolymer or UV resistant polymer. Back sheet with additional layer of Aluminium also will be considered.

(iv) The EVA used for the modules should be of UV resistant in nature. No yellowing of the back sheet with prolonged exposure shall occur.

(v) The sealant used for edge sealing of PV modules shall have excellent moisture ingress protection with good electrical insulation (Break down voltage >15 kV/mm) and with good adhesion strength.

(vi) The junction box used in the modules shall have protective bypass diodes to prevent hot spots in case of cell mismatch or shading. The material used for junction box shall be made with UV resistant material to avoid degradation during module life and the Junction sealing shall comply IP65 degree of protection.

(vii) The crystalline silicon based modules supplied should be of Potential Induced Degradation (PID) free modules and the test certificate from third party lab complying with the same shall be provided.

(viii) The rated output of the modules shall have positive tolerance of +5 W and no negative tolerance is allowed.

(ix) Modules should have rugged design to withstand tough environmental conditions and high wind speeds (as per relevant Indian Standard Specifications).

(x) Modules shall perform satisfactorily in relative humidity up to 95% and temperature between -10ºC and 85ºC (module temperature).

(xi) PV modules must be warranted for their output peak watt capacity, which should not be less than 90% of the initial value at the end of 10 years and 80% of the initial value at the end of 25 years.

(xii) The Modules shall be warranted for minimum of 10 years against all material / manufacturing defects and workmanship.

(xiii) All modules shall be certified, as per

IEC 61215 (Design qualification and type approval for Crystalline Si modules).

IEC 61730 (PV module safety qualification testing @ 1000 V DC or higher)

IEC 61701: Salt Spray test for highly corrosive environment, if applicable

IEC 62716: Ammonia Resistant certified, if applicable.

Test certificate from NABL approved or /ILAC member body certified labs shall be provided.

(xiv) The developer shall arrange for the details of the materials along with specifications sheets of from the manufacturers of the various components used in solar modules along with those used in the modules sent for certification. The Bill of Materials (BOM) used for modules shall not differ in any case from the ones submitted for certification of modules.

(xv) The Contractor would be required to maintain accessibility to the list of module IDs along with the parametric data for each module.

(xvi) The module frame shall be made of anodized Aluminium or corrosion resistant material, which shall be electrically compatible with the structural material used for mounting the modules. In case of metal frames for modules, it is required to have provision for earthing to connect it to the earthing grid.

(xvii) All materials used for manufacturing solar PV module shall have a proven history of reliability and stable operation in external applications. Module shall perform satisfactorily in relative humidity up to 95% with ambient temperature between -10°C to +50°C. The material shall withstand adverse climatic conditions, such as high speed wind, blow with dust, sand particles, and saline climatic / soil conditions and for wind speed of 200 km/hr.

(xviii) Modules only with the same rating and manufacturer shall be connected to any single Inverter.

(xix) The 'Engineer' or his / her authorized representative reserves the right to inspect the Modules ,at the Manufacturer's Works / Premises, prior to dispatch.

6.55.2. PV Array Configurations

The Solar array shall be configured in multiple numbers of sub-arrays, providing optimum DC power to auditable number of sub arrays. The Contractor shall submit their own design, indicating configuration of PCU and respective sub arrays and associated Bill Of Material.

6.56. ***Technical Specification of Module Mounting Structure***

6.56.1. The structure design shall be appropriate and innovative. It must follow the existing land profile.

6.56.2. The structure shall be designed to allow easy replacement of any Module and shall be in line with the site requirements.

6.56.3. Design & Drawings, including material selected & their standards, shall have to be submitted by the Contractor , for prior approval of the 'Engineer".

6.56.4. The support structure & foundation shall be designed with reference to the existing soil conditions, in order to withstand wind speed applicable for the zone (Site Location) or 200 kmph, whichever is higher, using relevant Indian wind load codes. The structures and foundations shall also conform to the seismic conditions pertaining to the zone using relevant Standards and codes.

6.56.5. The structure must be designed considering appropriate factor of safety. The Contractor shall provide the detailed design and calculation for the structural design. The structure shall be designed for simple mechanical and electrical installation. It shall support SPV modules at a given orientation & tilt, absorb and transfer the mechanical loads to the ground properly. Welding of structure at site shall not be allowed.

6.56.6. The array structure shall be made of mild steel members of suitable sizes with weather protection coating. The coating shall be as per ASTM A792/ A792M-10 standard Al Zn alloy with hot dip process and thickness of 150 GSM on both sides. It is to ensure that before application of this coating, the steel surface shall be thoroughly cleaned of any paint, grease, rust, scale, acid or alkali or such foreign material as are likely to interfere with the coating process. The Contractor should ensure that inner side should also be coated.

6.56.7. The array structure shall be so designed that it will occupy minimum space without sacrificing the output from SPV panels at the same time.

6.56.8. Nut & bolts, washers (packing and spring) supporting structures including Module Mounting Structures shall have to be adequately protected from atmosphere and weather prevailing in the area.

6.56.9. Two numbers of anti-theft fasteners of stainless steel on two diagonally opposite corners for each Module shall be provided. All the fasteners and washers for Module Mounting Structures and modules, shall be adequately protected from atmosphere & weather prevailing in the area. Fasteners & washers to be used for erection of mounting structures could be of SS 304, however fasteners used for fixing modules over structures shall be of stainless steel of grade SS 316, and must sustain the adverse climatic conditions to ensure the life of structure for 25 years.

6.56.10. Modules shall be clamped & bolted with the structure properly. The material of clamps shall be Al / Steel having weather resistant properties. Clamp bolt shall use EPDM rubber and shall be designed in such a way so as not to cast any shadow on

the active part of a module.

6.56.11. The array structure shall be grounded properly using maintenance free earthing kit.

6.56.12. The Contractor / Manufacturer shall specify installation details of the PV modules and the support structures with appropriate diagram and drawings.

6.56.13. The Contractor should design the structure height considering highest flood level at the site. The minimum clearance between the lower edge of the module and the ground shall be the higher of (i) accessed highest flood level at the site and (ii) 500 mm.

6.56.14. For multiple module mounting structures located in a single row, the alignment of all Modules shall be within an error limit of maximum 10 mm.

6.56.15. Civil foundation design and structural design of Module Mounting Structures (MMS) as well as Control Room, Equipment Room And Power Equipment shall be made in accordance with the Indian Standard Codes and prevailing soil conditions. The Successful Bidder shall submit the detailed foundation & structural design analysis along with calculations and basis / standards, duly certified by reputed institutes viz. IIT Kharagpur / IIT Madras/ IIEST, Shibpur / Jadavpur University for acceptance by HDC.

6.56.16. Cable should pass through Pipes and Cable-ties shall be used to hold and guide the Pipes (cables / wires) from the Modules to Junction Boxes or Inverters. All the cables shall be aesthetically tied to Module Mounting Structure.

6.56.17. In case the String Monitoring Unit (SMU or JB) is mounted on the Module Mounting Structure, the Contractor shall have to take into consideration the load thus added on the MMS. Accordingly, suitable supporting members for mounting the SMU/ JB must be considered and supplied. Separate structure for mounting of SMU can also be proposed.

6.56.18. The Contractor must submit complete quality documents i.e. Test Certificates for all tests conducted starting from raw material stage, in process, final testing w.r.t structure.

6.56.19. Every major Component of the Plant should be suitably named / numbered & marked for ease of traceability, identification and maintenance.

6.57. ***Technical Specification of Junction Box/ Combiner Box:***

6.57.1. All Junction/ Combiner Boxes including the string junction box, array junction box and main junction box/ combiner box should be equipped with appropriate functionality, safety (including fuses, grounding, contacts etc.) and protection.

6.57.2. The terminals will be connected to copper bus-bar arrangement of proper sizes to be provided. The junction boxes will have suitable cable entry points fitted with cable glands of appropriate sizes for both incoming and outgoing cables. Suitable markings shall be provided on the bus-bars for easy identification and UV resistant cable ferrules will be fitted at the cable termination points for identification.

6.57.3. The Junction/ Combiner Boxes shall have suitable arrangement for the followings:

(i) Strings are required to be connected to the bus bar through individual fuses. However, if keeping the losses within the specified limit.

(ii) Provide arrangement for disconnection for each of the groups.

(iii) Provide a test point for each sub-group for quick fault location and to provide group array isolation.

(iv) SCADA Communication device with all necessary equipment for communicating with main SCADA Server.

Junction/ Combiner Boxes should have suitable space for workability & natural cooling and provision of adequate number of spare terminals.

6.57.4. The rating of all component of Junction / Combiner Boxes shall be suitable (with adequate factor of safety) to interconnect the Solar PV array.

6.57.5. The Junction/ Combiner Boxes shall be dust, vermin & waterproof and made of thermoplastic / metallic in compliance with IEC 62208, which should be sunlight / UV resistive, as well as fire retardant, and must have minimum Ingress Protection (IP) of IP65 (Outdoor).

6.57.6. The Array Junction Box shall have suitable surge protection. In addition, over voltage protection shall be provided between positive & negative conductor and Earth Ground, such as Surge Protection Device (SPD). The Maintenance Free Earthing shall be done as per the relevant standard.

6.57.7. If the solar PV Module is not equipped with Reverse Blocking Diode, then each Array Junction Box shall have suitable Reverse Blocking Diodes of maximum DC blocking voltage of 1000V, with suitable arrangement for its connection. The Bypass & Reverse Blocking Diodes should work for temperature extremes and should have efficiency of 99.98%, confirming to appropriate IEC standards.

6.57.8. Adequate capacity solar DC fuses & isolating Miniature Circuit Breakers should be provided , as per recommendation of the Inverter Manufacturer. The fuses should be so designed that it should protect the Modules from the Reverse Current Overload.

6.57.9. Details of Junction Box specifications and data sheet, including all components, shall be provided with the Bid document.

6.57.10. The Contractor shall submit all the Test Reports / Test Certificates and compliance certificates before installation at site.

6.58. ***Technical Specification of Power Conditioning Unit (PCU)/ Inverter:***

6.58.1. Power Conditioning Unit (PCU) / Inverter shall consist of an electronic inverter along with associated control, protection and data logging devices, with following details:

(i) The Rated Power / Name Plate Capacity of the Inverters shall be the AC output of the Inverter at 50ºC. Any Inverter with AC output at 50ºC, below the Name Plate / Rated Power of the Inverter shall not be allowed.

(ii) The Inverter supplied shall have minimum of 10% additional DC input Capacity. (e.g. Inverter is supplied with rated capacity of 500 kW (AC) shall accept at least 550 kW of DC Power.)

(iii) All PCUs should consist of associated control, protection & data logging devices and remote monitoring hardware, compatible with software used for string level monitoring.

(iv) Dimension, weight, cooling arrangement etc. of the PCU shall be indicated by the Bidder in the offer. Type (in- door & out,-door) of installation also to be indicated.

(v) Only those PCUs / Inverters which are commissioned for more than 2 MW (AC) solar PV Project till date, in India , shall be considered for this Project. The Contractor shall have to provide sufficient information to the satisfaction of the 'Engineer', before placing the final order for PCUs / Inverters.

(vi) The minimum European efficiency of the inverter shall be 98% load as per IEC 61683 standard for measuring efficiency. The Bidder shall specify the conversion efficiency of different loads i.e. 25%, 50%, 75% and 100%.

(vii) The PCU shall be tropicalized and design shall be compatible with conditions prevailing at site. Provision of exhaust fan with proper ducting for cooling of PCUs should be incorporated in the PCUs, keeping in mind the extreme climatic condition of the site, as per the recommendations of OEM, to achieve desired performance and life expectancy.

(viii) The inverters shall have minimum Ingress Protection (IP) of IP21 (Intdoor).

(ix) Nuts & bolts and the PCU enclosure shall have to be adequately protected, taking into consideration the atmosphere and weather prevailing in the area.

(x) Grid Connectivity: Relevant CERC (Central Electricity Regulatory Commission) Regulations and Grid Code, as amended up-to-date , shall be complied with. The system shall incorporate a unidirectional Inverter and should be designed to supply the AC power to the Grid at load end. The Power Conditioning Unit shall adjust the voltage & frequency levels to suit the Grid.

(xi) All three phases shall be supervised with respect to rise / fall in programmable threshold values of frequency.

(xii) The Inverter output shall always follow the Grid in terms of voltage and frequency. This shall be achieved by sensing the Grid Voltage & Phase and feeding this information to the feedback loop of the Inverter. Thus controls the output voltage & frequency of the inverter, so that the Inverter is always synchronized with the Grid. The inverter shall be self- commutated with Pulse width modulation (PWM) technology.

6.58.2. **Operational Requirements for Inverter / PCU**

The PCU must have the feature to work in tandem with other similar PCUs and be able to be successively switched "ON" and "OFF" automatically based on solar radiation variations, during the day. Inverters must operate in synergy & intelligently to optimize the generation at all times, with minimum losses and shall have following operational features :

(i) The PCU shall be capable of controlling Power Factor dynamically.

(ii) Maximum Power Point Tracker (MPPT) shall be integrated in the Power Conditioner Unit to maximize energy drawn from the Solar PV Array. The MPPT should be Microprocessor based to minimize power losses. The MPPT unit shall confirm to IEC 62093 for design qualification.

(iii) The system shall automatically 'wake up' in the morning and begin to export power, provided there is sufficient Solar Energy and the Grid Voltage & Frequency are in range.

(iv) **Sleep Mode**: Automatic sleep mode shall be provided so that unnecessary losses are minimized at night. The power conditioner must also automatically re-enter standby mode when threshold of standby mode reached.

(v) **Stand By Mode**: The control system shall continuously monitor the output of the Solar Power Plant until pre-set value is exceeded & that value to be indicated.

(vi) **Basic System Operation (Full Auto Mode)**: The control system shall continuously monitor the output of the Solar Power Plant until pre-set value is exceeded & that value to be indicated.

(vii) PCU shall have provisions / features to allow interfacing with monitoring software and hardware devices.

6.58.3. **Protection against faults for PCU**

The PCU shall include appropriate self-protective and self-diagnostic feature to protect itself and the PV array from damage in the event of PCU component failure or from parameters protective features shall not allow signals from the PCU front panel to cause the PCU to be operated in a manner which may be unsafe or damaging. Faults due to malfunctioning within the PCU, including commutation failure, shall be cleared by the PCU protective devices. In addition, it shall have following minimum protection against various possible faults:

(i) **Grounding Leakage Faults**: The PCU shall have the required protection arrangements against grounding leakage faults.

(ii) **Over Voltage & Current**: In addition, over voltage protection shall be provided between positive & negative conductor and earth ground, such as Surge Protection Devices (SPD).

(iii) **Galvanic Isolation**: The PCU inverter shall have provision for galvanic isolation with external Transformer, if required.

(iv) **Anti-islanding** (Protection against Islanding of Grid): The PCU shall have anti-islanding protection. (IEEE 1547/UL 1741/ equivalent BIS standard).

(v) **Unequal Phases**: The system shall tend to balance unequal Phase Voltage (with 3- phase systems).

(vi) **Reactive Power**: The output Power Factor of the PCU should be of suitable range to supply or sink reactive power. The PCU shall have internal protection arrangement against any sustained fault in the feeder line and against lightning in the feeder line.

(vii) **Isolation**: The PCU shall have provision for input & output isolation. Each solid- state electronic device shall have to be protected to ensure long life as well as smooth functioning of the PCU.

(viii) PCU shall have arrangement for adjusting DC input current and should trip against sustainable fault downstream and shall not start till the fault is rectified.

(ix) Each solid state electronic device shall have to be protected to ensure long life of the Inverter as well as smooth functioning of the Inverter.

(x) All Inverters / PCUs shall be Three Phase using static solid state components. DC lines shall have suitably rated isolators to allow safe start up and shut down of the system. Fuses & Circuit Breakers used in the DC lines must be suitably rated.

6.58.4. **Standards & Compliances**

PCU shall confirm to the following standards , appropriately certified by the Labs:

(i) Efficiency measurement: IEC 61683

(ii) Environmental Testing: IEC 60068-2 or IEC 62093

(iii) Electromagnetic Compatibility (EMC), Harmonics, etc.: IEC 61000 series, 6-2, 6-4 and other relevant Standards.

(iv) Electrical safety: IEC 62109 (1&2), EN 50178 or equivalent.

(v) IEEE standard 929-2000 orequivalent.

(vi) Protection against islanding of grid: IEEE1547/ UL1741/ IEC 62116 or equivalent.

(vii) Grid Connectivity: Relevant CEA / CERC Regulation and Grid Code (amended up-to-date).

(viii) Reliability test standard: IEC 62093 or equivalent.

The Contractor shall select the Inverter (Central) as per their own system design, so as to optimize the power output.

6.58.5. **Desired Technical Specifications of PCU.**

(i) Sinusoidal Current Modulation with excellent dynamic response. Compact and Weather Proof Housing (indoor/ outdoor). Comprehensive network management functions [including the Low-Voltage Ride-Through (LVRT) and capability to inject reactive power to the Grid).

(ii) Total Harmonic Distortion (THD) <3%.

(iii) No Load Loss < 1% of rated power and maximum loss, in sleep mode, shall be less than0.05%.

(iv) Optional VAr Control.

(v) Power Factor Control range: 0.9

(vi) Humidity: 95% Non-condensing.

(vii) Unit wise & integrated Data Logging.

(viii) Ethernet for Networking.

(ix) Inverter / Power Conditioning Unit must provide protection against:

- Over Current
- Synchronization Loss
- Over Temperature DC Bus Over Voltage
- Cooling Fan Failure (If provided)
- Short circuit
- Lightning Earth Fault
- Surge voltage induced at output due to external source. Power Regulation in the event of thermal overloading. Set point pre-

selection for VAr Control.

(x) Bus Communication via interface, for integration.

(xi) Remote Control via Telephone Modem or Mini Web Server.

(xii) Integrated protection in the DC and Three Phase System.

(xiii) Insulation monitoring of the PV Array with sequential fault location.

(xiv) Ground fault detector which is essential for large PV Generators, in view of appreciable discharge current with respect to Ground.

(xv) Over Voltage Protection against atmospheric Lightning discharge to the PV Array is required.

(xvi) The power conditioner must be entirely self-managing and stable in operation.

(xvii) A self-diagnostic system check should occur on start up. Functions should include a test of key parameters on start up.

(xviii) PCU / Inverter front panel shall be provided with display (LCD or similar) to monitor,but not limited to, the following:

- DC Power Input
- DC Input Voltage DC Current
- AC Power Output
- AC Voltage (All 3 Phases and Line)
- AC Current (All 3 Phases and Line)
- Power Factor

(xix) Documentary Requirements & Inspection

The Bill Of Materials associated with should be clearly indicated while delivering the equipment.

The Contractor shall provide to the 'Engineer', Data Sheet containing detailed technical specifications of all the Inverters & PCUs, Type test Reports and Operation & Maintenance Manual . The 'Engineer' or his / her authorized representative reserves the right to inspect the PCUs / Inverters at the Manufacturer's Works / Premises, prior to dispatch.

6.59. Technical Specification of DC Cable and Wires:

6.59.1. All cables and connectors for use for installation of solar field must be of solar grade which can withstand harsh environment conditions including High temperatures, UV radiation, rain, humidity, dirt, salt, burial and attack by moss & microbes for 25 years, and voltages as per latest IEC standards. The Cables & wires should have following technical features:

(i) Insulation: 1.5 kV DC, Extruded Electron Beam Cross-linked LSOH insulated.

(ii) Outer sheath of cables shall be Extruded Electron Beam Cross-linked LSOH type and black in colour. In addition, Batch no. to be embossed / printed at

every one meter.

(iii) DC cables used from Solar Modules to Array Junction Box shall be solar grade copper (Cu) with Extruded Electron Beam Cross-linked LSOH insulated and rated for 1.5 kV. However, the cables used from Array Junction Box to Inverter can be XLPE Aluminium with 1.1 kV rating, as per relevant standards. Bidder shall provide the Type Test Report for each type of cable used before dispatch of the cable.

(iv) Wires with sufficient current capacity & required parameters shall be designed and used so that maximum voltage-drop at full power from the PV Modules to Inverter should be less than 1.5% (including diode voltage drop). Successful Bidder shall provide voltage drop calculations in excel sheet.

(v) Only terminal cable joints shall be accepted. No cable joint to join two cable ends shall be accepted. All wires used on the LT side shall conform to IS and should be of appropriate voltage grade. Only copper conductor wires compliant with IEC 60228, Class 5 of reputed make shall be used.

(vi) All High Voltage Cables connecting the Main Junction Box / Inverters to the Transformers should be XLPE insulated grade conforming to IS 7098.

(vii) Cable terminations shall be made with suitable cable lugs & sockets etc., crimped properly and passed through brass double compression type cable glands at the entry & exit point of the cubicles.

(viii) All Cable / Wires shall be provided with UV resistant printed ferrules on PVC tags for DC side. However, for HT cables, punched / embossed Aluminium PVC tags are required. The marking on tags shall be done with good quality letter and number ferrules of proper sizes, so that the cables can be identified easily.

(ix) The wiring for Modules interconnection could be in the HDPE pipe of reputed make. All the buried cables shall be run through HDPE pipe only.

6.60. Technical Specification of LT Switchboard / DC Distribution Box (DCDB) / AC Distribution Box (ACDB):

6.60.1. Sufficient number of switchboards / DCDB / ACDB , wherever required, shall be provided , as per the following details:

(i) All Boxes / Panels should be equipped with appropriate functionality, safety (including fuses, grounding, etc.) and protection.

(ii) The terminals will be connected to bus-bar arrangement of proper sizes to be provided. The Panels / Boxes will have suitable cable entry points fitted with cable glands of appropriate sizes for both incoming and outgoing cables.

(iii) Adequate rating fuses & isolating MCB/ MCCB should be provided.

(iv) The Panels/ Boxes shall have followings arrangements:

- Arrangement for disconnection.
- A test point for quick fault location.
- Isolation.
- Suitable current carrying rating , with adequate safety factor .

- Suitable rating ,with adequate safety factor, to interconnect to the local/ internal Grid.
- Thermal/ heat dissipation arrangement/ Vent for safe operation.
- Adequate number of spare terminals.

(v) The Boxes / Panels shall be dust, vermin, and waterproof and made of CACA in compliance with IEC 62208, which should be sunlight / UV resistive as well as fire retardant & must have minimum Ingress Protection to IP 55 (indoor).

(vi) All Panels / Boxes shall be provided with adequately rated bus-bar, incoming control, outgoing control etc. as a separate compartment inside the panel to meet the requirements of the CEA. All live terminals and bus bars shall be shrouded. The outgoing terminals shall be suitable to receive suitable runs and size of cables required for the Inverter / Transformer rating.

(vii) The Boxes / Panels must be grounded properly to ensure all safety related measures for safe operation. The parts of panel, wherever applicable, must be insulated properly.

(viii) All the Panels to be manufactured with sufficient space for working and must have separate cable and bus bar alley.

6.61. Technical Specification of Lightning Protection for PV Array:

6.61.1. The source of over voltage can be lightning or other atmospheric disturbance. Main aim of over voltage protection is to reduce the over voltage to a safe level before it reaches the PV or other sub-system components. Early Streamer Emission (ESE) type lightning arresters shall have to be provided by the Contractor and the same are to be placed at strategic locations to protect the plant from lightning, and shall not cause any shadow on the Solar Modules.

6.61.2. Necessary foundation / anchoring for holding the lightning conductor in position to be made after giving due consideration to shadow on PV array, maximum wind speed and maintenance requirement at site in future.

6.61.3. The site is prone to lightning strikes and hence bidder is suggested to take utmost care while designing the lightning protection system. The Bidder shall submit the drawings, calculations and detailed specifications of the PV array lightning protection equipment to Employer for approval before installation of system

6.61.4. The lightning conductor shall be earthed through flats and connected to the grounding mats as per applicable Indian Standards with earth pits. Three earth pits shall be provided for each lightning arrestor. Each lightning conductor shall be fitted with individual earth pit as per required Standards including accessories, and providing masonry enclosure with cast iron cover plate having locking arrangement, watering pipe using charcoal or coke and salt as required as per provisions of IS.

6.62. Solar Photovoltaic Power Plant Electrical System

The technical requirements of design & engineering, testing at works, supply,

installation, testing & commissioning of all electrical equipment required for the Solar Photovoltaic Power Plant starting from the local control panel of Plant and up to the Grid tie up with the State grid including all control protection, metering equipment, step up generator voltage transform, 11 kV indoor/ outdoor switchgears and balance of equipment complete in all respect shall be of high standard and quality meeting the requirement of respective Indian standard (following table).

All the type test reports along with Material Despatch Clearance Certificate (MDCC) for all equipment and cables are to be submitted by the Contractor prior to the despatch of the same.

Bidder has to provide the type test report for all the equipment used under this contract. If the equipment is not type tested, the bidder has to ensure conduction of such test and supply the type test to the Employer without any additional cost.

6.62.1. **Step-Up Transformer**

The transformer shall be copper wound, 3 phase, natural cooled, core type construction, and oil immersed and shall be suitable for outdoor applications.

The Bidder shall provide the complete turnkey design, supply, erection, testing and commissioning of transformers and transformer substation to step-up the output of the inverter to 11 kV at the location of the inverter. The power from different inverter rooms shall be collected at a common location from where it shall be transmitted to the nearby 11 kV overhead line through underground cable. However, the detailed scheme of design lies with the bidder and must submit the same to Employer for approval prior to construction.

Power Transformers utilized shall be 3 phase, Oil Filled, 1 1 kV, 50 Hz and associated Switchgear of approved make. RTCC panel, as per design, will be provided in control room. It is recommended to have standard ratings of transformer. Bidder is to provide the type test reports for the transformer(s) used. The vector group of transformer(s) must be in line with the system requirement and follow the prevailing grid codes at the location of Site.

The brief particulars and requirement of equipment is as under–

IS/ IEC Reference	**Specification**
IEC-298	A.C. Metal enclosed and control gear for rated voltages above 1KV and including 72.5KV
IS-3427	A.C. Metal enclosed and control gear for rated voltages above 1KV and including 52KV.

IS-8623	Specification for Low Voltage Switchgear and Control gear assemblies.
IS-13118/ IEC-56	Specification for High Voltage AC Circuit Breakers.
IEC-529	Degrees of Protection.
IS-5578 & 11353	Making and arrangement for switchgear bus bar main connections and auxiliary wiring.
IS-325	Specification for 3 Phase Induction motors.
IS-2629	Recommended practice for not dip galvanizing of iron and steel.
IEC-137	Bushing for AC Voltages.
IS-3347	Porcelain Transformer Bushings.
IS-5561	Terminal Connectors
IS-3156	Voltage Transformers
IS-2705	Current Transformers
IS-3231	Electric relays for power protection.
IS-13010	Watt hour meters
IS-13779	Static Energy Meters
IS-8686	Static Protection Relays
IS-1248	Electrical measuring instruments
IS-2099	High Voltage Porcelain Bushings.
IS-10118	Minimum clearances for Outdoor Switchgear.
IEC-694	Common Clauses for High Voltage Switchgear and Control gear
IEC-60255 & IEC-61330	Numerical Relays

All the transformers shall be suitable for outdoor installation with 3 phase 50Hz in which the neutral is effectively earthed and they should be suitable for service under fluctuations in supply voltage up to plus 10% to minus 15%.

General requirement for the transformers shall be as per below:

a) Standards:

Standards	**Relevance**
IS: 2026 (Part 1 to 4)	Specifications for Power Transformer
IS: 2099	Bushings for alternating voltage above 1000 V
IS: 3639	Fittings and accessories for power transformer
IEC: 60076 (Part 1 to 5)	Specifications for Power Transformer
IS: 9921 Part 1 to 5	Alternating currents dis connectors (isolators) and earthingswitches rating, design, construction, tests etc.

IS: 2705 Part 1 to 4 & IEC: 185	Current transformer
IS: 2544	Porcelain insulators for system above 1000 V
IS: 5350	Part III post insulator units for systems greater than 1000V
IS: 5621	Hollow Insulators for use in electrical equipment
IS: 5556	Serrated lock washers specification

The equipment and accessories covered by this specification shall be designed, manufactured and tested in accordance with the latest relevant standards and codes of practice published by the relevant Indian Standards (IS) as applicable.

All electrical equipment and installation shall confirm to the latest Indian Electricity Rules as regards safety, earthing and other essential provisions specified for installation and operation of electrical plants. Relevant national and international standards in this connection can be followed in order to improve the efficiency and safe operations.

All working parts, as far as possible, are to be arranged for convenience of operation, inspection, lubrication and ease of replacement with minimum downtime. All parts of equipment or of spare equipment offered shall be interchangeable.

The quality of materials of construction and the workmanship of the finished products / components shall be in accordance with the highest standard and practices adopted for the equipment covered by the specification.

All items of equipment and materials shall be thoroughly cleaned and painted in accordance with relevant Indian Standards. The finish paint shall be done with two coats of epoxy based final paint of colour Shade RAL 7032 of IS: 5 for indoor equipment.

Any fitting or accessories which may not have been specifically mentioned in the specification but which are usual or necessary in the equipment of similar plant or for efficient working of the plant shall be deemed to be included in the contract and shall be provided by the Contractor without extra charges. All plant and apparatus shall be complete in all details whether such details are mentioned in the specifications or not.
All equipment shall be designed for operation in tropical humid climate at the required capacity. The reference parameters for which the transformers are to be designed are as under:-

Ratings and specifications (230 ~ 415V / 11 kV Transformer)

The typical rating and electrical characteristics of the **230 ~ 415V**/ 11 kV ONAN type inverter duty transformer shall be as under however, the ratings may vary

subjected to design by the bidder and relevant to the respective IS codes :

Particulars	**230 ~ 415V / 11 kV Transformer Specs.**
Continuous kVA ratings	As per design
Design Ambient	45degree C
Type	Oil immersed
Frequency	50 Hz
Type of cooling	Oil Natural Air Natural (ONAN)
Insulation & Duty	Class-A, Inverter duty
Temperature rise over 45degree C	Winding-55 degree C Oil-35degree C
No. of phases	3 (Three)
Rating voltage H.V. side	11 kV
Highest System voltage on H.V. side	12 kV
Rated voltage on L.V. side	0.230~ 0.415 kV /0.230~ 0.415 kV (Two winding)
Vector Group	Dyn11
LV Winding	Copper
HV Winding	Copper
Connections	
a. H.V. Winding	Delta
b. L.V. winding	Star with Neutral solidly earthed(as per state grid code)
On load taps on H.V. Side (for H.V. Variation)	As per design (in steps of 1.25%)
Tap changer type	OFF-CIRCUIT TAP SWITCH/RTCC As per design
Impedance voltage (%)as per IS 2026	As per design
Transformer connections	LV side - Cable chamber with copper busbar to terminate multiple runs of Cables as per design
	HV Side- Cable chamber with copper busbar to terminate multiple

	runs of Cables as per design
Additional neutral Bushing	To be provided.
Dynamic Short circuit withstand capacity	To submit design calculations.
Buchhloz Relay	To be provided
MOG	To be provided
PRV	To be provided
Radiator Valves	Gun metal
OIL	To be supplied - 10% extra in drums.

Efficiency**:**

The percentage loading for the maximum efficiency shall be clearly stated at unity power factor as well as 0.8 and 0.9 power factor (lead and lag).

Insulation**:**

The dielectric strength of the winding, given insulation and the bushings shall conform to the values given in IS: 2026 (Part III)/1981 (or its latest amendment) for highest system voltage of 12 kV, 1.1 kV and shall be suitable for the impulse test\power frequency test voltages.

Factory Assembly and Tests:

The transformer shall be completely assembled and tested at the Factory. Routine and Acceptance tests as per specification/ standards are to be conducted and no deviationin respect of conducting these tests will be acceptable. No extra charges for these tests will be paid. Test charges shall be part of cost of the equipment. If purchaser selects to send a representative, all tests shall be carried out in his presence. Type test certificate shall be furnished before start of supply.

Routine Tests:
Each completed transformer shall be subjected to following routine tests as per IS: 2026 Part. I & III (latest amendment). No extra charges for any of the tests shall be paid. No deviation shall be acceptable.

- Measurement of resistance of each winding.
- Measurement of turn's ratio between HV-LV windings at each tap.
- Checking of polarity and phase relation-ships for each winding.
- Measurement of no load loss and no load current.
- Positive phase sequence impedance/short circuit impedance between
- HV-LV windings on minimum, maximum and normal taps.
- Separate source voltage withstand test.
- BDV test on transformer oil.

- Induced over voltage withstand test.
- Measurement of neutral unbalance current.
- OIL leakage test as per CBIP manual.
- Regulation at rated load at unity, 0.90 and 0.80 lagging power factor.
- Load losses measured at rated frequency by applying voltage sufficient to produce the rated relevant current in one winding with the other winding short circuited.
- Measurement of insulation resistance(PI).
- The total losses shall comprise of the No Load Losses, load losses at rated output duly converted at 75Degree C average winding temperature and shall also be indicated in the test report. Load losses shall be that corresponding to rated load on HV & LV winding.
- Routine dielectric tests as per IS: 2026(Part. I & III), 1981 and any amendments thereto. Check complete transformer against approved outline drawing, provision for all fittings, finish oil level etc.

Tests at Site:

After erection at site all transformer(s) shall be subjected to the following tests:

a) Insulation resistance test.
b) Ratio and polarity test.
c) Dielectric test on oil.
d) Physical check

In case the equipment is not found as per the requirements of the purchase order, all expenses incurred during site testing will be to the tenderer's account and the material shall be replaced by him at site, free of cost.

Further Tests:

The purchaser reserves the right of having other reasonable tests carried out at his own expenses either before dispatch or during performance guarantee period from Govt. approved/ Govt. recognized lab to ensure that the transformer complies with the requirements of this specification after due intimation to the supplier.

Frequency and System Voltage:

The transformer shall be suitable for continuous operation with a frequency variation of ± 2.5% from normal of 50Hz without exceeding the specified temperature rise. The highest system rated voltage shall be 12 kV. However the flux density requirements shall be as per this specification.

Installation & Commissioning

Mainly following activities are required to be carried out before commissioning of

Power Transformers:-

Assembling of Power Transformer accessories as per GA drawing.

Testing activities in presence of Purchaser such as

- Ratio Test
- Megger Value
- Magnetic balance.
- Oil BDV
- Earth Resistance
- Buchhloz Relay checking.
- WTI/OTI/MOLG (oil level) checking.
- Checking of points of leakage of oil from Transformer body/ Radiator/Valve
- Setting of Relays in Panel

6.62.2. Auxiliary transformer

The transformer used for auxiliary distribution within the plant must be in accordance with the reference standards. The ratings of the transformer shall be suitably designed by the bidder in order to maximize the net generation from the plant . The guaranteed technical particulars of the auxiliary transformer must be supplied along with the bid.
The bidder shall also provide the list of auxiliary loads considered for the project.

Particulars	**11 kV/0.433V Transformer Specs.**
Continuous kVA ratings	As per design
Design Ambient	45degree C
Type	Oil immersed
Frequency	50 Hz
Type of cooling	Oil Natural Air Natural (ONAN)
Insulation	Class-A
Temperature rise over 45degree C	Winding-55 degree C Oil-35degree C
No. of phases	3 (Three)
Rating voltage H.V. side	11 kV

Highest System voltage on H.V. side	12 kV
Rated voltage on L.V. side	0.433KV
Vector Group	Dyn11
LV Winding	Copper
HV Winding	Copper
Connections	
a. H.V. Winding	Delta
b. L.V. winding	Star with Neutral solidly earthed(as per state grid code)
On load taps on H.V. Side (for H.V. Variation)	+/- 5 % (in steps of 1.25%)
Tap changer type	OFF-CIRCUIT TAP SWITCH
Impedance voltage (%)as per IS 2026	As per design
Transformer connections	LV side - Cable chamber
	HV Side- Cable chamber
Additional neutral Bushing	To be provided.
Dynamic Short circuit withstand capacity	To submit design calculations.
MOG	To be provided
PRV	To be provided
Radiator Valves	Gun metal
OIL	To be supplied - 10% extra in drums.

6.62.3 METERING BAY

The instrument transformers i.e. current and voltage transformers shall be single phase transformer units and shall be supplied with a common GI junction box for a set of three single phase units. The tank as well as top metallic shall be hot dip galvanized or painted Grey colour as per RAL 9002.

The instrument transformers shall be oil filled hermetically sealed units. The instrument transformers shall be provided with filling and drain plugs.
Polarity marks shall indelibly be marked on each instrument transformer and at the lead terminals at the associated terminal block. The insulators shall have cantilever strength of more than 500 kg.

Current Transformer, Voltage Transformer, Circuit Breaker and Relays should match state Utility requirements.

The current & potential transformers shall be of outdoor type single phase, 50 Hz, oil immersed self-cooled suitable for operation in the climate conditions specified shall be complete in all respects.

The instrument transformers shall be hermitically sealed to eliminate breathing and entering of air and moisture in the tank. Provision of pressure releasing device is not permitted.
The CT core, to be used for protective relays shall be of accuracy class, specified or appropriate class suitable for back up, over current and earth fault, differential, bus bar and other protections as prescribed

Applicable Standards:
Unless otherwise modified in this specification, 11 KV CT-PT Metering Sets shall comply with the following Indian Standard Specification (latest version):

IS: 2705-1992	Specification for current transformers.
IS: 3156-1992	Specification for voltage transformers.
IS: 5621-1980	Specification for Hollow insulators and accessories
IS: 2099-1986	Specification for insulators/ bushing
IS: 3347-1986	Specification for the dimension of Porcelain
IS: 335-1983	Specification for new insulating oil

The core of instrument transformers to be used for metering and instrumentations shall have saturation factor, low enough to avoid damage to the instruments, in the event of maximum short circuit current

Nuts and bolts (or screws used for fixation of interfacing porcelain bushings for taking out terminals) shall be provided on flanges, cemented to the bushing and not on the porcelain i.e. Flange type 11 KV bushing for CT/PT, shall be provided.

For gasket joints, wherever used, Nitrile Butyl rubber gaskets shall be used. The gasket shall be fitted properly with adequate space for accommodating the gasket under compression.

The metering sets shall be supplied with first filling of insulating oil conforming to IS: 335 (including latest amendment).

The outer surface of metal tank shall be Hot Dip Galvanised, whereas, the inner portion shall be painted with oil resistive, insoluble paint. The purchaser reserves right for stage inspection during manufacturing process of tank / CT/PT.

The external surfaces of tanks of CT-PT sets shall be painted with one coat of primer and two coats of synthetic enamel paint of shade No.631 of IS: 5, the internal surfaces of the tank shall be painted with two coats of suitable heat resistant oil insoluble paint.

The 11 kV CT Set shall have 3 Nos. incoming and 3 Nos. outgoing outdoor type bushing complete with 6 Nos. bimetallic terminal connectors suitable for Dog/ Panther Conductor

6.62.4. Current Transformer (CT)

Current transformers may be either of the bushing type or wound type. The bushing types are normally accommodated within the transformer bushings and the wound types are invariably separately mounted. The location of the current transformer with respect to associated circuit breaker has an important bearing upon the protection scheme as well as layout of, substation. Current transformer class and ratio is determined by electrical protection, metering consideration.

Technical specifications – Current ratings, design, Temperature rise and testing etc. should be in accordance with IS: 2705 (part I to IV).

The current transformer should be of indoor/ outdoor type, single phase, oil immersed, self-cooled and suitable for operation in 3 phase solidly grounded system.
Type test certificate for the proposed CT shall be provided to the bidder before dispatch.

Each current transformers should have the following particulars under the site conditionsfor the system under design

General Parameters:

Particulars	**Details**
Highest system Voltage (Vm)	12 kV rms
Rated frequency	50 Hz
System Neutral Earthing	Effective earthed
Installation	Outdoor (IP 65)
Rated dynamic current	63 kA (Peak) appropriate dynamic current as per design

	calculations
Rated min power frequency withstand voltage (RMS value)	28 kV
Rated lightning impulse withstand voltage (peak value)	75 kVp
Partial discharge level	10 Pico coulomb max.
Temperature rise	As per IEC 60044
Type of insulation	Class A
Number of cores	Two (2) with One (1) protection core and one (1) metering core of accuracy 0.5 class
CT secondary current	Protection cores 1 Amp. Metering Core 1 Amp
Number of terminals in marshalling box	All terminals of control circuits wired up to marshalling/Junction box plus 20% spare terminals
CT ratio & Rated VA Burden, short time thermal rating ,class of accuracy	Minimum burden required (as per design): Metering core 40 VA Protection core 10 VA

6.62.5. Voltage Transformer (VT/ PT)

The oil level indicator with danger level marking shall be clearly visible to maintenance personnel standing on ground.

The secondary shall be protected by 3A HRC cartridge type fuses for all windings. In addition fuses shall also be provided for protection and metering windings. The secondary terminals shall be terminated on stud type non-disconnecting terminal blocks via the fuse inside the terminal box of degree of protection IP 55. The access to secondary terminals shall be without the danger of access to high voltage circuit.

The accuracy of metering core shall be maintained through the entire burden range up to 75 VA on all three windings without any adjustments during operations

The PTs should be single phase oil immersed self -cooled type suitable for outdoor.

The core should be of high grade non ageing electrical silicon laminated steel of high permeability. The PTs should be hermetically sealed to eliminate breathing and prevent air and moisture entering the tank.

Bidder has to provide the type test certificate for the proposed VT before dispatch.

Each voltage transformers should have the following particulars under the site conditions for the system under design.

Particulars	Details
Highest system voltage (Um)	**12 kV**
System neutral earthing	**effective earthed**
Installation	**Indoor (IP 20)/ Outdoor (IP 65)**
System fault level	**Appropriate**
Rated min power frequency withstand voltage **(rms value)**	**28 kV**
Rated lightning impulse withstand voltage	**75 kVp**
Standard reference range of frequencies forwhich the accuracy are valid	96% to 102% for protection and 99% to 101% for measurement
Rated voltage factor	1.2 continuous & 1.5 for 30 sec
Class of Accuracy	0.5 / 3P
Stray capacitance and stray conductance of LV terminal over entire carrier frequency range	As per IEC:358
One Minute Power frequency withstand voltage for secondary winding	2 kV rms
Temp rise over an ambient temp. of 50°C	As per IEC 60044
Number of terminals in control Cabinet	All terminals of control circuits wired upto marshalling box plus 10 terminals spare
Rated total thermal burden	350 VA (or as per design)
Partial discharge level	10 pico Coulombs max.
Number of cores	2 (two) 1 for protection and 1 for metering with 0.5 class accuracy.
Rated Output, insulation level, transformationratio, rated voltage factor	Should be provided by Bidder

The isolators and accessories shall conform in general to IEC 62271-102 (or equivalent Indian standard) except to the extent explicitly modified in specification. Each isolating switch should have the following particulars under the site conditions forthe system under design (typical values for 33 kV system are given).

6.62.6. Isolators

The isolators and accessories shall conform in general to IEC 62271-102 (or equivalent Indian standard) except to the extent explicitly modified in specification. Each isolating switch should have the following particulars under the site conditions forthe system under design (typical values for 33 kV system are given).

General Parameters:

Particulars	**Details**
Operating mechanism of Isolator and Earth Switch	Motor operated, Outdoor station type, double break, triple pole double throw with turn and twist mechanism. Off load, horizontal rotating, with earth switch.
Nominal system voltage	11 kV
Highest system voltage	12 kV
Type	Outdoor (IP 65)
Rated short time current of isolator and earth switch	40 kA (rms) for 1 sec. Or appropriate as per design
Rated continuous current	800A
Rated dynamic short time with stand current of isolator and earth switch	As per design
Impulse withstand voltage with 1.2/50 micro sec. wave	170kVp
One minute power frequency withstand Voltage	70 kV (rms)
Temperature rise	As per Table-IV of IS: 9921
Rated mechanical terminal load	As per 62271-102

6.62.7. 11kV Porcelain Clad Vacuum Circuit Breaker

The circuit breakers shall be capable of rapid and smooth interruption of currents under all conditions completely suppressing all undesirable phenomena even under the most severe and persistent short circuit conditions or when interrupting small currents or leading or lagging reactive currents. The circuit breakers shall be strike-Free under all operating conditions. The details of any device incorporated to limit or control the rate of rise of re-striking voltage across, the circuit breaker contacts shall be stated. The over voltage across, the circuit breaker contacts shall be stated. The over voltage caused by circuit breaker while switching inductive or capacitive loads shall not exceed 2.5 times the highest phase to neutral voltage. The actual make and break times for the circuit breakers throughout the ranges of their operating duties shall be stated in the offer and guaranteed.

6.62.7.1

TYPE

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

6.62.7.2

OUTDOOR APPLICATION:

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

6.62.7.3

TECHNICAL PARTICULARS:

Item Description	**Technical Particulars**
Standards	IEC 56 –1 through 6, 1987
Nominal system voltage	11kV
Highest system voltage	12kV
BIL	75kVp
Power Frequency withstand voltage	28 kV rms

Rated frequency	50Hz
Rated continuous current	800A
Closing mechanism	Electrical spring charging With 230 V AC motor and local manual closing.
a. Closing coil/tripping coil (2 nos.) b. No. of Poles	110V D.C. 3
Short time current rating (3 secs)	25kA
Symmetrical short circuit withstand capacity	63kA
Capacitive current break capability	Shall be suitable for breaking capacitive current equivalent to rated current.
Temperature rise	Not to exceed 55^0C above ambient temp. of 50^0C.
Operating duty	0-3 min. CO-3 min.-CO
Dead time of breaker	Adjustable from 0.3 sec. to 15 sec.
Total break time for any current up to the rated breaking current measured from the instant of trip coil energisation	Less than 3 cycles
First pole to clear factor	1.3
Whether breaker is intended for rapid re – closing	Yes
Latching requirement	Trip free
System neutral	Solidly earthed
Min. creeping distance	25mm/kV
Control supply voltage	110V D.C.
Auxiliary, contacts with each circuit breaker	6NO+6NC
Accessories	Interchangeable at site
Type tests for performance verification	As per standards

6.62.7.4 **Bushings**

- Equalized electrical stress internally and over the bushings surface.

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

6.62.7.5

Operating Mechanism

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

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

control voltage and tripping from 50% to 110% of the rated voltage.

6.62.7.6 **INTERLOCKS:**

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

6.62.7.7

TERMINAL CONNECTIONS:

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

6.62.7.8 **Indoor Control & Relay Panel** :

Control and Relay Panel (associated with outdoor type 11 KV Circuit Breaker), should be of Floor Mounted, Indoor, Free Standing, Cubical type. The Panel should consist of **fabricated Sheet Steel Enclosures** [duly painted (both inside and outside)] on the side, front, rear and top. The rear of the Panel should be in the form of lockable hinged flap door. The front of the Panel, which accommodates most of the mountings, should be fabricated with Sheet Steel of thickness not less than 3 mm. For the rest of the Panel, Sheet Steel of thickness not less than 2.5 mm. should be used.

The Panel should have adequate size and should be completed with wiring, earthing bar, fuses, links, vermin proof fitments, internal panel lighting arrangement (operated by a door switch), space heater, un-drilled Cable Gland Plate, etc. The Panel should be provided with facility for Remote Switching of the 11 KV Outdoor type Vacuum Circuit Breaker and should accommodate the followings :-

A. **Relays :**

(I) **I.D.M.T. type,** Numerical relay having **Over Current** & **Earth Fault** element (element of 5A), with **instantaneous** unit, shall have event logging features & shall be compatible with SCADA system

(II) **Electro**- magnetic Type, master trip relay, supply voltage 110V DC.

(III) Electro- magnetic Type, Trip circuit supervision relay.

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

b) **Digital Display type Load Manager.**

c) **Analogue type Voltmeter with Selector Switch**

d) **Static TRIVECTOR Meter (for measuring Static KWH,**

Maximum Demand, Frequency, PF, KVAH. KVRH etc.)

e) **Static Power Factor Meter**

f) **Necessary Indication Lamps** (LED Type) & **Push Buttons**

g) **Any other equipments considered necessary to make the Panel complete in all respect.**

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

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

B. **Load Manager & Voltmeter**:

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

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

C. **Static TRIVECTOR Meter**:

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

(I) Class of Accuracy : 1.0

(II) Frequency : 50 Hz. ± 5%

(III) Supply Voltage : 3 Phase, 3 Wire, 110 V

(IV) Display Panel: Back-lit LCD type

D. **Indication Lamp**:

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

"**Red**" for indicating **closed position** of the Breakers.

"**Green**" for indicating **opened position** of the Breakers.

E. **Selector Switches**:

4 positions (3 way and off) should be provided for Voltmeter.
Two sets of **Instruction Manuals** for **Erection, Operation** & **Maintenance** and **two sets** of **Drawings** for **Equipment Details** should be submitted along with the above Control & Relay Panel.

6.62.8 LIGHTNING ARRESTORS

a) Type

- Station class, 10 kA, heavy duty, non-linear resistance, metal oxide type gapless lightning arrestor for 11 kV system.
- Self-supporting type in single pole assembly for line to earth connection.
- Suitable for pedestal mounting, outdoor installation in open yard.
- Shall be designed to provide maximum protection against overvoltage during switching of capacitor banks, unloaded transformers and reactors and lightning and switching surges.
- Las shall be capable of discharging severe switching and lightning surges.
- The installation shall be complete with line and earth side connections, operation counter, leakage current indicator and other accessories and devices including guiding rings for improving voltage distribution.

b) Constructional Features

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

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

c) Fittings & Accessories

- Arrestors shall be complete with insulating bases having provision for

bolting to flat surface of structure.

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

d) Technical Particulars:-

Item Description	Technical Particulars
Standards	Relevant IS / IEC standards
Type	Zn0, Gapless
Nominal system voltage	11kV
Highest system voltage	12kV
BIL	75kVp
Power Frequency withstand voltage	28 kV rms
Rated frequency	50Hz
Rated Arrestor voltage	10kV
System neutral connection	Solidly earthed
Maximum discharge capacity (4/20 micro – second wave)	100 kA peak
Nominal discharge current for 8/20 micro sec.	10kA peak
Long duration discharge class as per IEC-99-4	3
Maximum residual voltage at nominal (peak) discharge current of 10/20 micro sec wave	100 kVP
Maximum steep current impulse (1/20 micro sec.) residual voltage at nominal discharge current	110 kV (peak)
Thermal discharge capacity	Shall be adequate for switching surges, long

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

6.63. **Earthing for PV Array and Metering Bay**

The photovoltaic modules, BOS and other components of power plant requires adequateearthing for protecting against any serious faults as guided by IEC 60364.

The earthing system shall be designed with consideration of the earth resistivity of theproject area. The earth resistivity values shall be measured prior to designing the earthing system. Unless otherwise specified, earthing system shall be in accordance with IS: 3043and IEEE 80, Indian Electricity Rules, Codes of practice and regulations existing in the location where the system is being installed.

The permissible system fault power level at 11 kV also shall be kept in consideration while designing the earthing system. Each array structure of the PV yard, LT power system, earthing grid for switchyard ,all electrical equipment ,control room ,PCU, All junction boxes, ACDB & DCDB ,all motors, pumps and any special earthing as required(electrical/electronics) shall be grounded properly as per IS 3043 - 1987. All metal casing / shielding of the plant shall be thoroughly grounded in accordance with Indian electricity act / IE Rules.

The earthing for array and LT power system shall be made of 3.0 m long 50 mm diameter perforated GI pipe / chemical compound filled, double walled earthing electrodes including accessories, and providing masonry enclosure with cast iron cover plate having pad-locking arrangement, watering pipe using charcoal or coke and salt as required as per provisions of IS: 3043.

Necessary provision shall be made for bolted isolating joints of each earthing pit for periodic checking of earth resistance.
Each string/ array and MMS of the plant shall be grounded properly.

For each earth pit, a necessary test point shall be provided.

Earthing Mesh is to prepared and installed in entire power plant.

The array structures are to be connected to earth pits as per IS standards. Necessary provision shall be made for bolted isolating joints of each earthing pit for periodic checking of earth resistance.

The complete earthing system shall be mechanically & electrically connected to provide independent return to earth.

In compliance to Rule 11 and 61 of Indian Electricity Rules, 1956 (as amended up to date), all non-current carrying metal parts shall be earthed with two separate and distinct earth continuity conductors to an efficient earth electrode.

The Bidder should submit the earthing system design calculations along with the system layout for Owner approval. Prior to the installation of the system.

Unless otherwise specified, the earthing system primary and secondary grid conductors, equipment connections shall be constructed with galvanized iron flat. However the earthing of transformer neutrals, plc and inverter terminals and electronic earthing shall be provided using copper earthing conductor only.

6.64. Metering System

ABT energy meter shall be provided as approved by state Utility under the metering scheme, to measure the delivered quantum of energy to the grid for sale. The responsibility of arranging for the meter, its inspection/calibration/testing charges etc. rests with the Bidder. All charges incurred on Meter testing, shall be borne by the Bidder. ABT energy metering system is to be approved by state utility.

a) Meter must be provided with the necessary data cables.

b) Separate metering system has to be provided for L.T. (incoming) and H.T.(outgoing) supply.

c) The Bidder shall provide ABT compliant meters at the interface points.

d) Interface metering shall conform to the Central Electricity Authority (Installation and Operation Meters) Regulation 2006 and amendment thereof Commercial settlement of solar Photovoltaic Grid Interactive based power project.

e) Meter shall be suitable for interfacing for synchronizing the built -in clock of the meter by GPS time synchronization equipment existing at the station either through a synchronization pulse received from the time synchronization equipment or through a remote PC synchronized to GPS clock shall also be in the scope of Bidder.

f) All charges for testing and passing of the meter with relevant government agency shall be borne by Bidder, the Employer will assist Bidder for necessary document as and when required. Bidder has to intimate the required documents at least 7 days prior of such requirements.

g) ABT compliant Energy Meters shall have technical specification as given below (not limited to specified requirement, Bidder can provide Meter with latest facilities):

h) Meters shall be microprocessor-based conforming to IEC 60687 / IEC 6205211/ IEC62053- 22 / IS 14697.

i) Meters shall carry out measurement of active energy (both import and export) and reactive energy (import) by 3-phase, 4 wire principle suitable for balanced/ unbalanced 3 phase load.

j) Meters shall have an accuracy of energy measurement of at least Class 0.2 for active energy and at least Class 0.5 for reactive energy according to IEC 60687, and shall be connected to Class 0.2 CT cores and Class 0.2 VT windings or as per state grid regulations.

k) The active and reactive energy shall be directly computed in CT & VT primary ratings.

l) Meters shall compute the net MWh and MVArh during each successive 15- minute block metering interval along with a plus/minus sign, instantaneous net MWh, instantaneous net MVARh, average frequency of each 15 minutes, net active energy at midnight, net reactive energy for voltage low and high conditions at each midnight.

m) Each energy meter shall have a display unit with a seven digit display unit. It shall display the net MWh and MVARh with a plus/minus sign and average frequency during the previous metering interval; peak MW demand since the last demand reset; accumulated total (instantaneous) MWh and MVARh with a plus/minus sign, date and time; and instantaneous current and voltage on each phases.

n) All the registers shall be stored in a non-volatile memory. Meter registers for each metering interval, as well as accumulated totals, shall be downloadable. All the net active/reactive energy values displayed or stored shall be with a plus /minus sign for export/import.

o) At least the following data shall be stored before being over-written for the following parameters.

Sl. No.	**Parameters**	**Details**	**Min No of days**

1	Net MWh	15 min. block	90 days in meter
2	Average Frequency	15 min. block	90 days in meter
3	Net MVARh for > 103%	15 min. block	90 days in meter
4	Cumulative net MWh	At every mid night	30 days in meter/ 90 daysin PC
5	Cumulative net MVARh for >103%	At every mid night	30 days in meter/ 90 daysin PC
6	Date & time blocks for VT failure onany phase		

p) Shall have a built in clock and calendar with an accuracy of less than15 seconds per month drift without assistance of external time synchronizing pulse.

q) Date/time shall be displayed on demand. The clock shall be synchronized by GPS timesynchronization equipment existing at the station provided by Bidder.

r) The meter shall be suitable to operate with power drawn from the VT supplies. The burden of the meters shall be less than maximum 2VA.

s) The power supply to the meter shall be healthy even with a single-phase VT supply. An automatic backup, in the event of non-availability of voltage in all the phases, shall be provided by a built in long life battery and shall not need replacement for at least 10 years with a continuous VT interruption of at least 2 years. Date and time of VT interruption and restoration shall be automatically stored in a non-volatile memory.

t) Even under the absence of VT input, energy meter display shall be available and it shall be possible to download data from the energy meters.

u) Meters shall have an optical port on the front of the meter for data collection from either a hand held meter reading instrument (MRI) having a display for energy readings or from a notebook computer with suitable software.

v) The meter shall have means to test MWh and MVARh accuracy and calibration at site in- situ and test terminal blocks shall be provided for the same.

w) The Employer/ Owner shall have the right to carry out surprise inspections of the Metering Systems from time to time to check their accuracy.

6.65. **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.
IEC 62271-1	Common Specifications for Switchgear & Control gear
IEC 62271-100	Circuit Breakers
IEC 62271-200	A.C. metal-enclosed switchgear and control gear for rated voltages above 1kV and up to and including 72kV and the IEC Code herein referred
IEC 60129	Alternating current disconnectors (isolators)
IEC 60255	Electrical relays
IEC 60529	Classification of degrees of protection provided by enclosures
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 1000V 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.

i) General Requirement

Indoor Switchgear and control gear fully type tested according to IEC 62271-200 standards. The Circuit Breaker shall confirm to IEC-62271-100. Switchgear shall be type tested for internal arc 25kA for 1 sec. Switchgear shall also be tested for Seismic zone IV and type test report shall be furnished.

The design of the switchgear shall be based on safety to personnel and equipment during operation and maintenance, reliability of service, ease of maintenance, mechanical protection of equipment, interchangeability of equipment and ready addition of future loads.

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.

Circuit breakers shall be withdraw-able Vacuum type of cassette design. The complete assembly of interrupters contact pressure springs and HV terminals (top and bottom) shall be type tested for compatibility of design.

The Circuit Breaker shall be suitable for E2, M2 & C2 (Single capacitor Bank) class duty. The offered circuit breaker should have valid type tests to support the afore-mentioned duty class & other GTP parameters

ii) VCB should be tested for Humidity test as per IEC 62271-100. As per IEC62271-200, the switchgear should be compliant to Partition Class Metallic (PM). It should be tested for Internal Arc compliancy for 1 second for all individual compartment

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 (48V 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.
- To ensure the integrity of the arc fault containment requirement, the operations must be carried out with the switchgear doors closed i.e. circuit breaker for opening and closing, racking of circuit breaker (or withdraw able voltage transformer) between service and test position.
- 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.
- The switchgear shall have integral making type earth switch.
- Offered switchgear should be supplied with factory fitted exhaust duct for evacuation of plasma, arising out of an internal flash over.
- Switchgear should have provision for real time thermal monitoring for all the probable hotspots inside the switchgear. A minimum of 6 hot spot monitoring

has to be offered for individual switchgear vertical. Display of the temperature can be done on a independent flush mounted HMI.

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.
2. An electro-mechanical device shall be provided to ensure the auxiliary circuits have been securely connected between the fixed and moving portions of the switchgear, before allowing closing operation of the circuit breaker. The voltage rating of the device shall be the same as the voltage used for the closing circuit.
3. It shall not be possible to disconnect the low voltage plug and socket as long as the circuit breaker truck is in service position.
4. It shall not be possible to withdraw the truck without disconnecting the low voltage plug and socket.
5. 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.
6. 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).
7. The switchgear shall have integral making type earth switch.
8. The circuit breaker truck shall ensure earthing in both connected and disconnected positions.
9. 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.
10. 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.
11. Shutters shall be lockable in closed position.
12. Where local/remote selector switches are called for , it shall be ensured that:
    I) 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.
    II) 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.
    III) 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)	11
Highest system voltage (kV)	12
One minute power frequency withstand voltage (kV)	28
1.2/50 micro sec impulse withstand voltage (kV)	75
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 Copper. Both rectangular and Round busbar are acceptable. The busbars shall be tinned /silver plated at joints.

- The continuous rating of the main horizontal bus shall not be less than the rating of the incomer specified.

- *The vertical bus rating shall be as follows:-*

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

- Design ambient temperature shall be 50^0C & final operating temperature under continuous operation in enclosure shall be as per IEC 62271-200.
- 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 11kV 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*

AC – Black	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

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 - 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.
- The module shall be either draw-out/Fixed type with withdrawable cards and there should be CT shorting facility. Galvanic isolation between field connection and relay hardware should be there. The relays should be housed in a robust metal case suitable for panel mounting conforming to IP 51 or higher (Front face). The relay shall have Web HMI feature.
- The relay shall have a second Ethernet port for providing connectivity of any other Ethernet device to an IEC 61850 station bus inside a switchgear bay.
- The relay must support, besides native IEC 61850, simultaneous communication using one of the following communication protocols: Modbus® (RTU-ASCII/TCP), IEC 60870-5-103 or DNP3 (serial/TCP).
- 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.
- All PCB used in relays should have harsh environmental coating as per standard IEC 60068 (HEC) to increase the particle repellence and thereby increasing the life of relay or it should be tested as per IEC60068 to operate under extreme harsh environmental conditions given in G3. Test report needs to be submitted on request. IED shall be manufactured using lead-free components.
- The relay shall be provided with suitable security (Password protection) against unauthorised WRITE ACCESS for change in relay setting. However, it should be possible to view metering, protection settings, status and event data as READ ONLY without password protection. The security should be available for change in

relay settings locally from relay HMI as well as when relay is accessed remotely through manufacturer software / remote HMI.

- The relay should have time synchronization through SNTP / IRIG-B
- **Fault record**: The relay shall have the facility to store at least 8 last fault records with information on cause of trip, date, time, trip values of electrical parameters.
- **Event record**: The relay shall have the facility to store at least 250-time stamped event records with 1 ms resolution.
- **Disturbance records**: The relay shall have capacity to store at least 50 disturbance record waveforms. The relay shall have a disturbance recorder supporting a sampling frequency of 32 samples per cycle and featuring up to 12 analog and 50 binary signal channels.
- Event log, trip log and disturbance record should go in history. The relay settings shall be provided with adequate password protection with 4 alternative setting groups.
- The numerical relays shall be provided with 1 set of common support software compatible with both Windows 98/ NT 4.0/ 2008/ Windows 7/ Windows 10 or higher, which will allow easy settings of relays in addition to uploading of event, fault, disturbance records, measurements and troubleshooting purposes.

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, 48V, L/R- 40ms.

xxiii) Push buttons

Contact Rating

Continuous	10 amps
AC11	4 amps, 240V
DC11	0.5A, 48V, 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 1set of test plugs.

xxvii) Constructional Features

Mechanical Design

- The switchgear and control gear panels shall be of the fully arc proof, free standing, floor mounting, flush fronted, withdraw able type, consisting of separate panels assembled into one or more sections to form a single structure with a common bus-bar assembly. All 3 compartments (Busbars, Circuit breaker & Cable compartment) shall be tested for Internal arc for the said rating.
- Internal arc should be valid also at the rear side of cubicle.
- The panels shall be constructed from prime quality folded and riveted CRCA /Aluminium Zinc coated steel sheet or pre-galvanized sheets of 2 mm thickness. Load bearing members to be constructed using sheets of 2.5 mm. Only doors and end covers shall be painted with paint shade as specified.
- The observation window on the CB compartment door shall be made of special toughened/ laminated glass substantiated in type test reports as proving it arc proof. Observation window shall be of same material and construction as the type tested design/construction as specified in IEC.
- The design of the panels shall be such that no permanent or harmful distortion occurs either when being lifted by eyebolts or when moved into position by rollers or trans-pallets.
- Each cubicle shall be equipped with anti-condensation heater controlled by thermostat.
- Sheet steel clad, compartmentalized, floor mounted, free standing design.
- Doors shall be provided with lock and key arrangement
- Degree of protection shall be IP4X.
- 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.
- 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.

- Metal cubicles shall be divided in the following compartments.
    1. Bus bar compartment
    2. Circuit breaker compartment
    3. Cable compartment
    4. LV compartment
- The switchboard shall have passed internal arc faulted containment testing for each compartment for 1 second at the rated fault current of 25 kA
- Each HV compartment should have individual exhaust channel / pressure relief flaps to let out over-pressurized hot gases at the top of the switchboard in the event of an internal fault. Suitable factory fitted arc duct arrangement shall be provided for vending out the arc out of the switchgear room.

xxviii) <u>INDOOR 11kV HT VCB PANEL</u>

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

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, Cassette type 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.01No.(one) Breaker handling trolley at each substation shall be provided.

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 : 110 V DC

i) Closing coil : 110V 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/√3/110 /√3Volts 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 400-200/1-1A (**to be finalised during detail engineering**).

n) The Trivector meters shall be digital type of approved make and it should display Amps, Volts, kVA, kW, kWHr, kVAR, PF and MD etc. The meter shall provide with external port for remote monitoring.

o) The Multi-Function Meter (MFM) shall be digital type of approved make and it should display Amps, Volts, kVA, kW, kWHr, kVAR, PF, Frequency and etc. The meter shall provide with external port for remote monitoring.

p) Breaker ON-OFF LED indicating lamp.

q) Circuit trip/healthy indicating LED lamp with pushbutton.

r) Breaker spring charged LED lamp indication.

s) TNC (Trip Neutral Close) switch.

t) Numerical relays consist of IDMTL + Inst 3 O/C + Inst E/F relay.
Frequency relay,
The auxiliary relay for transformer protection shall be provided.
Trip circuit supervision & master trip.
All relays shall be SCADA enabled with event/data logging features.
Operating handle, spring charging handle & other required accessories shall be supplied.

u) Cable box suitable for receiving single length of 4Rx 1C x 1000 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) 110V DC external supply shall be provided for control circuit of complete breaker operation.

y) Bus bar support insulator:-Non hygroscopic, track resistant, high strength insulator. (Calculation for validating dynamic force withstands capability to be submitted during drg. Approval)

z) Thermostat controlled space-heaters to be provided in bus bar, CB and Cable compartments.

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

Technical Specification same as Incoming feeder but without PT.
Numerical relays consist of IDMTL + Inst 3 O/C + Inst E/F relay.
Trip circuit supervision & master trip. All relays shall be SCADA enabled with event/data logging features.
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. Trivector meter not required. However, Outgoing feeders of SS-1 & SS-5 would have trivector meter.
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 400-200/1-1A **(to be finalised during detail engineering**

- **Outgoing Feeder** (**Transformer)**:

Technical Specification same as Incoming feeder but without PT.
Numerical relays consist of IDMTL + Inst 3 O/C + Inst E/F relay.
Trip circuit supervision & master trip.
All relays shall be SCADA enabled with event/data logging features.

The auxiliary relay for transformer feeder shall be provided. Job includes providing 8/12C copper control cable from transformer -WTI/OTI, Buchholz, NCT etc. to HT panel.
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. Trivector meter not required.

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 200-100/1-1A **(to be finalised during detail engineering**).

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.

Earthing truck :-

Earthing truck 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.

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 GI 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.

6.66. Low Voltage Switchgear Panels

The LT panels shall be designed as per the relevant IS codes and as per the approved design for the panel. All the parts of the panels must be rated as per the relevant rated voltage level. All the panels must have multifunction meters (MFM) flushed with the surface of the panels. However, the outgoing feeder can have Tri vector meter (TVM) for the energy accounting.

a) The Power Control Centre (PCC)/ LV Switchgear shall be rated for the maximum output of the supply transformer feeding the system. The short circuit withstand rating 50kA for 1 sec at rated voltage of the switchgear shall be relevant to the existing electrical system short circuit ratings.

b) The configuration of the PCCs shall be as per the Single Line Diagram of the system.

c) Power Control Centres (Construction)

Front operated / compartmentalized, modular design, degree of protection IP52 with provision of extension on both sides.
Incomer feeders: mains incomer - Electrically operated draw out type Air CircuitBreakers (ACBs), as applicable.

Outgoing feeders: Moulded Case Circuit Breakers (MCCBs)/ electrically operated draw out type Air Circuit Breakers (ACBs) as applicable.

The colour finish shade of switchgear enclosure for interior shall be glossy white &for exterior it shall be light grey, semi glossy shade 631 of IS: 5. if a different exteriorshade is desired by the Employer, the same shall be intimated to the supplier.
The PCC shall be fabricated out of CACA sheet steel; 2 mm thick for the outer shall all- round. The internal walls and separators shall be of 1.6 mm thick CACA sheet steelThe gland plates shall be 3 mm thick.
The panel shall be dust and vermin proof. Synthetic or neoprene gaskets shall be provided at all openings.

d) Control Circuit

Control supply for breaker closing or tripping - 110V DC.
Air Circuit Breaker spring charge motor - 240 V AC, 1 phase.
Moulded Case Circuit Breakers- 240 V AC, 1 phase
Indications, annunciation -110V DC
Space heater, sockets, etc. 240 V AC, 1 phase

e) Bus Bar & Cable Cavity

The material for main bus bars and tap off bus bars shall be electrolytic grade Copper with properly colour coded HR PVC sleeved insulation.
Bus bars shall be suitable for short circuit rating and current suitable for all connected load.
Cable entry for incoming and outgoing cables shall be from Bottom.
A suitable gland plate shall be supplied for termination of power, control and instrumentation cables.
Whenever feeders are housed in multi-tier configuration, these tiers shall be segregated by sheet metal barriers.
Earthing: Earthing bus bar shall be terminated at both ends of the switchgear to suit the connections to outside earthing conductor. All components inside the module are required to be earthed individually and are to be looped and connected to the horizontal earth bus. All the non-current carrying parts of the panels, e.g., enclosure, must be connected to earth as per the regulations.

f) Terminals:

CT circuit - Isolating link type terminals with shorting facility
PT circuit – clip on type terminals
Spare contacts shall be wired up to terminal block. 20% spare terminals shall be provided for each module.

g) Specific Requirement

All ACBs, as applicable, shall be 4 pole, electrically operated, draw-out type, with closing coil, spring charge motor, trip coil, TNC switch for close and trip, manual closing and tripping push buttons, door I/L, test and service position micro switches, emergency P.B., safety shutters, etc. The circuit breaker shall be provided with anti- pumping feature.
ACBs, as applicable, shall be complete with microprocessor release and shall be provided with over current, short circuit and earth fault protections.
Minimum10% spare feeders of each rating shall be provided in the switchgear.
All current transformers shall have 5/1A secondary and all meters shall be suitable for 5/1A operation.
All indicating lamps shall be of LED cluster type. ACB feeders shall be provided with ON, OFF, AUTOTRIP, SPRING CHARGED, TEST, SERVICE, TRIP CIRCUIT HEALTHY indications
All indicating instruments, including MFM, shall be flush mounting, Digital type and of standard size.

Window annunciator with hooter and accept, test, reset button shall be provided. Necessary auxiliary relays for contact multiplication shall be provided in the panel.

The maximum temperature of the bus bars, droppers and contacts at continuous current rating under site reference ambient temperature of 50º C shall not exceed as per IEC Standard.

Instrumentation: Switchgear instrumentation shall be provided as follows:

Mains Incomer-

Voltmeter with selector switch
MFM
TVM + MD meter
On-Off -Trip indicating lamps

Outgoing Feeders-Ammeter with selector switch on all feeders & On-Off - Trip indicating lamps

h) The panel shall be inspected at manufactures works before dispatch to site at the discretion of Employer.

All routine tests shall be carried out on the panel in presence of Employer or their representative or its representative. These tests shall include following:

Verification of components ratings and operation.
High voltage measurement test.
Insulation Resistance measurement.
Control testing

6.67. SCADA and Remote Monitoring System

The plant shall be automatically operated and shall be controlled by microprocessor based control system SCADA and should be Open Platform Communications (OPC) compliant. There shall be simultaneous data logging, recording and display system for continuous monitoring of data for different parameters of different sub systems, power supply of the power plant at DC side and AC side.

An integrated SCADA shall be supplied which should be capable of communicating with all inverters and provide information of the entire Solar PV Grid interactive power plant.

The SCADA shall be string level monitoring compatible and shall have features of remote access to the real time data. SCADA shall have features for generating the day ahead schedule of generation based on historical data/ suitable logic. Also, system must be capable of sending the telemetry data to the local SLDC via GPRS/ GSM/ suitable mode.

Computer-aided data acquisition unit shall be a separate & individual system comprising of different transducers to read the different variable parameters, A/D converter, multi plexer, de multiplexer, interfacing hardware & software, which will be robust & rugged suitable to operate in the control room Environment.

Reliable sensors for solar insolation, temperature, and other weather and electrical parameters are to be supplied with the data logger unit.

The Bill of Materials associated with the equipment must clearly indicate especially the details about the PC and Printers, etc.

The Data Acquisition System should be housed in a desk made of steel sheet.

All data shall be recorded chronologically date wise. The data file should be MS Excel/ CSV compatible. The data, if needed, can be accessible remotely through authorized access. The data logger shall have internal reliable battery backup and data storage capacity to record all sorts of data simultaneously round the clock. All data shall be stored in a common work sheet chronologically and representation of monitored data shall be in graphics mode or in tabulation form. All instantaneous data can be shown in the Computer Screen. Provision should be available for Remote Monitoring.

SCADA shall measure and continuously record electrical parameters and provide following data (but not limited to) at a 5-15 minute interval.

- Energy export to grid
- Main combiner box parameters
- Inverter level parameters
- Parameters at LV terminal (415V)
- Power characteristics of HT side
- Ambient temperature near array field
- Module surface temperature
- Wind Speed and direction
- Solar irradiation/isolation
- Any other parameter considered necessary by supplier based on current prudent practice

SCADA shall provide 15 minute daily, monthly and annual average of following parameters:

Exported Energy to grid
Energy, DC and AC voltage, power and pf of each inverterSolar Radiation (horizontal and tilted plane)
Temperature (ambient and module surface)

SCADA shall have feature to be integrated with the local system as well remotely viathe web using either a standard modem or a GSM/WIFI modem. The Bidder shall provide compatible software and hardware so that data can be transmitted via. Standard modem.

SCADA shall be provided with reliable power supply along with backup supply for at least one hour to cater to outage of grid.

The SCADA shall be compatible to the requirements for measuring and reporting the performance-ratio (PR) of the power plant.

The Contractor shall provide all administrative rights/ privileges/passwords of the SCADA system to the Employer. The Employer have rights over the data generated in theplant.

The Bidder shall submit the data sheet with technical specifications of the SCADA system .

The PC/ workstation shall be of Industrial type, rugged & robust in nature to operate in a hostile environment. The PC will have minimum Intel processor (7^{th} generation) having 2 X 1TB HDD with 8 GB RAM. The PC shall also have 19inch Colour monitor, DVD Drive with Writer, USB drive, Scroll Mouse and UPS for 4 hours Power back up. The bidder can suggest the industrial workstation best used for the purpose.

The printer shall be of industrial type, rugged & robust in nature and of reputed make.The printer shall be equipped for printing, colour scanning, copying and fax.

6.68. DC Battery & Charger

Adequate capacity DC battery Bank should be provided for control supply of inverters, control / protection system & emergency lighting at buildings. Appropriate capacity battery charger (float cum boost charger FCBC) with relevant IS/IEC standards & protection and automatic change over system should be provided to charge the battery bank along with relay circuit, fuses, annunciations and remote operating and controlling facility from the Main Control Room.

A DC power supply Distribution panel/board should be supplied along with the Charger (FCBC) as per relevant IS standards. Control room DC Battery Bank & DC supply system theoretical design, calculations and detailed explanations along with drawing shall be provided and approved by the Employer.

DC Batteries the batteries will have the following specifications:

Type : VRLA/ MF Stationary, sealed type, storage battery.

Rating : 110 V D.C.,Minimum 80 Ah at 8 Hour rate of discharge (or as per design)–
Standard : IS 1651 1979;
Performance as per IS 8702
Container : Plastic Resin, ABS or PP
Terminal Posts: Designed suitably to accommodate external bolted connections

The battery shall be provided with epoxy paint coated exhaust fan for removal ofgasses released from the battery cells.

The design of the battery bank and loads considered along with the data sheet for thebattery and battery charger shall be submitted for approval.

6.69. **Power and Control Cables specifications**

The size of each type of cable selected shall be based on minimum voltage drop; however the maximum drop shall be limited to 2%. Due consideration shall be made for the de-rating of the cables with respect to the laying pattern in buried trenches / on cable trays, while sizing the cables.

All cables shall be supplied in the single largest length to restrict the straight-through joints to the minimum number.

Only terminal cable joints shall be accepted. No cable joint to join two cable ends shall be accepted. All cable/wires shall be marked with good quality letter and number ferrules of proper sizes so that the cables can be identified easily. The ferrules used must be UV resistant. However, for HT cables, embossed ferrules can be used.

Cable terminations shall be made with suitable cable lugs & sockets etc., crimped properly and passed through brass compression type cable glands at the entry & exit point of the cubicles.

All high voltage cables should be XLPE insulated grade conforming to IS 7098 and cables shall also conform to IEC 60189 for test and measuring the methods.

Irrespective of utilization voltage and current rating all type of power cables shall be minimum of 1100 V grade XLPE insulated conforming to IS 7098 for working voltage less than 150 V control cable shall be of minimum 690 V grade, the control and power cable has to be laid separately. All LT XLPE cables shall confirm to IS: 7098 Part I & II. All HT XLPE Cables Shall confirm IS: 7098 PART-3 & IEC -60287, IEC-60332

The cables shall be adequately insulated for the voltage required and shall be suitably colour coded for the required service. Bending radii for cables shall be as per manufacturer's recommendations and IS: 1255.

Cables inside the equipment room, control room and in the switchyard shall be laid in Galvanized Cable Trays mounted on mild steel supports duly painted, in constructed trenches with RCC raft and sidewalls or bricks sidewalls and provided with removable RCC covers.

All the communication cables (RS 485, fibre optics etc.) must be supplied with type test reports and shall laid in accordance with the relevant IS codes. It must be laid so that there is no interference with the power cables.

Type test reports and Data sheets of individual cable sizes (HT, LT & DC) shall be submitted for approval by Employer. Drum numbers and drum length details shall be submitted with each consignment.

6.70. **Power Evacuation and Hardware**

The power from the plant must be evacuated to nearby 11 kV overhead line through 11 kV HT XLPE Cables of appropriate size as per prevailing conditions at site. The power evacuation system must be reliable, redundant and have low maintenance.

The design and arrangement for the laying of cable shall be in bidder's scope. Bidder has to take necessary precautions for easy maintenance.

The cable must be appropriately laid in order to have easy maintenance and marked with route markers for easy identification.

Metal fittings of specified material for string hardware meant for power conductor and earth wire shall have excellent mechanical properties such as strength, toughness and high corrosion resistance. The suspension and tension clamps shall be made from aluminium alloy having high mechanical strength. Suspension and tension clamps offered shall be suitable for cable/ conductor as per design.

All hooks, eyes, pins, bolts, suspension clamps and other fittings for attaching insulators to the tower or to the power conductor shall be so designed as to reduce (to a minimum) the damage to the conductor, insulator or the fitting arising from conductor vibration.

All drop-forged parts shall be free-from flaws, cracks, or other defects and shall be smooth, close-grained and of true forms and dimensions. All machined surfaces shall be true, smooth and well-finished.

All ferrous parts of hardware shall be galvanized in accordance with IS 2629.

The galvanization shall withstand four dips of 1-minute duration each in copper-sulphate solution as per the test procedure laid down in the relevant IS Standards.

The threads in nuts and tapped holes shall be cut after galvanizing, and shall be well- lubricated/greased. All other threads shall be cut before galvanizing.

Both the suspension and the tension hardware shall be of ball and socket type, and shall be with ' R' and 'W' type security clip of stainless steel or phosphor Bronze conforming to IS 2486.

The tension clamps of both compression type and bolted type as shown in the relevant drawings shall be offered. Arcing horns shall be provided on the line side for both the suspension type and compression type hardware.

6.71. Danger Plates

Size of each Danger Notice plates shall be 200 mm x 150 mm made of mild steel sheet and at least 2 mm thick, and vitreous enamelled white on both sides and with inscription in signal red colours on front side as required. The inscriptions shall be in Hindi, Bangla and English.

6.72. Fire alarm System

Buildings shall have fire detection and alarm system installed as per relevant standards and regulations. The installation shall meet all applicable statutory requirements, safety regulations in terms of fire protection.

Liquefied CO2/ Foam/ ABC type fire extinguisher shall be upright type of capacity 5/10 kg having IS: 2171. 7 IS: 10658 marked. The fire extinguisher shall be suitable for fighting fire of Oils, Solvents, Gases, Paints, Varnishes, Electrical Wiring, Live Machinery Fires, and all Flammable Liquid & Gas. Bidder shall provide portable fire extinguisher as per the recommendation by relevant fire safety authority.

The minimum 2 no. of fire extinguishers (CO_2 and Foam type each) shall be provided at every buildings.

Sand bucket should be wall mounted made from at least 24 SWG sheet with bracket fixing on wall conforming to IS 2546 at strategic locations.

The plan for fire extinguishing must be provided by the bidder to Employer for the approval.

6.73. CCTV cameras

PTZ CCTV cameras must be cover entire plant . Bidder may propose locations as required to provide security for the entire plant. Bidder has to propose the locations and number of cameras required for the plant. However, Employer will decision on number of cameras shall be final. GI tubular poles of 10Mtrs. Each with necessary fixing arrangement for PTZ cameras to be provided.
The CCTV system shall be designed as a standalone IP based network architecture. System shall use video signals from different cameras at defined locations, process the video signals for viewing on monitors at control room and simultaneously record all video streams using latest compression techniques.

Camera shall be colour, suitable for day and night surveillance (even under complete darkness) and network compatible. All cabling work to be done using HDPE pipes for easy maintenance. Power supply may be taken from local area lighting feeder pillars.

It shall be possible to control all cameras i.e., PTZ auto/ manual focus, selection of pre- sets, video tour selection etc. The software shall support flexible 1/2/4 windows split screen display mode or scroll mode on the display monitor for live video.

The system shall support video analytics in respect of the following:

- Video motion detection
- Object tracking
- Object classification

Camera server shall be provided with sufficient storage space to storage recordings of all cameras at HD mode for a period of 15 days. All recordings shall have camera ID, location, date and time of recording.

6.74. Testing Instruments for Electrical & Electronic

Bidder shall also provide required set of onsite testing instruments/equipment viz. earth resistance tester, rheostats, insulation tester, millimetres, clamp meters, CRO, Function Generator, Transformer oil BDV kit, Relay testing kit, infra-red thermal imaging hand held temperature meter, inverter testing kit etc. All testing equipment shall possess valid calibration certificate issued from approved NABL labs.

Specification of Weather Monitoring System

As a part of weather monitoring system, Bidder shall provide the following measuring instrument with all necessary software and hardware required to integrate with SCADA.

a) Pyranometer

- Bidder shall provide minimum 2 (two) number of pyranometers for measuring the incidental solar radiation at horizontal and inclined plane of array.
- Specification of the pyranometer shall be as follows:

Details	Values
Spectral Response.	0.31to2.8micron
Sensitivity	Min7micro-volt/w/m2
Time response (95%):	Max15s
Nonlinearity:	±0.5%
Temperature Response:	±2%
Tilt error:	<±0.5%.
Zero offset thermal radiation:	±7w/m2
Zero offset temperature change	±2w/m2
Operating temperature range:	0 deg to+80 deg.
Uncertainty(95%confidence Level):	Hourly- Max-3%, Daily- Max-2%
Non stability:	Max±0.8%
Resolution:	Min+/- 1W/m2
Input Power for Instrument &Peripherals:	230V a.c.(If required)

- Each instrument shall be supplied with necessary cables. Calibration certificate with calibration traceability to World Radiation Reference (WRR) or World Radiation Centre (WRC) shall be furnished along with the equipment. The signal cable length shall not exceed 20m. Bidder shall provide Instrument manual in hard and soft form.

b) Thermometer

Bidder shall provide minimum two thermometers (one for ambient temperature measurement with shielding case and other for module temperature measurement). The thermometers shall be RTD/ semiconductor type measuring instrument. Instrument shall have arrange of 0°C to 80°C.The instrument shall have valid calibration certificate.

c) Anemometer

Bidder shall provide minimum one no. anemometer with wind vane of rotating cup

Details	Values
Velocity range with accuracylimit	± 0.11m/s upto10.1 m/s ±1.1% of true when more than10.1 m/s

Wind direction range with accuracy limit	0 to 360^{o} with accuracy ± 4^{o}

6.75. Specification of Lighting in Solar Power Plant

a) Scope

This specification covers design of Array yard and sub-station, street light using suitable LED luminaires (to meet the required lux levels), tubular poles (from main gate up to the control room/switchyard gate and periphery wall of the plant) distribution pillar boxes, PVC cables, conduit steel trays etc. which shall be supplied by the contractor for installation of luminaires, their control gear and wiring on them. The street light shall work on the auxiliary supply and same shall be incorporated in auxiliary loads. The bidder will also design, supply and install lighting fixtures and accessories based on LED for equipment room and control room building and entry points/ gates. The Bidder shall furnish Guaranteed Technical Particulars**.** All LED luminaires shall be supplied with proper diffuser to avoid direct visibility of LED with proposer thermal management for longer life. Renowned brands available in the market need to be used.

b) General Technical Requirements:

The lighting system for outdoor and indoor areas of Solar Power Plant shall be designed in such a way that uniform illumination is achieved.

In outdoor yard equipment /bus bar areas and the peripheral wall are to be illuminated and luminaires shall be aimed for clear view.

c) Lighting Levels

- The minimum LUX level of 25 lm is to be maintained in switchyard and transformer bay is to be maintained. .
- Lighting in other areas such as control room, office rooms and battery room & other areas (i.e. street light) shall be such that the average LUX level to be maintained shall be as under:

S. No	Area	LUX
1.	Control Room and equipment rooms	300
2.	Office	300
3.	Battery & other rooms	150
4.	Other areas including periphery wall	10
5.	Transformer yard	45

6. H pole and metering point 45

d) Emergency Light Points:

- Light points using LED lamps of 15-20 W (at 240 V) shall also be provided as given below:

Control room and equipment room	4 Nos.
Battery room	1 Nos.
Office	1 Nos.
Corridor	1 Nos.

- These lights shall operate on AC/DC changeover supply from the DC distribution Board. Separate wiring and distribution board shall be provided from these lights.
- The lighting level shall take into account appropriate light output ratio of luminaires, coefficient of utilization maintenance factor (of 0.7 or less) to take into account deterioration with time and dust deposition.

- LED luminaires shall meet the following parameters

Luminaire Specification: Control gear specification:

EN 61347-2-13: Particular requirements for D.C. or A.C. supplied electronic control gear for LED modules

EN 62384: D.C. or A.C. supplied electronic control gear for LED modules.

- Luminaire EMC specification:

EN 61000-3-2: Electromagnetic compatibility (EMC). Limits for harmonic current emissions (Equipment input current < 16 A per phase)

EN 61000-3-3: Limitation of voltage fluctuation and flicker in low voltage supply systems for equipment with rated current < = 16 A

- e) Additional information:

- The LED luminaire housing, heat sink, pole mounting bracket, individual LED reflectors and front heat resistant tempered glass should be provided.
- The LED luminaire housing should be made of non-corrosive high pressure diecast aluminium and the housing should be power coated grey, so as to ensure good wetherability.
- Each individual LED source should be provided with a asymmetrical distribution high reflectance aluminized reflector, which should ensure

that the light distribution of the luminaire is suitable for road lighting applications (wide beam distribution) and should ensure high pole to pole spacing.

The luminaire should be provided with in built power unit and electronic driver. The luminaire should be should be so constructed to ensure that the gear and LED modules are replaceable, if required.

- The luminaire should be suitable for both standard street light poles with a typical pole diameter of 50 mm 60 mm and should be suitable for both side entry and bottom entry (post top).

6.76. Fire extinguisher

Liquefied CO_2 / foam/ ABC type fire extinguisher shall be upright type of capacity 10 kg having IS: 2171. 7, IS: 10658 marked. The fire extinguisher shall be suitable for fighting fire of Oils, Solvents, Gases, Paints, Varnishes, Electrical Wiring, Live Machinery Fires, and all Flammable Liquid & Gas.

6.77. Sand Bucket:

Sand buckets should be wall mounted made from at least 24 SWG sheet with bracket fixing on wall conforming to IS 2546. Bucket stands with four buckets on each stand shall be provided in the Transformer Yard 4 Nos.

6.78. Sign board

The sign board containing brief description of major components of the power plant as well as the complete power plant in general shall be installed at appropriate locations of the power plant as approved by Employer.

- The Signboard shall be made of steel plate of not less than 3 mm.

  Letters on the board shall be with appropriate illumination arrangements.
- Safety signs, building evacuation plan and direction signs, assembly points shall also beplaced at strategic locations.
- The Contractor shall provide to the Employer, detailed specifications of the signboards.

PART-II (CIVIL WORK):

6.79.

SUB-SECTION-I Scope of Civil Work

a) Detailed Contour Survey & Soil Investigation of the Site

The turnkey contractor shall be responsible for detailed soil investigation and contour survey at required location for the purposes of foundation design and other design/ planning required for the successful completion of the project. The contractor must submit the detailed reports for soil investigation, bore log records, ERT reports, contour survey, etc. to Employer.

b) Topographical survey

Topographical survey shall have to be done by the Successful Bidder of the proposed site at 10m interval with the help of Total Station or any other suitable standard method of survey. All necessary Reduced Levels (RL) as entered in the Field Book have to be submitted along with pre contour layout of the total site. The formation levels of the proposed power plant have to be fixed with reference to High Flood Level of the proposed site and the existing road level. The ground level and plinth level of structures shall be fixed taking into consideration the highest flood level, existing road level and surrounding ground profiles such that the working level of all structures remains at least 500mm above the existing road level. Accordingly, a detailed drawings for levelling and grading (if necessary) shall be submitted. The volume of cutting and filling of earth shall also be mentioned in the drawings. The filled earth must be well compacted as per relevant IS standards.

c) Soil Tests:

The Contractor is advised to and is solely responsible to carry out detailed Geotechnical investigation to ascertain soil parameters of the proposed site for the use of planning / designing / construction / providing guarantee / warranty of all civil work including but not limited to foundations / piling for module mounting structures, HT lines, etc. The Contractor shall carry out soil investigation through any Govt. approved / certified soil consultant. These reports shall be furnished to the Employer prior to commencing work. All RCC works shall be provided of required grade of concrete as per relevant IS specifications as well as soil data considering appropriate earthquake seismic zone, wind velocity, weather effect, soil characteristics etc.

d) Soil Investigations:

The scope of soil investigation covers execution of complete soil exploration including boring, drilling, collection of undisturbed soil sample where possible, otherwise disturbed soil samples, conducting laboratory test of samples to find out the various parameters mainly related to load bearing capacity, ground water level, settlement, and soil condition for each bore hole and submission of detail reports along with recommendation regarding suitable type of foundations including module mounting structure, equipment and buildings along with recommendation for soil improvement where necessary.

e) Other investigations

Successful Bidder shall obtain and study earthquake and wind velocity data for design of module mounting structure, equipment and building foundations after considering all parameters related to the weathers conditions like Temperature, humidity, flood, rainfall, ambient air etc. The Successful Bidder shall carry out Shadow Analysis at the site and accordingly design strings and arrays layout considering optimal use of space, material and man- power and submit all the details / design to Employer for its review / suggestions / approval.

f) Land Development for site activities

The contractor is responsible for making the site ready and easily approachable by clearing of bushes, filling of site with excavated earth upto the level as directed, felling of trees (if required with appropriate approval from concerned authority), levelling of ground (including reclaimation work wherever required) etc. for commencing the project. It will be ensured that land must be graded and levelled properly for the flow of water. It is advisable to follow the natural flow of water at the ground. If the land pocket needs any filling of sand, it is to ensure that the filled earth must be well compacted as per the relevant IS standards. Bidder shall take reasonable care to ensure that the plant is aesthetically designed. The bidders shall judiciously decide on making the price-bid accordingly.

g) Foundations:

The contractor is responsible for the detailed soil investigation and subsequent foundation design of all the structures in the plant. The foundation of the module mounting structures, equipment, buildings and other important structures must be approved by Employer prior to construction. The contractor must provide the detailed design and calculations of the foundation. The foundation designs must be approved by Charted Structural Engineer.

The foundations should be designed considering the weight and distribution of the structure and assembly, and a maximum wind

speed as per relevant Indian Standard Specification. Seismic factors for the site have to be considered while making the design of the foundation. Successful Bidder shall also plan for transport and storage of materials at site.

h) Switch yard civil works

Switchyard civil work includes transformer plinth, HT Switchgear kiosk plinth, 2 pole/ 4 pole structure foundation, earth pits and surrounding masonry work, metal spreading curb wall in and around switchyard, plinth protection, trenches & precast covers and fencing. All structures shall be GI with minimum galvanisation thickness as per relevant IS standard. The transformer/ HT switchgear kiosk plinth shall be made of RCC as per approved drgs., conforming to relevant standards. The height of transformer /HT Switchgear kiosk plinth shall be decided based on 33 kV ground clearance. Earth pit construction shall be of brickwork covered with RCC (1:2:4) slabs. Switchyard/ double/ four pole area must be surrounded by chain link fencing with pre-cast RCC post/ galvanized MS angle of suitable size with double leaf gate will be provided. Area enclosed within this perimeter must be filled with gravel. All the trenches shall be made up of precast sections/ brick work with plaster. The trenches must be covered with precast slabs with handles of suitable sizes.

i) Buildings

Buildings are required to be constructed for housing the electrical equipment/ panel and central control room with office cum store building for the operation & maintenance of Solar Photovoltaic Power Plant. Security houses/ cabins shall also be required at strategic locations to secure the plant from any theft/ burglary. The building shall be constructed with conventional RCC framed structure with brick partition walls. Equipment room shall be designed as per the OEM recommendations to ensure desired life of equipment.

Bidder shall furnish the drawing of the proposed buildings to the Employer for approval, prior to construction. The construction of the same shall be as under-

- RCC Works

All RCC works shall be as per IS 456 and the materials used viz. Cement, reinforcement steel etc. shall be as per relevant standards.

- Brick Works

Brick works shall be done with 1:4 cement mortar for 250 mm thick for external and load bearing walls and 125 mm thick for partition wall respectively and as directed by the client. All brick works shall be using 1st class bricks of approved quality as per IS 3102.

- Doors & Windows:

Steel framed doors, Windows and ventilators shall conform to IS 1081 with necessary float glass panels including of all fixtures and painting etc. complete. Doors and windows shall be made of aluminium sections. All sections shall be 10-12 microns anodized. Sections of door frame and window frame shall be adopted as per industrial standards. Door shutters shall be made of aluminium sections and combination of compact sheet and clear float/ wired glass. The control room shall require a number of windows/ louvers to provide ventilation/ fresh air circulations.

- Plastering

Plastering in cement mortar 1:4 and 1:3 shall be applied to all internal, external walls and ceiling of slab respectively as per IS 1542.

- Flooring (as per relevant IS codes for selection and laying)

Store area: Cement flooring in concrete mix (1:2:4) using 10 mm aggregates as per IS 2571: 1970

Supervisor room: Double charged Vitrified tiles of not less than 8 mm thickness

SCADA Room: Double charged Vitrified tiles of not less than 8 mm thickness

Equipment room: Double charged Vitrified tiles of not less than 8 mm thickness

Battery Room: Acid/ Alkali resistant tiles

Toilets: Anti skid Ceramic tiles for floor and polished Ceramic tiles for walls.

Lobby: Double charged Vitrified tiles of not less than 8 mm thickness

Skirting of 200mm with tiles shall be provided in floors

- Roofing

The roof of the building shall be insulated, with screed concrete for maintaining proper slope and waterproofing with PU membrane shall be done as per relevant IS standard.

- Plinth Protection

Plinth protection 1000mm wide shall be provided around all the buildings as per relevant standards using 1:2:4 Plain Cement concrete.

- Distempering & colour washing.

Distemper and colour washing work shall conform to relevant IS codes. The right of selection of colour/ shades shall lies with the Employer. Bidder has to follow respective and relevant IS codes of practice for the finishing process.

Internal walls: Acrylic distempering

External walls: Heat reflective weathercoat acrylic paint

MMS foundations and Earth pit enclosures: weathercoat acrylic paint
Steel/ Al doors, windows and ventilators: Synthetic Enamel paint

- Rolling Shutters.

Rolling shutters made of minimum 18 BG profile and conforming to IS 4030 with shall be provided with all fixtures, locking arrangements, latches, seam pipe, springs, accessories, painting, etc. all complete.

- Water supply.

PVC pipes of Schedule 80 quality conforming to IS shall be used for all water supply and plumbing works.

- Plumbing and Sanitary:

Sanitary fittings, which include water closet (EWC), wash basins, sink, urinal fitting including flushing tank, and necessary plumbing lines shall be provided for office cum stores building and Security house.

- Electrification of Building

Electrification of buildings shall be carried out as per relevant IS standards. The lighting design of the buildings shall be carried out as per IS 3646. The building shall be provided with adequate quantity of light fittings, 5A/ 15A 1 phase sockets, fans etc., controlled by required ratings of MCBs and MCB, DBs. Supervisor room must be fitted with suitably sized HVAC system. It is encouraged that bidder shall use the latest energy efficient equipment for the electrification and illumination.

- Toilet:

Toilet shall be designed for 10 persons; and constructed with following finish

Floor: Anti skid Ceramic tiles for floor and polished for walls

Door: Solid panel PVC Doors

Ventilators: Mechanical exhaust facility Plumbing fixtures: Repute make
Sanitary ware: Repute make
EWC with hand faucet, toilet paper roll holder and all fittings
Urinal with all fittings.
Wash basin as approved with all fittings.
Bathroom mirror as approved hard board backing
CP brass towel rail of heavy type with C.P. brass brackets
Soap holder and liquid soap dispenser.
PVC pipes of reputed makes

Overhead water tank equivalent of 1,000 litre capacity

- Drainage for Toilets:

Drainage pipes shall be of UPVC (110 mm dia, Type B) of repute make. Gully trap, inspection chambers, septic tank for 15 person and soak well to be constructed for above mentioned requirement.

- Air Conditioner for Control Room:

The control room shall be equipped with appropriate numbers of fans for effective heat dissipation. The supervisor room /SCADA cabin shall have split type air conditioning units.

j) Water supply & Cleaning

Water used for cleaning purpose shall be fit for cleaning the PV modules, cleaning procedure and pressure requirement shall be as per the recommendation of PV module manufacturer.

The Bidder shall estimate the water requirements for cleaning the photovoltaic modules at least once in every week or as per the environmental conditions prevailing at site, in order to operate the plant at its guaranteed plant performance. Also, bidder is required to plan the water storage accordingly.

Automatic sprinkler system for wet cleaning of the solar panels shall be in the scope of the bidders and accordingly the agency has to provide all the necessary equipment, accessories, tool & tackles, pumps and piping arrangement pertaining to module cleaning system.

Bidder has to plan and install the effective automatic module cleaning system as per the prevailing conditions at Site. The system may include the storage water tanks, pumps, laying of GI/ HDPE/ UPVC pipes, flexible pipes, taps/ valves , pressure gauges etc.as per the planning by the bidder. Bidder has to submit the dra
wing/ plan for the proposed automatic module cleaning system.

All the pipes thus laid must be buried in ground at least 150mm below FGL. Road crossings and drain crossings, the pipes must be passed through GI/ Hume pipes asapplicable.

k) Roads within Solar Power Plant

Suitable approach road and internal Solar Photovoltaic roads to carry safe and easy transportation of equipment and material at the project site shall be made. The road should provide easy and fast approach to each location of the plant. These roads are to be designed optimally to carry the crane load with all necessary chambers, gradients, super elevation, and radius of curvatures for the easy movement of cranes, trucks and public transport.

All Roads are to be constructed with well compacted soil, 400 mm (min.) thick DLC, 200 mm (minimum) sand filling and 100 mm thk M50 grade paver block on top with RCC guard walls on sides and 1.0 m wide well compacted shoulders on each side to carry safe and easy transportation of equipment and material at the project site during and after construction. The road must be well compacted as per the relevant IS standards and MORTH updated till date.

The road from Main gate to MCR/ Sub-station shall also have to be constructed. Also, all cable crossings and other crossings shall be provided with GI/ Hume pipes.

l) Peripheral Boundary/ peripheral wall:

The objective to provide a peripheral fencing is to demarcate the boundary and to keep away the unauthorized access to plant. The contractor shall provide GI chain link all around the periphery of the plant. The wall height must be minimum of 2 meter from the FGL. The boundary wall must be provided with a rugged main entry gate (s). The construction of peripheral wall and the main entry gate must conform to the relevant IS standards and practice. Additionally, there should be few strands of barbed wires attached to a tilted bracket above the fencing/wall.

All the drawings/ specifications for the peripheral wall and main entry gate design/ planning must be submitted to Employer for approval prior to construction for their accord.

m) Drainage

The storm water drainage shall be planned for the plant to ensure no water stagnation in the plant. The drains must be constructed with RCC sections with depths and slopes as per site conditions. The drains outfall must be connected to the nearest drain outside the plant premises. It is advised that the drainage for the plant must be designed keeping the natural flow of water to the nearest exit point.

Bidder is to provide RCC Hume pipe of appropriate size at the crossing of road and drains and at required locations. If the crossing is huge or if directed by the client then the bidder shall have to construct RCC box culverts for crossing of vehicles over the existing canal or at any other location within and surrounding the plant area. Drains are required to provide weep holes with PVC pipes at an interval of atleast 1.5 m. Bidder shall submit the drain plan and drain section details for the complete plot as required for the effective water evacuation to nearest outfall point for suggestion/ approval.

n) Painting & Finish:

All metal surfaces and support structures shall be thoroughly cleaned of rust, scale, oil, grease, dirt etc. Fabricated structures shall be pickled and then rinsed to remove any trace of acid. The under surface shall be made free from all imperfections before undertaking the finishing coat.

All metal surfaces shall be painted with two coats of yellow zinc chromate primer and two coats of premium quality synthetic enamel paint of reputed make.

o) Watchmen / Security Cabin:

Contractor shall provide adequate numbers of prefabricated Watchman's portable cabin at strategic locations within of the plant. The minimum size of Watchman's (Security Cabin) cabin is 1.2 meter x 1.8 meter size and height of 2.4 mm with appropriate roof at the top. Location of the watch cabin (Security Cabin) will be as directed by the Employer. The Prefabricated Security Cabin of size 3 metre x 3 metre at the main entrance gate shall be designed and constructed by the Successful Bidder keeping in view the safety and security of the power plant.

p) Automatic Module cleaning system

Contractor has to estimate the water requirement for cleaning the modules with a frequency of at least once a week or as per the environmental conditions prevailing at site. The frequency of cleaning shall be mutually agreed and approved during the detail engineering in order to achieve the guaranteed performance . The bidder is required to provide PVC water tank. Suitable sized pump shall also be installed to maintain the water pressure at the extreme ends. The design shall be as per relevant IS codes, bidder to take approval from Employer before the construction of module cleaning system.

1.0 CONFORMANCE TO INDIAN STANDARDS

Except where otherwise specified all materials shall conform to the latest editions of the relevant Indian Standards published by the Bureau of Indian Standards. For manufactured or proprietary items, the manufacturers' specifications as approved by the Engineer shall be applicable.

2.0 SAMPLES

In addition to the requirements of sampling and testing of materials as specified in the Indian Standards and in these specifications, samples of the following materials shall be taken and submitted by the Contractor to the Engineer for approval in advance of the commencement of Works. The cost of all sampling and testing shall be deemed to have been included in the rates and prices in the contract.

i) Cement
ii) Aggregates
iii) Reinforcement Bars
iv) Concrete
v) Rock
vi) Admixture
vii) Water
viii) Mild steel

3.0 MATERIAL STORAGE

All materials brought to the Site for use in the Works shall be properly stored and preserved as per IS:4082 to ensure their quality and fitness during the course of their use in Works. Cement and Steel shall not be allowed to be stored in the open areas. If the storage arrangements are not to the Engineer's satisfaction he may direct the Contractor for arranging proper storage facilities, failing which the Engineer will reserve the right to reject such materials as he deems it necessary. All materials shall be stored in adequate quantities well in advance to meet the Construction Schedule.

4.0 AGGREGATES

4.1 General

The aggregates (coarse/fine) used for concrete work shall conform to IS: 383. The aggregates shall not contain any harmful material such as iron pyrites, coal, mica, shale, or similar laminated materials, clay, alkali, soft fragments, sea shells organic impurities in such quantity which affect strength or durability of concrete. Aggregates reactive with alkalies of cement are strictly prohibited. The maximum quantity of deleterious materials in the aggregates shall be determined in accordance with IS:2386 (Part II) and shall not exceed the limits given in the Table 1, IS:383, unless otherwise directed by the Engineer.

4.2 Storage of Aggregates

Aggregates shall be stored at site in suitable bins or on clean hard durable surface well drained and maintained free from all contaminations. Different aggregates shall be stored in separate compartments or heaps without intermingling.

4.3 Coarse Aggregates

The size, shape, quality, specific gravity, grading, soundness, crushing strength, abrasion resistance of coarse aggregate for all concreting works shall comply in all respects with IS 383.

4.4 Fine Aggregate

Fine aggregate for all concrete works shall be sharp and clean dry river sand free from all debris organic matter clay or other foreign material which affect the durability of concrete, and shall be subject to the Engineer's approval. Suitable allowance shall be made for bulking when measuring sand as directed by the Engineer or his Representative. Sand shall be screened and washed properly to the Engineer's satisfaction.

The size of fine aggregate shall be such that most of it passes through 4.75 mm IS sieve and not more than 10% passes through 150 micron IS sieve. It shall, when tested as per IS: 2386, conform to Zone-II for concrete works or Zone-III for road/ hardstand filling works as per Table-III, IS:383. Fineness Modulus of sand used in the work shall not be less than 2.0.

5.0 CEMENT

5.1 Quality, Make & Testing

a) 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:8172/IS:269** or Portland Slag cement confirming to **IS:455** or Portland Pozzolona Cement conforming to **IS:1489. The brand/ manufacturer of the cement shall be subjected to prior approval of the Engineer.**

The Contractor shall get approval for at least 3 brands/ manufacturers in advance so as to have an alternative brand/ manufacturer in hand in case of disruption of supply from other brand/ manufacturer.

b) Once the quality and brand/ manufacturer of cement to be used in the works is approved after necessary testing of the samples of each brand/ manufacturer, the Contractor shall obtain further supplies of cement from the same brand/ manufacturer. The Contractor shall furnish manufacturer's test certificate along with challan for each batch of cement to be supplied for construction purpose.

c) 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 satisfactorily meet the specifications stipulated in the relevant Indian Standards. The supplier should also furnish the date of manufacture of the lot from which the consignment has been drawn by the Contractor. In addition, the Engineer shall be authorized to draw samples of

cement from the site and reject any consignment which do not pass necessary tests and/or specifications.

d) During the progress of work, the following quality assurance method shall be adhered to:

i) Contractor shall submit the **test certificate** of each **batch** of cement received at site for construction purpose.

ii) The Contractor shall conduct physical and chemical tests on samples from each batch of cement drawn jointly with the representative of Engineer as per relevant IS Code at the laboratory approved by the Engineer. The costs of all such tests shall be borne by the Contractor.

5.2 Delivery and Storage of Cement

Cement shall be transported handled and stored on the Site in such a manner as to avoid contamination or deterioration. Each consignment shall be stored separately so that it may be readily identified and inspected and cement shall be used in the sequence in which it is delivered at Site.

From the time that a consignment of cement is brought on the Site and tested and approved by the Engineer and until such time as cement is used in the Works, the Contractor shall be responsible for keeping the same in sound and acceptable condition.

If cement is to be stored in bulk containers these shall be subject to the prior approval of the Engineer and shall be large enough to contain such quantities as may be required with sufficient reserve to allow for the likely frequency of supply.

Cement stored in bulk containers shall be, in the opinion of the Engineer, adequately protected against rain, humidity, dewfall and dust, and all charging and discharging points shall be properly sealed. Aeration equipment for the bulk containers, if available, shall incorporate dehumidifiers.

If packaged cement is stored in bulk containers it shall be charged into the containers through a 5 mm mesh screen which is welded or bolted to and covers the entire feed area of the charging hopper.

Cement other than that stored in bulk shall be kept in the bags or containers in which it was delivered until use and shall be stored in a Dry Store large enough to contain such quantities as may be required with sufficient reserve to allow for the likely frequency of supply. Cement in bags or containers shall be unloaded under cover. This store shall be dry, well-ventilated, perfectly weatherproof and waterproof and shall be so situated as not to be liable to flooding and shall have a floor raised not less than 60 cm from the ground in order to protect the cement from moisture. An air space shall be left between the floor and the bottom layer of the bags. Cement bags shall be stored well away from outer walls of the store and not more than 12 bags shall be stacked in any tier. Each consignment shall be stacked separately therein to permit easy access for inspection and a record shall be kept so that each consignment may be identified by a serial number and date of delivery and used in the sequence in which it was delivered at site.

Cement shall be adequately protected at all times from rain and spray. Cement which has set or partially set and become lumpy shall not be used in the Works.

Notwithstanding the above provision, any cement which the Engineer considers has become stale or unsuitable through absorption of moisture from the atmosphere or for other reasons shall be rejected and removed from the Site at the Contractor's expense. Any cement in containers damaged so as to

allow the contents to spill or to be affected by atmospheric moisture prior to opening at the time of concrete mixing shall be rejected and removed from the Site at the Contractor's expense.

5.3 Rejection of Cement

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.

5.4 Identification and Records for Cement

Cement shall be stored in such a way 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.

5.5 Removal of Cement for use

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

5.6 MATERIAL TESTING LABORATORY

The Contractor shall maintain at site a material testing Laboratory with equipment and staff for testing of cement, aggregates, concrete etc. The Contractor shall furnish full details of all equipment and apparatus for such testing along with the tender.

6.0 WATER

a) Water used for mixing concrete, curing, cooling or washing of aggregate shall be clean and free from injurious amounts of oils, acids, alkalis, salt, sugar, organic material or any other substance that may be deleterious to concrete or steel. Potable water is generally considered satisfactory for mixing concrete.
b) pH value shall not be less than 6 nor more than 7.5.
c) River water shall not be permitted.

7.0 ADMIXTURES IN CONCRETE

Admixtures may be used in concrete at contractors cost only with the approval of the Engineer and shall conform to IS:9103 and IS:2645. The Contractor shall produce test certificates from recognized laboratories before use of admixtures. The proportion of admixture to be used in concrete shall be determined by tests as directed by the Engineer.

8.0 REINFORCEMENT STEEL

8.1 Reinforcement Steel

Steel reinforcement bars for concrete shall be round bars complying with Grade 1 Mild Steel as per IS:432 and high yield strength deformed bars conforming with IS:1786. **The Contractor shall get approval of at least 3 brands/ manufacturers of reinforcement/ structural steel in advance so as to have alternative in hand in case of disruption of supply from the other brand/ manufacturer.**

8.2 Test Certificates and Tests

Test certificates must be produced by the Contractor for all steel procured by him. However, the Engineer may order specimens from each consignment to all tests, (particularly tensile, bend, re-bend tests with results) required under Indian Standards, which tests shall be carried out by the Contractor at his own cost. Notwithstanding certificates produced by the Contractor, the Engineer may reject the consignments, test results of which do not conform to the specifications, and the Contractor shall forthwith remove such material from one 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.

8.3 Mild Steel Binding Wire

The mild steel binding wire shall be of 1.63 mm. or 1.22 mm. (16 or 18 gauge) diameter and shall conform to IS 280 (latest revision) and shall be as approved by the Engineer.

8.4 Stamping or Marking

The steel shall be marked or stamped with a private mark for the purpose of identification as may be directed by the Engineer.

9.0 STRUCTURAL STEEL (GENERAL USE)

10.1 All structural steel shall be mild steel confirming to IS:2062. The finished materials shall be free from cracks, surface flows laminations, rough and imperfect edges and any other defects. Steel shall be free from rust, scaling and pitting.

10.2 All structural steel tubes shall confirm to IS:1161.

10.3 All fixtures permanently embedded in concrete structure shall comply with relevant IS codes for stainless steel of marine grade.

10.4 Hexagon head bolts, screws and nuts of product grade-C (Part I) shall conform to IS:1363.

10.5 All electrodes required for metal are welding shall be covered electrodes and comply with the requirement of IS:816 and IS:814 unless otherwise specified.

10.6 In addition to any mechanical tests required under previous clauses herein above, the Engineer may require the contractor to carry out independent tests of the material. The cost of such testing shall be borne by the contractor.

10.0 CAST IRON

Cast iron shall generally comply with IS:210 'Gray Iron Castings'. Trench covers and gratings, if specified shall comply with the requirement of IS:1726 and shall be of heavy duty type unless otherwise indicated.

10.1 CAST STEEL

All steel castings shall be in accordance with IS: 1030-Steel Castings for General Engineering Purposes. The steel unless otherwise specified conform to Grade-I of this Code and shall satisfy all tests as specified in IS: 1030.

10.2 STAINLESS STEEL

All stainless steel materials shall conform to AISI:316 grade quality and fasteners shall be manufactured to IS:1367 (Part 14).

11.0 FASTENERS

Bolts and nuts of all types shall conform to IS: 1367.

Black bolts and nuts shall conform to IS:1363.

High strength Structural Bolts and Nuts shall conform to IS:3757 and IS: 1367 (Part-III) of Property Class 8.8 (Low Carbon Steel with additives).

Plain washers shall conform to IS: 2016 and taper washers for I beams shall conform to IS: 5374.

Countersunk head screws shall be in accordance with IS: 1365 and shall conform to product Grade-A as specified in the revision IS: 1367- Part II (Second Revision).

12.0 ELECTRODES

Electrodes for metal arc welding shall conform to the requirements of IS: 816 and IS:814 and shall be of best heavy coated type and of approved make.

13.0 High Density Polyethylene Pipes

HDPE pipes where specified shall conform to IS: 4984.

14.0 OTHER MATERIALS :

All materials not herein fully specified and which may be offered for use in the Works shall be of first class quality and of such kind as is generally used in first class work. The Engineer shall have the right to determine whether all or any of the materials offered or delivered for use in the Works are suitable for the purpose and his decision shall be final and binding on the Contractor.

15.0 EQUIVALENT MATERIALS :

The materials specified with brand/proprietary name shall only be used and the Contractors shall take procurement action well in advance so that the specified materials are available in time. However, if the specified material is not available as confirmed by the supplier or his agent to complete relevant work within the stipulated time, alternative material to the approval of the Engineer would be allowed with price adjustment as applicable. Engineer's decision shall be final and binding in this regard.

6.81. SUB-SECTION-III – WORKMANSHIP

The following specifications shall cover the general workmanship requirements for earthwork in excavation and filling, concreting and formwork etc. These specifications will supplement other specifications provided in the sections for Particular Applications.

1.0 CONCRETE

The following specifications cover the general workmanship requirement for concrete and concreting.

1.1 Standards

All concreting work shall be done in accordance to the provisions of IS: 456, and other allied standards mentioned in IS:456, unless otherwise specified or directed by the Engineer.

1.2 Work to be Provided for by the Contractor

The work to be provided for by the Contractor under this specification, unless otherwise specified shall include but not be limited to the following :

a) Furnish all labour, supervision, services including facilities as may be required under statutory labour regulations, materials, forms, templates, supports, scaffolds, approaches, aids, construction equipment, tools and plants, transportations, etc. required for the Works.

b) Except where it is excluded from the Scope of Contract, Contractor shall prepare progressively and submit for approval detailed drawings and Bar Bending Schedules for reinforcement bars showing the positions and details of spacers, supports, chairs, hangers etc.

c) Design and prepare working drawings of formwork, scaffolds, supports, etc. and submit for approval.

d) Submit for approval detailed drawings of supports, templates, hangers, etc. required for installation of various embedments like inserts, anchor bolts, pipe sleeves, frames, joint seals, openings etc.

e) Submit for approval detailed schemes of all operations required for executing the work, e.g. Material handling, Concrete mixing. Placement of concrete, Compaction, curing, services, Approaches etc.

f) Design and submit for approval, concrete mix designs required to be adopted on the job.

g) Furnish samples and submit for approval results of tests of various properties of the following : (Cost of Samples and testing to be borne by the Contractor)

i) The various ingredients of concrete

ii) Concrete

iii) Embedments

iv) Joint seals

h) For supply of certain materials normally manufactured by specialist firms, the Contractor may have to produce, if directed by the Engineer, a guarantee in approved proforma for satisfactory performance for a reasonable period as may be specified, binding both the manufacturers and the Contractor, jointly and separately.

1.3 No Concreting without Approval

The Contractor shall inform the Engineer, sufficiently in advance, whenever any section of the Work is ready for concreting. He shall accord all necessary help and assistance to the Engineer Representative for all checking required. No section of the Works shall be concreted without the approval of the Engineer.

1.4 Design Mix Concrete

Where Designed Concrete mix is specified, the Contractor shall calculate the proportions of the ingredients as per IS:10262 and IS 456 and carry out several trial mix batches to determine the final proportions by weight of cement, aggregate and water necessary to produce the concrete having the desired characteristics. The Contractor shall submit to the Engineer the following data for his approval:

1. The proportion of cement, coarse aggregate, fine aggregate and water so determined.
2. The sieve analysis of aggregates, which he proposes to use in the works.
3. Full details of preliminary tests on each class of concrete, and on the ingredients of each class of concrete.
4. For each trial mix, the mix strength - determined as the average of 10 test specimens - shall exceed the specified target strength specified below.
5. All calculations relevant to the design of each grade of concrete mix.

The proportions may also be determined by experiments at an approved laboratory so as to give the greatest possible strength and density for the mix. The density of concrete shall not be less than 2.40 t/cum.

The proportions adopted shall be subject to the approval of the Engineer and they must be determined for each different type of aggregate the Contractor proposes to use and whenever the Contractor proposes to change to a different type of aggregates during the course of the work. Proportions of a particular grade of concrete, once established by mix design and exhaustive trial mixes, shall not be altered on any account without the express approval of the Engineer.

The concrete mix shall be designed for values of target mean strength not lower than those indicated in Table below.

Grade of Concrete	Target mean strength(N/sq.mm.) after 28 days
M 30	**41**

1.5 Minimum Cement Content and Maximum Water Cement Ratio

The concrete mix shall comply with the minimum cement content and maximum water cement ratio as given in the Table below.

Grade of Concrete	Minimum Cement Content (Kg/Cu.M.)	Maximum Water Cement Ratio
M 30	**350**	**0.45**

The minimum cement content specified above are from considerations of durability of the structure and do not necessarily represent the contents of cement to be actually used for the design of the mix.

1.6 Proportioning of Concrete

Proportioning shall mean the determination of proportion of various ingredients to be used to produce concrete of required strength, workability, durability and other desired properties.

Preliminary mix design shall be established well ahead of the start of the Concreting working 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 desired strength, the Engineer shall order fresh trial mixes to be made by the Contractor and these shall be at the Contractor's cost. No claim shall be entertained for such changes in concrete mix.

Variations in cement consumptions shall be taken into consideration for material reconciliation.

1.7 Density of Concrete

For each grade of concrete, suitable proportions of sand and sizes of coarse aggregate 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.

1.8 Water-Cement Ratio of Concrete

Water-cement ratio of a mix which is specified and approved by Engineer 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 IS: 456 latest revision.

1.9 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.

1.10 Slump

The slump as determined according to IS: 1199 shall be within the following limits:

Degree of workability	Slump in mm.		Type of Construction
	Min.	Max.	
Medium	40	80	Reinforced Foundations, walls and footings.
Medium	25	75	Plain footings, substructure walls, etc.
Medium	50	100	Reinforced beams, columns, walls, etc.
High	150	180	Bored Piles.

Batching

In proportioning concrete, the quality 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. Water should be either measured by volume in calibrated tanks, or weighed. Any solid admixture that may be added, may be measured by weight; liquid and paste admixtures by volume or weight.

All measuring equipment should be maintained in a clean, serviceable condition, and their accuracy periodically checked. Batching plant when used shall conform to IS:4925 and shall be accurately calibrated.

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 the work, the grading of aggregate should be controlled by obtaining the coarse aggregate in different sizes, 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 weather conditions, the moisture content in fine and coarse aggregate shall be determined (in accordance with IS: 2386) at intervals specified by the Engineer and the amount of water added shall be adjusted to compensate for any 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 the values given in IS: 456 in the absence of exact data.

No substitutions in materials used 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.

1.11 Exposure

Exposure condition for concrete in this work shall be considered as "severe".

1.12 Sampling and Testing for Strength

Sampling, testing and acceptance of concrete shall be in accordance with IS:456.

1.13 Mixing

The concrete shall be mixed in approved type of automatic weigh batching plant of suitable capacity (to IS: 4925) or tilting or non-tilting type stationary mixers (to IS: 1791) or truck mixers of approved make and design. Mixing shall be continued until there is a uniform distribution of the materials and the mass is uniform in colour and consistency. If there is segregation after unloading from the mixer, the concrete shall be remixed. Workability of the concrete shall be controlled and checked at frequent intervals by testing as per IS:1199. **Calibration of the Batching Plant shall have to be done prior to commencement of the work, and subsequently, not less than two times during production of concrete. The frequency of calibrations to be carried out during the work shall be decided by the Engineer.**

The mixing time shall be about 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.

1.14 Remixing of Concrete

Concrete or mortar which has commenced to set shall not be remixed with additional cement or water and in no circumstances shall such concrete or mortar be used in the Works.

1.15 Transporting Concrete

Concrete shall be transported as rapidly as possible from the place of mixing to the place of final deposit. Concrete shall be transported by methods which prevent adulteration, segregation or loss of cement content and which ensure that the concrete is of the required workability at the point and time of placing.

1.16 Preparation of Concreting

Before concreting commences forms shall be carefully examined for any damage due to accident or repeated use. Any such damage is to be thoroughly repaired to the satisfaction of the Engineer.

The surfaces of the forms in contact with concrete shall be thoroughly cleaned. The insides of the forms shall be treated with a coating of an approved substance (oil for instance) to obviate adhesion, and where further necessary to prevent absorption from the concrete, the forms shall be thoroughly wetted shortly before concreting is commenced.

For concreting work on the ground, the ground shall first be excavated. The excavated ground shall be compacted thoroughly by mechanical means. A binding layer of 75 mm thick M-15 concrete shall be provided over the compacted ground, to the approval of the Engineer.

1.17 Depositing Concrete

a) Concreting for Piles : Specifications for concreting for piles are as given in the specifications for piles.

b) For other works : As soon as possible the concrete shall be deposited directly in the forms. Concrete shall not be allowed to fall through a height greater than 2 m.

1.18 Vibrating Concrete

Concrete used in the Works except for the concrete laid in piles shall be vibrated by means of approved form/immersion type vibrators.

Immersion Vibrators designed to operate with vibratory element submerged in concrete and having a frequency of at least 8000 cycles per minute (when submerged in concrete) shall be used. The number of vibrators used shall be sufficient to consolidate the concrete properly within ten minutes after it is deposited in the forms. Vibration shall be stopped immediately after the concrete has been compacted thoroughly and ceases to decrease in volume.

The use of mechanical vibrators complying with IS: 2505, IS: 4656 for compacting concrete is recommended. Wherever vibration has to be applied externally, the design of the formwork and the disposition of vibrators shall receive special consideration to ensure efficient compaction and to avoid surface blemishes. Care shall be taken to avoid segregation and excessive vibration.

1.19 Surface Treatment

All concrete surfaces shall be free from blemishes and shall be reasonably smooth and true. Any fins occurring at form work joints shall be removed and air holes filled with mortar after obtaining approval from the Engineer.

1.20 Curing

Concrete shall be protected during hardening from the direct sun rays and drying winds.

Immediately, after pouring concrete all exposed surfaces shall be protected by screens of thick matting or other suitable material which are to be kept wet throughout for a minimum period of seven days after depositing concrete.

1.21 Work in Extreme Weather Condition

During extreme weather conditions the concreting shall be done as per procedure set out in IS: 7861.

1.22 Commencement of Concreting

No concreting shall be commenced in any portion of the Works until the programme and preparation have been approved and permission given by the Engineer that the concreting in such portion of the Works may commence.

1.23 Intervals During Concreting

The schedule for depositing of concrete is to be so arranged that no face of concrete shall be left more than 20 minutes before concrete is deposited against it. Pauses for meals, changes of shifts etc. and the distribution of the concrete among the positions where work may be proceeding simultaneously must therefore be carefully organized to ensure that the above –mentioned interval is not exceeded.

1.24 Construction Joints

In-situ concreting shall be carried out continuously up to vertical construction joints, the position and arrangement of which shall be predetermined by the Engineer, other specifications of IRC 21-1987 shall be followed.

1.25 Concrete not to be Disturbed

Care shall be taken not to disturb the concrete by direct or indirect loading, striking of shutters or otherwise, until it has hardened sufficiently. In this regard Engineer's decision shall be final and binding.

1.26 Records of Concreting

An accurate and up-to-date record showing dates, times, weather and temperature conditions when various positions of the works were concrete will be kept by the Engineer and shall be counter-signed by the Contractor or his representative. If the Contractor fails to sign the Engineer's record it shall be regarded as correct and binding on the Contractor.

2.0 FORMWORK

2.1 General

The Contractor shall prepare, before commencement of actual work, designs and working drawings for formwork and centering and get them approved by the Engineer. The form work shall conform to the shape, grade, lines levels and dimension as shown on the drawings.

Materials used for the formwork inclusive of the supports and centering shall be capable of withstanding the working load and remain undistorted throughout the period it is left in service. All supports and scaffolds should be manufactured from structural or tubular steel except when specifically permitted otherwise by the Engineer.

The centering shall be true to vertical, rigid and thoroughly braced both horizontally and diagonally. Rakers are to be used where forms are to support inclined members. The forms shall be sufficiently strong to carry without undue deformation, the dead weight of the concrete as a liquid as well as the working load. In case the Contractor wishes to adopt any other4 design criteria, he has to convince the Engineer about its acceptability before adopting it. Where the concrete is vibrated, the formwork shall be strong enough to withstand the effect of vibration without appreciable deflection, bulging, distortion or loosening of its components. The joints in the formwork shall be sufficiently tight to prevent any leakage of slurry or mortar.

To achieve the desired rigidity, the bolts, spacer blocks, tie wires and clamps as approved by the Engineer shall be used but they must in no way impair the strength of concrete or cause stains or marks on the finished surface. Where there are chances of these fixtures being embedded, only mild steel or concrete of adequate strength shall be used. Bolts passing completely through liquid retaining walls/slabs for the purpose of securing and aligning the formwork shall not be used.

The formwork shall be such as to ensure a smooth uniform surface free from honeycombs, air bubbles, bulges, fins and other blemishes. Any blemish or defect found on the surface of the concrete must be brought to the notice of the Engineer immediately and rectified free of charge as directed by him.

For exposed interior and exterior concrete surfaces of beams, columns and wall, plywood or other approved from shall be thoroughly cleaned and tied together with approved corrosion-resistant devices. Rigid care shall be exercised in ensuring that all column forms are plumb and true and thoroughly cross braced to keep them so. All floor and beam centering shall be crowned not less than 8 mm in all directions for every 5 metres span. Unless specifically described on the drawings or elsewhere to the contrary, beveled forms 25 mm by 25 mm shall be fixed in the formwork at all corners to provide chamfering of the finished concrete and be secured sufficiently at lift joints to prevent bulges and offsets.

Temporary opening for cleaning, inspection and for pouring concrete shall be provided at the base of vertical forms and at other places, where they are necessary and as may be directed by the Engineer. The temporary openings shall be so formed that they can be conveniently closed when required, during pouring operations without leaving any mark on the concrete.

All parts of the forms shall be thoroughly cleaned of old concrete, wood shavings, saw dust, dirt and dust sticking to them before they are fixed in position. All rubbish, loose concrete, chippings, shavings, saw dust, etc. shall be scrupulously removed from the interior of the forms before concrete is poured Compressed air jet and/or water jet along with wire brushes, brooms, etc. shall be used for cleaning. The inside surface of the formwork shall be taken that oil or other compound does not come in contact with reinforcing steel or construction joint surfaces. The formwork will be inspected just prior to placement of concrete and re-done wherever necessary.

2.2 Formwork: Design

The formwork shall be so designed and erected that the forms for slabs and the sides of beams, columns and walls are independent of the soffits of beams and can be removed without any strain to the concrete already placed or affecting the remaining formwork. Removing any props or re-propping shall not be done except with the specific approval of the Engineer. If formwork for column is open and built up in section, as placing of concrete progress wedges, spacer bolts, clamps or other suitable means shall be provided to allow accurate adjustment and alignment of the formwork and to allow it to be removed gradually without jarring the concrete.

2.3 Inspection of Forms

Casting of concrete shall start only after the formwork has been inspected and approved by the engineer. The concreting shall start as early as possible within 3 (three) days after the approval of the formwork and the same shall be kept under constant vigilance against any interference. In case of delay being three days, a fresh approval from the Engineer shall be obtained.

2.4 Removal of Forms

Before removing any formwork the Contractor must notify the Engineer in advance to enable him to inspect the concrete if he so desires.

The Contractor shall record on the drawing or in any other approved manner, the date on which concrete is placed in each part of the work and the date of which formwork is removed there from and have this record checked and countersigned by the Engineer regularly. The Contractor shall be responsible for the safe removal of the formwork and any work showing signs of damage through premature removal of formwork or loading shall be rejected and entirely constructed by him without any extra cost to the Employer. The Engineer may however instruct to postpone the removal of formwork if he considers it necessary.

2.5 Tolerance

The formwork shall be so made as to produce a finished concrete, true to shape, lines, levels, plumb and dimensions as shown on the drawings subject to the following tolerances unless otherwise specified in this Specification or drawings or directed by the Engineer:

a) Sectional dimension + 5 mm, - nil

b) Plumb 1 in 1000 of height

+ 3 mm before any deflection has taken place.

The tolerance given above are specified for local aberrations in finished concrete surface and should not be taken as tolerance for the entire structure taken as a whole or for the setting and alignment of formwork, which should be as accurate as possible to the entire satisfaction of the Engineer. Any error, within the above tolerance limits or any other as may be specially set up by the Engineer, if noticed in any lift of the structure after stripping of forms, shall be corrected in the subsequent work to bring back the surface of the structure to its true alignment.

3.0 REINFORCEMENT

3.1 Storage

All reinforcing bars shall be stored on the site on timber or concrete supports suitably spaced and of sufficient height to keep the steel clear of the ground.

3.2 Bar Bending Schedules

All bar bending schedules will be prepared by the Contractor as per IS:2502.

The Contractor shall be responsible for the correctness of the numbers, lengths and bending details of reinforcing bars shown on the schedules must in all cases be verified by the Engineer-in-Charge. The bar bending schedules shall be submitted to the Engineer-in-Charge by the Contractor sufficiently in advance for approval.

3.3 Placing

The number, size, form and position of all the reinforcement shall, unless otherwise directed or authorized by the Engineer-in-Charge be strictly in accordance with the drawings, except that bars may be displaced locally as approved by the Engineer-in-Charge to clear bolts, pockets and the like which may not necessarily be shown on the reinforcement drawings. Nothing is otherwise to be allowed to interfere with the disposition of the reinforcing bars, and the Contractor is to make a particular point of seeking that they are placed correctly in every respect.

The longitudinal bars in piles, columns, ties etc., are to be straight, and fixed in correct relation to each other and to the sides of the moulds.

3.4 Reinforcement: Maintaining in Position

The steel reinforcement shall be so connected as to form a rigid cage. To prevent displacement before or during concreting the bars shall be secured one to the other with approved wire. Ends shall point inwards, to preserve the full specified amount of cover. Soft steel 18 gauge binding wire conforming to IS: 280 shall be used throughout the work. Where necessary steel spacers of approved diameter and spacing are to be provided between layers of reinforcement as shown on the drawings or as instructed by the Engineer-in-Charge.

Dense concrete (not mortar) spacer blocks shall, unless otherwise directed, be used between the reinforcement and the bottom and sides of the forms to ensure correct cover of concrete over the bars. The shapes and size and procedure for concreting the spacer blocks shall be to the approval of the Engineer-in-Charge and they shall be of a mix not leaner than the concrete in which they are to be embedded. After their removal from the moulds in which they are cast they shall be cured for 10 days in water.

The cost of providing tying wire, and concrete spacer blocks shall be deemed to be covered in the rates for reinforcing steel.

Care is to be taken to prevent any displacement or bending of the members of the reinforcement when adjusted and temporarily fixed in position before the commencement of concreting. In cases where bars project they are to be adequately protected against displacement both during concreting and subsequently.

3.5 Bending Reinforcement

Reinforcement bars shall be bent by machine or other approved means producing a gradual and even motion. All bars shall be bent cold.

Bars incorrectly bent shall be used only if the means used for straightening and re-bending have been approved by the Engineer-in-Charge.

No reinforcing bar shall be bent when in position in the work without the Engineer-in-Charge's approval whether or not it is partly embedded in hard concrete.

Bars shall comply with the dimensions given in the bar bending schedule. Links, hoops & stirrups are generally to be bent round pins of the same diameter as the bars they enclose, but the minimum diameter of the pin shall be twice the diameter of the link etc. The internal radius of bends and hooks of main reinforcing bars shall be not less than twice the size of the bar unless specified otherwise.

3.6 Reinforcement to be Clean

All reinforcing steel shall be free from rust, loose scale, oil, grease or other deleterious material.

3.7 Approval of Reinforcement

The Contractor must obtain the approval of the Engineer-in-Charge as to the reinforcement when placed, before any concrete is deposited in the shutters.

4.0 HIGH DENSITY POLYETHYLENE PIPES

High density polyethylene pipes to IS: 4984 of the diameters and the lengths shall be fixed at the locations shown by the Engineering-in-charge.

5.0 MISCELLANEOUS STEEL FIXTURES AND EMBEDMENTS

The work under this item involves fixing of miscellaneous steel at locations indicated in the drawing or as directed by the Engineer, Inserts, embedments or other items shall be fixed to proper lines, levels and orientation to the Engineer's satisfaction.

Payment will be made on the basis of weight of materials fixed or embedded. The rate shall include the cost of all such materials, galvanizing or painting as required, means of fixing, making and filling of pockets, all filling concrete, and all related work.

6.0 PAINTING

All dust, rust and other foreign matter shall be removed from the surface of to be painted and the material thoroughly cleaned to the Engineer's satisfaction. Where blast cleaning is specified it shall be done to Swedish standard Sa 2-1/2 and painting done within specified times.

In general the manufacturer's instruction shall be followed in application of paints.

The number of coats to be applies shall be as specified under the various items of work. The primer or first coat shall be applied to the Engineer's satisfaction and only after his approval shall subsequent coats of paints applied.

7.0 PILE FOUNDATION

This work shall consist of construction of RCC bored cast-in-situ piles for the liquid Cargo handling Jetty at different locations in accordance with the details shown on the drawings and to the requirements of the specifications.

The number of piles mentioned in the schedule of quantities in this contract is based on required capacities of bored cast in situ pile of and the basic length of pile and its dimensions are 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.

7.1 SPECIFICATIONS

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

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

7.2 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.

7.3 FOUNDING OF PILES

The founding levels of piles shall be as per design and soil investigation. However depending on the results of geo-technical investigations and 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.

7.4 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 Conform to the dimensions of the pile and is to be approved by the Engineer.

During boring, it shall always be ensured that the bottom of the lower-most liner shall be driven enough in advance of the boring tool to prevent the entry of soil into the casing, thus preventing the formation of cavities

and settlements in the adjoining ground. The joints of the casing shall be made as tight as possible to minimize inflow of water or leakage of slurry during concreting.

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 or boring shall be disposed off as directed by the Engineer within the quoted rates.

7.5 DRILLING MUD (BENTONITE)

The level of drilling mud shall always be maintained above the level of sea high water. Care shall be taken that during boring and removal of the spoil the hole shall remain almost full with the fluid which should preferably be kept in motion. The density and composition of the bentonite fluid shall be such as will suit the ground conditions and maintain the fine materials from the borings in suspension and shall conform to IS:2911 (Part I/Sec-2).

7.6 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.

7.7 PILE CONCRETING

The pile shall be RCC bored cast in situ type with design mix concrete of specified grade. Under-water concreting, if required, shall be done as per IS 456 (latest revision). For Piling Concrete, provision mentioned in IS 2911 regarding extra cement content in the mix shall be adhered to.

Concreting of pile shaft shall start as soon as possible after the procedure for cleaning the borehole bottom specified herein above have been completed and approval of Engineer-in-Charge obtained. Concrete shall be placed by means of a tremie pipe. Should a borehole be left un-concreted for more than two hours, it shall be cleaned thoroughly as directed by the Engineer-in-Charge before placing concrete. A vermiculite plug should be introduced in the tremie before pouring concrete.

For the first pour a plug shall be introduced at the junction of funnel and tremie pipe and concrete filled in the funnel. This plug is then removed and funnel lifted by about 150 mm to allow the concrete to fall and flush out the bottom.

During concreting, the concrete levels in the pile shaft shall be checked every two metres intervals in order to note the difference, if any, between the theoretical quantity that should have been placed and actual quantity that has gone in. This is to locate the position of over cut during boring, and/or under-filling of concrete.

7.8 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 of 200.0 mm 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.

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.

7.9 SEQUENCE OF PILING

During installation of piles, the sequence of construction shall be as directed by the Engineer.

When the piles are to be provided near the existing service lines and structures etc. care shall be taken to avoid damage to existing structures.

7.10 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.

7.11 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.

7.12 CHIPPING OF PILEHEAD

Manual chipping shall be permitted after three days of pile casting. Pneumatic chipping shall not be started before 7 days.

7.13 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 of (-) 10 m CD or refusal level whichever is earlier. 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. The length of liner cut off from the working platform to the cut off level has to be made scrap and cannot be reused for any other purpose.

7.14 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.

7.15 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. An indicative record sheet is shown below:

Indicative Table of Records to be kept		**Bored Cast *in situ* pile installation data**
1)	Work Order no.	
2)	Pile reference number and location	
3)	Pile type	
4)	Nominal cross-sectional dimensions	
5)	Original Ground Level / River bed level	
6)	Stipulated Pile Cut-Off Level	
7)	Boring Start Date & Time	
8)	Boring Completion Date & Time	
9)	Time taken for penetration of every 15 cm during last 1 m depth before founding level.	
10)	Pile Bottom Level (Founding Level)	
11)	Bottom Level of MS Liner	
12)	Top Level of Liner	
13)	Depth from Ground/ River bed level at pile position to Pile Bottom Level (Founding Level)	
14)	Steel Reinforcement details	

15)	Level of top of reinforcement cage as constructed	
16)	Method of cleaning bottom of hole at founding level before concreting	
17)	Date & time of Commencement of Concreting	
18)	Date & time of Completion of Concreting	
19)	Concrete Mix	
20)	Theoretical Concrete Quantity	
21)	Theoretical Cement Consumption (in 50 Kg bags)	
22)	Actual Cement Consumption at end of concreting (in 50 Kg bags)	
23)	Pile Head Level as constructed	
24)	Soil samples taken during pile formation	
25)	All information regarding obstruction delays and other interruptions to the sequence of work	

7.16 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.

7.17 Load Tests and Acceptance Criteria

7.17.1 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)- latest revision on isolated piles (separate piles to be casted for testing purpose) selected by the Engineer-in-Charge. Both initial test, for testing the ultimate bearing capacity of soil, and routine test on isolated single working pile has to be carried out as per the methodology and frequency laid down in IS: 2911 (Part IV)-latest revision. Based on that, the foundation design of all civil structures has to be carried out. 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 by 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 funded have the required bearing capacity.
The test loads to be applied on the loading platform supported on the pile shall be as per IS: 2911 (Part IV)-latest revision.

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.

7.17.2 Dynamic Load Test (Provisional)

In order to determine the load carrying capacity of the piles, High Strain Dynamic Load Test shall be carried out by the Contractor as per ASTM D 4945-latest revision on isolated piles selected by the Engineer-in-Charge. Bearing capacity of piles shall be assessed by applying a dynamic load to the pile head while recording acceleration and strain on the pile head. 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. 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.

7.17.3 Lateral Load Test (Provisional)

The test may be carried out by introducing a hydraulic jack with gauge between two piles which are closed by and to be selected by the Engineer or the reaction may be suitably obtained otherwise. If it is conducted by jack located between two piles, the full load imposed by the jack should be taken as the lateral resistance of the pile for load application at the jack level. The test shall be conducted as far as possible at the cut-off level of the piles. In determining the lateral resistance of the piles, the actual point of application of the lateral load at the mooring lines level should be taken into consideration and the lateral resistance obtained from jack loads shall be suitably amended accordingly.

The loading should be applied in increments of 20 percent of the design load. The next increment shall be applied after the rate of displacement is about 0.02 mm per hour of 2 hours, which ever is earlier.

The safe lateral load on the pile shall be taken as the least of the following subject to amending the test values theoretically for actual point of load application.

a) Fifty per cent of the final load at which the total displacement increases to 12 mm

b) Final load at which the total displacement corresponds to 5 mm, and

c) Load corresponding to any other specified displacement due to performance requirements.

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.

7.18 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 of decrease in the number of piles.

7.19 SPECIFICATION FOR PRECAST CONCRETE WORKS

The work consists of providing controlled cement concrete for precast concrete units of required sizes and dimensions. The work included formwork, mixing, laying, curing, conveying and placing to the correct profiles.

7.20 PRE-CASTING BEDS

All pre-cast units shall be cast on horizontal rigid beds of such design and character as the Engineer-in-Charge may approve.

All units shall be suitably marked with a reference number of the date of casting, which information shall be clearly visible when units are stacked.

7.21 FORMWORK FOR PRE-CAST CONCRETE UNITS

Formwork for pre-cast concrete units shall be of robust steel construction the design of formwork for blocks shall be submitted to the Engineer-in-Charge for his approval before they are fabricated. The formwork shall be capable of being dismantled without jarring or damage to the units.

7.22 PRE-CASTING RECORDS

Complete records are to be maintained by the Contractor of all precast works. Every units shall have a reference number, date of casting, date of removal of formwork, date of placing and location, all of which shall be recorded together with test results in a suitable Register.

7.23 CASTING TOLERANCE

Precast units shall be cast to within a tolerance of 5 mm on any dimension.

7.24 LIFTING, HANDLING AND PLACING OF PRE-CAST UNITS

Lifting and placing (and removal, if any) of precast units shall be undertaken without causing shock vibration or undue stress to or in the units. The units shall not be lifted, transported or used in the works until they are sufficiently matured. The crushing strength of test cubes which are to be kept with the precast units will be used to assess the maturity of the units.

The methods proposed for lifting, transporting and setting precast units should not overstress or damage the units in any way. In the event of overstress or damage due to whatever cause, the unit or units concerned will be liable for rejection and if so rejected shall be immediately broken up and removed from the site. The contractor shall replace such rejected units at his own cost. The contractor shall furnish detailed method for lifting and placing the units in final position for the approval of Engineer.

Part-III Inspection, Testing, Commissioning and Performance measurement Procedure

G. PERFORMANCE AND FUNCTIONAL WARRANTY / GUARANTEES:

a) PV modules used in grid connected solar power plants must be warranted for peak output wattage, which should not be less than 90% at the end of 10 years and 80% at the end of 25 years.

b) The modules shall be warranted for at least 10 years for failures due to material defects and workmanship.

c) The mechanical structures, electrical works and overall workmanship of the grid connected solar power plant must be warranted for a minimum of 10 years.

d) The Contractor must ensure that the goods supplied under the Contract are new, unused and of most recent or current models and incorporate all recent improvements in design and materials unless provided otherwise in the Contract.

e) The warranty / guarantee period shall be as follows:

- Solar PV Modules: Modules shall be warranted for a minimum period of 25 years in the Bidder's detailed Warranty/ Guarantee Certificate
- Power Conditioning Units (PCU): PCUs shall be warranted for a period of minimum 10 years or guarantee period provided by the OEM, whichever is higher.
- Transformers, associated switch gear and others: Bidder must furnish in detail its warranties/ guarantees for these items.
- All other associated equipment, not mentioned, but otherwise included in the scope of the contract must be warrantied for minimum 10 years against its performance and workmanship.

f) During the period of Warranty / Guarantee the Contractor shall remain liable to replace any defective parts, that becomes defective in the plant, of its own manufacture or that of its sub-Contractors, under the conditions provided for by the Contract under and arising solely from faulty design, materials or workmanship, provided such defective parts are not repairable at Site. After replacement, the defective parts shall be returned to the Contractors works at the expense of the Contractor unless otherwise arranged.

g) At the end of guarantee period, the contractor's liability shall cease in respect of

the goods not covered by the first paragraph of this clause, the Employer shall be entitled to the benefit of such guarantee given to the Contractor by the original Contractor or manufacturer of such goods.

h) During the guarantee period, performance demonstration and Operation & Maintenance thereafter, the Contractor shall be responsible for any defects in the work due to faulty workmanship or due to use of sub-standard materials in the work. Any defects in the work during the guarantee period shall therefore, be rectified by the Contractor without any extra cost to the Employer within a reasonable time as may be considered from the date of receipt of such intimation from the Employer failing which the Employer shall take up rectification work at the risk and cost of the Contractor.

i) During the O&M period, the bidder, in concurrence with the Employer, is encouraged to carry out the PR test in similar fashion, at regular intervals, in order to check the continued performance of the plant.

H. PERFORMANCE MEASUREMENT PROCEDURE:

Performance Ratio Test Procedure

a) The Performance ratio test aims at the comparison of the actual PV plant energy production with the guaranteed value for a limited operation time of the PV plant of 30 consecutive days.

b) After Commissioning of the Plant and after receiving all the satisfactory results regarding the correct operation of the plant, there will be continuous monitoring of the performance for 30 days. This monitoring will be performed on the site under the supervision of the Employer / Employer's engineer.

c) The final tests to prove the guaranteed performance parameters shall be conducted at site by the Contractor in presence of the Employer. The Contractor's commissioning / start-up Engineer shall make the plant ready to conduct such tests. The Performance Guarantee Tests (PG tests) shall be commenced, within a period of one (1) month after successful Commissioning. Any extension of time beyond the above one (1) month shall be mutually agreed upon. These tests shall be binding on both the parties to the contract to determine compliance of the equipment with the guaranteed performance parameters.

d) The test will consist of guaranteeing the correct operation of plant over 30 days, by the way of the efficiency rate (performance ratio) based on the

reading of the energy produced and delivered to the grid and the average incident solar radiation.

e) The Efficiency or performance ratio (PR) of the PV Plant is calculated as follows (according to IEC 61724)

Performance Ratio (PR)=**{YA/ YR}**x − α * [1 - {TCell avg.-TCell)]

Where;

YA = Final PV system yield (representing the number of hours that the system would need to operate at its rated output power PNom to contribute the same energy to the grid as was monitored)

Or YA = Eac / PNom

YR = Reference yield (representing the number of hours during whic h the solar radiation would need to be at STC irradiance levels in order to contribute the same incident energy as was monitored)

□ □□□□ YR = IR Site/ IR STC

Eac = AC energy injected into the grid during a clearly specified amount of time(kWh) PNom = Installed nominal peak power of modules (Flash test rating at STC)(kWp)

IR Site = Irradiation on the module plane of array during a clearly specified amount of time(measured with a pyranometer installed on the array plane) (kWh/sq. m)

IR STC = Irradiance at STC (kW/ sq. m)

Tcellavg = Average cell/ module temperature (°C)

Tcell= STC cell/ module temperature (°C)

α = temperature coefficient of power (negative in sign) corresponds to the installed Module (%/°C)

Minimum Performance Ratio (PR) should be -75%.

f) Monitoring System for PR Verification

The following instrumentation will be used to determine the

- Solar PlantPerformance: Power Meter at the delivery point.
- Power Meter for each inverter/ LT panel incomer for reference only.
- One nos. calibrated pyranometer to determine irradiance on the plane of array (with atarget measurement uncertainty of ± 2).
- One nos. calibrated pyranometer to determine irradiance on horizontal plane (with atarget measurement uncertainty of ± 2)
- Two nos. thermocouples to measure module temperature with a measurement uncertainty of ±1 °C.

- Shielded ventilated thermocouple with a measurement accuracy of ±1°C.
- An anemometer mounted on a 10m mast to measure wind speed (without additional shadowing on modules).

g) Data measurement shall be witnessed in the format mutually agreed before the start of PR test by the Employer and the Contractor jointly for the said period.

h) The bidder shall show the specified PR for Operational Acceptance and committed CUF for Final Acceptance (i.e. after one year form the date of commissioning).

i) Capacity **Utilization Factor (CUF)** shall be calculated as per the following formula : CUF = EN / (8760*Pnom)

EN = No. of units recorded at the ABT meter excluding the auxiliary consumption i,e. net generation

Pnom = Installed DC capacity

I. INSPECTION AND TESTING

a. Employer may deploy TPIA and/or consultant for appraisal of Drgs, Documents, Design reports, inspection of materials, testing and commissioning of Plant etc.

b. Employer shall have free access to bidder's/ manufacturer's works to inspect, expedite and witness **shop floor** tests. Any materials or work found to be defective or which does not meet the requirements of the specification will be rejected and shall be replaced at Bidder's cost. Employer reserves the right to carry out stage wise inspection of fabrication and components. The Bidder shall furnish a detailed quality assurance plan (QAP) for review by the Employer.

c. The test & inspection shall be carried out at manufacturer's work at the site with the Bidders obligation. The test and Inspection shall be done in accordance with the relevant standards and the Manufacturer's standard before the delivery to site as well as after the erection and commission at site. The bidders shall give the list of tests that they will carry out at site to show the performance of plant.

d. A detailed 'QAP' for Manufacturing and Inspection shall be submitted by the Bidder for Employer's approval. The data of each test and inspection shall be recorded and submitted as soon as the test/ trials are conducted and will also be a part of final documentation.

e. The shop test shall be carried out to prove the performance parameters of the offered model. The testing shall be done in the presence of the representatives of the department.

f. The Employer will nominate its representatives (max. of 2 nos.) for inspection of stage manufacturing and testing at works & 7 days training at premises of SPV module and PCU manufacturer. The notice of such inspection shall be given 30 days in advance in case of countries outside India and 15 days in India.

g. Manufacturer has to submit procedure for Test carried out at their Factory:

h. Start Up Trials

i. Load Test

j. Records & Measurements Safety Device List

k. Setting values for all sensors for Pressure and Temperature

l. Dimensional Check-up, Overall Inspection, Completeness of Scope of Supply Shop Test/Load Test for Solar Power Plant

m. Load Trials & Reliability test at Site

n. Performance Guarantee Test at Site for Grid Connect Solar Power Plant, HT Panel etc. These tests will be conducted at site as per site conditions at available load and after performing all pre-commissioning check and trials and after readiness of the entire Solar Power Plant system which are required to carry out the load trials

o. All the tests which are mentioned in the load test of Solar Power Plant will be carried out in presence of Employers Representative at Site under site conditions and the parameters checked in accordance with the data sheet and guaranteed parameters given by the Contractor.

p. All the equipment supplied by the vendor will be tested as per relevant standard/ Quality assurance plan at site conditions and the performance monitored.

q. Quality Considerations

Contractor will submit and get finalized detailed comprehensive Standard Field Quality Plan (SFQP) within 30 days from date of issue of the order for bought out items and items manufactured by them. The Standard Field Quality Plan shall relate to the specific and objective erection practices right from storage of equipment till final inspection and testing to be followed for bought out items and items manufactured by Contractor. Accordingly, the Manufacturing Quality Plan shall be submitted broadly under following sub-heads:-

- Raw material/Bought Out items and Components.

- In process inspection and test/checks to establish successful completion/accomplishment of the process.
- Final tests/checks in accordance with relevant national/international standards/ specification.

r. The quantum of check for each and every inspection/test items shall be based on an established sampling method and the quantum of check indicated in the SFQP should be designed adequate quality protection.

s. In case reference documents/acceptance norms are indicated as per plant standards then the same shall be duly substantiated/properly explained by well-established and proven engineering practices. All submissions will be in English language only.

t. Bidder will to allow Employer to carry out Quality/Audit/Quality surveillance of work with reference to contractual obligations to ensure that the quality management practices/norms as detailed out in the Quality Manual are adhered to. To facilitate this activity, you shall keep Employer informed all progress of work in this contract on monthly basis. Contractor will associate /fully witness in each inspection being carried out at their/ their sub-contractor's works by our authorised inspection engineer(s)

u. Employer shall also carry out quality audit and quality surveillance of your systems, procedures and quality control activities. However, this shall not relive you of any of your contractual responsibilities under the contract.

The major items (fabricated / bought out items) may be inspected & tested at Manufacturer's works by the representative of HDC, SMPK, before delivery. Physical checking & verification of the items will be carried out at site after delivery, as per the 'Technical Specification', based on Manufacturer's test certificate, as applicable. Other materials, which will be provided / installed by the Contractor, will be inspected at site, as applicable, before installation. Other details, in this regard, have been elaborated in **SCC Clause No. 9.33.**

SHEET-1

Guaranteed Technical Particular data Sheet for Solar PV Module

(To be furnished by the Contractor)

S. No.	Particulars	Unit	Type/ value
1	PV Module Manufacture (Name & Country)		
2	PV Module type (Crystalline- Mono/ Multi)		
3	Product Code (commercial)		
4	No. of PV cells per Module	cells	
5	Mounting arrangement for Solar Module		
6	Solar Module frame material (if framed)		
7	Module dimensions		
8	Output Cables (viz., Polarized Weather Proof DC ratedmulti-contact connector)		
9	Availability of Reverse Blocking Diode and Bypass Diode		
10	Construction:-Front glass description and thickness Back sheet details Encapsulating details		
11	Cell efficiency	%	
12	Module efficiency	%	
13	Nominal Wattage (Pnom)	W	
14	Power Tolerance	W	
15	Peak power voltage (Vmp)	V	
16	Peak power current (Imp)	A	
17	Open circuit voltage (Voc)	V	
18	Short circuit current (Isc)	A	
19	Weight of each module	kg	
20	Fill Factor	%	
21	Standards/Approvals from International Agencies IEC 61215 IEC 61730 IEC 61646 IEC 61701 IEC 62716 Others		
22	Module is suitable to operate up to 50^{o} ambient	Yes/No	

SHEET-2

Technical Particular Data Sheet for Power Conditioning Unit

(To be furnished by the Contractor)

Particulars	**Unit**	**Value**
Make		
Capacity		
Origin		
AC Side		
Nominal AC power @ 25°C	kW	
Nominal AC power @ 50°C	kW	
Output AC voltage	V	
Output AC Current	A	
Frequency (and Variation)	Hz	
Total Harmonic Distortion (< 3%)	%	
AC over/under voltage, over/under frequency protection		
Phase shift (cos phi)		
DC Side		
Maximum Input DC power	kW	
Maximum DC voltage	V	
MPPT voltage range	V	
Maximum DC current	A	
DC over voltage protection		
DC voltage ripple	%	
Others		
Maximum Efficiency	%	
Euro Efficiency	%	
Ambient temperature range	^{o}C	
Humidity (non-condensing)	RH	
Quiescent power	kW	
Degree of protection	IP	
Dimensions approx. (HXWXD)	mm	
Weight	kg	
Compliances (Reference Standards)		

SHEET -3

TECHNICAL PARTICULARS OF STEP-UP TRANSFORMER

(To be furnished by the Contractor)

S. No.	Description	Guaranteed particulars to be filled in by the manufacturer
1.	Service	
2.	Type	
3.	Rating (kVA)	
4.	Rated frequency (Hz)	
5.	Number of phase HV side LV side Neutral (separate outside)	
6.	Rated Voltage a) HV winding (kV) b) LV winding (kV)	
7.	Vector group	
8.	Type of cooling (ONAN/ONAF)	
9.	Insulation level a) Power frequency withstand -kV rms. (HV/LV) b) Impulse withstand voltage -kV (HV/LV)	
10.	Method of Earthing	
11.	Duty	
12.	Short circuit level	
13.	Off circuit tap changer: a) Range % b) In steps of c) Tapping provided on HV side	
14.	Tap changer type	
15.	Impedance voltage at 75°C a) At principal tapping %	
16.	Temperature rise above 50°C ambient a) Top of oil by thermometer °C	

	b) Womdomg by resistance °C	
17.	Terminal details a) HV side b) LV side	
18.	Losses (at 75°C and principal tapping) a) No load loss at rated voltage kWand frequency b) Load loss at rated current kW(ONAN) c) Total loss at maximum rated power kW	
19.	Efficiency at 75°C and 0.9 PF a) At full load (ONAN) % b) At 75% load (ONAN) % c) At 50% load (ONAN) %	
20.	Hot spot temperature in winding limit to °C	
21.	Shipping dimensions a) Height m b) Breadth m c) Length m	
22.	Painting	
23.	Reference Standards	

SHEET - 4

Guaranteed Technical Particulars of LED lights(To Be Submitted By the Contractor)

S. No.	Parameter	Guaranteed Value
1.	LED Operating Current	
2.	Output Luminous Flux	
3.	Beam Angle	
4.	Illuminance	
5.	Photometric Curve	
6.	Material of Luminaire	
7.	Dimension	
8.	Weight	
9.	Impact Resistance	
10.	LED Life	

J. LIST OF PREFFERED 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
19	PVC insulated copper conductor single/multi	HAVELLS / FINOLEX / RPG /UNIFLEX /NICCO /RR

Sl.No.	ITEM	Name of Manufacturers
	core stranded wires of 650/1100 volt grade	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 SOCOMEC/CONZERVE (ENERCON)
28	DWC HDPE Pipe	DURA LINE / CARLON / EMTELLE
29	Contactors	L&T / SCHNEIDER / SIEMENS/ABB / BCH
30	MCCB	L&T / SIEMENS / SCHENEIDER / 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

Sl.No.	ITEM	Name of Manufacturers
37	Panel PTs	AREVA / KAPPA / PRAGATHI
38	ACB	SCHNEIDER / SIEMENS / ABB / L&T
39	Selector Switch	KAYCEE / L&T / SIEMENS / BCH / GE / SALZAR
40	Capacitor Banks	EPCOS / L&T / UNIVERSAL/ABB
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	Structural Steel	JINDAL/ SAIL / TISCO
46	MS & GI Conduits Accessories	STEEL MARK / NIC
47	Inverter	ABB-FIMER/HITACHI/SIEMENS
48	Solar PV Module	VIKRAM/ADANI/TATA POWER/BHEL/WEBSOL/WAREE
49	Cement	Ultratech/ACC/Ambuja/Infracem
50	Reinforcement	SAIL/TATA/RINL
51	PVC & UPVC pipes	Supreme/Oriplast
52	Tiles	Kajaria/Johnson
53	Bathroom Fittings	Jaquar/Essco/Hindware/Parryware
54	Paints & primers	Asian Paints/Berger/ICI/Nerolac
55	Construction chemicals	Sika/Fosroc/Asian Paints/Berger
56	Waterproofing Chemicals	Asian Paints/Berger
57	PVC Tanks	Sintex/Oriplast/Raunaq

Sl.No.	ITEM	Name of Manufacturers
58	Items not covered above	As per samples approved by the engineer.

Bidders shall submit makers list for all major items [in line with the aforesaid list] during submission of Techno-Commercial bid. In case bidders fails to submit the list, it would be presumed that the bidder would strictly adhere to the preferred makes as indicated in the instant Bidding Document.

Any new make, other than preferred make mentioned in the instant Bidding Documents, may be accepted by the 'Engineer', if the same meets the following criteria: -

(a) Technical Specification of the equipment / items, as mentioned in the instant Bidding Document.

(b) Shall be manufactured by a reputed Manufacturer, for which the Contractor shall have to submit at least 3 nos. Work Order and Performance Certificate from Central Govt./ State Govt./ PSU/ other Reputed Organisation, against the offered make of equipment / items.

(c) Shall have valid type test certificates for the offered make of equipment / items, from CPRI /ERDA /ERTL /Gov. Labs, as applicable.

In case, the new make offered by the bidder does not meet above mentioned criteria, the Successful Bidder should be required to adhere to the preferred make list, as mentioned in the instant Bidding Document.

Part-IV (Comprehensive Operation Maintenance and Manning)

A **OPERATION AND MAINTENANCE**

a) The Contractor shall be entrusted to carry out the total Operation & Maintenance (O&M) activities of the 2 MW (AC) Solar Photovoltaic Power Plant , for the 10 (ten) years after commissioning ,w.e.f. from the date of operational acceptance.

b) The Turnkey Contractor shall be responsible for all the required activities for the successful running, committed energy generation & maintenance of the Solar Photovoltaic Power Plant covering:

(i) Deputation of qualified and experienced engineers and technicians.

(ii) Deputation of Security personnel for the complete security of plant .

(iii) Successful running of Solar Power Plant for committed energy generation.

(iv) Co-ordination with STU/SLDC/other statutory organizations as per the requirement on behalf of Employer for Joint Metering Report (JMR), furnishing generations schedules as per requirement, revising schedules as necessary and complying with grid requirements.

(v) Monitoring, controlling, troubleshooting maintaining of logs & records, registers. Supply of all spares, consumables and fixing / application as required.

(vi) Supply & use of consumables such as grease, oil etc. throughout the maintenance period as per recommendations of the equipment manufacturers.

(vii) Conducting periodical checking, testing, overhauling, preventive and corrective action. General up keeping of all equipment, building, roads, Solar PV modules, inverter etc.

(viii) Submission of periodical reports to Employer on the energy generation & operatingconditions of the power plant.

(ix) Furnishing generation data monthly to Employer by 1st week of every month for the previous month to enable Employer raise commercial bills on consumers.

(x) Periodic cleaning of solar modules as per the recommendations of OEM, Replacement of Modules, and other equipment as and when required.

c) Continuous monitoring the performance of the Solar Power Plant and regular underground cable, outdoor/indoor panels/ kiosks etc. are necessary for extracting and maintaining the maximum energy output from the Solar Power Plant.

d) Preventive and corrective O&M of the Solar Photovoltaic Power Plant including supply of spares, consumables, wear and tear, overhauling, replacement of damaged risks (Fire & allied perils, earth quake,

terrorists, burglary and others) as required, for a period of 10 (Ten) years from the date of start of O&M of the project shall be carried out at fixed annual cost.

e) The period of Operation and Maintenance will be deemed to commence from the date of completion of performance demonstration/Operational acceptance and successively the complete Solar Photovoltaic Power Plant to be handed over to the O&M contractor for operation and maintenance of the same. O&M contract shall further be extended on the mutually agreed terms and conditions for the period of minimum 5 years.

f) All the equipment required for Testing, Commissioning and O&M for the healthy operation of the Plant must be calibrated, time to time, from the NABL accredited labs and the certificate of calibration must be provided prior to its deployment.

B **OPERATION AND PERFORMANCE MONITORING**

a) Operation part consists of deputing necessary manpower necessary to operate the Solar Photovoltaic Power Plant at the full capacity. Operation procedures such as preparation to starting, running, routine operations with safety precautions, monitoring etc., operation of the complete system.

b) Daily work of the operation and maintenance in the Solar Photovoltaic Power Plant involves periodic cleaning of Modules, logging the voltage, current, power factor, power and energy output of the Plant at different levels. The operator shall also note down time/failures, interruption in supply and tripping of different relays, reason for such tripping, duration of such interruption etc. The other task of the operators is to check battery voltage-specific gravity and temperature. The operator shall record monthly energy output, down time, etc.

C **MAINTENANCE**

a) The contractor shall carry out the periodical/plant maintenance as per approved SOP to achieve committed generation.

b) Maintenance of switchgears and transformer shall be carried out as a part of routine, corrective & preventive.

c) In order to meet the maintenance requirements stock of consumables are to be maintained as well as various spare as recommended by the manufacturer at least for 5 years to be kept for usage.

d) Maintenance of other major equipment involved in Solar Photovoltaic Power Plant are step up transformers, underground cable, indoor VCB kiosk, associated switchgears, other fixtures & components and metering panel. Particular care shall be taken for outdoor equipment to prevent corrosion. Cleaning of the insulators and applying Vaseline on insulators shall also be carried out at regular intervals. Earth resistivity

of Plant as well as individual earth pit is to be measured and recorded every month. If the earth resistance is high, suitable action is to be taken to bring down the same.

e) According to the recommendations stock of special tools and tackles shall be maintained switchgears and other major electrical equipment. A maintenance record is to be maintained by the operator/engineer-in-charge to record the regular maintenance work carried out as well as any breakdown maintenance along with the date of maintenance reasons for the breakdowns steps have taken to attend the breakdown duration of the breakdown etc.

f) The Schedules will be drawn such that some of the jobs other than breakdown, which may require comparatively long stoppage of the Power Plant, shall be carried out preferably during the non-sunny days. An information shall be provided to Engineer-in-charge for such operation prior to start.

g) The Contractor shall deploy enough manpower at Solar Photovoltaic Power Plant site to carryout work instructions and preventive maintenance schedules as specified. The contractor shall keep at least one skilled and experienced supervisor at site on permanent basis to supervise the jobs that are being carried out at site.

h) The Contractor will attend to any breakdown jobs immediately for repair/ replacement /adjustments and complete at the earliest working round the clock. During breakdowns (not attributable to normal wear and tear) at O&M period, the Contractor shall immediately report the accidents, if any, to the Engineer In-charge showing the circumstances under which it happened and the extent of damage and or injury caused.

i) The Contractor shall comply with the provision of all relevant acts of Central or State Governments including payment of W ages Act 1936, Minimum Wages Act 1948, Employer's Liability Act 1938, Workmen's Compensation Act 1923, Industrial Dispute Act 1947, Maturity Benefit Act 1961, Mines Act 1952, Employees State Insurance Act 1948, Contract Labour (Regulations & Abolishment) Act 1970, Electricity Act 2003, Grid Code, Metering Code, MNRE guidelines or any modification thereof or any other law relating whereto and rules made there under or amended from time to time.

j) The contractor shall at his own expense provide all amenities to his workmen as per applicable laws and rules.

k) The Contractor shall ensure that all safety measures are taken at the site to avoid accidents to his or his sub-contractor or Employer's Workmen.

l) If negligence / mal-operation of the contractor's operator results in failure of equipment such equipment should be repaired replaced by contractor at free of cost.

m) If any jobs covered in O&M Scope as per O&M Plan are not carried out by the contractor during the O&M period, the Engineer-In-Charge can issue a notice to the Contractor. Repetition of such instances for more than 2 times a year may lead to the Termination of the O&M Contract by the Employer.

D **MANNING**

a) During Comprehensive O&M period of 10 years, the plant will have to be manned by the contractor **round the clock**.

b) During comprehensive O&M period, as indicated above, at least one(1) Technician and one(1) Helper in General shift shall have to be deployed to look after different maintenance activities, as well as trouble shooting. If required, additional manpower is to be provide.

c) During comprehensive O&M period, as indicated above, at least one(1) Security Guard & one (1) Technician shall have to be deployed in the 3-Shifts to look after different operation & maintenance activities, as well as trouble shooting, and security aspects. If required, additional manpower is to be provide.

d) One supervisor (B. Tech / Diploma in Electrical Engineering) with 5 / 10 years work experience to be deployed in General shift, responsible for round the clock comprehensive O&M.

e) The qualifications & experiences of the manpower, deployed by the Contractor, would be as follows:

Category		**Qualification / Experience [minimum requirement]**
Supervisor [Highly-skilled category]		Undergraduate Degree [B. Tech / B.E. / B. Sc. (Engg.)/ Equivalent] in Electrical Engineering or Technology, from a recognized Indian Institute or University . B. Tech in Electrical Engineering, with 5years experience and possessing a valid Supervisor's Certificate of Competency (SCC), issued by the appropriate statutory authority, against the relevant parts, for carrying out such type of job [i.e. at least for 11000 V system]. or

Category		Qualification / Experience [minimum requirement]
		Diploma in Electrical Engineering with 10 years experience and possessing a valid Supervisor's Certificate of Competency (SCC), issued by the appropriate statutory authority, against the relevant parts, for carrying out such type of job [i.e. at least for 11000 V system].
Technician(s) [Skilled category]		ITI (NCVT- 02 years) pass, with 8years experience and possessing valid Workman's Permit, issued by the appropriate statutory authority, against the relevant parts, for carrying out such type of job. or Class VIII pass, with 10 years experience and possessing valid Workman's Permit, issued by the appropriate statutory authority, against the relevant parts, for carrying out such type of job.
Helper [Unskilled category]		Class X pass, with 02 years work experience in industries.
Security Guard [Skilled category]		Class XII pass. From Retired Police/CISF/Army/Navy/Air-force/Other Para-military forces. Experience: - Must have not less than 15 years experience in service. Must have adequate experience in direct action, patrol, watch and ward.

f) Statutory Weekly Roster Off day is to be provided to all workmen. But, required number of relievers are to be made available to compensate against Weekly Roster Off days and for any absence due to leave, sickness, etc. At no stage, shortfall of staff will be accepted, in case of shift manning. No reliever is required against Weekly Roster Off days with respect to the General Shift manning. However, required numbers of relievers are to be made available to compensate against shortfall of General Shift manning (for absence due to leave, sickness, etc.), with respect to the minimum requirement mentioned above.

g) Providing required tools & accessories to the personnel deployed by the Contractor, for the instant work, is under the scope of the Contractor.

h) The bidder shall include in their bid any special tools and tackles, if any, for maintenance, erection & testing.

E **Quality Spares & Consumables**

In order to ensure longevity and safety of the core equipment and optimum performance of the system the contractor should use only genuine spares of high quality standards.

Maintaining stock of following minimum spares at sub-station, for the instant work, is under the scope of the Contractor.

Item Description	**Qty.**
Transformer Gasket	**01set**
Transformer radiator, Butterfly valve	**02Nos.**
Transformer HV bushing,11KV	**03Nos.**
Transformer LV bushing,1.1KV	**04Nos.**
11KV Single phase, Outdoor PT	**03Nos.**
11KV Single phase, Outdoor CT	**03Nos.**
VCB Tulip contacts	**02sets**
Numerical relay	**1set each type.**
VCB Spring charge motor	**1No.**
Multifunction meter	**1No.**
Space heaters	**03Nos.**
Cable repair Wrap around jacket	**As required**
HT Cable Heat shrinkable type St. through joints	**02Nos.**
Single phase 11KV ,LA	**03Nos.**
DC Cable	**500Mtrs.**
DC cable connectors	**LS**
Fuse	**1 Set (each ratings)**
Nuts and Bolts	**1lot**
Saddles	**1lot**
Inverter spares	**As recommended by OEM.**
MCB/MCCB	**01Set each rating.**
OFC cable	**1Lot**

After completion of the contract above spares are to be handed over to HDC on free of cost basis.

F **Testing Equipment, Tools and Tackles**

The Contractor shall arrange for all the necessary testing equipment, tools and tackles for carrying out all the construction, operation and maintenance work covered under this contract. All the instruments are required to be calibrated from NABL accredited lab before put in use. The certificate of the same shall be submitted to Employer for verification.

Providing following minimum testing instruments at sub-station, for the instant work, is under the scope of the Contractor

i)	Portable digital insulation tester, 500V	02 nos.
ii)	Portable digital insulation tester, 2500V	02 nos.
iii)	Digital Clamp meter cum Continuity tester	03 nos.
iv)	Power analyser	01 No.
v)	Portable Digital/Analog High Voltage testing kit 0-28KV AC.	01 set
vi)	Oil BDV testing machine	01 no.

G **Security services**

The contractor has to arrange proper security system including deputation of security personnel at his own cost for the check vigil for the Solar Power Plant. The security staff may be organized to work on suitable shift system; proper checking & recording of all incoming & outgoing materials vehicles shall be maintained. Any occurrence of unlawful activities shall be informed to Employer immediately. A monthly report shall be sent to Employer on the security aspects.

SECTION - VII

PRICE SCHEDULE

[To be uploaded, duly signed & stamped]

Tender No. : DM-PE/T/06/2024-2025

Preamble:

1. The '**Price Schedule'** is to be read in conjunction with the '**Instructions To Bidders (ITB)**" and other terms & conditions [including '**Technical Specification & Scope of Work'**] of the Bidding Document, considering all addenda / corrigenda (if issued).

2. This being a percentage rate tender, the Bidder shall quote their rate on-line, as percentage above / below / at par with the Estimated Amount put to tender, based on their own analysis.

3. Estimated Rates, shown in this '**Price Schedule'**, include all incidental charges and all taxes & duties of Central/ State/ Local bodies [excluding Goods & 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.

4. 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. The quantities given in this '**Price Schedule'** are indicative only, which may vary (both upward & downward) during execution and are given to provide a common base for tendering and evaluation. However, the payment will be made on the exact quantity to be executed by the Successful Bidder.

6. The accepted unit rates, based on the quoted percentage, should remain firm till all the jobs are completed. No Price escalation is admissible other than statutory increase in Taxes & Duties (within the scheduled Completion Period).

7. Except where otherwise expressly provided, the Contractor shall provide all materials, labour and plant and things necessary in connection with the Contract work although everything may not be fully specified and although there may be errors and omissions in the scope & specifications.

8. 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.

PRICE SCHEDULE

Name of Work: ***Design, Engineering, Supply, Construction, Erection, Testing & Commissioning of 2 MW (AC) Solar PV Grid Interactive Power Plant at Haldia Dock Complex, SMPK, under EPC mode, including Comprehensive Operation & Maintenance (O&M) for 10 years.***

Tender No.: DM-PE/T/ 06 /2024-2025

Sl. No.	Description of Work / Service		Quantity	Estimated Unit Rate [excluding GST] (in ₹)	Estimated Amount [excluding GST] (in ₹)
	Part- A: EPC Contract for 2 MW (AC) Solar PV Power Plant				
1.	Design, Supply, Construction, Erection, Testing and Commissioning of 2 MW (AC) Solar PV Grid Interactive Power Plant (in EPC mode) at Haldia Dock Complex, SMPK, including Electrical & Civil work, in totality, as per the 'Technical Specification & Scope of Work'.		1 Lump Sum (LS)	₹13,10,00,000.00	₹13,10,00,000.00
				Sub-total (Part: A)=	₹13,10,00,000.00
	Part- B: Comprehensive Operation &Maintenance (O&M) of the 2 MW (AC) Solar PV Plant				
2.	Operation, Maintenance and Manning of the 2 MW (AC) PV Grid Interactive Power Plant, for a period of 10years, as per the 'Technical Specification & Scope of Work'.				
	(i)	First Year	1 LS	₹ 24,74,700.00	₹ 24,74,700.00
	(ii)	Second Year	1 LS	₹ 26,23,620.00	₹ 26,23,620.00
	(iii)	Third Year	1 LS	₹ 27,79,840.00	₹ 27,79,840.00
	(iv)	Fourth Year	1 LS	₹ 35,99,200.00	₹ 35,99,200.00
	(v)	Fifth Year	1 LS	₹ 37,74,400.00	₹ 37,74,400.00
	(vi)	Sixth Year	1 LS	₹ 39,63,835.00	₹ 39,63,835.00
	(vii)	Seventh Year	1 LS	₹ 41,62,395.00	₹ 41,62,395.00
	(viii)	Eight Year	1 LS	₹ 43,72,635.00	₹ 43,72,635.00
	(ix)	Ninth Year	1 LS	₹ 45,94,190.00	₹ 45,94,190.00
	(x)	Tenth Year	1 LS	₹ 48,32,900.00	₹ 48,32,900.00
				Sub-total (Part:B)	₹ 3,71,77,715.00
				Total (Part: A+ Part: B) [excluding GST]:	**₹ 16,81,77,715.00**

Total estimated amount (without GST) [PART-A+PART-B]: ₹ 16,81,77,715.00.

[Indian Rupees: Sixteen Crore eighty-one lakh seventy-seven thousand seven hundred fifteen]

SECTION VIII

GENERAL CONDITIONS OF CONTRACT (GCC)

General Conditions of Contract
Forms and Agreements

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

Including Addendum Sanctioned by the Trustees Meeting held on July, 2014

KOLKATA PORT TRUST
KOLKATA DOCK SYSTEM
HALDIA DOCK COMPLEX
July 2014

GENERAL CONDITIONS OF CONTRACT		
	CLAUSE	**PAGES**
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14)	PROFORMA FOR B.G. FOR CONTRACT PERFORMANCE	
15)	INTEGRITY PACT DOCUMENT: PROFORMA	
16)	ADDENDUM	

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/-	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/-	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]

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 Kolkata, 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.	Drawings
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.	Contract
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.	Constructional Plant
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.	Site
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.	Contract Price
1.15.	"Month" means English Calendar Month.	Month
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).	Excepted Risks

1.17.	Word importing the singular only, also includes the plural and vice-versa where the context so requires.	Singular/ Plural
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.	Headings/ Marginal Notes.
1.19.	Unless otherwise stipulated the work "Cost" shall be deemed to include overhead costs of the Contractor, whether on or off the site.	Cost
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.	Engineer's Authority
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 :* (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	Engineer's Power
2.4.	*The Engineer's Representative shall* (i) watch and supervise the works. (ii) test and examine any material to be used or workmanship employed in connection with the work.	Power of Engineer's Representative.

(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.	Site & Local condition.
(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.	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/shareholders 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 Kolkata Branch of a Nationalised Bank of India drawn in favour of Kolkata Port Trust or in the form of any "Account Payee" Draft of any Nationalised Bank of India drawn in favour of "Kolkata Port Trust" and payable at Kolkata/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 Kolkata / 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. 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 supplying 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 Kolkata Port Trust and payable at Kolkata/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 Kolkata/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 Kolkata, 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, — Contractor to Execute Contract Agreement.

shall collectively be the Contract.

4.3.	Several documents forming the contract are to be taken as mutually explanatory of one another. Should there by 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. 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.	Contractor to submit his programme of work
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.	Contractor to supervise the works
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 is 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.	Contractor to deploy qualified men and Engineer's power to remove Contractor's men

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.	Contractor is responsible for line, level, setting out etc.
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.	Contractor is responsible to protect the work
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 structure / 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 travois, 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
5.7.	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)	(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 insect 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 aterials / 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 sat 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 wend 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 prepareand 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 –

Advance payment against Non-perishable materials

(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,

(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 Kolkata/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 over-certify 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

(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 ass 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 vitiate 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.

(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 ad 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.

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

(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

Extension of completion time

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.

'Liquidated Damage' and other compensation due to Trustees

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.

(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.

Defaultof the Contractors remedies & powers / Termination of Contract.

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 :

(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'' or his Representative'' 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 t 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.

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 I 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.

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 o 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 o 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 therefrom 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.

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..

10.3.4. The venue of the arbitration shall be either Kolkata 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.

(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.

(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.

THE BOARD OF TRUSTEES FOR THE PORT OF KOLKATA

FORM OF TENDER

To

.....

.....

.....

I/We_____

having examined the site of work, inspected the Drawings and read the specifications, General & Special Conditions of Contract and Conditions of the Tender, hereby tender and undertake to execute and complete all the works required to be performed in accordance with the Specification, Bill of Quantities, General & Special Conditions of Contract and Drawings prepared by or on behalf of the Trustees and at the rates & prices set out in the annexed Bill of Quantities within _____ months / weeks from the date of order to commence the work and in the event of our tender being accepted in full or in part. I / We also undertake to enter into a Contract Agreement in the form hereto annexed with such alterations or additions thereto which may be necessary to give effect to the acceptance of the Tender and incorporating such Specification, Bill of Quantities, Drawing and Special & General Conditions of Contract and I / We hereby agree that until such Contract Agreement is executed the said Specification, Bill of Quantities, Conditions of Contract and the Tender, together with the acceptance thereof in writing by or on behalf of the Trustees shall be the Contract.

THE TOTAL AMOUNT OF TENDER Rs. **NOT TO BE QUOTED**

(Repeat in words) .....

.....

I / We require _____ days / months preliminary time to arrange and procure the materials required by the work from the date of acceptance of tender before I We could commence the work.

I / We have deposited with the Trustees' Manager (Finance), HDC, vide Receipt No. _____ _____ of _____ as Earnest Money.

I / We agree that the period for which the tender shall remain open for acceptance shall not be less than four months.

Dated : (Signature of Bidder with Seal)

WITNESS :	
Signature:	Name of the Bidder : (In Block Letters)
Name: (In Block Letters)	
Address:	Address:
Occupation:	

Syama Prasad Mookerjee Port, Kolkata

FORM G.C.1

Contractor : _____

Address : _____

_____

Date of completion : _____

Dear Sir(s),

This is to certify that the following work viz :-

Name of work : _____

_____

_____

Estimate No. : E.E.O _____ Date _____

C.E.O. _____ Date _____

Work Order No. : _____

Allocation : _____

Contract No. : _____

which was carried out by you is in the opinion of the undersigned complete in every respect on the day of 2000 in accordance with terms of the Contract and you are required to maintain the work as per Clause 62 of the General Conditions of Contract and under provisions of the Contract for a period of _____ weeks / months / years.

from the _____ day of _____ 20_____

from the _____ day of _____ 20_____

Yours faithfully,

Signature :

(ENGINEER/ENGINEER'S REPRESENTATIVE)

Name : _____

Designation : _____

OFFICE SEAL

Syama Prasad Mookerjee Port, Kolkata

FORM G.C.2

Certificate of Final Completion.

The Financial Adviser & Chief Accounts Officer
The Manager (Finance), Haldia Dock Complex.

This is to certify that the following work viz :-

Name of work : _____

_____

_____

Estimate No. : E.E.O _____ Date _____

C.E.O. _____ Date _____

Work Order No. : _____

Contract No. : _____

Resolution & Meeting No. : _____

Allocation : _____

which was carried out by Shri / Messrs _____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.

Signature : _____

(ENGINEER/ENGINEER'S REPRESENTATIVE)

Name : _____

Designation : _____

OFFICE SEAL

Syama Prasad Mookerjee Port, Kolkata

FORM G.C.3

('NO CLAIM ' CERTIFICATE FROM CONTRACTOR)

The Engineer
Syama Prasad Mookerjee Port, Kolkata

Kolkata.

(Atten : _____)

Dear Sir,

I / We do hereby declare that I / we have received full and final payment from the Syama Prasad Mookerjee Port, Kolkata for the execution of the following work viz:-

Name of work : _____

_____

_____

Work Order No. : _____

Contract No. : _____

Agreement No. : _____ Date _____

and I / we have no further claim against the Syama Prasad Mookerjee Port, Kolkata in respect of the above-mentioned job.

Yours faithfully,

(Signature of the Contractor)

Dated _____

Name of Contractor : _____

Address : _____

(OFFICE SEAL OF THE CONTRACOR)

Syama Prasad Mookerjee Port, Kolkata

PROFORMA OF FORM OF AGREEMENT

THE BOARD OF TRUSTEES FOR THE PORT OF KOLKATA FORM OF AGREEMENT

THIS AGREEMENT made this ……..day of…….200 between the Board of Trustees for the Port of Kolkata, a body corporate constituted by the Major Port Trusts Act, 1963 (thereinafter called "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.

WHEREAS the Trustees are desirous that certain works should be executed / constructed, viz ……..……... a nd have accepted a Tender / Offer by the Contractor for the execution and maintenance of such work NOW THIS AGREEMENT WITNESSETH as follows :

1. In this Agreement words and expressions shall have the same meanings as are respectively assigned to them in General Conditions of Contract hereinafter referred to.
2. The following documents shall be deemed to from and be read and construed as part of this Agreement, viz.
   (a) The said Tender / Offer & the acceptance of the Tender / Offer.
   (b) The General Conditions of Contract (GCC).
   (c) The Special Conditions of Contract (SCC).
   (d) The Conditions of Tender.
   (e) The Technical Specification & Scope of Work.
   (f) The Schedule of Rates.
   (g) The Terms of Payment.
   (h) 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 and maintain the work in conformity in all respects with the provisions of the contract

4. The Trustees hereby covenants to pay to the Contractor, in consideration of such execution and maintenance of the Work, the Contract Prices at the times and in the manner prescribed by the Contract.

IN WITNESS whereof of the parties hereto have caused their respective Common Seals to be hereunto affixed (or have hereunto set their respective hands and seals) the day and year first above written.

The Seal of ……..……
……..

Was hereunto affixed in the presence of:

Name :

Address :

Or

SIGNED, SEALED AND DELIVERED

by the said

In the presence of :

Name :

Address :

The Common Seal of the Trustees was hereunto affixed in the presence of:

Name :

Address :

Draft Proforma of Bank Guarantee (Performance Bond) in lieu of cash Security Deposit, to be issued by the Kolkata/Haldia, as the case may be, of any nationalized Bank of India on Non-Judicial Stamp Paper worth Rs.50/- or as decided by the Engineer / Legal Adviser of the Trustees.

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 of the Port Kolkata, a body corporate - duly constituted under the Major port Trust Act, 1963 (Act 38 of 1963), having agreed to exempt Shri / Messrs Registered Company, having its Registered Office at ..... (hereinafter referred to as "The Contractor") from cash payment of Security Deposit / Payment of Security Deposit through deduction from the Contractors' bills under the terms and conditions of a contract made between the Trustees and the Contractor for (write the name of the work as per Work Order) in terms of the Work Order No. ….……..…… dated …… (hereinafter referred to as "the said contract"), for the due fulfilment by the contractor of all the terms and conditions contained in the said contract, on submission of a bank Guarantee for Rs …… (Rupees ……..…… ……). We, ……. Branch, Kolkata …… / Haldia, do on the advise of the contractor, hereby undertake to indemnify and keep indemnified the Trustees to the extent of the said sum of Rs …… (Rupees .....). We Branch, Kolkata …… / Haldia, further agree that if a written demand is made by the Trustees through any of its officials for honoring 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 Guaranteed in the manner aforesaid shall constitute sufficient reason for the Trustees to enforce the Bank Guarantee unconditionally without any reference, whatsoever, to the contractor.

2. We,……..…….. Branch, Kolkata ……...…… Haldia, further agree that a mere demand by the Trustees at any time 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 Guaranteed 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 is 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 up to and inclusive of ……. day of …….. 19 ……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 up to ……. 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 fore- bearance, act or commission on the part of the Trustees or any indulgence by the Trustees to the contractor or by any such matter or thing of whatsoever nature, which under the law relating to sureties would, but for this, provision, have effect of so relieving us, Branch, Kolkata ……. / Haldia.

5. We …… Branch, Kolkata / Haldia, 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.

INTEGRITY PACT

Between

Syama Prasad Mookerjee Port, Kolkata (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 compliances 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 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.

(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 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 anticorruption 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.

(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 Prot 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 Syama Prasad Mookerjee Port, Kolkata 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.

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) _____

_____

_____

ANNEX-A

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. **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.

ADDENDUM

Modification of clause no.3.4 of GCC as sanctioned vide Reso. No.210 by the Board of Trustees for the Port of Kolkata in the 13th Meeting held on 26.02.2013.

i. **Earnest Money :** Earnest money deposit @ 2% of the estimated cost will be applicable for works / service / O&M contract only and not for procurement contract for which existing system as mentioned in the GCC should be followed.

ii. **There will be no minimum ceiling of Earnest Money** which will be @ 2% of estimated cost of projects upto Rs.10 crore. EMD of project estimated above Rs.10 crore will be Rs.20 lakh + 1% of estimated cost by which it exceeds Rs.10 crore.

iii. **Upto Rs.10 lakh Earnest Money** will be accepted by Banker's cheque / Demand Draft / Pay order. EMD beyond Rs.10 lakh may be accepted in the form of Bank Guarantee issued by an Indian Nationalized / Scheduled Bank.

iv. **Refund of Earnest money** to other than L-1 bidders will be made within 2 month of opening of bid or on finalization / acceptance of tender, whichever is earlier.

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SECTION - IX

SPECIAL CONDITIONS OF CONTRACT (SCC)

A. GENERAL PROVISIONS

9.1. Preface

These provisions though given in a separate section are part of the Bidding 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 Bidding Documents, viz. Notice Inviting E-Tenderers, Instructions to Bidders, General Conditions of Contract (GCC), Technical Specification & Scope of Work, Drawings, Price Schedule 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 of Contract (GCC) provided there is discrepancy between them.

9.2. Correlation and Order of Precedence of Bidding Documents

If the stipulations in the various Bidding 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.

i) Drawings.

ii) Technical Specification & Scope of Work.

iii) Price Schedule / Bill of Quantities.

iv) Special Conditions of Contract (SCC).

v) Bidding Forms & Formats.

vi) Instructions to Bidder.

vii) General Conditions of Contract (GCC).

9.3. Priority of Contract documents:

The several documents forming the Contract are to be taken as mutually explanatory to one another, but in case of ambiguity or discrepancies, the same shall be explained and adjudicated by the ' Engineer of the Contract' (EoC), who shall thereupon issue to the Contractor instructions thereon which will be final and binding on the Contractor. Unless otherwise provided in the Contract, if the stipulations in the various documents forming a part of the Contract are found to be in variation in any respect then, unless a different intention appears, the provision(s) of one will override others (but only to the extent these are at variance) in order of precedence as given in the list below i.e. a particular item in the list will take precedence over all those placed lower down the list :

i) Letter of Acceptance (LOA) or Work Order or Order Letter [including Accepted Price Schedule].

ii) Drawings.

iii) Technical Specification & Scope of Work.

iv) Price Schedule / Bill of Quantities.

v) Special Conditions of Contract (SCC).

vi) Bidding / Contract Forms & Formats.

vii) Instructions to Bidder.

viii) General Conditions of Contract (GCC).

ix) Any other document(s) forming part of the Contract.

9.4. **Definitions:**

In the conditions of contract ("these conditions"), which includes particular 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.

9.4.1. The Contract:

a) "**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 and such further documents as may be expressly incorporated in the Letter Of Acceptance.

b) **"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.

c) "**Specification**" means the specification of the work included in the contract and any modification thereof or addition thereto or submitted by the Contractor and approved by the 'Engineer', in writing. "Specifications" also means the relevant & appropriate Bureau of Indian Standard's specifications / International Standard's Specifications (latest revisions) for materials and workmanship, unless stated otherwise in the Tender.

d) "**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.

e) "**Tender**" or "**Bid**" means the proposal (priced offer), along with all

supporting documents, submitted by the bidder to the Employer for consideration.

f) "**Price Schedule**" means the priced schedule of items, forming part of the bid.

g) "**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.

9.4.2. Parties and persons :

a) "**Party**" means the Employer or the Contractor, as the context requires.

b) "**Employer**" or "**Board**" means the **Board of Major Port Authority for 'Syama Prasad Mookerjee Port, Kolkata** (SMPK)'[Formerly Kolkata Port Trust], including their successors, representatives and assigns.

c) **"Contractor"** or "**Successful Bidder**" or "**Successful Tenderer"** means the person or persons, Firm or Company whose tender / offer has been accepted by SMPK and is named as Contractor in the Contract and includes the Contractor's representatives, heirs, successor & assigns, if any, permitted by the Board / Chairperson.

d) "**Contractor's representative**" means the person(s) named by the Contractor in the contract or appointed from time to time by the Contractor, 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 'Engineer'.

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 Board's official who has invited the tender on its behalf and includes the General Manager (Engineering), HDC 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.

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. 2.4 to 2.6, under **Section - VIII**.

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 Syama Prasad Mookerjee Port, Kolkata (Formerly Kolkata Port Trust).

k) "**Chairperson**" means the Chairperson of the **Board of Major Port Authority for Syama Prasad Mookerjee Port, Kolkata** (SMPK) [Formerly Kolkata Port Trust] and includes the person appointed to act in his place under sub-section (1) of section 4 of the Major Port Authorities Act, 2021.

l) "**Deputy Chairperson**" means the Deputy Chairperson, Haldia Dock Complex and includes the person appointed to act in his / her 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 Chairperson, HDC.

n) "**Senior Deputy Manager (P&E)"** means the Officer of Plant & Equipment Division of HDC, reporting to the General Manager (Engineering).

o) "**Deputy Manager (P&E)"** means the Officer of Plant & Equipment Division of HDC, reporting to the General Manager (Engineering) / Sr. Deputy Manager (P&E).

9.4.3. Dates and periods:

a) "**Completion period**" means the time of completion / period of execution notified under **SCC Clause No. 9.37** [Completion period].

b) "**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.

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

d) "**Day**", for the purpose of this contract, means English Calendar Day.

9.4.4. Money and payments:

a) "**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 these Bidding Documents.

b) "**Foreign Currency**" means the currency other than Indian Currency.

9.4.5. Work:

a) "**Excess work**" means the required quantities of work, in excess of the provision made against any item of the 'Bill of Quantities' or 'Price Schedule'.

b) "**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., 'Bill of Quantities' or 'Price Schedule') of the tender.

c) "**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.

9.4.6. Other definitions

a) "**Approved / approval**" means approval in writing.

b) "**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 'Engineer'.

c) "**Defect Liability Period (DLP)**" means the period defined in the **SCC Clause No. 9.39**.

d) "**Force Majeure**" is defined in **SCC Clause No. 9.54** [Definition of Force Majeure].

9.5. **Contract Documents**

9.5.1. 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.

9.5.2. 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.

9.5.3. 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.

9.6. **Interpretations :**

9.6.1. In the contract, except where the context requires otherwise:

a) words indicating one gender include all genders;

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

c) provisions including the word "agree", "agreed" or "agreement" require the agreement to be recorded in writing;

d) "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

e) the word "tender" is synonymous with "bid', and "tenderer" with "bidder" and the words "tender documents" with "bidding documents".

9.7. **All Drawings are SMPK's property:**

9.7.1. The Drawings, referred to in the 'Special Conditions of Contract' / 'Technical Specification & Scope of Work' / '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 SMPK 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.

9.8. **Language**

9.8.1. 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 are 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.

9.8.2. 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.

9.9. **Governing Law**

9.9.1. 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 Workmen's Compensation Act, 1923.

iii) The Payment of Wages Act, 1936.

iv) The Dock Workers' (Regulation of Employment) Act, 1948.

v) The Minimum Wages Act, 1948.

vi) The Employees Provident Fund Act, 1952.

vii) The Maternity Benefits Act, 1961.

viii) The Major Port Trust Act, 1963.

ix) The Payment of Bonus Act, 1965.

x) The Contract Labour (Regulation & Abolition) Act, 1970; Rules 1971.

xi) The Payment of Gratuity Act, 1972.

xii) The Equal Remuneration Act, 1976.

xiii) Interstate Migrant Workmen (Regulation of Employment & Conditions of Service) Act, 1979.

xiv) The Employees State Insurance Act, 1948 & The Employees State Insurance (Amendment) Act, 1989.

xv) Child Labour (Prohibition & Regulation) Act, 1986.

xvi) The Dock Workers (Safety, Health & Welfare) Act, 1986.

xvii) The Indian Arbitration and Conciliation Act, 1996 [considering its latest amendment in 2015].

9.9.2. 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.

9.9.3. 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.

9.9.4. 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.

9.10. **Patent Rights**

9.10.1. 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.

9.10.2. 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.

9.10.3. 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, by 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 SMPK in respect of or as a result of any such negotiation or litigation.

9.11. **Stamp duty & other expenses**

9.11.1. 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.

9.12. **Indemnity**

9.12.1. 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 work themselves or to any other property of SMP, Kolkata or to the lives, persons, property of others during the progress of the work.

9.12.2. 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 progress of the work.

9.12.3. 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-XII**].

9.13. **Employer's lien**

9.13.1. 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.

9.13.2. 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.

9.14. **Additions and alterations**

9.14.1. 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 & Scope of Work' 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.

9.14.2. 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 & Scope of Work'.

9.14.3. 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 work in lieu thereof, or may order any work or any portion of work executed or partially executed, to be removed, changed or altered, if required.

9.14.4. 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.

9.14.5. 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

9.15. Instructions of the 'Engineer' or Engineer's Representative

9.15.1. The Contractor shall execute, complete and maintain the work 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. 2.5, under Section-VIII**, from the Engineer's Representative.

9.15.2. The Contractor shall maintain a Site Order Book at their site office and all orders and instructions issued to them from time to time by the 'Engineer' or his representative will be recorded in the Site Order Book. The authorized representative of the Contractor shall promptly sign each entry as token of having received such orders.

9.16. Replacement of the Engineer

9.16.1. If the Employer intends to replace the 'Engineer', the Employer shall give notice to the Contractor in this respect.

9.17. Determinations

9.17.1. 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.

C. THE CONTRACTOR

9.18. Security Deposit / Performance Guarantee

9.18.1. Submission of Security Deposit / Performance Guarantee

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 Security Deposit / 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. 9.39**). 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 (including forfeiture of the Earnest Money Deposit, if any or taking action in line with Bid-securing Declaration, if submitted by the Bidder.).

9.18.2. The **Security Deposit / Performance Bank Guarantee** shall be denominated in the currency(ies) of payment in the Contract, and shall be in the form furnished in **Section-XII**.

While issuing Bank Guarantee issuing applicant must mention receiver's details as ICICI Bank IFSC ICICI0003507 Branch-Haldia Township Branch, in BG text at which SFMS IFIN 760 messages to be sent by issuing Bank, to establish the authenticity of given BG.

9.18.3. The original Bank Guarantee should be sent by the issuing Branch of the Bank, directly to the Employer, under Registered Post (A.D), at the following address:

General Manager (Finance),

Haldia Dock Complex (HDC),
Jawahar Tower Complex,
P.O: Haldia Township,
Dist.: Purba Medinipur,
PIN – 721 607,
State : West Bengal, India.

A photocopy of the Bank Guarantee should also be sent to the 'Engineer', by the Contractor, for record, at the following address:

Sr. Dy. Manager (P&E),
Haldia Dock Complex (HDC)
Operational Administrative Building (1st floor),
Chiranjibpur;
P.O. Haldia, Dist. Purba Medinipur;
PIN: 721 604;
West Bengal, India.

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.

9.18.4. The proceeds of **Security Deposit / Performance Guarantee** shall be payable to the 'Employer', as compensation, for any loss resulting from the Contractor's failure to complete its obligations under the Contract.

9.18.5. **Security Deposit / Performance Guarantee** 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.

9.18.6. 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.

9.18.7. The cost of obtaining **Security Deposit / 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 Security Deposit / 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.

9.18.8. On completion of execution of the work, the Contractor shall maintain the same during the "**Defect Liability Period**", as specified in **SCC Clause No. 9.39**, from the date mentioned in the "**Certificate of Completion of Work**" [as per the form furnished in **Section-XII**]. 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 their 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'.

9.18.9. The Contract shall not be considered completed and the work shall not be treated as finally accepted by SMPK, until a "**Certificate of Final Completion**" [as per the form furnished in **Section-XII**] 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 work or taking possession, working or using thereof by SMPK shall not relieve the Contractor of their obligations under the Contract for full and final completion of the work.

9.18.10. **Release / refund of Security Deposit / Performance Guarantee:**

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. 9.39**), the Contractor may apply for release / refund of his Security Deposit / Performance Guarantee [as stated in SCC **Clause No. 9.18.1]** by submitting to the 'Engineer' an application, alongwith "No Claim Certificate", as per the form furnished in **Section-XII,** whereupon the 'Engineer' shall issue "Certificate of Final Completion" [as per the form furnished in **Section-XII**]. The 'Engineer' shall also issue necessary recommendation for release of the said Security Deposit / Performance Guarantee [as stated in SCC **Clause No. 9.18.1]** or refund the balance due against the Security Deposit / Performance Guarantee [as stated in SCC **Clause No. 9.18.1]** to the Contractor, after making deduction therefrom in respect of any sum due to SMPK from the Contractor.

9.19. **Contractor's personnel and Contractor's representative**

9.19.1. 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:

a) persists in any misconduct or lack of care,

b) carries out duties incompetently or negligently,

c) fails to conform with any provisions of the contract, or

d) 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.

9.19.2. 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.

9.19.3. 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.

9.19.4. 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].

9.20. **<u>Assignment and sub-contracting</u>**

9.20.1. 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.

9.20.2. No **participating bidder** [in connection with the instant tender] will be allowed to act as a **Sub-contractor** of the successful bidder (Contractor).

9.20.3. In the event of the Contractor contravening aforesaid condition [**SCC Clause No. 9.20.2**], 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.

9.20.4. 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.

9.21. **Access to site**

9.21.1. The Contractor shall have to abide by the **rules and regulations of Syama Prasad Mookerjee Port, Kolkata** in respect of entry / exit and movement in the dock premises.

9.21.2. 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 of **Syama Prasad Mookerjee Port, Kolkata**], on receipt of a formal written request.

However, for issuing such Gate Pass, the following would be required:

i) **<u>For Indian nationals</u>**: A photocopy of the Voter's Identity Card/any other Photo Identity Card.

ii) **<u>For foreign nationals (excluding from Nepal and Bhutan)</u>**:

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).

9.21.3. 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.

9.21.4. 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)].

9.21.5. **No photograph within the Dock Area** shall be taken by the Contractor, without prior permission of the Engineer.

9.22. **Transportation of materials**

9.22.1. 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.

9.23. **Contractor's equipment**

9.23.1. 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.

9.24. **Supply of Water and Electricity**

9.24.1. <u>Supply of water</u>:

Drinking water supply at the Contractor's site office, store, workshop, assembly / erection yard, etc. will be given on chargeable basis.

Water supply, if required, for the actual work (including erection, commissioning) at the site and / or maintenance& repair (required to be carried out at site during the "Defect Liability Period") will be provided on chargeable basis.

However, Water supply, required, for the cleaning of modules at the site during COMC period would be provided free of cost basis.

The Contractor shall have to make all arrangements, including installation of Water Meters (if water supply is given on chargeable) 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 meters also.

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 their own cost during such periods.

9.24.2. Billing against supply of water:

In case water supply is given on chargeable basis, water consumption charges will be determined on the basis of actual consumption recorded through water meter and applicable rate of HDC, SMPK [based on the prevalent rates of SMP, Kolkata, as may be amended from time to time]. Billing will be done on the basis of aforesaid water consumption charges and overhead charges @ 19.25% [on the aforesaid water consumption charges] as per the notifications of Tariff Authority of Major Ports (TAMP).

The billed amount against water supply 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).

9.24.3. Supply of electricity:

Supply of Electricity at the Contractor's site office, store, workshop, assembly / erection yard, etc. will be on chargeable basis.

Power supply, if required, for the actual work (including erection and commissioning) at the site and/or maintenance and repair (required to be carried out at site during the "Defect Liability Period") will be on chargeable basis.

For this, the Contractor shall have to make all arrangements, including installation of Energy Meter (in case power supply is given on chargeable basis) 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.

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 their own cost during such periods.

9.24.4. Billing against supply of electricity:

In case power supply is given on chargeable basis, electricity consumption charges will be determined on the basis of Chargeable Unit (kWh) and applicable rate of West Bengal State Electricity Distribution Company Limited (WBSEDCL). Billing will be done on the basis of aforesaid Electricity consumption charges and overhead charges @ 19.25% [on the aforesaid Electricity consumption charges] as per the notifications of Tariff Authority of Major Ports (TAMP).

The billed amount against electric supply 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).

9.25. **Use of ground and land/covered space for Contractor's establishment**

9.25.1. 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 work. The Contractor shall be allowed to erect any temporary structures on this land 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.

For this, the Contractor shall have to make an application and the required land would be allotted on chargeable basis, as per SMP, Kolkata's "Schedule of Rate", prevailing at that time.

9.25.2. 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.

9.25.3. 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 **SCC Clause Nos. 9.24.2**] **and Electricity**

consumption charges [as per **SCC Clause No. 9.24.4**] (if Electricity / water is supplied from SMPK's 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.

9.26. **Existing services**

9.26.1. 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.

9.26.2. 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.

D. STAFF AND LABOUR

9.27. **Engagement of staff and labour**

9.27.1. The labour, as mentioned in the respective clauses, shall include all labourers of the approved sub-contractor(s), with respect to this contract.

9.27.2. 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).

9.27.3. SMP, Kolkata's store shall mean any store of Haldia Dock Complex, situated at Haldia.

9.27.4. 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, whatsoever, for the personnel to be engaged by the Contractor [or by the approved Sub-contractor(s)] for the work under this contract.**

9.28. **Labour Laws**

9.28.1. 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.

9.28.2. 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.

9.28.3. 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.

9.28.4. 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.

9.28.5. 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.

9.28.6. 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.

9.28.7. 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 **Security Deposit / Performance Guarantee** and any other amount as may remain due to the Contractor.

9.29. **Health and safety**

9.29.1. 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.

9.29.2. The Contractor shall provide all necessary First Aid measures, rescue & lifesaving equipment, to be available at Site of Work, in proper condition.

9.29.3. The Contractor shall adhere to safe construction practice, guard against hazardous & unsafe working conditions and follow all safety precautions for prevention of injury or accidents and safeguarding life & property. 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) Act, 1986**.

The Contractor shall be solely responsible for consequences arising out of non-compliance or violation of safety rules/ regulations.

9.29.4. The Contractor [including approved Sub-contractor(s)] shall have to provide (at their own expenses) all required **Personal Protective Equipment (PPE)** [such as Safety Belts , Helmets, Safety Shoes, Nose Masks, Hand Gloves, etc.] & **Safety Gears** for all personnel & labourers engaged during the work.

The Contractor shall also provide job specific PPEs [such as safety belts for working at heights; protective face & eye shield; goggles & hand gloves for welding / gas cutting work; protective foot wear & gloves for hot work; facemasks & gloves for painting work, mixing & material handling work, etc.], as directed by the 'Engineer' or his representative.

In case of failing to provide the PPEs & Safety Gears, as mentioned above, by the Contractor, the Employer shall provide the same & 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.

9.29.5. Safety Officer of the SMPK or Safety Inspectors shall be afforded all facilities for inspection of the work, tools, plant, machineries, equipment, etc., wherever so required. The Contractor shall further comply with any instruction issued by the 'Engineer', SMPK's Safety Officer, Safety Inspector in regards to safety which may relate to temporary, enabling or permanent work, working of tools, plants, machineries, equipment, means of access or any other aspect.

9.29.6. 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 equipment 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 their own cost.

9.29.7. The Contractor shall obtain permit for work at height & other related work, if applicable, from concerned Authority (if any) , at their own cost & arrangement.

9.29.8. 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) Their 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.

9.30. **Employees' Provident Fund & Employees' State Insurance**

9.30.1. 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.

9.30.2. 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.

9.30.3. 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.

9.30.4. 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

9.31. Materials to be supplied by the Employer

9.31.1. Regarding supply of any materials by SMPK 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 SMPK's Store [store of Haldia Dock Complex, situated at Haldia], watching, storing and keeping them in their 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 SMPK's Stores, as per the direction of the 'Engineer' or his Representative.

b) Being the custodian of SMPK's materials, the Contractor shall remain solely responsible for any such materials issued to them and for any loss or damage thereof for any reason other than "Excepted Risks", the Contractor shall compensate SMPK's, 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) SMPK's 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 SMPK's materials to them. The Contractor shall, however, communicate their requirement of such materials to the 'Engineer' from time to time.

d) Unless stipulated otherwise in the contract, the value of SMPK's materials issued to the Contractor shall be recovered from the Contractor's bills and/or any of their 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 their 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 SMPK's failure to effect timely supply thereof.

e) If the 'Engineer' decides that due to the Contractor's negligence, any of SMPK's 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 SMPK's Stores, and

ii) The market price of the material on the date of issue, as would be determined by the 'Engineer'.

9.32. **Contractor's arrangement for execution of the work**

9.32.1. 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.

9.32.2. 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.

9.32.3. 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.

9.32.4. 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.

9.32.5. 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 equipment & materials to be provided by SMP, Kolkata, as per contract) required for efficiently carrying out the work to the satisfaction of the Employer.

9.32.6. 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'.

9.33. **Inspection and testing**

9.33.1. The 'Engineer' or his authorised Representative or Consultant (to be appointed by HDC,SMPK) 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**).

9.33.2. The materials, to be supplied by the Contractor, will be inspected / tested before installation, either at Contractor's premises or at work site, jointly by the authorized representative of HDC, SMP, Kolkata and the Contractor, based on the "Technical Specification".

9.33.3. During execution of the work as well as after completion of the jobs, the same will be inspected and tested jointly by the authorized representative of HDC, SMPK and the Contractor at site, based on the 'Technical Specification & Scope of Work'. The Contractor will have to provide all facilities for inspection of the materials and executed work, at their own risk, cost and arrangement.

9.33.4. The major items (fabricated / bought out items) may be inspected & tested at Manufacturer's works by the representative of HDC, SMPK, before delivery. Physical checking & verification of the items will be carried out at site after delivery, as per the 'Technical Specification', based on Manufacturer's test certificate, as applicable. Other materials, which will be provided / installed by the Contractor, will be inspected at site, as applicable, before installation.

9.33.5. The materials supplied & utilised by the Contractor, in the instant work, should strictly conform to the laid down specification in the contract.

Samples from the supplies may be drawn for testing by SMPK's own arrangement or for testing at Government approved Test House. If the sample is found to be inferior to the laid down specification of the contract, the materials will be rejected in whole or in part. The Contractor shall be debited with the cost of test. Moreover, rejected materials shall have to be replaced by the Contractor at their own cost, risk & arrangement.

9.33.6. 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.

9.33.7. If found necessary, SMP, Kolkata reserves the right to get the materials inspected from a **Government** or **Government recognized Laboratory** / **Test House**.

9.33.8. In case of subletting 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.

9.33.9. The Employer may 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 commissioning of the renovated / upgraded system, Cable, etc.], in part or as a whole, on their behalf. In that case the relevant Certificates shall be produced by the **Third Party Inspection Agency** to the 'Engineer' or his authorised Representative.

9.33.10. 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 & Scope of Work' of the Bidding Documents].

9.33.11. The Contractor shall have to submit a **Quality Assurance Plan** (**QAP**) and a **Field Quality Assurance Plan** (**FQAP**), based on the 'Technical Specification & Scope of Work' and other terms & conditions stipulated in the bidding documents. The **QAP & FQAP** shall be approved by the "**Engineer**".

9.33.12. 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.

9.33.13. 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.

9.33.14. 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**

9.33.15. Inspection & testing of the work by the authorized representative of HDC,

SMPK or TIPA shall not relieve the Contractor from their obligations for conforming to the quality, workmanship, guaranteeing the performance, etc. as per the contract.

9.33.16. **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, if appointed by SMPK], 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 SMPK)** 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.

9.33.17. After completion of the work, on satisfactory testing & commissioning, as applicable, measurement of the executed work of will be certified by the representative of the 'Engineer' and 'Work Done Certificate' will be issued accordingly, against the executed work.

9.33.18. Notwithstanding the fact that the materials or installations work have passed the inspection, the Contractor is not relieved from their obligations to conform to the quality, workmanship, guaranteeing the performance, etc., as per the Contract.

9.34. **Removal of materials on completion**

9.34.1. 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.

9.35. **Workmanship and secrecy**

9.35.1. 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.

9.35.2. 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 work 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. COMPLETION OF WORK, HANDING OVER & TAKING OVER, ETC.

9.36. **Completion Certificate**

9.36.1. When the whole of the work has been completed to the satisfaction of the 'Engineer', the Contractor shall, within 21 (twenty-one) days of submission of their application to the 'Engineer', be entitled to receive from him a certificate for completion of work as per the form furnished in **Section – XII**.

9.37. **Completion Period**

9.37.1. All the jobs, in line with 'PRICE SCHEDULE' and 'Technical Specification & Scope of Work', are to be completed within **14 months** from the date of issue of Letter of Acceptance (LOA) [i.e. **award of contract].**

9.38. **Taking over of the Contract job by** SMP, Kolkata

9.38.1. The Contract job will be taken over by HDC, SMPK after completion of the works in accordance with the Contract, having passed all the tests under "Tests on completion" and submission of required Manuals, As Built Drawings, etc..

9.38.2. However, the actual date of completion of the contract will be considered as per **SCC Clause No. 9.37** [**Completion period**].

9.39. **Defect Liability Period (DLP)**

9.39.1. The materials supplied and work executed by the Contractor will be guaranteed for a period of 24 (twenty-four) months from the date of taking over, after complete execution of the work.

9.39.2. "**Defect Liability Period**" shall mean the **Guarantee Period**, which starts from the date of taking over the Contract job [as per S**CC Clause No. 9.38** (Taking over of the Contract job by SMP Kolkata)] and will continue till expiry of 24 months, calculated from the date of taking over the Contract job.

9.39.3. During "**Defect Liability Period**" [as specified above], 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.

9.39.4. 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 **SCC Clause No. 9.38** (Taking over of the Contract job by SMP, Kolkata)] and before expiry of Defect Liability Period [as specified above**]** 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.

9.40. **Defects after taking over**

9.40.1. If any such defects shall appear or damage occur (as detailed in **9.39.4**), 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'.

9.40.2. 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 24 (twenty-four) 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 **30** (**thirty**) **months** [from the date of taking over the **Contract job]** for the materials, installations & workmanship, with respect to the instant job, as a whole.

9.40.3. 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.

9.40.4. 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.

9.41. **Extension of completion period**:

Should the quantum of extra or additional work of any kind or delayed availability of SMPK's materials to be supplied as per contract or **Force Majeure** condition (as per **SCC Clause No. 9.54**) 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**" (**SCC Clause No. 9.42.1** 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**" (**SCC Clause No. 9.42.1** 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.

9.42. **Liquidated Damage:**

9.42.1. **Liquidated Damage**

If the Contractor fails to complete the work within the stipulated dates [as per **SCC Clause No. 9.37.1**] or such extension thereof, as communicated by the 'Engineer', in writing, the Contractor shall pay as compensation (**Liquidated Damage**) to SMPK and not as a penalty, **@** ½% (half percent) of the total value of work (contract piece, excluding GST) 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. Necessary GST, as applicable, on Liquidated Damage amount, shall also have to pay by the Contractor.

9.42.2. Without prejudice to any of their legal rights, SMPK shall have the power to recover the amount of compensation / damage / penalty**,** from any money due or likely to become due to the Contractor. The payment or deduction of such compensation / damage / penalty 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

9.43. **Contract Price**

9.43.1. 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.

9.43.2. The Accepted Rates [in Accepted Price Schedule] shall include all taxes & duties of Central / State / Local bodies [excluding Goods and Services Tax (GST)], as applicable, all incidental charges 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 the 'Price Schedule' & 'Technical Specification & Scope of Work'.

9.43.3. Changes **in statutory taxes & duties will be adjusted** time to time.

9.43.4. 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.

9.44. **Terms of payment**

9.44.1. *The quantities given in the "PRICE SCHEDULE" are indicative only [which may vary (both upward & downward) during execution] and are given to provide a common base for tendering & evaluation.* Payment to the Successful Bidder will be made against EPC work stage-wise as indicated below :-

a. **8% Against approval of layout drawings, schemes, material list of equipment(BoQ) .**

A. Approval of civil drawings- 3%

B. Approval of electrical drawings:- 5%

b. 32 % Against Supply & Delivery of materials :

Payment will be made 32% of EPC work value against supply and delivery of **each item** at site and submission of bills along with Custodian Certificate and other relevant documents like Inspection Reports, Challans, etc.

A. Module mounting structure:-2%

B. SPV Modules:-4%

C. Central Inverters:-3%

D. HT & LT Cables:-2%

E. Transformers:-5%

F. HT switchgears:-6%

G. Metering bay equipment :-2%

H. LT switchgears:-2%

I. Earthing equipment:-2%

J. Plant illumination and CCTV:-2%

K. Miscellaneous(All balance equipment):-2%

c. 32 % Against completion of civil work :

Payment will be made 32% of EPC work value against completion of following civil works and submission of bills along with Inspection Reports/ job certification etc

A. Equipment foundation(MMS, transformer, metering bay equipment):-5%

B. Sub-station building:-7%

C. Plant drainage:-5%

D. Plant Road network and approach road:-10%

E. Area fencing work:-5%

d. 12 % Against Installation:

Payment will be made 12% of EPC work value against installation of the respective item and submission of bills along with Installation Certificate.

A. Module mounting structure:-1%

B. SPV Modules:-1%

C. Central Inverter:-1%

D. HT & LT Cables:-1%

E. Transformers:-1%

F. HT switchgears:-1%

G. Metering bay equipment :-1%

H. LT switchgears:-1%

I. Earthing equipment:-1%

J. Plant illumination and CCTV:-1%

K. Miscellaneous(All balance equipment):-2%

e. 10% against testing and commissioning.

Payment will be made 10% of EPC work value against testing and commissioning of the plant.

f. 6% against successful trail run and handing over of project.

Payment will be made 6% of EPC work value against successful trail run of 30days, completion of all facilities, Approval of CEA and handing over of project.

9.44.2. **Against Comprehensive Maintenance and manning:**

Payment will be made on pro-rata Quarterly basis on successful maintenance and power generation of the system as per approved schedule. Copies of power generation statement, maintenance job card and monthly attendance, duly signed by HDC officials as per schedule, are to be submitted along with bill.

Normally, the breakdown call is to be attended /commissioned within 48 hours from the date and time of breakdown call.
Major breakdown:- Call is to be attended /commissioned within 7 days from the date of breakdown call in case, if it is not possible to commission the system due to valid reasons (major fault, replacement of spare parts not readily available etc.) which is to be acceptable to Engineer no penalty will be imposed till 7th day. However, non acceptance of reasons by Engineer for delay / non-commissioning of equipment within 7 days will attract penalty.

The contractor will have to pay to the trustee @ 1% of the Maintenance Contract value / day(without GST) if delay in commissioning of system

from 8th day onwards.

9.44.3. **Penalty**

a. Penalty against Non availability of minimum strength of manning: -

Non availability of minimum strength of deployment of man power shall attract penalty as per the table furnished below:-

Sl. No.	Category	Penalty
1.	Technician / Security Guard [Skilled category]	₹ 1,110.00 per shift per head
2.	Operator (Electrical) / Supervisor [Highly-skilled category]	₹ 1,250.00 per shift per head
3.	Helper [Semi-skilled / Unskilled category]	₹ 900.00 per shift per head

b. Penalty against non-achievement of minimum guaranteed net Generation.

Guaranteed Net Energy generation:- 28,00,000.00kWh annually(Cumulative). If Net power generation from the plant is less than 28Lakh kWh (i.e. Units) per annum cumulatively, during comprehensive maintenance / defect liability period of 10years, the contractor would have to pay to HDC, SMPK the amount against shortage units (i.e. kWH) of generation, at the rate(s) of WBSEDCL as applicable.

9.44.4. **Submission of Bill / Tax Invoice:**

Bills should be submitted, in triplicate, to Sr. Dy. Manager(P&E), Plant & Equipment Division, Haldia Dock Complex, along with required certifications / inspection reports and other relevant documents.

During submission of bill(s), the following information must be submitted by the Contractor regarding their banker:

i) Bank Account number.
ii) Name of the bank
iii) Name of the branch.
iv) Address of the branch.
v) MICR code of the branch.

9.44.5. **Payment of Goods & Services Tax (GST)**:

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 SMPK to get due credit against GST paid.

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

9.44.6. **Time of payment:**

The Contractor shall have to submit **bills in triplicate** to the 'Engineer', in accordance with **SCC Clause No. 9.44.3**. Payment will be made in Indian Rupees through the banker of the Contractor (i.e. through **ECS).**

In normal circumstances, payment of the bills, accompanied by Inspection Certificates / Work Done Certificate / Job Certification & other relevant documents, duly recommended by the 'Engineer' or his Representative, will be passed within 30 (thirty) days from the date of receipt of such bills, if found in order.

9.44.7. **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.

9.44.8. **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.

9.45. **Extra expenses incurred by the Employer**

9.45.1. 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.

9.46. **Recovery of deducted amount**

9.46.1. Without prejudice to any of their legal rights, SMPK 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.

H. SUSPENSION & TERMINATION

9.47. **Notice to correct**

9.47.1. 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.

9.48. **Termination by Employer**

9.48.1. The Employer shall be entitled to terminate the contract if:

a) the Contractor fails to comply with **SCC Clause No. 9.18** [**Security Deposit** / **Performance Guarantee**]

or

with a notice under **SCC Clause No. 9.47** [**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. 5.1** [**Preliminary time to commence work and maintenance of steady rate of progress**], under **Section -VIII**.

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 **SCC Clause No. 9.20.**

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.

l) Not able to achieve minimum guaranteed power generation for atleast 3 consecutive year of operations due to unsatisfactory work by Contractor's personnel.

9.48.2. 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 SMPK's **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.

9.48.3. 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.

9.49. **Valuation at date of termination**

9.49.1. As soon as practicable after a notice of termination under **SCC Clause No. 9.48** [**Termination by Employer**], has taken effect, the 'Engineer' shall proceed in accordance with **SCC Clause No. 9.17** [**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.

9.50. **Payment after termination**

9.50.1. After a Notice of termination, under **SCC Clause No. 9.48** [**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 **SCC Clause No. 9.24** [**Supply of water and Electricity**], under **SCC Clause No. 9.25** [**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 **SCC Clause No. 9.49** [**Valuation at date of termination**]. After recovering any such losses, damages and extra costs, the Employer shall pay any balance to the Contractor.

9.51. **Employer's entitlement to termination for convenience**

9.51.1. 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.

After such termination, the Contractor shall proceed in accordance with **SCC Clause No. 9.53** [**Cessation of work and removal of Contractor's equipment**] and shall be paid in accordance with **SCC Clause No. 9.58** [**Optional termination, payment and release**].

9.52. **Corrupt or fraudulent practices**

9.52.1. 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 **SCC Clause Nos. 9.48 to 9.50** shall apply as if such expulsion had been made under **SCC Clause No. 9.48** [**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 **SCC Clause No. 9.19** [**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.

9.53. **Cessation of work and removal of Contractor's equipment**

9.53.1. After a notice of termination under **SCC Clause No. 9.51** [**Employer's entitlement to termination for convenience**] or S**CC Clause No. 9.58** [**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 Work 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.

I. FORCE MAJEURE

9.54. **Definition of Force Majeure**

9.54.1. In this clause "**Force Majeure** "means an exceptional event or circumstance

a) which is beyond the control of the Employer and the Contractor,

b) which such party (Employer / Contractor) could not reasonably have provided against before entering into the contract,

c) which, having arisen, such party could not reasonably have avoided or overcome,

and

d) which is not attributable to other party.

Force Majeure may include, but not limited to, exceptional events or circumstances of the kind listed below, so long as conditions a) to d) above are satisfied:

i) war, hostilities (whether war be declared or not) , invasion, act of foreign enemies;

ii) rebellion, terrorism, sabotage by persons other than the Contractor's personnel, revolution, insurrection, military or usurped power, or Civil War;

iii) riot, commotion, disorder, strike or lockout by persons other than the Contractor's personnel;

iv) munitions of war, explosive materials, ionisation radiation or contamination by radio-activity, except as may be attributable to the Contractor's use of such munitions, explosives, radiations or radio-

activity;

v) natural catastrophes such as earthquake, tsunami (caused by earthquake at the ocean bed), fire, floods, hurricane, cyclone, typhoon or volcanic activity,

and

vi) pressure waves caused by air craft or other aerial devices travelling at sonic or supersonic speed at the site of the work.

9.55. **Notice of Force Majeure**

9.55.1. 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.

9.56. **Duty to minimise delay**

9.56.1. 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.

9.57. **Consequences of Force Majeure**

9.57.1. If the Contractor is prevented from performing its substantial obligations under the Contract by Force Majeure of which notice has been given under **SCC Clause No. 9.55** [**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 **SCC Clause No. 9.59** [**Engineer's decision**], to:

a) an extension of time for any such delay, if completion is or will be delayed, under **SCC Clause No. 9.41** [**Extension of completion period**,

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 **SCC Clause No. 9.17** [**Determinations**] to agree or determine these matters.

9.58. **Optional termination, payment and release**

9.58.1. 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 **SCC Clause No. 9.55** [**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 **SCC Clause No. 9.53** [**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 Work;

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.

J. CLAIMS, DISPUTES AND ARBITRATION

9.59. **Engineer's decision**

9.59.1. 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 work, whether during the execution of the work 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 work 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 **SCC Clause No. 9.62** (**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.

9.60. **Amicable settlement**

9.60.1. Where notice of intention to commence arbitration as to a dispute has been given in accordance with **SCC Clause No. 9.59** (**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.

9.61. **Arbitration**

9.61.1. Any dispute in respect of which

a) the decision, if any, of the Engineer, has not become final and binding pursuant to **SCC Clause No. 9.59 (Engineer's decision)** and

b) amicable settlement has not been reached within the period stated in **SCC Clause No. 9.60** (**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.

9.61.2. 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

9.61.3. 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.

9.61.4. 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 **SCC Clause No. 9.59** (**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.

9.61.5. Arbitration may be commenced prior to or after completion of the work, 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 work.

9.62. **Failure to comply with Engineer**'**s decisions**

9.62.1. Whether neither the Employer nor the Contractor has given notice of intention to commence arbitration of dispute within the period stated in **SCC Clause No. 9.59** (**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 **SCC Clause No. 9.61** (**Arbitration**).

The provision of **SCC Clause No. 9.59** (**Engineer's decision**) **and SCC Clause No. 9.60** (**Amicable settlement**) shall not apply to any such reference.

9.63. **Progress of work not to be interrupted**

9.63.1. The Contractor must, at all the times, fulfil their obligations under the Contract and shall not slow down or stop the progress of work during the period any dispute is under settlement either through reference to the 'Engineer' or through arbitration, pursuant to the preceding clauses. Even if the work to be carried out during such a period involve matters under dispute, the Contractor shall nevertheless proceed with the work 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 **SCC Clause No. 9.48** [**Termination by Employer**].

K. INSURANCE

9.64. **General requirements for insurances**

9.64.1. The contractor during the contract period shall provide for insurance of 110% of the contract value upto the taking over of the installation by HDC, SMPK after completion of EPC work.

9.65. **Deputation of Technical personnel by the Contractor during EPC work**

The contractor shall have to depute authorized Technical personnel (as detailed below) to supervise the work during construction phase of the project period at his own cost.

The Number of Technical personnel, Qualifications and Experience will be as follows:

Technical Personel	Number (Minimum)	Experience
A. Diploma holder in Civil Engineering	01	Minimum 5 years of Experience in building works.
A. Diploma holder in Electrical Engineering	01	Minimum 5 years of Experience. Must hold SCC for respective part.

Necessary documents pertaining to the qualification and experience of the Technical personnel should be submitted after LOA.

9.66. **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 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 equipment 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

SECTION – X

BIDDING FORMS

Tender No. : **DM-PE/T/ 06 /2024-2025**

Sl. No.	Bidding Form No.	Description
1)	BIDDING FORM – I	FORM OF TENDER
2)	BIDDING FORM – II	BID-SECURING DECLARATION FORM
3)	BIDDING FORM – III	DETAILS OF FEES & DEPOSITS
4)	BIDDING FORM – IV	BIDDER'S DECLARATION FORM [General]
5)	BIDDING FORM – V	INFORMATION RELATED TO PRE-QUALIFICATION CRITERIA AND OTHER DOCUMENTS
6)	BIDDING FORM – VI	FORMAT OF AFFIDAVIT [EPF]
7)	BIDDING FORM – VII	FORMAT OF AFFIDAVIT [ESI]
8)	BIDDING FORM – VIII	BIDDER'S DECLARATION FORM [ESI]
9)	BIDDING FORM – IX	GENERAL INFORMATION OF THE BIDDER
10)	BIDDING FORM –X	INTEGRITY PACT AGREEMENT FORMAT
11)	BIDDING FORM –XI	BANK GUARANTEE FOR BID SECURITY / EARNEST MONEY DEPOSIT
12)	BIDDING FORM –XII	POWER OF ATTORNEY FOR JV & JOINT BIDDING AGREEMENT

FORM OF TENDER

(To serve as a Covering Letter to both the Techno-commercial and Financial Proposals).

[To be **Uploaded,** duly filled up, signed & stamped, as part of Techno-commercial Proposal, along with supporting documents, if any] (***on Bidder's Letter-head***)

Reference No. **Date**

Name of Work: Design, Engineering, Supply, Construction, Erection, Testing & Commissioning of 2 MW (AC) Solar PV Grid Interactive Power Plant at Haldia Dock Complex, SMPK under EPC mode, including Comprehensive Operation & Maintenance (O&M) for 10 years.

TENDER NO. : DM-PE/T/06 /2024-2025

Name of the Company / Firm / Joint Venture, submitting the Proposal: …….

Address: …….

…….

To,
General Manager (Engg.)
Haldia Dock Complex;
Syama Prasad Mookerjee Port, Kolkata.

Sir / Madam,

I ……., the authorized signatory of ……. (Name of the bidding Company /Firm) ……of ……..……(Address of the bidder) ……., having examined the site of work 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 "Design, Engineering, Supply, Construction, Erection, Testing & Commissioning of 2 MW (AC) Solar PV Grid Interactive Power Plant at Haldia Dock Complex, SMPK under EPC mode, including Comprehensive Operation & Maintenance (O&M) for 10 years.", required to be performed in accordance with the 'Technical Specification & Scope of Work', 'General Conditions of Contract (GCC)', 'Special Conditions of Contract (SCC)', etc., at the rates & prices arrived based on quoted percentage (%) [above /below /at par] in the Price Bid [*submitted electronically, through the website* https://eprocure.gov.in], within **14 months** from the date of issuance of Letter of Acceptance (LOA), in the event of our bid being accepted.

Contd……FORM OF TENDER (Tender No. **DM-PE/T/06/2024-2025): BIDDING FORM – I**

I/we also undertake to enter into a **Contract Agreement** in the form hereto annexed [**Section XII**] with such alterations or additions thereto, which may be necessary to give effect to the acceptance of the bid and incorporating such 'Technical Specification & Scope of Work', '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 & Scope of Work', '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 require ……..days 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 ₹ ……. (Indian Rupees: ……) only to Haldia Dock Complex, through E-payment mode, vide Transaction ID no. ……dated……. and submitted Bank Guarantee for ₹ ……. (Indian Rupees: ……) only, as Bid Security / Earnest Money.

or

I / We have submitted necessary documents for availing exemption , including Bid-securing Declaration, as per attached format [BIDDING FORM – II].

I/We agree that the period for which the bid shall remain open for acceptance, shall not be less than **180 days**, from the last date of submission of bid.

WITNESS: (Signature of authorised person of the bidding Firm)

Signature: Name: _____

Name: Designation: _____
(In Block Letters)

Address: Date: _____

Occupation:

(Office Seal)

BID SECURING DECLARATION FORM

[To be **Uploaded,** duly filled up, signed & stamped, as part of Techno-commercial Bid, along with supporting documents, if any] (***on Bidder's Letter-head***)

(Strike out alternative phrases not relevant to you)

Reference No. **Date**

Name of Work: Design, Engineering, Supply, Construction, Erection, Testing & Commissioning of 2 MW (AC) Solar PV Grid Interactive Power Plant at Haldia Dock Complex, SMPK under EPC mode, including Comprehensive Operation & Maintenance (O&M) for 10 years.

TENDER NO. : **DM-PE/T/06/2024-2025**

Name of the Company / Firm / Joint Venture, submitting the Bid: …….

Address: …….
…….

To,
General Manager (Engg.)
Haldia Dock Complex;
Syama Prasad Mookerjee Port, Kolkata.

Sir / Madam,

I/We, the undersigned, declare that:

I/We understand that, according to conditions of the instant Bidding Document, bids must be supported by a Bid Securing Declaration [BSD], in case a Bidder claims exemption of EMD.

I/We accept that I/We may be disqualified from bidding for any Contract with HDC, SMPK for a period of three years from the date of notification, if I am /We are in a breach of any obligation under the tender conditions, because I / we

a) have withdrawn / modified / amended, impairs or derogates from the tender, my/our Bid during the period of Bid validity specified in the **FORM OF TENDER**;

or

b) having been notified of the acceptance of our Bid by the purchaser during the period of Bid validity

i) fail or refuse to execute the Contract, if required,

or

ii) fail or refuse to furnish the Security Deposit / Performance Guarantee, in accordance with the terms & conditions of the Bidding Document.

I/We understand this 'Bid Securing Declaration' shall cease to be valid if I am / we are not the Successful Bidder, upon the earlier of

i) the receipt of your notification of the name of the Successful Bidder;

or

ii) thirty days after the expiration of the validity of my/our Bid.

Yours faithfully,

Signed: *(Insert signature of person whose name and capacity are shown)*

……

In the capacity of *(Insert legal capacity of person signing the Bid-securing Declaration)*

Name: *(Insert complete name of person signing the Bid-securing Declaration)*

Duly authorized to sign the bid for an on behalf of *(insert complete name of Bidding Firm*)

Dated on _____ day of _____ *(insert date of signing)*

Corporate Seal:

Note: In case of a Joint Venture, the Bid-securing Declaration must be in the name of all partners to the Joint Venture that submits the Bid.

BIDDING FORM – III

DETAILS OF FEES & DEPOSITS

[To be **Uploaded,** duly filled up, signed & stamped, as part of Techno-commercial Bid, along with supporting documents, if any] (***on Bidder's Letter-head***)

Reference No. **Date**

Name of Work: Design, Engineering, Supply, Construction, Erection, Testing & Commissioning of 2 MW (AC) Solar PV Grid Interactive Power Plant at Haldia Dock Complex, SMPK under EPC mode, including Comprehensive Operation & Maintenance (O&M) for 10 years.

TENDER NO.: DM-PE/T/06/2024-2025

Name of the Company / Firm / Joint Venture, submitting the Proposal: …….

Address: …….

i)	RailTel Tender Processing Fee (Non- refundable)	::	a)	Mode of Payment: E-payment through Debit / Credit Card / Net Banking.
			b)	Paid Amount:
ii)	Bid Document Fee (Cost of bidding documents)	::	a)	Mode of Payment: E-payment through Debit / Credit Card / Net Banking.
			b)	Paid Amount:
			c)	Document for exemption of Bid Document Fee: Uploaded / Not Uploaded
iii)	Earnest Money Deposit (EMD)	::	a)	Mode of Payment: E-payment through Debit / Credit Card / Net Banking.
			b)	Paid Amount:
			c)	Value of Bank Guarantee:
			d)	Document for exemption of Earnest Money Deposit [including Bid Securing Declaration (as per format attached as Bidding Form-II)] Uploaded / Not Uploaded

Signature of authorised person of the Applicant
(with office seal)

BIDDING FORM – IV

BIDDER'S DECLARATION FORM [General]

[To be **filled on Bidder's Letter Head and** uploaded, duly signed & stamped]

Reference No. **Date**

Name of Work: Design, Engineering, Supply, Construction, Erection, Testing & Commissioning of 2 MW (AC) Solar PV Grid Interactive Power Plant at Haldia Dock Complex, SMPK under EPC mode, including Comprehensive Operation & Maintenance (O&M) for 10 years.

TENDER NO.: DM-PE/T/06/2024-2025

Name of the Company / Firm / Joint Venture, submitting the Proposal: ……

Address: ……

To,
General Manager (Engg.)
Haldia Dock Complex;
Syama Prasad Mookerjee Port, Kolkata.

Sir / Madam,

I ……, the authorized signatory of …….. (Name of the bidding 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 percentage above / below / at par has been quoted in the Price Bid, electronically, through the **eNivida Portal of RailTel** 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 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.

BIDDING FORM – V

INFORMATION RELATED TO PRE-QUALIFICATION CRITERIA AND OTHER DOCUMENTS

[To be **Uploaded,** duly filled up, signed & stamped, as part of Techno-commercial Bid, along with supporting documents, if any] (***on Bidder's Letter-head***)

Reference No. **Date**

Name of Work: Design, Engineering, Supply, Construction, Erection, Testing & Commissioning of 2 MW (AC) Solar PV Grid Interactive Power Plant at Haldia Dock Complex, SMPK under EPC mode, including Comprehensive Operation & Maintenance (O&M) for 10 years.

TENDER NO.: DM-PE/T/06/2024-2025

Name of the Company / Firm / Joint Venture, submitting the Proposal: …….

Address: …….

MINIMUM ELIGIBILITY CRITERIA

(I) **ANNUAL TURNOVER STATEMENT**

The annual turnover of ……..(name of the bidding firm), for the years **2019-2020 , 2020-2021 and 2021-2022**, based on the **Balance Sheets and Profit & Loss Accounts,** are given below:

Financial years	**Turnover** (as per Auditor's Report / Balance Sheet) **[in ₹]**
2020-2021	
2021-2022	
2022-2023	
Total	
Average Annual Turnover	

SIGNATURE OF CHARTERED ACCOUNTANT ::

NAME OF CHARTERED ACCOUNTANT ::

UDIN (Unique Document Identification Number) ::

(COMPANY SEAL)

NOTE: Copy of Balance Sheets and Profit & Loss Accounts should be enclosed with sealed & signed.

(II) **TECHNICAL EXPERIENCE**

Sl. No.	Contract No. / Order No. and date	Name and address of the Employer [including name & contact details (Mobile No. , e-mail ID , etc.) of the contact person]	Contract value [in ₹]	Date of completion of work/ tenure of Contract & Executed Value	Page number(s) of reference / supporting document (s), uploaded.

(III) **POWER OF ATTORNEY (if applicable).**

Scanned copy of Power of Attorney	::	Uploaded	
		Not Uploaded	
		Not Applicable	

OTHER DOCUMENTS

	Requirement	Submitted/Not submitted [Put √ if submitted & X if not submitted]		Validity/ For the month of
a)	**GST**			
i)	GST Registration Certificate.		If submitted, **Page Number(s)**:	Not applicable.
ii)	Document in support of non-applicability.		If submitted, **Page Number(s)**:	Not applicable.
b)	**FORM -26AS** Relevant period of submitted work order and payment received.		If submitted, **Page Number(s)**:	
c)	**PTCC**			
i)	Profession Tax Clearance Certificate (PTCC)		If submitted, **Page Number(s)**:	
	OR Profession Tax Payment Challan (PTPC)		If submitted, **Page Number(s)**:	
ii)	Document in support of non-applicability.		If submitted, **Page Number(s)**:	Not applicable.
d)	**EPF**			
i)	Certificate for allotment of EPF Code No.		If submitted, **Code No.**: **Page Number(s)**:	Not applicable.
ii)	Latest EPF Payment Challan.		If submitted, **Page Number(s)**:	
iii)	Document in support of non-applicability.		If submitted, **Page Number(s)**:	Not applicable.

OTHER DOCUMENTS

e)	**ESI**			
i)	Registration Certificate of ESI Authority.	☐	If submitted, **Code No**.: **Page Number**(**s**):	Not applicable.
ii)	Affidavit, Declaration and Indemnity Certificate.	☐	If submitted, **Page Number**(**s**):	Not applicable.
f)	**PAN Card**	☐	If submitted, **PAN No**.: **Page Number**(**s**):	Not applicable.
g)	UDYAM Registration certificate	☐	If submitted, **Page Number**(**s**):	

BIDDING FORM-VI

FORMAT OF AFFIDAVIT [EPF]

[**On the Rupees Ten Non – Judicial Stamp Paper**]

BEFOR THE 1ST CLASS JUDICIAL MAGISTRATE AT----------

AFFIDAVIT

I ---------- son of ---------- aged about ----------
--Years, by faith ----------, by occupation ----------, residing at----------
----------do hereby solemnly affirm and declare as follows:

1) That I am the Proprietor / Partner / Director / Authorised Person [POA holder] of ----------
----------, having office at ----------and carrying on business on the said name and style.

2) That my aforesaid Firm is exempted from E.P.F. Act and the said Firm has no valid **Employees' Provident Fund (EPF)** Registration.

3) That the present affidavit is to be filed before Syama Prasad Mookerjee Port, Kolkata (Formerly Kolkata Port Trust) as per the **Clause No.2.2.2 iii)** of Tender no. DM-PE/T/ 06 /2024-2025 issued by Syama Prasad Mookerjee Port, Kolkata, in respect of the work of "Design, Engineering, Supply, Construction, Erection, Testing & Commissioning of 2 MW (AC) Solar PV Grid Interactive Power Plant at Haldia Dock Complex, SMPK under EPC mode, including Comprehensive Operation & Maintenance (O&M) for 10 years.".

4) That the statements made above are all true to be the best of my knowledge and belief.

5) That in the event the declaration is found to be wrong and false, I will be held responsible for all the consequences in respect of compliance of the Employees' Provident Fund & Miscellaneous Provision Act, 1952 [amended up to date].

DEPONENT

Identified by me

BIDDING FORM-VII

FORMAT OF AFFIDAVIT [ESI]

[**On the Rupees Ten Non – Judicial Stamp Paper]**

BEFOR THE 1ST CLASS JUDICIAL MAGISTRATE AT----------

AFFIDAVIT

I ---------- son of ---------- aged about ----------
--Years, by faith ----------, by occupation ----------, residing at----------
----------do hereby solemnly affirm and declare as follows:

1) That I am the Proprietor / Partner / Director / Authorised Person [POA holder] of ----------, having office at ----------and carrying on business on the said name and style.

2) That my aforesaid Firm is exempted from E.S.I. Act and the said Firm has no valid E.S. I Registration.

3) That the present affidavit is to be filed before Syama Prasad Mookerjee Port, Kolkata (Formerly Kolkata Port Trust) as per the **Clause No.2.2.2 iv)** of Tender no. DM-PE/T/ 06 /2024-2025 issued by Syama Prasad Mookerjee Port, Kolkata, in respect of the work of "Design, Engineering, Supply, Construction, Erection, Testing & Commissioning of 2 MW (AC) Solar PV Grid Interactive Power Plant at Haldia Dock Complex, SMPK under EPC mode, including Comprehensive Operation & Maintenance (O&M) for 10 years.".

4) That the statements made above are all true to be the best of my knowledge and belief.

5) That in the event the declaration is found to be wrong and false, I will be held responsible for all the consequences in respect of compliance of the Employees' State Insurance Act, 1948 [amended up to date].

DEPONENT

Identified by me

BIDDER'S DECLARATION FORM [ESI]

[To be filled on Bidder's Letter Head and uploaded, duly signed & stamped]

Reference No. **Date**

Name of Work: Design, Engineering, Supply, Construction, Erection, Testing & Commissioning of 2 MW (AC) Solar PV Grid Interactive Power Plant at Haldia Dock Complex, SMPK under EPC mode, including Comprehensive Operation & Maintenance (O&M) for 10 years.

TENDER NO.: DM-PE/T/06/2024-2025

Name of the Company / Firm / Joint Venture, submitting the Proposal: …….

Address: …….

To,
General Manager (Engg.)
Haldia Dock Complex;
Syama Prasad Mookerjee Port, Kolkata.

Sir / Madam,

I ……., the authorized signatory of the ……. (Name of the Company /Firm) do hereby declare / confirm that :

1) We are exempted from E.S.I. Act and we have no valid E.S. I Registration.

2) We are enclosing necessary document(s) [to establish non-applicability], along with **affidavit, affirmed before a first-class Judicial Magistrate** to that effect.

3) We will obtain registration certificate of ESI authority, if required.

4) We will indemnify **Syama Prasad Mookerjee Port, Kolkata (Formerly 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 we become a Successful Bidder.

Signature of authorised person of the bidder
(with office seal)

BIDDING FORM-IX

GENERAL INFORMATION OF THE BIDDER

[To be **Uploaded,** duly filled up, signed & stamped, as part of Techno-commercial Bid, along with supporting documents, if any] (***on Bidder's Letter-head***)

Reference No. **Date**

Name of Work: Design, Engineering, Supply, Construction, Erection, Testing & Commissioning of 2 MW (AC) Solar PV Grid Interactive Power Plant at Haldia Dock Complex, SMPK under EPC mode, including Comprehensive Operation & Maintenance (O&M) for 10 years.

TENDER NO.: DM-PE/T/06/2024-2025

Name of the Company / Firm / Joint Venture, submitting the Proposal: …….

Address: …….

Note: Bidder shall fill in the following information and enclose certified copies of the documentary proof / evidence to substantiate the corresponding statement wherever necessary and applicable.

(Please tick appropriate boxes or strike out sentences / phrases not applicable to you)

1.		Bidder's Legal Name (IN CAPITAL LETTERS) [Name of the Company / Firm / Joint Venture, submitting the Bid]:	
2.	a)	Country of Registration / Principal Place of Business.	
	b)	Year of registration.	
	c)	Legal address in Country of Registration.	
	d)	Corporate Identification Number (CIN)	
	e)	Complete Postal Address (including PIN Code):	
	f)	Telephone nos. (with country / area codes):	

	g)	Mobile Nos.: (with country / area codes):	
	h)	URL of the Company / Firm / Joint Venture.	
3.	Whether the Participant is a **Proprietorship Firm** or **Partnership Firm** or **Limited Company**.		
	Submit a self-certified copy of the Registration Certificate – *In case of a Partnership Firm – Copy of Deed of Partnership;* *In case of a Company – Copy of its Registration;* *In case of Society – Copy of its Byelaws & Registration Certificate of the Firm.* *All these documents should be Notarized.*		
4.	Information regarding Bidder's authorised representative(s) / contact person(s)		
	a)	Name(s)	
	b)	Designation (s)	
	c)	Address(es)	
	d)	Telephone number(s)	
	e)	Mobile No (s)	
	f)	E-mail ID (s)	
5.	a)	Address of the Branch Office, if any	
	b)	Name of the contact person at Branch Office	

Contd… GENERAL INFORMATION (Tender No.: DM-PE/T/06/2024-2025) : <u>BIDDING FORM-IX</u>

5.	c)	Telephone number (s)	
	d)	Mobile No (s)	
	e)	E-mail ID (s)	
6.	Taxation:		
	a)	PAN number:	
	b)	Type of GST Registration as per the Act (Normal Taxpayer, Composition, Casual Taxable Person, SEZ, etc.):	
	c)	GSTIN number in Consultant and Service Site States:	
	d)	Registered / Certified Offices from where the Services would be supported and Place of Service Site for GST Purpose:	
	e)	Contact Names, Nos. & email IDs for GST matters (Please mention primary and secondary contacts):	
	f)	Comments on Tax liability and the breakup of CGST, SGST, IGST and Cess in this assignment	
	Documents to be submitted: Self-attested Copies of PAN card and GSTIN Registration.		
7.	Trade Registrations and Licences		
	a)	**Employees' Provident Fund** (**EPF**) **Code No**.	
	b)	**Employees' State Insurance** (**ESI) Code No**.	
	c)	Labour Licence.	
	d)	Any other required.	
8.	Mainlines of business		

(Signature of authorised person of the Participant Firm)

Name:
(In Block Letters)

Designation: ……

INTEGRITY PACT AGREEMENT FORMAT

[To be filled up and uploaded, duly signed & stamped by the Bidder]

Tender No. : DM-PE/T/06/2024-2025

INTEGRITY PACT

This Integrity Pact is made at..... on this .....day of ..... 20.....

Between

Syama Prasad Mookerjee Port, Kolkata (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 for the work of "Design, Engineering, Supply, Construction, Erection, Testing & Commissioning of 2 MW (AC) Solar PV Grid Interactive Power Plant at Haldia Dock Complex, SMPK under EPC mode, including Comprehensive Operation & Maintenance (O&M) for 10 years.". The Principal values full compliances 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 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.

(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 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 anticorruption 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.

(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 Prot 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 Syama Prasad Mookerjee Port, Kolkata 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.

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) _____

_____

_____

ANNEX-A

GUIDELINES FOR INDIAN AGENTS OF FOREIGN SUPPLIERS

2.5. 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.

2.6. 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.

2.7. 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.

3. **DISCLOSURE OF PARTICULARS OF AGENTS / REPRESENTATIVES IN INDIA. IF ANY.**

3.1. Tenderers of Foreign nationality shall furnish the following details in their offer :

3.1.1. 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

3.1.2. The amount of commission/ remuneration included in the quoted price(s) for such agents/ representatives in India

3.1.3. 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

3.2. Tenderers of Indian Nationality shall furnish the following details in their offers :

3.2.1. 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.

3.2.2. The amount of commission/remuneration included in the price(s) quoted by the Tenderer for himself.

3.2.3. 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

3.3. 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.

3.4. 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.

BANK GUARANTEE FOR BID SECURITY /EARNEST MONEY DEPOSIT

[To be submitted on Non-judicial Stamp Paper of worth not less than ₹ 50.00]

To
The Board of Major Port Authority,
for Syama Prasad Mookerjee Port, Kolkata (SMPK).

BANK GUARANTEE NO..... DATE.....

Name of Issuing Bank.....

Name of Branch..... ……

Address.....

In consideration of the **Board of Major Port Authority for Syama Prasad Mookerjee Port, Kolkata** (SMPK), a body corporate – duly constituted under the Major Port Authorities Act, 2021 [Act 3. (1)], (hereinafter referred to as "**The Board**" or "**SMPK**"), having agreed to exempt Shri / Messrs **……..,** a Proprietary/ Partnership/Limited / Registered Company, having its Registered Office at **……** (hereinafter referred to as "**The Bidder**", which expression shall unless repugnant to the context or meaning thereof include its successors, administrators, executors and assigns), from cash payment of Bid Security / Earnest Money Deposit in connection with Tender No. **DM-PE/T/06/2024-2025,** for "Design, Engineering, Supply, Construction, Erection, Testing & Commissioning of 2 MW (AC) Solar PV Grid Interactive Power Plant at Haldia Dock Complex, SMPK under EPC mode, including Comprehensive Operation & Maintenance (O&M) for 10 years." , for the due fulfilment by the Bidder of all the terms & conditions contained in the Bidding Document of the said tender, on submission of a Bank Guarantee for ₹.....(Indian Rupees:…….....), we, ...Bank, ... Branch, Kolkata ...../Haldia, do, on the advice of the Bidder, hereby undertake to indemnify and keep indemnified the Board to the extent of the said sum of ₹.....(Indian Rupees:…….....).

We, …….....Bank,……..... .....Branch, Kolkata ... ./Haldia, further agree that if a written demand is made by the Board 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 SMPK within a week from the date of such demand by an A/c Payee Banker's Cheque drawn in favour of " Syama Prasad Mookerjee Port, Kolkata ", without any demur. Even if there be any dispute between the Bidder and the Board, 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, ...Bank,. .....Branch, Kolkata..... .....Haldia, decline or fail or neglect to honour the Bank Guarantee in the manner aforesaid, shall constitute sufficient reason for SMPK to enforce the Bank Guarantee unconditionally without any reference, whatsoever, to the Bidder.

2. We, ...Bank,..... Branch, Kolkata ..../Haldia, further agree that a mere demand by SMPK at anytime and in the manner aforesaid, is sufficient for us, ...Bank,.....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 Bidder and no protest by the Bidder, made either directly or indirectly or through court, can be valid ground for us, ...Bank,..... Branch, Kolkata ...../Haldia, to decline or fail or neglect to make payment to SMPK in the manner and within the time aforesaid.

3. We,... ... ... Bank,.. .. .. 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 finalisation of the tender and that it shall continue to be enforceable till all the terms and conditions of the said tender have been fully honoured / fulfilled by the Bidder and accordingly, the Board have discharged the Bank Guarantee, subject however, that this guarantee shall remain valid upto and inclusive of .....day of..... ..202.....and subject all so that the provision that the Board shall have no right to demand payment against this guarantee after the expiry of 1 (one) calendar months from the expiry of the aforesaid validity period upto.....or any extension thereof made by us, ...Bank,..... .....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 SMPK, only on a written request by SMPK to the Bidder for such extension of validity of this Bank Guarantee.

4. We, ...Bank,.. ... ...Branch, Kolakta .. ../Haldia, further agree that, without our consent and without affecting in any manner our obligations hereunder, the Board shall have the fullest liberty to vary from time to time any of the terms and conditions of the said Tender or to extend the time for full performance of the said Tender including fulfilling all obligations under the said Tender by the Bidder or to postpone for any time or from time to time any of the powers exercisable by the Board against the Bidder and to forebear or enforce any of terms and conditions relating to the said Tender and we,.. ... ... .Bank,.. ....Branch, Kolkata... ..../Haldia, shall not be relieved from our liability by reason of any such variation or extension being granted to the Bidder or for any forbearance act or commission on the part of SMPK or any indulgence by SMPK to the Bidder 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, ...Bank, ...Branch, Kolkata ... ./Haldia.

5. We, ...-. ...Bank, ...Branch, Kolkata... ... .../Haldia, lastly undertake not to revoke this Bank Guarantee during its currency except with the previous consent of SMPK in writing.

6. Notwithstanding anything to the contrary contained herein:

(a) Our liability under this Guarantee shall not exceed ₹…….(Indian Rupees:……..) only.

(b) This Bank Guarantee shall be valid up to ……..(*expiry date*)

(c) We are liable to pay the guaranteed amount or any part thereof under this Bank Guarantee only and only if you serve upon us a written claim or demand on or before……. (*last date of claim*).

SIGNATURE... .....
NAME……..
DESIGNATION.....
(Duly constituted attorney for and on behalf of)
BANK. . . .., ...
BRANCH... ……..
KOLKATA... ...../HALDIA
Mobile No.:
E-mail ID:

(OFFICIAL SEAL OF THE BANK)

Note :

(i) In case of Bank Guarantee is submitted from a Branch of a Nationalized / Scheduled Bank of India, other than Kolkata / Haldia Branch, the same should be routed through any Kolkata / Haldia Branch of the said Nationalized / Scheduled Bank in India and such Branch shall confirm the same and standby for all the commitments under the Bank Guarantee. In all cases, any dispute regarding Bank Guarantee will be adjudicated under the jurisdiction of Calcutta High Court.

(ii) *While issuing Bank Guarantee issuing applicant must mention receiver's details as ICICI Bank IFSC ICICI0003507 Branch-Haldia Township Branch, in BG text at which SFMS IFIN 760 messages to be sent by issuing Bank, to establish the authenticity of given BG.*

E-Tender No. DM-PE/T/06/2024-2025

Format for Power of Attorney for Lead Member of Consortium & Joint Bidding Agreement

(To be executed before Notary Public on a Non-Judicial Stamp Paper of at least Rs 10)

POWER OF ATTORNEY

Whereas Haldia Dock Complex, Syama Prasad Mookerjee Port,Kolkata ("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.

IN WITNESS HEREOF WE HAVE EXECUTED THIS POWER OF ATTORNEY ON THIS …… DAY OF ……..20**

For …… ……..

(Name & Title)

For ……

…….

(Name & Title)

For ……

…….

(Name & Title)

Witnesses:

1.

2.

……

(To be executed by all the members of the Consortium)

Joint Bidding Agreement

(Refer Clause 2.1.4)

(**[To be submitted on Non-judicial Stamp Paper of worth not less than INR 100.00]**)

THIS JOINT BIDDING AGREEMENT is entered into on this the …… day of …… 20…

AMONGST

1. …… Limited, a company incorporated under the Companies Act, 1956/2013¥ and having its registered office at …… (hereinafter referred to as the "First Part" which expression shall, unless repugnant to the context include its successors and permitted assigns)

AND

2. …… Limited, a company incorporated under the Companies Act, 1956/2013 and having its registered office at …… (hereinafter referred to as the "Second Part" which expression shall, unless repugnant to the context include its successors and permitted assigns)

AND

3. {…… Limited, a company incorporated under the Companies Act, 1956/2013 and having its registered office at …… (hereinafter referred to as the "Third Part" which expression shall, unless repugnant to the context include its successors and permitted assigns)}

AND

4. {…… Limited, a company incorporated under the Companies Act, 1956/2013 and having its registered office at …… (hereinafter referred to as the "Fourth Part" which expression shall, unless repugnant to the context include its successors and permitted assigns)}

The above mentioned parties of the FIRST, SECOND, {THIRD and FOURTH} PART are collectively referred to as the "Parties" and each is individually referred to as a "Party"

WHEREAS,

A. Syama Prasad Mookerjee Port, Kolkata, established under the Major Port Trusts Act 1963 and having Principal Office at 15, Strand Road, Kolkata – 700001 (hereinafter referred to as the "SMP, Kolkata" which expression shall, unless repugnant to the

¥ A Bidder who is registered abroad may substitute the words,viz "a company registered under the Companies Act, 1956/2013" by the words, viz "a company duly organised and validly existing under the laws of the jurisdiction of its incorporation". A similar modification may be made in Recital 2, as necessary.

context or meaning thereof, include its administrators, successors and assigns) has invited bids (the Bids") by its Bidding Documents No. …… dated …… (the "Bidding Documents") for pre-qualification of bidders for **----------**

----- (the "Project").

B. The Parties are interested in jointly bidding for the Project as members of a Consortium and in accordance with the terms and conditions of the Bidding Document and other documents in respect of the Project, and

C. It is a necessary condition under the Bidding Document that the members of the Consortium shall enter into a Joint Bidding Agreement and furnish a copy thereof with the Bid.

NOW IT IS HEREBY AGREED as follows:

1. Definitions and Interpretations

In this Agreement, the capitalised terms shall, unless the context otherwise requires, have the meaning ascribed thereto under the Bidding Document .

2. Consortium

2.1 The Parties do hereby irrevocably constitute a consortium (the "Consortium") for the purposes of jointly participating in the Bidding Process for the Project.

2.2 The Parties hereby undertake to participate in the Bidding Process only through this Consortium and not individually and/ or through any other consortium constituted for this Project, either directly or indirectly or through any of their Associates.

3. Covenants

The Parties hereby undertake that in the event the Consortium is declared the successful Bidder and awarded the Project, it shall enter into a Contract Agreement with the Authority for performing all its obligations as the Contractor in terms of the Contract Agreement for the Project.

4. Role of the Parties

The Parties hereby undertake to perform the roles and responsibilities as described below:

(a) Party of the First Part shall be the Lead member of the Consortium and shall have the power of attorney from all Parties for conducting all business for and on behalf of the Consortium during the Bidding Process and under the Contract Agreement;

(b) Party of the Second Part shall be {the Technical Member of the Consortium;}

{(c) Party of the Third Part shall be the Financial Member of the Consortium; and}

{(d) Party of the Fourth Part shall be the Operation and Maintenance Member/ Other Member of the Consortium.}

5. Joint and Several Liability

The Parties do hereby undertake to be jointly and severally responsible for all obligations and liabilities relating to the Project and in accordance with the terms of the Bidding Document and the Contract Agreement.

6. Representation of the Parties

Each Party represents to the other Parties as of the date of this Agreement that:

(a) Such Party is duly organised, validly existing and in good standing under the laws of its incorporation and has all requisite power and authority to enter into this Agreement with SMP Kolkata;

(b) The execution, delivery and performance by such Party of this Agreement has been authorised by all necessary and appropriate corporate or governmental action and a copy of the extract of the charter documents and board resolution/ power of attorney in favour of the person executing this Agreement for the delegation of power and authority to execute this Agreement on behalf of the Consortium Member is annexed to this Agreement, and will not, to the best of its knowledge:

(i) require any consent or approval not already obtained;

(ii) violate any Applicable Law presently in effect and having applicability to it;

(iii) violate the memorandum and articles of association, by-laws or other applicable organisational documents thereof;

(iv) violate any clearance, permit, concession, grant, license or other governmental authorisation, approval, judgement, order or decree or any mortgage agreement, indenture or any other instrument to which such Party is a party or by which such Party or any of its properties or assets are bound or that is otherwise applicable to such Party; or

(v) create or impose any liens, mortgages, pledges, claims, security interests, charges or encumbrances or obligations to create a lien, charge, pledge, security interest, encumbrances or mortgage in or on the property of such Party, except for encumbrances that would not, individually or in the aggregate, have a material adverse effect on the financial condition or prospects or business of such Party so as to prevent such Party from fulfilling its obligations under this Agreement;

(c) this Agreement is the legal and binding obligation of such Party, enforceable in accordance with its terms against it; and

(d) there is no litigation pending or, to the best of such Party's knowledge, threatened to which it is a party that presently affects or which would have a material adverse effect on the financial condition or prospects or business of such Party in the fulfillment of its obligations under this Agreement.

7. Termination

This Agreement shall be effective from the date hereof and shall continue in full force and effect until the Financial Close of the Project is achieved under and in accordance with the Contract Agreement, in case the Project is awarded to the Consortium. However, in case the Consortium is either not pre-qualified for the Project or does not get selected for award of the Project, the Agreement will stand terminated in case the Bidder is not pre-qualified or upon return of the Earnest Money by the SMP, Kolkata to the Bidder, as the case may be.

8. Miscellaneous

8.1 This Joint Bidding Agreement shall be governed by laws of India.

8.2 The Parties acknowledge and accept that this Agreement shall not be amended by the Parties without the prior written consent of the SMP, Kolkata.

IN WITNESS WHEREOF THE PARTIES ABOVE NAMED HAVE EXECUTED AND DELIVERED THIS AGREEMENT AS OF THE DATE FIRST ABOVE WRITTEN.

SIGNED, SEALED AND DELIVERED	SIGNED, SEALED AND DELIVERED
For and on behalf of LEAD MEMBER by:	SECOND PART
(Signature) (Name) (Designation) (Address)	(Signature) (Name) (Designation) (Address)
SIGNED, SEALED AND DELIVERED	SIGNED, SEALED AND DELIVERED
For and on behalf of THIRD PART	For and on behalf of FOURTH PART
(Signature) (Name) (Designation) (Address)	(Signature) (Name) (Designation) (Address)

In the presence of:

1. 2.

Notes:

1. The mode of the execution of the Joint Bidding Agreement should be in accordance with the procedure, if any, laid down by the Applicable Law and the charter

documents of the executant(s) and when it is so required, the same should be under common seal affixed in accordance with the required procedure.

2. Each Joint Bidding Agreement should attach a copy of the extract of the charter documents and documents such as resolution / power of attorney in favour of the person executing this Agreement for the delegation of power and authority to execute this Agreement on behalf of the Consortium Member. For a Joint Bidding Agreement executed and issued overseas, the document shall be legalised by the Indian Embassy and notarized in the jurisdiction where the Power of Attorney has been executed.

SECTION – XI

CHECKLIST

Tender No. : DM-PE/T/06/2024-2025

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 percentage above / below / at par would be given in the "**Price Bid**" electronically, through the eNivida Portal of RailTel only.*

Sl.No.	Particulars	Submitted/ Not submitted [Put √ if submitted and put X if not submitted]	If submitted, page numbers
1.	**Filled up checklist.**	☐	☐
2.	Proof of deposition of **Bid Document Fee.** **OR** Document for availing exemption against deposition of **Bid Document Fee.**	☐ ☐	☐ ☐
3.	Poof of deposition of **Earnest Money Deposit** (EMD). **OR** Document for availing exemption against deposition of EMD and Bid-securing Declaration, as per BIDDING FORM – II.	☐ ☐	☐ ☐
4.	UDYAM Registration Certificate for exemption of Bid Document Fee & Earnest Money Deposit *[applicable for Micro & Small Enterprises (MSEs) only]*.	☐	☐

Sl.No.	Particulars	Submitted/ Not submitted [Put √ if submitted and put X if not submitted]	If submitted, page numbers
5.	**PRICE SCHEDULE** [To be uploaded, duly signed & stamped]		
6.	**Bidding Forms:**		
	i) **Bidding Form-I:: FORM OF TENDER** [To be **filled on Bidder's Letter Head and** uploaded, duly signed & stamped]		
	ii) **Bidding Form-II::** **BID-SECURING DECLARATION FORM** [To be filled on Bidder's Letter Head and uploaded, duly signed & stamped]		
	iii) **Bidding Form-III::** **DETAILS OF FEES & DEPOSITS** [To be filled up and uploaded, duly signed & stamped]		
	iv) **Bidding Form-IV:: BIDDER'S DECLARATION FORM [General]** [To be **filled on Bidder's Letter Head and** uploaded, duly signed & stamped]		
	v) **Bidding Form –V: INFORMATION RELATED TO PRE-QUALIFICATION CRITERIA** [To be filled up and uploaded, duly signed & stamped]		
	vi) **Bidding Form – VI: FORMAT OF AFFIDAVIT [EPF]**		
	vii) **Bidding Form – VII: FORMAT OF AFFIDAVIT [ESI]**		

Sl.No.	Particulars		Submitted/ Not submitted [Put √ if submitted and put X if not submitted]	If submitted, page numbers
	viii)	**Bidding Form – VIII: BIDDER'S DECLARATION FORM [ESI]** [To be **filled on Bidder's Letter Head and** uploaded, duly signed & stamped]		
	ix)	**Bidding Form – IX: GENERAL INFORMATION OF THE BIDDER** [To be filled up and uploaded, duly signed & stamped]		
	x)	**Bidding Form – X: INTEGRITY PACT AGREEMENT FORMAT** [To be filled up and uploaded, duly signed & stamped]		
	xi)	**Bidding Form – XI: BANK GUARANTEE FOR BID SECURITY /EARNEST MONEY DEPOSIT** [To be submitted on Non-judicial Stamp Paper of worth not less than ₹ 50.00]		

SECTION – XII

CONTRACT FORMS

Tender No. : **DM-PE/T/06/2024-2025**

Sl. No.	Contract Form No.	Description
1)	CONTRACT FORM – I	FORMAT FOR INDEMNITY BOND [ESI]
2)	CONTRACT FORM – II	FORMAT FOR INDEMNITY BOND [for materials received by the Contractor]
3)	CONTRACT FORM – III	BANK GUARANTEE FOR SECURITY DEPOSIT / PERFORMANCE GUARANTEE
4)	CONTRACT FORM – IV	CERTIFICATE OF COMPLETION OF WORK
5)	CONTRACT FORM – V	CERTIFICATE OF FINAL COMPLETION
6)	CONTRACT FORM – VI	'NO CLAIM CERTIFICATE' FROM CONTRACTOR
7)	CONTRACT FORM – VII	FORM OF AGREEMENT
8)	CONTRACT FORM – VIII	FORM OF INTEGRITY PACT AGREEMENT

CONTRACT FORM – I

FORMAT FOR INDEMNITY BOND [ESI]

[To be submitted on Non-judicial Stamp Paper of worth not less than ₹ 50.00, **duly notarised**]

INDEMNITY BOND

This deed of **Indemnity Bond** made on …… by ……. having their office at …… (hereinafter called "the **Contractor**").

Whereas the General Manager (Engineering), Haldia Dock Complex, Syama Prasad Mookerjee Port, Kolkata, Dist.: Purba Medinipur, West Bengal (hereinafter call "the **Engineer**") has placed an order, bearing no. …….. / ……../……./O-… dated …….. for the work of 'Design, Engineering, Supply, Construction, Erection, Testing & Commissioning of 2 MW (AC) Solar PV Grid Interactive Power Plant at Haldia Dock Complex, SMPK under EPC mode, including Comprehensive Operation & Maintenance (O&M) for 10 years.'.

WHEREAS , the said Syama Prasad Mookerjee Port, Kolkata asked the every Bidder, who is not covered under E.S.I Act or exempted, to furnish an Indemnity Bond in favour of General Manager (Engineering), Haldia Dock Complex, Syama Prasad Mookerjee Port, Kolkata, 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.

AND

WHEREAS in consideration of the said Contract, the Contractor has agreed to execute an Indemnity Bond and at all times keep indemnified Syama Prasad Mookerjee Port, Kolkata and its administrator and representative.

NOW THIS BOND OF INDEMNITY WITHNESSTH THAT the Contractor named herein above shall indemnify Syama Prasad Mookerjee Port, Kolkata against all damages & accident occurring to their labourer (including that of sub-contractor's labourers), in connection with the instant Contract, as demanded by Syama Prasad Mookerjee Port, Kolkata and which shall be legal and /or claimed by Syama Prasad Mookerjee Port, Kolkata during the execution of the work, stated in the Tender no. **DM-PE/T/06/2024-2025.**

In the event the declaration is found to be wrong and false, the Contractor will be held responsible for all the consequences in respect of compliance of 'The Employees State Insurance Act, 1948' [amended up to date].

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)

Name :

Designation

(Signature)

Name :

Designation

Signed in my presence and identified by me

FORMAT FOR INDEMNITY BOND

[for materials received by the Contractor]

[To be submitted on Non-judicial Stamp Paper of worth not less than ₹ 50.00, **duly notarised**]

INDEMNITY BOND

Reference:

Order No.: ……../……./……./O-… dated ……. for the work of 'Design, Engineering, Supply, Construction, Erection, Testing & Commissioning of 2 MW (AC) Solar PV Grid Interactive Power Plant at Haldia Dock Complex, SMPK under EPC mode, including Comprehensive Operation & Maintenance (O&M) for 10 years..

This deed of **Indemnity Bond** made on …… by ……. having their office at …… (hereinafter called "the **Contractor**").

Whereas the General Manager (Engineering), Haldia Dock Complex, Syama Prasad Mookerjee Port, 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 / maintenance/overhauling / repairing / **fault diagnosis & remedial work,** thereon shall be deemed to be the **property of the 'Engineer'**.

It is hereby agreed that the Contractor shall be liable for all injury, losses and damages that may be caused to the material(s), 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 the Contract in respect of which this **Indemnity Bond** is executed, the Contractor having undertaken to deliver 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 repaired material(s) complete thereon to the 'Engineer' or utilised the material(s) , 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)

Name :

Designation

(Signature)

Name :

Designation

Signed in my presence and identified by me

CONTRACT FORM – III

BANK GUARANTEE FOR SECURITY DEPOSIT / PERFORMANCE GUARANTEE

[To be submitted on Non-judicial Stamp Paper of worth not less than ₹ 50.00]

To
The Board of Major Port Authority,
for Syama Prasad Mookerjee Port, Kolkata (SMPK).

BANK GUARANTEE NO..... DATE.....

Name of Issuing Bank.....

Name of Branch..... ……

Address.....

In consideration of the **Board of Major Port Authority for Syama Prasad Mookerjee Port, Kolkata** (SMPK), a body corporate – duly constituted under the Major Port Authorities Act, 2021 [Act 3. (1)], (hereinafter referred to as "**The Board**" or "**SMPK**") 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 SMPK's Work Order No. …… / ……../……./O-….. dated ……. for "Design, Engineering, Supply, Construction, Erection, Testing & Commissioning of 2 MW (AC) Solar PV Grid Interactive Power Plant at Haldia Dock Complex, SMPK under EPC mode, including Comprehensive Operation & Maintenance (O&M) for 10 years." and the same having been unequivocally accepted by the Contractor resulting in a **CONTRACT** bearing No. **……./……/ /AGMT/……./……..** and the Contractor having agreed to provide a **BANK GUARANTEE** from a Nationalized / Scheduled Bank of India, in prescribed format for **₹……. (Indian Rupees ……..)** only, for the faithful and satisfactory performance of the entire Contract.

We, ...Bank,..... Branch, Kolkata ...../Haldia, do, on the advice of the Contractor, hereby undertake to indemnify and keep indemnified the Board to the extent of the said sum of **₹……. (Indian Rupees ……..)** only. We, …….....
…….....Bank,. .....Branch, Kolkata ... ./Haldia, further agree that if a written demand is made by the Board 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 SMPK within a week from the date of such demand by an A/c Payee Banker's Cheque drawn in favour of " Syama Prasad Mookerjee Port, Kolkata ", without any demur. Even if there be any dispute

between the Contractor and Board, this would be no ground for us, ... (Name of Bank), ... Branch, Kolkata ..../Haldia, to decline to honour the Bank Guarantee in the manner aforesaid. The very fact that we, ...Branch, Kolkata..... .....Haldia, decline or fail or neglect to honour the Bank Guarantee in the manner aforesaid, shall constitute sufficient reason for SMPK to enforce the Bank Guarantee unconditionally without any reference, whatsoever, to the Contractor.

7. We, ... Bank,.....' Branch, Kolkata ..../Haldia, further agree that a mere demand by SMPK at anytime and in the manner aforesaid, is sufficient for us, ...Bank,.....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, ...Bank,..... ..... Branch, Kolkata .....Haldia, to decline or fail or neglect to make payment to SMPK in the manner and within the time aforesaid.

8. We,... ... ...Bank, ... 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 SMPK 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 Board certify that the terms and conditions of the said Contract have been fully and properly observed/fulfilled by the Contractor and accordingly, the Board have discharged the Bank Guarantee, subject however, that this guarantee shall remain valid upto and inclusive of .....day of..... ..202.....and subject all so that the provision that the Board 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 SMPK, only on a written request by SMPK to the Contractor for such extension of validity of this Bank Guarantee.

9. We, ...Bank,. ... ...Branch, Kolkata .. ../Haldia, further agree that, without our consent and without affecting in any manner our obligations hereunder, the Board 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 Board against the Contractor and to forebear or enforce any of terms and conditions relating to the said Contract and We,.. ... ...Bank, ...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 SMPK or any indulgence by SMPK 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, ...Bank, ...Branch, Kolkata ... ./Haldia.

10. We, ……Bank,……. Branch, Kolkata ... ./Haldia do also agree that SMPK 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

SMPK may have in relation to the Contractor's liabilities.

11. We, ...-. ... ...Bank, ...Branch, Kolkata... ... .../Haldia, lastly undertake not to revoke this Bank Guarantee during its currency except with the previous consent of SMPK in writing.

12. Notwithstanding anything to the contrary contained herein:

(d) Our liability under this Guarantee shall not exceed ₹…….(Indian Rupees:……..)

(e) This bank Guarantee shall be valid up to ……..(*expiry date*)

(f) We are liable to pay the guaranteed amount or any part thereof under this Bank Guarantee only and only if you serve upon us a written claim or demand on or before……. (*last date of claim*).

SIGNATURE... .....
NAME……..
DESIGNATION.....
(Duly constituted attorney for and on behalf of)
BANK. . . .., ...
BRANCH... ……..
KOLKATA... ...../HALDIA
Mobile No.:
E-mail ID:

(OFFICIAL SEAL OF THE BANK)

Note :

(i) In case of Bank Guarantee is submitted from a Branch of a Nationalized / Scheduled Bank of India, other than Kolkata / Haldia Branch, the same should be routed through any Kolkata / Haldia Branch of the said Nationalized / Scheduled Bank in India and such Branch shall confirm the same and standby for all the commitments under the Bank Guarantee. In all cases, any dispute regarding Bank Guarantee will be adjudicated under the jurisdiction of Calcutta High Court.

(ii) *While issuing Bank Guarantee issuing applicant must mention receiver's details as ICICI Bank IFSC ICICI0003507 Branch-Haldia Township Branch, in BG text at which SFMS IFIN 760 messages to be sent by issuing Bank, to establish the authenticity of given BG.*

CONTRACT FORM – IV

Syama Prasad Mookerjee Port, Kolkata

Haldia Dock Complex

CERTIFICATE OF COMPLETION OF WORK

Contractor : _____

Address : _____

_____

Date of completion : _____

Dear Sir,

Subject : Design, Engineering, Supply, Construction, Erection, Testing & Commissioning of 2 MW (AC) Solar PV Grid Interactive Power Plant at Haldia Dock Complex, SMPK under EPC mode, including Comprehensive Operation & Maintenance (O&M) for 10 years.

Reference : i) **Work Order No**.: ...../……../……./O-… dated ……

ii) **Contract No./Agreement No**.: ….....…….……/……..…/ AGMT/ ……./

This is to certify that the above work which was executed / 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 the **Clause No. 9.40** of the Special Conditions of Contract.

(Signature of the Engineer/Engineer's Representative)

Name: ……..……..…..

Designation: ……

Date: ……

(OFFICIAL SEAL)

CONTRACT FORM – V

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 **:** Design, Engineering, Supply, Construction, Erection, Testing & Commissioning of 2 MW (AC) Solar PV Grid Interactive Power Plant at Haldia Dock Complex, SMPK under EPC mode, including Comprehensive Operation & Maintenance (O&M) for 10 years.

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.

(Signature of the Engineer/Engineer's Representative)

Name: ……..…..

Designation: ……

Date: ……

(OFFICIAL SEAL)

("NO CLAIM CERTIFICATE" FROM CONTRACTOR)

[To be submitted on Contractor's Letter Head]

General Manager(Engineering)
Haldia Dock Complex ;
Syama Prasad Mookerjee Port, Kolkata
Engineering Department
Jawahar Tower Complex ;
P.O.: Haldia Township;
Dist.: Purba Medinipur ;
PIN: –721607
West Bengal, India.

Dear Sir,

Subject: Design, Engineering, Supply, Construction, Erection, Testing & Commissioning of 2 MW (AC) Solar PV Grid Interactive Power Plant at Haldia Dock Complex, SMPK under EPC mode, including Comprehensive Operation & Maintenance (O&M) for 10 years.

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, Syama Prasad Mookerjee Port, Kolkata, for the execution of the subject work, and I/we have no further claim against Haldia Dock Complex, Syama Prasad Mookerjee Port, Kolkata in respect of the above-mentioned job.

Yours faithfully,

(Signature of Contractor)

Date : ……
Name of Contractor : ……
Address : ……..

(OFFICIAL SEAL OF THE CONTRACTOR)

CONTRACT FORM – VII

FORM OF AGREEMENT

(To be submitted on Non-judicial Stamp Paper of worth not less than ₹ 50.00)

CONTRACT NO. : GM(E)/……/ /AGMT/……./……..

TENDER REFERENCE:

Tender No**. :** DM-PE/T/ 06 /2024-2025

for

Design, Engineering, Supply, Construction, Erection, Testing & Commissioning of 2 MW (AC) Solar PV Grid Interactive Power Plant at Haldia Dock Complex, SMPK under EPC mode, including Comprehensive Operation & Maintenance (O&M) for 10 years.

ORDER REFERENCE: …… /……/ /O-… dated ……

This agreement made this …….. day of …….. , Two thousand ……. ,

BETWEEN

The Board of Major Port Authority for Syama Prasad Mookerjee Port, Kolkata (SMPK), a body corporate – duly constituted under the Major Port Authorities Act, 2021 [Act 3. (1)], (hereinafter referred to as "**The Board**" or "**SMPK**"), 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 Board is desirous that certain work should be executed by the Contractor, viz. "Design, Engineering, Supply, Construction, Erection, Testing & Commissioning of 2 MW (AC) Solar PV Grid Interactive Power Plant at Haldia Dock Complex, SMPK under EPC mode, including Comprehensive Operation & Maintenance (O&M) for 10 years." and have accepted a bid / offer by the Contractor for execution and maintenance of such work, including remedying any defects therein, during the Defect Liability Period.

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 **General Conditions of Contract / Special 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) Bidding Documents [E- Tender No. : DM-PE/T/06/2024-2025], including Addenda (if any) [Please insert Addenda Nos. ……...].

b) The said bid / offer [bid / offer, with respect to the refereed tender (Techno-commercial Bid and Price Bid opened on ……..)].

c) The Letter of Acceptance (LOA) of the bid / offer [vide Order No. GM(Engg.)/…./T/…/22-23/O-…… dated …….., 2024]

d) Acknowledgement of LOA, duly signed by the Contractor, as token of acceptance.

e) The Conditions of Contract and Scope of Work [all terms and conditions of E-Tender No.: DM-PE/T/ 06 /2024-2025, including all addenda issued (if any)].

f) "Price Comparative Statement", showing the prices quoted (electronically, through the eNivida Portal of RailTel) by the Successful Bidder, in the Price Bid.

g) 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 SMPK to the Contractor, as hereinafter mentioned, the Contractor hereby covenant with SMPK 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.

4. SMPK hereby covenant to pay to the Contractor, in consideration of such execution and maintenance of the Work, the Contract Prices at the times and in the manner prescribed by the Contract.

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 SYAMA PRASAD MOOKERJEE PORT, KOLKATA (SMPK)	…… (CONTRACTOR)
GENERAL MANAGER (ENGG.), HALDIA DOCK COMPLEX	
In presence of	**In presence of**
1.	**1.**
2.	**2.**

CONTRACT FORM – VIII

FORM OF INTEGRITY PACT AGREEMENT

(To be submitted on Non-judicial Stamp Paper of worth not less than ₹ 50.00)

INTEGRITY PACT

INTEGRITY PACT AGREEMENT NO. : GM(E)/…/ /IPAGMT/……./……..

TENDER REFERENCE:

Tender No**. :** DM-PE/T/06/2024-2025

for

Design, Engineering, Supply, Construction, Erection, Testing & Commissioning of 2 MW (AC) Solar PV Grid Interactive Power Plant at Haldia Dock Complex, SMPK, under EPC mode, including Comprehensive Operation & Maintenance (O&M) for 10 years.

ORDER REFERENCE: …… /……/ /O-… dated ……

CONTRACT NO. : GM(E)/……/ /AGMT/……./……..

This Integrity Pact is made at..... on this .....day of ..... 20.....

Between

Syama Prasad Mookerjee Port, Kolkata (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 for the work of "Design, Engineering, Supply, Construction, Erection, Testing & Commissioning of 2 MW (AC) Solar PV Grid Interactive Power Plant at Haldia Dock Complex, SMPK under EPC mode, including Comprehensive Operation & Maintenance (O&M) for 10 years." The Principal values full compliances 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 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.

(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)

(3) 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.

(4) 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 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 anticorruption 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.

(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 Prot 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 Syama Prasad Mookerjee Port, Kolkata 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.

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) _____

_____

_____

ANNEX-A

GUIDELINES FOR INDIAN AGENTS OF FOREIGN SUPPLIERS

3.5. 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.

3.6. 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.

3.7. 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.

4. DISCLOSURE OF PARTICULARS OF AGENTS / REPRESENTATIVES IN INDIA. IF ANY.

4.1. Tenderers of Foreign nationality shall furnish the following details in their offer :

4.1.1. 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

4.1.2. The amount of commission/ remuneration included in the quoted price(s) for such agents/ representatives in India

4.1.3. 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

4.2. Tenderers of Indian Nationality shall furnish the following details in their offers :

4.2.1. 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.

4.2.2. The amount of commission/remuneration included in the price(s) quoted by the Tenderer for himself.

4.2.3. 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

4.3. 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.

4.4. 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.