



# KERALA STATE HOUSING BOARD

THRISSUR DIVISION

AYYANTHOLE, THRISSUR 680003

## BID DOCUMENT

**Name of Work: KSHB-KHU-Kochi- Thrissur Division-WWH Chalakudy- Supply, conveyance, Installation, testing and commissioning of 30kwp on grid solar roof top solar plant**

**Tender Reference No: 4/EE/TCR/KSHB/2021-2022**

**P A C : Rs 16,72,383.00/- Excluding GST (DSOR 2018 with Cost Index 35.59 % )**

**Tender Inviting Authority : Executive Engineer, Kerala State Housing Board,  
Thrissur Division**

**Email-id : kshbthrissur@gmail.com**

## CONTENTS

Part	Item
	Notice Inviting Tender
I	Instruction to the Bidders
II	General Conditions of Contract
III	Special Conditions of Contract
IV	General Terms and Conditions of e-procurement
V	Specifications
VI	Contract Data
VII	Drawings – Preparation of Scheme approval and getting sanction from the EI department by the contractor
VIII	Forms and Declaration [Annexures I to VII]



# KERALA STATE HOUSING BOARD

THRISSUR DIVISION

AYYANTHOLE, THRISSUR 680003

No. : **DB/1626/2013/WWH/CKDY-VOL.IV**

Dated : 11-01-2022

## NOTICE INVITING TENDER

e-Government Procurement (e-GP)

**TENDER NO : 4/EE/TCR/KSHB/2021-2022**

The Executive Engineer, KSHB, Thrissur, for and on behalf of KSHB invites online bids for the works detailed below from registered "A" Class - Electrical bidders of KSHB/Kerala PWD/Central PWD with having "A" Grade Licence from the Kerala Electrical Inspectorate, Energy Audit Firms Registered with Energy Management Centre-Kerala without expiring the validity and from Government/Govt accredited agency for execution of Renewable Energy Systems with company registered in India under the Companies Act 1956/2013.

1	Name of work	<b>KSHB-KHU-Kochi- Thrissur Division-WWH Chalakudy- Supply, conveyance, Installation, testing and commissioning of 30kwp on grid solar roof top solar plant</b>
2	Location of work	<b>Thrissur</b>
3	Estimated cost of the work	<b>Rs. 16,72,383/- (Excluding GST)</b>
4	Brief description of work	<b>KSHB-KHU-Kochi- Thrissur Division-WWH Chalakudy- Supply, conveyance, Installation, testing and commissioning of 30kwp on grid solar roof top solar plant</b>
5	Bidding procedure	<b>E tender -Item rate</b>
6	Bid Security (EMD)	<b>Rs.50,000.00.00/-</b>
7	Bid Submission Fee (Tender Fee)	<b>Rs.2500.00/- + 450 GST</b>
8	Period of completion	<b>3 months</b>
9	Classification of Bidder	<b>"A" Class - Electrical bidders of KSHB/Kerala PWD/Central PWD with having "A" Grade Licence from the Kerala Electrical Inspectorate, Energy Audit Firms Registered with Energy Management Centre-Kerala without expiring the validity and Government/Govt</b>

		accredited agency for execution of Renewable Energy Systems with company registered in India under the Companies Act 1956/2013
10	Last date and time for submission of Bids	<b>20.01.2022 up to 5.00 PM</b>
11	Name and address of the Bidder	
12	Mobile No of the Bidder	
13	E mail ID of the Bidder	
14	Date and Time of Opening of Technical Bid	<b>22.01.2022 at 4.00 PM</b>
15	Tender documents	Can be downloaded from the web site <a href="http://www.etenders.kerala.gov.in">www.etenders.kerala.gov.in</a>
16	Last date and time of receipt of relevant document as mentioned in NIT by speed post	<b>20.01.2022 up 04.00 PM</b>

Tender documents and tender schedule (Bill of Quantities, BOQ) can be downloaded free of cost from the e-GP Website [www.etenders.kerala.gov.in](http://www.etenders.kerala.gov.in). A bid submission fee of **Rs.2500/-+ 450 GST** shall be remitted as online payment during the time of bid submission.

All bid/ tender documents are to be submitted online and in the designated cover(s)/envelope(s) on the e-GP website. Tenders/ bids shall be accepted only through online mode on the e-GP website and no manual submission of the same shall be entertained. Late tenders will not be accepted.

The hard copies of certificates and documents, as detailed below shall be submitted subsequently after online submission of bids in a separate cover by registered post/speed post before the date and time of opening of technical bid.

**Documents to be submitted through online/speed post.**

Sl. No.	Scanned copy (through online cover)	Through speed post (Superscribing name of work & tender no.)
1	Copy of remittance towards Bid Submission Fee and Bid Security	Copy of remittance towards Bid Submission Fee and Bid Security
2	If the bidder is Government/Govt accredited agency for execution of Renewable Energy Systems for submitting the Bid then accreditation letter , registration certificate must be submitted along with the bid and latest ISO 9001-2015 certificate.	If the bidder is Government/Govt accredited agency for execution of Renewable Energy Systems for submitting the Bid then accreditation letter , registration certificate must be submitted along with the bid and latest ISO 9001-2015 certificate.
4	Copy of Electrical Contractors Registration “A” Class - Electrical bidders of KSHB / Kerala PWD / Central PWD or MNRE/ANERT with having “A” Grade Licence from the Kerala Electrical Inspectorate Or Energy Audit Firms Registered with Energy Management Centre-Kerala without expiring the validity attested by Gazetted Officer of Government department with validity & class of registration.	Copy of Electrical Contractors Registration “A” Class - Electrical bidders of KSHB / Kerala PWD / Central PWD or MNRE/ANERT with having “A” Grade Licence from the Kerala Electrical Inspectorate Or Energy Audit Firms Registered with Energy Management Centre-Kerala without expiring the validity attested by Gazetted Officer of Government department with validity & class of registration.
5	Duly filled and signed Bid submission letter (Annexure – I)	Duly filled and signed Bid submission letter (Annexure – I)

6	Duly filled and signed Preliminary agreement, in Kerala stamp paper worth Rs. 200/- duly filled and signed by bidder. (Annexure – II)	Duly filled and signed Preliminary agreement, in Kerala stamp paper worth Rs. 200/- duly filled and signed by bidder. (Annexure – II)
7	Duly filled and signed copy of certificate for correctness of the Bid Documents / Integrity pact certificate (Annexure – III)	Duly filled and signed copy of certificate for correctness of the Bid Documents / Integrity pact certificate (Annexure – III)
8	Duly filled E-payment requisition (Annexure – IV)	Duly filled E-payment requisition (Annexure – IV)
9	Copy of Bank certificate to prove the available credit limit and proof for liquid cash asset to verify the working capital requirement	Copy of Bank certificate to prove the available credit limit and proof for liquid cash asset to verify the working capital requirement
10	Scanned copy of the recent income tax return statement filed by the Bidder before the appropriate Income Tax Authority.	Scanned copy of the recent income tax return statement filed by the Bidder before the appropriate Income Tax Authority.
11	Complete set of bid document with NIT and sections from 1 to IX	Complete set of bid document with NIT and sections from 1 to IX
12	Copy of EMD exemption certificate/concession certificate attested by Gazetted Officer of Government Department, if any	Copy of EMD exemption certificate/concession certificate attested by Gazetted Officer of Government Department, if any
13	Any other certificate required for tender acceptance	Any other certificate required for tender acceptance
14	Copy of CERTIFICATE OF EMPANELMENT from Energy Management Centre,Kerala	Copy of CERTIFICATE OF EMPANELMENT from Energy Management Centre,Kerala
15	Copy of confirmation of bid submission in the e-tenders	Copy of confirmation of bid submission in the e-tenders

**Price Bid** shall only be submitted through **online**.

The technical bids shall be opened online at the **O/o The Executive Engineer, KSHB, Thrissur** on the above mentioned date & time by Chief Engineer in the presence of the Bidders / their authorized representatives who are present at the time in the venue. If the tender opening date happens to be on a holiday or non-working day due to any other valid reason, the tender opening process will be done on the next working day at same time and place. Without necessary documents as mentioned above the tenders will not be considered and shall be summarily rejected.

The technical bids submitted by the Bidders will be evaluated as per the terms and conditions set out in the bid document and the price bid of only the qualified Bidders shall be opened. The date and time of opening of the Price bid will be intimated by e- mail to the Bidders who are qualified after evaluation of Technical Bids and will be published on the notice board at the office of the Tender Inviting Authority.

Online Tenders/ bids are to be accompanied by a scanned image of the preliminary agreement executed in Kerala stamp paper worth Rs.200/-.

Further details can be had from the NIT or **O/o The Executive Engineer, KSHB, Thrissur Division** during working hours. The undersigned reserves the right to reject any or all tenders without assigning any reason.

The bidders are advised to submit the bids well before the stipulated date & time to avoid any kind of network issues, traffic congestion etc. The firm period of the tender shall be **Three months** from the due date of opening of bids.

All other existing conditions related to inviting tenders of KSHB will be applicable in this tender also

unless expressly defined in the bidding document. The KSHB will not be responsible for any error like missing of schedule data while downloading or uploading the documents by the Bidder during the e-procurement process and for any kind of issues faced by the bidder.

Details required for e-payment (Details of bank account having core banking facility and e- mail address of the contractor) shall be furnished along with the tender. Tenders not accompanied by these details will be rejected. All subsequent Government orders connected to tenders and any revision in the rates of taxes would also be applicable to this tender.

**EXECUTIVE ENGINEER**

**KSHB,  
Thrissur  
(For and on behalf of KSHB)**

### **Part I- INSTRUCTIONS TO THE BIDDERS**

#### **GENERAL**

On line tenders are invited for and on behalf of Kerala State Housing Board from “A”Class - Electrical bidders of KSHB/Kerala PWD/Central PWD with having “A” Grade Licence from the Kerala Electrical Inspectorate, Energy Audit Firms Registered with Energy Management Centre-Kerala without expiring the validity and Government/Govt accredited agency for execution of Renewable Energy Systems with company registered in India under the Companies Act 1956/2013 for the work of **KSHB-KHU-Kochi- Thrissur Division-WWH Chalakudy- Supply, conveyance, Installation, testing and commissioning of 30kwp on grid solar roof top solar plant**. Tender forms and general specifications can be downloaded free of cost from the e-GP website. Tenders not submitted in such prescribed online format or submitted incomplete in any respect whatever such as unattested errors and corrections in rates, quantities, units or amounts (figures not expressed in words), totals of contract not entered, etc, shall be summarily rejected.

- All bids shall be submitted online on the e-GP website only in the relevant envelope(s)/ cover(s), as per the type of tender. No manual submission of bids shall be entertained for the tenders published through e-GP system under any circumstances.
- Mention of price details at any place other than the designated place, shall disqualify the bidder and the bid shall be summarily rejected.
- The contractor shall submit mandatory an attested copy of his / her valid and active Registration Certificate and original preliminary agreement; on or before the date specified in the NIT. The Board shall not be responsible for any postal / courier service delay or any other delay. The non-receipt of the documents in time or the failure to enclose any of the documents as specified will result in the rejection of the tender.
- Every bidder is expected before quoting his rate to inspect the site of the proposed work. He should also inspect the quarries and satisfy himself about the quality and availability of materials. The best class of materials to be obtained from the quarries or other source defined shall be used on the work. In every case the materials must comply with the relevant standard specification. Samples of materials as called for in the standard specification or in this tender notice, or as required by the Assistant Executive Engineer Electrical wing in any case, shall be submitted for the Chief Engineer KSHB approval before the supply to site of work is begun. The Kerala State Housing Board will not, however after

acceptance of contract rate pay any extra charges for lead or for any other reasons, in case the bidder is found later on to have misjudged the materials available.

*Note:* The Board does not undertake to construct or make available any approach road or other means of approach to the proposed work site and the bidder shall get acquainted with the available means of approaches to the proposed site and quote for the various items. The Board shall not be liable for any claim raised later on the plea of non-availability or non-access to the site.

- The bid invited shall be of **item rate contract**.
- The mode of this tender is e-tender .
- The terms “bid” and “tender” and their derivatives “Bidder/tenderer, bid/tender, bidding/tendering etc.”. are synonyms.

### **Source of funds**

The expenditure on this Work will be met from the Plan fund(State Budget)

- **Eligible Bidders**

Only those bidders having a “A”Class - Electrical bidders of KSHB/Kerala PWD/Central PWD with having “A” Grade Licence from the Kerala Electrical Inspectorate,Energy Audit Firms Registered with Energy Management Centre-Kerala without expiring the validity and Government/Govt accredited agency for execution of Renewable Energy Systems with company registered in India under the Companies Act 1956/2013

- **TECHNICAL ELIGIBILITY CRITERIA**

- The Bidder should have installed & commissioned at least 1000kWp aggregate capacities of rooftop/ground mounted solar plants in Kerala for any of Government departments and minimum 100kWp of single solar power plant should be installed in any of the government department in Kerala.
- The list of plants for which installation is completed and energization certificate have been received from Electrical Inspectorate will only be considered for evaluating eligibility criteria. Commissioning certificate/Sanction for Energisation from Electrical Inspectorate/Grid Connectivity Certificate from KSEB and Work order / Contract /Agreement/ from the Client/Owner shall be submitted in support of above. Contact details of the respective customers shall be enclosed as prescribed in the PQ questionnaire.
- Further, these plants should have been completed on time as per the stipulated time in the work order and EOT (Extension of Time) shall not have been availed.

- **FINANCIAL ELIGIBILITY CRITERIA**

➤ **NET WORTH**

- The average net worth in the 3 financial years preceding the bid opening date shall be positive.

➤ **ANNUAL TURNOVER**

- The bidder shall have an average annual turnover equal to or more than Rupees 3Crores for the last three financial years immediately preceding the bid opening date. Also, the bidder must have valid credit rating for solar SP1B or higher. Also the bidders shall submit audited financial statements in support of their financial capability. Bidders shall furnish documentary evidence duly certified by Authorized Signatory and the Statutory Auditor / Practicing Chartered Accountant of the Bidding Company in support of their financial capability.

➤ **SOLVENCY**

- The Bidder should provide a solvency certificate to the tune of Rs. 1 Crores from a Nationalised Scheduled Bank. The Solvency certificate shall be within 6 months prior to tender date.

➤ **TECHNICAL SUBMITTAL**

- The bidder shall mandatorily submit the following documents along with his bid:
- The bidder should have minimum 5 years of experience in similar work
- Single Line diagram of the proposed solar power plant
  - Tentative Plant Layout showing location of components
  - Simulation reports using a standard software such as PV Syst/Helioscope. Simulation reports shall be made using the PV Modules and Inverters proposed to be supplied for this project. If the bidder is proposing more than one make, reports for all possible combinations of the offered components shall be submitted.
  - Details of Solar modules (Additional)

Module structure	Mounting structure should be Hot dipped GI/ Aluminium and designed to withstand wind up to 150 km/hr from back from back side of the panel
Solar PV Module	Solar Module must be Mono PERC 385Wp and above from ALMM approved list. Panel conversion efficiency shall not less than 19% Make- Renewsys, Topsun, Vikram/Equivalent
Inverter	Grid tie inverter make- ABB/Delta/Hitachi/Equivalent

- All Bidders are required to register in the e-procurement portal. The bidders, who submit their bids for this tender after digitally signing using their Digital Signature Certificate (DSC), accept that they have clearly understood and agreed the terms and conditions including all the Forms/ Annexure of this tender.

- Ineligible bidders or bidders who do not possess valid & active registration, on the date of bid submission, are strictly advised to refrain themselves from participating in this tender. If such instances are noticed, the same shall be treated as “fake bidding” by the respective bidder and such bidder shall be blacklisted as per



departmental rules in force.

- The Price bids of qualified Bidders shall only be opened.

- A firm/Bidder shall submit only one bid in the same bidding process, either individually as a Bidder or as a partner in a joint venture or consortium. A Bidder (either as a firm or as an individual or as a partner of a firm) who submits or participates in more than one bid will cause all the proposals in which the Bidder has participated to be disqualified.

- Joint ventures, Consortiums Partnership firms of two or more registered contractors are permitted subjected to the conditions set out in the qualification criteria.

- The Bidder shall have valid GST Registration.

- **Cost of Bidding**

- The Bidder shall bear all costs associated with the preparation & submission of its bid and site visits, and the Board will in no case be responsible or liable for those costs, regardless of the conduct or outcome of the bidding process.

- The tender document(s), may be downloaded free of cost from the e- Government Procurement (e-GP) website ([www.etenders.kerala.gov.in](http://www.etenders.kerala.gov.in)). No payment is required for downloading the tender documents from the above website. However a bid submission fee, as mentioned in **clause 13 below** of this document, is required to be submitted/to be remitted online along with the online bid.

- **Site visit**

- The bidder is advised to visit and examine the Site of Works and its surroundings and obtain for itself on its own responsibility all information that may be necessary for preparing the bid and entering into a contract for construction of the Works. He shall examine the site condition and satisfy himself of the availability of materials at nearby places, difficulties which may arise during execution before submitting the bids. The costs of visiting the Site shall be at the bidder's own expense.

- The tenderers shall ensure the lead and quality and quantity of materials available before tendering. Any plea put forward later on for enhancement rate or grounds of adequacy of the materials available on for other reasons in the lead etc. will not be considered.

- **Getting information from web portal**

All prospective Bidders are expected to see all information regarding submission of bid for the Work published in the e tender website during the period from the date of publication of NIT for the Work and up to the last date and time for submission of bid.

- **Bidding Documents - Content of Bidding Documents**

The bidding documents shall consists of the following unless otherwise specified

- a) Notice Inviting Tender (NIT)
- b) Instructions to Bidders

- c) General and special Conditions of Contract
- d) Technical Specifications
- e) Form of Bid, Appendix to Bid, Preliminary agreement format
- f) Bill of Quantities

- **Clarification of Bidding Documents**

- A prospective Bidder requiring any clarification of the bidding documents shall contact the office of the Tendering Authority on any working day between 10.15 am and 5 pm.

- In case the clarification sought necessitates modification of the bid documents, being unavoidable, the Tender Inviting Authority may effect the required modification and publish them in the website through corrigendum.

- For works costing more than Rs. 20 Crores, the Board / Tender Inviting authority may decide to conduct a pre-bid meeting to clarify the queries raised by prospective Bidders. The venue, date and time for such pre-bid meetings, if any, will be notified in the Contract Data. The Bidder is requested as far as possible to submit any questions in writing or by e-mail, to reach the Board not later than three days before the meeting. It may not be practicable at the meeting to answer questions received late, but questions and responses will be transmitted in accordance with the following:

- Minutes of the meeting including the text of the questions raised and the responses given together with any responses prepared after the meeting will be published in the e-tenders portal as corrigendum.

- Any modification of the tender documents which may become necessary as a result of the pre-bid meeting shall be made by the Tender Inviting Authority exclusively through the issue of an addendum and not through the minutes of the pre-bid meeting.

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

- Non-attendance at the pre-bid meeting will not be cause for escape from any bid requirements whatsoever.

- **Amendment to bidding documents**

- Before the deadline for submission of bids, the Tender Inviting Authority may modify the bidding document by issuing addendum.

- Any addendum thus issued shall be a part of the bidding documents which will be published in the e-tender website. The Tender Inviting Authority will not be responsible for the prospective Bidders not viewing the website in time.

- If the addendum thus published does involves major changes in the scope of work, the Tender Inviting Authority may at his own discretion, extend the deadline for submission of bids for a suitable period to enable prospective Bidders to take reasonable time for bid preparation taking into account the addendum published.

- **Preparation of Bids**

- Language of the Bid - All documents relating to the bid shall be in the English language.

- Documents Comprising the Bid - The online bid submitted by the Bidder shall comprise the following

:

- Details required for e-payment (Details of bank account having core banking facility and e-mail address of the contractor) in the prescribed format.
- Online payment of bid submission fee as detailed in the e- tender web site.
- Bid Security payment details.
- Duly filled-complete Bid document with all the required certificates copies in the appropriate covers as required in the web portal
- Copy of Registration Certificate, Bank certificates etc duly attested.
- Duly signed preliminary agreement.
- Priced Bill of Quantities

- The relevant CPWD/MoRTH specifications , BIS/IS codes , relevant sections of the National Building Code, Kerala PWD Manual, Kerala PWD Quality Control Manual and the Kerala PWD Quality Control Laboratory Manual shall be considered as part of this bid documents though individual copies are not attached along with the bid documents.

- Bidders shall not make any addition, deletion or correction in any of the bid documents. If tampering of documents is noticed during tender evaluation, the bid will be rejected and the Bidder will be blacklisted.

- **Bid Prices**

- The Bidder shall bid for the whole work as described in the Bill of Quantities.

- For item rate tenders, the Bidder shall fill in rates in figures and should not leave any cell blank. The line item total in words and the total amount shall be calculated by the system and shall be visible to the Bidder.

- **The rates quoted** by the Bidder shall include cost of all materials and conveyance, labour charges, hire charges of plant and machinery, overheads and all incidental charges for execution of the contract. The rate quoted shall also include all statutory taxes as on the date of submission of the tender and such taxes shall be paid by the contractor.

- The quoted rates shall also include expenses towards all Quality Control tests (first tier) prescribed in the PWD Quality Control Manual to be done at Government approved institutions.

- The rate quoted by the bidder shall include all taxes duties and Construction Workers Welfare Fund Contribution etc except the GST (Goods and Service Tax) and the Government will not entertain any claim whatsoever in respect the same. However, in respect of GST, wherever legally applicable the same shall be paid by the contractor to the concerned Authorities as per the prevailing rules. The payment for any bill as per this contract shall be made for the total value of the works at the contract rate plus the applicable GST at the time of billing. Any variation in tax rate of GST (increase or decrease)after the last date of tender submission shall be adjusted at the time of settlement of bills. TDS and other deductions shall be made on payments excluding GST.

- All taxes, royalty, octroi and other levies payable by the contractor under the contract, or for any other cause as of the date 28 days prior to the deadline for submission of bids shall be included in the rates, prices and total of bid price quoted by the contractor. The bid prices shall also cater for any change in tax pattern during the tenure of work.

- No material will be issued by the department for executing the works under this contract.

- The rates and prices quoted by the Bidder shall remain firm during the entire period of contract.

- **Alterations and additions**

- The bid shall contain no alterations or additions, except those to comply with instructions issued by Board, or as necessary to correct errors made by the Bidder, in which case such corrections shall be initialled by the person or persons signing the bid.

- The bidder shall not attach any conditions of his own to the bid. The tender price must be based on the tender documents. The bidder is not required to present alternative construction options and he shall use without exception the Bills of Quantities as provided, with the amendments as notified in tender notices, if any, for the

calculation of his tender price. Any bidder who fails to comply with this clause will be disqualified.

- **Tender (Bid) submission Fee**

- a. The Bidder shall pay, a tender document fees of **Rs.2500.00/- + 450 GST**
- b. Any bid not accompanied by the **Tender Fee** as notified shall be rejected as non-responsive.
- c. The bid submission fee is **not refundable** on any circumstances.

- **EMD (Bid Security)**

- The Bidder shall pay, Earnest Money Deposit or Bid Security of **Rs.50,000.00**
- Any Bid not accompanied by an acceptable Bid Security/EMD shall be rejected as non-responsive.
- The Bid Security of the unsuccessful Bidders shall become refundable as promptly as possible after opening of Price Bid or finalization of the tender.
- The Bid Security of the unsuccessful bidders will be refunded in the next working day (as far as possible) after the bid evaluation, keeping only that of the first 2 lowest tenders. The Bid Security of the remaining unsuccessful bidders will also be refunded on the next day after acceptance of the contract via electronic media.
- The Bid Security of the successful Bidder will be discharged when the Bidder has signed the Agreement and furnished the required Performance Guarantee (Security Deposit).
- No interest, in any circumstances shall be payable by the Board to the bidder for the EMD / Performance Guarantee (Security Deposit) / Additional performance guarantee.
- Bidders shall remit the bid submission fee and EMD using the online payment options of e-procurement system only. Bidders opting for NEFT facility of online payment are advised to exercise this option at least 48 hours before the last date of bid submission to ensure that payment towards Bid Security is credited and a confirmation is reflected in the e-Procurement system.
- The Bid security is required to protect the purchaser against risk of Bidder's conduct, which would warrant the forfeiture of **performance guarantee (Security deposit)**.

- **EMD Exemption (Waiving of Bid Security)**

Bidders, who have secured exemption from individual EMD payments, need not do this except when special Earnest money is asked to be deposited. Such EMD exemption certificate/document needs to be scanned and submitted online along with the bid, failing which; the bid shall be rejected summarily. The original EMD exemption document may have to be produced, if required, failing which, the bid shall be rejected summarily.

- **Submission of Bids**

- All documents of the Bid as required shall be typed or written in indelible ink and shall be signed by

the Bidder or person duly authorised to sign on behalf of the Bidder.

- In the event of the tender being submitted by a partnership firm or joint venture/consortium, it must be signed by the lead partner holding a valid power-of attorney authorizing him to do so, such power of attorney to be produced with the tender, and it must disclose that the firm is duly registered under the Indian Partnership Act, 1952.

- The Bidder shall submit their bid online only through the e-GP web site of Kerala ([www.etenders.kerala.gov.in](http://www.etenders.kerala.gov.in)) as per the procedure laid down for e-submission as detailed in the web site. For e-tenders, the Bidders shall download the tender documents including the Bill of Quantity (BoQ) file from the e-tendering portal <http://www.etenders.kerala.gov.in>. The Bidder shall fill up the documents and submit the same online using their Digital Signature Certificate. On successful submission of bids, a system generated receipt can be downloaded by the Bidder for future reference. Copies of all certificates and documents shall be uploaded while submitting the tender online. The following scanned copies of documents are to be submitted online as required by the e-tenders portal.

- **Technical Bid-**

- Copy of remittance towards bid submission fee and Bid Security.
- Attested Copy of the Bidder's valid registration certificate in KSHB/KSELB / Kerala PWD / CPWD.
- Duly filled and signed copy of bid submission letter as per Annexure - I of this bid document
- Duly filled and signed copy of preliminary agreement as per Annexure - II of this bid document
- Duly filled and signed copy of Integrity pact certificate as per Annexure - III of this bid document.
- Duly filled and signed copy of requisition for e-payment form as per Annexure - IV of this bid document
- Copy of Bank certificate to prove the available credit limit and proof for liquid cash asset to verify the working capital. The bidder should possess adequate working capital of more than 10% of the probable estimated cost of work for which he is bidding.
- Self-attested copy of the bidder's valid GST registration certificate issued by Government.
- Any other relevant information with testimonials.
- The Bidder must attach the scanned copy of the recent income tax return statement filed by the Bidder before the appropriate Income Tax Authority along with their online tenders. The Bidder shall produce the necessary income tax documents, if required by the department for verification. In the case of proprietary or partnership firm, it will be necessary to submit aforementioned for the proprietor or proprietors and for each of the partners as the case may be. The Bidder shall digitally sign all statements, documents, certificates uploaded by him, owning sole correctness/authenticity as per the provisions of the IT ACT 2000.
- In addition to the above, the Bidder shall upload a complete set of bid document with NIT and sections from 1 to VIII using his digital signature as a token of acceptance of all bid conditions and the absence of complete set of bid document in the submitted bid shall be treated as non-responsive and will be rejected by the Employer.

- **Price bid**

- This shall contain only the duly filled BoQ-file in MS-Excel format and shall be uploaded using the digital signature of the Bidder in the e-tenders portal.
- The Price bid shall only be submitted through online.

- After the submission of bid online in the e-tenders portal, the hard copies of the following are to be submitted to the Tender Inviting Authority by registered post/Speed post of India Post in such a way that it shall be delivered to the office before the deadline fixed for opening of technical bid. The Tender Inviting Authority reserves the right to reject any bid, for which the above details are not received before the date and time fixed for the opening of technical bid.

- Copy of remittance towards Bid Submission Fee and Bid Security

- Copy of confirmation of bid submission in the e-tenders portal
- Attested Copy of the Bidder's valid registration certificate in KSHB / Kerala PWD, CPWD& Electrical Inspectorate Licence.
- Duly filled and signed copy of bid submission letter as per Annexure - I of this bid document
- Duly filled and signed copy of preliminary agreement as per Annexure - II of this bid document
- Duly filled and signed copy of Integrity pact certificate as per Annexure - III of this bid document.
- Duly filled and signed copy of requisition for e-payment form as per Annexure - IV of this bid document.

elf-attested copy of the bidder's valid GST registration certificate issued by Government.

- [Copy of Bank certificate to prove the available credit limit and proof for liquid cash asset to verify the working capital requirement as per Clause 1.E of Part VI – Working Capital and Credit Limit.](#)

- **Modification, Resubmission and Withdrawal of Bids**

- Resubmission or modification of bid by the Bidders for any number of times before the date and time of submission is allowed. Resubmission of bid shall require uploading of all documents including price bid afresh.
  - If the Bidder fails to submit his modified bids within the pre- defined time of receipt, the system shall consider only the last bid submitted.
  - The Bidder can withdraw his/her bid before the date and time of receipt of the bid. The system shall not allow any withdrawal after the date and time of submission.

- **Deadline for Tender submission**

- Tender duly signed using bidder's valid Digital Signature Certificate shall be submitted online on e-GP website [www.etenders.kerala.gov.in](http://www.etenders.kerala.gov.in) on or before **20.01.2022 up to 5.00 PM**
- The Tender Inviting Authority, in exceptional circumstances and at its own discretion, may extend the last date for submission of bids, in which case all rights and obligations of the Tender Inviting Authority and the bidders previously subject to the original date will then be subject to the new date of submission.
- The Bidder will not be able to submit his bid after expiry of the date and time of submission of bid (server time). The e-GP system shall not allow submission of bids online after the stipulated date & time. The bidder is advised to submit the bids well before the stipulated date & time to avoid any kind of network issues, traffic congestion, etc. In this regard, the Board shall not be responsible for any kind of such issues faced by bidder.
- All bids shall be submitted online on the e-GP website only in the relevant envelope(s)/ cover(s), as per the type of tender. No manual submission of bids shall be entertained for the tenders published through e-GP system under any circumstances.

- **Bid opening, Evaluation and Acceptance of Tender**

- The bids will be opened online at the office of the tender inviting authority on **22.01.2022 at 04.00 PM** by **Executive Engineer, KSHB** or his authorised representative in the presence of those bidders or their authorized agents who wish to be present.

- In case it is not possible to open the tenders on the specified date due to any valid reason the revised time and date of opening of tenders will be published on e-GP website. The bidders shall check the e-GP website regularly for such updates.

- Opening of bids shall be carried out in the same order as it is occurring in invitation of bids or as in order of receipt of bids in the portal. The Bidders & guest users can view the summary of opening of bids from any system. Bidders are not required to be present during the bid opening at the opening location if they so desire.

- The total amount of each tender will be read out. There is no provision for correction of bids once submitted online. However, multiple bids can be submitted by the bidder, in case of corrections, till the last date & time of bid submission and the most recent/ latest bid submitted before the stipulated date & time of bid submission shall only be considered by e-GP for further processing.

- Details of individual rates will be treated as confidential and will not be read out.

- Acceptance of the tender rests with the Tender Inviting Authority who does not undertake to accept the lowest or any particular tender

- Confidentiality

- Information relating to the examination, clarification, evaluation, and comparison of Bids and recommendations for the award of a contract shall not be disclosed to Bidders or any other persons not officially concerned with such process until the award has been announced in favour of the successful Bidder.

- Any effort by a Bidder to influence the Employer during processing of bids, evaluation, bid comparison or award decisions shall be treated as Corrupt & Fraudulent Practices and may result in the rejection of the Bidders' bid.

- No Bidder shall contact the Tender Inviting Authority on any matter relating to the submitted bid from the time of the bid opening to the time the contract is awarded. If the Bidder wishes to bring additional information to the notice of the Tender Inviting Authority, it shall do so in writing

- **Examination of Bids, and Determination of Responsiveness**

- During the detailed evaluation of Technical Bid, the Tender Inviting Authority will determine for each Bid

- meets the eligibility criteria as required in the NIT;

- meets the qualification criteria in accordance with the provision of NIT; and

- is accompanied by the required bid submission fee, bid security and the required documents and certificates.

A substantially responsive bid is one which conforms to all the terms, conditions, and requirements of the bidding documents, without material deviation or reservation. A material deviation or reservation is one

- which affects in any substantial way the scope, quality, or performance of the Works;

- which limits in any substantial way, inconsistent with the bidding documents, the Board's rights or the Bidder's obligations under the Contract; or

- whose rectification would affect unfairly the competitive position of other Bidders presenting substantially responsive Bids.
- If a Bid is not substantially responsive, it may be rejected by the Tender Inviting Authority, and may not subsequently be made responsive by correction or withdrawal of the nonconforming material deviation or reservation.
- Non submission of legible or required documents or evidences may render the bid non-responsive.
- The Technical evaluation of all the bids shall be carried out as per information furnished by Bidders. The Tender Inviting Authority will evaluate bid and finalize list of responsive Bidders.
- The technical bid submitted by the responsive Bidders shall be evaluated as per the qualification criteria by a Committee of Chief Engineers for selecting the qualified Bidder.
- The Price Bids of the technically responsive and qualified Bidders shall only be opened. The Bid Inviting Officer shall log on to the system and open the Price Bid in sequence. At the time of opening of “Price Bid”, Bidders, whose Technical Bids were found responsive, can be present, if they desire so.
- Bidder documents/summary reports for that particular work by logging on to the portal with his DSC from anywhere.
- Single tender shall not be opened in the first tender call.

- **Negotiation on Bids :**

For tender evaluation purpose, the bidder who has quoted the lowest total amount shall be considered as L1. If required, the Tender Inviting Authority may resort to negotiation with the Li Bidder only, to explore the possibility of bringing down the high quoted rate items if any to an acceptable level. For this purpose, the high quoted rates are those for which the quoted rates are more than the current schedule of rates.

- **Award of Contract :**

- The Tender Inviting Authority will award the Contract to the Bidder whose bid has been determined to be substantially responsive and who has offered the lowest evaluated bid price.

- In the eventuality of failure on the part of the lowest successful bidder to produce the original documents, or submit the performance guarantee, or enter into agreement with the Agreement Authority within the specified time limit, the Bidder shall be debarred in future from participating in all Bids of KSHB for three years and penal action by the competent authority will be recommended. In such cases, the work shall be re-tendered.

- If the grand total of quoted amount by a bidder is less than 75% (seventy-five percent) of the estimated PAC, then such bids will be processed based on the directions contained in Government order GO(P) No. 124/2016/Fin dated 29-8-2016 or any subsequent modifications thereof. If two or more bidders quote the same lowest amount, the Tender Inviting Authority will finalize the tender through a transparent draw of lots. The Tender Inviting Authority along with his subordinate officers and the contractors who have quoted the lowest and equal amounts in their bids (or contractor’s authorised representatives) shall be present during the draw of lots.

- Single qualified bid in response to the first tender call will be rejected.

- The Tender Inviting Authority reserves the right to accept or reject any Bid and to cancel the Bidding process and reject all Bids at any time prior to the award of Contract, without thereby incurring any liability to the affected Bidder or Bidders or any obligation to inform the affected Bidder or Bidders of the grounds for the Tender Inviting Authority 's action.



- Notification of Award and Signing of Agreement

- 

he Bidder, whose Bid has been accepted, shall be notified of award by the Agreement Authority prior to expiration of the Bid validity period by e-mail confirmed by letter sent through post. This letter (hereinafter and in the Conditions of Contract called the "Letter of Acceptance") will state the sum that the Board will pay the Bidder in consideration of the execution, completion and remedying defects, if any in the Works by the Contractor as prescribed by the Contract.

- 

he notification of award will constitute the formation of the Contract, subject only to the furnishing of a performance guarantee, within 21 (twenty one) days of issue of letter of acceptance.

- 

f the successful Bidder fails to furnish the required Performance Guarantee of this section and enter into contract, within the above stipulated time, further ten days time will be allowed at the request of the bidder, for which the successful Bidder has to remit a fine equal to Rs.25,000/- (twenty-five thousand only). This fine shall be remitted in the office of the Agreement Authority before executing agreement.

- 

pon the furnishing by the successful Bidder of the Performance Guarantee, the Agreement Authority will promptly notify the other Bidders that their Bids have been unsuccessful and refund the Bid Security.

- **Board's Right to Accept any Bid and to Reject any or all Bids**

The Tender Inviting Authority reserves the right to accept or reject any Bid and to cancel the Bidding process and reject all Bids at any time prior to the award of Contract, without thereby incurring any liability to the affected Bidder or Bidders or any obligation to inform the affected Bidder or Bidders of the grounds for the Tender Inviting Authority's action.

- **The Bid Security may be forfeited:**

- if the Bidder withdraws the Bid after Bid opening during the period of Bid validity including extended period of validity; or

- if any modification is effected to the tender documents.

- in the case of a successful Bidder, if the Bidder fails within the specified time limit to:

sign the Agreement; or

- Furnish the required Performance Guarantee

- If the bidder fails to convince about the reasonability of his bid prices in the case of an unbalanced bid.

- 

n such cases the work shall be rearranged at the risk and cost of the selected bidder.

- **Clarification of Bid**

To assist in the examination, evaluation, and comparison of bids, the Tender Inviting Authority may ask the bidder for required clarification on the information submitted with the bid. The request for clarification and the response shall be in writing or by e-mail, but no change in the price or substance of the Bid shall be sought, offered, or permitted.

- **Bid Validity (Firm Period)**

- In consideration of the bidder being allowed to quote for the work, he should keep the tender firm for a period of **Three months** from the date of opening of the Price Bid.

- Due to departmental or administrative reasons if it is found necessary to keep the tender open for a further period, prior consent of the bidder shall be obtained in writing for every further period of one month.

- **Performance Guarantee and Performance Security Deposit**

The bidder whose tender is accepted shall be required to furnish the following :

Performance Guarantee to be submitted before executing agreement and Performance Security Deposit to be recovered from running bills.

a) Performance Guarantee to be submitted at the award of contract should be **5%** of Contract amount and should be submitted within **21 (Twenty One)** days of receipt of LOA (Letter of Acceptance) by the successful Bidder in the following form

- At least Fifty percent(50%) of Performance Guarantee shall be in the form of Fixed Treasury Deposit / Fixed Deposit from any nationalized or scheduled bank in the name of Agreement Authority which shall remain valid till 28 (twenty-eight) days from the completion of defect liability period and

- The balance performance guarantee will be in the form of Bank guarantee or Fixed Deposit issued from Nationalised /Scheduled Bank/Kerala Financial Corporation to be submitted before executing agreement and shall be valid till 28(twenty-eight) days after the completion of defect liability of the Work.

Bank Guarantee is to be submitted in the format prescribed by the Board in the bid document. Bank Guarantee shall be unconditional and it shall be from any Nationalised Bank/Scheduled Bank to be submitted before executing agreement and shall be valid till 28(twenty-eight) days after the completion of defect liability of the Work, in approved format. The Bank Guarantee on installment basis with lesser period of validity shall not be accepted.

After the submission of Performance Guarantee and its acceptance the EMD or Bid Security will be refunded to the successful bidder.

- Performance Security Deposit to be recovered from running bill

Performance Security Deposit shall be deducted at 2.5% from running bills. Total of performance Guarantee is **5%** of contract amount (agreed PAC) while total of Performance Security Deposit is 2.5% of the value of work done. Total of performance Guarantee and Performance Security Deposit shall not exceed **7.5%** of contract amount.

- For item rate contracts, for each item in the BoQ, if the rate quoted by the bidder falls below 10% of the estimate rate for that item, then the additional performance guarantee is to be required to be deposited for that item.( If the rate quoted by the bidder for an item of work is "x%" below estimate cost where x lies above 10%, the additional performance guarantee for that item of work is equal to (x-10)% of the estimate amount for that item of work). The total of additional performance guarantee for the whole work is the total of individual additional performance guarantee for each item of work calculated as above. Additional performance Guarantee will be required to be deposited either in the form of Treasury Fixed Deposit in the name of Agreement Authority for a period not less than 28 (twenty-eight) days after the completion of works or in the form of unconditional bank guarantee from any Nationalised Bank/Scheduled Bank valid till 28 (twenty-eight) days after the completion of the

Work, in an approved format. The Bank Guarantee on instalment basis with lesser period validity shall not be accepted. This will be released only after satisfactory completion of the work without any interest.

- The above Guarantee amounts shall be payable to the Board without any condition whatsoever.
- The Performance Guarantee shall cover additionally the following guarantees to the Board:
  - The successful bidder guarantees the successful and satisfactory completion of the infrastructure and other related works under the contract, as per the specifications and documents.
  - The successful bidder further guarantees that the infrastructure and equipments provided and installed by him shall be free from all defects in material and workmanship and shall, upon written notice from the Agreement Authority or the Engineer, fully remedy free of expenses to the Board, such defects as developed under the normal use of the said infrastructure within the period of defect liability of the Conditions of Contract.
- The Performance Guarantee is intended to secure the performance of the entire Contract. However, it is not construed as limiting the damages stipulated in the other clauses in the bidding documents.
- The Agreement Authority shall be at liberty to deduct/appropriate from the Contract Performance Guarantee/Performance Security Deposit such sums as are due and payable by the contractor to the Board as may be determined in terms of the contract, and the amount appropriated from the Performance Guarantee/Performance Security Deposit shall have to be restored by Contractor subsequently.
- Performance Security Deposit shall bear no interest and can be released against bank guarantee on its accumulation of a minimum amount of Rs. 5 lakhs subject to the condition that the amount of BG except the last one shall not be less than Rs. 5 lakhs. This amount will be released after passing the final bill as in the case of refund of deposit. The minimum amount of Bank guarantee shall not be less than Rs. 5 lakhs at a time
- If he fails to execute the agreement as stipulated or in the case of maintaining a rate of progress as mentioned in the programme chart the EMD, performance guarantee and Security Deposit shall be forfeited to Board and fresh tenders shall be called for or otherwise disposed off. If as a result of such measures due to the default, of the bidder to pay the requisite deposit, sign contract or take position of the work, any loss to the Board results, the same will be recovered from him as arrears of revenue. Recoveries on this or any other account will be made from the sum that may be due to the bidder on this or any other subsisting contract or under the Revenue Recovery Act, otherwise the Board may decide.
- **Additional Performance Guarantee:**

Additional performance Guarantee will be required to be deposited, if the quoted amount by the bidder falls below 10% of the estimated rate.
- Additional performance guarantee will be required in all cases where quoted rate falls below 10% of the estimate cost.
  - The 10% standard exemption will be applicable to all estimates quoted below estimate cost
  - If the rate quoted by the contractor is "x%" below estimate cost the performance guarantee for an amount equal to (x-10) % of the estimate amount shall be deposited by the contractor as additional performance guarantee. This will be released only after satisfactory completion of the work without any interest.

- **Execution of Agreement**

Executing agreement for the works will be made within the time limit prescribed as follows:

- Time allowed for executing agreement without fine will be 21 days from the date of registration of the communication (selection notice) in the post office.
- Further time of 10 days shall be allowed to execute agreement by realizing a fine of Rs. 25,000/- .
  - In case of failure to execute the agreement within the above period (21 days), the offer of contract shall be cancelled, forfeiting the EMD and taking such other actions as mentioned in the bidding document.
  - Solicitors fee, if any, to be paid to the Law Officers of Board/Government for scrutinizing or drawing up of agreements will be paid and the same recovered from the successful bidder.
  - **Selected Bidder has to submit stamp paper for agreement having appropriate value in accordance with the amended Kerala Stamp Act vide the Kerala Financial Bill 2018.**

- **Time of Completion**

The work should be completed in all respects in **Three months** either from the date of handing over the site or from the 10<sup>th</sup> day of agreement whichever is earlier.

- **Extension of Time of Completion**

**GRACE PERIOD**

The tendering authority will consider genuine request for extension of time of completion of work at the time of executing agreement taking into account the climate conditions or other local problems at the site and grant extension of time up to three months. (from the original time of completion) . The tendering authority shall record the reason in such action with facts and figures.

The grace period will not be granted if the extension is necessitated due to the default on the part of the bidder.

- For extension of time of completion beyond the grace period time will be increased at the following rates.

Period of Extension	Rate of fine
First extension	1% of PAC subject to a minimum of Rs.1000/- and maximum of Rs.50000/-.
Beyond First Extension	2% of the PAC subject to minimum Rs.2000/- and Maximum Rs.1,00,000/-.

- Extension of time of completion that can be granted at a time will not exceed 25% of the original time or six months whichever is less. Maximum extension of time of completion will be limited to half of the original time of completion.

- **Release of Performance Guarantee :**

- The Performance Bank Guarantee submitted in the form of Bank Guarantee will be returned to the Contractor without any interest after 28 days after the satisfactory completion of defect liability period.

- Half of Performance Guarantee in the form of treasury fixed deposit can be released upon submission of an indemnity bond of equal amount by the Contractor indemnifying the Board any loss on account of this after the virtual completion of the Work.

- The balance half of Performance Guarantee in the form of fixed deposit will be released after 28 days after the satisfactory completion of Defects Liability Period.

- No interest, in any circumstances, shall be payable by the Board to the bidder for the EMD/ security deposit (performance guarantee), performance security deposit (Retention) and additional performance guarantee furnished.

- **Release of Performance Security Deposit :**

The performance security amount shall bear no interest and can be released against bank Guarantee on its accumulation of a minimum amount of Rs.5 lakhs subject to the condition that the amount of BG except the last one shall not be less than Rs.5 lakhs. This amount will be released after passing the final bill as in the case of refund of deposit.

- **Release of Additional Performance Guarantee**

Additional Performance Guarantee will be released without any interest only after satisfactory completion of work.

- **Defect liability Period**

a) For this work Defect liability Period is fixed as **36 months**

b) **Maintenance by contractor** during defects liability period: All defective items of work and defects noticed and brought to the attention of the Contractor during the Defects Liability Period shall be promptly and expeditiously attended to and replaced and/or rectified and made good by the Contractor at his own cost, to the complete satisfaction of the Engineer-in-Charge. The Contractor shall establish a field laboratory at the site at his own expense.

c) The solar panels must have a warranty period of 5 to 10 years

- **First tier Quality Control Tests**

a) Primary responsibility of maintaining quality of all items of work as per specifications and standards prescribed in the PWD Quality Control Manual vests with the Contractor. The Contractor shall carry out all First tier Quality Control tests prescribed in the PWD Quality Control Manual at his own expense and submit it along with the bills submitted for payment. The Contractor shall establish a field laboratory at the site at his own expense.

b) He shall also bear expenses towards rectification works, if any required during Technical Audit conducted after completion of the work.

- **Corrupt or Fraudulent Practices**

a) It is required that the bidders observe the highest standard of ethics during the procurement and execution of such contracts. In pursuance of this policy, it is defined, for the purposes of this provision, the terms set forth below as follows:

- “Corrupt practice” means the offering, giving, receiving or soliciting of anything of value to influence the action of a public official in the procurement process or in contract execution; and
- “Fraudulent practice” means a misrepresentation of facts in order to influence a procurement process or the execution of a contract to the detriment of the Board and includes collusive practice among Bidders (prior to or after bid submission) designed to establish bid prices at artificial non- competitive Government of the benefits of free and open competition.
- “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;
- “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.

b)The Board will reject a bid, and / or award if it determines that the Bidder recommended for award has engaged in any of the corrupt or practices in competing for the contract in question and will declare the firm ineligible, either indefinitely or for a stated period of time, to be awarded a contract, if it at any time determines that the firm has engaged in corrupt or fraudulent practices in competing for, or in executing the contract.

#### **Forms and declarations**

Various forms and formats for declarations to be submitted by the Bidder for Bid submission and post-qualification detail submissions are included in the sections- FORMS and Post-qualification Information. Bidders are requested to fill in the required forms and declarations and submit the same with their bids both online and in hard copy

**EXECUTIVE ENGINEER**

**KSHB,  
Thrissur.  
(For and on behalf of KSHB)**

### **Part II- GENERAL CONDITIONS OF CONTRACT**

- **Board**  
Board means Kerala State Housing Board
- **Employer**  
Employer means Board on whose behalf the Work is taken up for execution. Employer will carry out its functions and obligations through officers who have been delegated powers.
- **Accepting Authority and Agreement Authority**  
Chief Engineer of the Board is the Accepting Authority and Executive Engineer of the Board is the Agreement Authority
- **Technical Sanction Authority**  
Technical Sanction Authority means the competent Departmental Officer who has issued the technical sanction for the Work.

- **Engineer**  
Engineer means all Engineers in charge of the Work from Chief Engineer to Assistant Engineer.
- **Engineer-in-Charge**  
Engineer-in-Charge means the Executive Engineer, PWD, who is responsible for the execution of the Work.
- **Contract**  
Contract is the agreement between the Agreement Authority and the selected Bidder to execute, complete and maintain the Work.
- **Contractor**  
Contractor means person or persons or firms who have entered into contract for the execution of the work subject to the eligibility conditions of the NIT.
- **Contract Price**  
Contract Price is the price stated in the Letter of Acceptance and thereafter as adjusted in accordance with the provision of the contract.

**10. Bid or Tender**

Bid or Tender means the Contractor's priced offer to the Board for the execution and completion of the Work and the remedying of any defects therein in accordance with the provisions of Contract.

**11. Bill of Quantities**

Bill of Quantities means the priced and completed Bill of Quantities forming part of the bid.

**12. Specification**

Specification means the instructions, provisions, conditions and detailed requirements contained in the tender documents which form part of the contract and any modification or addition made or approved by the Accepting Authority.

**13. Drawings**

Drawings means all drawings, calculations and technical information related to the Work provided by the Engineer from time to time to the Contractor under the Contract.

**14. Letter of Acceptance or selection notice**

Letter of Acceptance or selection notice means intimation issued by the Accepting Authority as formal acceptance of Bid by the Board.

**15. Date of commencement**

Date of commencement means the date of handing over the site to the Contractor.

**16. Time of completion**

Time of completion means the period allowed for completing all works related to the Work including carrying out and passing the required quality control tests prescribed by the Quality Manual published by the PWD

**17. Date of completion**

Date of completion shall be the date of issue of virtual completion certificate. The virtual

completion certificate shall be issued by the Engineer-in charge within 15 days of the final measurement and shall specify the work has been completed satisfactorily by the contractor and taken over by the Board. In case of defects liability period the works shall be finally taken over after completion of defects liability period.

**18. Quality control tests**

Quality control tests means all relevant tests prescribed by the PWD Quality Control Manual applicable to the Work which are to be made and passed before each part bill is presented for payment.

**19. Defect**

A Defect is any part of the work not completed in accordance with the contract.

**20. Defects Liability Period**

Defects Liability Period is the period named in the NIT and calculated from the date of completion.

**21. Plant**

Plant is any integral part of the works which is to have a mechanical, electrical, electronic or biological function.

**22. Equipment**

Equipment means contractor's machinery and vehicles brought temporarily to site for execution of the Work.

**23. Site**

Site means the places provided by the Board where the Work is to be executed. It may also include any other place or places as forming part of the site, mentioned in the Contract.

**24. Materials**

Materials means all supplies, including consumables used by the contractor for incorporation in the works

**25. Works**

Works are what the Contract requires the contractor to construct, install and run over to the Board as defined in NIT.

**26. Days**

Days are calendar days, months calendar months.

**27. "Codes"**

"Codes" shall mean the following, including the latest amendments, and/or replacements, if any:

- Bureau of Indian Standards/Indian Roads Congress relevant to the works under the Contract and their specifications. If Indian Standards are not available British Standards or AASHTO Standards are to be followed.
- Other Internationally approved Standards and/or rules and regulations touching the subject matter of the Contract.
- Any other laws, rules, regulations and Acts applicable in India with respect to labour, safety, compensation, insurance etc.



## **28. Terms and expressions**

Terms and expressions, not defined herein, shall have the same meaning as are assigned to them in the Indian Contract Act, and failing that in the General Clauses Act.

## **29. "Government Approvals"**

"Government Approvals" shall mean all permits, licenses, authorisations, consents, clearances, decrees, waivers, privileges, approvals from and filing with government instrumentalities necessary for the development, construction and operation of the Work.

## **30. Measurement Books:**

Measurement Books: The "measurement books" shall be defined as the books with serially numbered and maintained during the currency of the Work to record all measurements qualifying for payment. Except for quantities of work paid on level basis, all measurements shall be recorded in the measurement book. For measurements taken on level basis, the levels shall be entered in properly numbered field books. All measurement books and Field Books shall be certified by the Engineer-in-Charge before entering measurements.

## **31. Extent:**

The Contractor shall carry out and complete the Work under the Contract in every respect, and his work shall include the supply of all labour, equipment, materials, plant and machinery, tools, transportation, form work, scaffolding and everything else necessary for the proper execution and completion of the Work in accordance with the Contract Documents and to the satisfaction of the Engineer-in charge. The Contractor shall be fully responsible and liable for everything and all matters in connection with or arising out of or being a result or consequence of his carrying out or omitting to carry out any part of the Work. Where any parts of the Work may be executed by Sub Contractors, such responsibility and liability of the Contractor shall cover and extend to the work of all such Sub-Contractors.

## **32. Site conditions:**

- Contractor to satisfy himself about site conditions: The Contractor ensures that before submitting bids for the Work the Contractor has visited the Site and satisfied himself about the Site conditions for construction and for logistics and smooth flow of workmen and materials as well as permission from Authorities for this purpose.
- It will be the responsibility of the Contractor to obtain necessary land for stacking the materials and establishing plants and equipment's for carrying out the work, if the specified site of work is of less extents.
- Land required for the work may not be available in full. Further land will be handed over as and when it is received from the Land Acquisition Authority.
- In the case of any delay in shifting the utility services like Telephone posts, Electric posts, Electric over head line and cables, water lines etc. by the utility Department, the Employer shall not in any way be liable to pay damages on account of this delay, instead a proportionate extension of time for completion of work will be granted in deserving cases on application by the Contractor.

## **33. Access to site by the contractor:**

The access to the Site will be shown immediately on award of the Contract to the Contractor and the Site shall be shared with other Contractors and Sub-Contractors as applicable. The Contractor shall upon being given such access commence the Work and diligently proceed with the execution of the Work in accordance with the Contract Documents. Access to the Site by the Contractor shall be merely a licence for carrying out the construction of the Work under the Contract, and the Contractor shall not by his being allowed such entry on the Site, acquire any right, lien or interest either in the Work carried out by him under the Contract or anything appurtenant or attached thereto or to any part of the Site, and his claim will only be in the nature of money found due and payable to him in accordance with the certificates issued by the Engineer-in-charge under the provisions contained herein. The Work shall be free from all liens, charges or claims of whatsoever nature from any party other than the Engineer. The Engineer shall have a lien over all work performed by the Contractor, Sub-Contractors and Vendors and also for the materials and equipment brought on Site by them.

### **34. Approach road**

The Board does not undertake to construct or make available any approach road or other means of approach to the proposed work site and the contractor shall get acquainted with the available means of approaches to the proposed site and quote for the various items. The Board shall not be liable for any claim raised later on the plea of non-availability or non-access to the site

### **35. Treasures, Antiquities found are property of Board:**

All fossils, antiquities and other objects of interest or value, which may be found on the Site at the commencement or during the progress of the Work, shall be the property of the Board. The Contractor shall carefully take out and preserve all such fossils, antiquities and objects and shall immediately deliver the same in their discovered state into the possession of the Board.

### **36. Nature of contract**

- The Contract shall be an item rate Contract wherein the item rates are for the finished work as per the Contract Documents. The estimated cost is tentative based on the estimated quantities and is liable to change during execution as per the actual quantities executed and approved by the Engineer-in charge. The Contractor understands and agrees that the amount payable is assessed on a re-measurable basis in accordance with the BoQ rates. The Contract Price shall include payment for the supply of all labour (including payment to his Sub-Contractors), equipment, materials, plant and machinery, tools, transportation, formwork, scaffolding, works under this contract and all applicable taxes, duties, octroi, levies, royalties, fees, insurance premiums, contributions towards employees benefits including Employee State Insurance and Provident Funds, arrangement of power and water and all services and activities constituting the Scope of Work defined in the General Conditions of Contract. The Contract Price shall also include the Contractor's establishment, infrastructure, overheads & profits, establishing site laboratories (for works costing more than Rs 2 Crores), first tier quality control tests, expenses for all rectifications including that necessitated as a result of bad quality and all other charges required by the Contract to be borne by the Contractor and necessary for the proper execution and completion of the Work under the Contract, in conformity with the Contract Documents and according to the best engineering and construction practices and to the satisfaction of the Engineer-in-charge. Goods & Services tax (GST), wherever legally applicable, shall be paid by the contractor to the concerned Authorities and the employer shall pay the applicable GST to the Contractor at the time of settlement of bills for the works done as per this contract.
- No prices escalation shall be allowed during the period of the contract for works.

### **37. Notices, Fees, Byelaws, Regulations, etc**

- The Contractor shall comply with all applicable laws and Government Acts including the Byelaws or regulations of Central and / or Local Authorities relating to the Work in so far as labour, construction, fabrication and installation activities are concerned, and he shall obtain from the Central and / or Local Authorities all permissions and approvals required for the plying of trucks, construction machinery etc., and also for construction of temporary offices, labour camps, batching plant, hot mix plant, base camp, stores and other temporary structures in connection with the Work, and the Contractor shall give all notices and pay all fees and charges that are and that can be demanded by law there under.
- The contractor is bound to follow relevant Kerala State Government orders, circulars, Kerala PWD Manuals etc prevailing at the time of contract connected to the execution of the work under the contract even though specific reference to these are not provided elsewhere in the contract conditions.

### **38. Licenses and permits**

The Contractor shall directly obtain all licences and permits for the materials under Government control, and those required to be obtained by the Contractor for the execution of the Work. The Contract Price shall include all transportation charges and the other expenses that may be incurred in this connection.

### **39. Contract documents**

- The following documents shall constitute the Contract documents:
  - Article of Agreement
  - Notice Inviting Tender
  - Letter of Acceptance of Tender indicating deviations, if any, from the conditions of Contract incorporated in the Tender document issued to the Bidder and/or the Bid submitted by the Bidder, conditions of contract, including general terms and conditions, instructions to Bidders, additional terms and conditions, technical terms and conditions, erection terms and conditions, special conditions, if any etc. forming part of the Agreement,
    - Specifications, where it is part of Tender Documents,
    - Scope of works/ Bills of quantities / Schedule of works / quantities and
    - Contract Drawings and finalized work programme.
    - After acceptance of Tender the Contractor shall be deemed to have carefully examined all Contract Documents to his satisfaction.
  - The Contractor shall enter into a Contract Agreement with the Agreement Authority within 21 (Twenty One) working days from the date of 'Acceptance of Tender' or within such extended time as may be granted by the Employer. The date of despatch of Letter of Acceptance by registered post shall be the date of Acceptance of Tender. The performance Guarantee for the proper fulfilment of the Contract shall be furnished by the contractor in the prescribed form within 21 (Twenty One) days of 'Acceptance of Tender'. The performance Guarantee shall be as per terms prescribed in the NIT.
    - The agreement, unless otherwise agreed to, shall be signed within 21 (twenty-one) working days from the date of Acceptance of Tender, at the office of the Agreement Authority on a date and time to be mutually agreed. The Contractor shall provide required details for signing of the contract like performance guarantee in copies as required, appropriate power of attorney and other requisite materials. In case it is agreed mutually that the contract is to be signed beyond the stipulated time as specified in Instruction to the Bidders, the bid security submitted with the tender will have to be extended accordingly.
    - After the signing of the agreement with the Agreement Authority and the Contractor, two certified copies of the agreement are to be made. Original shall be kept with the Agreement authority and the Contractor shall be provided with one certified copy and the other certified copy shall be kept with the Engineer-in Charge. None of these documents shall be used for any purpose other than this Contract and the Contractor shall ensure that all persons employed for this Contract strictly adhere to this.
- The laws applicable to this Contract shall be the laws in force in India.

### **40. Sublet:**

No part of the contract shall be sublet without written permission of the Executive Engineer nor shall transfer be made by power of attorney authorize other to receive payment on the bidders behalf.

### **41. Patent rights and royalties**

Royalties and fees for patent covering materials, articles, apparatus, devices, equipment or processes used in the works shall be deemed to have been included in the Contract Price. The Contractor shall satisfy all demands that may be made at any time for such royalties or fees and he alone shall be liable for any damages or claims for patent infringements and shall keep the Employer indemnified in that regard. The Contractor shall, at his own cost and expense, defend all suits or proceedings that may be instituted for alleged infringement of any patent involved in the works, and, in case of an award of damages, the Contractor shall pay for such award. In the event of any suit or other proceedings instituted against the Employer, the same shall be defended at the cost

and expense of the Contractor who shall also satisfy/comply any decree, order or award made against the Employer. But it shall be understood that no such machine, plant, work, material or thing for any purpose or any manner other than that for which they have been furnished and installed by the Contractor and specified under these specifications. Final payment to the Contractor by the Employer will not be made while any such suit or claim remains unsettled. In the event any apparatus or equipment, or any matter thereof furnished by the Contractor, is in such suit or proceedings held to constitute infringement, and its use is enjoined, the Contractor shall, at his option and at his own expense, either procure for the Employer, the right to continue use of said apparatus, equipment or part thereof, replace it with non-infringing apparatus or equipment or modify it, so it becomes non-infringing.

#### **42. Variation in quantity**

- The right to carry out the work in conformity with or in a manner entirely different from the terms of this invitation that may be considered most suitable before or subsequent to the receipt of tenders due to exigencies of work, is reserved with the Board.
- Engineer-in charge reserves the right to vary the quantities of items or groups of items to be ordered as specified in the Bill of quantities, as may be necessary, during the execution of the Contract.
- Abnormally High Quoted Rate (AHQR)-Items for which the quoted rate is having a deviation of more than 25 % over the corresponding rate in the technically sanctioned estimate.
- Abnormally Low Quoted Rate (ALQR)- Items for which the quoted rate is having a deviation of less than 25% below the corresponding rate in the technically sanctioned estimate.
- For AHQR items, the Contractor is bound to execute up to the agreed quantity. In case of variation over the agreed quantity, the admissible rate for the excess quantity shall be limited to the technically sanctioned estimate rate modified by the overall tender excess/tender deduction subject to a maximum of the PWD local market rate prevailing at the time of ordering the excess quantity.
- For the other items, the Contractor is bound to execute up to 25% over the agreed quantity. In case of variation over 25 % of the agreed quantity, the admissible rate for the excess quantity shall be limited to the technically sanctioned estimate rate modified by the overall tender excess/tender deduction subject to a maximum of the PWD local market rate prevailing at the time of ordering the excess quantity.
- No increase shall be permitted within the original contract and the rate in excess of market rate shall not be given under any circumstances. Up on rate revision shall be considered only in exceptional cases which shall be approved by the Employer for the enhanced rates based on the recommendation of the Engineer.
- Subject to clauses e and f, the department reserves the right to arrange such varied quantities of work through a separate contract.
- The Contractor is bound to carry out sinking of wells increase up to 10 meter (ten meter) extra depth beyond the estimated design depth and rate for which shall be paid as per schedule of rate and extra item conditions. In case of pile foundation, precast or cast in situ, in the same conditions as above shall apply

#### **43. Deductions from contract price**

All costs, damages or expenses, which the Board may have paid, for which under the Contract the Contractor is liable, will be claimed by the Employer. The Engineer-in charge shall deduct the amount, from any moneys due or becoming due by him to the Contractor under the Contract or may be recovered by actions of law or otherwise, if the Contractor fails to satisfy the Employer of such claims.

#### **44. Insurance**

- The Contractor shall provide, in the joint names of the Board and the Contractor, insurance covers in two parts, i.e. (a) from the start date to the completion date, and (b) for the Defect Liability period, in the amounts for the following events which are due to the Contractor's risks:

- loss of or damage to the Works, Plants and Materials;
  - loss of or damage to Equipment;
  - loss of or damage of property (except the Works, Plant, Materials and Equipment) in connection with the Contract;
  - Workman compensation policy to cover personal injury or death.
- Policies and Certificates for insurance shall be delivered by the Contractor to the Engineer's approval before the Start Date. All such insurance shall provide for compensation to be payable in the types and proportions of currencies required to rectify the loss or damage incurred.
    - Alterations to the terms of insurance shall not be made without the approval of the Employer.
    - Both parties shall comply with any conditions of the insurance policies.
    - Premium for all insurance policies shall be paid and borne by the Contractor and shall not be reimbursable. The Contractor shall provide to the Engineer-in-Charge all policies of insurance in original. These policies shall be fully executed and shall state that the policies cannot be cancelled until completion of the Contract or completion of defects liability period and any extensions thereof. The Contractor shall obtain policies from all Sub-Contractors and thereby assume similar responsibility for any claims or losses to the Board and Engineer-in-charge resulting from failure of any of the Sub-Contractors to obtain adequate insurance protection in connection with their work and shall indemnify and keep indemnified the Board and Engineer-in-charge including their employees, officers, servants, agents and any other person moving in the premises, accordingly.

#### **45. Liability for accidents and damages**

Under the Contract, the Contractor shall be responsible for any loss or damage to the works under this contract until the works are completed and taken over in accordance with the Contract.

#### **46. Unlimited liability:**

- In addition to the liability imposed by law upon the Contractor for injury (including death) to persons or damage to property by reason of the negligence of the Contractor or his agents, which liability is not impaired or otherwise affected hereby, the Contractor hereby assumes liability for and agrees to save the Employer and Engineer-in-Charge including their employees, officers, servants, agents and any other person moving in the premises harmless and indemnifies them from every expense, liability or payment by reason of any injury (including death) to persons or damage to property suffered through any act or omission of the Contractor, his employees, agents, servants, workmen, suppliers or any of his Sub-Contractors, or any person directly or indirectly employed by any of them or from the conditions of the Site or any part of the Site which is in the control of the Contractor or his employees or any of his Sub-Contractors, or any one directly or indirectly employed by either of them or arising in any way from the Work.
- All insurance claims, payable by the insurers, shall be paid to the Board which shall be released to the Contractor in instalments as may be certified by the Engineer-in-charge for the purpose of rebuilding or replacement or repair of the works and/or goods destroyed or damaged for which payment was received from the insurers.

#### **47. Hand Over / Take Over of Site :**

- The Contractor shall take over charge of the site **within 10 days** after execution of agreement and commenced the work. If the contractor does not turn up, the acknowledgement form for handing over the site duly signed by the site officers shall be sent to the contractor through registered post, it shall be deemed that the contractor has taken over the site from the date of posting
  - Recovery towards risk and cost will be made from the performance guarantee, if the contractor does not turn up to take charge of the site within the prescribed time.

#### **48. Time of Completion**

- Time: “the essence of the contract”: The time allowed for carrying out the Work as entered in the tender shall be strictly observed by the Contractor and shall be deemed to be of the essence of the Contract and shall be reckoned from the date of handing over the site to the Contractor. The Work shall proceed with due diligence until Final Completion. The Contractor shall prepare a Construction Programme with time schedule keeping in view the completion period stipulated for specific portions of the Work and also the overall completion time and submit the same for the approval of the Tendering Authority after the receipt of letter of acceptance or selection notice. The approved work programme shall be made as part of the contract agreement. The Contractor shall comply with this time schedule. In the event of the Contractor failing to comply with the overall and individual milestones contained in the time schedules, he shall be liable to pay liquidated damages as provided for in this Contract.
- Completion Period: The Date of commencement will be the date of site handover or the 10th day after agreement whichever is earlier. The Milestone dates shall be those specified in the Contract Data or as mutually discussed and agreed. In case the Contractor fails to meet the above stipulated completion period or milestone achievement period, Contractor shall be liable to pay to the Board, liquidated damages as specified in Clause “Liquidated Damages” of General Conditions of Contract. In addition to his own work in the overall time period, the Contractor shall provide for the works of other Sub-contractors and Vendors, including those employed directly by the Employer / Engineer-in-Charge.
- The contractor has to take over charge of the site by signing the acknowledgement form and commence the work within 10 days from the date of execution of agreement.
- If the site is not taken over by the contractor by signing the acknowledgement form, Engineer will forward the filled up form by registered/speed post, recording the date of taking over as the tenth day from the date of execution of agreement unless otherwise decided.
- The contractor has to resubmit the acknowledgement form duly signed within three days of receipt and commence the works.
- Unless otherwise decided by the agreement authority, it shall be deemed that the contractor has taken over charge of the site on the tenth day from the date of agreement irrespective of whether he has received the acknowledgement by post or has resubmitted it with his signature. The work will be terminated at his risk and cost if the contractor does not resubmit the acknowledgement form and commence the work.
- Recovery towards risk and cost will be made from the performance guarantee, if the contractor does not turn up to take charge of the site within the time prescribed,
- The works shall be carried out in accordance with the programme submitted by the contractor and agreed to by the Agreement Authority at the time of executing agreement and updated subsequently with the approval of the Agreement Authority.

#### **49. Liquidated damages (LD)**

- If the Contractor fails to maintain the required progress in terms of the agreed time and progress chart or to complete the work and clear the site on or before the date of completion of Contract or extended date of completion, he shall without prejudice to any other right or remedy available under the law to the Employer on account of such breach, pay as compensation/ Liquidated damages @ 1(one) percent of the contract price per week of delay or part thereof. The aggregate of such compensation / compensations shall not exceed 10 (ten) percent of the contract value. This will also apply to items or group of items for which separate period of completion has been specified. The amount of compensation may be adjusted or set off against any sum payable to the contractor under this or any other contract with the Employer.

- The Employer, if satisfied, that the work can be completed by the Contractor within a reasonable time after the specified time of completion, may allow further extension of time at its discretion as per clause “Extension of time of completion”. In the event of extension granted being with Liquidated Damages, the Employer will be entitled without prejudice to any other right or remedy available in that behalf, to recover from the Contractor as agreed damages equivalent to @ 1(one) percent of the contract price per week of delay or part thereof.
- If the contractor achieves balance milestones, even though he has failed to achieve initial milestones, and the work has been completed in the specified/original time of completion, the Agreement Authority may release the already levied liquidated damages at his sole discretion.
- The Agreement Authority, if not satisfied that the works can be completed by the Contractor and in the event of failure on the part of the Contractor to complete work within further extension of time allowed as aforesaid, shall be entitled, without prejudice to any other right, or remedy available in that behalf, to terminate the contract.
- The Agreement Authority, if not satisfied with the progress of the contract and in the event of failure of the Contractor to recoup the delays in the mutually agreed time frame, shall be entitled to terminate the contract.
- In the event of such termination of the contract as described in clauses 49. d and 49.e or both, the Employer, shall be entitled to recover Liquidated Damages up to ten percent (10%) of the contract value and forfeit the performance guarantee or Performance Security Deposit made by the Contractor to make good the losses besides getting the work completed by other means at the risk and cost of the Contractor.
- The Employer may waive the payment of compensation in the case of contracts where milestones are fixed, depending upon merit of the case, on request received from the Contractor if the entire work is completed within the date as specified in the Contract or as validly extended without stipulating any penalty.

#### **50. Contractor's default**

- If the Contractor shall neglect to execute the works with the diligence and expedition or shall refuse or neglect to comply with any reasonable orders given to him, in writing by the Engineer in connection with the works or shall contravene the provisions of the Contract, the Agreement Authority may give notice in writing to the Contractor to make good the failure, neglect or contravention complained of. Should the Contractor fail to comply with the notice within thirty (30) days from the date of service thereof, then and in such case the Agreement Authority shall be at liberty to employ other workmen and forthwith execute such part of the works as the Contractor may have neglected to do or if the Agreement Authority shall think fit, it shall be lawful for him, without prejudice to any other right he may have under the Contract, to take the works wholly or in part thereof and in that event the Employer shall have free use of all Contractor's equipment that may have been at the time on the site in connection with the works without being responsible to the Contractor for fair wear and tear thereof and to the exclusion of any right of the Contractor over the same, and the Agreement Authority shall be entitled to retain and apply any balance which may otherwise be due on the Contract by him to the Contractor, or such part thereof as may be necessary, the payment of the cost of executing the said part of the works or of completing the works as the case may be plus a fine of 20 percent of the value of work so carried out. If the cost of completing the works or executing a part thereof as aforesaid plus a fine of 20 percent of the value of work so carried out shall exceed the balance due to the Contractor, the Contractor shall pay such excess. Such payment of excess amount shall be independent of the liquidated damages for

delay, which the Contractor shall have to pay if the completion of works is delayed. In addition, such action by the Agreement Authority as aforesaid shall not relieve the Contractor of his liability to pay liquidated damages for delay in completion of works as defined in clause 15. The termination of the Contract under this clause shall not entitle the Contractor to reduce the value of the performance bank guarantee nor the time thereof. The performance guarantee shall be valid for the full value and for the full period of the Contract including Defects Liability Period.

- If the Contractor fails to complete the work and the Agreement is cancelled, the amount due to him on account of work executed by him, if payable, shall be paid to him only after due recoveries as per the provisions of the Contract and that too after alternative arrangements to complete the work has been made.

#### **51. Delays by Employer or his authorised agent**

In case the Contractor's performance is delayed due to any act of omission on the part of the Employer or his authorized agents, then the Contractor shall be given due extension of time for the completion of the works, to the extent such omission on the part of the Employer has caused delay in the Contractor's performance of his work. Regarding reasonableness or otherwise of the extension of time, the decision of the Engineer shall be final. The reasons for such delays shall be recorded in the hindrance register and shall be certified by the Field Engineers in charge of the work.

#### **52. Extension of time of completion**

- On happening of any events causing delay as stated hereinafter, the Contractor shall intimate immediately in writing to the Engineer-in-charge:

- due to any reasons defined as Force Majeure.
- non-availability of stores which are the responsibility of the Employer to supply
- non-availability or breakdown of tools and plant to be made available by the Employer
- Inclement weather conditions
- delay on the part of the Contractors or tradesmen engaged by the Employer not forming part of the Contract, holding up further progress of the work
- non-availability of design or detailed drawings or specifications time, which are to be made available by the Employer during progress of the work
- any other causes which, at the sole discretion of the Employer is beyond the control of the Contractor.

- A "Hindrance Register" shall be maintained by the Departmental Officer (not below the rank of AE) at site to record the various hindrances, encountered during the course of execution. The entries made in hindrance register are to be approved by the Engineer in charge. Contractor is permitted to sign the register and record his remarks.

- The Contractor may request the Agreement Authority in writing for extension of time within 14(fourteen) days of happening of such event causing delay stating also, if practicable, the period for which extension is desired. The Agreement Authority may, considering the eligibility of the request, give a fair and reasonable extension of time for completion of the work. Such extension shall be communicated to the Contractor in writing by the Agreement Authority through the Engineer-in-charge within one month of the date of receipt of such request. The Contractor shall however use his best efforts to prevent or make good the delay by putting his endeavours constantly as may be reasonably required of him to the satisfaction of the Engineer-in-charge. Related entries in the hindrance register shall also to be submitted along with the request for extension.

- When the period fixed for the completion of the Contract is about to expire, the question of extension



of the Contract may be considered at the instance of the Contractor or the Employer or the both. The extension will have to be by both party's agreement, expressed or implied.

### **53. Termination, suspension, cancellation & foreclosure of contract**

- Time is the essence of the contract. The contractor shall submit the chronological programme for execution of each stage of work before executing agreement, which shall be examined by the agreement authority and approve programme form part of the agreement. Undue and avoidable delay in the execution of the work will render the contractor liable to penalty.
- The Chief Engineer/ Chief Project Engineer /Regional Engineer/ Executive Engineer reserves the right to terminate the contract at risk and cost of the contractor at any time in case of bad work, slow progress (failure to maintain the progress as mentioned in the Programme chart) or violation of rules in other ways
- The Chief Engineer/ Chief Project Engineer / Regional Engineer reserves the right to abandon the work at any stage if he finds such a course necessary and the contractor will be paid only for the finished items of works.
- The Agreement Authority shall, in addition to other remedial steps to be taken as provided in the conditions of Contract, be entitled to cancel the Contract in full or in part, if the Contractor makes default in proceeding with the works with due diligence and continues to do so even after a notice in writing from the Engineer-in charge, then on the expiry of the period as specified in the notice, or commits default/breach in complying with any of the terms and conditions of the Contract Or fails to complete the work or items of work with individual dates of completion, on or before the date/dates of completion or as extended by the Agreement Authority, The Agreement Authority shall in such an event give fifteen (15) days' notice in writing to the Contractor informing his decision to do so.
- The Contractor upon receipt of such notice shall discontinue the work on the date and to the extent specified in the notice, make all reasonable efforts to obtain cancellation of all orders and Contracts to the extent they are related to the work terminated and terms satisfactory to the Employer, stop all further sub-Contracting or purchasing activity related to the work terminated, and assist the Employer in maintenance, protection, and disposition of the works acquired under the Contract by the Employer.
- On cancellation or on termination of the Contract, the Engineer-in-charge shall have powers
- to take possession of the site and any materials, constructional plant, implements, stores, etc. thereon.
- To carry out the incomplete work by any means at the risk of the defaulted Contractor.
- To determine the amount to be recovered from the Contractor for completing the remaining work or in the event the remaining work is not to be completed the loss/damage suffered, if any, by the Employer after giving credit for the value of the work executed by the Contractor up to the time of termination/cancellation less on account payments made till date and value of Contractor's materials, plant, equipment, etc., taken possession of after termination/cancellation.

### **54. No waiver of rights**

Neither the inspection by the Employer or the Engineer or Engineer's Representatives or any of their officials, employees or agents nor any order by the Employer or the Engineer for payment of money or any payment for

or acceptance of, the whole or any part of the works by the Employer or the Engineer, nor any extension of time, nor any possession taken by the Engineer, inspection by Chief Technical Examiner or his authorised representatives and mandatory waiting period for inspection by CTE wing etc shall operate as a waiver of any provision of the Contract, or of any power herein reserved to the

Employer, or any right to damages herein provided, nor shall any waiver of any breach in the Contract be held to be a waiver of any other or subsequent breach.

**55. Certificate not to affect right of Employer and liability of contractor**

No interim payment certificate of the Engineer, nor any sum paid on account, by the Employer, nor any extension of time for execution of the works granted by the Engineer shall affect or prejudice the rights of the Employer against the Contractor or relieve the Contractor of his obligations for the due performance of the Contract, or be interpreted as approval of the works done or of the equipment furnished and no certificate shall create liability for the Employer to pay for alterations, amendments, variations or additional works not ordered, in writing, by the Engineer or discharge the liability of the Contractor for the payment of damages whether due, ascertained, or certified or not, or any sum against the payment of which he is bound to indemnify the Employer, nor shall any such certificate nor the acceptance by him of any sum paid on account or otherwise affect or prejudice the rights of the Contractor against the Employer.

**56. Grafts and commissions etc.**

Any graft, commission, gift or advantage given, promised or offered by or on behalf of the Contractor or his partner, agent, officers, director, employee or servant or any one of his or their behalf in relation to the obtaining or to the execution of this or any other Contract with the Employer, shall, in addition to any criminal liability which it may incur, subject the Contractor to the cancellation of this and all other Contracts and also to payment of any loss or damage to the Employer resulting from any cancellation. The Employer/Engineer shall then be entitled to deduct the amount so payable from any moneys otherwise due to the Contractor under the Contract.

**57. Language and measures**

All documents pertaining to the Contract including specifications, schedules, instructions, drawings or any other writing shall be written in English language. The metric system of measurement shall be used exclusively in the Contract. Measurements, quantities, prices or rates and amounts shall have two digit precision.

**58. Release of information**

The Contractor shall not communicate or use in advertising, publicity, sales releases or in any other medium photographs or other reproduction of the works under this Contract, or descriptions of the site, dimensions, quantity, quality or other information, concerning the works unless prior written permission has been obtained from the Employer.

**59. Completion of contract**

Unless otherwise terminated under the provisions of any other relevant clause, this Contract shall be deemed to have been completed at the expiration of the Defects Liability Period as provided for under the NIT.

**60. Enforcement of terms**

The failure of either party to enforce at any time of the provisions of this Contract or any rights in respect thereto or to exercise any option herein provided, shall in no way be construed to be a waiver of such provisions, rights or options or in any way to affect the validity of the Contract. The exercise by either party of any of its rights herein shall not preclude or prejudice either party from exercising the same or any other right it may have hereunder.

**61. Engineer 's decision**

•

in respect of all matters which are left to the decision of the Engineer including the granting or withholding of

the certificates, the Engineer shall, if required to do so by the Contractor, give in writing a decision thereon.

- 

If the Engineer's decision is not in accordance with the meaning and intent of the Contract, the Contractor may file with the Engineer within 15(fifteen) days after receipt of the decision, a written objection to the decision. Failure to file an objection within the allotted time will be considered as acceptance of the Engineer's decision and the decision shall become final and binding.

- 

The Engineer's decision and the filing of the written objection thereto shall be a condition precedent to the right to any legal proceedings. It is the intent of the agreement that there shall be no delay in the execution of the works and the decision of the Engineer as rendered shall be promptly observed.

## **62. Co-operation with other Contractors, Consultants & Engineers**

The Contractor shall co-operate with the Employer's other Contractors Consultants and consulting Engineers, if employed in the site, and freely exchange with them such technical information as is necessary for the satisfactory execution of works.

## **63. Variations or additions**

- No alterations, amendments, omissions, suspensions or variations of the works (hereinafter referred to as "Variation") under the Contract as detailed in the Contract documents, shall be made by the Contractor except as directed in writing by the Engineer, but the Engineer shall have full power subject to the provision hereinafter contained from time to time during the execution of the Contract, by notice in writing, to instruct the Contractor to make such variation without prejudice to the Contract. The Contractor shall carry out such variation and be bound by the same conditions as far as applicable as though the said variation occurred in the Contract documents. If any suggested variation would, in the opinion of the Contractor, if carried out, prevent him from fulfilling any of his obligations or guarantees under the Contract, he shall notify the Engineer thereof in writing and the Engineer shall decide forthwith, whether or not the same shall be carried out and if the Engineer's guarantees shall be modified to such an extent as may be mutually agreed. Any agreed difference in cost occasioned by any such variation shall be added to or deducted from the Contract price as the case may be.

- In the event of the Engineer requiring any variation, such reasonable and proper notice shall be given to the Contractor to enable him to work his arrangements accordingly, and in cases where goods or materials are already prepared or any design, drawings or pattern made or work done requires to be altered, a reasonable and agreed sum in respect thereof shall be paid to the Contractor.

- In any case in which the Contractor has received instructions from the Engineer as to the requirement of carrying out the altered or additional substituted work which either then or later on, will in the opinion of the Contractor, involve a claim for additional payments, the Contractor shall immediately and in no case later than ten (10) days, after receipt of the instructions aforesaid and before carrying out the instructions, advise the Engineer to that effect. But the Engineer shall not become liable for the payment of any charges in respect of any such variations, unless the specifications of the same shall be confirmed in writing by the Engineer.

- If any variation in the works, results in reduction of Contract price, the parties shall, agree, in writing, so to the extent of any change in the price, before the Contractor proceeds with the change.

- In all the above cases, in the event of a disagreement as to the reasonableness of the said sum, the decision of the Engineer shall prevail.

- Notwithstanding anything stated above in this clause, the Engineer shall have the full power to instruct the Contractor, in writing, during the execution of the Contract, to vary the quantities of the items or groups of items. The Contractor shall carry out such variations and be bound by the same conditions, as though the said variations occurred in the Contract documents. However, the Contract price shall be adjusted at the rates and the prices provided for the original quantities in the Contract.

## **64. Replacement of defective parts and materials**

- If during the progress of the works the Engineer shall decide and inform in writing to the Contractor, that any part of work or materials used therein is unsound or imperfect or has furnished any work is inferior than the quality specified, the Contractor on receiving details of such defects or deficiencies shall at his own expense within seven (7) days of his receiving the notice, or otherwise, within such time as may be reasonably necessary for making it good, proceed to alter, re-construct or remove such work and furnish fresh materials up to the standards of the specifications.

- In case the Contractor fails to do so, the Engineer may on giving the Contractor seven (7) days' notice in writing of his intentions to do so, proceed to remove the portion of the works or materials so complained of and, at the cost of the Contractor, perform all such work or furnish all such equipment provided that nothing in this clause shall be deemed to deprive the Employer of or affect any rights under the Contract which the Employer may otherwise have in respect of such defects and deficiencies.

- The Contractor's full and extreme liability under this clause shall be satisfied by the payments to the Employer of the extra cost, of such replacement procured, including erection, as provided for in the Contract, such extra cost being the ascertained difference between the price paid by the Employer for such replacements and the Contract price portion for such defective work and repayments of any sum paid by the Employer to the Contractor in respect of such defective work. Should the Employer not so replace the defective work or materials, the Contractor's extreme liability under this clause shall be limited to repayment of all sums paid by the Employer under the Contract for such defective works or works using the defective materials.

#### **65. Defence of suits**

If any action in court is brought against the Employer or Engineer or an officer or agent of the Employer for the failure or neglect on the part of the Contractor to perform any acts, matters, covenants or things under the Contract, or for damage or injury caused by the alleged omission or negligence on the part of the Contractor, his agents, representatives or his sub-Contractors, workmen, suppliers or employees, the Contractor shall in all such cases indemnify and keep the Employer, and the Engineer and/or his representative, harmless from all losses, damages, expenses or decrees arising out of such action.

#### **66. Limitations of liabilities**

The final payment by the Employer in pursuance of the Contract shall mean the release of the Contractor from all his liabilities under the Contract. Such final payment shall be made only at the end of the defects liability period as detailed in NIT document and till such time as the Contractual liabilities and responsibilities of the Contractor, shall prevail. All other payments made under the Contract shall be treated as on account payments.

#### **67. Taxes, Permits & Licenses**

The Contractor shall be liable and pay all taxes, duties, levies, royalties etc lawfully assessed against the Contractor in pursuance of the Contract. In addition the Contractor shall be responsible for payment of all Indian duties, levies and taxes lawfully assessed against the Contractor for his personal income and property.

#### **68. Covering up:**

The Contractor shall give at least 24 hours clear notice in writing to the Engineer-in-Charge before covering up any of the Work in foundations or any other such areas in order that inspection of the Work may be carried out for maintaining proper quality control. In the event of the Contractor failing to provide such notice he shall, at his own expense, uncover such Work as required to allow the inspection to be taken and thereafter shall reinstate the Work to the satisfaction of the Engineer-in-Charge. Each stage of all hidden works shall be approved by the Engineer-in charge before executing the next stage.

#### **69. Rectification of improper work noticed:**

If it shall appear to the Engineer-in-Charge during the progress of the Work that any work has been executed with unsound, imperfect or unskilful workmanship or with materials of any inferior description or that any materials or articles provided by the Contractor for the execution of the Work are unsound or of a quality

inferior to that contracted for or otherwise not in accordance with the Contract, the Contractor shall, on demand in writing from the Engineer-in-Charge specifying the work, materials or articles complained of, notwithstanding that the same may have been passed and certified, forthwith rectify or remove and reconstruct the work so specified in whole, or in part as the case may require or as the case may be, remove the materials or articles so specified and provide other proper and suitable materials or articles at his own proper charge and cost and in the event of his failing to do so within a period so specified by the Engineer-in-Charge in his demand aforesaid, the Engineer-in-Charge may rectify or remove and re-execute the work or remove and replace with others, the materials or articles complained of as the case may be at the risk and expense in all respects of the Contractor, and deduct the expenses from the Performance Security Deposit any sums that may be due at any time thereafter to the Contractor or from his performance guarantee.

**70. Deductions for uncorrected work:**

If the Engineer-in-Charge deems it inexpedient to get corrected or rectified any work of the Contractor which is defective or damaged or of substandard quality or is generally not in accordance with the Contract Documents, then an equitable and appropriate deduction shall be made thereof from the Contract Price, and the Engineer-in-Charge's decision in this respect shall be final and binding on the Contractor.

**71. Defects liability:**

- The contractor during defects liability period: All defective items of work and defects noticed and brought to the attention of the Contractor by the Engineer in writing during the Defects Liability Period shall be promptly and expeditiously attended to and replaced and/or rectified and made good by the Contractor at his own cost, to the complete satisfaction of the Engineer-in-Charge.

- Replacement and/or rectification and making good by contractors of all defective materials, equipment and/or workmanship during defects liability period: The Contractor shall replace and/or rectify and make good, at his own cost, and to the satisfaction of the Engineer-in-Charge, all defective items of work and defects arising, in the opinion of the Engineer-in-Charge, from materials, equipment, and/or workmanship not performing or Being in accordance with the Drawings or Specifications or the instructions of the Engineer-in-Charge or other Contract Documents or the best engineering and construction practices, and which may appear or come to notice within Defects Liability Period after Virtual Completion of the Work. Any item, material or matter repaired or replaced shall receive a new Defects Liability Period of like duration beginning upon the date the repaired or replaced item, material or matter is returned for use to the Engineer-in-Charge, provided that the aggregate guarantee period shall not exceed 24 months.

**72. Final completion of the work :**

The Work shall be considered as finally complete at the end of the Defects Liability Period subject to the Contractor having replaced and/or rectified and made good all the defective items of work and defects and hand over the Work in accordance with clause above, to the satisfaction of the Engineer-in-Charge, and provided that the Contractor has performed all his obligations and fulfilled all his liabilities under the Contract, and when the Agreement Authority has certified in writing that the Works are finally complete.

**73. Taking over of the works**

The Contractor shall be responsible to maintain all his works till completion of the Defects Liability Period and to handover the work to the Assistant Engineer. In this regards the works would be jointly inspected by a team comprising of representatives of Contractor and the Engineer-in-Charge, for noting any discrepancy, defect, shortcomings. Within the time period specified by the Engineer-in-Charge the Contractor shall rectify, correct or replace the defective works so noted during the joint inspection, at his own cost to the satisfaction of the Engineer-in-Charge. On acceptance of the Contractor's work, the contractor shall prepare the inventory of his works, and hand over the Work & the inventory to the Assistant Engineer.

#### **74. Force majeure**

Force Majeure is herein defined as any cause which is beyond the control of the Contractor or the Employer as the case may be which they could not foresee or with a reasonable amount of diligence could not have foreseen and which substantially affect the performance of the Contract, such as:

- Natural phenomena, including but not limited to floods, draughts, earthquakes and epidemics:
- Acts of any government, including but not limited to war, declared or undeclared, priorities, quarantines, embargoes,

#### **75. Warranty as to documents submitted to Employer audit:**

The Contractor represents that all documents, including invoice, vouchers, financials to settlements, billings and other reports submitted or to be submitted by the Contractor to the Engineer-in-Charge in support of an application payment are true, correct, complete and accurate in all respects. Upon request of the Engineer-in-Charge, the Contractor agrees to cooperate fully with the Engineer-in-Charge and the field Engineers in the conduct of a Technical Audit for the Work by an independent agency entrusted by the Agreement Authority.

#### **76. Man-power and plant and machinery**

The Contractor shall at his own cost provide and install all equipment, materials, plant/machines. Provision of Passenger Lift, Batching Plant, Concrete Pumps, Cranes, and Material Hoists each of adequate capacity, will be required in case of bulk concreting and fast construction. Other equipments like concrete mixers (weigh batchers in case of design mixes), ladders, and scaffolding etc, necessary for the execution of the Work in conformity with the Contract Documents and to the satisfaction of the Engineer-in-Charge will also be provided by the contractor at his own cost in adequate quantity. All machines, tools, trucks, formwork material, man-power and everything else necessary for the proper and satisfactory execution and completion of the Work in accordance with the Contract Documents shall be provided by the Contractor at his own cost. **The pre-qualification** approval of the list of equipments however shall not relieve the Contractor of any of his responsibilities, obligations and liabilities under the Contract. The Contractor shall augment his manpower, plant and machinery without extra cost to the Engineer-in-Charge whenever required or so directed by the Engineer-in-Charge in order to conform to the approved construction programme for the achievement of milestones and Virtual Completion. The batching plant , hot mix plant WMM plant and Concrete batch mix plant shall be computerised (Microprocessor based) with printing facility so as to keep the printed out-put for each batch of concrete mix and for each component (stone aggregates, sand, cement, fly ash, water, plasticiser & any other concrete admixture) for each batch of design mix concrete for record purpose. The plants shall also be equipped with antipollution device and mechanisms.

#### **77. First Aid Facilities:**

The Contractor shall provide adequate first aid facilities at site.

#### **78. Labour regulations:**

The Contractor shall be wholly and solely responsible for full compliance with the provisions under all labour laws and /or regulations

#### **79. Safety/Site Conditions:**

The Contractor shall take full responsibility for the adequacy, stability and safety of all Site operations and ensure that the methods of carrying out the Work and the Work by the Contractor including his workmen, employees, Sub-Contractors and Vendors meet all the necessary safety standards and requirements.

### **80. Setting out and site surveys**

The Contractor shall establish, maintain and assume responsibility for all bench marks and grid lines, and all other levels, lines, dimensions and grades that are necessary for the execution of the Work, in conformity with the Contract Documents. The Contractor shall establish his relation to the permanent benchmarks and boundary lines established at the Site.

### **81. Drawings, specifications, interpretations etc**

- The drawings included/available with the tender are to be used for general guidance only. These drawings are broadly indicative of the work to be carried out. These drawings are not the "Construction Drawings and details indicated there in are for guidance only and are liable to be modified by the Engineer-in-Charge during course of actual construction. No claim what so ever shall be admissible on account of changes that may be introduced later by the Engineer-in-Charge.

- In general, the Drawings shall indicate the dimensions, positions and type of construction, the Specifications shall stipulate the quality and the methods and performance criteria, and the Schedule of Rates shall indicate the rates for each item of work for evaluating change orders. However, the above Contract Documents being complementary, what is called for by any one shall be binding as if called for by all. Wherever there is a discrepancy between drawings and specifications, the drawings shall be followed. In interpreting the specifications, the following order of decreasing importance shall be followed:

- i. Bill of Quantities
- ii. Technical Specifications
- iii. Drawing
- iv. CPWD/MoRTH/IRC Specifications
- v. Indian Standard Specification of BIS

- Matters not contained in the specifications and in case of any ambiguities in written specifications of the contract, the works shall be executed as per relevant Bureau of Indian Standards codes and Central Public Works Department specifications MoRTH specifications and IRC specifications in the above order of preference. If such codes have not been framed, the decision of the Engineer-in-charge shall be final.

### **82. Certificates:**

The Contractor shall furnish, at his own cost, test certificates, calibration certificates for the various materials and equipment as called for by the Engineer-in-Charge. Such test certificates should be for the particular consignment/lot/piece as decided by the Engineer-in-Charge. The details in respect of the test and calibration certificates shall be as decided by the Engineer-in-Charge for the relevant items.

### **83. Construction programme and Site order book**

- Construction Programme: The contractor should furnish an overall construction programme for the approval of the Engineer-in charge before the start of the works. The construction programme shall clearly show all the sequential activities of work required to be carried out from the commencement of the Work up to the Virtual Completion. The construction programme shall be based on the mutually agreed milestones.

Every month, or sooner if required by the Engineer-in-Charge, the approved programme charts shall be reviewed in relation to the actual progress of the Work, and shall be updated as necessary. If at any time it appears to the Engineer-in-Charge that the actual progress of the Work does not conform to the approved programme, the Contractor shall produce, at its expense and without reimbursement, a revised programme showing the modifications to the approved programme and the additional input of resources by

the Contractor necessary to ensure completion of the Work within the time stipulated for completion.

- Site Order Book/Work spot Order Book –shall be maintained at the Site as per the provisions contained in the Revised Kerala PWD Manual 2012.

#### **84. Site Register**

The Contractor shall maintain a site register that records the name and time of arrival and departure, at Site, of any visitors.

#### **85. Protections of works:**

The Contractor shall take full responsibility for the proper care and protection of the Work from commencement of work until completion and handing over of the Work to the Assistant Engineer at no additional cost.

#### **86. Overtime work**

If it is necessary for the Contractor or any Sub-Contractor to work on other than working days or outside the normal working hours in order to keep up to the time schedule and meet the Construction Programme, the Contractor shall obtain the prior approval of the Engineer-in-Charge in writing, which approval shall not be unreasonably withheld. The additional cost of wages and any other costs incurred as a result of overtime or any shift work (except supervision expenses incurred by the Employer) shall be borne by the Contractor.

#### **87. Contractor store, site offices and other facilities**

It is agreed that Contractor has inspected the site and has made his own assessment towards the availability of space at site for his stores, yards, offices, placement of batching plant, steel & shuttering yards, cranes, material hoists and Other facilities.

#### **88. Sanitary Convenience:**

The Contractor shall at his expense provide and erect with prior permission and details to the Engineer-in-Charge all necessary sanitary conveniences including septic tank and soak pits at the Site for the staff and all workmen of his own, his Sub-Contractors, Engineer and Engineer's Representatives.

#### **89. Temporary Roads:**

The Contractor shall at his cost construct and maintain temporary roads/access ways to suit Site requirements at locations mutually agreed with the Engineer-in-Charge. Such roads/access ways will also be used by other Contractors/vendors/Officials working at the Site.

#### **90. Temporary Lighting:**

The Contractor shall make his own arrangement in respect of the provision of adequate lighting at all places where adequate visibility is not there or at night works and also provide general lighting of site as a whole in a proper safe and satisfactory manner.

#### **91. Safety Equipment & Personnel:**

The Contractor shall provide sufficient helmets, safety boots/shoes, nets and protective clothing for use by the Work management team, his own staff, staff of its sub-contractors and Engineer, Engineer's Representative.

#### **92. Protection of Environment:**

The Contractor understands that the Site is free from pollutants at the time of access to the Site and commencement of the Work. The Contractor shall comply with all applicable environmental laws and regulations and shall ensure that the Site is and remains free from pollutants at the end of the Work.



### **93. Payment on lump sum basis or by final measurement at unit prices:**

- Final measurements need not be taken unless either the bidder or the Executive Engineer claims extras to or deductions from the quantities of Schedule .

- In case final measurements are claimed, they shall be taken only for those items for which either the bidder or the Executive Engineer claims final measurements and the quantities of the remaining items in Schedule shall be accepted as correct. The lump sum amount mentioned in the agreement will then be varied by addition there to or deducting there from as the case may be the difference (if any), between the amounts mentioned in Schedule for such items and the amounts arrived at by calculation at Contract rates based on the revised quantities for the same obtained by the final measurement aforesaid.

*Amendment:* When payment on earth work exceeding 300 Cu.m are made based on the tape measurements, the bidder shall give a declaration in writing to the effect that he agrees for the recovery of the over payment, if any, from the next bill.

- It shall be accepted as a condition of the contract that the payment of the final bill to the bidder less the withheld amount and his acceptance there of shall constitute a full and absolute release of Board from all further claims by the bidder under the contract.

- **Payment for additions and deductions for omissions.**

No authorized variation shall vitiate the contract but additions and omissions shall be measured

- It shall be accepted as a condition of the contract that the payment of the final bill to the bidder less the withheld amount and his acceptance there of shall constitute a full and absolute release of Board from all further claims by the bidder under the contract.

### **94. Extra items :**

Items of work not expressly or impliedly described in the schedule, plans or specifications will be treated as 'extras'. They will include only items of works which highly necessary for the proper execution of the work and for its completion, were not provided for in the original contract

#### **The execution of an extra item of work and payment-therefore will be based on the following conditions:-**

- There shall be an order in writing to execute the extra item of work duly signed by an Engineer not below the rank of an Assistant Engineer before its commencement.

- If the bidder finds, after examining the specifications and plans that extras are involved, he should give notice to the Engineer to this effect and shall proceed with the execution of the extra item only after receiving instructions in writing from Engineer.

- Extra items may be classified as additional substituted or altered items, depending, on their relation or otherwise to the original item or items of work.

- **The rates extra shall be worked out as below**

- In the case of all extra items whether additional altered or substituted, if accepted rates for identical items provided for in the contract such rates shall be applicable.

- In the case of extra items whether altered or substituted, for which similar items exists in the contract, the rates shall be derived from the original item by appropriate adjustment of cost of affected components. The percentage excess or deduction of the contract rate the original item with reference to the departmental estimated rate shall be applied in deriving the rates for such items.

- In the case of extra items whether altered or substituted and for which similar items do not exist in the contract and rates exists in the schedule of rates, the rates shall be arrived at on the basis of the departmental data rate current at on the time of ordering the extra item, after applying the tender deduction except on cost of departmental material. Tender excess, if any, will not be applied.

- In the case additional items, the rates shall be arrived at on the basis of the departmental data rates current at the time of ordering the extra item or the date of commencement of the extra item, whichever is earlier, after applying the tender deduction except, on the cost of departmental material. Tender excess, if any, will not be applied.

- In the case of extra items whether additional altered or substituted, for which the rates cannot be derived from similar items in the contract, and only partly from the departmental schedule of rates the rates for such part or parts of items as are not covered in the schedule of rates shall be determined by the Engineer on the basis of the prevailing market rates giving due consideration to the analysis of the rate furnished by the bidder with supporting documents, including bidder's profit. This shall be added on to the departmental rate (including bidder's profit) current at the time of ordering or executing the extra item, whichever is earlier for the other part the item for which rates can be derived from the schedule of rates.

- In the case of extra item whether additional, altered or substituted, for which the rates cannot be derived either from- similar item of work in the contract or from the departmental schedule of rates, the bidder shall within 14 days of the receipt of the order to carry out the said extra item of work. Communicate to the Engineer the rate which he proposes to claim for the item, supported by analysis of the rate claimed and the department shall within one month thereafter determine the rate on the basis of the market rate giving consideration to the rate claimed by the bidder.

- In the case of percentage rate contract, the rate for extra item shall be arrived at by applying the percentage excess or deduction to the departmental data rate as per the original schedule on which the tenders were invited.

- Wherever the term "Departmental data rate" appears, it shall mean the rate derived from the Departmental schedule of rate and shall include conveyance charges and bidder's profit.

- In cases in which the bidder has to execute extra items not contemplated in the agreement but the rates of which require sanctioned of higher authorities the Division Officer may in such case, sanction advance up to an amount not exceeding 75 per cent of the amount for the items at the rate worked out and certified by the Sub Division Officer The Assistant Engineer shall in all such cases promptly record all authorized extra items executed by the bidder including detailed measurements and quantities thereof in the Measurement Book. He shall neither enter any rate for the same in the Measurement Book nor include such extra items in the body of the bill. When the bill is received in the Sub Division, the sub Division Officer shall prepare a separate statement for those extra items showing the items executed, quantity of each items rate for each item worked out by him based on agreement, conditions and amount for each item in the basis of the rate worked out by him, He shall also furnish a certificate to

the effect that he has personally examined all the extra items and they are bonafide the amount payable for these items will not be less than Rs .....(amount to be specified) and that there is no objection in paying 75 per cent of this amount as a secured advance On receipt of the bill with the above statement and certificate the Division Officer may make payment not exceeding the amount recommended by the sub Division Officer as a lump sum secured for works done but not billed for.

#### **95. Quality testing's:**

- In normal case no departmental materials shall be supplied to the contractor by the Board.
- Primary responsibility for maintaining quality of all items of work as per specifications and standards vests with the Contractor. They will also establish laboratory facilities for testing the quality of the materials at their cost. The test results of the samples will be submitted to the agreement authority.
- The quality of materials used by the bidders should be ensured by the Board officers and testing of the materials wherever necessary will be done by the bidder at his cost.

#### **96. Departmental materials & Machineries**

- If cement and steel required for the work are supplied by Board and their value recovered at Rs. \_\_\_\_\_per tone of cement and Rs. \_\_\_\_\_per quintal of Tor steel / M.S rods. Cement and steel as well as other materials so issued shall remain the property of Board though in contractors' custody and shall not be removed from the stores at work site except written authorization by a competent authority not less than the rank of Assistant Engineer.
- Any other materials available in Departmental stores if issued to the bidder will be recovered at book value or issue rate plus 20 per cent supervision charge or market value or data rate whichever is higher.
- Board does not undertake to issue power roller for any work. The bidder will arrange the power roller from Public Works Department or other Department and pay the hire charges demanded by them.
- Value of quantities of the departmental materials issued for the work either allowed to deteriorate or unaccounted for amounting as it does to an excess supply over the sanction requirements shall be recovered at book value or issue rate plus 20 per cent supervision charges or market rates whichever is higher with sales tax and in addition specific penalty rate stipulated by the Board Market value will be the retail selling price of materials in the locality of the work or the nearest market town current on the day of issue, or recovery which is more. The Executive Engineer shall obtain the information and record within 7 days of such issue, sending a copy to the bidder. The decision of the Chief Engineer regarding current market rates shall be binding on the bidder. Unused balance if any at the time of completion or termination of the contract will not be accepted by the Board . The cost of such materials amounting as it does an excess over sanctioned requirements shall be recovered at book value +20 per cent or current market rate whichever is higher and in addition to specific penalty rates as may be fixed by Chief Engineer in the form of Board's Circular order from time to time shall also be recovered at the direction of Executive Engineer.
- Cost of small excess quantity of cement say less than one full bag will be recovered from the bidders without penalty and that if the excess is more than this, it will be transferred to other works as early as possible subject to condition that the quality of cement is ensured by a responsible officer not below the rank of Assistant Engineer, before utilizing it in one of the work for which it is transferred.
- In the case of excess steel rods, recovery of cost will be effected at agreement rates, if the excess is 3% (three per cent) of the total quantity of steel materials and the recovery of the cost of steel materials in excess of the above 3% limit will be effected at penal rate if the excess is not due to any change in design or abandoning a part of

the work.

- The materials will be issued to the bidder only for meeting the actual requirement so that large excess do not occur at the time of completion of work.
- Empty bags of cement used on the work need not be returned to the departmental stores. Value of empty cement bags will be recovered at rates fixed by the department from time to time.
- The bidder will provide his own tool and plant, store sheds to store his own materials as well as those supplied by the department and will be entirely responsible for the proper use and safe custody of the latter and also for any loss damage, theft, mishandling or any cause, whatsoever.
- If the department undertakes to supply particular materials, the claim for extra payment on account of delay in the supply of materials will not be entertained.

**97. Power of Attorney:**

The bidder shall not without the previous sanction in writing of the authority accepting the tender execute any power of attorney in respect of any matter, touching this contract, and any such power of attorney executed without such sanction shall not be recognized by or be binding upon Board or their officers. It shall be entirely within the discretion of the authority accepting the tender either to grant such sanction or to refuse it or to revoke a sanction once given.

**98. All disputes and differences arising out of the contract :**

Arbitration shall not be a means of settlement of any dispute or claim out of this contract. All disputes and differences arising out of the contract may be executed in pursuance of the contract shall be settled only by the Civil Court in whose jurisdiction the work covered by the contract is situated, for in whose jurisdiction the contract was entered into in case the work extended to the jurisdiction of more than one court.

**99. Relationship with Board's Servant :**

Bidders should declare that they are not related to any Board servant, who is in charge of or having control of the work. Relationship in this will be restricted to father, mother, son, daughter brother-in-law mother-in law/ and first cousin of the officer concerned. If the above condition is found to have been contravened, when they tender the earnest money/ security deposit of the bidder / tender will be forfeited and the contract entered into will stand cancelled.

**100. Engineering personnel at Site :**

Contractors Technical Personnel at site

The contractor shall employ Technical personnel in addition to other supporting staff as detailed below for tenure of the contract for works supervision depending upon the cost of work.

- **For works, Estimated cost from Rs. 500 lakhs to Rs.20 Crores-**
  - i. Works Manager- 1no.(Civil Engineering Graduate with minimum 3 years experience)
  - ii. Site Engineer - 2 nos (1 no for supervision and 1 no for Quality Control) - (Civil Engineering graduate with minimum 1 year experience)
  - iii. Supervisor - 2 nos (Civil Engineering Diploma holder with minimum 1 year experience)
  - iv. Supervisor(Mechanical) (if required) - 1 no (Mechanical Engineering Diploma holder with minimum 1 year experience)

- **For works, Estimated cost above Rs.20 crores**

- i. Works Manager- 1no.(Civil Engineering Graduate with minimum 5 years experience)
- ii. Site Engineers- 3 nos (2 nos for supervision and 1 no for Quality Control) - (Civil Engineering graduate with minimum 3 years experience)
- iii. Supervisor - 4 nos (Civil Engineering Diploma holder with minimum 2 year experience)
- iv. Supervisor (Mechanical) (if required) - 1 no (Mechanical Engineering Diploma holder with minimum 2 year experience)

**101. Safe custody of materials, Safety of the labour, Handling of explosives :**

- The responsibility for safe custody of materials at work site and during transit will be vested with the bidder. The concerned Overseer in charge of the work will verify the stock and initiate action of shortage in stock in notice. Other inspecting officers will also verify the stock during inspection.
- The bidder shall be responsible for the safety of the labour employed by him and he shall be liable of pay the necessary compensation in case of accidents, as per the Workmen's Compensation Act.
- The bidder should take a license under the current explosive rules to enable him to manufacture and possess the quantity of gun powder required by him for blasting, if necessary.

**102. Other instructions :**

- In the case of any delay in shifting the Telephone posts, Electric posts, Electric over head line and cables, water lines etc. by the concerned Department, the Agreement Authority shall not in any way be liable for damages on account of this delay, provided a proportionate extension of time for completion of work will be granted in deserving cases on application by the Contractor.
- The access to the Site will be shown immediately on award of the Contract to the Contractor and the Site shall be shared with other Contractors and Sub- Contractors as applicable.
- Selected bidder will be required to produce income-tax and sales tax clearance certificates before final payment is made for the work, and before security deposits released.
- Schedule of quantities, specifications of work to be done and conditions of contract to be entered into can be seen on the e-GP web site. It shall be definitely understood that the Board does not accept any responsibility for the correctness or completeness of the schedule that the schedule is liable to alteration by omissions, deductions or additions at the discretion of the competent departmental officer or as set forth in the conditions of contract. The bidder will however base this tender amount in the case of lump sum tender on the basis of those quantities, etc.
- In case of any additional remarks the bidders must attach/upload a pdf file along with on line bid. If they are prepared to carry out at their tendered rates such portion or portions of the work as may finally be allotted to them by the Officer deciding tenders.

*Note:* The Board reserves the right to allot such portion of the work included in the tender at the rates quoted by the bidder in the absence of specific noting by the bidder. Such allotment shall not vitiate the acceptance and the bidder shall indemnify Board against any loss to Board, due to failure on the part of the bidder to carry out such portion of the work allotted to him at the rates quoted by him.

- The tender inviting authority or other sanctioning authority reserves the right to reject any tender or all the tenders without assigning any reason thereof.
- The bidder will also be liable to abide by the fair wage clause condition attached separately.

- In the case of construction of steining to wells, excessive tilts if any occurring to the extent which is more than the percentage allowed as per rules will have to be rectified by the bidder at his own cost and if the bidder fails to attend to the same it will be got rectified by other agency and cost there of recovered from the original bidder.
- Tenders which are not in conformity with this tender notice are liable to rejection.
- This tender notice with the conditions stated herein will form part of the contract documents.
- In the case of schedule contracts when the rates quoted for a particular item in figures and words disagree, the rates quoted in words will be taken for the purpose, of the settlement of the contract. The bidder is bound to accept these rates if the contract is awarded to him. Similarly in the case of percentage rate contract when the prevail percentage rates quoted in figures and words disagree, the rates noted in words will be taken for the purpose of the settlement of the Contract. The bidder is bound to accept these rates if the contract is awarded to him.
- If any correction is made by the bidder in the tender schedule the tenders are likely to be rejected. Any corrections/ suggestions/ remarks etc. to be given by the bidder has to be made only in the “Remarks” page/ section of the online bid.
- The quantities provided in the schedule may vary and the bidder should be prepared to do excess up to 25% (twenty five per cent) over the schedule quantities of a quoted rate for the work.

The G.O.(P)No.13/2012/PWD dated 01.02.2012 and specification issued by the Chief Engineer, General in circular No. O&M(1) 240/89 dated 11-2-1988 shall also be referred to for the road works.

### **103. Amendment/ Corrigendum publication on e-GP website**

All amendment(s)/ corrigendum(s) shall be published on the e-GP website and bidders are advised to check the website regularly for the same upto the last date for the submission of bid. The Board shall not be responsible for bidder’s negligence in checking the website regularly for any updates on this tender. Any addendum thus issued shall be a part of the bidding documents which will be published in the e-tender website.

**104.** Any further information necessary can be obtained at the office of the tender inviting authority on all working days during office hours.

**EXECUTIVE ENGINEER  
KSHB,  
Thrissur.  
(For and on behalf of KSHB)**

### **Part III - SPECIAL CONDITIONS OF CONTRACT**

1. The Special Conditions of Contract are an extension of and are to be read in conjunction with the General Conditions of Contract. Should there be any contradictory requirements in the two, the requirement as per the Special Conditions of Contract shall prevail.
2. All works shall be done in conformity with the **specification and condition in the contract** in force in the P.W D. The bidder shall quote only single rate as an overall percentage above or below or at the rates given in the schedule by a single entry at the bottom of the schedule under the head "quoted rate of the bidder" by scoring out the irrelevant portion. The rates quoted shall be inclusive once covering all the operation contemplated in the specification and tender schedule and all incidental work necessary for such operations such as shoring, bailing, form work, scaffolding, etc The rates quoted all be inclusive of all applicable taxes.
3. The **rates quoted by the bidder** for the various items shall be inclusive of all tools and plants required for the proper execution work and all other incidental charges and separate claim for these will not be entertained under any circumstances.
4. **The quantities shown in the schedule** are only approximate and are subject to variations and the bidder is bound to do additional quantities of work if found necessary at his quoted rates.
5. All the **rates quoted** should be inclusive of all taxes as per clause 11.e of Part I.
6. The bidder has to quote for the specification and unit noted in the schedule. All suggestions, remarks, corrections and insertions are only to be made only in the "Remarks" page/ section of the online bid. Any revision / correction in price shall be made only by way of submitting another bid, complete in all aspects as stated in this tender, on or before the stipulated date & time of bid submission.
7. The contractor has to quote for the specification and unit noted in the schedule. No correction of specification unit or quantity is admissible and if they make any correction in the specification, etc., the same will be rejected.
9. The bidder is bound to carry out items of works which are not expressly or impliedly described in the tender schedule plans, specifications and agreement but which are found necessary for the proper completion of the work during execution. Payment for such extra items will be made on the basis of extra item rates.

10. **For LS items** the bidder will be paid only for the actual quantity of work done or materials supplied and labour engaged at agreed rates for such items and as per condition No.10 above for extra item but such payment will be limited to the lumpsum quoted by the bidder. If he fails to quote definite LS rates for such items the L S amount provided in the schedule will be operative in his case.
11. Roofing tiles, hip tiles, wire cut bricks, surki. etc, required for the work should be purchased from suppliers approved by the Stores Purchase Committee.
12. For materials issued for the work but not used and not returned to the store sales tax at the prevailing rates will be recovered in addition to the departmental recovery plus 20 per cent storage.
13. For cement and M. S. rods issued for the work but not used a penalty of Rs. ....per 50 kilograms of cement and Rs. ....per kilogram of MS. Rods will be recovered in addition to the value, 20 per cent storage and sales tax.
14. It will be the responsibility of the bidder to **obtain necessary land for stacking** the materials for arranging the work.
15. **Metal of the required sizes alone** should be brought to the site of the work. Breaking boulders or rubble into metal will not be allowed either on or the side of the road. Metal should be stacked on one side of the road only and in such a way as not to cause any hazards to traffic. The stacks should be formed as per the standards profile current in the department.
16. **Granite stone metal** supplied should be sound, hard tough and durable free from any decayed matter and of uniform colour and texture. Each piece should have sharp angular edges. The metal should not also contain any quarry dust or earth.
17. **Silicious gravel** shall consist of only hard nodules not more than 40mm. nor less than 6 mm. dia. in and direction scraped from the hill sides and free from admixture of earth or laterite chips.
18. **Sand supplied** should be clean, sharp and gritty to the touch, free from clay and other impurities and obtained from running water courses.
19. The bidder will have to make his **own arrangements to convey the materials supplied by the department and for stacking**, of materials and site shed, etc., which are found necessary for the proper, execution of the work. He will also be responsible for the safe custody of the materials till, they are used on works.
20. The bidder should take out **license for storing gun powder and explosives** required for rock blasting as per Explosive Act, 1940.
21. **Recovery for M. S. rods** shall be effected at agreed rates for the quantity actually used plus wastage, if any. The percentage of wastage will be fixed by the Executive Engineer but at any rates it should not exceed. 3 percent of the actual usage.
22. If the Board undertake the supply of any materials, **no claim for extra payment** due to delay in supply of those materials will be entertained.
23. If materials other than those specified in the tender are issued by the department, **recovery will be effected** at data rate plus storage plus sales tax or at current market rates at the time, of issue whichever is higher.



24. Machinery like concrete mixer, pump set, etc, if available will be supplied by the department as per rules and **hire charges recovered from the bidder** at the prevailing departmental rates. The bidder has to take the machinery from the store and return to the same spot at his cost and responsibility.
25. If **part payment is claimed for metal supply** 20 percent of the supply will only be made in the part bill. The spreading and consolidation should be done within two months of supply.
26. The **payment of the earth work** items will be made as per level measurements or tape measurements as per rules prevailing.
27. All items should be **carried out as per the relevant specification** in **the** MoRTH, CPWD /KPWD or IRC and all clauses of preliminary-specification should be complied with.
29. The moulds, shuttering etc., required for the work should be made by the bidder and got **approved by the departmental officers at site before use**.
30. **Tribes of the locality should be employed** to the extent possible.
31. The bidder alone is responsible for the **safety of his labourers and damages**, if any payable under "Workmen's Compensation Act" will be to his debit.
32. It shall be the contractor's responsibility to **protect the public / his employees against accident** from any cause during execution of the work and he shall indemnify the Government against any claims for injury to person or property resulting from any such, accident and he shall, were provisions of the Workmen's Compensation Act apply take steps to properly insure against any claims there under.
33. The bidder shall be **liable for any loss** caused to the Board on account or the above work including any that may arise due to non-fulfillment of the contract. He should comply with the rules laid down in the Central P. W. D. Contract regulations regarding fair wages.
34. The work shall be completed in all respects and also at the rate of progress within the time limit and stipulations in the Notice inviting tender, failing which the bidder is **liable to be fined** as stipulated in special condition.
35. Defects, if any noticed within 36 months or defect liability period specified from the date of completion of the work **will be got rectified by the bidder**, in default of which this will be attended by the department and the cost made good from the bidder.
36. The bidder should **produce latest GST and agricultural income-tax clearance certificate and also income tax clearance certificate** for receiving final payment.
37. The bidder shall be responsible for the **payment of GST** as per rules in force from time to time and the rates quoted for various items remain unaffected by any changes that may be made from time to time in the rate at which such tax is levied. Sales tax agricultural income tax and income tax due to Government from the bidder will be recovered from his bill for the work as per the advice of the authorities concerned.
38. All sums due to the Board under or by virtue of this contract shall be **recoverable first from the Performance guarantee (security) furnished** by the bidder and if the same is found insufficient, such deficit amount shall be recoverable under the provisions of the Revenue Recovery Act for the time

being in force as though the same were arrears of Land Revenue or in any other manner as the Board may deem fit.

39. The bidder agrees that before final payment shall be made on the contract, he will **sign and deliver to the Executive Engineer either in the measurement book** or otherwise as demanded, a valid release and discharge from any and all claims and demands whatsoever for all matters arising out or connected with the contract Provided that nothing in this clause shall discharge or release the contractor from his liabilities under the contract. It is further expressly agreed that the Executive Engineer in supplying the final measurement certificate need not be bound by the proceeding measurement and payments. The final measurements, if any, of the Executive Engineer shall be final conclusive and binding on the bidder.
40. The tender documents shall form **part of the Agreement**.
41. If during execution, the proportion of usage of materials issued departmentally alone is varied for which the price has been fixed in the tender, the quoted rate of the item will be allowed **effecting short or excess of departmental materials actually used** as well as labour charges or handing the short or excess is any provided is in the same position.
42. **All other conditions and specifications of contract** are the same as those in the Board.
43. The **method of measurements** will be as per Indian standards
44. All concrete should be **machine mixed and vibrated**.
45. The contractor for this work shall be bound to remit an amount equal to 1% (one per cent) of the value of the work to be done on account of this contract, excluding cost of departmental materials, towards the employer's contribution to Kerala **Construction workers Welfare Fund** as provided in the Kerala Construction Workers Welfare Fund Act 1989. This amount shall be recovered proportionately from the part bills and the final bill for the work and the contractor shall abide by such recoveries.
46. Conditional tenders will be summarily rejected and EMD forfeited .Also **each tenderer shall furnish a certificate to the effect that no conditions are enclosed** along with the tender.
47. The contractor is bound to keep a machine numbered well bound **work spot order book**, initialed by the Assistant Engineer in charge and he should carryout works as ordered in the book. No oral orders said to have been given will be accepted as a claim for payment unless they are got recorded in the order book.
48. **A hindrance register** will be maintained in all site offices. The reason for the actual delay from time to time in completing the work will be assessed and recorded in the register by the site officers. The contractors should therefore satisfy themselves the correctness of recordings in the register and confirm the same by putting their signatures in the register at least once in a week. The entries containing the signature of the contractors will alone be considered for their claims.
49. All Iron and Aluminum fittings required for the door, window, shutters, locks, special fittings and sanitary fittings like wash basin, closet, taps, showers etc. and items required for water supply and electrification should be brought by the contractor to site prior to the commencement of such works and get the **written approval of the concerned Executive Engineer before using the same in respective works**. This does not apply to steel / Iron / Aluminum doors and windows.

50. **Indian Standard Specifications** shall be followed in case of all the materials used, workman ship and other condition and requirements of the contract.
  51. The Contractor shall before commencement of the work submit a **programme schedule** indicating the date of start, monthly progress expected to be achieved and the anticipated completion date of each major item of work to be done by him. In case it is subsequently found necessary to alternate the schedule incorporating necessary modifications the same shall be got approved by competent authority.
  52. In case of departmental supply the Contractor shall, before starting the work, submit an **estimate of his total requirement of cement and steel** and shall place indents for his monthly requirements at least one month in the case of cement and two months in the case of steel in advance of the planned use. The contractor shall be responsible for all the consequence arising out of his failure to comply with these directions and any procedure that may be laid therefore.
  53. **Cement supplied for the work** shall not ordinarily be stored for period in excess of two months. When the storage period had exceeded two months the cement shall be used only after conducting special test at the contractors cost. The board does not undertake to take back the cement damaged due to delay in using it on the work.
  54. **Steel supplied for the work** shall be scraped and cleaned to be free from scales, rust, dirt etc. before they are used for RCC work.
  55. Concrete made for a particular grade should yield the specified strength when tested; **the tests should be carried out** in accordance with the relevant Indian Standard specifications. The number of test specimens required and the frequency of sampling and the criteria for acceptance of the concrete as conforming to the specified grade shall be in accordance with the standard specifications and from the test results of compressive strength of line cubes :at 28 days after mixing. The contractor shall at his own cost, arrange for the moulding of the concrete cubes and testing of its compressive strength at 7days and 28 days in the presence of an officer in charge of the work.
  56. The Engineer in charge of the work have full powers to engage other workmen on the premises to execute fittings or carryout **works not included in the contract** and the contractor shall afford reasonable facility for the same.
  57. No claim will be entertained by the Board on account of any increase in **railway or road freight cost** of all building materials and other materials like petrol, diesels, lubricants etc. and for any increase in the wages of labour increase in rates of sale tax etc. during the course of construction.
  58. Any **defects shrinkage or other faults** which may appear within **60 months** from the completion of the work shall be made good by the contractor at his own cost unless the Engineer in-charge of the work for reasons to be recorded in writing, decides that they may be paid for.
- **On completion of the work the contractor shall clear away and remove from the site** all construction plant surplus materials debris and temporary works of every kind and leave the whole of the site and working clear conditions to the satisfaction of the Engineer in charge and in the event of the failure of the contractor to comply with those directions within seven days after receipt by him of a notice to that effect from the Engineer In charge such clearness may be made by the Engineer in charge at the expense of the contractor.
  - The contractor shall take necessary arrangements with the presence of the Electrical engineer KSHB during the Load test of the Diesel Generator set in the factory

- The Contractor shall obtain the proper Scheme approval sanction for the Energisation of the DG Set from the Kerala State Electrical Inspectorate Department.

**60. Special Conditions for water supply and Sanitary works**

- The work shall be executed only through licensed plumbers.
- The cost of departmental connections for water supply and incidental charges if any shall first be borne by the selected contractor and he shall be paid the actuals based on vouchers produced by him. The account remittance in regard to Departmental connections for water supply and drainage shall be in the name of Secretary, Kerala State Housing Board, Thiruvananthapuram.
- All the other conditions apart from the above mentioned will have to be considered as based on the Revised PWD manual 2012 with effect from 01.02.2012.

- **Special Conditions for KVAT as per KERALA FINANCE ACT- 2008**

The rate quoted by the bidder shall include all taxes, duties, and Construction Workers Welfare Fund Contribution etc except the GST (Goods and Services Tax) and the Government will not entertain any claim whatsoever in respect of the same. Goods and Service Tax (GST), wherever legally applicable, shall be paid by the Contractor to the concerned Authorities and the Employer shall pay the applicable GST to the Contractor at the time of settlement of bills for the works done as per this contract. However, out of the total GST amount to be paid to the Contractor at the time of settlement of bills, an amount at the rate specified in the contract data shall be deducted as TDS and deposited at the Central Tax Department by the Employer. The Contractor shall be paid the balance amount of GST at the time of settlement of Bills. The Employer shall give necessary certificates to the Contractor in this regard.

- **Special Condition Towards Construction of Kerala Construction workers Welfare Fund Board.**

1 percent (one percent ) of the bill amount including cost of departmental materials and hire charges of departmental tools and plant will be recovered towards the construction of Kerala construction workers welfare fund and as Kerala construction welfare fund scheme 1990. This amount shall be remitted to K.C.W.W.F. by the Executive Engineer within 15 days on the payment to the bidder.

**63. FAIR WAGE CLAUSE**

- on the work. "Fair wages" means wage whether for time or piece work notified at the time of inviting tenders for the work and where such wages have not been so notified the wage prescribed by the Central P. W. D. for the District in which the work is done.
- The bidders shall notwithstanding the provisions of any contract to the contrary cause to be paid a fair wage to labourers indirectly engaged on the work including any labour engaged by his sub bidder in connection with the said work as if the labourers had been immediately employed by him.
- In respect of all labour directly or indirectly employed in the works for the performance of the bidder's part of this agreement the bidder shall comply with or cause to be complied with (the Central P.W.D. bidder's labour regulations made by Government in regard to payment of wages, wage period deduction from wages recovery of wages not paid deduction unauthorisedly made maintenance of wages register other terms of employment inspection

and submission of periodical returns and all wages cards, publication of scale of wages and returns and all other matters of a like nature.

- The Executive Engineer or Subdivision Officer concerned shall have the right to deduct from the moneys due to the contractor and any sum required of estimated to be required for making good the loss suffered by 2 worker or workers by reasons of nonfulfilment of the conditions of the contract for the benefit of the works nonpayment of wages or deductions made from his or their wages which are not justified by their terms of the contract or non observance of the regulations,
- Vis-a-vis the Central Government the bidder shall be primarily liable for all payment, to be made under and for the observance of the regulations aforesaid without prejudice to his right to claim from this sub bidders.
- The regulation aforesaid shall be deemed to be a part of this bidder and breach there of shall be a breach of this contract.

#### **64. CLAUSE-45 OF M.D.S.S.-ACCIDENTS-HOARDING-LIGHTING -OBSERVATIONS**

##### **WATCH MEN-**

- When excavations have been made or obstacles have been put in public through fares or in places where there is any likelihood of accidents, the bidder shall comply with any requirement of law on the subject and shall provide suitable boarding, lighting and watchmen as necessary.
- It shall be the bidder's sole responsibility to protect the public and his employees against accident from any cause and he shall indemnify Government against any claims for damages for injury to person or property, resulting from any such accidents and he shall, where the provisions of the Workmen's Compensation Act apply take steps to property ensure against any claims there under.
- On the occurrence of an accident which results in the death of any of the workmen employed by the bidder or which is so serious as to be likely to result in the death of any such workmen, the bidder shall within 24 hours of the happening of such accidents, intimate in writing to the concerned Section Officer of the Public Works Department, the fact of such accident. The bidder shall indemnify Government against all loss or damage sustained by Government resulting directly or indirectly from his failure to give intimation in the manner aforesaid including the penalties Of fines if any payable by Government a consequence of Government's failure to give notice under the Workmen's Compensation Act or otherwise conform to the aid Act in regard to such accident.
- In the event of an accident in respect of which compensation may become payable under the workmen's Compensation Act VIII of 1923 and its amendments time to time whether by the bidder or by the Government as principal it shall be lawful for the Executive Engineer to retain out of moneys due and payable to the bidder such sum or sums of money as may, the opinion of the said Executive Engineer, be sufficient to meet such liability. The opinion of the Executive Engineer shall be final in regard or all matters arising under this clause.

#### **65. Reference drawings**

The Contractor shall maintain on site one set of all Drawings issued to him for reference.

#### **66. Completion drawings (As Built) & Measurement books**

- On completion of the Work, the Contractor shall submit three (3) complete sets of drawings and marked up prints of "AS BUILT" drawings verified and approved by the Engineer-in-Charge. These drawings shall include and show all the changes / deviations made from the working drawings during the course of construction and

also the other details as called for by the Engineer-in-Charge. During the execution of the Works a set of drawings prepared initially shall be retained in the Contractors Site Offices for the exclusive purpose of recording changes made to the Work as the construction proceeds. The drawings shall be prepared on computer through CAD Software and provided to the Engineer-in- Charge as hard and soft copy.

- Along with the completion drawings the Contractor shall also prepare and submit to the Engineer-in-Charge, a complete set of all final measurement of works in the form of bound measurement books and a soft copy of the same. Measurement Books shall incorporate the standard measurements of the items as per the completion / as built drawings in modules finalized in consultation with the Engineer-in-Charge.

#### **67. Testing of installations:**

All water retaining structures and the basement shall be tested as specified for the waterproof qualities, in the presence of the Engineer-in- Charge or his authorised representative. The Contractor shall also perform all such tests as may be necessary and required by the Engineer-in-Charge to ensure quality of the executed works. The Contractor shall provide all labour, equipment, and materials etc., required for the performance of the tests.

#### **68. Quality assurance and Quality Control**

- The Contractor shall establish an effective quality control system at the Site and implement the same through an independent team consisting of qualified and experienced Engineers and technical personnel to enforce quality control on all items of the Work at all stages.

- The Engineer and his Representatives shall have the right to direct Contractor to remove materials supplied which do not conform to standards specified.

- The contractor shall conduct first tier quality control tests for all items of work at the site laboratory as per the procedure and frequency stipulated in the PWD Quality Control manual at his own expense.

- Third party testing shall be done in an independent approved laboratory, if there is dispute due to difference in the test results of first- tier and second-tier testing or if any manipulated results are suspected.

- In case, certain specific tests cannot be carried out with the facilities available in the Contractor's site laboratory or the Department laboratories, third party laboratory testing shall be resorted to.

- Engineer in charge shall decide whether third party testing is required to settle a dispute. His decision will be final and binding on the Contractor.

- Third party tests, if approved by the Engineer-in charge shall be arranged by the Contractor in an approved laboratory as directed by the Engineer-in-charge. It is desirable that the test shall be done in the presence of the representatives of the Engineer-in charge and the Contractor to eliminate any further disputes. The expenses shall be met by the Contractor. The result obtained in the test shall be final and binding on both the Contractor and the Employer.

- Wherever specified, the contractor shall also obtain manufacture's test certificate from the manufacturer/dealer and submit the same before executing the items listed in such certificates. Contractor shall be responsible for the genuineness of the Manufacturer's Test Certificate obtained and submitted by him. Contractor shall record a statement in the Manufacturer's Certificate that "This Certificate for supply of

..... (Name of material with item no in BoQ) has been obtained by me from ..  
.....(Name and address of Manufacturer/Dealer) on ..... (date of receipt of certificate)

for the actual materials supplied at site.

- The rate quoted by the Bidder shall include all expenses for carrying out the first tier quality control tests. Expenses for third party tests, if required, shall also be borne by the Contractor.

**69. Drilling, cutting etc.**

- All cutting and drilling of walls or other elements of the building or structure for the proper entry/installation of inserts, boxes, equipment, etc. shall be carried out using electrically operated tools only. Manual drilling, cutting, chiselling, etc. shall be permitted with the written approval of Agreement authority. No structural member shall be cut or chased without the written permission of the Engineer-in-Charge. Cutting and drilling of structural members shall be carried out using vibration free diamond wire sawing and diamond drilling only with prior permission from the Engineer-in-Charge. The costs for procurement and using such equipment are deemed to be included in the Contract and no extra costs will be paid.

- Horizontal cutting of walls or other supporting structural elements for laying pipe conduits, water supply lines etc., shall be avoided as far as possible. Conduits shall be laid through lintels or slabs or similar elements without affecting the structural safety. The conduits shall be connected to the required locations through vertical cuts in the walls or the supporting elements.

**70. Approval by statutory bodies:**

The Employer will handle commencement Certificate, No Objection Certificate and Occupation Certificate if applicable under this Contract. The contractor shall be responsible for providing required notices to authorities and to obtain and retain with him at his own cost all other approvals from the statutory bodies pertaining to works under this tender and temporary structures to be constructed at site or equipments to be erected, labour, Employee Insurance, Provident Funds, Tax Departments. Etc and any other approval required to facilitate performance of Contractor's work under the Contract till completion.

**71. Name board and publicity**

The contractor is not entitled to do any publicity on account of the Work.

**72. Water and Electricity**

Contractor shall make his own arrangement for electricity and water for construction purposes. All statutory Fees, & miscellaneous expenses and costs for electric power and Water connection for construction purposes shall be borne by the Contractor.

**73. Protection / preservation of trees:**

Contractor shall take all measures necessary to ensure the protection and preservation of existing trees within / outside the boundary of the site.

**74. Sub-Contracting**

No subcontracting shall be done without prior written approval of Agreement Authority. Maximum value of works to be sub-contracted is limited to 25% of Contract value. The value of a sub-contract and Provisional Sums items as and when awarded, should be intimated by the Contractor to the Engineer-in charge and it should also be certified that the cumulative value of





- **Bid submission:** Bidders have to submit their bids along with supporting documents to support their eligibility, as required in this tender document on [www.etenders.kerala.gov.in](http://www.etenders.kerala.gov.in). No manual submission of bid is allowed and manual bids shall not be accepted under any circumstances.
- **Opening of Bids :** Bids shall be opened on the specified date.

**Note:** The blank price bid should be downloaded and saved on bidder's computer without changing file-name otherwise price bid will not get uploaded. The bidder should fill in the details in the same file and upload the same back to the website.

**Fixed price:** Prices quoted by the Bidder shall be fixed during the bidder's performance of the contract and not subject to variation on any account. A bid submitted with an adjustable/ variable price quotation will be treated as non - responsive and rejected.

### C) Tender Document Fee and Earnest Money Deposit (EMD) :

The bidder shall remit the tender document fee and Earnest Money Deposit or bid security through on line mode as specified in the NIT.

**Online Payment modes:** The tender document fees and EMD can be paid in the following manner through e-Payment facility provided by the e-Procurement system:

- **State Bank of India (SBI) Internet Banking:** If a bidder has a SBI internet banking account, then, during the online bid submission process, bidder shall select SBI option and then select Internet banking option. The e-Procurement system will re-direct the bidder to SBI's internet banking page where he can enter his internet banking credentials and transfer the tender document and EMD amount.
- **National Electronic Fund Transfer (NEFT)** If a bidder holds bank account in a different bank, then, during the online bid submission process, bidder shall select NEFT option. An online remittance form would be generated, which the bidder can use for transferring amount through NEFT either by using internet banking of his bank or visiting nearest branch of his bank. After obtaining the successful transaction receipt no., the bidder has to update the same in e-Procurement system for completing the process of bid submission. Bidder should only use the details given in the Remittance form for making a NEFT payment otherwise payment would result in failure in e-Procurement system.

**As NEFT payment status confirmation is not received by e-Procurement system on a real-time basis, bidders are advised to exercise NEFT mode of payment option at least 48 hours prior to the last date and time of bid submission to avoid any payment issues.**

NEFT payment should done according to following guidelines:

- **Single transaction for remitting Tender document fee and EMD:** Bidder should ensure that tender document fees and EMD are remitted as one single transaction.
- **Account number as per Remittance Form only:** Account no. entered during NEFT remittance at any bank counter or during adding beneficiary account in Internet banking site should be the same as it appears in the remittance form generated for that particular bid by the e-Procurement system. Bidder should ensure that tender document fees and EMD are remitted only to the account number given in the Remittance form provided by e-Procurement system for that particular tender.

Bidders must ensure that the banker inputs the Account Number (which is case sensitive) as displayed in the Remittance form. No additional information like bidder name, company name, etc. should be entered in the account no. column along with account no. for NEFT remittance.

- **Only NEFT Remittance Allowed:** RTGS payments, Account to Account transfers, State Bank Group

Transfers (GRPT), Payments from NRE Accounts, SWIFT Transfers or Cash payments are not allowed and are treated as invalid mode of payments. Bidder must ensure that the banker does NEFT transaction only irrespective of the amount and specially instruct the banks not to convert the payment type to RTGS or GRPT.

- **Amount as per Remittance form:** Bidder should ensure that the amount being remitted is neither less nor higher than the amount shown in remittance form.
- **UTR Number:** Bidders should ensure that the remittance confirmation (UTR number) received after NEFT transfer should be updated as it is, in the e-Procurement system for tracking the payment.
- **One Remittance Form per Bidder and per Bid:** The remittance form provided by e-Procurement system shall be valid for that particular bidder and bid and should not be re-used for any other tender or bid or by any other bidder.

Any transaction charges levied while using any of the above modes of online payment has be borne by the bidder. The supplier/contractor's bid will be evaluated only if payment status against bidder is showing "Success" during bid opening.

#### **D) SUBMISSION PROCESS:**

For submission of bids, all interested bidders have to register online as explained above in this document. After registration, bidders shall submit their Technical bid and Financial bid online on [www.etenders.kerala.gov.in](http://www.etenders.kerala.gov.in) along with online payment of tender document fees and EMD.

For page by page instructions on bid submission process, please visit [www.etenders.kerala.gov.in](http://www.etenders.kerala.gov.in) and click "Bidders Manual Kit" link on the home page.

**It is necessary to click on "Freeze bid" link/ icon to complete the process of bid submission otherwise the bid will not get submitted online and the same shall not be available for viewing/opening during bid opening process.**

**EXECUTIVE ENGINEER,  
KSHB,  
Thrissur.  
(For and on behalf of KSHB)**

## **Part V – SPECIFICATIONS**

### **(I) – GENERAL**

- The rates tendered by a Bidder for the work shall include the cost of:
  - a) All labour and supervision thereof, all materials, tools, implements and plant of every description, ladders, cordage tackle, etc. as well as the provision of safe and substantial scaffolding required for the proper execution of the work in conformity with the various items of work;
  - b) Supplying the requisite agency with necessary equipment's, to set out the work as well as to afford facilities for such examination of the work as the Departmental Officers may at any time consider desirable, as also to count, weigh and assist in the measurement or check measurement of the work or materials;
  - c) Providing and maintaining all temporary fences, shelters, lights , watchmen and danger signals and such other precautions as are necessary for the protection of the work or materials, as well as to protect the public and those connected with the work from accidents at the site of, or on account of the work;
  - d) All sheds, mortar mills and mixing platform of every kind required for the proper execution of the work according to the specifications;
  - e) All fees and royalties of materials and
  - f) Finally clearing away of all rubbish, surplus materials, plant etc. on completion of the work and dressing and levelling of and restoring the site to a tidy condition, prior to handing over the work to the Division Officer or his authorized assistant and also its maintenance until so taken over.
- 2. In the case of supplies of materials such as rubble, broken stones, gravel, sand etc. which may have to be measured prior to being used on the work, the Bidder must always stack or arrange them neatly on level ground or on ground cleared and levelled by him for the purpose in such manner as may be ordered by the Officer-in-charge so that they may be easily susceptible of inspection and measurement, the cost of such clearing, levelling and stacking or arranging being included in the rates for work. Each stack must be straight and of uniform section throughout and of the dimensions specified by the Officer-in-charge. Materials not stacked or arranged in accordance with instructions issued will not be measured and paid for.
- 3. The Bidder shall be bound to bear the expense of defense of any action or law proceedings that may be brought by person for any injury sustained owing to neglect of above precautions in connection with the execution of the work, and to pay any damages and cost which may be awarded in consequence.
- 4. The Bidder shall also help himself out of any difficulties of penalties arising from interference with private property in the execution of the contract.
- 5. The Bidder should state whether he has all the plant necessary for execution of the work. If the opinion of the Division Officer, Bidder's own plant is neither sufficient nor suitable for the proper execution of the work, the department may supply other available plant and recover reasonable hire for the same.

The Division Officer's decision in the matter shall be final and binding on the Bidder.

6. The Bidder shall bear the running expenses inclusive of pay of the departmental staff attached to such plant and cost of repairs of all Government plant while in his possession on hire as also the cost of restoring the same in good condition at the time of return, due allowance being made for fair wear and tear.
7. All stores and plant that are to be made over to the Bidder by the Department shall be handed over to him at the Division Office or Store yards at division headquarters or the PWD General stores, Trivandrum and the charges for their handling, loading and unloading and conveyance to and from for the respective work as also for stacking the materials neatly and in regular heaps on the ground or sheds to which they are brought shall be deemed to be included in the rates for the work.
8. Unless otherwise specifically provide for in the contract, the Bidder shall at his own cost keep all portions of the work free from water whether due to springs, or inclement weather and neat and sanitary condition and shall also see that drainage and sewage are prevented from entering the site of work or accumulating therein.
9. The Bidder shall be responsible for the proper use and bear the cost of protection of materials made over to him by the Department for use on the work and bear any loss form deterioration of from faulty workmanship or any other cause. The cost of materials thus allowed to deteriorate amounting as it does to and excess issue over sanctioned quantities, will be recovered at rates 20 percent over the actual cost. The orders of the Division Officer in the matter shall be final binding on Bidder.
10. The Bidder shall be responsible to see that the level or the other pegs, profiles, bench, marks masonry pillars or other marks set up by the Department for guidance in the execution of the work are not disturbed, removed or destroyed, the will be replaced by the Department at the cost of Bidder.
11. Any materials brought to the site of work, or any work done by the Bidder but rejected by the Officer-in-charge as being not up to the specifications shall in the case of materials supplied be then and there removed from or broken up at the site of work, and in the case of work done, the dismantled or rectified at the expense of the Bidder, as may be ordered by the Officer-in-charge.
12. In all cases whether so specified in the contract or not, the work shall be executed in strict accordance with the Bidder's accepted tender and these specifications and with such further drawings and specifications and orders as may from time to time be issued by the Division Officer.
13. Whenever the Bidder is ordered by the Division officer or his authorized assistant or subordinate to execute any item of work which is not in the tender, it shall be the Bidder's duty to get a special price arranged for any item and to see that it is written in the work spot order book (which shall be provided by the division officer and kept in the work spot by the subordinate-in-charge) and that this order is initiated and dated by the Bidder and entered in the work spot order book and initialed both by the Bidder and the departmental officer ordering such extra item that Bidder shall have not claim for extra payment.
14. Arbitration shall not be a means of settlement of any disputes or claims arising out of the contract relating to the work.
15. The work shall be carried out in accordance with the design and drawings furnished by the Department. The drawings shall have to be properly co-related before executing the work. In case of any discrepancy noticed between the drawings, final decision, in writing of the Engineer shall be obtained by the contractor. For items, where so required, by the relevant clause in PWD Quality Control

Manual, samples shall be prepared before starting the particular items of work for prior approval of the Engineer and nothing extra shall be payable on this account.

16. All materials to be used on works shall bear I.S. certification mark unless specifically permitted otherwise in writing. In case I.S. marked materials are not available (not produced), the materials used shall conform to relevant I.S. Code or CPWD/MORTH specifications, as applicable in this contract.
17. Unless otherwise specified in the bill of quantities, the rates for all items of work shall be considered as inclusive of pumping out or bailing out water if required for which no extra payment will be made. This will include water encountered from any source such as rains, floods, or due to any other cause whatsoever.
18. The rate for all items in which the use of cement is involved is inclusive of charges for curing.
19. Rates for plastering work, if any (excluding washed grit finish on external wall surfaces) shall include for making grooves, bands, chicken wire mesh over joints etc. wherever required and nothing extra shall be paid for the same.
20. The rates quoted for all brick/concrete work shall be deemed to include making openings and making good these with the same specifications as shown in drawings and/or as directed. No extra payment shall be made to the contractor on this account.
21. Rates for all concrete/plaster work shall include for making drip course moulding, grooves etc. wherever required and no extra shall be paid for the same.
22. The drawing(s) attached with the tender documents are for the purpose of tender only, giving the tenderer a general idea of the nature and the extent of works to be executed. The rates quoted by the tenderer shall be deemed to be for the execution of works taking into account the "Design Aspect" of the items and in accordance with the "Construction Drawings" to be supplied to the Contractor during execution of the works.
23. The contractor shall also ensure that all work sites within the site are properly cordoned off by means of barricades and screens up to a height of 3.0 m above ground level at his own cost.
24. Stacking of materials and excavated earth including its disposal shall be done as per the directions of the Engineer-in-Charge.
25. The Contractor will have to take prior approval of the Engineer-in charge for the Make of materials before procurement of the same. It may also be noted that if any of the makes does not comply with Standards, it will not be allowed for use. No claim whatsoever shall be entertained on this account.
26. The contractor shall carry out the survey of the site and shall establish sufficient number of grids and level marks to the satisfaction of the Engineer-in-charge, who shall decide on the basis of this information, the general levels of the construction works.
27. Prior to commencement of construction, the contractor shall in consultation with the Engineer-in-charge, establish several site datum bench-marks, their number depending on the extent of the site. The bench-marks shall be sited and constructed so as to be undisturbed throughout the period of construction.

28. The Contractor shall set out the works using Total Station
29. Samples : The contractor shall submit to the Engineer-in charge samples of all materials for approval and no work shall commence before such samples are duly approved.

In all cases whether so specified in the contract or not , the work shall be executed in strict accordance with the Contractor's accepted bid and these specifications and with such further drawings and specifications and orders as may from time to time be issued by the Engineer-in charge.

**EXECUTIVE ENGINEER,  
KSHB,  
Thrissur.**

**(For and on behalf of KSHB)**

**Part VII- CONTRACT DATA**

Sl No	Item	Data
1	Identification No. of the Contract	: <b>4/EE/TCR/KSHB/2021-22</b>
2	Name of work	: <b>KSHB-KHU-Kochi- Thrissur Division-WWH Chalakudy- Supply, conveyance, Installation, testing and commissioning of 30kwp on grid solar roof top solar plant</b>
3	Employer	Kerala State Housing Board [KSHB]
4	Tender Inviting Authority	Executive Engineer, KSHB, Thrissur
5	Agreement Authority	Executive Engineer, KSHB, Thrissur Division
6	Name of KSHB Division	Thrissur Division
7	Estimated Probable Amount of Contract	Rs : <b>16,72,383/-</b> (Excluding GST)
8	Source of Fund	Central Government & State Government Fund
9	Location of work	Thrissur
10	Type of work [Brief description about the nature of work]	<b>KSHB-KHU-Kochi- Thrissur Division-WWH Chalakudy- Supply, conveyance, Installation, testing and commissioning of 30kwp on grid solar roof top solar plant</b>
11	Time of completion of work (in months)	Three months
12	Class / Registration of Bidder	“A”Class - Electrical bidders of KSHB/Kerala PWD/Central PWD with having “A” Grade Licence from the Kerala Electrical Inspectorate, Energy Audit Firms Registered with Energy Management Centre-Kerala without expiring the validity and Government/Govt accredited agency for execution of Renewable Energy Systems with company registered in India under the Companies Act 1956/2013
13	Bid Submission start date	<b>11/01/2022</b>
14	Last date and time of Bid submission	<b>20.01. 2022, 05.00 PM</b>
15	Bid Submission Fee	Rs. 2,500.00/- + 450.00 GST
16	Bid Security (EMD)	Rs. <b>50,000.00/-</b>
17	Performance Guarantee	5.00 % of Contract amount
18	Performance security deposit	Performance Security Deposit shall be deducted at <b>2.5%</b> from running bills
19	Insurance requirements	As per NIT
20	First tier quality control tests / Minimum tests to be conducted	As per Kerala PWD Quality Control Manual
21	Defect Liability Period	36 months
22	Liquidated damages	As per NIT
23	Work items for which guarantee is required	As per NIT
24	Contractor's equipment, tools and plants	As per NIT
25	Limit of sub-contracting	25.00%

26	Maximum extent of change in quantity	25.00%
27	Weather mobilization advance applicable	Not applicable
28	Deduct towards KVAT / GST	As per rules
29	Deduction towards KCWWF	As per rules

**EXECUTIVE ENGINEER**  
**KSHB,**  
Thrissur  
**(For and on behalf of KSHB)**

**Part XI – FORMS and DECLARATIONS**

**Annexure - I**

**KERALA STATE HOUSING BOARD**

**FORM OF TENDER**

**(Bid submission letter)**

**Name of Work :KSHB-KHU-Kochi- Thrissur Division-WWH Chalakudy- Supply, conveyance, Installation, testing and commissioning of 30kwp on grid solar roof top solar plant To**

The Executive Engineer  
Division Office ,  
Kerala State Housing Board  
Thrissur

Sir,

- I/We do hereby tender to execute the works enumerated in the Schedule accompanying in accordance with the terms in your tender No. **4/EE/TCR/KSHB/2021-22** and specifications and conditions of contract in force in Kerala P.W.D.
- Copy of the electronically signed specifications signed is also enclosed.
- I/We further agree to complete the whole work in **3** months from date of receipt of order to start work, and / or in the case of piece-works, maintain the minimum rate or progress specified in the Tender Schedule.
- I/We do/do not agree to accept and carry out such portion of the work included in my/our tender as may be allotted to me /us if the whole work be not given to me/us.
- In consideration I/We being registered as a Bidder in the Bidder in the “A”Class - Electrical bidders of KSHB/Kerala PWD/Central PWD with having “A” Grade Licence from the Kerala Electrical Inspectorate, Energy Audit Firms Registered with Energy Management Centre-Kerala without expiring the validity and Government/Govt accredited agency for execution of Renewable Energy Systems with company registered in India under the Companies Act 1956/2013 invited to tender, I/We agree to keep the tender open for acceptance days from the date of submission thereof and not to make any modifications in its terms and conditions which are not acceptable to Government.
- I/We agree that Arbitration shall not be a means of settlement of any disputes or claims arising out of the contract relating to the work.
  - None of the Partners of our firm is relative of employee of Kerala State Housing Board who is involved with the arrangement and execution of this work.
  - All information furnished by us in respect of fulfilment of eligibility criteria and qualification information of this Tender is complete, correct and true.
  - All documents/credentials submitted along with this Tender are genuine, authentic, true and



valid.

- I/we undertake to deploy all plant and machinery, tools and tackles, man and materials etc. as required for execution of the work.

- I/We hereby declare that I/We have perused in detail and examined closely the Central Public Works Department Specifications, Kerala PWD Manual, Kerala PWD Quality Manual and Laboratory Manual, before I/We submit the tender/ bid and I/We agree to be bound by and comply with all such specifications and requirements.

- I / We agreed to meet all expenses towards compensation / rectification in the case of occurrence of any accident / damages at Site to the labourers / employees.

- If any information and document submitted is found to be false/incorrect at any time, department may cancel my/our Tender and action as deemed fit may be taken against us, including termination of contract, forfeiture of all dues including Earnest Money, revoking of Bank Guarantees and banning/delisting of our firm and all partners of the firm etc.

A sum of Rs.50,000/- is hereby Deposited online from Bank as Earnest Money. If I/We fail to keep the tender open as aforesaid or make any modifications in that terms and conditions of the tender which are not acceptable to Board.

OR

If after tender is accepted, I/We fail to execute the agreement as provided in tender notifications or to commence the execution of the work as provided in the conditions, I/We agree that the Board shall, without prejudice to any other right or remedy be at liberty to forfeit the said earnest money absolutely and also recover from me/us the entire loss that may be caused to the Board by the retender or rearrangement of the work or otherwise under the provision of the Revenue Recovery Act or otherwise.

- Acc:
- i. Tender Schedule (submitted with Financial Bid):
  - ii. Earnest Money
  - iii. Signed copy of specification:
  - iv. Signed copy of plan:

Nationality:

Full Name of Bidder:

Place of Residence:

**PRELIMINARY AGREEMENT TO ACCOMPANY IN KERALA STAMP PAPER WORTH Rs. 200/-  
ALONG WITH THE BID**

Article of Agreement executed on this the day of .....(month) two thousand twenty between the Kerala State Housing Board acting through the ....., Kerala State Housing Board (hereinafter referred to as "the Board") of the one part

And

Shri.....  
.....(name address of the tenderer) (hereinafter referred to as " the bounden " of the other part.).....

Whereas in response to the invitation for tenders, contained-in Notifications No -----  
-----  
dated .....inviting tenders the bounden has submitted to the Board a tender for the ..... specified therein subject to the terms and conditions contained in the said tender.

I/We undersigned hereby offer to construct the proposed work in strict accordance with the contract/bid document for the consideration to be calculated in terms of the priced schedule of quantities.

I/We undertake to complete the whole of the works as per the attached schedule from the date of issue of intimation by you that our tender has been accepted and upon being permitted to enter site. I/We further undertake that on failure, subject to the conditions of the contract relating to extension of time, I/We shall pay agreed `Liquidated Damages' for the period during which the work shall remain incomplete.

WHEREAS I/We has also deposited with the Board a sum of Rs.-----/-  
(Rupees.....)  
[carrying no interest] as earnest money for execution of an agreement under taking the due fulfillment of the contract in case his tender is accepted by the Board.

I/We agree that this sum shall be forfeited in the event of the Board accepting my/our tender and I/We fail to

take up the contract when called upon to do so as per the bid document.

I/We further agree for the deduction of 2.5% from the `Interim Payment/RA Bill' and up to a maximum of 2.5% of the contract value towards the `Performance Security Deposit', which will be returned as per the relevant clauses in the agreement.

I/We will furnish the Performance Guarantee Bond as per the approved format, if our bid is accepted. Bid Security deposited shall be treated as security for the proper fulfillment of the same and shall execute an agreement for the work in the prescribed form. If I/We fails to do this or maintain a specified rate of progress (as specified in the Milestone details of Contract Data in the bid document), the performance guarantee(both treasury fixed deposit and irrevocable bank Guarantee) and Performance Security Deposit if any deducted from the RA Bills shall be forfeited to Government and fresh tenders shall be called for or the matter otherwise disposed off. If as a result of such measures due to the default of the Bidder to pay the requisite deposit, sign contract or take possession of the work any loss to Government due to the same will be recovered from me/us as arrears of revenue, but should it be a saving to Government. I/We shall have no claim whatever to the difference. Recoveries on this or any other account will be made from the sum that may be due to us on this or any or other subsisting contracts or under the Revenue Recovery act or otherwise the Government may decide.

I/We further agrees that, in the case of becoming the lowest Bidder in this tender and in the event of failure on part of me/us to produce any of the original documents, or submit the performance guarantee, or enter into agreement with the first part within the specified time limit, the first part may take appropriate action as provided in the bid document. Recoveries on this or any other account will be made from the sum that may be due to us on this or any or other subsisting contracts or under the Revenue Recovery act or otherwise the Government may decide.

NOW THESE PRESENTS WITNESS AND IT IS HEREBY MUTUALLY AGREED AS FOLLOWS.

1. In case the tender submitted by the bounden is accepted by the Board and the contract for the **WWH-Chalakudy- Supply, conveyance, Installation, testing and commissioning of 30kwp on grid solar roof top solar plant** is awarded to the bounden, the bounden shall within **21** days of acceptance of his tender execute an agreement with the Board incorporating all the terms and conditions under which the Board accepts his tender.
2. In case the bounden fails to execute the agreement as aforesaid incorporating the terms and conditions governing the contract, the Board shall have power and authority to recover from the bounden any loss or damages caused to the Board, by such breach as may be determined by the inadequate the deficit amount may be recovered from the bounden and his properties movable and immovable and also in the manner herein after contained
3. All sums found due to the Board under by virtue of this agreement shall be recoverable from the bounden and his properties, movable and immovable under the provisions of the Revenue Recovery Act for the time being in force as though such sums are arrears of land Revenue and also in such other manner as the Board may deem fit.

In witnesses where of Shri .....( Name and designation) for and on behalf of the Board and Shri.....the bounden have here unto set their names that day and year shown against their respective signatures.

Signed by

Shri .....

(date)

In the presence witnesses :

- 1.
- 2.

Signed by Shri.....  
(date)

In the presence witnesses:

- 1.
- 2.

**Annexure - III**

**CERTIFICATE FOR CORRECTNESS OF THE BID DOCUMENTS**  
**(Format for Integrity Pact)**

(Certificate to be furnished by the Bidder with the tender document downloaded from e-GP Web-site)

I/We..... undertake that the tender submitted by us is downloaded from e-GP Website ([www.etenders.kerala.gov.in](http://www.etenders.kerala.gov.in)) and is same in content and form (verbatim), and any deviation, of detected, at any stage, would entitle the Employer to reject our bidding/ offer without assigning any reason or recourse to any penal action and would be legally binding on us.

Signature.....(of Bidder)

Seal.....

**Annexure - IV**

**Requisition for e-Payment**

[ To be attached with tender form as per G.O (P) No.06/2012/PWD dated 10/01/2012 ]

Certified that I am having a Savings / Current Account in <Name of Bank>

at <Name of Branch> with IFSC Code \_\_\_\_\_

The Account Number is: \_\_\_\_\_

I wish to receive all payments in this account through NEFT and RTGS systems, as the case may be, for all payments relating to this work.

Name of Bidder

Place:

Date:

## **Special Conditions For Electrification Works**

### **TECHNICAL SPECIFICATIONS**

#### **INDEX**

<b>Section I</b>	<b>:</b>	<b>General Requirements</b>
<b>Section II</b>	<b>:</b>	<b>Medium Voltage Distribution System</b>
<b>Section III</b>	<b>:</b>	<b>MCB- DB, MCB And RCCB</b>
<b>Section IV</b>	<b>:</b>	<b>Earthing</b>
<b>Section V</b>	<b>:</b>	<b>LT (1.1 Kv Grade Cables)</b>
<b>Section VI</b>	<b>:</b>	<b>Medium Voltage Distribution Board /Panel</b>

#### **SECTION I**

##### **GENERAL REQUIREMENTS**

#### **1. Scope of Work:**

##### **1 General:**

The scope of work shall be generally as given in the Tender Schedule and in the drawings for the electrification work. The intention of the specification, Tender Schedule and the drawings is to give finished work of approved and standard quality and all duly tested and commissioned. All minor items of details usually not shown or indicated but necessary for the completion of the system, including testing, commissioning and handing over shall deem to have been included in the work and in the rates quoted by the contractor.

##### **2. The work is divided under following main groups:**

- a. The entire internal electrification work shall be with Cu wires in concealed/in open PVC conduits with necessary accessories and switch boxes, light/fan points, power

points, etc.

- b. The Supply and Erection of lighting luminaries, ceiling fans, exhaust fans etc.
- c. The complete earthing system including earthing stations, earth conductors, earth bus and their connections.
- d. Providing power supply from sub-station to the sub panels in different locations as indicated in the drawings. The complete installation, testing and commissioning of external lighting within the plot area including lighting poles, their earthing, cabling, control unit and DB, pole terminal boxes, lighting luminaries and lamps etc.

## 2 Liaison and Co-ordination work:

2.1All liaison and co-ordination work with KSEB, Electrical Inspector or any other statutory body and agency will be contractor's responsibility and statutory expenses towards the same will be met by the owner. This liaison work will include all activities in all stages starting from making application to KSEB and/ or other agencies and up to and including release of required permanent electric connections for this project. The owners will pay the official fees, deposits and such other payments, which are to be paid in the name of the owners.

2.2After connection of regular supply by KSEB, the installation shall be again checked by the contractor.

2.3The contractor shall carry out all minor civil works connected with the electrical job. The contractor shall repair and make good the damages caused by him to the civil structure while executing the electrification work. The foundations for the panel board, and distribution pillars, grouting of frames in the wall, erection of D.B./switchboards on the wall etc. are all to be carried out by the contractor.

## 3. Abbreviations:

The following abbreviations have been used in the specifications, drawings and bill of quantities.

BIS : Bureau of Indian Standards.	SFU : Switch fuse unit.
ISS : Indian Standard Specifications.	E : Earth conductor.
HRC : High Rupturing Capacity.	Cu : Copper conductor.
GI : Galvanized Iron.	AL : Aluminium conductor.
MV : Medium Voltage.	MSB : Main Switch board.
LV : Low Voltage.	MS : Mild Steel
AMP : Amperes.	V : Volts.

KV :	Kilo Volts.	KVA :	Kilo Volt Ampere
CI :	Cast Iron.	SDF :	Switch disconnector fuse
MCB :	Miniature Circuit Breaker.	TPN :	Triple pole and Neutral.
MCCB:	Moulded case circuit breaker. Pole.	SP :	Single
ACB :	Air circuit breaker.	CT :	Current transformer.
DB :	Distribution board.	DG :	Diesel generator.

#### **4. Regulations and standards:**

The installation shall conform in all respects to Indian Standard code of Practice for Electrical Wiring installation IS 732-1963 and IS 2214-1963. It shall also be in conformity with the current Indian Electricity Rules, Indian Electricity Act. National Electric Code and Regulations of the Local Electrical Supply Authority in so far as these become applicable to the installation. Wherever this specification calls for a higher standard of material and/or workmanship than those required by any of the above regulations then this specification shall take precedence over the said regulations and standard. In general, the materials equipment and workmanship not covered by the above shall conform to the relevant Indian Standards.

#### **5. Approvals and tests:**

The contractor shall get approval for the work from KSEB and Electrical Inspector. On completion of the work the contractor shall obtain and deliver to the Consultant certificates of final inspection and approval by the local electric supply authority and electrical inspector. The consultant/client have full powers to test the materials or work or arrange to be tested by an independent agency at the electrical contractor's expense in order to prove their soundness and adequacy.

#### **6. Actual route of cables / Conduits etc:**

The locations of the DB's, light/fan points, power points and routing of the conduits, wires and cables as shown on the drawings are only indicative. Therefore the actual route and locations may differ from the plans according to the working drawings for civil construction and site conditions.

#### **7. Drilling and cutting:**

The contractor shall supply and install at his expense all secondary materials and special fittings found necessary to overcome the interference and to supply the



modifications on the route of mains and conduits that are found necessary during the work, to the complete satisfaction of the owner's representative.

Cutting of walls or other parts of the building for the complete and proper installation of the electrical equipments shall be the responsibility of the electrical contractor. However Beams, girders and other principal structural members shall not be cut or drilled. Any damage to finished surfaces shall be made good by repair or replacement at the contractor's expense. The contractor shall possess and make use of necessary tools and equipment for cutting grooves on walls.

## **8. Material and equipment:**

All material and equipment shall conform to the relevant standards and shall be of the approved make and design. Unless otherwise called for, only the best quality materials and equipment shall be used. The materials and equipment shall conform to relevant Indian Standards. The Contractor shall be responsible for the safe custody of all the materials and shall insure them against theft, damage by fire, earthquake etc. A list of items of materials and equipment, together with sample of each shall be submitted to the consultant.

All materials of the same kind of service shall be identical and made by the same manufacturer. The Consultant shall approve any deviation to this rule.

## **9. Voltage:**

Except for supplies to specialist equipment, the normal utilization voltages shall be 3 phase, 4 wire, 50 Hz, 415 volt between phases, 240 volt between any phase and neutral, with a solidly earthed neutral.

## **10. Manufacturers:**

Where manufacturers have furnished specific instructions relating to the materials proposed to be used in this job, covering points not specifically mentioned in these documents, these instructions are to be followed.

Where manufacturer's names and/or catalogue numbers are given, this is an indication of the quality, standards and performance required.

## **11. Rating:**

Rating of all items shall be appropriate for the conditions on the particular site on which the item will be used. All the equipment shall be fit for continuous work under

the heaviest conditions of site and shall be rated for the following condition.

- Outdoor temperature 45<sup>0</sup>C
- Temperature under shade 40<sup>0</sup> C

## **12. Inspection and testing:**

The owner's representative reserves the right to request inspection and testing at manufacturer's works at all reasonable times during manufacture of items for this contract. Tests on site of complete works shall demonstrate, among other things.

1. That the equipment installed complies with specification in all particulars and is of the correct rating for the duty and site conditions.
2. That all item operate efficiently and quietly to meet the specified requirements.
3. That all circuits are correctly fused and protected and that protective devices are properly coordinated.
4. That all non-current carrying metal work is properly and safely grounded in accordance with the specifications.

The contractor shall provide all necessary instruments and labour for testing shall make adequate records of test procedures and readings, shall repeat any tests requested by the Consultant/client and shall provide test certificates signed by a properly authorized person. Such test certificates shall cover all works. If tests fail to demonstrate the satisfactory nature of the installation or any part thereof then no claims for the extra cost of modifications, replacements or retesting will be considered. The Consultant/client's decision as to what constitutes a satisfactory test shall be final. The above general requirements as to testing shall be read in conjunction with any particular requirements specified for testing and commissioning.

## **13. Allowance for future growth:**

To allow for future increases in electric load it is desirable that all mains and DB shall be provided with spare capacity / ways. The no. of spare ways shall be discussed and finalized with the clients before placing order these materials.

## **14. Test certificates:**

The contractor shall submit test certificates for all the electrical material/system. These shall be issued by a government recognized inspection office certifying that all equipment, materials, construction and functions are in agreement with the requirements of these specifications and accepted standards.

**15. Samples and catalogues:**

Before ordering the material necessary for these installations, the contractor shall submit to the Consultant/client for approval a sample of every kind of material such as cables, conductors, conduits, switches, socket outlets, boxes etc. along with the catalogues. For big items such as switchboards the submission of shop drawings and catalogues shall be enough. After the selection by the Consultant/client the contractor shall arrange inspection and testing at the manufacturer's factory or assembly shop for final approval. No material shall be procured prior to the approval of the Consultant.

**16. Vendor and shop drawings:**

The contractor shall prepare and submit to the consultant/client for his approval two sets of detailed drawings of all distribution boards, switch boards, outlet boxes, special pull boxes, and other likewise materials and equipment's to be fabricated by the contractor or other vendor.

Before starting the work, the contractor shall submit to the Consultant for his approval in the prescribed manner, the shop/execution drawings for the entire installation, specially the main connection and junctions, the route of Conduits and cables, no and size of wires to be drawn through the conduits, location of all the outlet points and switch boards and distribution boards and any other information required by the Consultant/client. The Consultant/client reserves the right to alter or modify these drawings if they are found to be insufficient or not complying with the established technical standards or if they do not offer the most satisfactory performance or accessibility for maintenance.

**17. As built drawings:**

At the completion of work and before issuance of certificate of virtual completion the contractor shall submit to the consultant/client layout drawing drawn at appropriate scale indicating the complete system "as installed". These drawings must provide.

1. Run, location and size of conduits and inspection, junction, and pull boxes, along with the location of sockets and switches containing the light and power outlets.
2. Location and details of DB's, main switches, switchgears and other particulars.
3. A complete wiring diagram as installed and scheduled drawings showing all connection in the complete electrical system.
4. Location of all earthing stations, route and size of all earthing conductors, Route and particulars of all cables, cable chambers, RCC pipes etc.

**18. Safety of materials:**

The contractor shall provide proper and adequate facilities to protect all the materials and equipment including those issued by the owner against damage from any cause whatsoever.

**19. Completion certificate by Contractor.**

On completion of the electrical installation (or extension to an installation) the contractor countersigned by the supervisor shall furnish a certificate, under whose direct supervision the installation was carried out. This certificate shall be in the prescribed form as required by the local supply authority. The contractor shall be responsible for getting the electrical installation inspected and approved by the local concerned authorities, including electrical inspector.

**20. Staff:**

The contractor shall employ a competent fully licensed, qualified full time electrical engineer to direct the work at site, to receive instructions from Consultant/client and to correlate the progress of work in conjunction with all relevant requirements of the supply authority.

## **SECTION - II**

### **MEDIUM VOLTAGE DISTRIBUTION SYSTEM**

**1. Wiring for lighting and power:**

This specification covers, system and method of wiring, definition of point wiring, and supply, installation, connection, testing and commissioning of point wiring for light points, fan points, convenience socket outlet points, power socket outlet points, bell outlet points, etc. Wiring shall be with copper conductor PVC insulated wires drawn in rigid PVC conduits on walls, ceiling, etc. Wiring shall be from meter rooms to distribution boards, from DB to switch boards and from switchboard to outlet points. The method of wiring for this particular work shall be as mentioned under tender schedule.

**2. System of wiring:**

Medium voltage distribution system shall be applicable for wiring three phase, 4 wire, 415V, 50Hz, AC supply and single phase, 2 wire, 230V, 50Hz, AC supply. Light circuits shall be limited in any one of the three phases.

**3 Applicable standards:**

- 1 IS: 732 Code of Practice for Electrical wiring installation  
(system voltage not exceeding 650 V).
- 2 IS: 1646 Code of Practice for fire safety of buildings (General)  
Electrical Installation.
- 3 IS: 9537 (Part II) Rigid steel conduits for electrical wiring.
- 4 IS: 694 PVC insulated cables
- 5 IS: 1293 3 pin plugs and sockets.
- 6 IS: 8130 Conductors for insulated electric cables and flexible cord

7	IE: Rules	Indian Electricity Act and Rules
8	IS: 5133	Boxes for enclosure of electrical accessories Part 1: Steel& CI boxes.
9	IS: 371	Ceiling roses (Second revision)
10	IS: 4615	Switch socket outlets (non interlocking type)
11	IS: 3854	Switches for domestic and similar purposes.

**4. General Requirements:**

- 1 Before the conducts are installed the exact route shall be marked at the site for approval and the actual work shall be undertaken only after approval.
- 2 Load balancing of circuits in three-phase installation shall be planned before the commencement of wiring and shall be strictly adhered to.
- 3 Definition of point wiring:  
A point shall consist of the branch wiring from the switchboard together with a switch and point control boxes as required, as far as and including the wiring accessories such as ceiling fan box of socket outlet point or suitable termination. A point shall include, in addition, the earth continuity conductor/wire from the switchboard to the earth pin/stud of the outlet/switch box.

**5. Scope of work:**

**PV Module: System Specification**

- The Module Manufacture should be from **REC Solar, Sun Power, Panasonic, Adani Panel.**
- The Solar PV Module should have at-least 10 year product warranty and 25 years linear power output warranty or Insurance cover. Maximum permissible degradation of solar modules starting from the second year in performance should not be more than 0.8% per annum. The rated output power of any supplied module shall have only positive tolerance. Panel Wattage: Unit panel watt peak should not be less than 365Wp, Array Structure MS tubes, angles, channels etc. of various sizes can be used for mounting panels or arrays. Leak-proof Structure: Vendor should provide detailed design & drawings for the roof structure and roofing in the Administrative block . The panel should be used to constitute the roof of the Administrative block □ The design should ensure 100 % Leak proofing.

The medium voltage distribution system wiring shall be carried out in the under mentioned manner:

- a) Supply, installation, fixing of conduits and necessary accessories, switch boxes, outlet boxes and pull / junction boxes.
- b) Supplying and drawing of wires of required size including earth continuity wire.
- c) Supply, installation and connection of switches, sockets, cover plates, switch plates, concealed fan hook boxes / fan hooks as specified etc.
- d) The point shall be complete with the branch wiring from the switchboards to the outlet point, conduits and casing capping with accessories, control switch, socket outlet boxes, ceiling roses, batten/angle holder, connector etc.

## **6. Boxes:**

### **6.1 Junction boxes:**

All the boxes for junction boxes, pull boxes used in conduit wiring system shall be fabricated from 1.5 mm thick mild sheet steel with two coats of enamel paint of approved shade or powder coated as specified. The boxes shall have smooth external and internal finished surface. Separate screwed earth terminal shall be provided in the box for earthing purpose. All boxes shall have adequate no of knock out holes of required diameter for conduit entry. All PVC junction boxes shall be deep boxes.

The boxes shall be provided with a minimum of four fixing lugs located at the corners for fixing the covers. All fixing lugs shall have tapped holes to take machined brass screws. The boxes shall be sufficiently strong to resist mechanical damage under normal service conditions. Wherever different phase conductors are brought into the same enclosure, phase barriers shall be provided. The boxes shall have removable covers at top and bottom if specified.

### **6.2 Switch boxes and Outlet boxes:**

Switch boxes to receive switches, socket outlets, power outlets, Telephone outlets and fan regulators etc. shall be 16 SWG cadmium plated GI/MS boxes as manufactured by the switch manufacturer for erection of plate of modular type switches. The depth of the switchboard boxes shall be 50 mm and the size shall be selected so as to accommodate required number of switches, sockets and fan regulators without overcrowding the box.

### **6.3 Fan Regulator:**

Fan regulators shall be incorporated in the front plate of switchboard and shall from a single unit under one front plate for switches erected on GI boxes.

## 7 Cables

- 7.1 All cables / wires used for internal wiring shall be PVC insulated single core stranded conductor (FRLS) as specified and of 1100 volts grade and with copper conductors.
- 7.2 The conductors shall be plain annealed circular copper conductors. The minimum number and diameter of wires for circular stranded conductor shall be as per relevant IS specifications. The insulation shall be PVC compound complying with the requirements of IS specifications and the thickness of PVC insulation shall be as set out in the relevant standards.
- 7.3 All wires shall be colour coded as follows.

Single phase	:	Red
Three phase	:	Red, Yellow and Blue
Neutral	:	Black
Earth	:	Green on Green/Yellow (insulated)
Control (if any)	:	Grey

- 7.4 The wires shall be supplied in sealed coils of 100 Mts length and bear the manufacturers name, trademark, ISI mark, voltage grade etc.

### 7.5 Bunching of cables:

- a Wires carrying current shall be so bunched in the conduit that the outgoing and return wires are drawn into the same conduit. Wires originating from two different phases shall not be run in the same conduit.
- b. The number of insulated wires/cables that may be drawn into the conduits shall be as per the following table. In any case conduits having less than 20 mm dia shall not be used.
- c. Bunching of cables in conduits:

Max permissible no. of 1 core cables that may be drawn through different conduits:

Cable size (sq.mm)	Size of conduits (in mm)



		20	25	32	40
1.5 (stranding)(22/. 3)		7	15	24	-
2.5 (36/. 3)		5	11	17	-
4.0 (56/. 3)		4	8	13	-
6.0 (		2	4	6	7
16.0		-	3	4	6

## 8. Drawing of conductors:

- 8.1 No wire shall be drawn into any conduit, until all work of any nature that may cause injury to wire is completed. Care shall be taken in pulling the wires so that no damage occurs to the insulation of the wire. Before the wires are drawn into the conduits the conduits shall be thoroughly cleaned of moisture dust and dirt or any other obstruction by forcing compressed air through the conduits. The drawing and joining of copper conductor or wires shall be executed with due regard to the following precautions.
- 8.2 While drawing insulated wires into the conduits, care shall be taken to avoid scratches and kinks, which may cause breakage of conductors. There shall be no sharp bends in the conduit system.
- 8.3 Insulation shall be shaved off for a length of 15 mm at the end of wire like sharpening of a pencil and it shall not be removed by cutting it square or ringing.
- 8.4 Strands of wires shall not be cut for connecting to the terminals. The terminals shall have adequate cross section to take all the strands.
- 8.5 All looped joints shall be soldered and connected through terminal block/connectors. The pressure applied to tighten terminal screws shall be just adequate, neither too much nor too less.
- 8.6 Conductors having nominal cross-section area exceeding 2.5sq. mm shall be provided with crimping type cable sockets.
- 8.7 At all bolted terminals, brass flat washer of large area and approved steel spring washers shall be used. Brass Nuts & Bolts shall be used for all connections.

8.8 Only certified wiremen and cable jointers shall be employed to do jointing work.

8.9 For all internal wiring PVC insulated wires of 1100 volts grade shall be used. The sub-circuit wiring for point shall be carried out in looping system and no joint shall be allowed in the length of the conductors.

8.10 General wiring installation shall be as under.

a. Sub-main wiring

Wiring from meter room or main panel board to the distribution boards.

b. Circuit wiring

Wiring from DB's to point control boxes for lighting fan 6A sockets call bells etc. and from DB to the power sockets in the case of power wiring.

8.11 The sub-main wiring shall be either three phase, four wire or single phase, tow-wire system. Each sub-main wiring circuit shall also have its own earth continuity wire. The no and size of earth continuity wire shall be as per detailed drawings or as specified.

8.12 The circuit wiring shall generally be in single-phase system. However a maximum of 3 to 4 single-phase circuits belonging to the same pole/phase could be installed in the same conduit or raceway Each circuit wiring shall be provided with suitable earth continuity conductor as per standard specifications.

8.13 Not more that 10 light points/fan points shall be grouped on the one lighting circuit. The load per circuit shall not exceed 800 watts. The minimum size of conductor for wiring of lighting circuit shall not be less than 1.0 Sq.mm. Power circuit wiring shall not have more than two sockets connected to one circuit.

## **9. Joints in wiring:**

The wiring shall be by looping system, and hence all joints shall be made at main switches, distribution boards, socket outlets, lighting outlets and switch boxes only. No joints shall be made inside conduits and junction boxes. Conductors shall be continuous from outlet. For unavoidable joints due to any reason prior permission shall be obtained before making such connection. Joints by twisting conductors are prohibited.

## **10. Switches, sockets and accessories:**

#### 10.1 Switches(Modular):

- a. Switches shall conform to IS 3854, IS 1293, IS 6538 and IS 4615. Switches shall be single pole, single or two-way as shown on the drawings.
- b. The switches shall be rocker operated with a quite operating mechanism with bounce free snap action mechanism enclosed in an arc resistant chamber. .
- c. Switches at the same location shall be ganged to form a single unit under one cover plate. Where fan regulators are to be provided with the switchboards the same shall be incorporated.

#### 10.2 Sockets(Modular):

- a. The sockets shall conform to IS 1293. Each socket shall be provided with control switch of appropriate rating. The sockets shall be molded type, rated for 250 volts, and either of full 6 Amp or 16 Amp, capacity, as mentioned.
- b. Sockets shall be of three-pin type, the third pin being connected to earth continuity conductor. The socket shall be flush type. The sockets installed in machine room plant room or wet/damp area shall be metal clad weatherproof type. The socket shall have fully sprung socket contacts and solid brass shrouded terminals to ensure positive electrical connections.
- c. If specified, the sockets shall be provided with automatic shutters, which open only when earth pin of the plug inserts in the socket and provided with three pin plug top suitable to the socket and of the same make as socket.
- d. All 6A sockets, 16A switched sockets, DP switches, connector boxes etc. shall be as specified and with the finishing and make same as lighting switches. These shall be erected on the boxes as specified in drawings.

#### 10.3 Lamp holders, Ceiling roses etc.:

Accessories for light outlets such as lamp holders, ceiling roses, etc. shall be white in colour and in conformity with requirements of relevant IS specification. Ceiling roses shall be 3-plate type wherever specified. Angle and batten holder shall be erected on the junction boxes erected on wall/ceiling.

#### 10.4 Installation of switch, socket and accessories:

- a. Connection to be made only after testing the wires for continuity /cross phase etc with the help of a megger.
- b. The switch controlling the light point or fan shall be connected on to the phase wire of the circuit and neutral shall be continuous, having no fuse or switch

installed in the line except at the D.B. the third pin of the socket shall be connected to the earth continuity conductor of the circuit.

- c. Outlets shall be terminated into ceiling rose for ceiling mounted points. For other wall light points the outlets shall be connected into an angle holder. For wall plug sockets the conductors may be terminated directly into the switches and sockets.

## **11. Earthing:**

All earthing systems shall be in accordance with IS 3043 code of practice for earthing the type and size of earthing wire shall be as specified separately and in BOQ and drawings.

## **12. Testing and commissioning of installation:**

Before a completed installation is put into service, the testing of the installation shall be done as per IS 732.

### **12.1 Insulation Resistance:**

- a. The insulation resistance shall be measured by applying 500 volt. megger with all fuses in places, circuit breaker and all switches closed.
- b. The insulation resistance of an installation shall be required to have a value greater than one-mega ohms.
- c. The insulation resistance shall be measured between.
  - 1 Earth to phase
  - 2 Earth to Neutral
  - 3 Phase to Neutral

12.2 Earth continuity conductors shall be tested for electrical continuity and the electrical resistance of the same along with the earthing lead but excluding any added resistance or earth leakage circuit-breaker, measured from the connection, with the earth electrode to any point in the earth continuity conductor in the completed installation and shall not exceed one ohm.

### **12.3 Polarity or single pole switches:**

- a. A test shall be made to verify that every non-linked, single pole switch is

connected to one of the phase of the supply system.

- b. In, a two-wire installation a test shall be made to verify that all non-linked single pole switches have been fitted in the same conductor throughout and such conductor shall be labeled or marked for connection to an outer or phase conductor or to the non-earthed conductor of the supply.
- c. In a three wire or four wire installation a test shall be made to verify that every non-linked single pole switch is fitted in a conductor and which shall be labeled or marked for connection to one of the outer or phase conductor of the supply.

### **SECTION -III**

#### **MCBDB, MCB and RCCB**

#### **1. Miniature Circuit Breaker Distribution boards:**

- 1.1 Miniature circuit breaker distribution boards shall conform to IS 2675, IS 8623 and shall be suitable for operation on three phase, 4 wire, 415 V, 50 Hz, AC supply or single phase 2 wire 230 V 50 Hz, AC supply.
- 1.2 The MCB distribution board shall be in sheet steel enclosures with removable type cover with additional door for protecting accidental operation.
- 1.3 Enclosure and door shall be made out of CRCA sheet steel and powder coated and of approved shade. The interior shall be off white finish. The DB shall be totally enclosed with dust and vermin proof construction and shall be of domestic pattern. The DB boxes shall be as supplied by the original manufacturer.
- 1.4 Where distribution boards are specified to be complete with an isolator as incomer, the isolator shall be double pole for SP and N distribution boards and 4 pole for TP and N distribution boards.
- 1.5 Where distribution boards are specified to be complete with MCB + ELCB as incomer, the MCB + ELCB shall be double pole for SP and N distribution boards and 4 pole for TP and N distribution boards.
- 1.6 Bus bars shall be tinned copper. The internal connections in the DB shall be by using stranded copper conductor, PVC insulated wire with copper lugs crimped at

both ends. Neutral busbar and earth busbars shall also be provided in the enclosure. Neutral busbar shall have equal rating of phase busbars.

1.7 Distribution boards shall be provided with circuit identification by means of directory on the front cover. Upon completion of the works, the contractor shall provide and fix accurate framed circuit lists for all distribution boards. These shall consist of Perspex envelopes, fixed securely by an approved method on the inside face of each distribution board front cover into which shall be inserted a neatly typed list of circuits, indicating the number of circuits, phase, cable, size, number of points connected, circuit rating and the loading.

The contractor, shall also provide and fix by means of brass screws tapped into the D.B. cover, labels, with black letter on a white background for all distribution boards, MCB + ELCB, Isolator etc. The engraving on the labels and the inscription on the circuit lists shall be approved by the Consultants before the work is carried out.

1.8 All incoming terminals shall be fully shrouded.

1.9 The conduit entry plates shall be removable type and shall be provided at top and bottom. All the conduits shall be properly terminated using glands, grips, check nuts, female adapters with bush etc.

1.10 Wiring shall be terminated properly using crimping type copper plugs/sockets. Identification ferrules shall be provided on all wires.

1.11 Two No. earth terminals shall be provided on each Distribution Board.

Recessed mounted DB shall be erected in the chase/cut portion of the wall. The cutting or the walls shall be done while constructing the wall and shall be of adequate size to comfortably accommodate the DB. The cut portion shall be smoothed and made plain and shall be fine finished. The DB shall be fixed in this chased portion with suitable clamps and bolts. The top cover of the DB cabinet shall be projecting out of the wall surface and free from any obstruction so as to open the same smoothly.

## **2. Miniature Circuit Breakers:**

2.1 MCBs shall be manufactured in accordance with IS 8828 having a short circuit breaking capacity category 10000 Amps at both 240 volts 50Hz. and 240/415 V, 50 Hz and complying with the test requirements for both reference calibration temperatures of 20 degree C and 40 degree C. (10kA as per IS/IEC 60898-1-2002(0.5-63A))

- 2.2 All miniature circuit breakers shall be rated to withstand the fault currents of the circuits they protect without causing any interference in any other protective device associated with the distribution system. At the same time the design of the circuit breakers shall be such that, it will protect the circuit for which it is intended and not cause or allow other protective devices to operate when fault conditions apply.
- 2.3 Miniature circuit breakers shall be capable of carrying its full rated current continuously without tripping out.
- 2.4 All the miniature circuit breakers shall be fitted with a magnetic undelayed tripping mechanism.

### **3. Residual Current Operated Circuit Breakers (RCCB)**

- 3.1 RCCBs shall be manufactured in accordance with IS 12640 and IS 8828 having a short circuit breaking and earth fault protection up to 10 KA at both 240 Volts 50 Hz and 240/415 V, 50 Hz and complying with the test requirements as per IS 2640.
- 3.2 All RCCB shall be high sensitive and calibrated rating. This means that a 30 mA sensitivity RCCB should trip when the residual current is in the range of 15 to 30 mA and a 300 mA RCCB should trip when the residual current is in the range of 150 to 300mA.
- 3.3 The RCCBs shall be truly current operated, which means that it shall be totally independent of the main voltage for tripping. RCCB must operate for nominal voltage well below the maximum safe value of 10 volts. RCCB shall interrupt the circuit within 30 millisecond at a leakage current of 30 mA.
- 3.4 RCCB shall be provided with a neutral advance mechanism. RCCB shall be functioning even in the event of failure of neutral and/or any one or two of phase supply conductor. RCCB shall be provided with trip free mechanism ensuring that the device cannot be reclosed / reset if the fault persists. RCCB shall be functioning even in the case of interchange of load and supply side connections.
- 3.5 Test button shall be provided to check the correct operation of the unit.
- 3.6 RCCB shall be designed for a very long life of a minimum of 20,000 operations and shall be capable of withstanding inrush current of 4 to 8 times the rated current. For the proper functioning the RCCB should not require any connection of earthing on the device.
- 3.7 The device should have high tripping accuracy of less than 5% of rated tripping current. The RCCB shall be provided with clear indication to show whether the tripping is due current leakage or overload/short circuit.

## **SECTION - IV**

### **EARTHING**

#### **1. Scope:**

This specification covers supply of necessary materials, and erection at site, of complete earthing system including earth pits at the locations indicated, earth conductors from earth pit to the respective equipments, switchgears, pillars etc. and making connections, testing at site, commissioning and handing over.

#### **2. Applicable Standards:**

The entire work of earthing system, shall conform to IS 3043, Indian Electricity Act and Rules and relevant regulations.

#### **3. General requirements:**

- 3.1 The earthing shall generally be carried out in accordance with the requirements of Indian Electricity Rules 1956 as amended from time to time and relevant regulations. Following IE rules are particularly applicable. IE Rule Nos. 32, 51, 61, 62, 67, 69, 88(2) & 90.
- 3.2 All earth connections shall be carefully made, visible for inspection, and the testing of individual earth electrode shall be possible.
- 3.3 All materials, fittings etc. used in earthing shall conform to IS specifications and in the absence of which the approval of competent authority shall be obtained.



- 3.4 The earthing electrode shall be at a minimum distance of 1.5 metres away from the outer face of the building wall. A minimum clearance of twice the depth of the electrode shall be maintained between two earthing stations.
- 3.5 A brick masonry chamber to facilitate easy identification and for carrying out periodical tests and inspection shall be constructed on top of the earth pit.
- 3.6 All metal conduits, trunkings, cable sheaths, HT and MV switchgears, Transformers, distribution boards, meters, light fixtures, fans, and all other metal parts forming part of the work shall be bonded together and connected to earthing network as specified.
- 3.7 Earthing system shall be mechanically robust and the joints shall be capable of retaining low resistance even after passage of fault currents.
- 3.8 Joints shall be soldered, tinned and double rivet. All the joints shall be mechanically, electrically continuous and effective. Joints shall be provided against corrosion.

#### **4. Earth Electrodes:**

- 4.1 The materials of earth electrode and earth conductors shall be galvanized iron unless specified otherwise in Bill of Quantities, specifications or drawings.
- 4.2 The earth electrodes shall be free from paint, enamel, grease etc.
- 4.3 The earth electrode shall be embedded as far as practicable in a moist soil and below permanent moist level.
- 4.4 The earth electrode shall not be installed in the proximity of a metal fence.

#### **5. Types of earth electrodes:**

The earth electrodes shall be either a pipe electrode or plate electrode, the details of which are as given in the following sections of specifications, drawings and BOQ.

#### **6. Pipe electrode:**

- 6.1 Pipe electrode shall consist of 2.5 meter long single piece G.I. pipe of min. 40 mm dia, as specified and shall be cut tapered at the bottom. 12mm dia. holes shall be drilled with 75 mm spacing between the holes and in a staggered manner as indicated in IS 3043.
- 6.2 The electrode shall be buried vertically in a specially prepared earth pit of size 35 cm x 35 cm and the earth pit shall be filled with alternate layers of charcoal, salt and fine washed sand for a minimum thickness of 150 mm. A funnel with wire mesh inside shall be fixed to the top of the GI pipe for watering purpose.

- 6.3 A masonry chamber with a cast iron cover hinged to the cast iron frame embedded in the top portion of the masonry shall be constructed on top of the GI pipe to house the funnel and the earth connection. The approximate size of the chamber shall be 300 mm x 300 mm and 300 mm deep.
- 6.4 The earth conductor from electrode shall be taken out of the masonry chamber through a protecting pipe embedded in the masonry.
- 6.5 The top of the masonry chamber shall be 50 mm above the finished ground level.

**6.a Plate electrode:**

- 6.a1 Plate electrode shall consist of GI or CI Plate of size 1200X1200X12mm as specified.
- 6.a2 The electrode shall be buried vertically in a specially prepared earth pit of size 1500x1500x600mm, earth pit shall be filled with alternate layers of charcoal, and fine washed sand for a minimum thickness of 150 mm upto 150mm above the plate. A funnel with wire mesh inside shall be fixed to the top of the GI pipe for watering purpose.
- 6.a3 A masonry chamber with a cast iron cover hinged to the cast iron frame embedded in the top portion of the masonry shall be constructed on top of the GI pipe to house the funnel and the earth connection. The approximate size of the chamber shall be 450mm x 450 mm and 450 mm deep.
- 6.a4 A test joint shall be provided mounted on the watering pipe below the funnel(the size of strip as per standards in IS 3043) with drilled holes for connecting earth leads, earth interconnection and lead from electrode.
- 6.a5 The earth lead and interconnection shall be based on the fault level calculation and all electrodes shall be interconnected.

**7. Earth conductor:**

All earthing conductors shall be of high conductivity copper and or GI as specified and shall be protected against mechanical injury or corrosion. The connection of earth continuity conductors or earth bus and earth electrode shall be strong and sound and shall be rigidly fixed to the walls, cable trenches, cable trays or conduits and cables by using suitable clamps made of non-ferrous metals.

**8. Testing:**

On completion of the entire installation, the earthing network shall be tested for their resistance to earth in accordance with IS 3043. All meters, instruments & about required for the test shall be provided by the contractor. The test results shall be submitted in triplicate to the owners for approval. The following tests shall be conducted.



#### **4. General requirements:**

- 4.1 All cables shall be new without any kinks or visible damage. The manufacturers name, insulating material, conductor size and voltage class shall be marked on surface of the cable at distance not exceeding 1M.
- 4.2 Procurement of cables shall be on the basis of the actual site measurements and the quantities given shall be regarded as a guide. Before procurement of the cables, the contractor shall submit the cable lengths and after approval of the same place orders for the cables.
- 4.3 Cables shall be tested at factory as per IS requirement. The tests shall incorporate routine tests, type tests and acceptance test. The certificate for type test shall be produced by the Contractor.
- 4.4 The cables shall be one of the makes mentioned in the list of approved materials and with ISI mark.
- 4.5 The cables shall be supplied and delivered at site in original cable drums with manufacturer's name, cable size, type and length all clearly indicated on each drum.
- 4.6 The unit rate shall include loading, unloading, transport, storage, handling, unwinding the cable from cable drums and laying in the cable trench or erected on cable trays etc.
- 4.7 The cables shall be laid by skilled and experienced labor.
- 4.8 Where the cable route intersects roads, streets or pathways, RCC spun pipes shall be laid in the trenches to serve as cable ducts. The pipes shall be joined by RCC spun collars. The RCC pipes shall project at least 150 mm on either side of road crossing.
- 4.9 The cable loops shall be kept at both ends of the cable length Minimum 3 metres long loop shall be provided.
- 4.10 The contractor shall take care to see that the cables received at site are apportioned to various locations to ensure maximum utilization and cable joints are avoided. This apportioning shall be got approved before the cables are cut to lengths. Straight joints are permitted only under exceptional circumstances.

#### **5 Storage and loading, unloading of cables:**

- 5.1 Cable drums shall not be stored one above the other. Sufficient space between cable drums shall be left for air circulation and the drums shall stand on battens placed directly under the flanges.

- 5.2 Cable drums shall be stored preferably on a plain ground without having any hard stones or any other sharp materials projecting above the ground surface. The drums shall be stored preferably in the shed or otherwise they shall be covered by tarpaulin.
- 5.3 Drums shall be stored and kept in such a way that bottom cable end does not get damaged.
- 5.4 Drums shall be rotated only in the direction marked on the drum.
- 5.5 Loading and unloading shall be done with material handling equipments only.

## **6 Cable trenches (excavated):**

- 6.1 The cable trenches shall be excavated 75 cms below the finished ground level and shall have a minimum width of 350 mm for laying of single cable. When more than one cable are laid in the same trench, the width of the trench shall be increased such that the spacing between the cables is 200 mm and the end cables are at minimum 100 mm from the side of the trench. At the turning of the cable route the trench shall be dug with radius equal to 15 times the cable diameter. For 11kV cables, the trench depth is 1.2mtr.
- 6.2 The trenches shall be cut square with vertical side walls and with uniform depth. Suitable shoring and propping may be done to avoid caving in of trench walls. The floor of the trench shall be rammed and leveled. The bottom of the cable trench shall be prepared with 100 mm sand bed for laying the cables.
- 6.3 The cables shall be laid in trenches over the rollers. After the cable is laid and straightened it shall be covered with sand, and bricks shall be placed on top and at the side of the cable.
- 6.4 Wherever specified, half round RCC pipes shall be placed above the cables.
- 6.5 The cable trench then shall be refilled with excavated materials after removing the stones and other sharp materials and the refilled materials shall be compacted with light ramming.
- 6.6 Approved Cable markers made of Aluminium or CI with 15 cms crown shall be provided along the route of cables at a spacing of 25 - 30 meters and also at both ends of crossings or at the cable turning point. The class, type, No. of cables shall be indicated on markers.
- 6.7 Cable shall be laid in Hume pipes at all road crossings and in GI pipes at the wall entries or at the crossing of the drains/gutters.

## **7 Cable Termination. :**

- 7.1 All cable terminations shall have tinned copper/aluminium compression lugs.
- 7.2 Cable termination shall be done in cable end box or in terminal box or in pillars etc. The end terminations shall be insulated with a minimum of six half lapped layers of PVC tape.

- 7.3 Cable terminations are to be made with flange type brass cable glands so as to grip inner and outer PVC sheaths and also the cable armour. Cable gland shall be bonded to the earth.
- 7.4 The cable conductor ends are to be connected by crimping tinned heavy duty copper lugs. Hydraulic crimping tool shall be used.
- 7.5 Every connection at a cable termination shall be mechanically and electrically sound and protected against mechanical damage and any vibration liable to occur shall not impose any harmful mechanical damage to the cable conductor.

## **SECTION - VI**

### **MEDIUM VOLTAGE DISTRIBUTION PANEL BOARDS**

#### **1 Scope:**

This section shall cover supply, assembly, installation, connection, testing and commissioning of medium voltage distribution panel boards as described in this specifications, drawings and schedule of quantities.

#### **2 System:**

All the medium voltage distribution panel boards shall be suitable for operation on three phase, 4 wire or single phase, 2 wire with normal system voltage of 415.240 volts, 50 Hz, A.C. supply with solidly grounded neutral system.

#### **3 Weather condition at site:**

The panel boards shall be suitable for continuous operation and designed to withstand heaviest conditions at site, which is a coastal area.

- a) Temperature range: 40 to 45° C
- b) Relative humidity : 50 to 100%
- c) Weather: Dusty

#### **4 Applicable IS Standards:**

The panel boards to be supplied under this specification shall conform to latest editions of relevant Indian Standards and Indian Electricity rules and regulations. The following Indian Standards shall be complied with.

IS 4237 : General requirements for switch gear and control gear for voltage not exceeding 1000 V.

IS 2208 : HRC cartridge fuse links upto 610 V.

IS 2705 : Current transformers

IS 1248 : Electrical Indicating Instruments.

IS 375 : Switch gear bus-bars, main connection and auxiliary wiring, marking and arrangement for.

IS 2147 : Degree of protection provided by enclosures for low voltage switch gear and control gear.

IS 2675 : Enclosed distribution fuse boards and cutouts.

IS 2557 : Danger notice plates.

## **5 General**

### 5.1 Shop drawing:

Prior to fabrication of the panel boards, the contractor shall submit for the approval of the Engineer in charge the shop /vendor drawing and design calculations indicating type, size, short circuit rating of all the electrical components used, busbar size, internal wiring size, panel board dimension, colour, mounting detail etc. The contractor shall submit manufacturer's catalogues of the electrical components installed in the panel boards.

### 5.2 Inspection:

At all reasonable times during production and prior to transport of the panel boards to site, the contractor shall arrange and provide all the facilities at manufacturer's plant for inspection and testing and any state inspection agreed upon.

### 5.3 Test certificates:

Testing of panel boards shall be carried out at factory or at site as specified in Indian Standards in the presence of Engineer in charge. The test results shall be recorded on prescribed forms. The test certificates for the test carried out at factory or at sit shall be submitted in duplicate to the Engineer in charge for approval.

## **6 Cubicle type panel boards:**

### 6.1 Construction:

#### 6.1.1 Structure:

The panel boards shall be metal enclosed sheet cubical, compartmentalized suitable

for indoor or outdoor installation having dead front, floor mounting type. All M.S. sheets used in the construction of panel boards shall be 14 SWG thick for main panel and 16SWG for other panels unless specified otherwise in the item and shall be folded and braced as necessary to provide a rigid support for all components. Joints of any kind in sheet steel shall be seam welded, all welding slag ground off and welding pits wiped smooth with plumber metal.

The panel boards shall be totally enclosed, completely dust and warm proof Gaskets between all adjacent units and beneath all covers shall be provided to render the joints dust proof. All doors and covers shall be lockable and fully gasketed with foam rubber or neoprene rubber strips.

All panel and covers shall be properly fitted and secured with the frame, and holes in the panel correctly positioned. Fixing screws shall enter into holes tapped into an adequate thickness of metal or provided with bolt and nuts. Self-threading screws shall not be used in the construction of panel boards. Suitable base channels (min size 75 mm x 75 mm x 5 mm thick) shall be provided at the bottom. A Clearance of 300 mm between the floor of the panel board and the bottom of the lower most units shall be provided. Panel boards, if necessary shall be preferable arranged in multitier formation. The panel boards shall be of adequate size with a provision of spare space (as jointly decided with EIC) to accommodate possible future additional switchgear. The size of the panel boards shall be designed in such a way that the internal space is sufficient for hot air movement, and the electrical component does not attain temperature more than 40 degree Celsius. Opening for natural ventilation shall be provided and shall have screens or grills made of brass or stainless steel wire mesh. Silica gel bags shall be placed at the bottom of every compartment. This requirement is in addition to space heater.

The panel boards shall be provided with removable sheet steel plates at top and bottom with knockout holes of appropriate size and number in conformity with the number, and size of incoming and outgoing conduits /cables.

The panel boards shall be designed to ensure maximum safety during operation, inspection, connection of cables, maintenance and repairs etc. with busbar system energised. Means shall be provided to prevent shorting of power and /or control terminals due to accidental drop of maintenance tools etc. inside the panel board. Partitions between feeder compartments, busbar chamber, cable alleys, vertical panels etc. shall be provided to take care of this aspect. The panel boards shall be sufficiently rigid to support the equipment without distortion under normal and short circuit condition; they shall be suitably braced for short circuit duty.

For buses and cables, access shall be limited from front and top only. All other equipment shall be mounted on the front side, (unless specified otherwise for any specific panel) and shall be accessible from the front. All joints and connections shall be made by cadmium plated high tensile steel bolts nuts and washers secured against loosening. The erection switchboards shall be in conformity with IE 51 (1) c

It shall be possible to insert any new cable and to connect all load side wiring with the busbar energised, without any special precautions. Opening of the busbar chamber



shall be possible with special tools only. Indication lamps and meters shall not be fitted on the door of the switches or busbar chamber cover.

#### 6.1.2 Protection class:

All the outdoor panel boards shall have protection class of IP 55 The complete board shall be double jacketed with insulation material to withstand outdoor temperature. All the indoor panel boards shall have protection class IP 52

#### 6.1.3 Circuit compartments:

Each switch fuse units and meters shall be housed in a separate compartment and shall be enclosed on all sides. Sheet steel hinged lockable door shall be duly interlocked with breaker/switch fuse units in “ON” and “OFF” position. However it shall be possible to bypass this interlock for inspection purpose.

#### 6.1.4 Instrument compartment:

Separate and adequate compartment shall be provided for accommodating instruments, indicating lamps, control contactors /relays, and control fuses etc. These components shall be accessible for testing and maintenance without any danger of accidental contact with live parts of the circuit breaker/switch fuse units, busbar and connections.

#### 6.1.5 Busbar:

The busbars shall be of three-phase four wire system with separate neutral and earth bar. The busbar and interconnection between busbars and various components shall be with high conductivity, hard drawn, electrolytic copper strips.

The busbars shall be of rectangular cross section designed to withstand full load current for phase busbars and half rated current for neutral busbars and shall be extensible on either side. The busbar shall have uniform cross-section through out the length. The rating of the busbars shall be as specified in BOQ and/or drawings.

The busbars and interconnections shall be insulated with color-coded insulation tapes/covers. The busbars shall be supported on unbreakable, non-hygroscopic insulated supports at sufficiently close intervals to prevent sagging and shall effectively withstand electromagnetic stresses in the event of short circuit. The busbars shall be housed in a separate compartment. The busbar shall be isolated with 3 mm thick hylam sheet to avoid any accidental contact. All bus bar connection shall be done by drilling holes in busbars & connecting by chromium plated brass bolt and nuts. Additional cross section of bus bars shall be provided in all distribution boards to cover up the holes drilled in the busbars. Spring and flat washers shall be used for tightening the bolts. All interconnections between busbars and circuit breakers/switches and between circuit breakers/switches and cable terminals shall be through solid copper strips of proper size to carry full rated current. These strips shall

be insulated with insulating tapes/covers.

#### 6.1.6 Terminals:

The outgoing terminals and neutral link shall be brought out to a cable alley suitably located and accessible from the panel front. The current transformers for instruments metering shall be mounted on the terminal blocks. No direct connection of incoming or outgoing cables to internal components of the panel board is permitted. Only one conductor may be connected in one terminal. Adequate no of spare terminals of required size shall be left in each compartment.

#### 6.1.7 Wireways:

A horizontal wire way with screwed covers shall be provided at the top to take interconnecting control wiring between different vertical sections.

#### 6.1.8 Cable compartments:

Cable compartments of adequate size shall be provided for easy termination of all incoming and outgoing cables entering from bottom or top. Adequate proper supports shall be provided in the cable compartments to support cables. All outgoing and incoming feeder terminals shall be brought out to terminal blocks in the cable compartment.

#### 6.1.9 Earthing:

Copper earth bars shall be provided for the entire length of the panel. Size of the earth busbars, unless specified otherwise in BOQ, shall be 25mm x 3mm horizontally and 25 mm x 3mm vertically in cable alleys etc. Provision shall be made for connection from this horizontal earth bar to the earth pit on both side of panel board. The earth continuity conductor of each incoming and outgoing feeder shall be connected to the vertical earth bar.

All non-current carrying parts and the framework of panel board shall be connected to this earth bar. All doors and movable parts shall be connected to earth bus with flexible copper connections. Armour of the cable shall be properly connected with earthing clamp, and the clamp shall be bonded with the earth bar.

#### 6.1.10 Danger notice plates:

Danger notice plates with symbol as per IS shall be provided on panel boards.

#### 6.1.11 Fuse puller etc:

One set of fuse puller (for various amps of fuses), panel keys and special tools etc. shall be supplied with each panel board.

## **6.2 Indicating lamps**

Panel mounting type low power consumption solid state lamps suitable for specified voltage shall be used Lamps shall be provided with suitable current limiting resistors. Lamps shall be provided with translucent lamp covers to diffuse light Lamps shall be provided with bayonet cap bulbs.

### **6.3 Measuring instruments:**

All measuring instruments shall be square pattern moving from 90 deg. scale, 96mm x 96mm, flush mounting type. Instrument shall be of accuracy class 1 as per IS 1248 Ammeters for motor and other feeders shall be graduated for full load current of motor with a compressed scale at the end for at least 6 times full load current. The KW meter and PF meter shall be suitable to measure unbalance loads on 3-phase 4 wire system PF meter shall be in 0.5-1- 0.5 range.

### **6.4 Installation:**

The panel boards shall be installed at the location as indicated in the drawings. The contractor shall submit for approval a shop drawing indicating room size, panel size and method of installation prior to installation.

The cubicle type panel board shall be installed on suitable foundation. Foundation shall be as per the dimensions supplied by the panel manufacturer. The foundation shall be flat and level. Suitable grouting holes shall be provided in the foundation. Suitable MS base channel shall be embedded in foundation on which the panel can be directly installed. If the panel is provided with an angle iron pedestal or base plate the same shall be grouted firmly in the floor. The panel boards shall be properly aligned and erected in plumb and bolted to the foundation by bolt parallel to the walls.

After installation of the panel boards, various components of the boards shall be checked and be put in working order. The cables laid through cable trench or on cable trays/racks etc shall be terminated on the bottom plate or top plate as the case may be by using Siemens type brass compression glands. The individual cables shall then be led through the panels to the required feeder compartments for necessary terminations. The cables shall be clamped to the supporting arrangement. The switchboard earth bus shall be connected to the local earth grid. Connection of cables shall be by crimping type Cu /Al lugs using hand operated or hydraulic crimping tool as per cable sizes.

### **6.5 Testing:**

#### 1) Testing at factory:

Panel boards shall be inspected at factory at pre-assembly stage and any modifications or changes as suggested shall be incorporated. The panel boards shall be again inspected and tested at the factory after assembly of all components and completion of all inter-connections and wiring. The tests shall include all routine and type tests as per relevant ISS.

#### 2) Testing and pre-commissioning checks at site:

Panels shall be commissioned only after the successful completion of the following

tests. The tests shall be carried out in the presence of Engineer in charge.

#### **6.6 Precommissioning checks**

- 1) Check all panels are aligned in line and property erected in plumb.
- 2) All withdrawable portions shall be capable of smooth extraction and isolation
- 3) All main and auxiliary bus bar connections shall be checked and tightened.
- 4) All wiring terminations and bus bar joints shall be checked and tightened.
- 5) Wiring shall be checked to ensure that it is according to the drawing.
- 6) Before fitting the covers, all chambers, compartments, cable alleys etc. shall be checked for complete cleanliness and removal of foreign matter if any, particularly the tools used for erection, cut pieces of cable armour etc. Covers shall be properly fixed with all fixing screws in places.
- 7) All mechanical interlocks shall be checked and all fuses and links shall be inserted.
- 8) Earthing connections shall be checked.
- 9) Operational checks on all circuit breakers or switchgear shall be carried out, both mechanically and electrically to check that correct indications are provided for closed and open positions.
- 10) The panel boards will be, if required, subjected to Inspectorate inspection, checking and testing at the site and the contractor shall arrange to provide Inspectorate seals wherever required.
- 11) The panels shall be checked to ensure that moisture ingress has not taken place during transit and storage.

#### **TERMS & CONDITIONS FOR THE ELECTRIFICATION WORK AS PER SCHEDULE ACCOMPANYING THE TENDER / WORK ORDER**

1. Rate for individual items shall be quoted and total for each item and grand total of all the items shall be shown in the tender. Income tax, KVAT and other statutory recoveries will be made in the bill as per rules.
2. Only approved make of materials accepted as per list appended shall be used for the work. All other materials not mentioned in the list specifically shall conform to relevant IS standards.
3. M.V. installation shall conform IS. 732.
4. Earthing shall conform IS 3043 / 1988.
5. Lightning protection as per IS 2309.

6. All wires shall be colour coded as below:

- a) Single phase - Red.
- b) Three phase - Red, Yellow, Blue.
- c) Neutral - Black.
- d) Earth - Green.

7. The final rates for the various items of work and materials if any coming under your scope of supply will be as detailed in the schedule.

8. The work shall be commenced immediately and carried out strictly in accordance with a time schedule prepared by you and approved by our consultants.

9. It shall be the responsibility of the contractor to prepare detailed drawings as per the design and guidelines given by the consultant and to submit the scheme for necessary approval under Rule 63 of IER 1956 from the Electrical Inspectorate. The contractor shall keep close liaison with the Electrical inspectorate and KSEB to expedite formalities like, scheme approval, power allocation and sanction for energisation.

10. The schedule in general contains almost all the work and the material required for the work. In case any additional work / modification is found necessary during the actual execution of work it shall be carried out only with prior approval of the Consultant / Client and on mutually agreed terms.

11. The client shall bare all expenses towards statutory fees and charges leviable by the Electrical inspectorate and KSEB. Such fees shall be paid by the contractor and the amount spent by the contractor shall be reimbursed by the client on production of vouchers / receipts.

12. Terms of payment:

As decided by CAPE.

13. It shall be the responsibility of the contractor to carry out to the satisfaction of the client and consultant all necessary pre-commissioning tests before preparing the completion certificate for submission to the KSEB.

14. The contractor shall comply with the provisions of IER 1956 and Licensing Board Rules in regard to the execution and completion of the work.
15. The work shall be completed in all respects in accordance with the schedule within a period of two months from the date of finalizing the tender
16. The contractor shall furnish a guarantee for a period of one year from the date of commissioning of the installation, for all the works carried out as per this tender and shall undertake to replace/repair any equipment or materials supplied by them during this period of guarantee free of cost. The contractor shall furnish a Bank guarantee equivalent to 5% of the total value of the contract.
17. Any alteration or rectification of works of the existing installations suggested by Electrical Inspectorate shall be treated as extra items.
18. A copy of this shall be signed and returned to the Client as a token of acceptance.
19. The contractor should sign on all pages of tender documents
20. The successful bidder to whom the work is awarded should furnish 5% of the quoted value or Rs One lakh which ever is less towards security deposit in the form of DD from a nationalized bank.
21. Retentions of ..... of the gross amount of each running bill will be deducted as retention. .... of retention amount along with security deposit will be released on commissioning of work. The balance retention amount will be released after completion of the guarantee period of one year.
22. The amount towards Earnest Money Deposit, Security Deposit and retention will not carry any interest.

Contractor

## APPROVED LIST OF MAKE OF MATERIALS

SI	NAME OF MATERIAL	MAKE
1	Wires	Tracocable, RR-cable, Polycab, Havells , V-Guard
2	Armoured Cable	Finolex, Havells, Polycab, RR cable
3	PVC Pipe	Balco, Precision, BEC, Toms, Polycab ISI
4	Modular Accessories Switch, Socket, Stepregulator, TV Socket, RJ-45, RJ-11	Legrand, MK, Siemens, Schneider, GM,
5	Enclosures- Metal Box, DB, MCB, Isolator, RCCB RCBO, MCCB	Siemens, Schneider, L&T, ABB, Havells, Legrand
6	Switch Gears, Isolator, Changeover Switch, Circuit Breakers	L&T, Siemens, Schneider, Legrand, GE ABB, Havells.
7	Capacitors	Crompton, Keltron, Seimens, L&T
8	Fan, Exhaust fan , Aircirculators	Crompton -highspeed, Havells Orient, GEC, Almonard,
9	Tube Light & Light Fixtures	Crompton, Havells, Wipro, GE, Jaquar, Luker, Bajaj, Dewton
10	Out-door solar Street light	Crompton, Wipro, Bajaj, Dewton
11	Generator	Cummins, Crompton Greaves, Kirloskar, Cooper, Caterpillar Perkins, Volvo

12	Alternators	Stamford, Crompton, Kirloskar, KEC, KEL
13	Transformer	KEL, BHEL, Voltamp, Kirloskar, Intrans
14	CT & PT	Kappa, Intrans, AE, MEI
15	Lifts	Kone, Otis ,Johnson ,Mitsubishi, Fuji, Schindler,
16	Pump Motors	Kirloskar, L&T, Crompton, CRI, Mahindra
17	Starters	L&T, Crompton, Seimens, Schneider
18	Air Conditioner	Voltas, Daiken, Electrolux, Sharp, Carrier Hitachi, Mitsubishi
19	Inverter & UPS	Hykon, Emerson, Mitsubhishi, Keltron, Numeric, And ANERT approved makes
20	Battery	Exide, Bosch, Amaron, Panasonic
21	RMU & ADD ON	ABB, Schneider, Seimens
22	HRC Fuse	L&T, Seimens, Standard, GE
23	Energy Meters 1& 3 Phase	L&T, REMCO(BHEL)
24	PV Module	REC Solar, SunPower, Panasonic, Adani Panel, And ANERT approved makes
25	GI pipe	Jindal, Tata, Zenith, Surya-Prakash
26	Cable Management System	Legrand, MK, OBO
27	Street Light Pole	K-light, Unieuepoles, Bajaj, Metal Coats, Schreder,
28	Angle batten, Ceiling rose, bell-push	Anchor-Panasonic , Wonder, Oswal, GM, MK