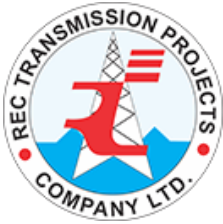


REC TRANSMISSION PROJECTS COMPANY LIMITED



On Behalf of J&K Power Transmission Corporation Ltd. (JKPTCL erstwhile JKPDD)

As Project Implementation Agency

(Invites bid through e-Tendering mode only)

**FOR
TURNKEY CONTRACT PACKAGE OF**

“Design, Engineering, Supply & Construction of Residential Staff Quarters & associated facilities at 160 MVA, 220/33 kV Gas Insulated Substation (GIS) at Lassipora(Srinagar Region) on Turnkey Basis associated with Strengthening of Transmission System of JKPTCL under PMDP Scheme-15”.

**Tender Specification No- RECTPCL/PIA/JKPTCL/Lassipora-Qtr/01 of 2020 dated:
19-07-2020**

VOL-I

July 2020

REC Transmission Projects Company Limited
(A wholly owned subsidiary of REC, a 'Navratna CPSE'
Under the Ministry of Power, Govt of India)
ECE House, 3rd Floor, Annexe – II,
28 A, K G MARG, NEW DELHI – 110 001
Website: www.rectpcl.in

SECTION – I

INVITATION FOR BIDS (IFB)

**INVITATION FOR BIDS (IFB)
FOR**

“Design, Engineering, Supply & Construction of Residential Staff Quarters & associated facilities at 160 MVA, 220/33 kV Gas Insulated Substation (GIS) at Lassipora (Srinagar Region) on Turnkey Basis associated with Strengthening of Transmission System of JKPTCL under PMDP Scheme-15”

**(SINGLE STAGE TWO ENVELOPE BIDDING)
under e-procurement**

DATE OF ISSUANCE OF IFB : 19/07/2019

SPECIFICATION NO(s) : RECTPCL/PIA/JKPTCL/QTR/01

FUNDING : DOMESTIC (PMDP Scheme-15)

- 1.0 This invitation for bids follows the e-procurement notice (Invitation for Bids) for the subject packages which appeared in National and Regional Newspapers on 19/07/2020. The tender document is available at RECTPCL website (www.rectpcl.in), REC website (www.recindia.com), e-bidding portal (<http://www.mstcecommerce.com/eprochome/rectpcl>) and (www.eprocure.gov.in). Interested bidders may view, download the e-Bid document, seek clarification and submit their e-Bid online up to the date and time mentioned in the table at Clause no-5.0 of IFB:
- 2.0 **Jammu Kashmir Power Transmission Corporation Ltd.** (erstwhile JKPDD), J&K (hereinafter referred to as ‘JKPTCL/’Owner’) has decided to set up, as an Owner, “**Strengthening of Transmission System in J&K under PMDP Scheme-15**”.
- 2.1 The Project Implementing activities in respect of the aforesaid Project on behalf of JKPTCL have been entrusted to REC Transmission Projects Company Limited (RECTPCL) is a wholly owned subsidiary of Rural Electrification Corporation Limited, a Navratna Public Sector Undertaking, and was incorporated on 8 January 2007 as Public Limited Company. RECTPCL's registered office is situated at Core-4, SCOPE Complex, 7, Lodhi Road, New Delhi-110003, India and Corporate office is at (hereinafter referred to as ‘RECTPCL/’EMPLOYER/’PURCHASER’) and RECTPCL intends to use funds to be provided by JKPTCL for eligible payments under the contracts for the Package as mentioned above. The Ownership of the project shall, however, remain vested with JKPTCL.
- 3.0 RECTPCL, on behalf of JKPTCL therefore, invites bids from eligible bidders for the aforesaid packages on Domestic Competitive Bidding basis under secured e-procurement procedure.

This Invitation for Bids extended through media, website or written communication or by any other means, shall not be construed to mean that the prospective bidders to whom the Invitation for Bids has been extended is deemed to be an eligible bidder. The eligibility of the bidders shall be determined as per the provisions of Bidding Documents.

3.1 **“Design, Engineering, Supply & Construction of Residential Staff Quarters & associated facilities at 160 MVA, 220/33 kV Gas Insulated Substation (GIS) at Lassipora (Srinagar Region) on Turnkey Basis associated with Strengthening of Transmission System of JKPTCL under PMDP Scheme-15”**

The broad scope of work shall include Design, Engineering, Supply & Construction of Residential Staff Quarters, associated Plumbing & Sanitary works, Water supply, Internal and External Electrical works, Road Work, and associated allied works etc.

The scope of work shall include but not be limited to the following

- a) Construction of Residential staff quarters & other buildings including boundary wall.
- b) Contouring and site leveling (if required)
- c) External water supply arrangement for colony etc.
- d) External sewerage system
- e) Supply, Erection, testing & commissioning of lighting poles, panels and control cubicles of equipment (as required in complete).
- f) Construction of underground water storage tank for colony
- g) Construction of septic tank & soak pit for residential building
- h) Supply, Erection, Testing & Commissioning of Pole mounted 1 x 100 KVA, 11/0.433 kV (Minimum BEE 4 Star Rating), Three Phase Distribution transformer along with 11kV Gang operated switch, Drop out fuse, Surge arrestors etc. in HV side and Main Township Distribution Board comprising of Two 200A, 20KA MCCB incoming feeders (One from MSB in ACDB Room & other from 100KVA Transformer), 200 Amps, 20KA Bus, One 200A Bus coupler MCCB and Eight outgoing MCCB feeders (2 of 63A & 4 of 32 A & 2 of 25A), LT cable from Transformer to Main Township Distribution Board etc. in LV side.
- i) External lighting and illumination for the Colony Area under present scope including Street Lighting with RCC htp poles with Led Lightning
- j) Internal Electrification of the buildings.
- k) From LT Sub-station - Cable Connection from LT Main Panel outgoing feeders to the Sub-Main Panels distribution box shall be provided by the Contractor as per Bid Price Schedule.
- l) RCC Roads 3.75 Mtr. As per approved layout of township.
- m) Any other item required for completion of scope of works

Details of Residential Quarters: -

S.No.	Particulars	Qty	Area	Configuration
1.	JE Quarters	4x2 Sets	(Total area- 2500 Sfts x 2)	Double Storey

The above scope of work is indicative and the detailed scope of work is given in the Technical Specification (Volume-II) of the Bidding Documents.

3.2 The completion period for the works shall be the **06 Months**.

3.3 Bidding will be conducted through the **Domestic Competitive Bidding** procedures as per the provisions of ITB and the contract shall be executed as per the provisions of the Contract. The respective rights of the Employer and the Bidder/Contractor shall be governed by the Bidding Documents/Contract signed between the Employer and the Contractor for the package.

4.0 The detailed Qualification Requirements (QR) are given in the Section-III, Vol-I of Bidding Document.

5.0 The tender document is available at RECTPCL website (www.rectpcl.in), REC website (www.recindia.com), e-tendering portal (<http://www.mstcecommerce.com/eprochome/rectpcl>) and (www.eprocure.gov.in). However, in case of any contradiction the tender documents at e-tendering portal <http://www.mstcecommerce.com/eprochome/rectpcl> shall prevail. Interested bidders may view, download the e-Bid document, commence preparation of bids to gain time, seek clarification and submit their e-Bid online up to the date and time mentioned in the table below:

Important Dates	
Date of Release of Bid Document	19/07/2020
Last date of queries/ seeking Clarification	27/07/2020, up to 11:00 Hrs. (IST)
Pre bid Meeting	30/07/2020, at 14:00 Hrs. (IST)
Start of Tender and Registration on MSTC portal	19/07/2020, 10:00 Hrs. onwards
Starting Date & Time of Bid submission	05/08/2020, 10:00 Hrs. onwards
Last Date & Time of submission of Bid	10/08/2020, till 16:00 Hrs. (IST)
Date of opening of Technical bid	10/08/2020, at 17:00 Hrs. (IST)
Tender Document	The details can be downloaded free of cost from the websites www.rectpcl.in (or) www.recindia.com (or)

	http://www.mstcecommerce.com/eprochome/rectpcl (or) www.eprocure.gov.in
Pre Bid Meeting Address	REC Transmission Projects Company Limited ECE House, 3 rd Floor, Annexe – II, 28 A, K G MARG, NEW DELHI – 110 001 Tel: 011 – 47964705, Telefax : 011-47964747
Cost of Tender	Rs 5,000/- (Rs Five Thousand Only)
EMD #	Rs. 2,50,000 (Rs. Two Lakhs Fifty Thousand only)
Address for Bid submission/EMD/PBG	Shri. Bhupender Gupta , Addl. CEO REC Transmission Projects Company Limited ECE House, 3 rd Floor, Annexe – II, 28 A, K G MARG, NEW DELHI – 110 001 Tel: 011 – 47964705, Fax : 011-47964704 Email- bgupta@recl.nic.in
Contact Person	Shri. Arun Kumar Chaturvedi Deputy General Manager, Deputy General Manager, REC Transmission Projects Company Limited ECE House, 3 rd Floor, Annexe – II, 28 A, K G MARG, NEW DELHI – 110 001 Tel: 9650130505 Email- arun.k.chaturvedi78@gmail.com ; rectpcl.jkpddpia@gmail.com

The bidding documents are meant for the exclusive purpose of bidding against this specification and shall not be transferred to any parts or reproduced or used otherwise for any purpose other than for which they are specifically uploaded.

- 6.0 Interested bidders have to necessarily register themselves on the e-bidding portal of MSTC and are strongly recommended to go through the E-Tendering methodology & Tips for successful online Bid submission in the MSTC's e-procurement platform i.e <http://www.mstcecommerce.com/eprochome/rectpcl> provided in the Section-IIA (Annexure to ITB) of the Bidding Document.

Resolution to all general queries and system setting is given in the bidders guide. In case of any other issue please contact:

e-Bidding portal: <http://www.mstcecommerce.com/eprochome/rectpcl>

S.no	Name	Email	Contact

			number
1.	S D Sharma	sdsharma@mstcindia.co.in	7878055855
2.	Chirag Sindhu	chiragsindhu@mstcindia.co.in	9830336290

Even though the MSTC support team will be available from 0930 hrs to 1800 hrs on all working days, but in case Bidders are unable to reach MSTC then communications can also be done through e-mail or sms and MSTC team will be respond to the queries within 24 hrs.

Bidder has to pay the transaction charges and bidders are requested to refer Section-IIA (Annexure-A to ITB) MSTC Registration for details.

Bidders are advised to deposit the transaction fee atleast two days before the last date of submission and to submit their bids least one day before the last day of submission to avoid any last minute issues

They may obtain further information regarding this IFB from the office of Additional Chief Executive Officer, RECTPCL at the address given at para 12.0 below from 15:00 hours to 17:00 hours on all working days.

- 7.0 For proper uploading of the bids on the portal namely **<http://www.mstcecommerce.com/eprochome/rectpcl>** *(hereinafter referred to as the 'portal')*, it shall be the sole responsibility of the bidders to apprise themselves adequately regarding all the relevant procedures and provisions as detailed at the portal as well as by contacting from M/s MSTC Limited, New Delhi directly, as and when required, for which contact details are mentioned above. The Employer in no case shall be responsible for any issues related to timely or properly uploading/submission of the bid in accordance with the relevant provisions of Section II – ITB of the Bidding Documents.
- 7.1 A pre-bid meeting will be held at the address mentioned in on **30.07.2020** at 14:00 Hrs to clarify the bidders various issues raised in accordance with clause 6.4 of ITB.
- 8.0 A Single Stage Two Envelope Bidding Procedure will be adopted and will proceed as detailed in the Bidding Documents.
- 8.1 Soft Copy Part of the Bids must be uploaded under Single Stage Two Envelope Bidding Procedure on the portal at or before 16:00 hours on **10.08.2020**. The e-Procurement system would not allow any late submission of bids through the portal after due date & time as specified.

Hard Copy Part of the Bids must be submitted under Single Stage Two Envelope Bidding Procedure at the address given in Table at Clause no-5.0 of IFB at or before 16:00 hours on **10.08.2020**. In case Hard copy part of the bid is not received by the Employer till the deadline for submission of the same prescribed by the Employer, but the bidder has uploaded the soft copy part of the bid, the

bid will be considered as late bid. Such bids will be rejected during preliminary examination.

First Envelope i.e. Techno -Commercial Part shall be opened on **10.08.2020** in the presence of the bidders' representatives who choose to attend in person at the address below at **17:00 hours**. Second Envelope i.e. Price Part of those bidders who qualify techno-commercially, shall be opened in the presence of the Bid Opening Committee constituted by the employer at the time, date and at the location given in the intimation for opening of Second Envelope in accordance with Clause 25 of ITB or may be viewed by the bidders by logging in to the portal.

All bids must be accompanied by a bid security of **Rs. 2, 50,000 (Rs. Two Lakhs Fifty Thousand only) for this package.**

Bid Security, Integrity Pact and Safety Pact must be submitted in physical form at the address given at para 12.0 below.

- 9.0 Employer/ Owner / Purchaser reserves the right to go in for e-Reverse Auction (e-RA) in accordance with clause 29.0 of ITB among the technically and commercially acceptable bidders. The decision to conduct reverse auction or not, will be conveyed to short listed bidders prior to opening of price bid. In view of this, the bidders must quote most competitive prices in the first instance itself.

Once the decision to conduct Reverse Auction is conveyed to the bidders, it will be mandatory for the bidders to participate in Reverse Auction, failing which, the bidder shall be liable for punitive action including but not limited to rejection of offer, encashment of bid security, wherever applicable, etc. For this purpose, even log-in to the system shall be construed as participation.

- 10.0 **RECTPCL reserves the right to annul the bidding process at any time prior to award of contract including rejection of any or all bids after the same has been received, without assigning any reason and without their incurring any liability to the effected bidder or bidders or any obligation to inform the effected bidder or bidders on the ground of RECTPCL's action.**

- 11.0 The Integrity Pact Program (IPP) of RECTPCL will be applicable for the Package(s). **Shri P. V. Rao, IRS** , shall be the Independent External Monitor for the **Substation Packages –SS03** respectively. Correspondence, if any, to the IEM be addressed to the following:

Shri P. V. Rao, IRS
Ex-Chief Commissioner of Income Tax,
The IEMs' Secretariat,
Procurement and Contract Management (PCM) Division,
REC LIMITED (Formerly Rural Electrification Corporation Limited),
Core-IV, SCOPE Complex, 7-Lodhi Road,

New Delhi- 110003

Email: [pasupuletirao\[at\]yahoo\[dot\]co\[dot\]in](mailto:pasupuletirao[at]yahoo[dot]co[dot]in)

12.0 Bidders are also requested to visit our website <http://www.rectpcl.in/> / <http://www.mstcecommerce.com/eprochome/rectpcl> for any corrigendum/addendum /errata/clarification/amendment which shall be considered integral part of bidding document. No separate notifications shall be published in the Newspaper(s) or any media for these activities.

13.0 All correspondence with regard to the above shall be to the following address.

(By Post/In Person)

Additional Chief Executive Officer,

REC Transmission Projects Company Limited

ECE House, 3rd Floor, Annexe – II,

28 A, K G MARG, NEW DELHI – 110 001

Tel: 011 – 47964705, Fax : 011-47964704

Email- bgupta@recl.nic.in

For more information on RECTPCL, visit our site at: <http://www.rectpcl.in>

For more information on the portal, visit on site of

M/s MSTC Limited, New Delhi at:

<http://www.mstcecommerce.com/eprochome/rectpcl>

---- End of Section-I (IFB) ----

SECTION – II
INSTRUCTION TO BIDDERS (ITB)

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INSTRUCTION TO BIDDERS (ITB)

Preamble

This section (Section-II) of the Bidding Documents provides the information necessary for bidders to prepare responsive bids, in accordance with the requirements of the Employer. It also provides information on bid submission and uploading the bid on portal (<http://www.mstcecommerce.com/eprochome/rectpcl>) on line bid opening, evaluation and on contract award. This Section (Section II) contains provisions that are to be used unchanged

However, provisions governing the performance of the Contractor, payments under the contract or matters affecting the risks, rights and obligations of the parties under the contract are not included in this section but instead under Section – IV: General Conditions of Contract and/or Section – V: Special Conditions of Contract.

The respective rights of the Employer and Bidders/Contractors shall be governed by the Bidding Documents/Contracts signed between the Employer and the Contractor for the respective package(s).

A. Introduction

These tender documents have been issued specifically for “**Design, Engineering, Supply & Construction of Residential Staff Quarters & associated facilities at 160 MVA, 220/33 kV Gas Insulated Substation (GIS) at Lassipora (Srinagar Region) on Turnkey Basis associated with Strengthening of Transmission System of JKPTCL under PMDP Scheme-15**” and cannot be used for any other purpose. Tender documents are not transferable. Bids that are not in compliance with all the conditions laid down in the tender documents are liable for rejection.

1. Source of Funds

- 1.1 Jammu Kashmir Power Transmission Corporation Limited, J&K** (hereinafter referred to as ‘JKPTCL/’Owner’) erstwhile JKPDD intends to use domestic funding under Prime Minister Development Project (PMDP-15) for this Project.

All eligible payments under the contract for the package for which this Invitation for Bids is issued shall be made by the Employer name in the **IFB**.

2. Eligible Bidders

- 2.1** This Invitation for Bids, issued by the Employer is open to all firms including company (ies), Government owned Enterprises registered and incorporated in India as per Companies Act, 1956/2013 (with amendment from time to time), barring Government Department as well as foreign bidders/MNCs not registered and incorporated in India and those bidders with whom business is banned by the Employer.

- 2.2** A Bidder shall not have a conflict of interest. All Bidders found to have a conflict of interest shall be disqualified. A Bidder may be considered to have a conflict of interest with one or more parties in this bidding process, if:

- (a) they have a controlling partner in common; or
- (b) they receive or have received any direct or indirect subsidy from any of them; or
- (c) they have the same legal representative for purposes of this bid; or
- (d) they have a relationship with each other, directly or through common third parties, that

puts them in a position to have access to information about or influence on the bid of another Bidder, or influence the decisions of the Employer regarding this bidding process; or

- (e) a Bidder submits more than one bid in this bidding process, either individually [including bid submitted as an authorized representative on behalf of one or more manufacturer(s) or through Licensee – Licensor route, wherever permitted as per the provision of Qualification Requirement for the Bidders in Section-III, Volume-I or as a partner in a joint venture, except for alternative offers if permitted under ITB Clause 9.3. This will result in the disqualification of all such bids. However, this does not limit the participation of a Bidder as a subcontractor in another bid, or of a firm as a subcontractor in more than one bid; or
- (f) a Bidder or any of its affiliates participated as a consultant in the preparation of the design or technical specifications of the Plant and Installation Services that are the subject of the bid; or
- (g) A Bidder or any of its affiliates has been hired (or is proposed to be hired) by the Employer as Project Manager for the contract.

2.3 The Bidder, directly or indirectly shall not be a dependent agency of the Employer.

3. Eligible Plant, Equipment, and Services

3.1 For the purposes of these Bidding Documents, the words “facilities,” “plant and equipment,” “installation services,” etc., shall be construed in accordance with the respective definitions given to them in the General Conditions of Contract.

3.2 All plant and equipment to be supplied and installed and services carried out under the contract shall have their origin in any country barring those countries against whom sanction for conducting business is imposed by Government of India and barring those firms with whom business is banned by the Employer.

3.3 For purposes of this clause, “origin” means the place where the plant and equipment or component parts thereof are mined, grown, or produced. Plant and equipment are produced when, through manufacturing, processing or substantial and major assembling of components, a commercially recognized product results that is substantially different in basic characteristics or in purpose or utility from its components.

3.4 The origin of the plant, equipment, and services is distinct from the nationality of the Bidder.

4. Cost of Bidding

4.1 The Bidder shall bear all costs associated with the preparation and submission of its bid including post-bid discussions, technical and other presentations etc., and the Employer will in no case be responsible or liable for these costs, regardless of the conduct or outcome of the bidding process.

4.2 The nonrefundable fee towards the cost of Bidding Documents shall be **INR 5,000/-**. However, Micro and Small Enterprises (MSEs) registered with District Industries Centres (DICs) or Khadi & Village Industries Commission (KVIC) or Khadi & Industries Board (KVIB) or Coir Board or National Small Industries Corporation (NSIC) or Director of Handicrafts and Handlooms or Udyog Aadhar Memorandum or any other body specified by Ministry of Micro, Small and Medium Enterprises are exempted from submission of fee towards the cost of

Bidding Documents as per the provisions of the Public Procurement Policy for Micro and Small Enterprises (MSEs) order 2012. This shall be subject to production of documentary evidence with regard to registration with authorities mentioned above

- 4.3 The bidder has to ensure his registration with M/s MSTC Limited, New Delhi on their portal <http://www.mstcecommerce.com/eprochome/rectpcl>. Bidder has also to pay the applicable transaction charges and the details are provided in Section-IIA (Annexure-A to ITB).

B. The Bidding Documents

5. Content of Bidding Documents

- 5.1 The facilities required, bidding procedures, contract terms and technical requirements are prescribed in the Bidding Documents. The Bidding Documents comprise of the following and shall include amendments, if any, thereto:

VOLUME – I:	Conditions of Contract
Section I	Invitation for Bids (IFB)
Section II	Instructions to Bidders (ITB)
Section III	Qualification Requirement
Section IV	General Conditions of Contract (GCC)
Section V	Special Conditions of Contract (SCC)
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Section VII	Contractor's Labour Regulation
Section VIII	Safety Regulation
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	1.2 Price Schedule
	2. Bid Security Form
	3. Form of Notification by the Employer to the Bank
	4. Form of Contract Agreement
	4.1 Appendix-1: Procedures of Payment
	4.2 Appendix-2: Price Adjustment
	4.3 Appendix-3: Insurance Requirements
	4.4 Appendix-4: Time Schedule
	4.5 Appendix-5: List of Approved Subcontractors
	4.6 Appendix-6: List of Document for Approval or Review
	4.7 Appendix-7: Guarantees, Liquidated Damages for Non-Performance
	4.8 Integrity Pact
	4.9 Safety Pact
	5. Performance Security Form
	6. Form of Taking Over Certificate
	7. Form of Indemnity Bond to be executed by the Contractor for the Equipment handed over in one lot by Employer for performance of its contract.
	8. Form of Indemnity Bond to be executed by the Contractor for the Equipment handed over in installments by Employer for performance of its contract.
	9. Form of Authorisation Letter

10. Form of Trust Receipt for Plant, Equipment and Materials received
11. Form of Extension of Bank Guarantee
12. A) Form of Power of Attorney
B) Form of Power of Attorney for Joint Venture
13. Form of Joint Venture Agreement
14. Format for Evidence of Access to or Availability of Credit/ Facilities
15. Form of Operational Acceptance
16. Form of Safety Plan to be submitted by the Contractor within sixty days of award of contract
17. Form for Information to be furnished by the Contractor in respect of the Procurement made from MSE Vendors

Volume-II: Technical Specification

Volume-III: Bid Form, Price Schedules & Technical Data Sheets

5.2 The Bidder is expected to examine all instructions, forms, terms, specifications and other information in the Bidding Documents. Failure to furnish all information required by the Bidding Documents or submission of a bid not substantially responsive to the Bidding Documents in every respect will be at the Bidder's risk and may result in rejection of its bid.

5.3 Scope of Work is given in Volume-II of Bidding Documents titled "Technical Specifications".

Utmost care has been taken by the Employer in formulating the programmed Attachments and Price Schedules. Bidders are expected to thoroughly verify with trial run at their end and notify to the Employer Arithmetical, Logical, Formatting or any such error, if found in the same for suitable action. Irrespective of corrections made in this regard through amendment(s), if any, rectification of error for evaluation shall be carried out in accordance with stipulated provisions of Bidding Documents.

5.4 All the Bidders except those exempted pursuant to ITB Sub-Clause-5.5 shall submit along with the hard copy part of bid a non-refundable fee as mentioned below towards the cost of Bidding Documents in the form of demand draft in favour of REC Transmission Projects Company Limited, payable at New Delhi.

The non-refundable fee towards the cost of Bidding Documents shall be INR 5,000/-

Any bid not accompanied by an acceptable Demand Draft towards the cost of Bidding Documents, except as exempted in ITB Sub- Clause 5.5 below, shall be rejected by the Employer as being nonresponsive.

5.5 Micro and Small Enterprises (MSEs) registered with National Small Industries Corporation (NSIC) or with any other designated Authority of GoI under the Public Procurement Policy for MSEs are exempted from submission of fee towards the cost of Bidding Documents as per the Provisions of the Public Procurement Policy for Micro and Small Enterprises (MSEs) order 2012. This shall be subject to production of documentary evidence with regard to registration with authorities mentioned above.

6. Clarification of Bidding Documents; and Pre-Bid Meeting

6.1 A prospective Bidder requiring any clarification of the Bidding Documents may notify the Employer and may also seek clarification in writing/by email at the Employer's mailing address indicated in the **IFB**. Similarly, if a Bidder feels that any important provision in the

documents, such as those listed in ITB Sub-Clause 22.3.1, will be unacceptable, such an issue should be raised as above. The Employer will clarify the queries through the portal <http://www.mstcecommerce.com/eprochome/rectpcl> to any request for clarification or modification of the Bidding Documents that it receives no later than **Seven (07)** days prior to the original deadline for submission of bids prescribed by the Employer. The Employer shall not be obliged to respond to any request for clarification received later than the above period. Further, the mere request for clarification from the Bidders shall not be a ground for seeking extension in the deadline for submission of bids. Employer's response (including an explanation of the query but not identification of its source) will be uploaded on portal <http://www.mstcecommerce.com/eprochome/rectpcl> where all the bidders can see clarification/reply to query.

- 6.2** The Bidder is advised to visit and examine the site where the facilities are to be installed and its surroundings and obtain for itself on its own responsibility and cost all information that may be necessary for preparing the bid and entering into a contract for supply and installation of the facilities. The costs of visiting the site shall be at the Bidder's own expense.
- 6.3** The Bidder and any of its personnel or agents will be granted permission by the Employer/Owner to enter upon its premises and lands for the purpose of such inspection, but only upon the express condition that the Bidder, its personnel and agents will release and indemnify the Employer and its personnel and agents from and against all liability in respect thereof and will be responsible for death or personal injury, loss of or damage to property and any other loss, damage, costs and expenses incurred as a result of the inspection.
- 6.4** The Bidder's designated representative(s) is/are invited to attend a pre-bid meeting, which, if convened, will take place at the venue and time stipulated in the **IFB**. The purpose of the meeting will be to clarify any issues regarding the e-procurement method, the Bidding Documents in general and the Technical Specifications in particular. The Bidder is requested, as far as possible, to submit any question in writing, to reach the Employer not later than one week before the meeting. It may not be practicable at the meeting to answer questions received late, but questions and responses will be transmitted as indicated hereafter. Minutes of the meeting, including the text of the questions raised (without identifying name of the bidders) and the responses given, together with any responses prepared after the meeting, will be transmitted without delay through the e-bidding portal only. Any modification of the Bidding Documents listed in ITB Sub-Clause 5.1, which may become necessary as a result of the pre-bid meeting shall be made by the Employer exclusively through the issue of clarification/Amendment/Addendum pursuant to ITB Clause-6 & 7 respectively and not through the minutes of the pre-bid meeting. During the pre-bid meeting, all the technical and commercial issues shall be discussed to ensure that the bid received subsequent to pre-bid meeting shall be without any deviations to terms and conditions.
- 6.5** Non-attendance at the pre-bid meeting will not be a cause for disqualification of a bidder. In case any bidder does not attend the pre-bid meeting, it shall be understood that the bidder has a clear understanding of the scope & terms & conditions of the bidding document and does not have any comments/ deviations to the requirements of the bidding document.
- 6.6** Based on the pre-bid discussions, no-deviation form/techno-commercial compliance shall be signed and submitted in Attachment-6 of the Envelope-1, Vol-III as part of their offer. After pre-bid meeting, no deviation shall be accepted and if any deviation is found in the bid of such bidder, their offer may be liable to be rejected without raising any technical/commercial queries.

7. Amendment of Bidding Documents

7.1 At any time prior to the deadline for submission of bids, the Employer may, for any reason, whether at its own initiative, or in response to a clarification requested by a prospective Bidder, amend the Bidding Documents.

7.2 The amendment will be notified only through the portal <http://www.mstcecommerce.com/eprochome/rectpcl>. The clarifications/amendments/addendums to the Bidding Documents will be binding on the bidders and the notification of the clarifications / amendments / addendums through portal shall be deemed to be construed that such clarifications / amendments / addendums to the Bidding Documents have been taken into account by the Bidder in its bid.

7.3 In order to afford reasonable time to the prospective Bidders to take the amendment into account in preparing their bid, the Employer may, at its discretion, extend the deadline for the submission of bids, in which case, the Employer will notify through portal <http://www.mstcecommerce.com/eprochome/rectpcl> where all prospective bidders may see the extended deadline.

In case of extension of deadline for the submission of bids by the Employer for reasons inter-alia including the above, prospective bidders can download the Bidding Documents from the portal <http://www.mstcecommerce.com/eprochome/rectpcl>, as per the provisions available therein.

C. Preparation of Bids

8. Language of Bid

8.1 The bid prepared by the Bidder and all correspondence and documents exchanged by the Bidder and the Employer related to the bid shall be written in the English language, provided that any printed literature furnished by the Bidder may be written in another language, as long as such literature is accompanied by English translation of its pertinent passages, in which case, for purposes of interpretation of the bid, the English translation shall govern.

9. Documents Comprising the Bid

I. Hard Copy Part

Hard copy part of the bid shall comprise of following documents to be submitted in sealed envelope, as part of First Envelope

- (i) DD towards Bidding Document fee of the amount as specified in the in accordance with clause 5.4 of ITB or documentary evidence in support of exemption of Bidding Document fee as per ITB 5.5
- (ii) Bid Security (in Original) or documentary evidence in support of exemption of Bid Security, in separate envelope in accordance with clause 13 of ITB, Section-II
- (iii) Integrity Pact (in Original) in accordance with clause 9.3 (o) of ITB, Section-II in separate envelope
- (iv) Power of Attorney in the prescribed form no-12A of Section-IX, Vol-I as per Clause 9.3 (b).
- (v) In case of Bid from Joint Venture, the Joint Venture Agreement & Power of

Attorney of Joint Venture Agreement, both in original.

- (vi) Safety Pact (in Original) in accordance with clause 9.3 (s) of ITB, Section-II in separate envelope.
- (vii) Bidders shall submit signed & stamped copy of bidding documents alongwith all clarifications/amendments/addendums thereof issued in the e-bidding portal.
- (viii) Bidders shall submit an undertaking on company's letter head confirming the validity of bid submitted as per the provision of bidding document.
- (ix) Any other document further specified in the Bidding Document duly signed and stamped on each page
- (x) The Bidder shall also submit Hard Copy of all the Documents as uploaded on E-Bidding Portal except Price Bid.

Bidder shall note that no document is required to be submitted as part of Second envelope in Hard Copy.

II. Soft Copy Part

Soft copy part of the bid shall comprise of following documents to be uploaded on the portal as per provisions therein.

- (a) As part of First Envelope (Cover-1 of the e-Bidding portal)
 - (i) Programmed file -Attachments (Attachment to Bid Form including attachment to QR) in MS Excel format & its revision covering various attachments, Integrity Pact and bid form for first envelope.
 - (ii) Scanned copies of all the documents mentioned at 15.4 of ITB as part of **Cover-2 of the e-Bidding portal.**
 - (iii) Bidder shall submit signed & scanned copy of bid document along with all clarifications/ amendments/ addendums thereof issued in the e-bidding portal.
- (b) As part of Second Envelope (Cover-3 of the e-Bidding portal)
 - (i) Price Schedules in MS excel format & its revision covering various price schedules for Second Envelope.

9.1 The bid shall be submitted by the Bidder under "Single Stage – Two Envelope" procedure of bidding. Under this procedure, the bid submitted by the Bidder in two envelopes - First Envelope (also referred to as Techno - Commercial Part) and Second Envelope (also referred to as Price Part) shall comprise of the following documents:

First Envelope:

- (a) Bid Form (First Envelope) duly completed and signed by the Bidder, together with all Attachments & Technical Data Sheets (available in Volume-III) as uploaded on the portal <http://www.mstcecommerce.com/eprochome/rectpcl> and identified in ITB Sub-Clause 9.3 below.
- (b) Hard copy of the following documents to be submitted at the address mentioned in IFB:

- (i) DD towards Bidding Document fee of the amount as specified in the in accordance with clause 5.4 of ITB or documentary evidence in support of exemption of Bidding Document fee as per ITB 5.5
- (ii) Bid Security (in Original) or documentary evidence in support of exemption of Bid Security, in separate envelope in accordance with clause 13 of ITB, Section-II
- (iii) Integrity Pact (in Original) in accordance with clause 9.3 (o) of ITB, Section-II in separate envelope;
- (iv) Power of Attorney as per Clause 9.3 (b);
- (v) In case of Bid from Joint Venture, the Joint Venture Agreement & Power of Attorney of Joint Venture Agreement
- (vi) Safety Pact (in Original) in accordance with clause 9.3 (s) of ITB, Section-II in separate envelope
- (vii) Bidders shall submit signed & stamped copy of bidding document alongwith all clarifications/amendments/addendums thereof issued in the e-bidding portal.
- (viii) Bidders shall submit an undertaking on company's letter head confirming the validity of bid submitted as per the provision of bidding document.
- (ix) Any other document further specified in the Bidding Document duly signed and stamped on each page.
- (x) The Bidder shall also submit Hard Copy of all the Documents as uploaded on E-Bidding Portal except Price Bid.

Second Envelope:

- (a) Price Schedules (available in Volume-III), duly completed as uploaded on the portal <http://www.mstcecommerce.com/eprochome/rectpcl>.

9.2 Alternative bids shall not be permitted.

9.3 Bidder is required to provide complete and precise information in the bid along with supporting documentary evidences, as applicable. The bidder should attach separate sheet(s) in case space provided is not sufficient. RECTPCL will consider the bid solely on the basis of information/details/data/documentary evidences etc. provided by the bidder in the bid only without seeking further clarifications from the bidder in normal circumstances.

Incomplete, partially complete, not clearly filled bid giving incorrect information is liable to be rejected without any consideration.

Where the answer is a statement of fact it must be accurate and supported by documentary evidence wherever required. It is the bidder's responsibility to respond with such clarity that will ensure RECTPCL not to mis-interpret the bid.

Bidder shall submit soft copy of following documents by uploading on the portal <http://www.mstcecommerce.com/eprochome/rectpcl> and Hard copy of documents wherever stipulated in the manner specified in ITB Clause 9.1 above along with its Techno -

Commercial Part (First Envelope):

- (a) Attachment 1: Bid Security (if required) or documentary evidence in support of exemption of Bid Security (*submission of Hard Copy in „Original for Bid Security and in Copy for documentary proof in support of exemption*)

A bid security or documentary evidence in support of exemption of Bid Security, in sealed separate envelope shall be furnished in accordance with ITB Clause 13 & ITB Clause 16.

Bidder shall submit the hard copy of the Bid Security or documentary evidence in support of exemption of Bid Security in original.

- (b) Attachment 2: Power of Attorney (*submission of Hard copy in “Original and uploading of Scanned Copy*)

A power of attorney, duly notarized, indicating that the person(s) signing the bid has(ve) the authority to sign the bid and thus that the bid is binding upon the Bidder during full period of its validity, in accordance with ITB Clause 14.

Scanned copy of above documents shall be uploaded. (refer para 15.4 below)

- (c) Attachment 3: Bidders Eligibility and Qualifications (*Uploading of Scanned Copies of documentary evidence in support of Bidders qualification. In case of Joint Venture bid, submission of Hard Copy in “Original of the JV Agreement and POA for JV”*)

In the absence of prequalification, documentary evidence establishing that the Bidder is eligible to bid in accordance with ITB Clause 2 and is qualified to perform the contract in accordance with **Qualification Requirement Sec-III, Vol-I**, if its bid is accepted.

The documentary evidence of the Bidders eligibility to bid shall establish to the Employers satisfaction that the Bidder, at the time of submission of its bid, is eligible as defined in ITB Clause 2.

The documentary evidence of the Bidders qualifications to perform the contract, if its bid is accepted, shall establish to the Employers satisfaction that the Bidder has the financial, technical, production, procurement, shipping, installation and other capabilities necessary to perform the contract, and, in particular, meets the experience and other criteria outlined in the Qualification Requirement for the Bidders in Sec-III, Vol-I and shall also include:

The documentary evidence defining i) the constitution or legal status; (ii) The principal place of business; (iii) The place of incorporation (for bidders who are corporations); or the place of registration and the nationality of the Owners (for applicants who are partnerships or individually-owned firms) (iv) in support of meeting the Technical Experience, self-certified copy of Contract/ Award Letter and Utility Certificate.

The bidder shall furnish along with its bid a declaration as per the enclosed format from its Power of Attorney holder and Key Managerial Personnel (KMP) of the company i.e. CEO/Managing Director/ Company Secretary/ Director/ CFO/any of the partner in case of partnership firm/ any other officer entrusted with substantial powers of the management of the affairs of the company/firm, declaring the eligibility/qualification data to be true and correct

Declaration for anticipated change in legal structure/ ownership, if any.

The complete annual reports together with Audited statement of accounts of the company for last five years of its own (separate) immediately preceding the date of submission of bid.

The Bidder shall also furnish documentary evidence/ declaration regarding financial re-structuring of the company, if any.

Scanned copy of above documents shall be uploaded (refer para 15.4 below).

[Note I. In the event the Bidder is not able to furnish the above information of its own (i.e., separate), being a subsidiary company and its accounts are being consolidated with its Group/ Holding/ Parent company, the Bidder should submit the audited balance sheet, income statement, other information pertaining to it only (not of its Group/Holding/Parent company) duly certified by any one of the authority [(i) Statutory Auditor of the Bidder/(ii) Company Secretary of the Bidder a (iii) A certified Public Accountant] certifying that such information/documents are based on the audited accounts as the case may be.

Note II. Similarly, if the Bidder happens to be a Group/Holding/ Parent company, the Bidder should submit the above documents/information of its own (i.e., exclusive of its subsidiaries) duly certified by any one of the authority mentioned in Note I above certifying that these information/documents are based on audited accounts, as the case may be.]

Unless otherwise mentioned in **bidding document**, bids submitted by a joint venture of two or more firms as partners, if allowed as per stipulated Qualification Requirements in SEC-III, Vol-I, shall comply with the following requirements:

- (i) The bid shall include all the information required for Attachment 3 as described above for each joint venture partner.
- (ii) The bid shall be signed so as to be legally binding on all partners.
- (iii) One of the partners responsible for performing a key component of the contract shall be designated as leader; this authorization shall be evidenced by submitting with the bid a power of attorney signed by legally authorized signatories as per Form-12 of Section-IX, Vol-I.
- (iv) The leader shall be authorized to incur liabilities and receive instructions for and on behalf of any and all partners of the joint venture, and the entire execution of the contract, including payment, shall be done exclusively with the leader, provided otherwise requested by the joint venture and agreed between the Employer and the leader.
- (v) All partners of the joint venture shall be liable jointly and severally for the execution of the contract in accordance with the contract terms.
- (vi) A copy of the agreement entered into by the joint venture partners shall be submitted with the bid as per Form-13 of Section-IX, Vol-I, including interalia delineation of responsibilities and obligations of each partners appended thereto, notwithstanding the joint and several liability.
- (vii) The joint venture agreement should indicate precisely the responsibility of all members of JV in respect of planning, design, manufacturing, supply, installation, commissioning and training. All members of JV should have active participation in execution during the currency of the contract. This should not be varied/modified subsequently without prior approval of the Employer; and

In order for a joint venture to qualify, each of its partners or combination of partners must meet the minimum criteria listed in the Qualification Requirement for the Bidder as per Sec –III, Vol-I for an individual Bidder for the component of the contract they are designated to perform. Failure to comply with this requirement will result in rejection of the joint venture bid.

A firm can be a partner in only one joint venture; bids submitted by joint ventures or consortia including the same firm as partner will be rejected.

In the case of a Bidder who offers to supply and/or install plant and equipment under the contract that the Bidder did not manufacture or otherwise produce and/or install, the Bidder shall (i) have the financial and other capabilities necessary to perform the contract; (ii) have been duly authorized by the manufacturer or producer of the related plant and equipment or component as per proforma in attachment 8 to supply and/or install that item in the Employers country; and (iii) be responsible for ensuring that the manufacturer or producer complies with the requirements of ITB Sub-Clause 3.2 and meets the minimum criteria listed for an individual Bidder for that item.

(d) Attachment 4: Deviations

Bid should be submitted without any deviations, terms & conditions. However In unavoidable circumstances, if any unresolved deviation remains; bidder shall submit the same only in Attachment 4 to the Envelope-1, Vol-III. Deviation written in other places other than in Attachment 4 to the Envelope-1 shall not be taken in to cognizance and such exceptions /deviations shall be treated as null & void.

However, the attention of the bidders is drawn to the provisions of ITB Sub-Clause 22.3 regarding the rejection of bids that are not substantially responsive to the requirements of the Bidding Documents.

Bidder's attention is also drawn to the provisions of ITB Sub- Clause 22.3.1

- (e) Attachment 5: Information regarding Ex- employee of employer in bidders firms
- (f) Attachment 5A: Items, Components, Raw Material, Services proposed to be sourced from Micro and Small Enterprises

The bidder shall furnish the details of the items, components, raw material, services which they propose to buy/avail from Micro and Small Enterprises for the purpose of completion of works.

- (g) Attachment 6: Work Completion Schedule
- (h) Attachment 7: Declaration regarding Social Accountability
- (i) Attachment 8 : Price Adjustment Data (NOT APPLICABLE FOR THIS PACKAGE)
- (j) Attachment 9: Integrity Pact (*submission of Hard Copy in Original*)

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

The required Integrity Pact is automatically generated as Attachment 14-Integrity Pact

in the file Attachment (in Excel format). Bidders shall take print out in two copies discussed above and as explained in the Attachment 9-Integrity Pact.

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

Bidders failure to submit the Integrity Pact duly signed in Original alongwith the Bid or subsequently pursuant to ITB Sub-Clause 21.1 shall lead to outright rejection of the Bid

(k) Attachment 10: Additional Information (*uploading of Scanned Copy, as applicable*)

- i. Certificate from their Banker(s) (as per prescribed formats in Form 14, Section-IX, Vol-I: Sample Forms and Procedures) indicating various fund based/non fund based limits sanctioned to the Bidder and the extent of utilization as on date. Such certificate should have been issued not earlier than three months prior to the date of bid opening. Wherever necessary the Employer may make queries with the Bidders Bankers.
- ii. Detailed information on any litigation or arbitration arising out of contracts completed or under execution by it over the last five years. A consistent history of awards involving litigation against the Bidder or any partner of JV may result in rejection of Bid.
- iii. Details of Provident Fund Code Number of the Bidder.
- iv. Any other information which the Bidder intends to furnish
- v. Declaration of Key Managerial person jointly with Power of Attorney Holder. The Bidder shall furnish the CV and experience details of a project manager with 15 years' experience in executing such contract of comparable nature including not less than five years as manager.
- vi. Any other information which the Bidder intends to furnish.

Scanned copy of above documents shall be uploaded (refer para 15.4 below)

(l) Attachment 11: Safety Pact (submission of Hard Copy in Original)

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

Bidders shall take print out in two copies discussed above and as explained in the Attachment 11- Safety Pact.

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

Bidders failure to submit the Safety Pact duly signed in Original along with the Bid or subsequently pursuant to ITB Sub-Clause 21.1 shall lead to outright rejection of the Bid.

(m) Attachment 12: Declaration

- (n) Attachment – 13: Affidavit (submission of Hard Copy in 'Original')
signed and stamped with company seal by a full time Director/ CEO/ Chairman-cum-Managing Director and attested/ notarized by a Magistrate/ Notary for correctness of

all the information/details/data/documentary evidences etc. as submitted by the bidder are correct.

10. Bid Form and Price Schedules

10.1 The Bidder shall complete the Bid Form(s) and the appropriate Price Schedules furnished in the Bidding Documents as indicated therein, following the requirements of ITB Clauses 11 and 12.

11. Bid Prices

11.1 Bidders are required to quote the price for the commercial, contractual and technical obligations outlined in the Bidding Documents. The quoted price shall include inter-alia, all costs such as cost of necessary materials, their transportation to site, cost towards tools, equipment and machineries including cost of personnel that may be required for successful completion of the work as per the Tender Documents, including cost of site arrangement, overheads, insurance, whatsoever, as stipulated in the bidding documents for the total scope of work including all applicable taxes, duties and levies for all transactions between the Contractor and his Sub – Contractors. No claim on account of any taxes, duties or other levies or any interest therein shall be entertained by RECTPCL. **Contract Price shall however be excluding GST for all transactions between the Contractor and RECTPCL.**

11.2 Bidders shall give a breakdown of the prices in the manner and detail called for in the Price Schedules.:

Bid Price Summary Sheet: Required calculations will be carried out automatically after filling of prices in schedule-1 and the same will reflect in the Bid Price Summary

Schedule 1 Design, Engineering, including procurement and subcontracting (if any), delivery, construction, installation and completion of the facilities including supply of mandatory spares (if any)

11.3 Second Envelope (Price Bid) filled against the line items of excel file downloaded from the portal <http://www.mstcecommerce.com/eprochome/rectpcl> shall be grouped in the following Heads:

- i. Charges towards Services/Erection;
- ii. Taxes and Duties amount

11.2.1 The bid price for (i) the items for which quantities have been indicated as lumpsum or lot or set and/or (ii) where the quantities are to be estimated by the Bidder shall remain constant unless there is change made in the Scope of Work by Purchaser. The quantities and unit prices (i) subsequently arrived while approving the Bill of Quantities (BOQ) /Billing breakup of lumpsum quantities/lot/Set and/or (ii) estimated by the bidder shall be for on account payment purpose only. In case additional quantities, over and above the quantities BOQ/billing breakup and /or estimated by the bidder, are required for successful completion of the scope of work as per Technical Specification, the Bidder shall execute additional quantities of these items for which no additional payment shall be made over and above the lumpsum bid price. In case quantities of these items supplied at site are in excess of that required for successful completion of scope of work, such additional quantities shall be the property of the bidders and they shall be allowed to take back the same from the site for which no deduction from the lumpsum bid price shall be made.

Further, in case actual requirement of quantities for successful completion of scope of work is less than the quantities identified in the approved BOQ /billing breakup and/or estimated by the bidder, the lumpsum bid price shall remain unchanged and no deduction shall be made from the lumpsum price due to such reduction of quantities.

HSN/SAC has not been indicated for lumpsum quantities/lot/Set as each of these consists of many items for which billing break up shall be furnished during contract execution. For the purpose of evaluation, the bidder has to indicate the rate of GST applicable on these items. As it is possible that the incidence of GST on each of these items may be different, provision has been made in the price schedules for quoting the bid price in different categories based on the incidence of GST. The bidder shall accordingly quote price in different tax categories. HSN /SAC for these items shall be furnished along with billing breakup prior to payment for these items. Purchaser's liability for reimbursement of GST shall be lower of the GST applicable at the rate as confirmed/deemed confirmed in the bid or actual GST paid/payable by the bidder for that item.

11.2.2 It shall be the responsibility of the bidders to pay all statutory taxes, duties and levies (including GST) and interest, if applicable on account of additional revised invoice issued for actual material supplied, to the concerned authorities for such return/supply of such surplus material, which would otherwise have been, lawfully payable. The bidders shall submit an indemnity bond to keep Purchaser harmless from any liability, before release of such material to the bidder by Purchaser.

11.2.3 Set/Lot/Lumpsum shall be governed as per the requirement of the corresponding item description read in conjunction with relevant provisions of Technical Specifications

11.4 In the schedules, Bidder shall give the required details and a breakdown of their price **considering and taking into account the Input Tax Credit (ITC) as may be available under the Goods and Services Tax (GST) Laws and Regulations**, in the schedules as follows:

- (a) Erection Charges for Installation shall be quoted/ filled separately against the line items in the price schedule as indicated therein and shall include rates and prices for all commercial, contractual and technical obligations outlined in the Bidding Documents including cost of necessary materials, their transportation to site, cost towards tools, equipment and machineries including cost of personnel that may be required for successful completion of the work as per the Tender Documents, including cost of site arrangement, overheads, insurance, whatsoever, as stipulated in the bidding documents for the total scope of work. The price quoted in respect of all items in the above schedule shall be excluding GST.
- (b) HSN/SAC has not been indicated for lumpsum quantities/lot/Set as each of these consists of many items for which billing break up shall be furnished during contract execution. For the purpose of evaluation, the bidder has to indicate the rate of GST applicable on these items. As it is possible that the incidence of GST on each of these items may be different, provision has been made in the price schedules for quoting the bid price in different categories based on the incidence of GST. The bidder shall accordingly quote price in different tax categories. HSN /SAC for these items shall be furnished along with billing breakup prior to payment for these items. Purchaser's liability for reimbursement of GST shall be lower of the GST applicable at the rate as confirmed/deemed confirmed in the bid or actual GST paid/payable by the bidder for that item.

To facilitate the bidders, Purchaser has indicated an HSN/SAC code and rate of GST against each item in the Bill of Material except for lumpsum quantities/lot/Set. It shall entirely be the responsibility of the bidder to check the HSN/SAC code and rate of GST given against each item. The bidder may either confirm the HSN and rate of GST or if the bidder opts to classify the item in question under a different HSN/SAC code or opts to indicate a different rate of GST, bidder may indicate the same in the columns provided. The bidders shall solely be responsible for HSN/SAC classification and the rate of GST for each item. Purchaser's liability for reimbursement of GST shall be lower of the GST applicable at the rate as confirmed/deemed confirmed in the bid or actual GST paid/payable by the bidder for that item;

- (c) Total GST on Supply of goods and Services shall be indicated in the price schedule.
- (d) The Input Tax Credit (ITC) available, if any, under the GST Law as per the relevant Government policies wherever applicable shall be taken into account by the Bidder while quoting bid price
- (e) Purchaser shall, deduct taxes at source as per the applicable laws/rules, if any, and issue Tax Deduction at Source (TDS) Certificate to the Contractor.

11.5 Bid Price shall be excluding GST, which shall be reimbursed separately as per SAC applicable for the services supplied.

11.6 The Prices quoted by the Bidder shall be Fixed & Firm and shall not be subject to any adjustment during performance of the Contract.

11.7 The bidder shall fill up their response only against the Line items available in the price schedule, Taxes and Duties, as per the provision available in the price schedule. Required calculations will be carried out automatically and the same will reflect in the Bid Price Summary.

12. Bid Currencies

12.1 Prices shall be quoted in Indian Rupees Only.

13. Bid Security

13.1 The Bidder shall furnish, except as exempted herein below, as part of its bid, a bid security in the amount and currency as stipulated in the **IFB**. The bid security must be submitted in the form provided in the Bidding Documents.

Micro and Small Enterprises (MSEs) registered with National Small Industries Corporation (NSIC) or with any other designated Authority of GoI under the Public Procurement Policy for MSEs are exempted from submission of Bid Security as per the Provisions of the Public Procurement Policy for Micro and Small Enterprises (MSEs) order 2012. This shall be subject to production of documentary evidence with regard to registration with authorities mentioned above.

13.2 The bid security shall, at the bidders option, be in the form of a crossed bank draft/pay order /banker certified cheque in favour of Employer as stipulated in **IFB** or a bank guarantee from a scheduled bank selected by the bidder. The format of the bank guarantee shall be in accordance with the form of bid security included in the Bidding Documents. Bid security shall remain valid for a period of thirty (30) days beyond the original bid validity period, and

beyond any extension subsequently requested under ITB Sub-Clause 14.2.

The Account details of RECTPCL for the purpose of Bank Guarantee (towards Bid Security) to be issued using SFMS Platform are as given below:

Name of the Bank and Address	IFSC Code	RECTPCL Current A/c No.
ICICI BANK, 9A, PHELPS, CONNAUGHT PLACE, NEW DELHI-110001	ICIC0000007	000705041872

Bid security shall remain valid for a period of thirty (30) days beyond the original bid validity period i.e., for a period of **Four (04)** Months after the last date of bid submission, and beyond any extension subsequently requested under ITB Sub-Clause 14.2.

The Bid Security shall be in favour of REC Transmission Projects Company Limited payable at New Delhi.

- 13.3** Any bid not accompanied by an acceptable bid security, except as exempted at 13.1 above, shall be rejected by the Employer as being nonresponsive, pursuant to ITB Sub-Clause 22.4. In case of JV, normally EMD shall be submitted only in the name of the JV and not in the name of constituent member. However, in exceptional cases, EMD in the name of lead partner can be accepted subject to submission of specific request letter from lead partner stating the reasons for not submitting the EMD in the name of JV and giving written confirmation from the JV partners to the effect that the EMD submitted by the lead partner may be deemed as EMD submitted by JV firm
- 13.4** The bid securities of unsuccessful bidders will be returned as promptly as possible, but not later than twenty-eight (28) days after the expiration of the bid validity period.
- 13.5** The successful Bidder shall be required to keep its bid security valid for a sufficient period till the performance security(ies) pursuant to ITB Clause 35 are furnished to the satisfaction of the Employer. The bid security of the successful Bidder will be returned when the Bidder has signed the Contract Agreement, pursuant to ITB Clause 34, and has furnished the required performance security, pursuant to ITB Clause 35.
- 13.6** The bid security may be forfeited
- (a) if the Bidder withdraws its bid during the period of bid validity specified by the Bidder in the Bid Form; or
 - (b) In case the Bidder does not withdraw the deviations proposed by him, if any, at the cost of withdrawal stated by him in the bid and/or accept the withdrawals/rectifications pursuant to the declaration/confirmation made by him in Attachment – Declaration of the Bid; or
 - (c) If a Bidder does not accept the corrections to arithmetical errors identified during preliminary evaluation of his bid pursuant to ITB Sub-Clause 27.2; or
 - (d) If, as per the requirement of Qualification Requirements the Bidder is required to submit a Deed of Joint Undertaking and he fails to submit the same, duly attested by Notary Public of the place(s) of the respective executant(s) or registered with the Indian Embassy/High Commission in that Country, within ten days from the date of

intimation of post – bid discussion; or

(e) in the case of a successful Bidder, if the Bidder fails within the specified time limit

(i) to sign the Contract Agreement, in accordance with ITB Clause 34, or

(ii) to furnish the required performance security(ies), in accordance with ITB Clause 35 and/or to keep the bid security valid as per the requirement of ITB Sub-Clause

13.7 No interest shall be payable by the Employer on the above Bid Security.

14. Period of Validity of Bid

14.1 Bids shall remain valid for the period of **Three (03)** months after the last date of bid submission. A bid valid for a shorter period shall be rejected by the Employer as being non-responsive.

14.2 In exceptional circumstance, the Employer may solicit the Bidders consent to an extension of the bid validity period. The request and responses thereto shall be made in writing or by cable. If a Bidder accepts to prolong the period of validity, the bid security shall also be suitably extended. A Bidder may refuse the request without forfeiting its bid security. A Bidder granting the request will not be required or permitted to modify its bid.

15. Format and Signing of Bid

15.1 The bidder shall prepare the bid in the manner indicated in ITB Clause 9.0 and submit the bid in following manner:

First Envelope:

(i) The soft copy of the bid consisting of the documents listed in ITB Clause 9 including relevant scanned documents (refer ITB Clause 15.4) shall be uploaded through the portal only. Submission of Soft Copy of any documents by any other means shall not be accepted by the Employer in any circumstances.

(ii) Hard copy of followings:

- a) DD towards Bidding Document fee of the amount in accordance with clause 5.4 of ITB or documentary evidence in support of exemption of Bidding Document fee as per ITB 5.5;
- b) Bid Security (in Original) or documentary evidence in support of exemption of Bid Security, in separate envelope in accordance with clause 13 of ITB, Section-II;
- c) Integrity Pact (in Original) in accordance with clause 9.3 (o) of ITB, Section-II in separate envelope;
- d) Power of Attorney as per Clause 9.3 (b);
- e) In case of Bid from Joint Venture, the Joint Venture Agreement & Power of Attorney of Joint Venture Agreement;
- f) Safety Pact (in Original) in accordance with clause 9.3 (s) of ITB, Section-II in separate envelope.
- g) Affidavit signed and stamped with company seal by a full time Director/ CEO/ Chairman-cum-Managing Director and attested/ notarized by a Magistrate/ Notary for correctness of all the information/details/data/documentary evidences etc. as submitted by the bidder are correct.
- h) Any other document further specified in the ITB duly signed and stamped on each page

Second Envelope:

The soft copy of the price schedules as per ITB Clause 11 to be uploaded on the portal. Submission of Soft Copy of any documents by any other means shall not be accepted by the Employer in any circumstances.

- 15.2** The bid shall contain no alterations, omissions or additions, unless such corrections are initialed by the person or persons signing the bid.
- 15.3** –deleted–.
- 15.4** The List of following documents shall be scanned & uploaded on the portal as per table given below:

S. No.	Description of Documents	Name of File to be uploaded on the portal
1.	Power of Attorney	poa.pdf
2.	DD against Bidding Document fee	dd.pdf
3.	Constitution of legal status	legal.pdf
4.	Declaration for anticipated change in legal structure/ ownership	decl_legal.pdf
5.	The principal place of business	principal.pdf
6.	The place of Incorporation or the place of registration and the nationality of the owner	incorporation.pdf
7.	Technical Experience certificate issued by utility	techexp.pdf
8.	Financial Balance Sheets (for last five years)	balsheet.pdf
9.	Declaration in regard to Financial re-structuring	Decl_Fin_re_struc.pdf
10.	Bank Certificate	bank.pdf
11.	Work Schedule (BAR Chart)	barchart.pdf
12.	Cancelled Cheque	cheque.pdf
13.	Other Documents	other.pdf

1. The various documents are to be uploaded with the help of ATTACH button provided at relevant section of Attachment-QR sheet of Volume-III, Attachment.xls.
2. Bidder may put three (03) characters suffix for each file preceded by an under score for their identification. (Example- poa_xyz.pdf)
3. In case more file are to be uploaded under the same head Numeric suffix may be put by the bidder. (Example - poa1_xyz.pdf, poa2_xyz.pdf, poa3_xyz.pdf.....).
4. For uploading any additional documents bidder may decide the name of file with prefix as other succeeded by underscore and suffix as name of document in short. (Example – other_ISO certificate1_xyz.pdf, other_ISO certificate2_xyz.pdf)
5. For other types of files supported on the portal, please refer the related provisions on the portal.

D. Submission of Hard Copy of Bids

16. Sealing and Marking of Bids

16.1 The Bidder shall upload the soft copy part of the bid as per the provisions of the portal (refer para 15.1 & 15.4 above) and submit the hard copy of DD towards Bidding Document fee or documentary evidence in support of exemption of Document fee (as applicable), Bid Security or documentary evidence in support of exemption of Bid Security (as applicable), Integrity Pact, Safety Pact, Power of Attorney, Joint Venture Agreement (as applicable) and Power of Attorney of Joint Venture Agreement (as applicable) and Joint Deed of Undertaking (as applicable) (refer para 15.1 above), duly marked First Envelope (Techno – Commercial Part) in the following manner.

Envelope – 1: Bidding Document fee /documentary evidence in support of exemption of Bidding Document fee

Envelope – 2: Bid Security/ documentary evidence in support of exemption of Bid Security

Envelope – 3: Integrity Pact

Envelope – 4: Power of Attorney, Joint Venture Agreement (as applicable) and Power of Attorney of Joint Venture Agreement (as applicable) and Joint Deed of Undertaking (as applicable) and any other documents as required (refer para 15.1 above).

Envelope –5: Safety Pact

The Bidder shall upload the Excel files of Price Schedule and Attachments downloaded from the portal as part of the bid duly filled in the required cells. If the bid submitted by the bidder is found different from the files downloaded from the portal, as part of the bidding document or tampered/modified locked contents, the bidder may run with risk of rejection of bid.

16.2 The envelope shall

- (a) be addressed to the Employer at the address given in the **IFB**, and
- (b) bear the contract name & Tender Specification No. indicated in the **IFB**, and the statement “Do Not Open Before [date],” to be completed with the time and date specified in the **IFB**.

16.3 DD towards Bidding Document, Bid Securities, Integrity Pact and the Safety Pact in original shall be submitted in separate superscribed envelopes (one for DD towards Bidding Document, one for Bid Security, one for Integrity Pact and one for Safety Pact) alongwith First Envelope.

Bidder may upload Soft copy of the any other documents which they consider relevant along with First Envelope.

All the envelopes shall also indicate the name and address of the Bidder so that the bid can be returned unopened in case it is declared “late.”

In case, pursuant to Ministry of Finance, GOIs Circular dated 17th July, 2012, the Bank

Guarantee is issued using SFMS Platform by the banks located in India, the copy of such Bank Guarantee shall be submitted by the bidder along with the First Envelope.

The Account details of RECTPCL for the purpose of Bank Guarantee (towards Bid Security) to be issued using SFMS Platform are as given below:

Name of the Bank and Address	IFSC Code	RECTPCL Current A/c No.
ICICI BANK, 9A, PHELPS, CONNAUGHT PLACE, NEW DELHI-110001	ICIC0000007	000705041872

- 16.4** If the envelope is not sealed and marked as required by ITB Sub- Clause 16.2 above, the Employer will assume no responsibility for the bid's misplacement or premature opening.

17. Deadline for Submission of Bids

- 17.1** Soft copy of the bid shall be uploaded through the portal <http://www.mstcecommerce.com/eprhome/rectpcl> at or before the submission time and date as stipulated in the bidding document. Demand Draft, hard copy of Bid Security in accordance with clause 13 of ITB, Section-II in separate envelope, Integrity Pact, Safety Pact, Power of Attorney, Joint Venture Agreement & Power of Attorney of Joint Venture Agreement (in case bid from Joint Venture) (as applicable), JDUs (as applicable), and Affidavit for correctness must be received by the Employer at the address specified under ITB Sub-Clause 16.2 no later than the time and date stated in the IFB. In the event of the specified date for the submission of bids being declared a holiday for the Employer, the bids will be received/uploaded upto the appointed time on the next working day.

Hard copy of Joint Deed of Undertaking must be received by the Employer at the address specified under ITB Sub-Clause 16.2 not later than the time and date stated in the IFB.

- 17.2** Bidding timelines will be defined as per the e-Procurement server clock only.

- 17.3** The Employer may, at its discretion, extend this deadline for submission of bids any time prior to opening of bids, in which case all rights and obligations of Employer and bidders will thereafter be subject to the deadline as extended.

Further the Employer also reserves the right to extend bid submission timeline or recall the tender if e- Procurement server is down (i.e. inaccessible / inoperative) for a prolonged period of time within the last 24 hours of the bid submission due date.

18. Late Bids

- 18.1** The bidder shall not be permitted to submit the soft copy part of the bid by any mode other than uploading on the portal within the specified deadline for submission of bids. The e-Procurement system would not allow any late submission of bids through the portal after due date & time as specified in IFB. After electronic online proposal submission, the system generates a unique identification number which is time stamped. This shall be treated as acknowledgement of the bid submission.

In case Hard copy part of the bid is received by the Employer after the deadline for submission of the same prescribed by the Employer in the IFB but the bidder has uploaded the soft copy part of the bid, the bid will be considered as late bid. Such bids will be rejected

during preliminary examination.

19. Modification and Withdrawal of Bids

19.1 Bidder may modify its bids through the relevant provisions on the portal <http://www.mstcecommerce.com/eprochome/rectpcl>. The Bidder may modify or withdraw its bid after submission, provided that modification is done on the portal prior to the deadline prescribed for bid submission.

19.2 The Bidders modifications shall be done and submitted as follows:

(i) Soft copy of the entire bid if any modification is there.

19.3 Bidder may withdraw its bid through the relevant provisions of portal only.

19.4 No bid may be withdrawn in the interval between the bid submission deadline and the expiration of the bid validity period specified in ITB Clause 14. Withdrawal of a bid during this interval may result in the Bidders forfeiture of its bid security, pursuant to ITB Sub-Clause 13.6.

E. Bid Opening and Evaluation

20. Opening of First Envelope by Employer

20.1 After receipt of Bids till last date of submission of Bids as per schedule, the First Envelope i.e., Techno – Commercial Part of Bids shall be kept unopened by the Employer.

The Employer will open the First Envelope i.e. Techno – Commercial Part in public, including withdrawals and modifications made pursuant to ITB Clause 19, in the presence of bidders designated representatives who choose to attend, at the time, date, and location stipulated in the **IFB**. The bidders representatives who are present shall sign a register evidencing their attendance. In the event of the specified date for the submission of bids being declared a holiday for the Employer, the bids will be received upto the appointed/scheduled time on the next working day

20.2 During the opening of bids, Envelopes marked “Withdrawal” shall be opened first. Bids withdrawn pursuant to ITB Clause 19 shall be not be opened.

20.3 For all other Bids, the bidders names, deviation, if any, the presence of bid security, Integrity Pact, Safety Pact and any such other details as the Employer may consider appropriate, will be get declared during techno-commercial bid opening . Subsequently, all envelopes marked “Modification” shall be opened. Opening of bid, whether or not accompanied with the Tender fee and/or bid security and/ or Integrity Pact and/or Safety Pact, shall not be construed to imply its acceptability which shall be examined in detail pursuant to the provisions contained in this Section-II.

On behalf of Employer, the Integrity Pact and Safety Pact will be signed by its representative at the time of Bid Opening..

20.4 The Employer shall prepare minutes of the bid opening in the form of Bid Opening Statement, including the information disclosed to those present in accordance with ITB Sub-Clause 20.3.

20.5 Bids not opened at bid opening shall not be considered further for evaluation, irrespective of the circumstances and shall be returned to the Bidder unopened/send to archive unopened.

21. Clarification of Bids

- 21.1** During bid evaluation, the Employer may, at its discretion, ask the Bidder for a clarification of its bid. In case of erroneous/non submission of documents related to/identified in ITB Sub-Clause 9.3 (b), (j), (l) and (m) or Deed of Joint Undertaking pursuant to ITB Sub- Clause 9.3 (c), 9.3 (n) required to be submitted by the Bidder as per the provisions of the Bidding Documents, the Employer may give the Bidder not more than 7 working days' notice to rectify/furnish such documents, failing which the bid shall be rejected. The request for clarification and the response shall be in writing, and no change in the price or substance of the bid shall be sought, offered or permitted.

22. Preliminary Examination of First Envelope

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

In case of non-submission of bid in the portal (soft copy part of the bid) within the stipulated deadline, then even if the bidder has submitted the specific documents in hard copy part in original within the stipulated deadline pursuant to ITB 17.1, its bid shall be considered as incomplete bid, which shall be summarily rejected.

Similarly, in case of non-submission of Hard copy part of the bid, but the bidder has uploaded the soft copy part of the bid, the bid will be considered as incomplete bid. Such bids will be rejected during preliminary examination.

- 22.2** The Employer may waive any minor informality, nonconformity or irregularity in a bid that does not constitute a material deviation, whether or not identified by the Bidder in Attachment 4 to its bid, and that does not prejudice or affect the relative ranking of any Bidder as a result of the technical and commercial evaluation, pursuant to ITB Clause 24.

- 22.3** Prior to the detailed evaluation, the Employer will determine whether each bid is of acceptable quality, is complete and is substantially responsive to the Bidding Documents. Any deviations, conditionality or reservation introduced in Attachment-4 and/or in the Bid Form, Technical Data Sheets and covering letter, or in any other part of the bid will be reviewed to conduct a determination of the substantial responsiveness of the bidder's bid. For purposes of this determination, a substantially responsive bid is one that conforms to all the terms, conditions and specifications of the Bidding Documents without material deviations, objections, conditionalities or reservations. A material deviation, objection, conditionality or reservation is one (i) that affects in any substantial way the scope, quality or performance of the contract; (ii) that limits in any substantial way, inconsistent with the Bidding Documents, the Employer's rights or the successful Bidder's obligations under the contract; or (iii) whose rectification would unfairly affect the competitive position of other bidders who are presenting substantially responsive bids.

- 22.3.1** Bids containing deviations from critical provisions relating to GCC & SCC Clauses i.e Clause No-5(i)(b) of GCC (Governing Law), 7(i) of GCC (Contractor's Responsibilities), 9.0 of GCC (Performance Security), 27.0 of GCC (Liquidity Damage), 31 (i) (a) of GCC (Defect Liability Period), 33.0 of GCC (Payment Terms), 39.0 of GCC (Limitations of Liability), 47.0 of GCC (Settlement of Disputes), 48.0 of GCC (Arbitration), 20.0 of SCC (Taxes and Duties), and Appendix 2 to the Form of Contract Agreement (Price Adjustment) will be considered as non-responsive

22.3.2 Regarding deviations, conditionality or reservations introduced in the bid, which will be reviewed to conduct a determination of substantial responsiveness of the Bidder's bid as stated in ITB Sub- Clause 22.3, the order of precedence of these documents to address contradictions, if any, in the contents of the bid, shall be as follows:

- I. Bid Form
- II. Attachment-4 : Deviations
- III. Technical Data Sheet
- IV. Any other part of the bid

Contents of the document at Sr. No. I above will have overriding precedence over other documents (Sr. No. II to IV above). Similarly, contents of document at Sr. No. II above will have overriding precedence over other documents (Sr. No. III to IV above), and so on.

22.4 If a bid is not substantially responsive, it will be rejected by the Employer, and may not subsequently be made responsive by the Bidder by correction of the nonconformity. The Employer's determination of a bid's responsiveness is to be based on the contents of the bid itself without recourse to extrinsic evidence.

23. Qualification

23.1 The Employer will ascertain to its satisfaction whether Bidders determined having submitted substantially responsive bids are qualified, as per the Qualification Requirement specified in Section-III of Vol-I to satisfactorily perform the contract. The Employer shall be the sole judge in this regard and the Employer's interpretation of the Qualification Requirement shall be final and binding.

23.2 The determination will take into account the Bidder's financial, technical capabilities including production capabilities, in particular the Bidder's contract work in hand, future commitments & current litigation and past performance including fatal accidents during execution of contracts. It will be based upon an examination of the documentary evidence of the Bidder's qualifications submitted by the Bidder in Attachment 3 to the bid, as well as such other information as the Employer deems necessary and appropriate. This shall, however, be subject to assessment that may be carried out, if required, by the Employer as per the provisions of Qualification Requirement.

23.3 The Employer may waive any minor informality, nonconformity or irregularity in a bid that does not constitute a material deviation, affecting the capability of the Bidder to perform the Contract.

23.4 An affirmative determination will be a prerequisite for the Employer to evaluate the Techno - Commercial Part and open the Second Envelope of the Bidder. A negative determination will result in rejection of the Bidder's bid.

24. Evaluation of Techno - Commercial Part (First Envelope)

24.1 The Employer will carry out a detailed evaluation of the bids of the qualified bidders in order to determine whether the technical aspects are in accordance with the requirements set forth in the Bidding Documents. In order to reach such a determination, the Employer will examine the information supplied by the bidders, pursuant to ITB Clause 9, and other requirements in the Bidding Documents, taking into account the following factors:

- (a) overall completeness and compliance with the Technical Specifications and Drawings;

deviations from the Technical Specifications as identified in Attachment 4 to the bid and those deviations not so identified; suitability of the facilities offered in relation to the environmental and climatic conditions prevailing at the site; and quality, function and operation of any process control concept included in the bid. The bid that does not meet minimum acceptable standards of completeness, consistency and detail will be rejected for non-responsiveness.

- (b) Compliance with the time schedule called for in the corresponding Appendix to the Form of Contract Agreement and evidenced as needed in a milestone schedule provided in the bid;

Time schedule (program of performance)

The plant and equipment covered by this bidding shall have the "Taking Over" by the employer after successful Completion within the period specified in **IFB**. No credit will be given to earlier completion. Bids offering completion beyond the specified period are liable to be rejected.

- (c) type, quantity and long-term availability of mandatory and recommended spare parts and maintenance services
- (d) any other relevant technical factors that the Employer deems necessary or prudent to take into consideration.
- (e) any deviations to the commercial and contractual provisions stipulated in the Bidding Documents.
- (f) details furnished by the bidder in response to the requirements specified in Volume-II of the Bidding Documents.

25. Opening of Second Envelope by Employer

- 25.1** The Second Envelope i.e., Price Part of only those Bidders shall be opened who are determined as having submitted substantially responsive bids and are ascertained to be qualified to satisfactorily perform the Contract, pursuant to ITB Clause 23 and 24. A negative determination of the bids pursuant to ITB Clause 23 and 24, shall be notified by the Employer to such Bidders and the Second Envelope submitted by them shall be unopened and Bid Security shall be returned.
- 25.2** The Employer will open Second Envelope i.e., Price Part at the specified time and date in the presence of bid opening committee constituted by the employer at the time, date, and location stipulated in the intimation for opening of Second Envelope.
- 25.3** The prices and details as filled up in the price schedule by the bidder and opened during the bid opening and recorded in the Bid Opening Statement would not be construed to determine the relative ranking amongst the Bidders, or the successful Bidder, and would not confer any right or claim whatsoever on any Bidder. The successful Bidder (also referred to as the L1 Bidder) shall be determined as per the provisions of this Section – II and considered for award of contract as provided in ITB Clause 31.
- 25.4** The Employer shall prepare minutes of the bid opening, including the information disclosed to those present in accordance with ITB Sub-Clause 25.3.

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

26. Conversion to Single Currency

26.1 This shall not be applicable as domestic firms are required to quote the prices in Indian Rupees only.

27. Evaluation of Second Envelope (Price Part)

27.1 The Employer will examine the Price Parts (Second Envelopes) to determine whether they are complete, whether any computational errors have been made, whether the documents have been properly signed, and whether the bids are generally in order.

The Price Part containing any deviations and omissions from the contractual and commercial conditions and the Technical Specifications which have not been identified in the First Envelope are liable to be rejected.

27.2 Arithmetical errors will be rectified on the following basis. If there is a discrepancy between the unit price and the total price, which is obtained by multiplying the unit price and quantity specified by the Employer, or between subtotals and the total price, the unit or subtotal price shall prevail, and the quantity and the total price shall be corrected. However, in case of items quoted without indicating any quantity or the items for which the quantities are to be estimated by the Bidder, the total price quoted against such items shall prevail. If there is a discrepancy between words and figures, the amount in words will prevail.

If there is a discrepancy between the quantity specified by the Employer and the quantity indicated by the bidder in any price schedules, the quantity specified by the Employer shall prevail and shall be corrected accordingly.

The prices of all such item(s) against which the Bidder has not quoted rates/amount (viz., items left blank or against which „-„ is indicated) in the Price Schedules will be deemed to have been included in other item(s).

In respect of taxes, duties and other levies indicated by the Bidder in the Bid, which are reimbursable in line with the provisions of the Bidding Documents, the applicable rate and amount thereof shall be ascertained by the Employer based on which, if required, necessary rectification and arithmetical correction shall be carried out by the Employer. The rate and amount so ascertained by the Employer shall prevail.

If the bidder has left the cells for confirmation of HSN/SAC code and/or corresponding rate of GST “blank”, the HSN/SAC code and/or corresponding rate indicated by the Employer shall be deemed to be the one confirmed by the Bidder. The GST rate and amount so ascertained by the Employer for the said HSN/SAC code shall prevail.

The rate of GST for the purpose of evaluation shall be the rate of GST as confirmed/deemed confirmed by the bidder for each item in the bid/schedules.

If there is difference in HSN/SAC classification and corresponding rate of GST of an item as confirmed/deemed confirmed by the bidder in its bid and HSN/SAC and corresponding rate of GST as interpreted under any interpretation/ judgment/ Notification/ Circular issued under the GST law before or after the award of contract, GST reimbursable to the bidder/Contractor shall be lower of the GST applicable at the rate as confirmed/deemed

confirmed in the bid or actual GST paid/payable by the bidder for that item.

The subtotal, total price or the total bid price to be identified in Bid Form for this purpose, irrespective of the discrepancy between the amount for the same indicated in words or figures shall be rectified in line with the procedure explained above.

If the Bidder does not accept the correction of errors as per this clause, its bid will be rejected and the amount of Bid Security forfeited.

- 27.3** The comparison shall be on the total price in Bid Price Summary Sheet of price schedule. The comparison shall also include the applicable taxes, duties and other levies, which are reimbursable in line with the provisions of the Bidding Documents.

The Employer's comparison will also include the costs resulting from application of the evaluation procedures described in ITB Sub-Clause 27.4 & 27.5.

- 27.4** –deleted–

- 27.5** –deleted–

- 27.6** Any adjustments in price that result from the above procedures shall be added, for purposes of comparative evaluation only, to arrive at an “Evaluated Bid Price.” Bid prices quoted by bidders and rectified as per ITB Sub Clause 27.2 shall remain unaltered.

28. Purchase/ Domestic Preference

- 28.1** No purchase preference is presently applicable for the Plant and Equipment to be supplied under the Contract.

No margin of domestic preference will be allowed in evaluation and comparison of bids.

29. e-Reverse Auction (e-RA)

- 29.1.** Employer reserve the right to conduct the electronic Reverse Auction (e-RA) as per the requirement and e-RA if required, shall be carried out in the manner as indicated herein below.
- 29.2.** Based on “Evaluated Bid Price” determined pursuant to ITB Sub Clause 27.6, the Bidders shall be ranked in an ascending order. Basis such ranking, the lowest ranked $N/2$ bidders (in case “N is even) or $(N+1)/2$ bidders (in case „N is odd), subject to minimum of three (03) bidders, shall be invited to participate in the e-Reverse Auction (e-RA), where „N” is the number of bidders whose bids have been found to be responsive and their “Evaluated Bid Price” has been determined in accordance with ITB Sub Clause 27.6.
- 29.3.** However, in case only bids of two bidders are found to be responsive whose “Evaluated Bid Price” has been determined in accordance with ITB Sub Clause 27.6, the e-RA would be carried out with both the parties.
- 29.4.** The Applicable Ceiling Price for e-RA for bidders shall be “Evaluated Bid Price” determined in accordance with ITB Sub Clause 27.6. During e-RA, these Bidders shall be permitted to place their prices lower than the Applicable Ceiling Price.

- 29.5. The e-RA shall be conducted on a designated electronic platform of any Application Service Provider (hereinafter referred to as “ASP”), for and on behalf of the Employer.
- 29.6. The Qualified Bidders shall be permitted to place their Final Offer on the electronic bidding platform, which is lower than zero point zero five (0.5) % of the prevailing bid price.
- 29.7. The initial period for conducting the e-reverse bidding should be at least 30 minutes which will be extended by 10 minutes from the last received bid time, if the bid is received during the last 10 minutes of the scheduled or extended bid time. Subsequently, it will be extended again by 10 minutes from the latest received bid time.
- 29.8. Notwithstanding above, the bidder(s) who either do not submit the requisite compliances for e-RA do not participate in e-RA, their original price bid as opened, if valid, shall be considered for evaluation.
- 29.9. In the event of identical evaluated bid price from the Initial Offer having been arrived for one or more Bidders, all such Bidders shall be assigned the same rank for the purposes of determination of Qualified Bidders.
- 29.10. The Employer shall be the sole judge in this regard

30. Confidentiality and Contacting the Employer

- 30.1** After the public opening of bids, information relating to the examination, clarification, and evaluation of bids and recommendations concerning awards shall not be disclosed to Bidders or other persons not officially concerned with this process until the publication of contract award. From the time of bid opening to the time of contract award, if any Bidder wishes to contact the Employer on any matter related to its bid, it should do so in writing.
- 30.2** Any effort by a Bidder to influence the Employer in the Employer's bid evaluation, bid comparison or contract award decisions may result in rejection of the Bidder's bid. The Employer shall be the sole judge in this regard.

F. Award of Contract

31. Award Criteria

- 31.1** Subject to ITB Clause 32, the Employer will award the contract to the successful Bidder (also referred to as the L1 Bidder) whose bid has been determined to be substantially responsive and to be the lowest evaluated bid, further provided that the Bidder is determined to be qualified, as per the Qualification Requirement specified in Qualification Requirement, (Section-III of Vol-I) to perform the contract satisfactorily.
- 31.2** –deleted-
- 31.3** The Employer reserves the right to vary the quantity of any of the spares and/or delete any items of spares altogether at the time of Award of Contract.
- 31.4** The mode of contracting with the successful bidder will be as per stipulation outlined in ITB Sub-Clause 31.4.1 which is briefly indicated below:

- 31.4.1 The Contracts to be entered into with the successful Bidder shall be as under:
The award shall be made in one contract covering all works and related services.

32. Employer's Right to Accept any Bid and to Reject any or all Bids

- 32.1 The Employer reserves the right to accept or reject any bid, and to annul the bidding process and reject all bids at any time prior to award of contract, without thereby incurring any liability to the affected Bidder or bidders or any obligation to inform the affected Bidder or bidders of the grounds for the Employer's action.

33. Notification of Award

- 33.1 Prior to the expiration of the period of bid validity, the Employer will notify the successful Bidder in writing, that its bid has been accepted. The notification of award will constitute the formation of the contract.

- 33.2 The Employer shall publish the results on its website and the portal, identifying the bid and Specification numbers and the following information: (i) name of each Bidder who submitted a Bid; (ii) bid prices displayed as per e-form at bid opening; (iii) name and evaluated prices of each Bid that was evaluated; (iv) name of bidders whose bids were rejected and the reasons for their rejection; and (v) name of the winning Bidder, and the price it offered, as well as the duration and summary scope of the contract awarded.

The Employer shall promptly respond in writing to any unsuccessful Bidder who, after notification of award in accordance with above, requests in writing the grounds on which its bid was not selected.

- 33.3 Upon the successful Bidder's furnishing of the performance security pursuant to ITB Clause 35, the Employer will promptly discharge the bid securities, pursuant to ITB Sub-Clause 13.4 & 13.5.

34. Signing the Contract Agreement

- 34.1 At the same time as the Employer notifies the successful Bidder that its bid has been accepted, the Employer in consultation with the Bidder will prepare the Contract Agreement provided in the Bidding Documents, incorporating all agreements between the parties.
- 34.2 The Contract Agreement shall be executed within Fifteen (15) days of the Notification of Award and the successful Bidder and the Employer shall sign and date the Contract Agreement immediately thereafter.

35. Performance Security

- 35.1 Within Fifteen (15) days after receipt of the Letter of Award, the successful Bidder shall furnish the performance security for 10% (Ten percent) of the contract price plus additional performance securities, if any, in line with the requirement of Qualification Requirements, in the amount given in the bidding document and in the form provided in Section IX, Sample Forms and Procedures, of the Bidding Documents. The performance security of a joint venture shall be in the name of joint venture.
- 35.2 Failure of the successful Bidder to comply with the requirements of ITB Clause 34 or Clause 35 shall constitute sufficient grounds for the annulment of the award and forfeiture of the bid security, in which event the Employer may make the award to the next lowest evaluated Bidder or call for new bids.

36. Fraud and Corruption

It is the Employer's policy that requires the Bidders, suppliers and contractors and their subcontractors under the contracts to observe the highest standard of ethics during the procurement and execution of such contracts. In pursuance of this policy, the Employer:

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

- (i) "corrupt practice" is the offering, giving, receiving or soliciting, directly or indirectly, of anything of value to influence improperly the actions of another party;
- (ii) "fraudulent practice" is any act or omission, including a misrepresentation, that knowingly or recklessly misleads or attempts to mislead, a party to obtain a financial or other benefit or to avoid an obligation;
- (iii) "collusive practice" is an arrangement between two or more parties designed to achieve an improper purpose, including to influence improperly the actions of another party;
- (iv) "coercive practice" is impairing or harming, or threatening to impair or harm, directly or indirectly, any party or the property of the party to influence improperly the actions of a party;
- (v) "obstructive practice" is

(aa) deliberately destroying, falsifying, altering or concealing of evidence material to the investigation or making false statements to investigators in order to materially impede a Employer's investigation into allegations of a corrupt, fraudulent, coercive or collusive practice; and/or threatening, harassing or intimidating any party to prevent it from disclosing its knowledge of matters relevant to the investigation or from pursuing the investigation;

or

(bb) acts intended to materially impede the exercise of the Employer's inspection and audit rights.

- (b) will reject a proposal for award if it determines that the bidder recommended for award has, directly or through an agent, engaged in corrupt, fraudulent, collusive, coercive or obstructive practices in competing for the contract in question;
- (c) will sanction a firm or individual, including declaring 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, directly or through an agent, engaged in corrupt, fraudulent, collusive, coercive or obstructive practices in competing for, or in executing, a contract; and
- (d) will have the right to require that the provision be included in Bidding Documents and in contracts, requiring Bidders, suppliers, and contractors and their sub-contractors to permit the Employer to inspect their accounts and records and other documents relating to bid submission and contract performance and to have them audited by auditors appointed by the Employer.

-- End of Section-II (ITB) --

Bidder's guide for Bidding through excel based uploading in RECTPCL portal:

1. Use Internet Explorer to go to https://www.mstcecommerce.com/eprochome/rectpcl/buyer_login.jsp

The screenshot displays the RECTPCL portal homepage. At the top, there are logos for 'एन एच टी सी लिमिटेड' (NHTC Limited), 'MSTC LIMITED', and 'IBM'. Below these is a navigation bar with links: Home, About Us, Terms of Use, Notices, Privacy Policy, Corporate site, and Contact Us. The main content area is divided into three sections. On the left is the 'RECTPCL Login' section with fields for Username and Password, and buttons for Login, Reset, Reset Password?, and Reset Password without. Below this are links for Vendor Guide, Java Download, FAQ, and Download NIT/Corr. In the center is the 'Bulletin Board' section with a 'Live Tenders' list (1. Tender No. RECTPCL/17-18/ET/3 for RECTPCL TEST 3) and a 'Forthcoming Tenders' section. Below the bulletin board is a 'Welcome to REC Transmission Projects Company Ltd. e-Procurement...' message. On the right is the 'Vendor Login' section with similar fields and buttons, and a 'Register as Vendor' link. At the bottom right is an 'MSTC SUPPORT' section listing services like 30 MBPS LEASE LINE, High End IBM P-Series Server, Skilled Support Team, 24x7 Hrs. Support, Disaster Recovery Site, and Best Viewed in IE 7 & Above. The footer contains the copyright notice 'copyright@MSTC Limited 2014'.

2. On the right side of the page click on Register as a Vendor:

This is a close-up screenshot of the 'Vendor Login' section. It shows a teal background with a yellow 'Vendor Login' header. Below the header are input fields for 'Username' and 'Password', and buttons for 'Login' and 'Reset'. At the bottom of the section are links for 'Reset Password?' and 'Register as Vendor'.

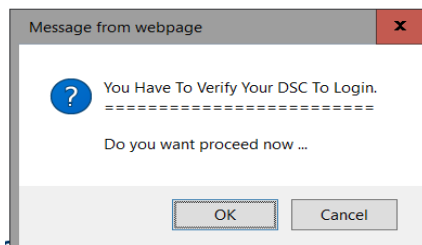
3. Fill the form that appears to create username and password.

The screenshot shows the 'Vendor > New Registration' page on the MSTC Limited e-Procurement portal. The form is divided into several sections: 'Personal Information' (Company Name, Contact Person, Company Type), 'User Preferences' (Choose a Username, Choose a Password, Retype Password), 'Your Contact Details' (Email Id, Mobile Phone No., Day Phone, Fax No.), and 'Your Contact Address' (Street, City, Pin, District, Country, State). A red asterisk indicates mandatory fields. A link 'Click here to check availability of your User Id' is provided next to the username field. The 'Country' is set to 'India' and 'State' is a dropdown menu.

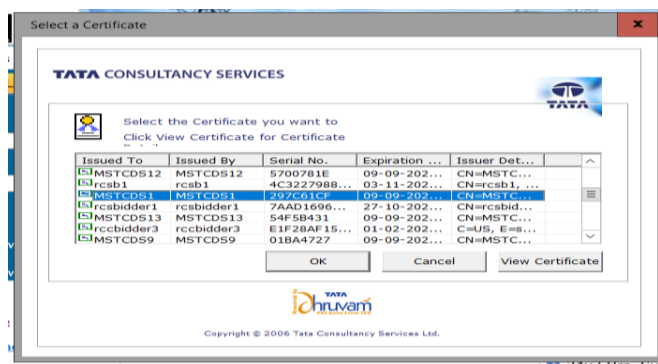
4. Once the registration is done, login with your user name and password:

The screenshot shows the 'Vendor Login' page. It has a teal background with a yellow 'Vendor Login' header. The login fields are 'Username' (with the text 'rectplvendor1') and 'Password' (masked with dots). There are 'Login' and 'Reset' buttons. Below the login fields, there are links for 'Reset Password?' and 'Register as Vendor'.

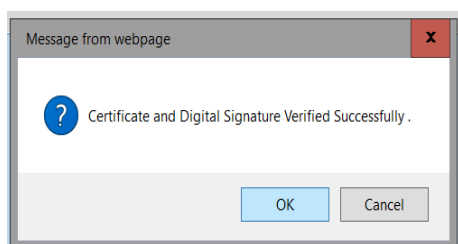
5. System will ask you to verify your digital signature



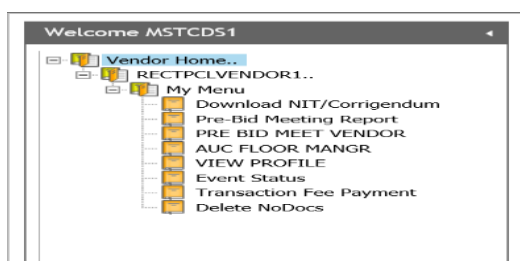
6. Press Ok and select your digital signature from the List:



7. Your digital signature will be verified



8. Once login is complete, a bidder can access My Menu through the left side of the page:



9. Here click on Download NIT/Corrigendum button to download the NIT/Corrigendums. Select Event number and click on download to download the files:

10. After going through NIT, a bidder will be required to submit the transaction fee before submitting the bid. To submit transaction fee click on transaction fee payment and select tender number. The transaction fee amount will be input by the system automatically. A bidder can deposit the transaction fee through Debit Card/Credit card/Net Banking by selecting the online payment option or through NETF/RTGS. Payment through online mode is authorized immediately while through NEft/RTGS is authorized by the system upon receipt of payment (this can take approx. 1 working day).

Select a Event :	RECTPCL/17-18/ET/3
Transaction fee :	5750.0
Select Payment Type:	☐ NEFT/RTGS ☒ Online Payment
Proceed To Payment	

11. After the transaction fee is paid a bidder can proceed to Auc-Floor Manager through the left side My menu. In Auc floor manager click on live events to view a list of Live events. In live events select the tender number where you wish to submit a bid. (tenders have the denotation ET while e-Reverse Auctions have denotation RA).

Welcome MSTCDS1

- Vendor Home..
- RECTPCLVENDOR1..
- My Menu
 - Download NIT/Corrigendum
 - Pre-Bid Meeting Report
 - PRE BID MEET VENDOR
 - AUC FLOOR MANGR**
 - VIEW PROFILE
 - Event Status
 - Transaction Fee Payment
 - Delete NoDocs

Welcome MSTCDS1 [Log Out](#)

Hi MSTCDS1

e-Procurement Event Info Server Time : 2017/5/16 11:34:37

Select Buyer : REC Transmission Projects Company Ltd.

Live e-Procurement Events :

Forthcoming e-Procurement Events :

e-Procurement Event Listing For Live e-Procurement Events

e-Procurement Event No.	e-Procurement Event Start Date	e-Procurement Event Close Date
MSTC/17-18/RA/1	2017-05-16 10:12	2017-05-19 14:30
RECTPCL/17-18/ET/3	2017-05-16 10:05	2017-05-19 13:00

12. On clicking the tender number following screen will appear:

Hi MSTCDS1

Events Details

Event No: RECTPCL/17-18/ET/19

EVENT INFO

Current Server Time: 7.11.2017 12:11:23 IST

Event Type: 3Cover_Price_Bid_Upload_in_Excel

Event Start Time: 30.10.2017 16:30:00

Event Close Time: 10.11.2017 17:00:00

ITEM NO	ITEM Name	Cover 3	Final Submission	Withdraw Bid	Delete Bid	Bid Status
1	1	Download Upload Price	Final Submission	Withdraw Bid Submit regret letter with	Delete Bid	Qualification part Bid Saved
2	2	Download Upload Price	Final Submission	Withdraw Bid Submit regret letter with	Delete Bid	Technical Saved

13. The first step towards submitting the bid is Cover 1 on the left side. Click on Cover 1 and fill the form given therein. Conditions with agree have to be necessarily agreed, while in the conditions with empty remarks field bidder can give their comments.

Purchaser's Specification			Agree
1 Technical Terms			
1.1	a		Agree Agree with remarks
1.2	a		Remarks
1.3	a		AGREE
1.4	a		Agree Agree
1.5	a		AGREE

14. After the common terms are saved, a bidder can proceed to saving the Cover 2. To fill Cover 2 form click on cover 2 and fill the form therein.

Purchaser's Specification			Agree
1 Commercial Terms			
1.1	a		AGREE
1.2	a		AGREE
1.3	a		AGREE
1.4	a		AGREE
1.5	a		AGREE

15. Once Cover 2 are saved, proceed with submitting the price bid. Click on Download button to download the Excel sheet for Price Bid.

Do you want to open or save 17-18-ET-19-5312-38840-Book2.xls (19.0 KB) from mstcauction.com?	Open	Save	Cancel	X

16. Fill up the excel sheet as per the details given therein and tender document.

17. To upload the filled up excel click on Upload Price Button, click on browse to select the file and then click on Upload and Save encrypt file.

18. Once all the covers are saved, click on upload documents on the top to upload documents for the said tender. Select the cover for which document are being uploaded. A list of previously uploaded files will be visible at the bottom of the screen:

19. After the documents have been uploaded, click on final submit to finally submit the bid. In case of any amendments after final submit, click on delete bid button to delete the techno-commercial and price bids and resubmit the same. Please note that at the end the bid must be final submit, otherwise the same will not be considered.

E-Reverse Auction:

20. The Financial Bid will comprise of two rounds. In the first round, the total Initial Price Offer (submitted online along with the Cover 1 and 2) of the Technically Qualified bidders shall be opened and total Initial Price Offer shall be ranked on the basis of ascending order for determination of the L-1 bid. This L-1 Bid shall become the ceiling price for start of e-reverse auction. The qualified bidders shall be permitted to place their Final Price Offer on the electronic bidding platform which must be lower than 0.5% of prevailing L-1 Price. Prevailing L-1 price will be displayed to all the bidders up to the point no other bidder out bids that offer by quoting a lower price. All bidders may reduce their bids by any amount in the multiples of 0.5% of prevailing L-1 bid (rounded to the nearest whole number) by bidding any number of times for the duration of the auction. The initial period for conducting e-reverse auction shall be 30 minutes which will be extended by 10 minutes from the last received bid time if the bid is received during the last 10 minutes of the scheduled or extended bid time. Subsequently, it will be extended again by 10 minutes from the latest received bid time.

21. At the close of the e-Reverse auction the successful bidder will be notified by email that their bid amount _____ received in the system is the lowest amount in the system. They will be required to give a break up of the bid quoted by them. The break up should be pro rata reduced (without disturbing amount of taxes) from their initial price offer at Tender stage.
-

SECTION-III, VOL-I
QUALIFICATION REQUIREMENT

Qualification Requirement of the Bidder

“Design, Engineering, Supply & Construction of Residential Staff Quarters & associated facilities at 160 MVA, 220/33 kV Gas Insulated Substation (GIS) at Lassipora (Srinagar Region) on Turnkey Basis associated with Strengthening of Transmission System of JKPTCL under PMDP Scheme-15”

Qualification of bidder will be based on meeting the minimum pass/fail criteria specified below regarding the Bidder's technical experience and financial position as demonstrated by the Bidder's responses in the corresponding Bid Schedules.

Technical experience and financial resources of any proposed subcontractor shall not be taken into account in determining the Bidder's compliance with the qualifying criteria. The bid can only be submitted by an individual firm. Joint Venture firms are not accepted.

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

1.1 Technical Experience

The Bidder should have experience of successfully completed similar works** during the last 7 (seven) years ending last day of month previous to the one in which application are invited:

One single work/project of value not less than **Rs. 0.90 Crore**

OR

Two works/projects, each of a value not less than **Rs. 0.56 Crore**

OR

Three works/projects, each of a value not less than **Rs. 0.45 Crore**

Note-1: *In case bidder is a holding company, the technical experience referred to in clause 1.1 shall be of that holding company only (i.e. excluding its subsidiary/group companies). In case bidder is a subsidiary of a holding company, the technical experience referred to in clause 1.1 shall be of that subsidiary company only (i.e. excluding its holding company).*

1.2 Financial Position

Bidder must meet the following minimum criteria:

- a) Net Worth for last 3 financial years should be positive
- b) Minimum Average Annual Turnover* (MAAT) of the bidder for best three years i.e. 36 months out of last five financial years as annualized, should not be less than **Rs. 78.40 Lakhs.**

* Note- Annual total income as incorporated in the profit & loss account except non-recurring income e.g. sale of fixed assets

Qualification Requirement of the Bidder

“Design, Engineering, Supply & Construction of Residential Staff Quarters & associated facilities at 160 MVA, 220/33 kV Gas Insulated Substation (GIS) at Lassipora (Srinagar Region) on Turnkey Basis associated with Strengthening of Transmission System of JKPTCL under PMDP Scheme-15”

- c) Shall have a solvency of **Rs. 44.80 Lakhs**. The applicant shall submit the solvency certificate, not older than three months prior originally scheduled date of Bid submission, issued by any scheduled bank in original.

Note-2 : *In case bidder is a holding company, the Financial Position criteria referred to in clause 1.2 above shall be that of holding company only (i.e. excluding its subsidiary / group companies). In case bidder is a subsidiary of a holding company, the Financial Position criteria referred to in clause 1.2 above shall be that of subsidiary company only (i.e. excluding its holding company).*

- 1.3** Start –Ups as defined by DIPP/MSEs, meeting the specified requirements at Para 1.2 (a) in Financial position shall also be considered qualified if they meet 80% of the requirement specified at Para 1.2 (b), and 1.2 (c) applicable as on originally scheduled date of bid opening.

- 1.4** The bidder shall furnish documentary evidence in support of the qualifying requirement stipulated as above.

SECTION-IV, VOL-I
GENERAL CONDITIONS OF CONTRACT (GCC)

SECTION - IV

GENERAL CONDITIONS OF CONTRACT

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SECTION-IV
GENERAL CONDITIONS OF CONTRACT

CLAUSE-1: DEFINITIONS:

In the Contract, as hereinafter defined, the following words and expressions shall have the meanings hereby assigned to them, except where the context otherwise requires:

- i) 'RECTPCL'/ 'Purchaser'/'Implementing Agency' means the REC Transmission Project Company Ltd. and the legal successor in title to the RECTPCL, who will employ the contractor. 'Owner' means the State Government of concerned state where the works are to be executed.
- ii) 'Contractor/Supplier' means the person or persons, firm or company, group of firms or Joint Venture, who has been awarded the work by the RECTPCL and includes the Contractor's personnel, representatives, successors and permitted assigns.
- iii) 'Engineer-in-Charge' means the Additional Chief Executive Officer of RECTPCL.
 - (a) 'Engineer-in-Charge's Representative' means the Chief Project Manager and Project Engineers of the project. The Site in-charge will assist the Engineer-in-charge's representatives to perform the duties set forth in Clause-2 hereof, whose authority shall be notified in writing to the Contractor by the Engineer-in-Charge.
 - (b) The responsibilities assigned herewith as above in iii (a) to various officers does not absolve them from taking the approval from the competent authority under various state laws/rules/regulations and book of financial powers.
- iv) "Works" shall include both permanent Works and Temporary Works or either of them as appropriate and shall mean supply of Goods and Services.
- v) "Temporary Works" means all temporary Works of every kind other than Contractor's plant, equipment and machinery required in or about the execution and completion of the Works and remedying of any defects --therein.
- vi) "Permanent Works" means the permanent Works to be executed in accordance with the Contract.
- vii) The 'Goods' means all the equipment, machinery and/or other materials which the Contractor is required to supply to RECTPCL under the Contract.
- viii) 'Services' means services ancillary to the supply of Goods such as but not limited to transportation and insurance from ex-works till defect liability period, handling, storage and preservation at store/site, erection, testing, painting, commissioning of goods, training and other such obligations of the Contractor covered under the Contract.
- ix) 'Contract' means the agreement entered into between RECTPCL and the Contractor as recorded in the Form of Agreement, signed by both the parties including all attachments and appendices thereto and all documents incorporated by reference their in.

- x) 'Contract Price' means the sum as stated in the Letter of Award payable to the Contractor under the contract for full and proper performance of his contractual obligations i.e. providing goods and services and remedying any defects therein in accordance with the provisions of the Contract.
- xi) 'Plant' and 'Equipment' or 'Machinery' means and include plant, equipment, machinery, tools, appliances, other implements of all description or things of whatsoever nature other than the Temporary Works required in or about the execution and completion of the Works and remedying of any defects therein but does not include materials or other things intended to form or forming part of the Permanent Works.
- xii) 'Specifications' means the specifications of Works included in the Contract and any modification thereof or addition thereto or deduction there from as may, from time to time, decided by RECTPCL and/or submitted by the Contractor and approved in writing by the Additional Chief Executive Officer, RECTPCL.
- xiii) 'Drawings' means the drawings referred to in the Contract and any modification of such drawings approved in writing by the Engineer-in-Charge and such drawings, as may , from time to time, be furnished by RECTPCL and/or the Contractor and approved in writing by the Additional Chief Executive Officer, RECTPCL.
- xiv) 'Site' means the places where the Works are to be executed and any other places as may be specifically designated in the Contract as forming part of Site.
- xv) 'Store' means the place where the goods supplied under this Contract are stored by the Contractor near to the Project site. Such place will be treated as forming part of site.
- xvi) 'Approved' means approved in writing, including subsequent written confirmation of previous verbal approval and 'approval' means approval in writing, including as aforesaid.
- xvii) 'Consultant' means company/individual as appointed by owner/employer .
- xviii) Chief Engineer means Chief Manager (Technical), RECTPCL.
- xix) Development Commissioner (Power) means Representative of the Owner of the Project.
- xx) 'GoI' means The Government of India.
- xxi) 'Sub-Contractor' means the party or parties having direct contract with the Contractor and to whom any part of the Works has been sublet by the Contractor with the consent, in writing, of the Engineer-in-Charge and the legal successors in title to such person, but not any assignee of any such person.
- xxii) 'Manufacturer' means the party proposing to design and/or manufacture the Goods as specified, complete or in part.
- xxiii) 'Letter of Award' means the letter from RECTPCL conveying award of Works subject to such reservations as may have been stated therein.

- xxiv) 'Tests on Completion' means the tests specified in the Contract or otherwise agreed to by RECTPCL and the Contractor to be performed before the Works are taken over by RECTPCL.
- xxv) 'Day' means a day from midnight to midnight.
- xxvi) 'Month' means from the beginning of a given date of a calendar month to the end of the preceding date of the next calendar month.
- xxvii) 'Week' means seven consecutive days.
- xxviii) 'Quarter' means a period of three consecutive months starting from January, April, July and October i.e. January to March, April to June, July to September and October to December.
- xxix) 'C.E.A.' means Central Electricity Authority.
- xxx) 'Near Relative' means wife/husband, parents and grandparents, children, first cousins, brothers-in-law, sisters-in-law and parents-in-law.
- xxxi) 'Rupees' means Rupees in Indian Currency.
- xxxii) Words in singular number shall include the plural number and vice-versa where the context so requires. 'He' shall include 'She' and vice – versa.
- xxxiii) 'IS' Means Indian Standard specifications with latest amendments or revision as currently in force at the time of execution of the Works.
- xxxiv) 'Bill of Quantities'/ 'Price Schedule' means the priced and completed bill of quantities.
- xxxv) 'Project Manager' means the person appointed from time to time by the Contractor and notified in writing to the RECTPCL to act as the in-charge for the purpose of the Contract. The Project Manager shall have a minimum of 12 years' experience in the related field, out of which at least 5 years' experience shall be at executive level in "transmission works at 220 KV level"

CLAUSE-2 DUTIES AND POWERS OF ENGINEER-IN-CHARGE AND ENGINEER-IN-CHARGE'S REPRESENTATIVE:

- i) The Engineer-in-Charge shall carry out the duties specified in the Contract.
- ii) The Engineer-in-Charge may exercise the authority specified in or necessarily to be implied from the Contract, provided however, that if the Engineer-in-Charge is required to obtain the specific approval from a Competent Authority before exercising any such authority, he will do so and convey the decision to the Contractor.
- iii) The Engineer-in-Charge's Representative will be appointed by and be responsible to the Engineer-in-Charge and will carry out such duties and exercise such authority as may be delegated to him by the Engineer-in-Charge under Sub Clause (iv) of this Clause. He shall have no authority to relieve the Contractor of any of his duties or obligations under the Contract nor, except as expressly provided hereunder or elsewhere in the Contract, to order any work

involving delay or any extra payment by the RECTPCL, nor to make any variation in the Works.

- iv) The Engineer-in-Charge may, from time to time delegate to the Engineer-in-Charge's Representative any of the powers and authorities vested in the Engineer-in-Charge and he may at any time revoke such delegation. Any communication issued by the Engineer-in-Charge's Representative to the Contractor in accordance with such delegation shall have the same effect as though it had been issued by the Engineer-in-Charge. Provided that:
 - a. any failure of the Engineer-in-Charge's Representative to disapprove any work or materials shall not prejudice the authority of the Engineer-in-Charge thereafter to disapprove such work or materials and to give instructions for the removal or for the rectification thereof.
 - b. If the Contractor questions any communication of the Engineer-in-Charge's Representative, he may refer the matter to the Engineer-in-Charge who will confirm, reverse or vary the contents of such communication.
- v) The Engineer-in-Charge may have any number of persons to assist the Engineer-in-Charge's Representative in carrying out of his duties. Such assistants shall have no authority to issue any instructions to the Contractor, except in so far as such instructions may be necessary to enable them to carry out their duties and to secure their acceptance of materials, plant, equipment and machinery or workmanship as being in accordance with the Contract, and any instructions given by any of them for those purposes shall be deemed to have been given by the Engineer-in-Charge's Representative.
- vi) Instructions given by the Engineer-in-charge shall be in writing, provided that if for any reason the Engineer-in-charge considers it necessary to give any such instruction orally, the contractor shall comply with such instruction. Confirmation in writing of such oral instruction given by the Engineer-in-Charge, whether before or after carrying out of the instruction, shall be deemed to be an instruction within the meaning of this sub-clause. Provided further that if the Contractor, within seven days, confirms in writing to the Engineer-in-Charge any oral instructions of the Engineer-in-Charge and such confirmation is not contradicted in writing within seven days by the Engineer-in-Charge, it shall be deemed to be an instruction of the Engineer-in-Charge. The provisions of this sub-Clause shall equally apply to instructions given by the Engineer-in-Charge's Representative and any assistants of the Engineer-in-Charge or the Engineer-in-Charge's Representative pursuant to Sub-Clause (v).

CLAUSE-3 ASSIGNMENT OF CONTRACT

The Contractor shall not, without the prior consent of the RECTPCL, assign the Contract or any part thereof, or any benefit or interest therein or there under, otherwise than by:

- (i) A charge in favour of the Contractor's bankers of any monies due or to become due under the Contract, or

- (ii) Assignment to the Contractor's insurers (in cases where the insurers have discharged the Contractor's loss or liability) of the Contractor's right to obtain relief against any other party liable.

CLAUSE-4 SUBLETTING:

- (i) The Contractor shall not sublet the whole of the Works except where otherwise provided by the Contract, the Contractor shall not sublet any part of the Works without the prior written consent of the Engineer-in-charge. However, any such consent shall not relieve the Contractor from any liability or obligation under the Contract and he shall be responsible for the acts, defaults and neglects of any sub-contractor, his agents, servants or workmen as fully as if they were the acts, defaults or neglects of the Contractor, his own agents, servants or workmen. Provided that the Contractor shall not be required to obtain such consent for:
 - a) The provision of labour, or
 - b) The purchase of materials which are in accordance with the standards specified in the Contract, or
 - c) The subletting of any part of the Works for which the sub-contractor is named in the Contract.
- (ii) The Contractor shall furnish un-priced copies of the major sub-contracts (costing more than Rs. 5.0 million) to RECTPCL wherever these are executed. This action would, however, not involve RECTPCL in any complications arising between the Contractor and his sub-contractor(s) or any other liabilities. This action would also be without prejudice to the provision under this Clause.
- (iii) In the event of a sub-contractor having under taken the Contract in respect of the work executed or the goods, materials, plant, equipment and machinery or services supplied by such sub-contractor, any continuing obligation extending for a period exceeding that of the Defects Liability Period or its extension under the Contract, the Contractor shall at any time, after the expiration of such period, assign to the RECTPCL, the benefit of such obligation for the unexpired duration thereof.

CLAUSE-5: LANGUAGE(S) AND LAW:

- i
 - a) The Contract Documents shall be drawn up in English. All correspondence and documents relating to the Contract, exchanged by the Contractor and RECTPCL shall be submitted in the prescribed form in English. All supporting documents and printed literature in connection with the Contract shall be in English. In case the supporting documents and printed literature are in any other language, these shall be accompanied by an appropriate translation in English and in that case, for the purpose of interpretation, the English translation shall govern.
 - b) **Governing Law & its Jurisdiction:**
The Contract shall be governed by and interpreted in accordance with laws of Union of India and the Courts of New Delhi shall have exclusive jurisdiction in all matters arising under this Contract.
- ii **Documents Mutually Explanatory**

Several documents forming the Contract are to be taken as mutually explanatory of one another, but in case of ambiguities or discrepancies, the documents shall

take precedence in the order in which they are set out in the proforma of Contract Agreement (attached in Sample Forms & Procedures, Section-IX, Vol-I).

CLAUSE-6: DRAWINGS:

- i) After the award of Contract, the supplier & purchaser will hold design co-ordination meetings to finalize steps to be taken to implement the Contract including procedure for submission of drawings, design details & approval thereof in such a manner & procedures which would bring out workable solution to step by step process. At least seven print copies of all the drawings for any part of the Work and seven copies of complete design calculations shall be submitted by the Contractor for approval, at least ninety days prior to the date on which such drawings are required to ensure that the work is carried out in accordance with the approved program Work. The Engineer-in-charge shall accord and convey the approval to the design calculation and drawings, if found in order, within 30(thirty) days from the receipt of the drawings from the Contractor. Otherwise he shall apprise the Contractor of his comments on such design calculations and drawings within the above mentioned period.
- ii) Where such comments are communicated to the Contractor, the Contractor shall be bound to ensure that 7 print copies of all the revised drawings and 7 copies of revised design calculations, in view of these comments, are submitted to the **Additional Chief Executive Officer, RECTPCL, New Delhi**. (Engineer-in-charge) within fifteen days of receipt of these comments. Similar course of action, as aforesaid, shall be taken by the **Additional Chief Executive Officer, RECTPCL, New Delhi** on the revised designs calculation and drawings. On receipt of approval of drawings/design processes/design calculation etc. The Contractor shall furnish seven print copies (Five copies of A1 or higher size and 2 copies of A3 size) and two (2) nos. paper type reproducible copies of approved drawings and ten copies of approved design calculation to **Additional Chief Executive Officer, RECTPCL, New Delhi** within 30 days of such approval. In addition, 2 sets of CDs of computer/AutoCAD drawings of such approved drawings shall also be supplied.
- iii) Notwithstanding the approval of the **Additional Chief Executive Officer, RECTPCL, New Delhi** to the Contractor's design and drawings, the Contractor shall be responsible for the stability of Works in accordance with the provisions of the Contract and the approval accorded shall not absolve him of his responsibility for meeting all requirements of specifications.
- iv) One copy of the approved drawings shall be kept by the Contractor on the site and the same shall, at all reasonable times, be available for inspection and use by the Engineer-in-Charge and the Engineer-in-Charge's Representative and by any other person authorized by the Engineer-in-Charge.
- v) **Additional Chief Executive Officer, RECTPCL, New Delhi** shall, however, have full power and authority to modify, from time to time, during the progress of Works, the drawings approved previously in consultation with the contractor, as shall be necessary for the purpose of proper and adequate execution and completion of Works. The Contractor, shall carry out and be bound by such modification.
- vi) Final Drawings

After completion of the erection work the Contractor shall furnish 5 copies (3 copies of A1 or higher size and 2 copies of A3 size duly bound in folder) and one copy on reproducible tracing cloth or velograph of final as built drawings of work. For computer/AutoCAD drawn drawings, two sets of CDs containing such drawings shall be supplied. Each set shall include an index showing the drawing number, Revision No. & titles.

vii) Record Drawings

Prior to shipment of the equipment, the Contractor shall furnish to Purchaser one complete set of full size permanent reproducible cloth or film copies of approved quality and type and one full size set of prints of all supplier's drawings of structures, foundations, material etc. as finally built, including any suggested modification. In addition, five (5) bound sets of half-size prints of all Contractor's drawings shall be furnished. Each set shall include an index showing the drawing numbers and titles and shall be bound for permanent reference.

viii) Instructions/ Procedures for Storage & Preservation, Installation/Erection, Testing & Commissioning at Site and Operation & Maintenance of Goods.

The Contractor shall submit 7 sets of written detailed Instructions/Procedures in English language, for Storage & Preservation, Installation/Erection, Testing & Commissioning at site and Operation and Maintenance manual for each component of Transmission Line. The instructions/procedures shall be submitted as early as possible so that final reviewed copies can be made available to the field for use in planning the work well in advance of actual installation and operation. After review, seven (7) durable bound copies of the final instructions shall be furnished. Each of these copies shall have a presentation similar to a hard-bound book resistant to wear and tear and firmly holding each of the pages. A book shall contain a maximum of approximately 240 pages to offer easy handling; if the material requires more space, the manual shall be divided into two (2) or more volumes. Each volume shall have its title, printed on the front of the binding and on the back of the book. The paper used, the reproduction technique, the binding, and the presentation shall be of an approved quality and type. 2 sets of CDs containing final Instructions/Procedures shall also be furnished.

ix) The RECTPCL specification drawings, specifications and other information to the Contractor shall remain the property of the RECTPCL. They shall not, without the consent of the RECTPCL, be used, copied or communicated to a third party by the Contractor unless necessary for the purposes of this Contract.

x) The Contractor shall be responsible for any errors or omissions in the Contractor's drawings unless they are due to incorrect RECTPCL specification drawings or other written information supplied by the RECTPCL. Errors, if any, noticed by the Contractor in the RECTPCL drawings, specification and other information shall, however, be promptly pointed out by the Contractor to the RECTPCL. Approval by the Additional Chief Executive Officer, RECTPCL, New Delhi of the Contractor's drawings shall not relieve the Contractor from any responsibility under this Sub-Clause.

xi) The Contractor shall bear all costs which he may incur as a result of delay in providing drawings and other information or as a result of errors or omissions therein, for which he is responsible.

- xii) The Contractor shall, at his own cost, carry out any alterations or remedial work necessitated by such errors or omissions for which he is responsible and modify the drawings and such other information accordingly.

CLAUSE-7: CONTRACTOR'S GENERAL RESPONSIBILITIES:

(i) Contractor to carry out Work with care and diligence.

The Contractor shall, in accordance with the Contract and with due care and diligence, design, manufacture, assemble, test at manufacturer's Works before dispatch, transport to site, store and preserve, assemble and erect, test and commission the Goods and carry out the Works within the Time for Completion. The Contractor shall also provide all necessary plant, equipment and machinery, superintendence, labor and all necessary facilities required for completion of works thereof.

(ii) Contractor Responsible for Stability and Safety of Site Operations.

The Contractor shall take full responsibility for the adequacy, stability and safety of all site operations and methods of execution, notwithstanding any approval by the Engineer-in-Charge. The Contractor shall provide, at his cost sufficient illumination, firefighting equipment in and around the place of work to the satisfaction of Engineer-in-Charge. Further, Contractor shall follow the safety precautions as covered in Section-7 of this Document.

(iii) Instructions and Orders in Site Order Book.

All instructions and orders given by the Engineer-in-Charge or his Representative at site are to be maintained in the Site Order Book and shall be taken to have been conveyed to the Contractor for his compliance.

(iv) Contractor's Site Office.

The Contractor must have a site office to receive normal correspondence between 10 AM and 5 PM on working days and urgent correspondence at any time on all days.

(v) Shift Works

To achieve the required progress, the Work, may be required to be carried out round the clock. The time for completion and number of working days shall not be affected by the number of shifts each day. No extra amount on account of any shift work is payable to the Contractor.

Whenever the work is carried out in shifts, notice to this effect shall be given by the Contractor to the Engineer-in-Charge regarding the details of Works he intends to carry out in shifts so that necessary supervision arrangements can be made.

(vi) Contractor to keep Site Clean

- a) During the progress of the Works, the Contractor shall keep the site reasonably free from all unnecessary obstructions and shall remove from site any of his plant, equipment and machinery, surplus material or temporary works, no longer required. The Contractor

shall also keep the site clean, tidy and orderly at all times and remove from site any wreckage, rubbish, scrap, packing material etc. promptly.

- b) In case the Contractor does not keep the area clean and if found necessary to get the area cleaned, the Engineer-in-Charge shall issue a notice of forty-eight hours to the Contractor. In the event of non-compliance by the Contractor, the Engineer-in-charge shall get the area cleaned by some other agency. The cost of such cleaning shall be borne by the Contractor. In case of rubbish, accumulating due to deposition by more than one Contractor, the share of charges to be borne by the Contractors as indicated by the Engineer-in-Charge shall be final.

(vii) Clearance of Site on Completion

On the completion of the Works, the contractor shall clear away and remove from the Site all his plant, equipment and machinery, surplus materials, rubbish and Temporary Works of every kind, and leave the whole of the Site and Works clean and in a workman like condition to the satisfaction of the Engineer-in-Charge

(viii) Giving of Notices, Payment of Fees and Compliance with Statutes and Regulations etc.

- a) Giving of Notices and Payment of Fees

The Contractor shall give all notices and pay all fees required to be given or paid under any National or State Statute, Ordinance, or other Law, or any regulation, or bye-law of any local or other duly constituted authority in relation to the execution of Works and by the rules and regulations of all public bodies and companies whose property or rights are affected or may be affected in any way by the Works.

- b) Compliance with Statutes, Regulations etc.

The Contractor shall conform, in all respects, with the provisions of any such Statute, Ordinance or Law as aforesaid and the regulation or bye-law of any local or other duly constituted authority which may be applicable to the Works and with such rules and regulations of public bodies and companies as aforesaid and shall keep the RECTPCL indemnified against all penalties and liability of every kind for breach of any such Statute, Ordinance or Law, regulation or bye-law.

- c) Statutory Obligations

If the cost to Contractor in the performance of the Contract shall be increased or reduced by reasons of the making, passing or promulgation of any law after 30 days prior to the latest date of submission of bids, any order, regulation or by-law having the force of the law, the amount of such an increase or reduction shall be added to or deducted from the Contract Price as the case may be.

(ix) Opportunities for Other Contractors

- (a) The Contractor shall, in accordance with the requirements of the Engineer-in-Charge, afford all reasonable opportunities for carrying out their Works to:
- any other Contractors employed by the RECTPCL, and workmen, and
 - the workmen of the RECTPCL, and
 - the workmen of any duly constituted authorities who may be employed in the execution on or near the Site of any work not included in the Contract or of any Contract which the RECTPCL may enter into in connection with or ancillary to the Works.

- (b) The Contractor shall jointly use with other Contractors and the RECTPCL, approach roads, access roads and adits, drainage and other facilities. The use of other Contractor's facilities shall be coordinated by the Engineer-in-Charge between the Contractors, if required, for execution of the Works connected with the project. (Cost, if any, on this account shall be settled between the Contractors concerned).

The use of common facilities shall be coordinated by the Engineer-in-Charge through meetings of various parties. In case of any conflict, the decision of the Engineer-in-Charge in the matter shall be binding on all the parties.

- (c) If any part of the Contractor's work depends, for proper execution or results, upon the work of any other Contractor, the Contractor shall inspect and promptly report in writing to the Engineer-in-Charge, any defects in such work that render it unsuitable for such proper execution and results. His failure to inspect and report shall constitute an acceptance of other Contractor's work as fit and proper for the reception of his own work, except as to defects, which may develop in the other Contractor's work after the proper execution of his own work.

(x) Patent Rights and Royalties.

- (a) The Contractor shall indemnify the RECTPCL from and against all claims and proceedings for or on account of infringement of any patent rights, designs, trademark or name or other protected rights in respect of any of his plant, equipment and machinery or materials used for or in connection with the Works or any of them and from and against all claims, proceedings, damages, costs, charges and expenses, whatsoever, in respect thereof or in relation thereto.

Except where otherwise specified, the Contractor shall pay all royalties, rent and other payments or compensation, if any, for getting any materials required for the Works.

- (b) In the event of any claims made under or action brought against RECTPCL in respect of any such matters, as aforesaid, the Contractor shall be immediately, notified thereof and the Contractor shall be at liberty, at his own expense, to settle any disputes or to conduct any litigation that may arise there from, provided that the Contractor

shall not be liable to indemnify the RECTPCL if the infringement of the patent or design or any alleged patent or design right is the direct result of an order passed by the Engineer-in-Charge in this behalf.

(xi) Packing

- a) The Contractor shall provide such packing of the Goods as is required to prevent their damage or deterioration during transit to the final destination as indicated in the Contract. The packing shall be sufficient to withstand, without limitation, rough handling during transit and exposure to extreme temperatures, humid and salt laden climate (where applicable) and precipitation during transit and open storage. Packing case size and weights shall take into consideration, the remoteness of the Goods' final destination, the existing road condition and the absence of heavy handling facilities at all points in transit.

- b) **Project storage site**

The Contractor shall submit instructions for packing, handling, marking, storage code and documentation within and outside the package for approval by the Engineer-in-Charge. The packing, handling, marking, storage code and documentation within and outside the package shall comply strictly with such instructions. These instructions can be modified/changed at any time during the execution of works by the Engineer-in-Charge and Contractor shall comply with such instructions.

(xii) Delivery and Documents

- a) Delivery of the Goods shall be made by the Contractor in accordance with the terms specified in the Contract. The Contractor shall warrant that the goods supplied under the Contract are new, unused, of most recent or current models and incorporate all recent improvements in design and materials unless provided otherwise in the Contract. The Contractor further warrants that the goods supplied under this Contract shall have no defect arising from design, materials workmanship, installation or erection or from any act of omission of the supplier that may develop under normal use of supplied goods in conditions available at site.
- b) The Contractor shall carryout all the required tests at his works as per approved Quality Assurance Plan. No material/goods shall be dispatched unless required shop tests have been performed and Material Dispatch Clearance Certificate (MDCC) has been issued by the Engineer-in-Charge after witnessing the tests.
- c) The Contractor shall request the Engineer-in-Charge for issue of MDCC as under:
 - i) In case tests at works are not to be witnessed by RECTPCL, Contractor shall carryout these tests through reputed and recognized test houses of India and submit the test certificates to Engineer-in-Charge along with request for issue of MDCC for that component.

- ii) In case test at works are to be witnessed by RECTPCL, Contractor shall submit test certificates to the Engineer-in-Charge after such inspection along with a request for issue of MDCC for that component.
- iii) MDCC shall be issued within 15 (fifteen) days after the approval of test certificates.

The Contractor shall be responsible for arranging Import License and Customs clearance (wherever required). The RECTPCL will assist the Contractor where required, in arranging Import License and Import Duty exemption certificate and obtaining clearance through the Customs. Any assistance that the RECTPCL can give to the Contractor shall be provided on a "no responsibility basis".

(xiii) Communication and Transport

Jammu Tawi is the largest railway station in Jammu and Kashmir state. It is a major railhead for other places in the state and for tourists heading towards the Kashmir Valley. Jammu-Baramulla line project starts northwards from here. Administratively, it is in the Firozpur division of Northern Railways.

Jammu Tawi is well connected to major Indian cities by Indian railways trains.

With the commencement of the Jammu-Baramulla line, all trains to the Kashmir Valley will pass through Jammu Tawi. A part of the Jammu-Baramulla project has been executed and the track has been extended to Katra. Jalandhar - Pathankot - Jammu Tawi section has been doubled and electrified.

National Highway 1A which passes through Jammu connects it to the Kashmir valley. National Highway 1B connects Jammu with Poonch town. Jammu is just 80 kilometres (50 mi) from Kathua town, while it is 68 kilometres (42 mi) from Udhampur city. Katra is also 49 kilometres (30 mi) away.

Jammu Airport is in the middle of Jammu. It has direct flights to Srinagar, Delhi, Amritsar, Chandigarh, Leh and Mumbai and Bengaluru. Jammu Airport operate daily 30 arrival and departure flights which is Goair, Air India, Spicejet and Indigo running daily flights.

The city has JKSRTC city buses under and mini buses for local transport which run on some defined routes. These mini buses are called "Matadors". Besides this auto-rickshaw and cycle-rickshaw service is also available. Local taxis are also available.

Bidder may visit the site prior to bidding and make sure about Transportation of Material to site.

(xiv) Transportation and Storage/Preservation

- (a) The Contractor is required under the Contract to undertake transportation of goods from Ex-works to Project Site including clearing, forwarding and handling, storage and preservation at site, intermediate location (if any) and further transportation to work site, including handling wherever required. All necessary transportation equipment including lifting and handling equipment shall be provided and/or hired by the Contractor at his own cost.

- (b) Where the Contractor is required to effect delivery under any other terms, for example, by post or to another address, the Contractor shall be required to meet all the expenses until delivery on the site.

(xv) Spares

- (a) The Contractor shall carry sufficient inventories to assure ex-stock supply of spares and same shall be supplied as promptly as possible but in any case within six months of placement of order.
- (b) It shall be mandatory for the Contractor to specify the unit rates and prices for the spares as specified in the Schedule of Prices. The RECTPCL, however, reserve the right, during the execution of Contract, to vary the quantity of spares specified in the Schedule of Prices.

(xvi) Quality Assurance

In order to ensure that the Goods to be supplied under this Contract and the civil works to be executed meet the specification requirements, the Contractor shall prepare a comprehensive quality assurance plan and submit the same within 30 days after commencement date of the Contract to the Engineer-in-charge (**Additional Chief Executive Officer, RECTPCL, New Delhi**) for approval. Any national or International quality assurance certificates such as IS: 14000 series/ISO 9000 series obtained by the Contractor along with its validity period shall be stated.

CLAUSE-8: CONTRACT AGREEMENT:

The Contractor shall, when called upon to do so, enter into and execute a Contract Agreement in the Proforma (attached in Section-IX, VOL-I) of Bidding Document, with such modification as may be necessary.

CLAUSE-9: PERFORMANCE SECURITY:

- (i) For the due performance of the Contract, the Contractor shall, within 15 (fifteen) days of receipt of notification of award but not later than the date of signing of the Contract Agreement, furnish to the RECTPCL, a performance security for an amount equivalent to 10 (ten) percent of the Contract Price. The cost of complying with the requirements of this Clause shall be borne by the Contractor, unless the Contract otherwise provides.
- (ii) The performance security shall be in the form of an irrevocable Bank Guarantee on the Proforma (attached in Section-IX, VOL-I). The Bank Guarantee shall be in favour of the Accounts Officer with **Additional Chief Executive Officer, RECTPCL, New Delhi**, issued by any Nationalized /Scheduled Indian Bank.
- (iii) The proceeds of the performance security shall be payable to RECTPCL as compensation for any loss, resulting from Contractor's failure to complete his obligation under the Contract.
- (iv) The performance security shall be valid until 30 days after the date of issue of Defects Liability Certificate. No claim shall be made against the performance security after the issue of the Defects Liability Certificate and the performance

security will be discharged and returned to the Contractor thirty days after the Defects Liability Period.

- (v) If the completion of last Defects Liability Period is extended due to the delays attributable to the Contractor, he shall, at his own cost, get the validity period of Bank Guarantee extended. The Contractor shall furnish the extended revised Bank Guarantee one month before the expiry date of the Original Bank Guarantee or any extension thereof. In case the extended/revised Bank Guarantee is not received by RECTPCL within the specified period, the RECTPCL, entirely at its discretion, shall be at liberty to encash the aforesaid Bank Guarantee.

CLAUSE 10: INSPECTION OF SITE:

- (i) The Contractor shall be deemed to have inspected and examined the Site and its surroundings and information available in connection therewith and to have satisfied himself, as to
 - (a) the form and nature thereof
 - (b) the hydrological and climatic conditions
 - (c) the extent and nature of work, materials and water for construction necessary for the execution and completion of the Works and remedying of any defects therein, and
 - (d) the means of access to the Site and the accommodation he may require and, in general, shall be deemed to have obtained all necessary information as to risks, contingencies and all other circumstances.
- (ii) The Contractor shall be responsible for the interpretation of any data supplied by the RECTPCL.

CLAUSE-11: SUFFICIENCY OF BID:

The Contractor shall be deemed to have satisfied himself as to the correctness of the rates and prices stated in the Schedule of Prices, all of which shall, except in so far as it is otherwise provided in the Contract, cover all his obligations under the Contract and all matters and things necessary for the proper execution and completion of the Works and remedying of any defects therein.

CLAUSE-12: WORK TO BE IN ACCORDANCE WITH THE CONTRACT:

The Contractor shall execute and complete the Works and remedy any defects therein in strict accordance with the Contract to the satisfaction of the Engineer-in-Charge and shall comply with and adhere strictly to the Engineer-in-Charge's instructions and directions on any matter whether mentioned in the Contract or not, touching or concerning the Works. The Contractor shall take instructions and directions only from the Engineer-in-Charge, or, subject to the limitations referred to in Clause-2 hereof, from the Engineer-in-charge's Representative.

CLAUSE-13: PROGRAMME TO BE FURNISHED:

- (i) The Contractor shall within 30 days after the Commencement Date, submit to the Engineer-in-Charge, for his approval a detailed work programme in Primavera along with 2 sets of CDs of same indicating the following:
- (a) The order in which the Contractor proposes to carry-out the Works (including design, manufacture, supply, erection, testing and commissioning) so as to complete the works within specified time schedule.
 - (b) The times when submission and approval of the Contractor's drawings are required (time frame for this shall conform to that set out under Clause-6 hereof).
 - (c) The times by which the Contractor requires the RECTPCL
 - to furnish data/specification drawings, if any
 - to have completed any other associated Works

The approval by the Engineer-in-charge of the programme shall not relieve the Contractor from any of his obligations under the Contract.

- (ii) The programme shall cover activities on the site and procurement and delivery activities and no material alteration to such programme shall be made without prior approval of Additional Chief Executive Officer, RECTPCL, New Delhi
- (iii) The programme shall be in the form of a network diagram which shall show in detail and in orderly sequence all activities, their descriptions, duration, and dependencies or precedencies, necessary to the completion of the Works.
- (iv) The Contractor shall base his programme on the completion times and periods and other relevant Contract requirements and shall co-ordinate his programme with information given to him by the Engineer-in-Charge concerning the project programme and programme of other Contractors to be engaged on the site to the extent that this can be done within the framework of the periods and information available at the time.
- (v) The Contractor shall, supply to the Engineer-in-Charge, at such times as he may direct during the progress of the Works, such written particulars, photographs and information as are reasonably required by the Engineer-in Charge to enable a progress record to be maintained in respect of the Works.
- (vi) The Contractor shall also submit a narrative report periodically with updated analysis which shall include but not be limited to the description of the problem areas, current and anticipated, delaying factors and their impact and an explanation of the corrective actions taken or proposed.

CLAUSE-14: CONTRACTOR'S SUPERINTENDENCE:

The Contractor shall provide all necessary superintendence during the execution of the Works and as long thereafter as the Engineer-in-Charge may consider necessary for the proper fulfilling of the Contractor's obligations under the Contract. The Contractor, or a competent and authorized representative approved of in writing by the Engineer-in-Charge, which approval may at any time be withdrawn, shall give his whole time to the superintendence of the

Works. Such authorized representative shall receive on behalf of the Contractor, instructions from the Engineer-in-Charge or subject to the provisions of Clause-2 hereof the Engineer-in-Charge's Representative. If approval of the representative is withdrawn by the Engineer-in-Charge, the Contractor shall, as soon as is practicable, having regard to the requirement of replacing him as herein after mentioned, after receiving notice of such withdrawal, remove the representative from the Works and shall not thereafter employ him again on the Works in any capacity and shall replace him by another representative approved by the Engineer-in-Charge.

CLAUSE-15: CONTRACTOR'S EMPLOYEES:

- (i) The Contractor shall provide on the Site in connection with the execution and the completion of the Works and the remedying of any defects therein;
 - (a) only such technical assistants as are skilled and experienced in their respective trades and such foremen and leading hands as are competent to give proper superintendence of the Works; and
 - (b) such skilled, semi-skilled and unskilled labour as is necessary for the proper and timely fulfilling of the Contractor's obligations under the Contract.
- (ii) The Engineer-in-Charge shall be at liberty to object to and require the Contractor to remove forthwith from the Works any person provided by the Contractor who in the opinion of the Engineer-in-Charge, misconducts himself, or is incompetent or negligent in the proper performance of his duties, or whose presence on the site is otherwise considered by the Engineer-in-Charge to be undesirable and such persons shall not be again allowed upon the Works without the written consent of the Engineer-in-Charge. Any person so removed from the Works shall be replaced as soon as possible by a competent substitute approved by the Engineer-in-Charge.

CLAUSE-16: EXTRAORDINARY TRAFFIC:

Protection of Highways and Bridges

The Contractor shall use every reasonable means to prevent any of the highways or bridges communicating with or on the routes to the site from being damaged by any traffic of the Contractor or any of his subcontractors and, in particular, shall select routes, choose and use vehicles and restrict and distribute loads so that any such extraordinary traffic, as will inevitably arise from the moving of Goods or his plant, equipment and machinery and materials from and to the site, shall be limited, as far as reasonably possible, and so that no unnecessary damage may be occasioned to such highways and bridges. In case, however, highways and bridges are damaged on account of movement of any traffic of the Contractor, he shall be liable to restore the highways and bridges to their original condition at his expense.

CLAUSE-17: SAFETY, SECURITY AND PROTECTION OF THE ENVIRONMENT:

The Contractor shall, throughout the execution and completion of the Works and the remedying of any defects therein;

- (i) have all the regard for the safety of all persons entitled to be on the site and keep the site (so far as the same is under his control) and the Works (so far as the same are not completed or taken over by the RECTPCL) in an orderly state appropriate to the avoidance of danger to such persons, and
- (ii) provide and maintain, at his own cost all lights, guards, fencing, warning signs and watching, when and where necessary or required by the Engineer-in-Charge or his representative or by any duly constituted authority, for the protection of the machines, equipment, Works or for the safety and convenience of the public or others, and
- (iii) take all reasonable steps to protect the environment on and off the site and to avoid damage or nuisance to persons or to property of the public or others resulting from pollution, noise or other causes arising as a consequence of his methods of operation, and shall preserve and protect all existing vegetation such as trees on or adjacent to the site which do not unreasonably interfere with the execution of the Works. The Contractor shall be held responsible for all unauthorized cutting of and damage to trees, by careless operation of his plant, equipment and machinery and stockpiling of materials etc. and the RECTPCL shall have no responsibility on this account.

CLAUSE-18: OBLIGATIONS OF THE RECTPCL:

Access to and Possession of the Site

The RECTPCL shall, in reasonable time grant the Contractor access to and possession of the site, which may, however, not be exclusive to the Contractor.

CLAUSE-19: LABOUR:

(i) Engagement of Labour

The Contractor shall make his own arrangements for the engagement of all labour, local or otherwise, for the transport, housing, food, medical care etc. at his own expenses. The contractor shall not employ in connection with the Works any person who has not completed 18 years of age. No female labour shall be employed in the night shift. The Contractor shall not recruit or attempt to recruit his staff and labour from amongst persons in the service of RECTPCL.

The labour force, technical, administrative and other personnel engaged by the Contractor shall be confined to the nationals of India.

(ii) Supply of Water

The Contractor shall, so far as is reasonably practicable, provide on the site, to the satisfaction of the Engineer-in-charge or Engineer-in-Charge's Representative, an adequate supply of drinking and other water for the use of his staff and workmen.

The contractor shall arrange, at his cost, water for construction purposes at site.

(iii) Alcohol Liquor or Drugs

The Contractor shall not, otherwise than in accordance with the Statutes, Ordinances and Govt. Regulations or Orders for the time being in force, import, sell, give, barter or otherwise dispose of any alcoholic liquor or drugs, or permit or suffer any such importation, sale, gift, barter or disposal by his subcontractors, agents or staff or labour.

(iv) Epidemics

In the event of any outbreak of illness of an epidemic nature, the Contractor shall comply with and carry out such regulation, orders and requirements as may be made by the Government, or the local medical or sanitary authorities for the purpose of dealing with and overcoming the same.

(v) Disorderly Conduct etc.

The Contractor shall, at all times, take all reasonable precautions to prevent any unlawful, riotous or disorderly conduct by or amongst his staff and labour and for the preservation of peace and protection, of persons and property in the neighborhood of the Works.

(vi) Contractor to follow Labour Laws

The Contractor shall, in respect of labour employed by him, comply with the provision of the various Labour Laws, Minimum Wages Act as per Rules and Regulation as applicable and shall indemnify the RECTPCL in respect of all claims that may be made against the RECTPCL for non-compliance thereof by the Contractor. In case of noncompliance by the contractor, the Engineer-in-Charge may take such actions as may be necessary for compliance of the various Labour Laws and recover the costs thereof from the Contractor.

(vii) Housing for Labour

So far as the Contract otherwise provides, the Contractor shall provide and maintain such accommodation and amenities as he may consider necessary for all his staff and labour, employed for the purpose of or in connection with the Contract, including all fencing, water supply (both for drinking and other purposes), electricity supply, sanitation, cook houses, fire prevention and firefighting equipment, and other requirements in connection with such accommodation or amenities. On completion of the Contract, unless otherwise agreed with the RECTPCL, the temporary camps/housing provided by the Contractor shall be removed and the Site reinstated to its original condition, to the satisfaction of the Engineer-in-Charge.

(viii) Accident Prevention Officer

The Contractor shall have on his staff on Site an officer dealing only with questions regarding the safety and protection against accidents of all staff and labour. This officer shall be qualified for this work and shall have the authority to issue instructions and shall take protective measures to prevent accidents.

(ix) Health and Safety

Due precautions shall be taken by the Contractor, and at his own cost, to ensure the safety of his staff and labour and, in collaboration with and to the requirements of the local health authorities, to ensure that medical staff, first aid

equipment and stores, sick bay and suitable ambulance service are available at the camps, housing and on the Site at all times throughout the period of the Contract and that suitable arrangements are made for the prevention of epidemics and for all necessary welfare and hygiene requirements.

(x) Observance by Sub-Contractors

The Contractor shall be responsible for observance by his sub-contractors of the aforesaid provisions.

CLAUSE-20: RETURNS OF LABOUR:

The Contractor shall, deliver to the Engineer-in-Charge or Engineer-in-Charge's Representative or at his office, a return in detail in such form and at such intervals as the Engineer-in-Charge may prescribe showing the supervisory staff and the number of the several classes of labour from time to time employed by the Contractor on the site and such information in respect of the Contractor's plant, equipment and machinery as the Engineer-in-Charge may require.

CLAUSE-21: WORKMANSHIP AND MATERIALS:

(i) Manner of execution

The goods to be supplied shall be manufactured and all Works to be done shall be executed in the manner set out in the Contract.

Where the manner of manufacture and execution is not set out in the Contract, the Work shall be executed in a proper and workman like manner in accordance with recognised good practice and relevant standards.

(ii) Covering up work

The Contractor shall give the Engineer-in-Charge full opportunity to examine, measure and test any work on site which is about to be covered up or put out of view.

The Contractor shall give due notice to the Engineer-in-Charge whenever such work is ready for examination, measurement or testing.

The Engineer-in-Charge shall then, unless otherwise, notifies the Contractor that he considers it unnecessary, without unreasonable delay carry out the examination, measurement or testing

(iii) Uncovering work

If so instructed by the Engineer-in-Charge, the Contractor shall expose any parts of the works. The Contractor shall reinstate and make good such works to the satisfaction of the Engineer-in-Charge.

CLAUSE-22: INSPECTION AND TESTING:

(i) Independent Inspection

The Engineer-in-Charge shall have the right to inspect and/or to test the goods to confirm their conformity to the Contract specifications at no extra cost to the Purchaser. The Technical Specifications shall specify the inspection and tests required by Engineer-in-Charge. The Engineer-in-Charge may, delegate inspection and testing of contracted equipment or a part thereof to an independent Inspector and such independent Inspector shall be considered as the Engineer-in-Charge's Representative. Notice of such appointment shall be given by the Engineer-in-Charge to the Contractor.

(ii) Inspection and Testing During Fabrication/Manufacture

Any departmental representative or independent inspector nominated by Engineer-in-charge shall be entitled during fabrication/manufacture to inspect, examine and test the materials and workmanship and check the progress of fabrication/manufacture of the Goods to be supplied under the Contract. This shall take place on the Contractor's premises. If the Goods are being fabricated/manufactured on other premises, the Contractor shall obtain permission for the Engineer-in-charge to carry out such inspection, examination and testing on those premises.

The contractor shall certify that his persons conducting the tests are qualified specialist on the subject matter of relevant tests.

No such inspection, examination or testing shall release the Contractor from any obligation under the Contract.

(iii) Dates for Inspection and Testing

The Contractor shall give at least 15 days' notice to the Additional Chief Executive Officer, RECTPCL, New Delhi regarding his intention to carry out the tests. The Contractor shall agree with the Additional Chief Executive Officer, RECTPCL, New Delhi about the time and place for the testing of the Goods as provided in the Contract. The inspector nominated by Additional Chief Executive Officer, RECTPCL, New Delhi shall give the Contractor at least 24 hours' notice of his intention to attend the tests.

(iv) Facilities for Testing

Where the Contract provides for tests on the premises of the Contractor or of any sub-contractor, the Contractor shall provide such assistance, documents, labour, materials, electricity, fuel, apparatus and instruments as may be necessary to carry out the tests efficiently.

(v) Certificate of Testing

When the Goods have passed the tests referred to in this Contract, the Additional Chief Executive Officer, RECTPCL, New Delhi shall furnish to the Contractor a certificate within 15 days.

(vi) Rejection

If, as a result of the inspection, examination or testing, the Engineer-in-Charge decides that any work is defective or otherwise not in accordance with the Contract, he may reject such work and shall notify the Contractor thereof

immediately. The notice shall state the Engineer-in-Charge's objections with reasons.

The Contractor shall then, with all speed, make good the defect or ensure that any rejected work complies with the Contract.

If the Engineer-in-Charge requires such Works to be re-tested, the tests shall be repeated under the same terms and conditions. All costs incurred for the repetition of the tests shall be borne by the Contractor.

CLAUSE-23: SUSPENSION OF WORKS, TRANSPORTATION OR ERECTION:

(i) Order to Suspend

The Engineer-in-Charge or his representative may, at any time instruct the Contractor to:

- (a) Suspend progress of the Works, or
- (b) Suspend transportation of the Goods, if fabricated/ manufactured at a place other than on the site, which are ready for transportation to the site at the time specified in the programme, or if no time is specified, at the time appropriate for it to be transported, or
- (c) Suspend the erection of the Goods which have been delivered to the site

The Contractor shall, during suspension, protect and secure the Works or Goods affected at the Contractor's Works or elsewhere or on the site, as the case may be, against any deterioration, loss or damage.

(ii) Cost of Suspension

The additional cost, if any, incurred by the Contractor in protecting, securing and insuring the Works or the Goods in following the Engineer-in-Charge or his representative's instructions under Sub-clause (i) of this Clause and in resumption of the Work, shall be added to the Contract Price.

The Contractor shall not be entitled to be paid any additional costs if such suspension is necessary by reason of some default on the part of Contractor.

The Contractor shall not be entitled to additional costs unless he notifies the Engineer-in-Charge or his representative of his intention to make such claim, within 30 days after receipt of the order to suspend progress or transportation or erection.

(iii) Suspension Lasting more than 90 days

If suspension under Sub-Clause (i) of this clause has continued for more than 90 days, and the suspension is not due to Contractor's default, the Contractor may, by written notice to the Engineer-in-Charge, request for permission within 30 days after the expiry of the above period to proceed with the Works.

If permission is not granted within that time, the Contractor may treat the suspension as an omission under Clause-32 hereof, of the section it affects or if

the suspension affects the whole of the Works, as an abandonment of the Contract by the RECTPCL.

CLAUSE-24: TIME FOR COMPLETION, EFFECTIVE DATE AND COMMENCEMENT DATE:

The Contract shall become effective on the date of issuance of LoA from RECTPCL to the successful bidder. The effective date shall be considered as commencement date.

The time for completion shall be reckoned from Commencement Date i.e. the date of issuance of LoA from RECTPCL to the successful bidder. The work i.e **“Design, Engineering, Supply & Construction of Residential Staff Quarters & associated facilities at 160 MVA, 220/33 kV Gas Insulated Substation (GIS) at Lassipora(Srinagar Region) on Turnkey Basis associated with Strengthening of Transmission System of JKPTCL under PMDP Scheme-15”**. on Turnkey basis is to be completed within **06 months** of date of Award of Contract. The bidder shall submit a bar chart along with the bid giving schedule for completion of entire works covering supply as well as services indicating commencement and completion of each activity and foundation work considering zero date as the date of signing of Contract Agreement between RECTPCL & successful bidder.

The Works shall be completed and shall have passed the tests as per the prevalent Regulations/Act on completion within the time indicated above.

CLAUSE-25: EXTENSION OF TIME FOR COMPLETION:

The Contractor may claim an extension of the Time for Completion, if the completion of the Works is delayed by any of the following causes:

- (i) Extra or additional work ordered in writing under Clause-32 hereof.
- (ii) Delay by any other Contractor engaged by the RECTPCL, which affects this contract materially.
- (iii) Any suspension of the works under Clause-23 hereof except when due to the Contractor's default.
- (iv) Any force majeure conditions.

The Contractor shall give to the Engineer-in-charge, notice of his intention to make a claim for an extension of time within 14 days of the circumstances for becoming known to the Contractor for such an extension. The notice shall be followed as soon as possible with full supporting details.

The Engineer-in-charge will evaluate such details and grant the Contractor from time to time, either prospectively or retrospectively; such extension of Time for Completion as may be justified provided always that, the circumstances leading to the extension of Time for completion are other than through a default of the Contractor. The Engineer-in-charge shall notify the Contractor accordingly.

CLAUSE-26: RATE OF PROGRESS:

If for any reason, which does not entitle the Contractor to an extension of Time for Completion, the rate of progress of the Works or any section at any time is not commensurate with the time for completion set out under clause 24 hereof and in the opinion of the Engineer-in-Charge does not ensure completion by the

prescribed Time or extended Time for Completion, the Engineer-in-Charge shall so notify the Contractor in writing and the Contractor shall thereupon take such steps as are necessary and the Engineer-in-Charge may approve to expedite progress so as to complete the Works or such section by the prescribed time or extended time. The Contractor shall not be entitled to any additional payment for taking such steps.

CLAUSE-27: LIQUIDATED DAMAGES FOR DELAY:

If the Contractor fails to complete the Work as specified in Clause 24 hereof, the purchaser shall, without prejudice to its other remedies under the Contract, deduct the amount from any monies in its hands, due or which may become due to the Contractor, as liquidated damages (which is a genuine pre-estimate agreed by the parties hereto of the loss or damage which the purchaser would have suffered on account of delay without giving any proof of the loss or damages) a sum equivalent to 1.0% of the Contract price plus GST payable thereon per week of delay or part thereof subject to a maximum of 10% of the Contract price plus GST payable thereon.

The payment or deduction of such damages shall not relieve the Contractor from his obligations to complete the works or from any of his obligations and liabilities under the Contract.

CLAUSE-28: PROLONGED DELAY:

If at any time it appears to the Engineer-in-Charge that the Contractor is unable to adhere to the prescribed time schedule and the delay is not due to a cause for which the RECTPCL or some other Contractor employed by it is responsible or if the aggregate of the liquidated damages levied in terms of the provisions under Clause-27 hereof has reached a maximum of ten percent of the Contract Price, then the RECTPCL may at its discretion, by further notice to the Contractor either:

- i) require the Contractor to complete, or
- ii) may itself complete at the Contractor's risk and cost, provided that it does so in a reasonable manner, or
- iii) terminate the Contract.

If the RECTPCL terminates the Contract, it shall be entitled to recover from the Contractor any loss it has suffered.

CLAUSE-29: TESTS ON COMPLETION:

(i) Notice of Tests

The Contractor shall give to the Engineer-in-Charge, fifteen days' notice of the date after which he will be ready to make the Tests on completion hereinafter called the Tests. Unless otherwise agreed, the Tests shall take place within fifteen days after the said date, on such day or days as the Engineer-in-Charge notifies the Contractor.

(ii) Time for Tests

If the Engineer-in-Charge fails to notify a time after having been asked to do so, or does not attend at the time and place notified, the Contractor shall be entitled

to proceed with the Test in his absence and such tests shall be deemed to have been carried out in the presence of Engineer-in-charge.

(iii) Delayed Tests

If the Tests are being unduly delayed by Contractor, the Engineer-in-Charge may, by a notice, require the Contractor to make the Tests within twenty-one days after the receipt of such notice. The Contractor shall make the Tests on such days within that period as the Contractor may fix and of which he shall give notice to the Engineer-in-charge.

If the Contractor fails to make the Tests within twenty-one days, the Engineer-in-Charge may himself proceed with the Tests. All Tests so made by the Engineer-in-Charge shall be at the risk and cost of the Contractor and the cost thereof shall be deducted from the Contract Price. The Tests shall then be deemed to have been made in the presence of the Contractor and the results of the Tests shall be accepted as accurate.

(iv) Facilities for Tests on Completion

Except where otherwise specified, the Contractor shall provide, at his cost, such labour, materials, electricity, fuel, apparatus, and other necessary equipment as may be required to carry out the Tests.

(v) Re-Testing

If the Works or any section fails to pass the Tests, the Engineer-in-Charge may require such Tests to be repeated on the same terms and conditions. The costs on account of repetition of the Tests under this Sub-Clause or under Sub-Clause-31 (vii) hereof shall be borne by the Contractor.

(vi) Disagreement as to Results of Tests

If the Engineer-in-Charge and the Contractor disagree on the interpretation of the Test results, each shall give a statement of his views to the other within fourteen days after such disagreement arises. The statement shall be accompanied by all relevant evidence. In case of such disagreement, the decision of Additional Chief Executive Officer, RECTPCL, New Delhi shall be final.

(vii) Consequences of Failure to Pass Tests on Completion

If the Works or any section fails to pass the Tests on the repetition thereof under Sub-Clause (v) of this Clause, the Engineer-in-Charge Shall be entitled to:

- (a) order one further repetition of the Tests under the conditions of Sub-Clause (v) of this Clause, or
- (b) reject the Works or section in which event the contractor shall replace that part of work or section without any cost to the purchaser within reasonable time without affecting the completion schedule. Testing on this part of work or section shall be performed in the presence of Engineer-in charge or his representative as per procedure specified above.

(viii) Test Certificate

As soon as the Works or any section thereof has passed the Tests, a joint protocol shall be signed based upon which the Engineer-in-Charge shall issue a Certificate to the Contractor to that effect within seven days of signing the protocol and submission of all relevant documents.

CLAUSE-30: TAKING OVER:

(i) Taking over

The Works shall be taken over by the RECTPCL when they have been completed in accordance with the Contract and duly inspected & cleared for energisation by **Electrical Inspection Agency of the employer/Owner**, except in minor respects that do not affect the use of the Works for their intended purpose, have passed the Tests on Completion and a Taking Over Certificate has been issued in accordance with Sub-Clause (ii) of this Clause.

(ii) Taking Over Certificate

The Contractor may apply to the Engineer-in-Charge for issue of a Taking Over Certificate not earlier than fourteen days before he proposes to carry out commissioning and acceptance tests on each equipment of the substation.

The Engineer-in-Charge shall, within thirty days after the receipt of the Contractor's application either:

- (a) Issue the Taking Over Certificate to the Contractor stating the date on which the Works were complete and ready for taking over, or
- (b) Reject the application giving his reasons and specifying the work required to be done by the Contractor to enable the Taking Over Certificate to be issued.

(iii) Use before Taking Over

The RECTPCL shall not use any part of the Works unless a Taking Over Certificate has been issued in respect thereof.

If nevertheless, the RECTPCL uses any part of the Works, that part which is used shall be deemed to have been taken over at the date of such use. The Engineer-in-Charge shall, on request of the Contractor, issue a Taking Over Certificate accordingly. If the RECTPCL uses any part of the Works before taking over, the Contractor shall be given the earliest opportunity of taking such steps as may be necessary to carry out the Test on Completion.

The Works shall not be deemed to have been taken over if they are not substantially in accordance with the Contract.

The provisions set out under Clauses-29 and 31 hereof shall apply as if the part had been taken over on the date it was taken into use.

(iv) Interference with Tests on Completion

If the Contractor is prevented from carrying out the tests on completion by a cause for which the Engineer-in-charge or other Contractors employed by the

RECTPCL are responsible, the RECTPCL shall be deemed to have taken over the Works on the date when the Tests on Completion would have been completed but for such prevention, the Engineer-in-Charge shall issue a Taking Over Certificate accordingly.

The Works shall not be deemed to have been taken over if they are not substantially in accordance with the Contract.

If the Works are taken over under this Clause, the Contractor shall, nevertheless, carry out the Tests on Completion during the Defects Liability Period. The Engineer-in-Charge shall require the Tests on Completion to be carried out by fourteen days' notice and in accordance with the relevant provisions of Clause-29 hereof.

CLAUSE -31: DEFECTS AFTER TAKING OVER:

(i) Defects Liability Period

- a) The expression "Defects Liability Period" shall mean a period of Twelve (12) months from the date the Works are taken over under Clause-30 (i) hereof and the Taking Over Certificate is issued in accordance with Clause-30 (ii) hereof.

Where any part of the Works is taken over separately, the Defects Liability Period for that part shall commence on the date it was taken over.

(ii) Notice of Defects

If any defect appears or damage occurs during the defect liability period, the Engineer-in-Charge shall forthwith notify the Contractor thereof. However, delay or failure of the Engineer-in-Charge in notifying shall not relieve the Contractor from his liability for remedying the defects at his own cost.

(iii) Making Good Defects

Upon the receipt of such notice the Contractor shall be responsible for making good any defect in or damage to any part of the Works which may appear or occur during the Defects Liability Period and which arises from either;

- (a) any defective materials, workmanship or design, or
- (b) any act or omission of the Contractor during the Defects Liability Period.

The Contractor shall make good the defect or damage as soon as practicable and at his own cost.

(iv) Extension of Defects Liability Period

The provisions of this Clause shall apply to all replacements or renewals carried out by the Contractor as if the replacement and renewals had been taken over on the date they were completed.

The Defects Liability Period for the Works shall be extended by a period equal to the period during which the Works cannot be used by reasons of a defect or damage. If only a part of the Works is affected, the Defect Liability Period shall be extended only for that part.

In neither case shall the Defects Liability Period be extended by more than twelve months.

(v) Failure to Remedy Defects

If the Contractor fails to remedy a defect or damage within a reasonable time, the Engineer-in-Charge may fix a final time for remedying the defect or damage.

- (a) If the Contractor fails to do so, the Engineer-in-Charge may carry out the work himself or by others at the Contractor's risk and cost. The costs actually incurred by the Engineer-in-Charge in remedying the defect or damage shall be recovered from any payments due or which may become due to the Contractor.

(vi) Removal of Defective Work

If the defect or damage is such that repairs cannot be expeditiously carried out on the site, the Contractor may, with the consent of the Engineer-in-Charge and after furnishing a proper security acceptable to the RECTPCL in case the item is paid for, remove from the site, for the purposes of repair, any part of the Works which is defective or damaged.

(vii) Further Tests on Completion

If the replacements or renewals are such that they may affect the performance of the Works, the Engineer-in-Charge may request that the Tests on Completion be repeated to the extent necessary. The request shall be made by notice **within thirty days** after the replacement of renewal. The Tests shall be carried out in accordance with Clause-29 hereof.

(viii) Right of Access

Until the Final Certificate of Payment has been issued, the Contractor shall have the right of access to all parts of the Works and to records of the working and performance of the Works.

Such right of access shall be during the RECTPCL normal working hours at the Contractor's risk and cost. Access shall also be granted to any duly authorised representative of the Contractor, whose name has been communicated in writing to the Engineer-in-Charge.

Subject to the Engineer-in-Charge's approval, the Contractor may also, at his own risk and cost, make any tests which he considers desirable.

(ix) Defects Liability Certificate

When the Defect, Liability Period for the Works or any part thereof has expired and the Contractor has fulfilled all his obligations under the Contract for defects in the Works or that part, the Engineer-in-Charge shall issue, within thirty days, to the Contractor, a Defects Liability Certificate to that effect.

No certificate other than the Defects Liability Certificate referred to herein above shall be deemed to constitute approval of the Works.

(x) Exclusive Remedies

The RECTPCL remedies under this Clause shall be in place of and to the exclusion of any other remedy in relation to defects whatsoever.

CLAUSE-32: VARIATIONS:

(i) The RECTPCL may make any variation in the form, quality or quantity of the Works or any part thereof or substitution for original specifications, design, drawings and instructions that may, in his opinion be necessary and for that purpose, or if for any other reason it shall, in his opinion be desirable, he shall have power to order the Contractor to do the following and the Contractor shall do the same;

- a) increase or decrease the quantity of any work included in the Contract,
- b) omit or substitute any such work,
- c) change the drawings, designs specifications, character or quality or kind of any such work,
- d) change the levels, lines, positions and dimensions of any part of the Works,
- e) execute additional work of any kind necessary for the completion of the Works,
- f) change any specified sequence, method or timing of construction of any part of the Works,
- g) change method of dispatch or packing, and
- h) change the place of delivery.

No such variations shall in any way vitiate or invalidate the Contract. Any altered, additional or substituted work which the Contractor may be directed to do in the manner above specified as part of the Work, shall be carried out by the Contractor on the same conditions in all respects on which he agreed to do the main Work.

The contractor may also at any time propose variations of the Works to the Engineer-in-Charge.

(ii) Procedure to order variation:

The Engineer-in-Charge shall notify the Contractor of the nature and form of the variation considered necessary. After having received such notice, the Contractor shall submit to the Engineer-in-Charge.

- a) a description of work, if any, to be performed and a programme for its execution, and
- b) the Contractor's proposal for any modifications to the programme, if considered necessary, according to Clause-25 hereof or to any of the Contractor's obligations under the Contract, and
- c) the Contractor's proposals for adjustment to the Contract Price.

Following the receipt of the Contractor's submission, the Engineer-in-Charge shall, decide as soon as possible whether or not the variation shall be carried out.

1. Changes Originating from Employer

- a. The pricing of any Change shall, as far as practicable, be calculated in accordance with the rates and prices included in the Contract. If such rates and prices are inequitable, the parties thereto shall agree on specific rates for the valuation of the Change.
- b. The Contract Price for (i) the items for which quantities have been indicated as lumpsum or lot or set and/or (ii) where the quantities are to be estimated by the Contractor shall remain constant unless there is change made in the Scope of Work by Employer. The quantities and unit prices (i) subsequently arrived while approving the Bill of Quantities (BOQ)/Billing breakup of lumpsum quantities/lot/Set and/or (ii) estimated by the Contractor shall be for on account payment purpose only. In case additional quantities, over and above the quantities in BOQ/billing breakup and /or estimated by the Contractor, are required for successful completion of the scope of work as per Technical Specification, the Contractor shall execute additional quantities of these items for which no additional payment shall be made over and above the lumpsum Contract Price. In case quantities of these items supplied at site are in excess of that required for successful completion of scope of work, such additional quantities shall be the property of the Contractor and they shall be allowed to take back the same from the site for which no deduction from the lumpsum Contract Price shall be made. Further, in case actual requirement of quantities for successful completion of scope of work is less than the quantities identified in the approved BOQ/billing breakup and/or estimated by the Contractor, the lumpsum contract price shall remain unchanged and no deduction shall be made from the lumpsum price due to such reduction of quantities.

It shall be the responsibility of the Contractor to pay all statutory taxes, duties and levies to the concerned authorities for such surplus material which would otherwise have been, lawfully payable in case of non-deemed export contracts. The Contractor shall submit an indemnity bond to keep Employer harmless from any liability, before release of such material to the Contractor by Employer.

Set/Lot/Lumpsum shall be governed as per the requirement of the corresponding item description read in conjunction with relevant provisions of Technical Specifications and the Billing breakup referred to above shall be issued by the Employer based on Contractor's

request, if and as may be required during the currency of the Contract.

- c. If rates and prices of any change are not available in the Contract, the parties thereto shall agree on specific rates for the valuation of the change and all matters therein related to the change. Based on the same, the Employer shall, if it intends to proceed with the Change, issue the Contractor with a Change Order.
- d. The Employer shall issue the Contractor with a Change Order by way of amendment to the Contract or in any other manner deemed appropriate. Even if the Employer and the Contractor cannot reach agreement on the price for the Change, an equitable adjustment to the Time for Completion, or any other matters related to the Change Proposal, the Employer may nevertheless instruct the Contractor to proceed with the Change by issue of a "Pending Agreement Change Order" ("Pending Agreement Amendment").

Upon receipt of a Pending Agreement Change Order, the Contractor shall immediately proceed with effecting the Changes covered by such Order. The parties shall thereafter attempt to reach agreement on the outstanding issues under the Change Proposal.

If the parties cannot reach agreement within sixty (60) days from the date of issue of the Pending Agreement Change Order, then the matter may be referred to the Arbitrator in accordance with the provisions of GCC Clause 48.

If the Engineer-in-Charge decides that the variation shall be carried out, he shall notify the Contractor to proceed with the variations. If the Engineer-in-Charge and the Contractor are unable to agree the adjustment of the Contract Price, the provisions of Sub-Clause (iii) of this Clause shall apply.

(iii) Disagreement on Adjustment of the Contract Price

If the Contractor and the Engineer-in-Charge are unable to agree on the adjustment of the Contract Price, the adjustment shall be determined in accordance with the rates specified in the Schedule of Prices.

No payment shall be made for the items of Work ordered to be omitted.

Varied items and additional items of Work which are not provided in the Schedule of Prices, shall be paid on the basis of actual expenditure relating to that item including cost of materials, fabrication/machinery handling and installation at site plus 25% (twenty-five percent) towards overheads including profits.

The price of varied items determined by the Engineer-in-Charge and approved by Additional Chief Executive Officer, RECTPCL, New Delhi shall be final and binding on the Contractor. No claim of the Contractor shall be entertained by RECTPCL in this regard.

(iv) Contractor to Proceed

On receipt of the notification to proceed with the variations, the Contractor shall forthwith proceed to carry out the variation and be bound to these conditions in doing so as if such variation was stated in the Contract.

The work shall not be delayed pending the granting of an extension of the time for completion or an adjustment to the Contract Price under Sub-Clause (iii) of this Clause and the Contractor shall execute the varied work at the same terms and conditions provided in the Contract.

(v) Records of costs

In any case where the Contractor is instructed to proceed with a variation prior to the determination of the adjustment to the Contract Price in respect thereof, the Contractor shall keep records of the cost of undertaking the variation and of time expended thereon. Such records shall be open to inspection by the Engineer-in-Charge at all reasonable times.

(vi) Variations in quantities:

Variations by the employer: The employer will have the right to vary the quantities by $\pm 20\%$. No compensation shall be applicable for reducing the quantity. The increased quantity executed shall be built on the same item rates as given in the price schedule. In case of unforeseen circumstances, the Employer reserves his right to delete any Activity Schedule or part thereof.

Variation during actual execution: There may be variation in the executed quantities as per the site conditions. Variation in actual number of quantity required may be more or less than given in price schedule such variations shall be billed by the contractor on the item rates given in the price schedule for the actually executed quantities.

CLAUSE-33: TERMS OF PAYMENT

- a. The Contract Price shall be paid as specified in the corresponding Appendix - 1 (Terms and Procedures of Payment) to the Contract Agreement. The procedures to be followed in making application for and processing payments shall be those outlined in the same Appendix.
- b. Except otherwise stated in Appendix-1 (Terms and Procedure of Payment) to the Contract Agreement, the payments under the Contract shall be made in the currency or currencies in which the Contract Price has been stated in Contract Agreement, subject to the general principle that payments will be made in the currency or currencies in which the Contract Price has been stated in the Contractor's bid.

33.1 Securities

33.1.1 Issuance of Securities

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

33.1.2 Advance Payment Security

33.1.2.1 The Contractor shall, within fifteen (15) days of the notification of contract award, provide a security in an amount equal to 110% (one hundred ten percent) of the advance payment calculated in accordance with the corresponding Appendix - 1 (Terms and Procedures of Payment) to the Contract Agreement, and in the same currency(ies) with initial validity of up to ninety (90) days beyond the date of Completion of the Facilities in accordance with GCC Clause 30. The same shall be extended by the Contractor time to time till ninety (90) days beyond the actual date of Completion of the Facilities, as may be required under the Contract.

33.1.2.2 The security shall be in the Form of unconditional Bank Guarantee attached hereto in Section IX - Sample Forms and Procedures. The security shall be discharged after completion of the facilities or relevant part thereof.

- Procedure for effective reduction in the Advance Payment Security

The Advance Payment Security shall be allowed to be reduced every six (06) months after First Running Account Bill/Stage payment under the Contract if the validity of the Bank Guarantee is more than one year. The cumulative amount of reduction at any point of time shall not exceed seventy five percent (75%) of the advance corresponding to cumulative value of the Facilities completed as per a certificate to be issued by the Project Manager. It should be clearly understood that reduction in the value of advance Bank Guarantee shall not in any way dilute the Contractor's responsibility and liabilities under the Contract including in respect of the Facilities for which reduction in the value of security is allowed.

CLAUSE-34: CLAIMS

i) Pursuant to the provisions under the Contract, the procedure for submitting claims by the Contractor shall be as under;

- a) the Contractor shall give to the Engineer-in-Charge a notice of his intention to make such claim within thirty days after such claim arises stating the reasons for his claim and
- b) as soon as reasonably practical after the date of such notice, submit to the Engineer-in-Charge full and detailed particulars of his claim, but not later than 90 days after such notice, unless otherwise agreed by the Engineer-in-Charge . The Contractor shall thereafter promptly submit such further particulars as the Engineer-in-Charge may require assessing the validity of the claim.

ii) **Assessment**

When the Engineer-in-Charge of project has received full and detailed particulars of the Contractor's claim in accordance with Sub-Clause (i) of this Clause and such further particulars as he may have required, he shall determine whether the Contractor is entitled to additional payment and notify him accordingly.

The Engineer-in-Charge project may reject any claim for additional payment which does not comply with the requirements of Sub-Clause (i) of this clause and the decision of the said Engineer-in-charge shall be final and binding on the Contractor.

CLAUSE-35: CURRENCIES FOR PAYMENTS:

The Payments shall be made in Indian Rupees.

CLAUSE-36: RISK AND RESPONSIBILITY:

i Allocation of Risks and Responsibility

The Risks of loss of or damage to physical property and of death and personal injury, which arise in consequence of the performance of the Contract shall be allocated between the RECTPCL and the Contractor as follows:

- (a) The RECTPCL: the RECTPCL Risks as specified in Sub-Clause (ii) below.
- (b) the contractor: The Contractor's Risks specified in Sub-Clause (iii) below.

ii RECTPCL's Risks

The RECTPCL's Risks are:

- (a) loss or damage due to the use or occupation of the Works or any part thereof by the RECTPCL; except as may be provided for in the Contract;
- (b) loss or damage to the extent that it is due to the design of any part of the Works by the RECTPCL or those for whom the RECTPCL is responsible.

iii Contractor's Risks:

The Contractor's Risks are all risks other than those identified as the RECTPCL's Risks.

CLAUSE-37: CARE OF THE WORKS AND PASSING OF RISK:

(i) Contractor's Responsibility for the Care of the Works.

The Contractor shall be responsible for the care of the Works or any section thereof from the Commencement Date until the Risk Transfer Date applicable thereto under Sub-Clause (ii) of this Clause.

The Contractor shall also be responsible for the care of any part of the Works upon which any outstanding work is being performed by the Contractor during the Defects Liability Period until completion of such outstanding work.

(ii) Risk Transfer Date

The Risk Transfer Date in relation to the Works or a section thereof is the earliest of either:

- (a) the date of issue of the Taking Over Certificate, or
- (b) the date when the Works are deemed to have been taken over in accordance with **Clause-30** hereof, or

- (c) the date of expiry of the notice of termination when the Contract is terminated by the RECTPCL in accordance with these Conditions.

(iii) Passing of Risk of Loss or of Damage to the Works

The risk of loss or of damage to the Works or any section thereof shall pass from the Contractor to the RECTPCL on the Risk Transfer Date applicable thereto.

(iv) Loss or Damage Before Risk Transfer Date

Loss of or damage to the Works or any section thereof occurring before the Risk Transfer Date shall:

- (a) to the extent caused by any of the Contractor's risks, be made good forthwith by the Contractor at his own cost, and
- (b) to the extent caused by any of the RECTPCL's Risks, be made good by the Contractor at the RECTPCL's expense if so required by the Engineer-in-Charge within thirty days of the occurrence of the loss or damage. The price for making good such loss and damage shall be in all circumstances reasonable and shall be agreed by the RECTPCL and the Contractor, or in the absence of agreement, the RECTPCL shall fix a reasonable price which shall be final and binding.

(v) Loss or Damage after Risk Transfer Date

After the Risk Transfer Date, the Contractor's liability in respect of loss of or damage to any part of the Works shall, except in the case of gross misconduct, be limited:

- (a) to the fulfillment of the Contractor's obligations under **Clause-31** hereof in respect of defects therein, and
- (b) to making good forthwith loss or damage caused by the Contractor during the Defects Liability Period.

CLAUSE-38: DAMAGE TO PROPERTY AND INJURY TO PERSONS:

(i) Contractor's Liability

Except as provided under Sub-Clause (iii) of this Clause, the Contractor shall be liable for and shall indemnify the RECTPCL against all losses, expenses and claims in respect of any loss of or damage to physical property, death or personal injury occurring before the issue of the last Defects Liability Certificate to the extent caused by;

- (a) defective design, material or workmanship of the Contractor.
- (b) negligence or breach of statutory duty of the Contractor, his sub-contractors or their respective employees and agents.

(ii) RECTPCL's Liability

The RECTPCL shall be liable for and shall indemnify the Contractor against all losses, expenses or claims in respect of loss of or damage to any physical property or of death or personal injury whenever occurring, to the extent caused by any of the RECTPCL's Risks.

(iii) Accidents

The Contractor shall be liable for and shall indemnify the RECTPCL against all losses, expenses or claims arising in connection with the death of or injury to any person employed by the Contractor or his sub-contractors for the purposes of the Works, unless caused by any defaults of the Engineer-in-Charge or other Contractors engaged by the RECTPCL or by their respective employees or agents and in such cases the RECTPCL shall be liable for and shall indemnify the Contractor against all losses, expenses and claims arising in connection therewith.

CLAUSE-39: LIMITATIONS OF LIABILITY:

(i) Except in cases of gross negligence or willful misconduct,

- (a) the Contractor and the Employer shall not be liable to the other party for any indirect or consequential loss or damage, loss of use, loss of production, or loss of profits or interest costs, provided that this exclusion shall not apply to any obligation of the Contractor to pay liquidated damages to the Employer and
- (b) the aggregate liability of the Contractor to the Employer, whether under the Contract, in tort or otherwise, shall not exceed the total Contract Price, provided that this limitation shall not apply to the cost of repairing or replacing defective equipment, or to any obligation of the Contractor to indemnify the Employer with respect to patent infringement.

(ii) Liability after expiration of Defects Liability Period

The Contractor shall have no liability to the RECTPCL for any loss of or damage to the RECTPCL's physical property which occurs after the expiration of the Defects Liability Period unless caused by gross misconduct of the Contractor.

(iii) Exclusive Remedies

The RECTPCL and the Contractor intend that their respective rights, obligations and liabilities as provided for in these conditions shall alone govern their rights under the Contract and in relation to the Works.

Accordingly, the remedies provided under the Contract in respect of or in consequence of:

- a) any breach of Contract, or
- b) any negligent act or omission, or
- c) death or personal injury, or
- d) loss or damage to any property

are to be to the exclusion of any other remedy that either may have against the other under the law governing the Contract or otherwise.

(iv) Mitigation of Loss or Damage

In all cases the party claiming a breach of contract or a right to be indemnified in accordance with the contract shall be obliged to take all reasonable measures to mitigate the loss or damage.

CLAUSE-40: INSURANCE

Refer Appendix-III, Insurance Requirement, Section-IX, Vol-I,

CLAUSE-41: FORCE MAJEURE:

(i) Definition of Force Majeure

Force Majeure means any circumstances beyond the control of the parties, including but not limited to:

- a) war and other hostilities, (whether war be declared or not), invasion, act of foreign enemies, requisition or embargo;
- b) rebellion, revolution, insurrection, military or usurped power and civil war;
- c) ionising radiation or contamination by radio activity from any nuclear fuel or from any nuclear waste from the combustion of nuclear fuel, radio-active toxic explosives, or other hazardous properties of any explosive nuclear assembly or nuclear components thereof;
- d) riot, commotion or disorder, except where solely restricted to employees of the Contractor or of his sub-contractors.
- e) Earthquake affecting Contractor's work.

(ii) Effect of Force Majeure

Neither party shall be considered to be in default or in breach of his obligations under the Contract to the extent that performance of such obligations is prevented by any circumstances of Force Majeure which arise after the date of the Letter of Award or the date when the Contract becomes effective, whichever is the earlier.

(iii) Notice of Occurrence

If either party considers that any circumstances of Force Majeure have occurred which may affect performance of his obligations, he shall promptly notify the other party.

(iv) Performance to Continue

Upon the occurrence of any situation of Force Majeure, the Contractor shall endeavor to continue to perform his obligations under the Contract so far as reasonably practicable. The Contractor shall notify the Engineer-in-Charge of the steps he proposes to take including any reasonable alternative means for performance which is not prevented by Force Majeure. The Contractor shall not take any such steps unless directed so to do by the Engineer-in-Charge.

(v) Additional Costs caused by Force Majeure

If the Force Majeure events exceed a period of six months and if the Contractor incurs additional costs in complying with the Engineer-in-Charge's directions under Sub-Clause (iv) of this Clause then, the Contractor shall be compensated for the additional costs and expenses during the period of Force Majeure exceeding six months and for the costs and expenses to be incurred for the continuation of execution of the Contract.

(vi) Termination in Consequence of Force Majeure

If circumstances of Forces Majeure have occurred and shall continue for a **period of twelve months** then, notwithstanding that the Contractor may by reason thereof has been granted an extension of Time for Completion of the Works, either party shall be entitled to serve upon the other 30 days' notice to terminate the Contract. If at the expiry of the period of 30 days, Force Majeure shall still continue, the Contract shall be terminated.

(vii) Payment on Termination for Force Majeure

If the Contract is terminated under Sub-Clause (vi) of this Clause, the Contractor shall be paid the value of the work done.

The Contractor shall also be entitled to receive;

- a) the amounts payable in respect of any preliminary items so far as the work or service comprised therein has been carried out and a proper proportion, as certified by the Engineer-in-Charge, of any such item in which the work or service comprised has only been partially carried out,
- b) the cost of materials or goods reasonably ordered for the Works or for use in connection with the Works which have been delivered to the Contractor or of which the Contractor is legally liable to accept delivery. Such materials or goods shall become the property of RECTPCL when paid for by it and the Contractor shall place the same at the RECTPCL's disposal,
- c) the amount certified by the Engineer-in-Charge, being the amount of any expenditures which in the circumstances was reasonably incurred by the Contractor in the expectation of completing the whole of the Works insofar as such expenditure shall not have been covered by any other payments referred to in this Sub-Clause.

CLAUSE-42: DEFAULT:

(i) Notice of Default

If the Contractor is not executing the Works in accordance with the Contract or is neglecting to perform his obligations there under so as to seriously affect the carrying out of the Works, the Engineer-in-Charge or his representative may give notice to the Contractor requiring him to make good such failure or neglect.

(ii) Contractor's Default

If the Contractor;

- (a) has failed to comply, within a reasonable time, with a notice under Sub-Clause (i) of this Clause, or
- (b) assigns the Contract or subcontracts the whole or part of the Works without the RECTPCL's written consent, or
- (c) becomes bankrupt or insolvent, has a receiving order made against him or compounds with his creditors, or carries on business under a receiver, trustee or manager for the benefit of his creditors or goes into liquidation.

The RECTPCL may, after having given seven days' notice to the Contractor, terminate the Contract and expel the Contractor from the site. Any such expulsion and termination shall be without prejudice to any other rights or powers of the RECTPCL under the Contract. The RECTPCL may upon such termination, complete the Works itself or by any other Contractor.

(iii) Valuation at Date of Termination

The Engineer-in-Charge shall, as soon as possible after such termination, certify the value of the Works and all sums then due to the Contractor as at the date of termination in accordance with Clause-33 hereof.

(iv) Payment after Termination

The RECTPCL shall not be liable to make any further payments to the Contractor until the Works have been completed and the Defects Liability Period is over. The RECTPCL shall be entitled to recover from the Contractor the extra costs, if any, of completing the Works after allowing for any sum due to the Contractor under Sub-Clause (iii) of this Clause. If there is no such extra cost, the RECTPCL shall pay any balance due to the Contractor.

(v) Effect on Liability for Delay

The Contractor's liability under Clauses-27 and 28 hereof shall immediately cease when the RECTPCL expels him from the site without prejudice to any liability thereunder that may have already occurred.

CLAUSE 43- INCREASE OR DECREASE OF COSTS

The Contract Price shall be subject to adjustment in accordance with the provisions of Appendix 2 (Price Adjustment) to the Contract Agreement. The Contract Price shall be increased or reduced on account of variation in quantity in accordance with Clause 32 of GCC.

CLAUSE-44: TAXES AND DUTIES:

(i) For Supply of Goods:

The prices shall include all duties, levies and taxes in India that may be levied according to the Laws and regulation, save, as provided under para 1.13 of 'Information & Instructions' and clause 33 (ii) of the General Conditions of the Contract. Nothing in the contract shall relieve the contractor from his

responsibility to pay any tax that may be levied in India on profits made by him in respect of the Contract.

(ii) Income Taxes on Staff

The Contractor's staff, personnel and labour will be liable to pay personal income tax in respect of such of their salaries and wages as are chargeable under the laws and regulations for the time being in force and the Contractor shall perform such duties in regard to such deductions thereof as may be imposed on him by such laws and regulations.

CLAUSE-45: OWNERSHIP:

Ownership of goods shall pass from the Contractor to the RECTPCL on arrival of the goods at site. However, such passing of ownership shall not in any way dilute the responsibility of the Contractor to insure the goods as per Clause-40 hereof and shall not absolve the Contractor of his obligations and liabilities under the Contract. The goods shall be handed over back to the Contractor for performance of services under the Contract for which Contractor shall submit an Indemnity Bond to the purchaser as per proforma attached at SECTION-IX, VOLUME-I.

CLAUSE-46: NOTICES:

(i) Service of Notices on Contractor

All notices or written orders to be given by the RECTPCL or by the Engineer-in-Charge or his representative to the Contractor under the terms of the Contract shall be served either by sending by post to or delivering the same to the Contractor's office on site or his principal place of business, or such other address as the Contractor shall nominate for this purpose.

(ii) Service of Notices

All notices to be given to the Engineer-in-Charge under the terms of Contract shall be served by sending by post or delivering the same to the respective address given below.

Additional Chief Executive Officer

RECTPCL, ECE House, 3rd Floor, Annexe - II, 28A, KG Marg, New Delhi - 110001

(iii) Change of Address

Either party may change a nominated address to another address by prior written notice to the other party.

CLAUSE-47: SETTLEMENT OF DISPUTE:

- i. If any dispute of any kind whatsoever shall arise between the Employer and the Contractor in connection with or arising out of the Contract, including without prejudice to the generality of the foregoing, any question regarding its existence, validity or termination, or the execution of the Facilities, whether during the progress of the Facilities or after their completion and whether before or after the termination, abandonment or breach of the Contract, the parties shall seek to resolve any such dispute or difference, to the extent possible, amicably by mutual consultation.
- ii. If the parties fail to resolve such a dispute or difference by mutual consultation at the execution site level, then the dispute shall be referred by the Contractor to the Project

Manager, who, within a period of thirty (30) days after being requested by Contractor to do so, shall give written notice of his decision.

- a. The decision/instruction of the Project Manager shall be deemed to have been accepted by the Contractor unless notified by the Contractor of his intention to refer the matter for Arbitration within thirty (30) days of such decision/instruction.
 - b. In the event the Project Manager fails to notify his decision as aforesaid within thirty (30) days, the Contractor, if he intends to go for Arbitration, shall notify his intention to the Project Manager within 30 days of expiry of the first mentioned period of thirty days failing which it shall be deemed that there are no dispute or difference between the Employer and the Contractor.
- iii. In case of dispute or difference between the Employer and the Contractor, if the Employer intends to go for Arbitration, he shall notify such intention to the Contractor.

CLAUSE-48: ARBITRATION:

- i. All disputes or differences in respect of which the decision, if any, of the Project Manager and/or the Head of the Implementing Authority has not become final or binding as aforesaid shall be settled by arbitration in the manner provided herein below:
- ii. The arbitration shall be conducted by three arbitrators, one each to be nominated by the Contractor and the Employer and the third to be appointed by both the arbitrators in accordance with the Indian Arbitration Act. If either of the parties fails to appoint its arbitrator within sixty (60) days after receipt of a notice from the other party invoking the Arbitration clause, the arbitrator appointed by the party invoking the arbitration clause shall become the sole arbitrator to conduct the arbitration.
- iii. The language of the arbitration proceedings and that of the documents and communications between the parties shall be English. The arbitration shall be conducted in accordance with the provisions of the Indian Arbitration and Conciliation Act, 1996 or any statutory modification thereof. The venue of arbitration shall be New Delhi.
- iv. The decision of the majority of the arbitrators shall be final and binding upon the parties. In the event of any of the aforesaid arbitrators dying, neglecting, resigning or being unable to act for any reason, it will be lawful for the party concerned to nominate another arbitrator in place of the outgoing arbitrator.
- v. During settlement of disputes and arbitration proceedings, both parties shall be obliged to carry out their respective obligations under the Contract.

CLAUSE-49: TERMINATION OF CONTRACT FOR RECTPCL's CONVENIENCE:

- (i) The Engineer-in-Charge of RECTPCL shall be entitled to terminate this Contract at any time for the RECTPCL's convenience after recording sufficient reasons and getting approval from the relevant contract committee after providing the contractor an opportunity of being heard for which 30 days' prior notice shall be given to the contractor by the Executive Engineer, in-charge project with a copy to the Engineer, in-charge.
- (ii) In the event of such termination, the Contractor shall be paid by the RECTPCL as provided in Sub-Clause – 41 (vii) hereof.

CLAUSE-50: JOINT VENTURES:

If the Contractor is a joint venture or consortium, all partners of the joint venture shall be jointly and severally liable to the RECTPCL for the execution of the entire Contract in accordance with its terms.

SECTION-V, VOL-I
SPECIAL CONDITIONS OF CONTRACT (SCC)

SPECIAL CONDITIONS OF CONTRACT

1.0 Scope of Work

1.1 The scope of work includes “Design, Engineering, Supply & Construction of Residential Staff Quarters & associated facilities at 160 MVA, 220/33 kV Gas Insulated Substation (GIS) at Lassipora(Srinagar Region) on Turnkey Basis associated with Strengthening of Transmission System of JKPTCL under PMDP Scheme-15”. Contractor has to carry out the work as per BOQ, Technical Specifications, and latest CPWD Specifications and as per directions of Engineer-in-Charge for successful completion of work. Detailed scope of work is described in the BOQ and Technical Specifications for the work.

1.2 Details of Residential Quarters:-

S.No.	Particulars	Qty	Area	Configuration
1	JE Quarters	4x2 Sets	(Total area- 2500 Sfts x 2)	Double storey

2.0 Location

a) Site is located at 160 MVA, 220/33 kV Lassipora GIS Substation, Srinagar

3.0 Materials, Water and Power

- (i) Material: **No material shall be supplied by RECTPCL under this contract** and the bidder should accordingly quote rates. Item rates for all the items shall include cost of all material and taxes. Therefore, the provisions of relating to Owner Supplied Material in the Conditions of Contract for Civil Works stand superseded.
- (ii) Water Supply: The contractor should arrange point for water connection, or arrange water tankers at his own cost, no payment shall be made for this.
- (iii) Power supply: **In case available, it shall be provided on chargeable basis.** The charges shall be at the prevailing tariff rate of State Electricity Board as prevalent for the nature of work at the work site at the time of award of work. All electric fixtures and fittings shall be arranged by the Agency.

4.0 Completion Schedule / Period

4.1 Time is the essence of contract. The entire work is scheduled to be completed in all respect within **06 (Six) Months** from the date of Notification of award/ Letter of Award. The date of notification of award/Letter of Award shall be considered as zero date for all the purposes.

4.2 The contractor shall deploy sufficient Manpower, Equipment and T&P for this work to complete the work within the completion period specified above.

5.0 The work shall be executed in accordance with the specifications stipulated in the tender documents read along with CPWD specifications.

6.0 The tender documents forming the contract are to be taken as mutually explanatory to one another and in case of any varying or conflicting provisions in any of the documents; following order of preference shall be adopted.

- (a) Item Description in Bill of Quantities

- (b) Special Conditions of Contract/ Particular Specification, if any.
- (c) CPWD Specification
- (d) Approved drawings cleared for construction
- (e) General Condition of the Contract

7.0 Engineer-in-charge:

- 7.1 **Addl. CEO (RECTPCL)** will be the Engineer-in-charge for the subject work. The address of the Engineer -in-charge is as follows:

**REC Transmission Project Company Limited
3rd Floor, Annexe II, ECE House,
28-A, KG Marg, Connaught Place,
New Delhi- 110001**

- 8.0 Engineer-in-charge may authorise any of his officers as his representative for the execution of the subject work.
- 9.0 All necessary tools & tackles and plants & equipment shall be arranged and transported to sites, associated with the above scope of work, by the Contractor at his cost and expense. Nothing shall be arranged and provided by the Owner, whatsoever.
- 10.0 The contractor shall deploy additional Manpower, Machinery, Materials etc., as and when considered necessary by the Engineer-in-charge or his representative, without any additional liability on any reason whatsoever.
- 11.0 Insurance**
- 11.1 Insurance such as transit insurance of materials, third party & workmen insurance, insurance of tools & tackles and plant & equipment or any other insurance more specifically detailed in GCC clause no. 40 shall be arranged by the Contractor at his cost and expense.
- 11.2 The Contractor at his cost shall arrange, secure and maintain all insurance as may be pertinent to the works and obligatory in terms of law against all perils and the responsibility to maintain adequate insurance coverage at all times during the period of contract shall be of the Contractor alone. The Contractor's failure in this regard shall not relieve him of any of his contractual responsibilities and obligations.
- 11.3 The perils required to be covered under the insurance shall include all risks, but not limited to fire and allied risks, miscellaneous accidents, workman compensation risks, loss or damage in transit, theft, pilferage, riot and strikes and malicious damages, civil commotions, weather conditions, accidents of all kinds etc. The Contractor shall be responsible for the safety and security of the employees of the Contractor & his Sub-contractors throughout execution of the works.
- 11.4 All costs on account of insurance liabilities covered under the Contract will be on Contractor's account and will be included in Contract Price.

12.0 Contract Price

- 12.1 The Contract Price includes inter-alia, all costs such as cost of necessary materials, their transportation to site, cost towards tools, equipment and machineries including cost of personnel that may be required for successful completion of the work as per the Bidding Documents, including cost of site arrangement, overheads, insurance, whatsoever, as stipulated in the bidding documents for the total scope of work and all applicable taxes, duties and levies for all transactions between the Contractor and his Sub – Contractors. However, the contract price is excluding GST applicable on transactions between Contractor and RECTPCL.
- 12.2 In addition, the rates quoted by party shall be inclusive of BOCW Welfare Cess. RECTPCL shall deduct BOCW Welfare Cess @ 1% of the amount of bill(s) and deposit the same with BOCW Welfare Board constituted by the State. In case the contractor wishes to deposit the BOCW Welfare Cess directly with the BOCW Welfare Board, the contractor has to intimate RECTPCL in writing prior to commencement of work. In such case the contractor has to regularly submit documentary proof of depositing the BOCW Welfare Cess to BOCW Welfare Board and on completion of the work, the contractor shall submit the proof of final assessment and settlement of BOCW Welfare Cess done by the Assessing Officer in relation to the Contract. The Input Tax Credit (ITC) available, if any, under GST as per the relevant Government laws wherever applicable has been taken into account by the Contractor.
- 12.3 Further the price for supply of services viz. Installation are excluding GST, if any, payable. The GST will be reimbursable (along with subsequent variation if any), by the Employer on the supplies made by the Contractor but limited to the tax liability on the transaction between the Employer and the Contractor.
- 12.4 Employer would not bear any liability on account of any other taxes, duties, levies applicable locally. Employer shall, deduct taxes at source as per the applicable laws/rules, if any, and issue Tax Deduction at Source (TDS) Certificate to the Contractor.
- 12.5 Reimbursement of GST by the Employer shall be at the rate applicable on the HSN/SAC of the goods/ services supplied by the Contractor to the Employer. The reimbursement of GST except advance payment shall be against Invoice/Debit Note containing particulars specified under the GST Act and related Rules, Notifications, etc as notified by the Government in this regard. In the event that the Contractor fails to provide the invoice in the form and manner prescribed under the GST Act and Rules, the Employer shall not be liable to make any payment against such invoice. Reimbursement of GST payment against Advance payment shall be against a proforma invoice. Further, the Contractor shall, within 7 days from the date of receipt of Advance, furnish an Advance Receipt Voucher to the Employer, as prescribed under the GST Law.
- If there is difference in HSN/SAC classification and corresponding rate of GST of an item as confirmed/deemed confirmed by the bidder in its bid and HSN/SAC and corresponding rate of GST as interpreted under any interpretation/ judgment/ Notification/ Circular issued under the GST law before or after the award of contract, GST reimbursable to the bidder/Contractor shall be lower of the GST applicable at the rate as confirmed/deemed confirmed in the bid or actual GST paid/payable by the bidder for that item.
- 12.6 The Contractor shall comply with all tax laws in force in India. The Contractor shall indemnify and hold harmless the Employer from and against any and all liabilities, interest, damages, claims, fines, penalties and expenses of whatever nature arising or

resulting from the violation of such tax laws by the Contractor or its personnel, including the Subcontractors and their personnel.

12.7 Owner's (JKPTCL) GSTIN number in the state of Jammu and Kashmir may be provided to the contractor after award of the work. While raising invoice/proforma invoice for Supply of Goods, Contractor shall bill to and ship to the address of the Owner in the State/UT where the Goods or part thereof is to be Supplied and mention GSTIN of Owner in of the same state/UT. #In case of Supply of Services, the Contractor shall invoice the Owner using the GSTIN of Owner in the state/UT in which the service or part thereof is to be rendered.

12.8 Notwithstanding anything above or elsewhere in the Contract, in the event that the input tax credit of the GST charged by the Contractor is denied by the tax authorities to the Employer for reasons associated with non-compliance/ incorrect compliance by the Contractor, the Employer shall be entitled to recover such amount from the Contractor by way of adjustment from any of the subsequent invoices submitted by the Contractor to the Employer. In addition to the amount of GST, the Employer shall also be entitled to recover interest and penalty, in case any interest and/or penalty are imposed by the tax authorities on the Employer for incorrect/wrong availment of Input Tax Credit. The Employer shall determine whether the denial of credit is linked to the non-compliance/ incorrect compliance of the Contractor and the said determination shall be binding on the Contractor.

13.0 Price Variation / adjustment

13.1 The Rates of various items in the contract shall be firm and shall not be subject to any variation or adjustment.

14.0 Terms of Payment

14.1 Any payment under this contract shall be released after following activities are completed by the contractor:

- i) Contractor's GST Invoice.
- ii) Submission of acknowledged copy of Notification of Award.
- iii) Signing of Contract Agreement with RECTPCL.
- iv) Submission of Contract Performance Guarantee as per clause no. 9 of General Conditions of Contract.
- v) Submission of the details of items, components, raw materials, services etc. procured/availed from MSEs, if any, for the preceding 6 months.

14.2 Payments shall be released by **RECTPCL, New Delhi**. Bills along with all details of measurement sheets shall be submitted by the contractor as per the provisions of General Conditions of Contract Clause No. 33.0. Payment for the work will be regulated in accordance with the above Clause of General Conditions of Contract. However, the initial payment shall be released after submission of a copy of the License obtained under Contract Labour (Regulation and Abolition) Act 1970. All bills shall be submitted through the Engineer-in-charge.

14.3 All the payments to be made directly to the contractor under the contract shall be made by RECTPCL through electronic payment mechanism (e-payment) only for which necessary details shall be tied up during execution of the contract.

- 14.4 Income Tax and other statutory levies as applicable at the time of payment shall be deducted at source unless concerned tax authorities exempt the contractor. RECTPCL shall affect TDS as per the rules / statutory requirements and issue TDS certificate.

15.0 Field Quality Plan

The Contractor at no extra cost to RECTPCL shall arrange all tests on materials and finished products, required as per the tender documents and Standard Field Quality Plans of RECTPCL applicable for the work. The rates quoted are shall be inclusive of all the tests and nothing shall be paid extra on account of this.

16.0 Severability:

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

17.0 Country of Origin:

“Origin” means the place where the materials, equipment and other supplies for the Facilities are mined, grown, produced or manufactured, and from which the services are provided. Plant and equipment are produced when, through manufacturing, processing or substantial and major assembling of components, a commercially recognized product results that is substantially different in basic characteristics or in purpose or utility from its components.

18.0 Contractor’s Organization Chart:

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

19.0 Supplementary Clauses may be read out with GCC Clause no-17 for SAFETY, SECURITY and PROTECTION OF THE ENVIRONMENT:

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

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

Compliance with Labour Regulations:

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

and the Sub-contractor in no case shall be treated as the employees of the Employer at any point of time.

- The Contractor shall keep the Employer indemnified in case any action is taken against the Employer by the competent authority on account of contravention of any of the provisions of any Act or rules made there under, regulations or notifications including amendments.
- If the Employer is caused to pay under any law as principal employer such amounts as may be necessary to cause or observe, or for non-observance of the provisions stipulated in the notifications/ byelaws/Acts/ Rules/regulations including amendments, if any, on the part of the Contractor, the Employer shall have the right to deduct any money due to the Contractor under this contract or any other contract with the employer including his amount of performance security for adjusting the aforesaid payment. The Employer shall also have right to recover from the Contractor any sum required or estimated to be required for making good the loss or damage suffered by the Employer.
- Notwithstanding the above, the Contractor shall furnish to the Employer the details/documents evidencing the Contractors compliance to the laws applicable to establishments engaged in building and other construction works, as may be sought by the Employer. In particular the Contractor shall submit quarterly certificate regarding compliance in respect of provisions of Employees' Provident Fund and Misc. Provisions Act 1952 to the Employer. For this purpose, the Contractor as well as its Sub-Contractor(s) should have Provident Fund Code Number and all the workers deployed by the Contractor or Sub-Contractor must be enrolled as members of Provident Fund having an Universal Account Number (UAN).

Salient features of some major laws applicable to establishments engaged in building and other construction works

- **Workmen Compensation Act 1923:** The Act provides for compensation in case of injury by accident arising out of and during the course of employment.
- **Payment of Gratuity Act 1972:** Gratuity is payable to an employee under the Act on satisfaction of certain conditions on separation if an employee has completed 5 years' service or more or on death at the rate of 15 days wages for every completed year of service. The Act is applicable to all establishments employing 10 or more employees
- **Employee P.F. and Miscellaneous Provision Act 1952:** The Act provides for monthly contribution by the employer plus workers @10% or 8.33%. The benefits under the Act are
 - Pension or family pension on retirement or death, as the case may be
 - Deposit linked insurance on death in harness of the worker
 - Payment of P.F. accumulation on retirement/death etc
- **Maternity Benefit Act 1951:** The Act provides for leave and some other benefits to women employees in case of confinement or miscarriage etc
- **Contract Labour (Regulation & Abolition) Act 1970:** The Act provides for certain welfare measures to be provided by the Contractor to contract labour and in case the Contractor fails to provide, the same are required to be provided, by the Principal Employer by law. The Principal Employer is required to take Certification of Registration and the Contractor is required to take license from the designated Officer. The Act is applicable to the establishments or Contractor of Principal Employer if they employ 20 or more labour contract labour.
- **Payment of Wages Act 1936:** It lays down as to by what date the wages are to be paid, when it will be paid and what deductions can be made from the wages of the workers.

- **Equal Remuneration Act 1979:** The Act provides for payment of equal wages for work of equal nature to Male and Female workers and for not making discrimination against Female employees in the matters of transfers, training and promotions etc.
- **Payment of Bonus Act 1965:** The Act is applicable to all establishments employing 20 or more employees. The Act provides for payments of annual bonus subject to a minimum of 8.33% of wages and maximum of 20% of wages to employees drawing Rs. 3500/- per month or less. The bonus is to be paid to employees getting Rs. 2500/- per month or above upto Rs. 3500/- per month shall be worked out by taking wages as Rs. 2500/- per month only. The Act does not apply to certain establishments. The newly set-up establishments are exempted for five years in certain circumstances. Some of the State Governments have reduced the employment size from 20 to 10 for the purpose of applicability of this Act.
- **Industrial Dispute Act 1947:** the Act lays down the machinery the procedure for resolution of Industrial disputes, in what situations a strike or lock-out becomes illegal and what are the requirements for laying off or retrenching the employees or closing down the establishment.
- **Industrial Employment (Standing Orders) Act 1946:** It is applicable to all establishments employing 100 or more workmen (employment size reduced by some of the States and Central Government to 50). The Act provides for laying down rules governing the conditions of employment by the Employer on matters provided in the Act and get the same certified by the designated Authority.
- **Trade Unions Act 1926:** The Act lays down the procedure for registration of trade unions of workmen and employers. The Trade Unions registered under the Act have been given certain immunities from civil and criminal liabilities.
- **Child Labour (Prohibition & Regulation) Act 1986:** The Act prohibits employment of children below 14 years of age in certain occupations and processes and provides for regulation of employment of children in all other occupations and processes. Employment of Child Labour is prohibited in Building and Construction Industry.
- **Inter-State Migrant workmen's (Regulation of Employment & Conditions of Service) Act 1979:** The Act is applicable to an establishment which employs 5 or more inter-state migrant workmen through an intermediary (who has recruited workmen in one state for employment in the establishment situated in another state). The Inter-State migrant workmen, in an establishment to which this Act becomes applicable, are required to be provided certain facilities such as housing, medical aid, travelling expenses from home upto the establishment and back, etc.
- **The Building and Other Construction workers (Regulation of Employment and Conditions of Service) Act 1996 and the Cess Act of 1996 :** All the establishments who carry on any building or other construction work and employ 10 or more workers are covered under this Act. All such establishments are required to pay cess at the rate not exceeding 2% of the cost of construction as may be modified by the Government. The Employer of the establishment is required to provide safety measures at the Building or construction work and other welfare measures, such as Canteens, First-Aid facilities, Ambulance, Housing accommodations for workers near the work place etc. The Employer to whom the Act applies has to obtain a registration certificate from the Registering Officer appointed by the government.
- **Factories Act 1948:** The Act lays down the procedure for approval at plans before setting up a factory, health and safety provisions, welfare provisions, working hours, annual earned leave and rendering information regarding accidents or dangerous occurrences to designated authorities. It is applicable to premises employing 10 persons or more with aid of power or 20 or more persons without the aid of power engaged in manufacturing process.

Following law be added against Environment Protection: Salient features of some of the major laws that are applicable are given below:

- The Water (Prevention and Control of Pollution) Act, 1974, this provides for the prevention and control of water pollution and the maintaining and restoring of wholesomeness of water. „Pollution“ means such contamination of water or such alteration of the physical, chemical or biological properties of water or such discharge of any sewage or trade effluent or of any other liquid, gaseous or solid substance into water (whether directly or indirectly) as may, or is likely to, create a nuisance or render such water harmful or injurious to public health or safety, or to domestic, commercial, industrial, agricultural or other legitimate uses, or to the life and health of animals or plants or of aquatic organisms.
- The Air (Prevention and Control of Pollution) Act, 1981, This provides for prevention, control and abatement of air pollution. „Air Pollution“ means the presence in the atmosphere of any „air pollutant“, which means any solid, liquid or gaseous substance (including noise) present in the atmosphere in such concentration as may be or tend to be injurious to human beings or other living creatures or plants or property or environment.
- The Environment (Protection) Act, 1986, This provides for the protection and improvement of environment and for matters connected therewith, and the prevention of hazards to human beings, other living creatures, plants and property. „Environment“ includes water, air and land and the inter-relationship which exists among and between water, air and land, and human beings, other living creatures, plants, micro-organism and property
- The Public Liability Insurance Act, 1991, This provides for public liability insurance for the purpose of providing immediate relief to the persons affected by accident occurring while handling hazardous substances and for matters connected herewith or incidental thereto. Hazardous substance means any substance or preparation which is defined as hazardous substance under Environment (Protection) Act, 1986, and exceeding such quantity as may be specified by notification by the Central Government.

Safety Precautions

- The Contractor shall observe all applicable regulations regarding safety on the Site. Unless otherwise agreed, the Contractor shall, from the commencement of work on Site until Taking Over, provide:
 - fencing, lighting, guarding and watching of the Works, and
 - Temporary roadways, footways, guards and fences which may be necessary for the accommodation and protection of Employer / his representatives and occupiers of adjacent property, the public and others.
- The Contractor shall ensure proper safety of all the workmen, materials, plant and equipment belonging to him or to Employer or to others, working at the Site. The Contractor shall also be responsible for provision of all safety notices and safety equipment required both by the relevant legislations and the Project Manager, as he may deem necessary.
- The Contractor will notify well in advance to the Project Manager of his intention to bring to the Site any container filled with liquid or gaseous fuel or explosive or petroleum substance or such chemicals which may involve hazards. The Project Manager shall have the right to prescribe the conditions, under which such container is to be stored, handled and used during the performance of the works and the Contractor shall strictly adhere to and comply with such instructions. The Project Manager shall have the right at his sole discretion to inspect any such container or such construction plant/equipment for which material in the container is required to be used and if in his opinion, its use is not safe, he may forbid its use. No claim due to such prohibition shall be entertained by the Employer and the Employer shall not entertain any claim of the Contractor towards additional safety provisions/conditions to be provided for/constructed as per the Project Manager's instructions. Further, any such decision of the Project Manager shall not, in any way, absolve the Contractor of his responsibilities and in case, use of such a container or entry thereof into the Site area is forbidden by the Project Manager, the Contractor shall use alternative methods with the approval of the Project Manager without any cost implication to the Employer or extension of work schedule.

- Where it is necessary to provide and/or store petroleum products or petroleum mixtures and explosives, the Contractor shall be responsible for carrying-out such provision and/or storage in accordance with the rules and regulations laid down in Petroleum Act 1934, Explosives Act, 1948 and Petroleum and Carbide of Calcium Manual published by the Chief Inspector of Explosives of India. All such storage shall have prior approval of the Project Manager. In case, any approvals are necessary from the Chief Inspector (Explosives) or any statutory authorities, the Contractor shall be responsible for obtaining the same.
- All equipment used in construction and erection by Contractor shall meet Indian/International Standards and where such standards do not exist, the Contractor shall ensure these to be absolutely safe. All equipment shall be strictly operated and maintained by the Contractor in accordance with manufacturer's Operation Manual and safety instructions and as per Guidelines/rules of Employer in this regard.
- Periodical examinations and all tests for all lifting/hoisting equipment & tackles shall be carried-out in accordance with the relevant provisions of Factories Act 1948, Indian Electricity Act 1910 and associated Laws/Rules in force from time to time. A register of such examinations and tests shall be properly maintained by the Contractor and will be promptly produced as and when desired by the Project Manager or by the person authorised by him.
- The Contractor shall be fully responsible for the safe storage of his and his Sub-Contractors radioactive sources in accordance with BARC/DAE Rules and other applicable provisions. All precautionary measures stipulated by BARC/DAE in connection with use, storage and handling of such material will be taken by the Contractor.
- The Contractor shall provide suitable safety equipment of prescribed standard to all employees and workmen according to the need, as may be directed by the Project Manager who will also have right to examine these safety equipment to determine their suitability, reliability, acceptability and adaptability. The Contractor shall also provide Reflective Jackets to all workmen working on the site including different coloured such Jackets to the persons working at height.
- Where explosives are to be used, the same shall be used under the direct control and supervision of an expert, experienced, qualified and competent person strictly in accordance with the Code of Practice/Rules framed under Indian Explosives Act pertaining to handling, storage and use of explosives.
- The Contractor shall provide safe working conditions to all workmen and employees at the Site including safe means of access, railings, stairs, ladders, scaffoldings etc. The scaffoldings shall be erected under the control and supervision of an experienced and competent person. For erection, good and standard quality of material only shall be used by the Contractor.
- The Contractor shall not interfere or disturb electric fuses, wiring and other electrical equipment belonging to the Employer or other Contractors under any circumstances, whatsoever, unless expressly permitted in writing by Employer to handle such fuses, wiring or electrical equipment
- Before the Contractor connects any electrical appliances to any plug or socket belonging to the other Contractor or Employer, he shall:
 - a. Satisfy the Project Manager that the appliance is in good working condition;
 - b. Inform the Project Manager of the maximum current rating, voltage and phases of the appliances;
 - c. Obtain permission of the Project Manager detailing the sockets to which the appliances may be connected.
- The Project Manager will not grant permission to connect until he is satisfied that;
 - a. The appliance is in good condition and is fitted with suitable plug;
 - b. The appliance is fitted with a suitable cable having two earth conductors, one of which shall be an earthed metal sheath surrounding the cores.

- No electric cable in use by the Contractor/Employer will be disturbed without prior permission. No weight of any description will be imposed on any cable and no ladder or similar equipment will rest against or attached to it.
- No repair work shall be carried out on any live equipment. The equipment must be declared safe by the Project Manager and a permit to work shall be issued by the Project Manager before any repair work is carried out by the Contractor. While working on electric lines/equipment, whether live or dead, suitable type and sufficient quantity of tools will have to be provided by the Contractor to electricians/workmen/officers.
- The Contractors shall employ necessary number of qualified, full time electricians/electrical supervisors to maintain his temporary electrical installation.
- The Contractor employing more than 250 workmen whether temporary, casual, probationer, regular or permanent or on contract, shall employ at least one full time officer exclusively as safety officer to supervise safety aspects of the equipment and workmen, who will coordinate with the Project Safety Officer. In case of work being carried out through Sub-Contractors, the Sub-Contractor's workmen/employees will also be considered as the Contractor's employees/workmen for the above purpose.
- In case, the Contractor fails to deploy Qualified Safety Officer(s)/Safety Staff(s) under each Contract, as specified, then the Contractor shall be responsible for payment of a sum of Rs. 15,00,000/- per quarter till the Safety Officer(s)/Safety Staff(s) is deployed, to be deposited with the Employer, which will be retained in the Safety Corpus Fund.
- The name and address of such Safety Officers of the Contractor will be promptly informed in writing to Project Manager with a copy to Safety Officer-In charge before he starts work or immediately after any change of the incumbent is made during currency of the Contract. In case any accident occurs during the construction/ erection or other associated activities undertaken by the Contractor thereby causing any minor or major or fatal injury to his employees due to any reason, whatsoever, it shall be the responsibility of the Contractor to promptly inform but no later than 24 hrs. of the occurrence of the same, to the Project Manager in prescribed form and also to all the authorities envisaged under the applicable laws.
Notwithstanding above, in case of any fatal accident, the Board of Directors of Contractor shall review the incidence and a copy of Board's resolution signed by the Director/Company Secretary of the firm along with action plan for avoidance of such incidences in future shall be furnished promptly but no later than 60 days, to the Employer. Besides above, the CEO of the Contractor shall meet and apprise RECTPCL along with the Board's resolution of the cause of the fatal accident occurred and their future action plan/safety preparedness to prevent recurrence of such accidents in future within 60 days of the occurrence of the fatal accident.
- The Project Manager shall have the right at his sole discretion to stop the work, if in his opinion the work is being carried out in such a way that it may cause accidents and endanger the safety of the persons and/or property, and/or equipment. In such cases, the Contractor shall be informed in writing about the nature of hazards and possible injury/accident and he shall comply to remove shortcomings promptly. The Contractor after stopping the specific work can, if felt necessary, appeal against the order of stoppage of work to the Project Manager within 3 days of such stoppage of work and decision of the Project Manager in this respect shall be conclusive and binding on the Contractor.
- The Contractor shall not be entitled for any damages/compensation for stoppage of work due to safety reasons as provided above and the period of such stoppage of work will not be taken as an extension of time for completion of work and will not be the ground for waiver of levy of liquidated damages.
- It is mandatory for the Contractor to observe during the execution of the works, requirements of Safety Rules which would generally include but not limited to following:

- **Safety Rules**

- Each employee shall be provided with initial indoctrination regarding safety by the Contractor, so as to enable him to conduct his work in a safe manner.
- No employee shall be given a new assignment of work unfamiliar to him without proper introduction as to the hazards incident thereto, both to himself and his fellow employees.
- Under no circumstances shall an employee hurry or take unnecessary chance when working under hazardous conditions.
- Employees must not leave naked fires unattended. Smoking shall not be permitted around fire prone areas and adequate fire fighting equipment shall be provided at crucial location.
- Employees under the influence of any intoxicating beverage, even to the slightest degree shall not be permitted to remain at work.
- There shall be a suitable arrangement at every work site for rendering prompt and sufficient first aid to the injured.
- The staircases and passageways shall be adequately lighted.
- The employees when working around moving machinery, must not be permitted to wear loose garments. Safety shoes are recommended when working in shops or places where materials or tools are likely to fall. Only experienced workers shall be permitted to go behind guard rails or to clean around energized or moving equipment.
- The employees must use the standard protection equipment intended for each job. Each piece of equipment shall be inspected before and after it is used.
- Requirements of ventilation in underwater working to licensed and experienced divers, use of gum boots for working in slushy or in inundated conditions are essential requirements to be fulfilled.
- In case of rock excavation, blasting shall invariably be done through licensed blasters and other precautions during blasting and storage/transport of charge material shall be observed strictly.

- The Contractor shall follow and comply with all Employer Safety Rules, relevant provisions of applicable laws pertaining to the safety of workmen, employees, plant and equipment as may be prescribed from time to time without any demur, protest or contest or reservations. In case of any discrepancy between statutory requirement and Employer Safety Rules referred above, the latter shall be binding on the Contractor unless the statutory provisions are more stringent.

- If the Contractor fails in providing safe working environment as per Employer Safety Rules or continues the work even after being instructed to stop work by the Project Manager as provided above, the Contractor shall promptly pay to Employer, on demand by the Employer, compensation at the rate of Rs. 10,000/- per day or part thereof to be deposited in Safety Corpus Fund pursuant to clause below, till the instructions are complied with and so certified by the Project Manager. However, in case of accident taking place causing injury to any individual, the provisions contained in Clause below shall also apply in addition to compensation mentioned in this Clause.

- If the Contractor does not take adequate safety precautions and/or fails to comply with the Safety Rules as prescribed by the Employer or under the applicable law for the safety of the equipment and plant

A	Fatal injury or accident causing death	Rs. 15,00,000/- per person
B	Major injuries or accident causing 25% or more permanent disablement	Rs. 5,00,000/- per person

- The amount paid/ recovered from the Contractor on account of non-compliance to Safety measures shall be deposited in the „Safety Corpus Fund“, if not specified otherwise, established by the Employer. The „Safety Corpus Fund“ shall be used for augmentation of Safety measures in construction works, capacity building of workers, development of

working conditions of workers like providing tents/ mobile toilets/ caravans, safety tools & plants etc. and undertaking such other activities which will facilitate in reducing the accidents. However, the Contractor shall have no claim in this regard and the Employer shall be sole judge in this regard.

- If the Contractor observes all the Safety Rules and Codes, Statutory Laws and Rules during the currency of Contract awarded by the Employer and no accident occurs then Employer may consider the performance of the Contractor and award suitable "ACCIDENT FREE SAFETY MERITORIOUS AWARD" as per scheme as may be announced separately from time to time.
- The Contractor shall also submit "Safety Plan" as per proforma specified in Section-IX (Sample Forms and Procedures) of the Bidding Documents alongwith all the requisite documents mentioned therein and as per check-list contained therein to the Engineer In-Charge for its approval within 60 days of award of Contract. Further, one of the conditions for release of first progressive payment / subsequent payment towards Services Contract shall be submission of "Safety Plan" alongwith all requisite documents and approval of the same by the Engineer In-Charge

20.0 Supplementary Clauses may be read out with GCC Clause no-44 for Taxes and Duties or any other clause of the document as applicable

TAXES & DUTIES:

- The Contractor shall be entirely responsible for payment of all taxes, duties, licence fees and other such levies legally payable/incurred until delivery of the contracted supplies to the Employer.
- If it is statutory requirement to make deductions towards such taxes and duties or any other applicable taxes and duties, the same shall be made by the Employer and a certificate for the same shall be issued to the Contractor.
- The Contractor shall be solely responsible for the taxes that may be levied on the Contractor's persons or on earnings of any of his employees and shall hold the Employer indemnified and harmless against any claims that may be made against the Employer. The Employer does not take any responsibility whatsoever regarding taxes under Indian Income Tax Act, for the Contractor or his personnel. If it is obligatory under the provisions of the Indian Income Tax Act, deduction of Income Tax at source shall be made by the Employer.
- In respect of **supply of goods to** the Employer **by** the Contractor, the EXW price is inclusive of all cost as well as duties and tax (viz., custom duties & levies, duties, **GST** etc.) paid or payable on components, raw materials and any other items used for their consumption incorporated or to be incorporated in the Plant & Equipment. Further, the EXW price of (i) imported Equipments/items offered as 'Off the Shelf' or dispatched directly from the Indian Port of disembarkation are inclusive of all cost **as well as any duties paid/payable in relation to import of such goods (viz., Customs duties, GST & levies etc.)** and no separate claim on this behalf will be entertained by the Employer. If any tax exemptions, reductions, allowances or privileges may be available to the Contractor in the Country where the site is located and the Contractor has declared the same in its bid, the Employer shall use its best endeavors to enable the Contractor to benefit from such tax savings to the maximum allowable extent.

The Input Tax Credit (ITC) available, if any, under GST as per the relevant Government laws wherever applicable has been taken into account by the Contractor.

- Ex-works price for the supply of goods viz. Equipment/items by the Contractor is excluding GST, if any, payable. The GST will be reimbursable (along with subsequent variation if any), by the Employer on the supplies made by the Contractor but limited to the tax liability on the transaction between the Employer and the Contractor.

Type test charges, if applicable, are excluding GST, if any, payable. Type test shall be considered an incidental expense incurred prior to the supply of goods viz. Equipment/items and would be added to the value of goods viz. Equipment/items for GST purposes and GST for Type Test shall be reimbursed at the rate applicable for such Equipment/items.

Further the price for supply of services viz. Installation and training are excluding GST, if any, payable. The GST will be reimbursable (along with subsequent variation if any), by the Employer on the supplies made by the Contractor but limited to the tax liability on the transaction between the Employer and the Contractor.

It is the Employer's understanding that as per extant provisions, on the charges for supply of services related to Inland transportation, In-transit insurance, loading and unloading by the Contractor to the Employer, GST is not payable. The Contractor is, however, advised to check the position from their own sources. If payable, the same shall be to the Contractor's account and Employer shall not reimburse any GST on this account.

- Employer would not bear any liability on account of any other taxes, duties, levies applicable locally.
- Employer shall, deduct taxes at source as per the applicable laws/rules, if any, and issue Tax Deduction at Source (TDS) Certificate to the Contractor.
- Reimbursement of GST by the Employer shall be at the rate applicable on the HSN/SAC of the goods/ services supplied by the Contractor to the Employer. The reimbursement of GST shall be against Invoice/Debit Note containing particulars specified under the GST Act and related Rules, Notifications, etc as notified by the Government in this regard. In the event that the Contractor fails to provide the invoice in the form and manner prescribed under the GST Act and Rules, the Employer shall not be liable to make any payment against such invoice.
- If there is difference in HSN/SAC classification and corresponding rate of GST of an item as confirmed/deemed confirmed by the bidder in its bid and HSN/SAC and corresponding rate of GST as interpreted under any interpretation/ judgment/ Notification/ Circular issued under the GST law before or after the award of contract, GST reimbursable to the bidder/Contractor shall be lower of the GST applicable at the rate as confirmed/deemed confirmed in the bid or actual GST paid/payable by the bidder for that item.
- The Contractor shall comply with all tax laws in force in India. The Contractor shall indemnify and hold harmless the Employer from and against any and all liabilities, interest, damages, claims, fines, penalties and expenses of whatever

nature arising or resulting from the violation of such tax laws by the Contractor or its personnel, including the Subcontractors and their personnel.

- Owner's GSTIN number will be provided to bidder on request. While raising invoice/proforma invoice for Supply of Goods, Contractor shall bill to and ship to the address of the Owner in the State/UT where the Goods or part thereof is to be Supplied and mention GSTIN of Owner in of the same state/UT. #In case of Supply of Services, the Contractor shall invoice the Owner using the GSTIN of Owner in the state/UT in which the service or part thereof is to be rendered.
- Notwithstanding anything above or elsewhere in the Contract, in the event that the input tax credit of the GST charged by the Contractor is denied by the tax authorities to the Employer for reasons associated with non-compliance/incorrect compliance by the Contractor, the Employer shall be entitled to recover such amount from the Contractor by way of adjustment from any of the subsequent invoices submitted by the Contractor to the Employer. In addition to the amount of GST, the Employer shall also be entitled to recover interest and penalty, in case any interest and/or penalty are imposed by the tax authorities on the Employer for incorrect/wrong availment of Input Tax Credit. The Employer shall determine whether the denial of credit is linked to the non-compliance/incorrect compliance of the Contractor and the said determination shall be binding on the Contractor

For the purpose of the Contract, it is agreed that the Contract Price specified in Article 2 (Contract Price and Terms of Payment) of the Contract Agreement is based on the taxes, duties, levies and charges prevailing at the date seven (07) days prior to the last date of bid submission (hereinafter called "Tax"). If any rates of Tax are increased or decreased, a new Tax is introduced, an existing Tax is abolished, or any change in interpretation **except for classification related purpose**, or application of any Tax occurs in the course of the performance of the Contract, which was or will be assessed on the Contractor in connection with performance of the Contract, an equitable adjustment of the Contract price shall be made to fully take into account any such change by addition to the Contract price or deduction therefrom, as the case may be, in accordance with GCC Clause 31 (Changes in Laws and Regulations) hereof. **These adjustments shall be applicable for all transactions between the Employer and the Contractor for supply of goods and services under the Contract but shall not be applicable on procurement of raw materials, intermediary components etc. by the Contractor and on account of variation in taxes, duties & levies applicable locally.**

In respect of raw materials, intermediary components etc and the taxes, duties & levies applicable locally, neither the Employer nor the Contractor shall be entitled to any claim arising due to increase or decrease in the rate of Tax, introduction of a new Tax or abolition of an existing Tax in the course of the performance of the Contract.

21.0 SITE ORDER BOOK

The Engineer-in-Charge shall maintain the site order book systematically and securely till completion of the Works. The site order book shall be available at the site during

working hours. Orders regarding the Work as and when necessary shall be entered in this book by the Engineer-in-Charge or his representative with dated signatures in exercise of the powers vested in him, which orders shall be duly noted by the Contractor or his authorized agent with his dated signature. Order entered in this book and noted by the Contractor's agent shall be considered to have been duly given to the Contractor.

22.0 Change in Laws and Regulations

If, after the date seven (07) days prior to the date of Bid Opening, any law, regulation, ordinance, order or by-law having the force of law is enacted, promulgated, abrogated or changed in India (which shall be deemed to include any change in interpretation or application by the competent authorities) that subsequently affects the costs and expenses of the Contractor and/or the Time for Completion, the Contract Price shall be correspondingly increased or decreased, and/or the Time for Completion shall be reasonably adjusted to the extent that the Contractor has thereby been affected in the performance of any of its obligations under the Contract. These adjustments shall be applicable for all transactions between the employer and contractor for supply of goods & services under the contract but shall not be applicable on procurement of raw material, intermediary component etc. by the contractor for which employer shall be the sole judge. Notwithstanding the foregoing, such additional or reduced costs shall not be separately paid or credited if the same has already been accounted for in the price adjustment provisions where applicable.

SECTION-VI, VOL-I
MODEL RULE FOR HEALTH & SANITARY
ARRANGEMENTS FOR
CONTRACTOR'S WORKMEN

SECTION - VI
MODEL RULES FOR HEALTH AND SANITARY ARRANGEMENTS FOR
CONTRACTOR'S WORKMEN
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SECTION-VI

MODEL RULES FOR HEALTH AND SANITARY ARRANGEMENTS FOR CONTRACTOR'S WORKMEN

1 APPLICATION

These rules shall apply to all buildings and erection works of REC Transmission Projects Company Limited(RECTPCL).

2 DEFINITIONS

- (i) "Work place"/or work site means a place at which, at an average 50 or more workers are employed, in connection with construction work.
- (ii) "Large work place" or large work site means a place at which at an average 500 or more workers are employed in connection with construction work.

3 FIRST AID

- (i) At every work place, there shall be maintained in a readily accessible place first aid appliance including an adequate supply of sterilized dressings and sterilized cotton wool. The appliances shall be placed in good order and in a large work place. They shall be placed under the charge of a responsible person who shall be readily available during working hours.
- (ii) At large work places, where hospital facilities are not available within easy distance of the work, First Aid posts shall be established and run by trained compounders.
- (iii) Where large work places are remote from regular hospitals, an indoor ward shall be provided with one bed for every 250 employees.
- (iv) Where large work places are situated in cities/towns or in their suburbs and no beds are considered necessary owing to the proximity of city or town hospitals, suitable transport will be provided to facilitate removal of emergent cases to the hospitals. At other work places, some conveyance facilities such as car shall be kept readily available to take injured person(s) or person(s) suddenly taken seriously ill, to the nearest hospital.

4 DRINKING WATER

- (i) In every work place, there shall be provided and maintained at suitable places, easily accessible to labour, a sufficient supply of cold water fit for drinking.
- (ii) Where drinking water is obtained from an intermittent public water supply, each work place shall be provided with storage where such drinking water shall be stored.
- (iii) Every water supply storage shall be at distance of not less than 15 metres from latrine, drain or any other source of pollution. Where water has to be drawn from an existing

well which is within such proximity of latrine, drain or any other source of pollution, the well shall be properly chlorinated before water is drawn from it for drinking. All such wells shall be entirely closed in and be provided with trap door which shall be dust and water proof.

- (iv) A reliable pump shall be fitted to each covered well, the trap door shall be kept locked and opened only for cleaning or inspection which shall be done at least once in a month.

5 WASHING AND BATHING PLACES

- i) Adequate washing and bathing places shall be provided, separately for men & women.
- ii) Such places shall be kept in a clean and drained condition.

6 LATRINES AND URINALS

There shall be provided within the precincts of every work place adequate number of latrines and urinals in an accessible place. If women are employed, separate urinals and latrines shall be provided for them. All these shall be cleaned regularly and kept in a sanitary condition.

7 DISPOSAL OF EXCRETA

Unless otherwise arranged for by the local sanitary authority, arrangements for proper disposal of excreta by incineration at the work place shall be made by means of a suitable incinerator approved by the local health officer or Engineer-in-Charge. Alternatively, excreta may be disposed of by putting a layer of night soil at the bottom of pucca tank prepared for the purpose and covering it with a 150mm layer of waste or refuse and then covering it up with a layer of earth for a fortnight (when it will turn into manure).

8 PROVISION OF SHELTER DURING REST

At every work place there shall be provided free of cost for the use of labour, two suitable sheds, one for meals and the other for rest.

9 CRECHES

At every work place, at which 50 or more women workers are ordinarily employed, there shall be provided a crèche for the use of children, belonging to such women.

10 CANTEEN

A cooked food canteen on a moderate scale shall be provided for the benefit of workers wherever it is considered expedient.

The above rules shall form an integral part of the contract.

SECTION-VII, VOL-I
CONTRACTOR'S LABOUR REGULATION

SECTION –VII

CONTRACTOR’S LABOUR REGULATIONS

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SECTION - V

CONTRACTOR'S LABOUR REGULATIONS

1 SHORT TITLE

These regulations may be called the "REC Transmission Projects Company Limited", Contractor's Labour Regulations".

2 DEFINITIONS

In these regulations, unless otherwise expressed or indicated, the following words and expressions shall have the meaning hereby assigned to them respectively, that is to say:-

- (i) "Labour" means workers employed by RECTPCL Contractor directly or indirectly through a sub-contractor or other persons or by an agent on his behalf but will not include supervisory staff like section officers, etc.
- (ii) "Fair Wage" 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 wages prescribed by the RECTPCL for the area in which the work is done. Such wages will not be less than the minimum wages fixed by the Government of India for that class of employee engaged on the same type of work in the same area.
- (iii) "Contractor" shall include every person whether a sub-contractor or head-man or agent, employing labour on the work taken on contract.

Normally working hours of a worker should not exceed 9 (Nine) hours a day. The working day shall be so arranged that inclusive of interval for rest, if any, it shall not spread over more than 12 (twelve) hours on any day.

3 DISPLAY OF NOTICE REGARDING WAGES, ETC.

The Contractor shall

- (i) before he commences his work on Contract, display and correctly maintain and continue to display and correctly maintain in a clean and legible condition in conspicuous place on the work, notices in English and in Hindi and local language spoken by the majority of the workers, giving the rate of wages which have been certified by the Engineer-in-Charge as fair wage and the hours of work for which such wage are earned, and
- (ii) Send a copy of such notices to the certifying office.

4 PAYMENT OF WAGES

- (i) Wages due to every worker shall be paid to him direct.
- (ii) Arrears claimed after 3 months after the completion of the Work shall not be entertained.
- (iii) All wages shall be paid in current coin or currency or in both.

5 FIXATION OF WAGE PERIODS

- (i) The Contractor shall fix the wage periods in respect of which the wages shall be payable.
- (ii) No wage period shall exceed one month.

- (iii) Wages of every worker employed on the contract shall be paid; (a) in the case of establishment in which wage period is one week within 3 days from the end of the wage period and (b) in the case of other establishments before the expiry of the 7th day or 10th day from the end of the wage period for the number of workers employed in such establishment not exceeding 1000 and exceeding 1000 respectively.
- (iv) When the employment to any worker is terminated by or on behalf of the Contractor, the wages earned by him shall be paid before the expiry of the day succeeding the one on which his employment is terminated.
- (v) All payments of wages shall be made on a working day except when the work is completed before the expiry of the wage period in which case final payment shall be made within 48 hours of the last working day at work site and during the working time.

6 WAGE BOOK AND WAGE SLIPS ETC

- (i) The Contractor shall maintain a Wage Book of each worker in such forms as may be convenient at the place of works, but the same shall include the following particulars:
 - a Name of the worker.
 - b Rate of daily or monthly wages.
 - c Nature of work on which employed.
 - d Total number of days worked during each wage period.
 - e Dates and periods for which worked overtime.
 - f Gross wages payable for the work during each wage period.
 - g All deductions made from the wage with an indication in each case of the ground on account of which the deduction is made.
 - h Wages actually paid for each wage period
 - i Signature or thumb impression of the worker.
- (ii) The Contractor shall also issue a wage slip containing the aforesaid particulars to each worker employed by him on the work at least a day prior to the day of disbursement of wages.
- (iii) The Contractor shall also issue an "Employment Card" in the prescribed 'Form I' (attached) to each worker on the day of work or entry into his employment.
- (iv) The Contractor shall issue an 'Attendance cum Wage Card' as per 'Form II' to each worker on the day of entry into his employment.

7 REGISTER OF UNPAID WAGES

The Contractor shall maintain a register of unpaid wages in such form as may be convenient at the place of work but the same shall include the following particulars.

- i) Full particulars of the labourers whose wages have not been paid.
- ii) Reference number of the muster roll and wage register.
- iii) Rate of Wages.
- iv) Wage period.
- v) Total amount not paid.
- vi) Reasons for not making payment.
- vii) How the amount of unpaid wages was utilised.
- viii) Acquaintance with dates.

8 REGISTER OF ACCIDENTS

The Contractor shall maintain a register of accidents in such form as may be convenient at the work place, but the same should include the following particulars.

- i) Full particulars of the Worker(s) who met with accident.
- ii) Rate of wages.
- iii) Sex.
- iv) Age.
- v) Nature of accident and cause of accident.
- vi) Time and date of accident.
- vii) Date and time when admitted in hospital.
- viii) Date of discharge from the hospital.
- ix) Period of treatment and result of treatment.
- x) Percentage of loss of earning capacity and disability assessed by medical officer.
- xi) Compensation required to be paid.
- xii) Date of payment of compensation.
- xiii) Amount paid with details of the person to whom the same was paid.
- xiv) Authority by whom the compensation was assessed.
- xv) Remarks.

9 FINES AND DEDUCTIONS WHICH MAY BE MADE FROM WAGES

- i) The wages of a worker shall be paid to him without any deductions of any kind except the following:
 - a) Fines
 - b) Deductions for absence from duty i.e. from the place or the places where by the terms of his employment he is required to work. The amount of deduction shall be in proportion to the period for which he was absent.
 - c) Deduction for damage to or loss of goods expressly entrusted to the employed person for custody, or for loss of money or any other deduction which he is required to account, where such damage or loss is directly attributable to his neglect or default.
 - d) Deduction for recovery of advance or for adjustment of over payment of wages, advances granted shall be entered in a register.
 - e) Any other deduction which the Jammu & Kashmir Power Development Department may from time to time allow.
- ii) No fine shall be imposed on any worker except in respect of such acts and omissions on his part as have been approved of by the Engineer-in-Charge.
- iii) No fine should be imposed on a worker and no deduction for damage or loss shall be made good from his wages until the worker has been given an opportunity of showing cause against such fines or deductions.

10 REGISTER OF FINES

- i) The Contractor shall maintain a 'Register of Fines' and a 'Register of Deductions for Damages or Loss' in 'Form Nos. III & IV' respectively which should be kept at the places of work.
- ii) The Contractor shall maintain both English and in the local language, a list approved by the Engineer-in-Charge clearly stating the acts and omissions for which penalty or fine may be imposed on a workman and display it in a good condition in a conspicuous place on the work.

11 PRESERVATION OF REGISTER

The wage book, the wage slips, register of unpaid wages, the register of accidents, the register of fines, deduction required to be maintained under these regulations shall be preserved for 12 months after the date of last entry made in them and shall be made available for

inspection by the Engineer-in-Charge, labour officer or any other officer authorised by the RECTPCL on their behalf.

12 POWERS OF LABOUR WELFARE OFFICERS TO MAKE INVESTIGATION OR ENQUIRY

The Labour Welfare Officer or any other person authorised by the Indian **Govt.** on their behalf shall have power to make enquiries with a view to ascertaining and enforcing due and proper observance of the fair wage clause and the provisions of these regulations. He shall investigate into any complaint regarding the default made by the contractor or sub-contractor in regard to such provision.

13 REPORT OF LABOUR WELFARE OFFICER

The labour welfare officer or other persons authorised as aforesaid shall submit a report of result of his investigation or enquiry to the Engineer-in-Charge concerned indicating the extent, if any, to which the default has been committed, with a note that necessary deductions from the contractor's bill be made and the wages and other dues be paid to the labourers concerned. In case an appeal is made by the contractor under **para 14** of these regulations actual payment to labourers will be made by the Engineer-in-charge or authorised agent after RECTPCL has given its decision on such appeal.

The Engineer-in-Charge shall arrange payments to the labourers concerned within 45 days from the receipt of the report from the labour welfare officer.

14 APPEAL AGAINST THE DECISION OF LABOUR WELFARE OFFICER

Any person aggrieved by the decision and recommendations of the Labour Welfare Officer or other person so authorised may appeal such decision to the labour court, within 30 days from the date of decision. The decision of the labour court shall be final and binding upon the Contractor and RECTPCL as the case may be.

15 INSPECTION OF BOOKS AND SLIPS

The Contractor shall allow inspection of the wage books and the wage slips, register of unpaid wages, register of accidents, the register of fines and deductions to any of his workers or to his agent at convenient time and place after due notice is received or to the Labour Welfare Officer or any other persons, authorised by Engineer-in-Charge on his behalf.

16 SUBMISSION OF RETURNS

The Contractor shall submit periodical returns as may be specified from time to time.

17 AMENDMENTS

RECTPCL may from time to time add to or amend the regulations and on any question as to the application, interpretation or affect of those regulations, the decision of the Engineer-in-Charge or of his authorized representative shall be final.

FORM – I
EMPLOYMENT CARD REGULATION

Name & Sex of the worker.

Age or date of birth.

Father's name

Identification marks

.(Particulars of next of kin ,wife and children, if any or of
dependent next to kin in case the worker

has no wife or child)

Name

Full address of dependents

(Specify village, district and state).

Sl.No	Name and address of employer (Specify whether a contractor or Sub-contractor).	Particulars of location work site and description of work done	Total period for which the worker is employed (From.....to.....)	Actual number of days worked	Leave taken (Number of days Should be Specified)
1	2	3	4	5	6

(BACK SIDE OF THE CARD)

Nature of work done by the workers	Wage period	Wage rate (with particulars of unit in case of piece work)	Total wage earned by the worker during the period Shown under column(5)	Remarks	Signature of the employer
7	8	9	10	11	12

FORM – II

ATTENDANCE –CUM-WAGE CARD

Card No.

Name of Contractor.....

Name of work.....

Name of worker.....

Address.....

Designation.....

Rates of wages

Dates	Attendance	Signature of person marking attendance	REMARKS
1. 2. 3. 4. 5. etc.			

(ON THE BACK SIDE OF CARD)

Wage period	Date on which overtime Worked	Gross wage payable	Deductions if any.	Actual Wages paid	Date of payment	Signature of the Worker

FORM - III
REGISTER OF FINES

Sl. No.	Name	Father's/ Husband's Name	Sex	Department	Nature and Date of the offence for which fine imposed	Whether worker showed cause against Fine or not, if so, enter date.	Rate of Wages	Date and amount of fine Imposed	Date on which Fine Realised	Remarks
1	2	3	4	5	6	7	8	9	10	11

FORM - IV

REGISTER OF DEDUCTIONS FOR DAMAGES OR LOSS

Sl. No.	Name	Father's/ Husband's Name	Sex	Department	Damage or loss caused with date	Whether worker showed cause against deduction if so, enter date.	Date and amount of deduction Imposed	Number of install-ment, if any	Date on which total amount Realised	Remarks
1	2	3	4	5	6	7	8	9	10	11

SECTION-VIII, VOL-I
SAFETY REGULATIONS

SECTION - VIII

SAFETY PRECAUTIONS

- 1 Suitable scaffolds shall be provided for workmen for all Works that cannot safely be done from the ground, or from solid construction except such short period work as can be done safely from ladders. When a ladder is used, an extra workman shall be engaged for holding the ladder. If the ladder is used for carrying materials as well, suitable footholds and handholds shall be provided on the ladder and the ladder shall be given an inclination not steeper than 0.25 to 1 (0.25 horizontal and 1 vertical).
- 2 Scaffolding or staging more than 3.6 m above the ground or erected floor, swung or suspended from an overhead support or erected with stationary support shall have a guard rail properly attached, bolted, braced and otherwise secured at least 0.9 m high above the floor or platform of such scaffolding or staging and extending along the entire length of the outside and ends thereof with only such opening as may be necessary for the delivery of the materials. Such scaffolding or staging shall be so fastened as to prevent it from swaying from the structure.
- 3 Working platform, gangways and stairways shall be so constructed that they do not sag unduly or unequally, and if the height of the platform or the gangway or the stairway is more than 3.6 m above ground level or floor level, they shall be closely boarded, and shall have adequate width and shall be suitably fastened.
- 4 Every opening in the floor of a structure or in a working platform shall be provided with suitable means to prevent the fall of persons or materials by providing suitable fencing or railing whose minimum height shall be 0.9 m. Employees working on steep slopes or otherwise subject to possible falls from levels not protected by guardrails or safety nets, shall be secured by safety belts.
- 5 Safe means of access shall be provided to all working platforms and other working places. Every ladder shall be securely fixed. No portable single ladder shall be over 9.0 m in length while the width between side rails in hung ladder shall, in no case, be less than 28 cm. for ladder upto and including 3.0 m in length. For longer ladders, this width shall be increased at least by 6 mm for each additional 30 cm of length. Uniform step spacing shall not exceed 30 cm. Adequate precautions shall be taken to

prevent danger ~~from~~ electrical equipment. No materials on any of the Sites of Work shall be so stacked or placed as to cause danger or inconvenience to any person or the public.

6 EXCAVATION AND TRENCHING

All trenches, 1.2 m or more in depth, shall, at all times, be supplied with at least one ladder for each 30 metres length or fraction thereof. Ladder shall be extended from bottom of the trench to at least 0.9 m above the surface of the ground. The side of the trenches which are 1.5 m or more in depth shall be stepped back to give suitable slope or securely held by timber bracing, so as to avoid the danger of sides to collapse. The excavated materials shall not be placed within 1.5 m of the edges of the trench or half of the depth by the trench whichever is more. Cutting shall be done from top to bottom. Under no circumstances undermining or undercutting shall be done.

7 DEMOLITION

Before any demolition work is commenced and also during the process of the work:

- (i) All roads and open areas adjacent to the site shall either be closed or suitably protected.
- (ii) No electric cable or apparatus which is liable to be a source of danger over a cable or apparatus used by the operator shall remain electrically charged.
- (iii) All practical steps shall be taken to prevent danger to persons employed from risk of fire or explosion or flooding. No floor, roof or other part of the structure shall be overloaded with debris or materials as to render it unsafe.

8 All necessary personal safety equipment as considered adequate by the Engineer-in-Charge shall be kept available for the use of the persons employed on the Site and maintained in condition suitable for immediate use, and the Contractor shall take adequate steps to ensure proper use of equipment by those concerned.

- (i) The Contractor shall provide rubber gauntlets, gloves, mats, boots and galoshes, insulated platform and stools, safety belts, hand lamps, tower

wagons and other special insulated devices as required for working on electrical equipment and apparatus.

- (ii) Workers employed on mixing asphaltic materials, cement mortar and cement concrete shall be provided with protective footwear and protective goggles.
- (iii) Those engaged in mixing or stacking of cement bags or any materials which is injurious to eyes shall be provided with protective goggles.
- (iv) Those engaged in welding Works shall be provided with welder's protective eye shields.
- (v) Stone breakers shall be provided with protective goggles and protective clothing and seated at sufficiently safe intervals.
- (vi) The Contractor shall not employ any person **below the age of 18 years**. Whenever a person above the age of 18 years is employed on the work of lead painting, the following precautions shall be taken:-

- (a) No paint containing lead, sulphate of lead or product containing their pigments shall be used except in the form of paste or readymade paint.
- (b) Suitable face masks shall be supplied for use by the workers when paint is applied in the form of spray or a surface having lead paint dry rubbed and scrapped.
- (c) Overalls shall be supplied by the Contractor to the workmen and adequate facilities shall be provided to enable the working painters to wash during the cessation of Work.
- (d) Measures shall be taken, whenever required, in order to prevent danger arising from the application of a paint in the form of spray.
- (e) Measures shall be taken, whenever practicable, to prevent danger arising out from dust caused by dry rubbing down and scrapping.
- (f) Suitable arrangements shall be made to prevent clothing put off during working hours, being spoiled by painting materials.
- (g) Cases of lead poisoning and suspected lead poisoning shall be notified and shall be subsequently verified by a medical officer appointed by the competent authority.
- (h) The contractor, when necessary, shall arrange for medical examination of workers and same shall be monitored by medical officer appointed by competent authority.

(i) Instructions with regard to special hygienic precautions to be taken in the painting trade shall be distributed to working painters.

(vii) The Contractor shall observe all safety precautions to control the noise on all Sites and also provide all workmen deployed in the affected areas with the necessary equipment for safety against noise.

9 When the Work is done near any place where there is risk of drowning, all necessary equipment shall be provided and kept ready for use and all necessary steps taken for prompt rescue of any person in danger and adequate provision shall be made for prompt first aid treatment of all injuries likely to be sustained during the course of the Work.

10 Use of hoisting machines and shackle including their attachments, anchorage and supports shall conform to the following standards or conditions:

(i) These shall be of good mechanical construction, sound materials and adequate strength and free from patent defect and shall be kept in good working order.

(ii) Every rope used in hoisting or lowering materials or as a means of suspension shall be of durable quality and adequate strength and free from patent defects.

(iii) Every crane driver or hoisting appliance operator shall be properly qualified for his job.

(iv) In case of every hoisting machine and of every chain ring hook, shackle swivel and pulley block used in hoisting or as means of suspension, the safe working load shall be ascertained by adequate means. Every hoisting machine and all gears referred to above shall be plainly marked with the safe working load.

In case of hoisting machine having a variable safe working load, each safe working load and the conditions under which it is applicable shall be clearly indicated. No part of any machine or any gear referred to above in this paragraph shall be loaded beyond the safe working load except for the purpose of testing. The capacity of the hoisting machines shall be periodically checked.

- (v) The Contractor shall notify the safe working load of the machines to the Engineer-in-Charge whenever he brings any machinery to Site of work and gets it verified by the Engineer-in-Charge or his representative.

11 Motors, gearing, transmission, electric wiring and other dangerous parts of hoisting appliances shall be provided with efficient safeguards.

Hoisting appliances shall be provided with such means as shall reduce to the minimum, the risk of any part of a suspended load becoming accidentally displaced. When workmen are employed on or near electrical installations which are already energized, insulating mats, wearing apparel, such as gloves, sleeves and boot, as may be necessary, shall be provided. The workers shall not wear any rings, watches and carry keys or other materials which are good conductors of electricity.

12 All scaffolds, ladders and other safety devices mentioned or described herein shall be maintained in safe conditions and no scaffold, ladder or equipment shall be altered or removed while it is in use. Adequate washing facilities shall be provided at or near places of Work.

13 These safety provisions shall be brought to the notice of all concerned by display on a notice board at a prominent place on the Site. The person responsible for compliance of the safety code shall be named therein by the Contractor.

14 To ensure effective enforcement of the rules and regulations relating to safety precautions, the arrangements made by Contractor shall be open to inspection by the Labour officer /or the Engineer-in-Charge.

15 In addition to above, the Contractor shall take the following specific precautions for the Underground Works.

- (i) All precautions regarding safety of personnel working in tunnels/caverns/shafts, in connection with the handling of electrical installations, loading, blasting and seepage water etc. as specified in the relevant stipulations of IS codes shall be taken by the Contractor in order to ensure safe underground working. He shall also provide adequate medical, drinking water, sanitation, lighting and ventilation facilities.

- (ii) Emergency material shall be provided at each underground excavation heading

This equipment shall include, but not be limited to the following:

- 3 stretchers
- 3 woolen blankets
- 2 appliances for artificial breathing
- 1 oxygen flask
- 3 explosion-proof lamps
- wound dressing and disinfection material
- anti-pain injections
- gas masks

- (iii) At least two members of the Rescue Team as described hereinafter, properly instructed and trained in the rescue procedures, shall be in each crew working underground.
- (iv) Prior to the commencement of construction, the Contractor shall organize and train a Rescue Team composed of his employees. This Rescue Team shall be capable to render help after accidents caused by fire, gas explosion and avalanche etc.
- (v) The Rescue Team shall be organized in such a way that sufficient numbers of members are ready for action at any time until the Completion of Work.
- (vi) The Rescue Team members shall be instructed and trained for their task by a qualified and experience person. If required, the Contractor shall hire an outside specialist to perform such training. A refresher training for all members of the Rescue Team shall be conducted at least every six months.
- (vii) Each Rescue Team member shall be skilled in giving the first aid, dealing with the appliances for artificial respiration and fire fighting equipment and shall possess a good local knowledge. Adequate equipment for reaching even the remotest working area shall be at their disposal.
- (viii) The Contractor shall submit the details of the proposed Rescue Team organization to the Engineer-in-Charge for approval.

- 16 The Contractor shall at all times exercise reasonable and proper precautions for the safety of the people on the Works and shall comply with the provisions of current safety law and building and construction codes as may be applicable. All machinery and equipment and other sources of physical hazards shall be properly guarded. The Contractor shall have a full time staff exclusively in charge of securing the safety of the Work ensuring that all safety regulations are followed and in charge of indoctrination and teaching course on safety to the work force.
- 17 The Contractor shall provided all necessary fencing and lights to protect the public from accidents and shall be bound to bear all the expenses of defence of every suit, action and other proceedings at Law that may be brought by any person for injury sustained owing to neglect of the above precautions and to pay any damages and costs which may be awarded in any such suit, action and proceedings to any such persons or which may, with the consent of the Contractor, be paid to compromise any claim by any person.
- 18 About his employees, the Contractor shall ensure as follows:
- (i) Each employee shall be provided initial indoctrination regarding safety by the Contractor so as to enable him to conduct his Work in a safe manner.
 - (ii) No employee shall be given a new assignment of work unfamiliar to him without proper introduction as to the hazardous incident thereto, both to himself and his fellow employees.
 - (iii) Under no circumstances shall an employee hurry or take unnecessary chances when working under hazardous conditions.
 - (iv) Employees shall not leave naked fires unattended. Adequate fire fighting equipment shall be provided at crucial locations.
 - (v) Employees under the influence of any intoxicating beverage, even to the slightest degree, shall not be permitted to remain on Work.
 - (vi) There shall be suitable arrangement on every site for rendering prompt and sufficient first aid to the injured.
 - (vii) The stair cases and passage ways shall be adequately lighted.
 - (viii) The employees, when working around moving machinery, shall not be permitted to wear loose garments. Safety shoes are recommended when working in shops or places where materials or tools are likely to fall.

Only experienced workers shall be permitted to go behind guard rails or to clean around energized or moving equipment.

- (ix) The employees shall use the standard protection equipment intended before and after it is used.

19 The following precautions shall be taken for fire prevention:

- (i) All construction areas and storage yards shall be kept clean and well arranged.
- (ii) A clear space of 15 metres around the outer boundary of saw mill and lumber storage area may be provided. All lumber shall be stored in sections with fire breaks with a distance of 15 metres between consecutive section.
- (iii) All combustible waste material, wood scalings and soiled rags etc shall be removed daily and burnt in suitable burning area. The saw mill and lumber yard shall be kept free from accumulation of combustible debris.
- (iv) Fires, welding, flame cutting shall in general not be permitted in combustible area. Fires and open flame devices shall not be left unattended.
- (v) Smoking shall be prohibited in all fire prone areas, flammable material storages viz. Carpentry, paint shops, garages, service stations etc. "No smoking" signs shall be pasted on all such areas.
- (vi) Accumulations of flammable liquids on floors, walkways etc. should be prohibited. All spills of flammable liquids shall be cleaned up immediately.
- (vii) Smoke pipes from Diesel Engines passing through roof of combustible material e.g. in compressor stations on various Sites shall be insulated by asbestos. All joints of smoke pipe shall be riveted, welded or otherwise securely fastened together and supported to prevent accidental displacement or separation. The joints shall not be leaky.
- (viii) Flammable liquids, lubricants etc. shall be handled and transported in safety containers and drums which can be kept tightly capped.
- (ix) Storage of fuels and other flammable materials and liquids shall be set not less than 100 m away from the Works and permanent installations. All storage installations and tanks shall conform to the regulations set out in relevant Indian Standards.

- (x) Petrol or other flammable liquids with a flash point below 100 degrees Centigrade shall not be used for cleaning purpose.
- (xi) Oxygen cylinders shall not be stored with combustible materials.
- (xii) All electric installation shall be properly earthed. Repairs shall not be made on electrical circuits until the circuit has been de-energized.

20 THE FOLLOWING FIRE FIGHTING ARRANGEMENTS SHALL BE MADE BY THE CONTRACTOR:

- (i) Fire extinguishers and fire buckets filled with clean dry sand, painted red, shall be provided at all fire hazardous locations viz. Bathing and Mixing Plant, Winch houses, Workshops, store yards, Saw-mill, Switch Gear Room, Compressor Stations, Office establishments etc. The extinguishers shall be inspected, serviced and maintained in accordance with manufacturer's instructions. The inspection shall be evidenced by notations on tag attached to the extinguisher.
- (ii) Full reliance shall never be placed on portable hand extinguishers as all of these have a very limited capacity. Water, in ample quantity and under adequate pressure, shall always be available for fire fighting.
- (iii) Where a group of work points are located beyond the range of protection from a public water supply, the installation of a water system for private fire protection shall be warranted.
- (iv) Evacuation facilities and fire exit shall be provided at all locations featuring fire hazards.
- (v) Siren or other suitable fire alarm arrangement shall be made on all Sites. Warning signs shall be pasted at all locations having fire hazards.
- (vi) All staff shall be conversant with the use of all type of fire extinguishing apparatus.
- (vii) In the event of fire on electrical mains or apparatus, the effected part shall immediately be completely isolated from its source of supply of electrical energy.
- (viii) Demonstrations and training in fire fighting shall be conducted at sufficient intervals to ensure that sufficient personnel are familiar with and are capable of operating fire fighting equipment.

21 When any work is carried on, which is likely to affect the security or stability of an installation or structure or any part thereof and endanger any person employed, all practicable precautions shall be taken by shoring or otherwise to prevent collapse of

structure or fall of any part thereof and thus remove the cause of danger to such structures and the persons employed.

- 22 For persons engaged in handling of corrosive materials, adequate equipment shall be provided.
- 23 Where, in connection with any grinding, cleaning, spraying or manipulation of any material, there is emission of dust or fume of such character and to such extent as is likely to be injurious to the health of persons employed, all practical measures shall be taken by securing adequate ventilation or by the provision and use of suitable respirators or otherwise to prevent inhalation of such dust and fume.
- 24 The Contractor shall strictly follow the safety procedures & practices as mentioned in Indian standard IS5216-1982 “Guide for Safety Procedure & Practices in Electrical Work” during the execution of this Contract. In this regard the under J&K Electricity rules 1978 shall also be applicable to the Contractor to fulfill the safety precaution for workmen and Plant.
- 25 In addition to instructions contained here-in-above the safety regulations contained in the following IS Codes shall also apply wherever the provisions in the codes are exhaustive in nature.

i)	IS:4756-1978 (Reaffirmed 1991)	Safety Code for Tunneling Work
ii)	IS: 3696-1987 (Part-I) (Reaffirmed 1991)	Safety Code of Scaffolds & Ladders (Pt. I Scaffolds)
iii)	IS: 3696-1991 (Part-II)	Safety Code of Scaffolds & Ladders (Pt. II Ladders)
iv)	IS: 3016-1982 (Reaffirmed 1990)	Fire precaution in welding and cutting operations
v)	IS - 5216-1982 Part 1 & 2 (Reaffirmed 1990)	Guide for Safety procedures and Practices in Electrical work Part 1 – General Part-2 – Life saving techniques

- 26 Notwithstanding the above provisions, the Engineer-in-Charge may require the Contractor to follow any other Act or Rules in force in J&K in respect of Safety Precautions so as to ensure the safety of the Workmen and the Plant and the Contractor shall promptly comply with such requirements.

SECTION – IX

SAMPLE FORMS AND PROCEDURES (FORMS)

SAMPLE FORMS AND PROCEDURES (FORMS)

Preamble

This Section (Section –IX) of the Bidding Documents [named as Sample Forms and Procedures (FORMS)] provides proforma to be used by the bidders at the time of their bid preparation and by the Contractor subsequent to the award of Contract.

The Bidder shall complete, sign and submit with its bid the relevant FORMS to be used unamended, in accordance with the requirements included in the Bidding Documents.

The Bidder shall provide the Bid Security, either in the form included hereafter or in another form acceptable to the Employer, pursuant to the provisions in the instructions to Bidders.

The Form of Contract Agreement shall be used unamended, except for the need to complete Article 1.1 (Contract Documents), as appropriate and as may be required to suit the specific requirement of the Contract. The form shall also include the Appendices listed, as required, which should be completed according to the instructions for their completion provided at the beginning of each Appendix. The Price Schedule deemed to form part of the contract shall be modified according to any corrections or modifications to the accepted bid resulting from price corrections, pursuant to the provisions of the Instructions to Bidders.

The Performance Security (ies) and Bank Guarantee for Advance Payment forms should not be completed by the bidders at the time of their bid preparation. Only the successful Bidder will be required to provide the Performance Security(ies) and Bank Guarantee for Advance Payment, according to one of the forms indicated herein or in another form acceptable to the Employer and pursuant to the provisions of the General and Special Conditions of Contract, respectively.

Depending on specific facts and circumstances related to the Bid, other specific agreement, if any, and the contract, the text of the Forms herein may need to be modified to some extent. The Employer reserves the right to make such modifications in conformity with such specific facts and circumstances and rectify and consequent discrepancies, if any. However, modifications, if any, to the text of the Forms that may be required in the opinion of the Bidder/Contractor shall be effected only if the same is approved by the Employer. The Employer's decision in this regard shall be final and binding.

1. BID FORMS AND PRICE SCHEDULES

1.1 Bid Form

Please see Volume – III.

1.2 Price Schedule

Please see Volume - III

2. BID SECURITY FORM

((To be stamped in accordance with Stamp Act, the Non-Judicial Stamp Paper should be in the name of the issuing Bank. For the purpose of verification/confirmation of this Bank Guarantee by the Employer, the Bank shall indicate 2 official email ids of the authorized signatories from Issuing Branch and also of the designated higher office (Corporate Office, Zonal Office etc) in the covering letter of the Bank forwarding the Bank Guarantee.))

Bank Guarantee No.:

Date:

To: *(insert Name and Address of Employer)*

WHEREAS M/s. *(Insert name of Bidder)*..... having its Registered/Head Office at *(Insert address of the Bidder)* (Hereinafter called "the Bidder") has submitted its Bid for the performance of the Contract for***(insert name of the Package)*** under***(insert Specification No)***..... (Hereinafter called "the Bid")

KNOW ALL PERSONS by these present that WE *(insert name & address of the issuing bank)* having its Registered/Head Office at*(insert address of registered office of the bank)*..... (hereinafter called "the Bank"), are bound unto*(insert name of Employer)*..... (hereinafter called "the Employer") in the sum of*(insert amount of Bid Security in figures & words)*..... for which payment well and truly to be made to the said Employer, the Bank binds itself, its successors and assigns by these presents.

Sealed with the Common Seal of the said Bank this day of 20....

THE CONDITIONS of this obligation are:

- (1) If the Bidder withdraws its bid during the period of bid validity specified by the Bidder in the Bid Form; or
- (2) In case the Bidder does not withdraw the deviations proposed by him, if any, at the cost of withdrawal stated by him in the bid and/or accept the withdrawals/rectifications pursuant to the declaration/confirmation made by him in Attachment – Declaration of the Bid; or
- (3) If the Bidder does not accept the corrections to arithmetical errors identified during preliminary evaluation of his bid pursuant to ITB Clause 27.2; or
- (4) If, as per the requirement of Qualification Requirements the Bidder is required to submit a Deed of Joint Undertaking and he fails to submit the same, duly attested by Notary Public of the place(s) of the respective executants (s) or registered with the Indian

Embassy/High Commission in that Country, within ten days from the date of intimation of post – bid discussion; or

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

(i) To sign the Contract Agreement, in accordance with ITB Clause 34, or

(ii) To furnish the required performance security, in accordance with ITB Clause 35.
or

(6) In any other case specifically provided for in ITB.

WE undertake to pay to the Employer up to the above amount upon receipt of its first written demand, without the Employer having to substantiate its demand, provided that in its demand the Employer will note that the amount claimed by it is due to it, owing to the occurrence of any of the above-named CONDITIONS or their combination, and specifying the occurred condition or conditions.

This guarantee will remain in full force up to and including (*insert date, which shall be the date 30 days after the period of bid validity*)....., and any demand in respect thereof must reach the Bank not later than the above date.

Notwithstanding anything contained herein:

1. Our liability under this Bank Guarantee shall not exceed _____ (*value in figures*) _____ [*value in words*] _____.
2. This Bank Guarantee shall be valid upto _____ (*validity date*) _____.
3. We are liable to pay the guaranteed amount or any part thereof under this Bank Guarantee only & only if we receive a written claim or demand on or before _____ (*validity date*) _____

For and on behalf of the Bank

[*Signature of the authorised signatory(ies)*]

Signature _____

Name _____

Designation _____

POA Number _____

Contact Number(s): Tel. _____ Mobile _____

Fax Number _____

email _____

Common Seal of the Bank _____

Witness:

Signature _____

Name _____

Address _____

Contact Number(s): Tel. _____ Mobile _____

email _____

Note:

1. Normally EMD shall be submitted only in the name of the JV and not in the name of constituent member. However, in exceptional cases, EMD in the name of lead partner can be accepted subject to submission of specific request letter from lead partner stating the reasons for not submitting the EMD in the name of JV and giving written confirmation from the JV partners to the effect that the EMD submitted by the lead partner may be deemed as EMD submitted by JV firm.
2. The Bank Guarantee should be in accordance with the proforma as provided. However, in case the issuing bank insists for additional paragraph regarding applicability of ICC publication No: 758, the following may be added at the end of the proforma of the Bank Guarantee [*i.e., end paragraph of the Bank Guarantee preceding the signature(s) of the issuing authority(ies) of the Bank Guarantee*]:

“This Guarantee is subject to Uniform Rules for Demand Guarantee, ICC publication No. 758.”

3a. FORM OF NOTIFICATION BY THE EMPLOYER TO THE BANK
(Applicable for Forfeiture of Bank Guarantee)

To: *(insert Name and Address of the issuing Bank)*

Ref.: Forfeiture of Bid Security Amount against Bank Guarantee No. dated
..... for, issued by you on behalf of M/s.*(insert name of the Bidder)*
.....

Dear Sirs,

Please refer to the subject Bank Guarantee executed by you in our favour for as
Bid Security for the bid submitted by M/s.*(insert name of the Bidder)* against
(insert name of the Package) ; Specification No.

As per the terms of the said guarantee, the bank has guaranteed and undertaken to pay
immediately on demand by the Employer the amount of without any reservation,
protest, demur and recourse. Further, any demand made by the Employer shall be conclusive
and binding on the Bank irrespective of any dispute or difference raised by the Bidder.

In terms of the said guarantee, we hereby submit our claim/demand through this letter for
remittance of Bid Security amount to ... *(insert name of the Employer)* owing to the
occurrence of the condition referred to at Sl. No. The Bank is requested to remit the full
guaranteed sum towards proceeds of the bid security in the form of Demand
Draft in favour of '... *(insert name of the Employer)*', payable at*(insert place of the
Employer)*....'.

Thanking you,

For.....*(Name of the Employer)*

(AUTHORISED SIGNATORY)

Copy to:

.....*(Registered Office of the Bank)*....

3b. FORM OF NOTIFICATION BY THE EMPLOYER TO THE BANK
(Applicable for conditional claim pending extension of Bank Guarantee by the Bidder)

To: *(insert Name and Address of the issuing Bank)*

Ref.: Conditional Claim against Bank Guarantee No. dated for
valid up to issued by you on behalf of M/s.*(insert name of the Bidder)*
.....

Dear Sirs,

Please refer to the subject Bank Guarantee executed by you in our favour on behalf of M/s.
.....*(insert name of the Bidder)*, who have submitted this Bank Guarantee to us
towards Bid Security against *(insert name of the Package)* ; Specification No.
.....

We, ... *(insert name of the Employer)* do hereby request you to lodge our
claim/demand against the subject Bank Guarantee for full guaranteed sum. Kindly note that
this claim/demand against the subject Bank Guarantee is without any further notice in case
the amendment to Bank Guarantee No. dated extending its validity upto
..... is not got arranged by*(insert name of the Bidder)* in our favour and
are not received by us upto In such an event you are requested to remit the full
guaranteed amount in terms of the subject guarantee in its letter and spirit and proceeds of
this Bank Guarantee shall be forwarded to us in form of demand draft in favour of '.... *(insert
name of the Employer)*, payable at*(insert place of the Employer)*....'.

This is without prejudice to our right under this guarantee and under the law.

Thanking you,

For.....*(Name of the Employer)*

(AUTHORISED SIGNATORY)

Copy to:

(insert Name and Address of the Bidder)

- You are requested to do the needful so that the amendment to the subject Bank Guarantee
extending the validity up to is received by us by

4. FORM OF CONTRACT AGREEMENT
(On non-judicial stamp paper of appropriate value)

Format will be shared with the qualified bidder

4.1 PROCEDURES OF PAYMENT

TERMS AND PROCEDURES OF PAYMENT

In accordance with the provisions of GCC Clause 33 (Terms of Payment), the Employer shall pay the Contractor in the following manner and at the following times, on the basis of the Price Breakdown given in the section on price schedules. **Payments will be made in the Indian currencies.** The Contractor may make applications for payment in respect of part deliveries as work proceeds.

1. Payment Terms for Supply, Delivery, Freight & Insurance, Erection, testing and commissioning of the facility

a) 70% of Contract Price of the works shall be paid as progressive payment on the receipt of goods at site and its successful Erection, Testing and Commissioning (as applicable) including civil works against pro-rata contract value of the work completed and certified by the Site Engineer of RECTPCL and on submission of Supplier's commercial invoice in triplicate, completion certificate issued by Engineer-In-Charge and copy of Insurance Policy(s) taken by the Contractor as per provision of Contract.

b) The balance payment (minus insurance charges for Defect Liability Period) of the contract price shall be made after successful erection, testing & commissioning and issuance of inspection clearance certificate by inspection agency of RECTPCL within 30 days thereafter.

Prorata payment of insurance charges for Defect Liability Period shall be paid in monthly installments during defect liability period.

c) Deduction towards taxes and duties as applicable shall be made from every interim payment certified by RECTPCL.

d) Any payment under this contract shall be released after following activities are completed by the contractor:

- i) Contractor's GST Invoice.
- ii) Submission of acknowledged copy of Notification of Award.
- iii) Signing of Contract Agreement with RECTPCL.
- iv) Submission of Contract Performance Guarantee as per clause no. 9 of General Conditions of Contract.
- v) Submission of the details of items, components, raw materials, services etc. procured/availed from MSEs, if any, for the preceding 6 months.

e) Payments shall be released by RECTPCL, New Delhi. Bills along with all details of measurement sheets shall be submitted by the contractor as per the provisions of General Conditions of Contract Clause No. 33.0. Payment for the work will be regulated in accordance with the above Clauses. However, the initial payment shall be released after submission of a copy of the License obtained under Contract Labour (Regulation and Abolition) Act 1970. All bills shall be submitted through the Engineer-in-charge.

2. PAYMENT PROCEDURES

2.1. Method of Payment

The Employer shall make payments promptly within thirty (30) days of submission of an invoice/claim by the Contractor, complete in all respects and supported by the requisite documents and fulfillment of stipulated conditions, if any. **All invoices/claim shall be raised by the contractor in the name of owner acting through RECTPCL .**

All payments to be made directly to the Contractor shall be made by the Employer through electronic payment mechanism (e-payment) for which necessary details shall be tied up during execution of the Contract. However, a request for payment to be released through cheque shall be considered on case to case basis and merit of the same.

4.2 PRICE ADJUSTMENT

NOT APPLICABLE

4.3 INSURANCE REQUIREMENTS**A) Insurances to be taken out by the Contractor**

In accordance with the provisions of GCC Clause 40, the Contractor shall at its expense take out and maintain in effect, or cause to be taken out and maintained in effect, during the performance of the Contract, the insurances set forth below in the sums and with the deductibles and other conditions specified. The identity of the insurers and the form of the policies shall be subject to the approval of the Employer, such approval not to be unreasonably withheld. The inability of the insurers to provide insurance cover in the sums and with the deductibles and other conditions as set forth below, shall not absolve the Contractor of his risks and liabilities under the provisions of GCC Clause 40. However, in such a case the Contractor shall be required to furnish to the Employer documentary evidence from the insurer in support of the insurer's inability as aforesaid.

(a) Marine Cargo Policy/Transit Insurance Policy:**(I)(i) Marine Cargo policy for imported equipment**

The Contractor shall take the Marine Cargo Policy for Plant and Equipment including mandatory Spares to be supplied from abroad wherein export/import including inland transit is involved for the movement of the Plant and Equipment including mandatory Spares. The policy shall cover movement of Plant and Equipment including mandatory Spares from the manufacturer's works to the project's warehouse at final destination site. The policy shall cover all risk for loss or damage that may occur during transit of Plant and Equipment including mandatory Spares from the Contractor/sub-Contractor's works or stores until arrival at project's warehouse/ store at final destination. Institute Cargo Clause (ICC) 'A' along with war & Strike Riots & Civil Commotion (SRCC) cover shall be taken.

(I)(ii) Transit Insurance Policy for indigenous equipment

Similarly, Transit Insurance Policy shall be taken wherein only inland transit is involved for the movement of Plant and Equipment including mandatory Spares supplied from within India. The policy shall cover movement of Plant and Equipment including mandatory Spares from the manufacturer's works to the project's warehouse at final destination site. Inland Transit Clause (ITC) 'A' along with war & Strike Riots & Civil Commotion (SRCC) extension cover shall be taken.

Amount	Deductible Limits	Parties insured	From	To
120% of CIP Entry Border Point Price /CIF Indian Port of Entry Price of all the Plant and Equipment including mandatory Spares to be supplied from abroad plus customs duties (including BCD, GST, Cess etc.) on merit rate and 120% of Ex-work Price of all the Plant and Equipment including mandatory Spares to be supplied from within India plus GST , if additionally payable.	Nil	Contractor & Employer	Mfrs ware-house	Project's ware-house store at final destination

(II) If during the execution of Contract, the Employer requests the Contractor to take any other add-on cover(s)/ supplementary cover(s) in aforesaid insurance, in such a case, the Contractor shall promptly take such add-on cover(s)/ supplementary cover(s) and the charges towards such premium for such add-on cover(s)/ supplementary cover(s) shall be reimbursed to the Contractor on submission documentary evidence of payment to the Insurance company. Therefore, charges towards premium for such add-on cover(s)/ supplementary cover(s) are not included in the Contract Price.

(III) The Contractor shall take the policy in the joint names of Employer and the Contractor. The policy shall indicate the Employer as the beneficiary. However, if the Contractor is having an open policy for its line of business, it should obtain an endorsement of the open cover policy from the insurance company indicating that the dispatches against this Contract are duly covered under its open policy and include the name of the Employer as jointly Insured in the endorsements to the open policy.

(b) Erection All Risk Policy/Contractor All Risk Policy:

(I) The policy should cover all physical loss or damage to the facility at site during storage, erection and commissioning covering all the perils as provided in the policy as a basic cover and the add on covers as mentioned at Sl. No. (III) below.

Amount	Deductible limits	Parties insured	From	To
105% of CIP Entry Border Point Price /CIF Indian Port of Entry Price of all the Plant and Equipment including mandatory Spares to be	Nil	Contractor & Employer	Receipt at site of first lot of the Plant and Equipment including mandatory	Up to Operational Acceptance

supplied from abroad plus customs duties (including BCD, GST, Cess etc.) on merit rate and 105% of Ex-work Price of all the Plant and Equipment including mandatory Spares to be supplied from within India plus GST , if additionally payable. and 100% of erection price component			Spares	

- (II) The Contractor shall take the policy in the joint name of Employer and the Contractor. All these policies shall indicate Employer as the beneficiary. The policy shall be kept valid till the date of the Operational Acceptance of the project and the period of the coverage shall be determined with the approval of the Employer.

If the work is completed earlier than the period of policy considered, the Contractor shall obtain the refund as per provisions of the policy and pass on the benefit to Employer. In case no refund is payable by the insurance company then the certificate to that effect shall be submitted to Employer at the completion of the project.

- (III) The following add-on covers shall also be taken by the Contractor:

- i) Earthquake
- ii) Terrorism
- iii) Escalation cost (approximately @10% of sum insured on annual basis)
- iv) Extended Maintenance cover for Defect Liability Period
- v) Design Defect
- vi) Other add-on covers viz., 50-50 clause, 72 hours clause, loss minimization clause, waiver of subrogation clause (for projects of more than Rs.100 crores, cover for offsite storage/fabrication (over Rs.100 crores).

- (IV) ***Third Party Liability cover with cross Liability within Geographical limits of India as on ADD-on cover to the basic EAR cover:***

The third party liability add-on cover shall cover bodily injury or death suffered by third parties (including the Employer's personnel) and loss of or damage to property (including the Employer's property and any parts of the Facilities which have been accepted by the Employer) occurring in connection with supply and installation of the Facilities.

Amount	Deductible limits	Parties insured	From	To
- For projects upto Rs. 100 crores, the third party liability limit shall be 10% of the project value for single occurrence/ multiple occurrences in aggregate during the entire policy period. - For projects from Rs. 100 crores to Rs. 500 crores, the third party liability limit shall be Rs. 10 crores for single occurrence/multiple occurrences in aggregate during entire policy period. For projects of more than Rs.500 crores, the third party liability limit shall be Rs. 25 crores for single occurrence/ multiple occurrences in aggregate during entire policy period.	Nil	Contractor/ Sub-contractor	Receipt at site	Upto Defect Liability Period.

(V) As there is no OSM material in this contract. So, Contractor shall take consolidated insurance on all supply items mentioned in the Supply Contract.

(c) Automobile Liability Insurance

The Contractor shall ensure that all the vehicles deployed by the Contractor or its Subcontractors (whether or not owned by them) in connection with the supply and installation of the Facilities in the project are duly insured as per RTA act. Further the Contractor or its Subcontractors may also take comprehensive policy(own damage plus third party liability) of each individual vehicles deployed in the project on their own discretion in their own name to protect their own interest.

(d) Workmen Compensation Policy:

(I) Workmen Compensation Policy shall be taken by the Contractor in accordance with the statutory requirement applicable in India. The Contractor shall ensure that all the workmen employed by the Contractor or its Subcontractors for the project are adequately covered under the policy.

- (II) The policy may either be project specific covering all men of the Contractor and its Subcontractors. The policy shall be kept valid till the date of Operational Acceptance of the project.

Alternatively, if the Contractor has an existing 'Workmen Compensation Policy' for all its employees including that of the Subcontractor(s), the Contractor must include the interest of the Employer for this specific Project in its existing 'Workmen Compensation Policy'.

- (III) Without relieving the Contractor of its obligations and responsibilities under this Contract, before commencing work the Contractor shall insure against liability for death of or injury to persons employed by the Contractor including liability by statute and at common law. The insurance cover shall be maintained until all work including remedial work is completed including the Defect Liability Period. The insurance shall be extended to indemnify the Principal for the Principal's statutory liability to persons employed by the Contractor.

The Contractor shall also ensure that each of its Subcontractors shall effect and maintain insurance on the same basis as the 'Workmen Compensation Policy' effected by the Contractor.

(e) Contractor's Plant and Machinery (CPM) Insurance

The Employer (including without limitation any consultant, servant, agent or employee of the Employer) shall not in any circumstances be liable to the Contractor for any loss of or damage to any of the Contractor's Equipment or for any losses, liabilities, costs, claims, actions or demands which the Contractor may incur or which may be made against it as a result of or in connection with any such loss or damage.

The Employer shall be named as co-insured under all insurance policies taken out by the Contractor except for the Third Party Liability, Workmen Compensation Policy Insurances, and the Contractor's Subcontractors shall be named as co-insureds under all insurance policies taken out by the Contractor except for the Cargo Insurance During Transport, Workmen Compensation Policy Insurances. All insurer's rights of subrogation against such co-insureds for losses or claims arising out of the performance of the Contract shall be waived under such policies.

B) Insurances to be taken out by the Employer

The Employer shall at its expense take out and maintain in effect during the performance of the Contract the following insurances.

Amount	Deductible limits	Parties Insured	From	To

____ NIL ____

-- *End* --

4.4 TIME SCHEDULE

1. The Project Completion Schedule shall be as follows:

Description	Duration in Months from the date of Notification of Award
Taking Over by the Employer upon successful Completion of:	
“Design, Engineering, Supply & Construction of Residential Staff Quarters & associated facilities at 160 MVA, 220/33 kV Gas Insulated Substation (GIS) at Lassipora(Srinagar Region) on Turnkey Basis associated with Strengthening of Transmission System of JKPTCL under PMDP Scheme-15”	06 months

- 1.1 The activity(ies) under the Contractor’s programme for Project Completion shall be in the form of a master network (MNW) and shall identify the various activities like design, engineering, manufacturing, supply, installation, factory testing, transportation to site, site testing and commissioning, trial operation and Taking Over etc. of the Facilities or specific part thereof (where specific parts are specified in GCC). The network shall conform to the above Project Completion Schedule.

This master network will be discussed and agreed before Award in line with above, engineering drawing and data submission schedule shall also be discussed and finalised before Award. Liquidated damages for delay in successful Completion of the Facilities or specific part thereof (where specific parts are specified in GCC) and Operational Acceptance at rates specified in Tender document shall be applicable beyond the date specified above.

- 1.2 The Employer reserves the right to request minor changes in the work schedule at the time of Award of Contract to the successful Bidder.
- 1.3 The successful Bidder shall be required to prepare detailed Network(s) and project implementation plans & programmes and finalise the same with the Employer as per the requirement specified in Technical Specifications, which shall form a part of the Contract.

4.5 LIST OF APPROVED SUBCONTRACTORS

Please Refer Volume- II, Technical Specification in this regard

Further, erection portion of the contract shall not be subcontracted without the prior approval of the Employer. However, such approval shall not be necessary for engaging labour.

4.6 LIST OF DOCUMENTS FOR APPROVAL OR REVIEW

Pursuant to tender document, the Contractor shall prepare, or cause its Subcontractor to prepare, and present to the Project Manager (EMPLOYER) in accordance with the requirements of contract (Program of Performance), the following documents for:

A. Approval

- 1.
- 2.
- 3.

B. Review

- 1.
- 2.
- 3.

Note:

Bidder shall furnish the exhaustive list, which shall be discussed and finalised for incorporation into the Contract Agreement.

4.7 GUARANTEES, LIQUIDATED DAMAGES FOR NON – PERFORMANCE

NOT APPLICABLE

.

Instruction for printing & submitting Integrity Pact

The requisite format of Integrity Pact is displayed here below.

Take print out of first page on a non-judicial stamp paper of Rs. 100/- /Company's Letterhead, as applicable, and other pages on plain A4 size paper. **Such two sets shall be prepared by the bidder.**

All the pages of both the copies of the Integrity Pact shall be signed by the authorised representative of the bidder and duly stamped.

Both the original copies shall be submitted by the bidder in the form of Hard Copy as part of the first envelope before due date & time of submission of the bid.

4.8 AGREEMENT

UNDER INTEGRITY PACT

No.

Dated

To,

**REC Transmission Projects Company Limited,
New Delhi**

Sub : Procurement of Bidding Documents

Ref. Tender no.

RECTPCL and the Bidder agree that the Notice Inviting Tender (NIT) is an offer made on the condition that the bidder will sign the Integrity Pact and the Bid would be kept open in its original form without variation or modification for a period of (state the number of days from the last date for the receipt of tenders stated in the NIT) days and the making of the bid shall be regarded as an unconditional and absolute acceptance of this condition of the NIT.

We confirm acceptance and compliance with the Integrity Pact in letter and spirit. We further agree that the contract consisting of the above conditions of NIT as the offer and the submission of Bid as the Acceptance shall be separate and distinct from the contract which will come into existence when bid is finally accepted by RECTPCL.

The consideration for this separate initial contract preceding the main contract is that RECTPCL is not agreeable to sell the NIT to the Bidder and to consider the bid to be made except on the condition that the bid shall be kept open for days after the last date fixed for the receipt of the bids and the Bidder desires to make a bid on this condition and after entering into this separate initial contract with RECTPCL.

RECTPCL promises to consider the bid on this condition and the Bidder agrees to keep the bid open for the required period. These reciprocal promises form the consideration for this separate initial contract between the parties.

If Bidder fails to honour the above terms and conditions, RECTPCL shall have unqualified, absolute and unfettered right to encash / forfeit the bid security submitted in this behalf.

Yours faithfully,

(BIDDER)

Yours faithfully

(PURCHASER)

INTEGRITY PACT

PRE-CONTRACT INTEGRITY PACT

General

This pre-bid contract Agreement (hereinafter called the Integrity Pact) is made on _____ day of the month of __ 20____, between, on one hand, the CEO of REC Transmission Projects Company Limited through Shri. _____ Designation of the officer, Ministry, Department, Government of India (hereinafter called the "BUYER", which expression shall mean and include, unless the context otherwise requires, his successors in the office and assigns) of the First Part and M/s. _____ represented by Shri _____, Authorized Signatory (hereinafter called the "BIDDER/Seller" which expression shall mean and include, unless the context otherwise requires, his successors and permitted assigns) of the Second Part.

WHEREAS the BUYER proposes to procure _____ (Name of the stores/equipment/items) and the BIDDER/Seller is willing to offer/has offered the stores and

WHEREAS the BIDDER is a private company/ public company/Government undertaking / partnership / registered export agency, constituted in accordance with the relevant law in the matter and the BUYER is a Ministry/Department of the Government of Indian/PSU performing its functions on behalf of the President of India.

NOW, THEREFORE,

To avoid all forms of corruption by following a system that is fair, transparent and free from any influence/prejudiced dealings prior to, during and subsequent to the currency of the contract to be entered into with a view to:-

Enabling the BUYER to obtain the desired stores/equipment at a competitive price in conformity with the defined specifications by avoiding the high cost and the distortionary impact of corruption on public procurement, and

Enabling BIDDER to abstain from bribing or indulging in any corrupt practice in order to secure the contract by providing assurance to them that their competitors will also abstain from bribing and other practices and the BUYER will commit to prevent corruption, in any form, by its officials by following transparent procedures.

The parties hereto hereby agree to enter into this Integrity Pact and agree as follows:

Commitments of the Buyer

1.1 The Buyer undertakes that no official of the BUYER, connected directly or indirectly with the contract, will demand, take a promise for or accept, directly or through intermediaries, any bribe, consideration, gift, reward, favour or any material or immaterial benefit or any other advantage from the BIDDER, either for themselves or for any person, organization or third party related to the contract in exchange for an advantage in the bidding process, bid evaluation, contracting or implementation process related to the Contract.

- 1.2 The Buyer will, during the pre-contract stage, treat all Bidders alike, and will provide to all Bidders the same information and will not provide any such information to any particular BIDDER which could afford an advantage to that particular BIDDER in comparison to other BIDDERS.
- 1.3 All the officials of the Buyer will report to the appropriate Govt. Office for any attempted or completed breaches of the above commitments as well as any substantial suspicion of such a breach.
2. In case of any such preceding misconduct on the part of such official(s) is reported by the BIDDER to the BUYER with full and verifiable facts and the same is *prima facie* found to be correct by the Buyer, necessary disciplinary proceedings, or any other action as deemed fit, including criminal proceedings may be initiated by the BUYER and such a person shall be debarred from further dealings related to the contract process. In such a case while an enquiry is being conducted by the Buyer the proceedings under the contract would not be stalled.

Commitments of Bidders

3. The BIDDER commits itself to take all measures necessary to prevent corrupt practices, unfair means and illegal activities during any stage of its bid or during any pre contract or post-contract stage in order to secure the contract or in furtherance to secure it and in particular commits itself to the following:-
 - 3.1 The will not offer, directly or through intermediaries, any bribe, gift, consideration, reward, favour, any material or immaterial benefit or other advantage, commission, fees, brokerage or inducement to any official of the Buyer, connected directly or indirectly with the bidding process, or to any person, organization or third party related to the contract in exchange for any advantage in the bidding, evaluation, contracting and implementation of the Contract.
 - 3.2 The BIDDER further undertakes that it has not given, offered or promised to give, directly or indirectly any bribe, gift, consideration, reward, favour, any material or immaterial benefit or other advantage, commission, fees, brokerage or inducement to any official of the Buyer or otherwise in procuring the Contract or for bearing to do or having done any act in relation to the obtaining or execution of the Contract or any other Contract with the Govt for showing or for bearing to show favour or dis-favour to any person in relation to the Contract or any other Contract with the Govt..
 - 3.3 The BIDDERS shall disclose the name and address of agents and representatives and Indian BIDDERS shall disclose their foreign principals or associates.
 - 3.4 The BIDDERS shall disclose the payments to be made by them to agents/brokers or any other intermediary, in connection with this bid/contract.
 - 3.5 The BIDDER further confirms and declares to the BUYER that the BIDDER is the original manufacturer/integrator/authorized govt. sponsored export entity of the defense stores

and has not engaged any individual or firm or company whether Indian or foreign to intercede, facilitate or in any way to recommend to the BUYER or any of its functionaries, whether officially or unofficially to the award of the contract to the BIDDER, nor has any amount been paid, promised or intended to be paid to any such individual, firm or company in respect of any such intercession, facilitation or recommendation.

- 3.6 The Bidder, either while presenting the bid or during pre-contract negotiations or before signing the contract, shall disclose any payments he has made, is committed to or intends to make to officials of the Buyer or their family members, agents, brokers or any other intermediaries in connection with the contract and the details of services agreed upon for such payments.
- 3.7 The BIDDER will not collude with other parties interested in the contract to impair the transparency, fairness and progress of the bidding process, bid evaluation, contracting and implementation of the contract.
- 3.8 The BIDDER will not accept any advantage in exchange for any corrupt practice, unfair means and illegal activities.
- 3.9 The BIDDER shall not use improperly, for purposes of competition or personal gain, or pass on to others, any information provided by the BUYER as part of the business relationship, regarding plans, technical proposals and business details, including information contained in any electronic data carrier. The BIDDER also undertakes to exercise due and adequate care lest any such information is divulged.
- 3.10 The BIDDER commits to refrain from giving any complaint directly or through any other manner without supporting it with full and verifiable facts.
- 3.11 The BIDDER shall not instigate or cause to instigate any third person to commit any of the actions mentioned above.
- 3.12 The BIDDER shall not lend to or borrow any money from or enter into any monetary dealings or transactions, directly or indirectly, with any employee of the BUYER.

4. Previous Transgression

- 4.1 The BIDDER declares that no previous transgression occurred in the last three years immediately before signing of this Integrity Pact, with any other company in any country in respect of any corrupt practices envisaged hereunder or with any Public Sector Enterprise in India or any Government Department in India that could justify BIDDER exclusion from the tender process.
- 4.2 The BIDDER agrees that if it makes incorrect statement on this subject, BIDDER can be disqualified from the tender process or the contract, if already awarded, can be terminated for such reason.

5. Earnest Money (Security Deposit)

5.1 While submitting commercial bid, the BIDDER deposit an amount_____ (to be specified in the RFP (Request for Proposal) as Earnest Money/Security Deposit, with the BUYER through any of the following instruments :-

(i) Bank Draft or a Pay Order in favour of _____

(ii) A confirmed guarantee by an Indian Nationalized Bank, promising payment of the guaranteed sum to the BUYER, on demand within three working days without any demur whatsoever and without seeking any reasons whatsoever. The demand for payment by the BUYER shall be treated as conclusive proof of payment.

(iii) Any other mode or through any other instrument (to be specified in RFP).

5.2 The Earnest Money/Security Deposit shall be valid & retained by the buyer for such period as specified in the RFP/GTC.

5.3 In the case of successful BIDDER, a clause would also be incorporated in the Article pertaining to Performance Bond in the Purchase Contract that the provisions of Sanctions for Violation shall be applicable for forfeiture of Performance Bond in case of a decision by the BUYER to forfeit the same without assigning any reason for imposing sanction for violation of this pact.

5.4 No interest shall be payable by the BUYER to the BIDDER/SELLER on Earnest Money/Security Deposit for the period of its currency.

6. Sanctions for Violation

6.1 Any breach of the aforesaid provisions by the BIDDER or any one employed by it or acting on its behalf (whether with or without the knowledge of the BIDDER/SELLER) shall entitle the BUYER to take all or any one of the following actions, wherever required:-

(i) To immediately call off the pre-contract negotiations without assigning any reason or giving any compensation to the BIDDER. However, the proceedings with the other BIDDER(s) would continue.

(ii) The Earnest Money Deposit (in pre-contract stage) and/or Security Deposit /Performance Bond (after the contract is signed) shall stand forfeited either fully or partially, as decided by the BUYER and the BUYER shall not be required to assign any reason therefore.

(iii) To immediately cancel the contract, if already signed, without giving any compensation to the BIDDER.

(iv) To recover all sums already paid by the BUYER, and in case of an Indian BIDDER with interest thereon at 2% higher than the prevailing Prime Lending Rate of State Bank of India, while in case of a BIDDER from a country other than India with interest thereon at 2% higher than the LIBOR. If any outstanding payment is due to the BIDDER from the BUYER in connection with any other contract for any other stores, such outstanding payment could also be utilized to recover the aforesaid sum and interest.

- (v) To encash the advance bank guarantee and performance bond/warranty bond, if furnished by the BIDDER, in order to recover the payments, already made by the BUYER, along with interest.
- (vi) To cancel all or any other Contracts with the BIDDER. The BIDDER shall be liable to pay compensation for any loss or damage to the BUYER resulting from such cancellation/rescission and the BUYER/principal shall be entitled to deduct the amount so payable from the money(s) due the BIDDER
- (vii) To debar the BIDDER from participating in future bidding processes of the Government of India BUYER/Principal for a minimum period of five years, which may be further extended at the discretion of the BUYER.
- (viii) To recover all sums paid in violation of this Pact by BIDDER to any middleman or agent or broker with a view to securing the contract.
- (ix) In cases where irrevocable Letters of Credit have been received in respect of any contract signed by the BUYER with the BIDDER, the same shall not be opened.
- (x) Forfeiture of Performance Bond in case a decision by the BUYER to forfeit the same without assigning any reason for imposing sanction for violation of this Pact.

6.2 The BUYER will be entitled to take all or any of the actions mentioned at para 6.1 (i) to (x) of this Pact also on the Commission by the BIDDER or anyone employed by it or acting on its behalf (whether with or without the knowledge of the BIDDER), of an offence as defined in Chapter IX of the Indian Penal code, 1860 or Prevention of Corruption Act, 1988 or any other statute enacted for prevention of corruption.

6.3 The decision of the BUYER to the effect that a breach of the provisions of this Pact has been committed by the BIDDER shall be final and conclusive on the BIDDER. However, the BIDDER can approach the Independent monitor(s) appointed for the purposes of this Pact.

7. Independent Monitors

7.1 The BUYER has appointed Independent Monitors (hereinafter referred to as Monitors) for this Pact in consultation with the Central Vigilance Commission .

Shri P. V. Rao, IRS
Ex-Chief Commissioner of Income
Tax,
The IEMs' Secretariat,
Procurement and Contract
Management (PCM) Division,
REC LIMITED (Formerly Rural
Electrification Corporation Limited).,
Core-IV, SCOPE Complex, 7-Lodhi
Road,
New Delhi- 110003
Email:

- 7.2 The task of the Monitors shall be to review independently and objectively, whether and to what extent the parties comply with the obligations under this Pact.
- 7.3 The Monitors shall not be subject to instructions by the representatives of the parties and perform their functions neutrally and independently.
- 7.4 Both the parties accept that the Monitors have the right to access all the documents relating to the project/procurement, including minutes of meetings.
- 7.5 As soon as the Monitors notice, or has reason to believe, a violation of this Pact, he will so inform the authority designated by the BUYER.
- 7.6 The BIDDER(s) accepts that the Monitors has the right to access without restriction to all Project documentation of the BUYER including that provided by the BIDDER. The BIDDER will also grant the Monitor, upon his request and demonstration of a valid interest, unrestricted and unconditional access to his project documentation. The same is applicable to Subcontractors. The Monitor shall be under contractual obligation to treat the information and documents of the BIDDER/Subcontractor(s) with the confidentiality.
- 7.7 The BUYER will provide to the Monitor sufficient information about all meetings among the parties related to the Project provided such meetings could have an impact on the contractual relations between the parties. The parties will offer to the Monitor the option to participate in such meetings.
- 7.8 The Monitors will submit a written report to the Designated Authority of the BUYER/Secretary in the Department/within 8 to 10 weeks from the date of reference or intimation to him by the BUYER / BIDDER and, should the occasion arise, submit proposals for correcting problematic situations.

8. Facilitation of Investigation

In case of any allegation of violation of any provisions of this Pact or payment of commission, the BUYER or its agencies shall be entitled to examine all the documents including the Books of Accounts of the BIDDER and the BIDDER shall provide necessary information and documents in English and shall extend all possible help for the purpose of such examination.

9. Law and Place of Jurisdiction

This Pact is subject to Indian Law. The place of performance and jurisdiction is the seat of the BUYER.

10. Other Legal Actions

The actions stipulated in this Integrity Pact are without prejudice to any other legal action that may follow in accordance with the provisions of the any extent law in force relating to any civil or criminal proceedings.

11. **Validity**

- 11.1 The validity of this Integrity Pact shall be from date of its signing and extend up to 5 years or the complete execution of the contract to the satisfaction of both the BUYER and the BIDDER/SELLER, including warranty period, whichever is later. In case BIDDER/SELLER is unsuccessful, this Integrity Pact shall expire after six months from the date of the Signing of the contract.
- 11.2 Should one or several provisions of this Pact turn out to be invalid, the remainder of this Pact remains valid. In this case, the parties will strive to come to an agreement to their original intentions.

12. The Parties hereby sign this Integrity Pact at ____ on ____

BUYER

BIDDER

Name of the Officer
Designation
/Dept/Ministry/PSU

Name of the Officer
Authorized Signatory

Witness

Witness

1. _____

1. _____

2. _____

2. _____

Provision of these clauses would need to be amended/deleted in line with the policy of the BUYER in regard to involvement of Indian Agents of foreign Supplies.

Instruction for printing & submitting Safety Pact

1. The requisite format of Safety Pact is getting generated automatically and displayed here below.
2. Take print out of first page on a non-judicial stamp paper of Rs. 100/- /Company's Letterhead, as applicable, and other pages on plain A4 size paper. **Such two sets shall be prepared by the bidder.**
3. All the pages of both the copies of the Safety Pact shall be signed by the authorised representative of the bidder and duly stamped.
4. Both the original copies shall be submitted by the bidder in the form of Hard Copy as part of the first envelope before due date & time of submission of the bid.

4.9 SAFETY PACT

Between

REC Transmission Projects Company Limited,
(A 100% subsidiary of REC Ltd, Government of India Enterprise), a company incorporated
in India having their Registered Office at Core-4, SCOPE Complex, 7, Lodhi Road, New Delhi-
110003,, India

hereinafter referred to as "RECTPCL"

and

insert name of bidder

having its Registered Office at

and

*insert name of partner(s) in case of JV having its
Registered Office at*

Hereinafter referred to as "The Bidder/Contractor"

Preamble

RECTPCL intends to award, under laid-down organisational procedures, contract(s) for Substation Package of **“Design, Engineering, Supply & Construction of Residential Staff Quarters & associated facilities at 160 MVA, 220/33 kV Gas Insulated Substation (GIS) at Lassipora(Srinagar Region) on Turnkey Basis associated with Strengthening of Transmission System of JKPTCL under PMDP Scheme-15”** and Specification Number: **RECTPCL/PIA/JKPTCL/Lassipora-Qtr/01 of 2020 dated: 19-07-2020**

RECTPCL values full compliance with all relevant laws and regulations and the principles of Safety, Health & Environment in its relations with its Bidders/ Contractors.

In order to achieve these goals, RECTPCL and the above named Bidder / Contractor enter into this agreement called "Safety Pact" which will form part of the Bid.

It is hereby agreed by and between the parties as under:

Section I - Commitments of RECTPCL:

RECTPCL commits itself to take all measures necessary to prevent accidents during Construction and Operation of the Transmission Assets and to observe the following:

- 1 RECTPCL recognizes and accepts its statutory responsibilities for ensuring construction, operation and maintenance of equipments and for the provision of safe methods of work and safe working conditions.
- 2 RECTPCL recognizes and accepts its statutory responsibilities for ensuring safety of not only its employees but also that of the Contracting Agencies as Principal Employer.
- 3 RECTPCL shall review the accidents in a structured manner and take necessary actions to ensure that the safety criteria are strengthened for safe construction as well as Operation & Maintenance of the Transmission Assets.
- 4 RECTPCL shall conduct necessary awareness and training programmes to its Employees to augment the various safety requirements to be followed during Construction and Operation & Maintenance of the Transmission Assets from time to time.
- 5 RECTPCL shall, from time to time, issue necessary guidelines, instructions and deterrents to its employees as well as to the Contracting Agencies, to update them to take necessary preventive measures to avoid repetition of similar accident attributes.
- 6 RECTPCL shall review and provide necessary guidance to the Contracting Agencies, as and when, any abnormality / special situations are brought to its notice by the Contracting Agencies during execution of the Transmission Projects being executed by them.
- 7 RECTPCL shall conduct periodical surveillance site inspections / audits to identify the unsafe conditions and unsafe actions, and bring them to the knowledge of the Contracting Agencies for taking timely corrective actions.
- 8 RECTPCL shall investigate all accidents, fatal as well as non-fatal, to identify the lapses, the reason for the accident / incident and suggest measures for prevention of recurrence of such accidents, and fix responsibility for the lapses leading to the accident.

9 RECTPCL shall augment the training to the workers and supervising personnel of the Contracting Agencies, as per schedules, upon nomination by the Contracting Agencies in reasonable time frame.

10 RECTPCL shall exercise the right to claim and recover compensation from the Contracting Agencies in case of any violation of the safety requirements / provisions during execution of the Transmission Projects, as built in the applicable Laws and contractual specifications / guidelines in vogue / issued by RECTPCL from time to time.

11 **Section II - Commitments of the Bidder / Contractor:**

The Bidder / Contractor commits himself to take all measures necessary to prevent / minimise accidents at their construction / erection sites and to observe the following:

1 The Bidder / Contractor recognizes and accepts the statutory and comprehensive responsibility for ensuring safe construction and Testing & Commissioning in the Transmission Projects being executed by them by providing safe methods of work, working conditions and Tools & Plants for human safety.

2 The Bidder / Contractor recognizes and accepts the responsibilities for ensuring safety of not only their employees but also that of the Sub-contractors, Principal Employer and the general public during execution of the Transmission Projects / works.

3 The Bidder / Contractor shall review the accidents in a structured manner and take necessary actions to ensure that the safety criteria are strengthened for safe construction of the Transmission Assets.

4 The Bidder / Contractor shall endeavour continuous development of safe methods of work to ensure that the effect of risks and perils are minimised to the extent possible and implement the same at their work sites.

5 The Bidder / Contractor shall conduct periodical Training to their Employees as well as to that of their Sub-contractors for safety awareness during construction works being executed by them.

6 The Bidder / Contractor shall provide all requisite Tools & Plants required for the work and ensure their healthiness by periodical inspections / testing as required. Unhealthy and sub-standard Tools & Plants will be immediately removed from site as and when they are identified.

- 7 The Bidder / Contractor shall, at their cost, provide all necessary Personal Protective Equipments such as Double Lanyard Safety Belts, Appropriate Fall Arrest Systems, Safety Helmets, Foot Wear, Hand Gloves, etc., as required for various activities pertaining to execution of the Projects / works, confirming to relevant Indian Standards.
- 8 The Bidder / Contractor shall ensure that dedicated qualified Safety Officers are posted in the construction projects being executed by them and ensure that the Safety Officer visits each and every gang periodically and conducts audits / inspections to identify the unsafe conditions and unsafe actions, to be rectified by the site supervising personnel promptly.
- 9 The Bidder / Contractor shall conduct appropriate medical checks-up for the workers before deploying them at their construction sites to ensure that only those who are medically fit are deployed in the Projects / works to be executed by them. The copy of the Medical Reports shall be provided by the Bidder / Contractor to RECTPCL, whenever requested by RECTPCL.
- 10 The Bidder / Contractor shall screen the workers before deploying them at their construction sites to ensure that only those with the skills, experience and competence to work at height and also medically fit for work at height are deployed for work at height in the Projects executed by them.
- 11 The Bidder / Contractor shall ensure daily before starting the work that their site Supervising Personnel / Safety Officer briefs the workers about the work for the day and the safety measures / precautions required to be taken by them.
- 12 The Bidder / Contractor shall investigate all the accidents at their working sites to ascertain the lapses leading to the incident and the precautionary / corrective measures required to be taken to avoid recurrence of such accidents. These accidents will be reviewed at the Board Management level of the Agencies and the findings / recommendations will be put up to RECTPCL Apex Safety Board within the stipulated period.
- 13 The Bidder / Contractor shall ensure that all accidents, whether fatal or non-fatal in nature, will be informed to RECTPCL, in writing, immediately on the occurrence of the same and in any case, within not more than 24 hours of occurrence of the same.
- 14 The Bidder / Contractor shall ensure that in case of any accident, all necessary medical help / support shall be provided to the victims / injured till they are completely fit to return to work.

- 15 The Bidder / Contractor shall ensure that in case of fatal accidents, all statutory Authorities, including Police, concerned Labour Dept. Officials, concerned Workmen Compensation Commissioner, etc., will be intimated in writing as required by the statutory Law, and followed up for compliance of all statutory obligations. The Bidder / Contractor shall own full responsibility of timely accident reporting to various authorities, including RECTPCL.
- 16 The Bidder / Contractor shall ensure that in case of fatality or serious injury leading to permanent disablement of the victims, the compensation amount will be deposited with the concerned authorities, as required by the Laws, and followed up for early disbursement to the beneficiaries of the victims.
- 17 The Bidder / Contractor assures that they shall co-operate to the fullest extent for carrying out any investigation of the accidents at their work sites by RECTPCL to identify the lapses, the reason for the accident / incident and suggest measures for prevention of recurrence of such accidents. All factual details of the occurrence of the accident will be provided to RECTPCL, as and when required.
- 18 The Bidder / Contractor assures that they take full responsibility of meeting the statutory obligations in case of accidents, and in case of any reference by any Statutory Body at a later date also, they shall provide all information to RECTPCL and meet all the statutory obligations, including payment of additional compensation, if any.
- 19 The Bidder / Contractor assures that in case of any inspection of their work site or Notice by any Statutory Authority, they shall comply promptly and inform RECTPCL Site Officials of the same, and also provide all necessary information and assistance for smooth compliance of the observations / instructions of such Authorities.
- 20 The Bidder / Contractor accepts the provisions regarding safety, including payment of compensation to RECTPCL, in case of any violation of the safety requirements / provisions during execution of the Transmission Projects, as built in the Contractual Conditions, Safety Plan and the Safety Pact, and confirm to abide by the same.

Section III - Equal treatment to all Bidders / Contractors:

- 1 RECTPCL will enter into agreements with identical conditions as this one with all Bidders.
- 2 RECTPCL will disqualify, from the tender process, any bidder/ take punitive actions on the bidder, who does not sign this Pact or violate its provisions.

Section IV - Pact Duration:

This Pact begins when both parties have legally signed it. It expires for the successful Bidder / Contractor after closure of the contract and, for all other Bidders, after the contract has been awarded.

Section V - Other Provisions:

- 1 This agreement is subject to Indian Law. Place of performance and jurisdiction is the establishment of RECTPCL. The Arbitration clause provided in the main tender document / contract shall not be applicable for any issue / dispute arising under the Safety Pact.
- 2 Changes and supplements need to be made in writing, which shall come into force only upon mutual agreement / acceptance.
- 3 If the Contractor is a partnership firm or consortium of Joint Venture, this agreement must be signed by all partners, consortium members and Joint Venue partners, as applicable as per the Tender Specifications.
- 4 Nothing in this agreement shall affect the rights of the parties available under General Conditions of Contract (GCC) and Special Conditions of Contract (SCC).
- 5 Should one or several provisions of this agreement turn out to be invalid, the reminder of this agreement remains valid. In this case, the parties will strive to come to an agreement to their original intentions.

(Signature)_____

(For & on behalf of RECTPCL)

(Office Seal)

Name:_____

Designation:_____

Witness 1:_____

(Name & Address)_____

Witness 2:_____

(Name & Address)_____

(Signature)_____

(For & on behalf of Bidder / Partner(s) of
Joint Venture/ Consortium partner (s))

(Office Seal)

Name:_____

Designation:_____

Witness 1:_____

(Name & Address)_____

Witness 2:_____

(Name & Address)_____

5. PERFORMANCE SECURITY FORM

(TO BE SUBMITTED BY THE CONTRACTOR OPTING FOR SUBMISSION OF PERFORMANCE SECURITY IN ACCORDANCE WITH CLAUSE GCC 9)

(For the purpose of verification/confirmation of this Bank Guarantee by the Employer, the Bank shall indicate 2 official email ids of the authorized signatories from Issuing Branch and also of the designated higher office (Corporate Office, Zonal Office etc) in the covering letter of the Bank forwarding the Bank Guarantee.)

Bank Guarantee No.

Date.....

NOA/Contract No.....

.....[Name of Contract].....

To: [Name and address of the **Owner**]

Dear Ladies and/or Gentlemen,

We refer to the Contract ("the Contract")

vide notification of award issued on (insert date of the notification of award)....by M/s. REC Transmission Project Company Ltd., 3rd Floor ECE House, Annex-II, 28A KG MARG ,New Delhi-110001 ("the Employer"/"RECTPCL") on behalf of Name of OWNER..... (hereinafter referred to as 'Owner') to M/s (Name of Contractor)

(or)

signed on(insert date of the Contract)..... between M/s. REC Transmission Project Company Ltd., having its Registered Office at Core-4 SCOPE Complex, 7, Lodhi Road, New Delhi-110003 ("the Employer"/"RECTPCL") on behalf of Name of OWNER..... (hereinafter referred to as 'Owner'), and M/s (Name of Contractor),having its Principal place of business at(Address of Contractor) and Registered Office at(Registered address of Contractor) ("the Contractor") and the Contract ("the Contract") signed on(insert date of the Contract)..... between you and M/s (Name of Associate), having its Principal place of business at

.....(*Address of Associate*) and Registered Office at(*Registered address of Associate*), the Associate of the Contractor for executing the Facilities concerning (*Indicate brief scope of work*) for the complete execution of the (*insert name of Package alongwith name of the Project*)..... [*Applicable for Bank Guarantees to be issued by Contractor against those Contracts awarded to their Associate*]

By this letter we, the undersigned, ...(*insert name & address of the issuing bank*), a Bank (which expression shall include its successors, administrators, executors and assigns) organized under the laws of and having its Registered/Head Office at(*insert address of registered office of the bank*)..... do hereby irrevocably guarantee payment to you up to i.e., ten percent (10%) of the Contract Price until 60 months i.e., upto and inclusive of (*dd/mm/yy*).

We undertake to make payment under this Letter of Guarantee upon receipt by us of your first written demand signed by the Employer's duly authorized officer or the authorized officer of Owner declaring the Contractor to be in default under the Contract and without cavil or argument any sum or sums within the above named limits, without your need to prove or show grounds or reasons for your demand and without the right of the Contractor to dispute or question such demand.

Our liability under this Letter of Guarantee shall be to pay to you whichever is the lesser of the sum so requested or the amount then guaranteed hereunder in respect of any demand duly made hereunder prior to expiry of the Letter of Guarantee, without being entitled to inquire whether or not this payment is lawfully demanded.

This letter of Guarantee shall remain in full force and shall be valid from the date of issue until 60 months i.e. upto and inclusive of (*dd/mm/yy*) and shall be extended from time to time for such period, as may be desired by M/s. on whose behalf this Letter of Guarantee has been given.

Except for the documents herein specified, no other documents or other action shall be required, notwithstanding any applicable law or regulation.

Our liability under this Letter of Guarantee shall become null and void immediately upon its expiry, whether it is returned or not, and no claim may be made hereunder after such expiry or after the aggregate of the sums paid by us to you shall equal the sums guaranteed hereunder, whichever is the earlier.

All notices to be given under shall be given by registered (airmail) posts to the addressee at the address herein set out or as otherwise advised by and between the parties hereto.

We hereby agree that any part of the Contract may be amended, renewed, extended, modified, compromised, released or discharged by mutual agreement between you and the Contractor, and this security may be exchanged or surrendered without in any way

impairing or affecting our liabilities hereunder without notices to us and without the necessity for any additional endorsement, consent or guarantee by us, provided, however, that the sum guaranteed shall not be increased or decreased.

No action, event or condition which by any applicable law should operate to discharge us from liability hereunder shall have any effect and we hereby waive any right we may have to apply such law so that in all respects our liability hereunder shall be irrevocable and, except as stated herein, unconditional in all respects.

Notwithstanding anything contained herein:

1. Our liability under this Bank Guarantee shall not exceed _____ (*value in figures*)_____ [*value in words*]_____.
2. This Bank Guarantee shall be valid upto _____(*validity date*)_____.
3. We are liable to pay the guaranteed amount or any part thereof under this Bank Guarantee only & only if we receive a written claim or demand on or before _____(*validity date*) _____."

For and on behalf of the Bank

[*Signature of the authorised signatory(ies)*]

Signature_____

Name_____

Designation_____

POA Number_____

Contact Number(s): Tel._____Mobile_____

Fax Number_____

email _____

Common Seal of the Bank_____

Witness:

Signature_____

Name_____

Address_____

Contact Number(s): Tel._____Mobile_____

email _____

Note :

1. For the purpose of executing the Bank Guarantee, the non-judicial stamp papers of appropriate value shall be purchased in the name of Bank who issues the 'Bank Guarantee'.
2. The Bank Guarantee shall be signed on all the pages by the Bank Authorities indicating their POA nos. and should invariably be witnessed.
3. The Bank Guarantee should be in accordance with the proforma as provided. However, in case the issuing bank insists for additional paragraph regarding applicability of ICC publication No: 758, the following may be added at the end of the proforma of the Bank Guarantee [*i.e., end paragraph of the Bank Guarantee preceding the signature(s) of the issuing authority(ies) of the Bank Guarantee*]:
"This Guarantee is subject to Uniform Rules for Demand Guarantee, ICC publication No. 758 except that article 15(a) is hereby excluded."

6. FORM OF TAKING OVER CERTIFICATE

Date.....

Name of Contract.....

Contract No.....

To :

(Name and address of the Contractor)

Dear Ladies and/or Gentlemen,

Pursuant to GCC 30 (Taking Over) of the General Conditions of the Contract entered into between yourselves and the Employer dated relating to the *(insert brief description of the Facilities)*..... we hereby notify you that the following part(s) of the Facilities was (were) complete on the date specified below, and that, in accordance with the terms of the Contract, the Employer hereby takes over the said part(s) of the Facilities, together with the responsibility for care and custody and the risk of loss thereof on the date mentioned below :

1. Description of the Facilities or part thereof
.....
2. Date of Completion :.....

However, you are required to complete the outstanding items listed in the attachment hereto as soon as practicable.

This letter does not relieve you of your obligation to complete the execution of the Facilities in accordance with the Contract nor of your obligations during the Defects Liability Period.

Very truly yours,

Title
(Project Manager)

7. FORM OF INDEMNITY BOND TO BE EXECUTED BY THE CONTRACTOR FOR THE EQUIPMENT HANDED OVER IN ONE LOT BY(abbreviated name of the Employer)..... FOR PERFORMANCE OF ITS CONTRACT

INDEMNITY BOND

THIS INDEMNITY BOND is made this..... day of 20.... by a Company registered under the Companies Act, 1956/Partnership firm/ proprietary concern having its Registered Office at.....(hereinafter called as 'Contractor' or "Obligor" which expression shall include its successors and permitted assigns) in favour of (insert name of the Employer)....., a Company incorporated under the Companies Act, 1956 having its Registered Office at(insert registered address of the Employer) and its project at (hereinafter called ".....(abbreviated name of the Employer)....." which expression shall include its successors and assigns):

WHEREAS(abbreviated name of the Employer)..... has awarded to the Contractor a Contract for..... vide its Notification of Award/Contract No..... dated..... and its Amendment No. (applicable when amendments have been issued) (hereinafter called the "Contract") in terms of which(abbreviated name of the Employer)..... is required to hand over various Equipment to the Contractor for execution of the Contract.

And WHEREAS by virtue of Clause No.....of the said Contract, the Contractor is required to execute an Indemnity Bond in favour of(abbreviated name of the Employer)..... for the Equipment handed over to it by(abbreviated name of the Employer)..... for the purpose of performance of the Contract/Erection portion of the contract (hereinafter called the "Equipment").

AND THEREFORE, This Indemnity Bond witnesseth as follows:

1. That in consideration of various Equipment as mentioned in the Contract, valued at (amount in words.....) handed over to the Contractor for the purpose of performance of the Contract, the Contractor hereby undertakes to indemnify and shall keep(abbreviated name of the Employer)..... indemnified, for the full value of the Equipment. The Contractor hereby acknowledges receipt of the Equipment as per despatch title documents handed over to the Contractor duly endorsed in their favour and detailed in the Schedule appended hereto. It is expressly understood by the Contractor that handing over of the despatch title documents in respect of the said Equipments duly endorsed by(abbreviated name of the Employer)..... in favour of the Contractor shall be construed as handing over of the Equipment purported to be covered by such title documents and the Contractor shall hold such Equipment in trust as a Trustee for and on behalf of(abbreviated name of the Employer).....
2. That the Contractor is obliged and shall remain absolutely responsible for the safe transit/protection and custody of the Equipment at(abbreviated name of

- the Employer*)..... project Site against all risks whatsoever till the Equipment are duly used/erected in accordance with the terms of the Contract and the Plant/Package duly erected and commissioned in accordance with the terms of the Contract, is taken over by(*abbreviated name of the Employer*)..... The Contractor undertakes to keep(*abbreviated name of the Employer*)..... harmless against any loss or damage that may be caused to the Equipment.
3. The Contractor undertakes that the Equipment shall be used exclusively for the performance/execution of the Contract strictly in accordance with its terms and conditions and no part of the equipment shall be utilised for any other work of purpose whatsoever. It is clearly understood by the Contractor that non-observance of the obligations under this Indemnity Bond by the Contractor shall inter-alia constitute a criminal breach of trust on the part of the Contractor for all intents and purpose including legal/penal consequences.
 4. That(*abbreviated name of the Employer*)..... is and shall remain the exclusive Employer of the Equipment free from all encumbrances, charges or liens of any kind, whatsoever. The equipment shall at all times be open to inspection and checking by the Employee or Employer's Representative in this regard. Further, ...(*abbreviated name of the Employer*)..... shall always be free at all times to take possession of the Equipment in whatever form the equipment may be, if in its opinion, the Equipment are likely to be endangered, misutilised or converted to uses other than those specified in the Contract, by any acts of omission or commission on the part of the Contractor or any other person or on account of any reason whatsoever and the Contractor binds himself and undertakes to comply with the directions of demand of(*abbreviated name of the Employer*)..... to return the equipment without any demur or reservation.
 5. That this indemnity Bond is irrevocable. If at any time any loss or damage occurs to the Equipment or the same or any part thereof is misutilised in any manner whatsoever, then the Contractor hereby agrees that the decision of the Employer's Representative as to assessment of loss or damage to the Equipment shall be final and binding on the Contractor. The Contractor binds itself and undertakes to replace the lost and/or damaged Equipment at his own cost and/or shall pay the amount of loss to(*abbreviated name of the Employer*)..... without any demur, reservation or protest. This is without prejudice to any other right or remedy that may be available to(*abbreviated name of the Employer*)..... against the Contractor under the Contract and under this Indemnity Bond.
 6. NOW THE CONDITION of this Bond is that if the Contractor shall duly and punctually comply with the terms and conditions of this Bond to the satisfaction of(*abbreviated name of the Employer*)....., THEN, the above Bond shall be void, but otherwise, it shall remain in full force and virtue.

IN WITNESS WHEREOF, the Contractor has hereunto set its hand through its authorised representative under the common seal of the Company, the day, month and year first above mentioned.

SCHEDULE

Particulars of the Equipment handed over	Quantity	Particulars of Despatch title Documents		Value of the Equipment	Signature of the Attorney in token of receipt
		RR/GR No. date of lading	Carrier		

For and on behalf of
M/s.....

WITNESS

1. Signature.....

Signature.....

Name.....

Name.....

Address.....

Address.....

2. Signature.....

Authorised representative

Name.....

(Common Seal)

Address.....

(In case of Company)

Indemnity Bonds are to be executed by the authorised person and (i) in case of contracting Company under common seal of the Company or (ii) having the power of attorney issued under common seal of the company with authority to execute Indemnity Bonds, (iii) In case of (ii), the original Power of Attorney if it is specifically for this Contract or a Photostat copy of the Power of Attorney if it is General Power of Attorney and such documents should be attached to Indemnity Bond.

8. FORM OF INDEMNITY BOND TO BE EXECUTED BY THE CONTRACTOR FOR THE EQUIPMENT HANDED OVER IN INSTALLMENTS BY(abbreviated name of the Employer)..... FOR PERFORMANCE OF ITS CONTRACT

INDEMNITY BOND

THIS INDEMNITY BOND is made this day of 20..... by a Company registered under the Companies Act, 1956/Partnership firm/proprietary concern having its Registered Office at(hereinafter called as 'Contractor' or 'Obligor' which expression shall include its successors and permitted assigns) in favour of(insert name of the Employer)....., a company incorporated under the Companies Act, 1956 having its Registered Office at(insert registered address of the Employer)..... and its project at (hereinafter called ".....(abbreviated name of the Employer)....." which expression shall include its successors and assigns):

WHEREAS(abbreviated name of the Employer)..... has awarded to the Contractor a Contract for vide its Notification of Award/Contract No. dated and Amendment No. (applicable when amendments have been issued) (hereinafter called the "Contract") in terms of which(abbreviated name of the Employer)..... is required to handover various Equipment to the Contractor for execution of the Contract.

AND WHEREAS by virtue of Clause No.....of the said Contract, the Contractor is required to execute an Indemnity Bond in favour of(abbreviated name of the Employer)..... for the Equipment handed over to it by(abbreviated name of the Employer)..... for the purpose of performance of the contract/Erection portion of the Contract (hereinafter called the "Equipment".)

NOW THEREFORE, This Indemnity Bond witnesseth as follows:

1. That in consideration of various Equipments as mentioned in the Contract, valued at (amount in words _____) to be handed over to the Contractor in installments from time to time for the purpose of performance of the contract, the Contractor hereby undertakes to indemnify and shall keep(abbreviated name of the Employer)..... indemnified, for the full value of Equipment. The Contractor hereby acknowledges receipt of the initial installment of the equipment per details in the schedule appended hereto. Further, the Contractor agrees to acknowledge receipt of the subsequent installments of the Equipment as required by(abbreviated name of the Employer)..... in the form of Schedules consecutively numbered which shall be attached to this Indemnity bond so as to form integral parts of this Bond. It is expressly understood by the Contractor that handing over the despatch title documents in respect of the said Equipments duly endorsed by(abbreviated name of the Employer)..... in favour of the Contractor shall be construed as handing over the Equipment purported to be covered by such title documents

and the Contractor shall hold such Equipments in trust as a Trustee for and on behalf of(*abbreviated name of the Employer*).....

2. That the Contractor is obliged and shall remain absolutely responsible for the safe transit/protection and custody of the Equipment at(*abbreviated name of the Employer*)..... project Site against all risks whatsoever till the Equipment are duly used/erected in accordance with the terms of the Contract and the Plant/Package duly erected and commissioned in accordance with the terms of the Contract, is taken over by(*abbreviated name of the Employer*)..... The Contractor undertakes to keep(*abbreviated name of the Employer*)..... harmless against any loss or damage that may be caused to the Equipment.
3. The Contractor undertakes that the Equipment shall be used exclusively for the performance/execution of the Contract strictly in accordance with its terms and conditions and no part of the equipment shall be utilised for any other work or purpose whatsoever. It is clearly understood by the Contractor that non-observance of the obligations under this Indemnity Bond by the Contractor shall inter-alia constitute a criminal breach of trust on the part of the Contractor for all intents and purpose including legal/penal consequences.
4. That(*abbreviated name of the Employer*)..... is and shall remain the exclusive Employer of the Equipment free from all encumbrances, charges or liens of any kind, whatsoever. The equipment shall at all times be open to inspection and checking by the Employer or Employer's Representative in this regard. Further, ...(*abbreviated name of the Employer*)..... shall always be free at all times to take possession of the Equipment in whatever form the Equipment may be, if in its opinion, the Equipment are likely to be endangered, misutilised or converted to uses other than those specified in the Contract, by any acts of omission or commission on the part of the Contractor or any other person or on account of any reason whatsoever and the Contractor binds himself and undertakes to comply with the directions of demand of(*abbreviated name of the Employer*)..... to return the equipment without any demur or reservation.
5. That this indemnity Bond is irrevocable. If at any time any loss or damage occurs to the Equipment or the same or any part thereof is misutilised in any manner whatsoever, then the Contractor hereby agrees that the decision of the Employer's Representative as to assessment of loss or damage to the Equipment shall be final and binding on the Contractor. The Contractor binds itself and undertakes to replace the lost and/or damaged Equipment at its own cost and/or shall pay the amount of loss to(*abbreviated name of the Employer*)..... without any demur, reservation or protest. This is without prejudice to any other right or remedy that may be available to(*abbreviated name of the Employer*)..... against the Contractor under the Contract and under this Indemnity Bond.
6. NOW THE CONDITION of this Bond is that if the Contractor shall duly and punctually comply with the terms and conditions of this Bond to the satisfaction

of(*abbreviated name of the Employer*)....., THEN, the above Bond shall be void, but otherwise, it shall remain in full force and virtue.

IN WITNESS WHEREOF, the Contractor has hereunto set its hand through its authorised representative under the common seal of the Company, the day, month and year first above mentioned.

SCHEDULE No. 1

Particulars of the Equipment handed over	Quantity	Particulars of Despatch title Documents		Value of the Equipment	Signature of the Attorney in token of receipt
		RR/GR No. date of lading	Carrier		

For and on behalf of
M/s.....

WITNESS

1. Signature.....
Name.....
Address.....

Signature.....
Name.....
Address.....

2. Signature.....
Name.....
Address.....

Authorised representative
(Common Seal)
(In case of Company)

Indemnity Bonds are to be executed by the authorised person and (i) in case of contracting Company under common seal of the Company or (ii) having the power of attorney issued under common seal of the company with authority to execute Indemnity Bonds, (iii) In case of (ii), the original Power of Attorney if it is specifically for this Contract or a photostat copy of the Power of Attorney if it is General Power of Attorney and such documents should be attached to Indemnity Bond.

9. FORM OF AUTHORISATION LETTER

Ref. No:

Date :

To

M/s.....

.....

.....

REF.: Contract No. dated for awarded by
....(*insert name of the Employer*).....

Dear Sir,

Kindly refer to Contract No. dated for
You are hereby authorised on behalf of (*Name of Employer*)..... a
company incorporated under the laws of Companies Act 1956 and having its Registered
Office at(*registered address of the Employer*) and its Project at
..... to take physical delivery of materials/equipments covered under Despatch
Document/Consignment Note No.*..... dated and as detailed in the
enclosed schedule for the sole purpose of successful performance of the aforesaid
contract and for no other purpose, whatsoever.

(Signature of Project Authority)**

Designation.....

Date.....

Encl: As Above.

** To be signed not below the rank of Manager.

* Mention LR/RR No.

Schedule of Material/Equipment covered under Despatch Title Document (RR No./LR
No.)

Sl. No.	Contract Name	NOA No./ CA No.	Description of Materials/ Equipments	Spec. No.	Qty.	Value	Remarks

(Signature of the Project Authority)

(Designation)

(Date)

10. FORM OF TRUST RECEIPT FOR PLANT, EQUIPMENT AND MATERIALS RECEIVED

We M/s.(*insert name of the Contractor*) having our Principal place of business at having been awarded a Contract No. dated for (*insert Package name alongwith name of the Project*)..... by(*insert name of the Employer*)

We do hereby acknowledge the receipt of the Plant, Equipment and Materials as are fully described and mentioned under Documents of Title/RR/LR etc. and in the schedule annexed hereto, which shall form an integral part of this receipt as "Trustee" of (*insert name of the Employer*)..... The aforesaid materials etc. so received by us shall be exclusively used in the successful performance of the aforesaid Contract and for no other purpose whatsoever. We undertake not to create any charge, lien or encumbrance over the aforesaid materials etc, in favour of any other person/institution(s)/Banks.

For M/s
(*Contractor's Name*)

Dated :

(AUTHORISED SIGNATORY)

Place :

SEAL OF COMPANY

11. FORM OF EXTENSION OF BANK GUARANTEE

Ref. No.....

Dated:.....

To: *[Name and address of the Employer]*

Dear Sirs,

Sub.: Extension of Bank Guarantee No. dated for, issued to you on behalf of M/s. *(insert name of the Contractor)* in respect of Contract No. dated for *(insert name of the Package alongwith the Project name)* (hereinafter called original Bank Guarantee).

At the request of M/s..... *(insert name of the Contractor)*, We*(insert name & address of the issuing bank)*, a Bank organized under the laws of and having its Registered/Head Office at*(insert address of registered office of the bank)*..... do hereby extend our liability under the above-mentioned Guarantee No. Dated for a further period of Years/Months from to expire on Except as provided above, all other terms and conditions of the original Bank Guarantee No. dated shall remain unaltered and binding.

Please treat this as an integral part of the original Guarantee to which it would be attached.

For and on behalf of the Bank

[Signature of the authorised signatory(ies)]

Signature_____

Name_____

Designation_____

POA Number_____

Contact Number(s): Tel._____Mobile_____

Fax Number_____

email _____

Common Seal of the Bank_____

Witness:

Signature_____

Name_____

Address_____

Contact Number(s): Tel._____Mobile_____

email _____

Note:

1. For the purpose of executing the Bank Guarantee, the non-judicial stamp papers of appropriate value shall be purchased in the name of Bank who issues the 'Bank Guarantee'.
2. The Bank Guarantee shall be signed on all the pages by the Bank Authorities indicating their POA nos. and should invariably be witnessed.

12A. POWER OF ATTORNEY

To be on non-judicial stamp paper of appropriate value as per Stamp Act relevant to place of execution.

Know all men by these presents, We(name and address of the registered office of the Bidder) do hereby constitute, appoint and authorize Mr./Ms.....(name and residential address) who is presently employed with us and holding the position of as our attorney, to do in our name and on our behalf, all such acts, deeds and things necessary in connection with or incidental to our Response against Tender No..... Name of work the bids for which have been invited by (insert name of the Employer alongwith address) (hereinafter called the 'Employer') to undertake the following acts :

- a. To submit proposal and participate in the aforesaid Bid Specification of the Employer.
- b. To negotiate with the Employer the terms and conditions for award of the Contract pursuant to the aforesaid Bid and to sign the Contract with the Employer.
- c. To do any other act or submit any document related to the above.
- d. To receive, accept and execute the Contract.
- e. To ensure performance of the Contract(s)
- f. It is expressly understood that this Power of Attorney shall remain valid binding and irrevocable till completion of the Defect Liability Period in terms of the Contract.

We hereby agree to ratify all acts, deeds and things lawfully done by our said attorney pursuant to this Power of Attorney and that all acts, deeds and things done by our aforesaid attorney shall and shall always be deemed to have been done by us.

for and on behalf of the bidder

.....

.....

.....

Seal and Signature

in the presence of:

WITNESS

Signature..... Name Designation Occupation.....	Signature..... Name Designation Occupation.....

Note :

1. For the purpose of executing the Agreement, the non-judicial stamp papers of appropriate value.
2. The Agreement shall be signed on all the pages by the authorized representatives

12B. FORM OF POWER OF ATTORNEY FOR JOINT VENTURE

KNOW ALL MEN BY THESE PRESENTS THAT WE , the Partners whose details are given hereunder have formed a Joint Venture under the laws of and having our Registered Office(s)/Head Office(s) at (hereinafter called the 'Joint Venture' which expression shall unless repugnant to the context or meaning thereof, include its successors, administrators and assigns) acting through M/s being the Partner in-charge do hereby constitute, nominate and appoint M/s..... a Company incorporated under the laws of and having its Registered/Head Office at as our duly constituted lawful Attorney (hereinafter called "Attorney" or "Authorised Representative" or "Partner In-charge") to exercise all or any of the powers for and on behalf of the Joint Venture in regard to Specification No..... Package the bids for which have been invited by (insert name of the Employer alongwith address) (hereinafter called the 'Employer') to undertake the following acts :

- i) To submit proposal and participate in the aforesaid Bid Specification of the Employer on behalf of the "Joint Venture".
- ii) To negotiate with the Employer the terms and conditions for award of the Contract pursuant to the aforesaid Bid and to sign the Contract with the Employer for and on behalf of the "Joint Venture".
- iii) To do any other act or submit any document related to the above.
- iv) To receive, accept and execute the Contract for and on behalf of the "Joint Venture".

It is clearly understood that the Partner In-charge (Lead Partner) shall ensure performance of the Contract(s) and if one or more Partner fail to perform their respective portions of the Contract(s), the same shall be deemed to be a default by all the Partners.

It is expressly understood that this Power of Attorney shall remain valid binding and irrevocable till completion of the Defect Liability Period in terms of the Contract.

The Joint Venture hereby agrees and undertakes to ratify and confirm all the whatsoever the said Attorney/Authorised Representatives/Partner in-charge quotes in the bid, negotiates and signs the Contract with the Employer and/or proposes to act on behalf of the Joint Venture by virtue of this Power of Attorney and the same shall bind the Joint Venture as if done by itself.

IN WITNESS THEREOF the Partners Constituting the Joint Venture as aforesaid have executed these presents on this day of under the Common Seal(s) of their Companies.

for and on behalf of the
Partners of Joint Venture

.....
.....
.....

The Common Seal of the above Partners of the Joint Venture:

The Common Seal has been affixed there unto in the presence of:

WITNESS

1. Signature.....
Name
Designation
Occupation
2. Signature.....
Name
Designation
Occupation

Note:

1. For the purpose of executing the Agreement, the non-judicial stamp papers of appropriate value shall be purchased in the name of Joint Venture.
2. The Agreement shall be signed on all the pages by the authorised representatives of each of the partners and should invariably be witnessed.

13. FORM OF UNDERTAKING BY THE JOINT VENTURE PARTNERS

THIS JOINT DEED OF UNDERTAKING executed on this..... day of..... Two Thousand and..... by a company incorporated under the laws of and having its Registered Office at(hereinafter called the "Party No.1" which expression shall include its successors, executors and permitted assigns) and M/s.....a company incorporated under the laws of and having its Registered Office at (hereinafter called the "Party No.2" which expression shall include its successors, executors and permitted assigns) and M/s..... a Company incorporated under the laws of and having its Registered Office at (hereinafter called the "Party No.3" which expression shall include its successors, executors and permitted assigns) for the purpose of making a bid and entering into a contract [hereinafter called the "Contract" {in case of award}] against the Specification No..... for (*insert name of the package alongwith project name*) of (*insert names of the Employer*), a Company incorporated under the Companies Act of 1956 having its registered office at(*insert registered address of the Employer*)..... (hereinafter called the "Employer").

WHEREAS the Party No.1, Party No.2 and Party No.3 have entered into an Agreement dated.....

AND WHEREAS the Employer invited bids as per the above mentioned Specification for the design, manufacture, supply, erection, testing and commissioning of Equipment/ Materials stipulated in the Bidding Documents under (*insert name of the package alongwith project name*)

AND WHEREAS Clause 9.3, Section-ITB and Section-III, VOL-I., Qualification Requirement forming part of the Bidding Documents, inter-alia stipulates that an Undertaking of two or more qualified manufacturers as partners, meeting the requirements of Qualification Criteria, as applicable may bid, provided, the Joint Venture fulfills all other requirements under Clause 9.3 (c) of ITB and Section-III, VOL-I., Qualification Requirement and in such a case, the Bid Forms shall be signed by all the partners so as to legally bind all the Partners of the Joint Venture, who will be jointly and severally liable to perform the Contract and all obligations hereunder.

The above clause further states that this Undertaking shall be attached to the bid and the Contract performance guarantee will be as per the format enclosed with the Bidding Documents without any restrictions or liability for either party.

AND WHEREAS the bid is being submitted to the Employer vide proposal No.....dated by Party No.1 based on this Undertaking between all the parties; under these presents and the bid in accordance with the requirements of Clause 9.3, Section-ITB and Section-III, VOL-I., Qualification Requirement , has been signed by all the parties.

NOW THIS UNDERTAKING WITNESSETH AS UNDER:

In consideration of the above premises and agreements all the parties of this Deed of Undertaking do hereby declare and undertake:

1. In requirement of the award of the Contract by the Employer to the Joint Venture Partners, we, the Parties do hereby undertake that M/s..... the Party No.1, shall act as Lead Partner and further declare and confirm that we the parties to the Joint Venture shall jointly and severally be bound unto the Employer for the successful performance of the Contract and shall be fully responsible for the design, manufacture, supply and successful performance of the equipment in accordance with the Contract:
2. In case of any breach or default of the said Contract by any of the parties to the Joint Venture, the party(s) do hereby undertake to be fully responsible for the successful performance of the Contract and to carry out all the obligations and responsibilities under the Contract in accordance with the requirements of the Contract.
3. Further, if the Employer suffers any loss or damage on account of any breach in the Contract or any shortfall in the performance of the equipment in meeting the performances guaranteed as per the specification in terms of the Contract, the Party(s) of these presents undertake to promptly make good such loss or damages caused to the Employer, on its demand without any demur. It shall not be necessary or obligatory for the Employer to proceed against Lead Partner to these presents before proceeding against or dealing with the other Party(s), the Employer can proceed against any of the parties who shall be jointly and severally liable for the performance and all other liabilities/obligations under the Contract to the Employer.
4. The financial liability of the Parties of this Deed of Undertaking to the Employer, with respect to any of the claims rising out of the performance or non-performance of the obligations set forth in this Deed of Undertaking, read in conjunction with the relevant conditions of the Contract shall, however not be limited in any way so as to restrict or limit the liabilities or obligations of any of the Parties of this Deed of Undertaking.
5. It is expressly understood and agreed between the Parties to this Undertaking that the responsibilities and obligations of each of the Parties shall be as delineated in Appendix – I (*to be suitably appended by the Parties alongwith this Undertaking in its bid*) to this Deed of Undertaking. It is further undertaken by the parties that the above sharing of responsibilities and obligations shall not in any way be a limitation of joint and several responsibilities of the Parties under the Contract.
6. It is also understood that this Undertaking is provided for the purposes of undertaking joint and several liabilities of the partners to the Joint Venture for

submission of the bid and performance of the Contract and that this Undertaking shall not be deemed to give rise to any additional liabilities or obligations, in any manner or any law, on any of the Parties to this Undertaking or on the Joint Venture, other than the express provisions of the Contract.

7. This Undertaking shall be construed and interpreted in accordance with the provisions of the Contract.
8. In case of an award of a Contract, we the parties to this Deed of Undertaking do hereby agree that we shall be jointly and severally responsible for furnishing a Contract performance security from a bank in favour of the Employer in the currency/currencies of the Contract.
9. It is further agreed that this Deed of Undertaking shall be irrevocable and shall form an integral part of the bid and shall continue to be enforceable till the Employer discharges the same or upon the completion of the Contract in accordance with its provisions, whichever is earlier. It shall be effective from the date first mentioned above for all purposes and intents.

IN WITNESS WHEREOF, the Parties to this Deed of Undertaking have through their authorised representatives executed these presents and affixed Common Seals of their companies, on the day, month and year first mentioned above.

Common Seal of
has been affixed in my/ our
presence pursuant to Board of
Director's Resolution dated

For Lead Partner (Party No.-1)
For and on behalf of M/s
.....

Name

Designation

Signature

(Signature of the authorized
representative)

WITNESS :

I.

II.

Common Seal of
has been affixed in my/ our
presence pursuant to Board of
Director's Resolution dated

For Party No.-2
For and on behalf of
M/s.....

Name

(Signature of the authorized
representative)

Designation

Signature

WITNESS :

I.

II.

Common Seal of
has been affixed in my/ our
presence pursuant to Board of
Director's Resolution dated

For Party No.-3
For and on behalf of M/s.
.....

Name

Designation

Signature

(Signature of the authorized
representative)

WITNESS :

I.

II.

Note:

1. For the purpose of executing the Joint Deed of Undertaking, the non-judicial stamp papers of appropriate value shall be purchased in the name of Joint Venture.
2. The Undertaking shall be signed on all the pages by the authorised representatives of each of the partners and should invariably be witnessed.

14. FORMAT FOR EVIDENCE OF ACCESS TO OR AVAILABILITY OF CREDIT/FACILITIES

BANK CERTIFICATE

This is to certify that M/s. _____ (*insert Name & Address of the Contractor*) _____ who have submitted their bid to(*insert name of the Employer*)..... against their tender specification Vide ref. No. for (*insert name of the package alongwith the project name*) is our customer for the past years.

Their financial transaction with our Bank have been satisfactory. They enjoy the following fund based and non-fund based limits including for guarantees, L/C and other credit facilities with us against which the extent of utilization as on date is also indicated below:

Sl. No.	Type of Facility	Sanctioned Limit as on Date	Utilisation as on Date

This letter is issued at the request of M/s. _____.

Signature _____

Name of Bank _____

Name of Authorised
Signatory _____

Designation _____

Phone No. _____

Address _____

SEAL OF THE BANK

15. FORM OF OPERATIONAL ACCEPTANCE

Date.....

Name of Contract.....

Contract No.....

To :

(Name and address of the Contractor)

Dear Ladies and/or Gentlemen,

Pursuant to GCC 29, 30 of the General Conditions of the Contract entered into between yourselves and the Employer dated relating to the (*insert brief description of the Facilities*)..... we hereby notify you that the we System tests and Acceptance tests of the following part(s) of the Facilities were satisfactorily completed on the date specified below :

1. Description of the Facilities or part thereof
.....
2. Date of Operational Acceptance:.....

This letter does not relieve you of your obligation during the Defects Liability Period and Latent Defect warranty.

Very truly yours,

Title
(Project Manager)

FORM No. 16

FORM OF SAFETY PLAN TO BE SUBMITTED BY THE CONTRACTOR WITHIN SIXTY DAYS OF AWARD OF CONTRACT

[TO BE EXECUTED ON A NON JUDICIAL STAMP PAPER WORTH RS. TWENTY ONLY]

SAFETY PLAN

THIS SAFETY PLAN is made this day of 20..... by a Company registered under the Companies Act, 1956 or 2013, as the case may be/Partnership firm/proprietary concern having its Registered Office at[*to be modified suitably for JV Contractor*] (hereinafter called as 'Contractor' which expression shall include its successors and permitted assigns) for approval of(*insert name of the Employer*)....., a company incorporated under the Companies Act, 1956 having its Registered Office at(*insert registered address of the Employer*)..... for its Contract for (*insert package name, project name alongwith Specification number of the Contract*).....

WHEREAS(*abbreviated name of the Employer*)..... has awarded to the Contractor the aforesaid Contract vide its Notification of Award/Contract No. dated and Amendment No. (applicable when amendments have been issued) (hereinafter called the "Contract") in terms of which the Contractor is required to submit 'Safety Plan' alongwith certain documents to the Engineer In-Charge/Project Manager of the Employer within Sixty (60) days of Notification of Award for its approval.

NOW THEREFORE, the Contractor undertakes to execute the Contract as per the safety plan as follows:

1. THAT the Contractor shall execute the works as per provisions of Bidding Documents including those in regard to Safety Precautions / provisions as per statutory requirements.
2. THAT the Contractor shall execute the works in a well planned manner from the commencement of Contract as per agreed mile stones of work completion schedule so that planning and execution of construction works goes smoothly and consistently through out the contract duration without handling pressure in last quarter of the financial year/last months of the Contract and the shall be finalized in association with RECTPCL Engineer In-charge/Project Manager from time to time as required.
3. THAT the Contractor has prepared the safe work procedure for each activity i.e. foundation works including civil works, erection, stringing (as applicable), testing & commissioning, disposal of materials at site / store etc. to be executed at site, which is enclosed at **Annexure – 1A (SP)** for acceptance and approval of Engineer

In-charge/Project Manager. The Contractor shall ensure that on approval of the same from Engineer In-charge/Project Manager , the approved copies will be circulated to Employer's personnel at site [Supervisor(s)/Executive(s)] and Contractor's personnel at site [Gang leader, supervisor(s) etc.] in their local language / language understood by gang.

THAT the Contractor has prepared minimum manpower deployment plan, activity wise as stated above, which is enclosed at **Annexure – 1B (SP)** for approval of Engineer In-charge/Project Manager.

4. THAT the Contractor shall ensure while executing works that they will deploy minimum 25% of their own experienced work force who are on the permanent roll of the company and balance 75% can be a suitable mixed with the hired gangs / local workers / casual workers if required. The above balance 75% work force should be provided with at least 10 days training by the construction agencies at sites and shall be issued with a certificate. No worker shall be engaged without a valid certificate. Hired gang workers shall also follow safe working procedures and safety norms as is being followed by company's workmen. It should also be ensured by the contractor that certified fitters who are climbing towers / doing stringing operations can be easily identifiable with a system like issue of Badge / Identification cards (ID cards) etc. Colour identification batches should be worn by the workers. Contractor has to ensure that inexperience workers / unskilled workers should not be deployed for skilled job.
5. THAT the Contractor's Gang leader / Supervisor / Senior most member available at every construction site shall brief to each worker daily before start of work about safety requirement and warn about imminent dangers and precautions to be taken against the imminent dangers (Daily Safety Drill). This is to be ensured without fail by Contractor and maintain record of each gang about daily safety instructions issued to workers and put up to RECTPCL site In-charge for his review and record.
6. THAT the Contractor shall ensure that working Gangs at site should not be left at the discretion of their Gang Leaders who are generally hired and having little knowledge about safety. Gang leader should be experienced and well versed with the safe working procedures applicable for transmission line/ Sub Station works. In case gang is having Gang leader not on permanent roll of the company then additional Supervisor from company's own roll having thorough knowledge about the works would be deployed so as to percolate safety instructions upto the grass root level in healthy spirits. Contractor has to ensure close supervision while executing critical locations of transmission lines / sub stations and ensures that all safety instructions are in place and are being followed.
7. THAT the Contractor shall maintain in healthy and working condition all kind of Equipments / Machineries / Lifting tools / Lifting tackles / Lifting gears / All kind of Ropes including wire ropes / Polypropylene ropes etc. used for Lifting purpose during execution of the project and get them periodically examined and load

tested for safe working load in accordance with relevant provisions and requirement of Building & other construction workers Regulation of Employment and Conditions of Services Act and Central Rule 1998, Factories Act 1948, Indian Electricity Act 2003 before start of the project. A register of such examinations and tests shall be properly maintained by the contractor and will be promptly produced as and when desired by the Engineer In-charge/Project Manager or by the person authorised by him. The Contractor has to ensure to give special attention on the formation / condition of eye splices of wire rope slings as per requirement of IS 2762 Specification for wire rope slings and sling legs.

THAT the Contractor has prepared a list of all Lifting machines, lifting Tools / Lifting Tackles / Lifting Gears etc. / All types of ropes and Slings which are subject to safe working load is enclosed at **Annexure – 2 (SP)** for review and approval of Engineer In-charge/Project Manager.

8. THAT the Contractor has to procure sufficient quantity of Personal Protective Equipment (PPE) conforming to Indian / International standards and provide these equipment to every workman at site as per need and to the satisfaction of Engineer-in-charge/Project Manager of RECTPCL. The Contractor's Site Supervisor/ Project Manager has to ensure that all workmen must use Personal Protective Equipment at site. The Contractor shall also ensure that Industrial Safety helmets are being used by all workmen at site irrespective of their working (at height or on ground). The Contractor shall further ensure use of safety shoes by all ground level workers and canvas shoes for all workers working at height, Rubber Gum Boots for workers working in rainy season and concreting job, Use of Twin Lanyard Full body Safety Harness with attachment of light weight such as aluminium alloy etc. and having features of automatic locking arrangement of snap hook, by all workers working at height for more than three meters and also for horizontal movement on tower shall be ensured by contractor. The Contractor shall not use ordinary half body safety harness at site. The Contractor has to ensure use of Retractable type fall arrestors by workers for ascending / descending on suspension insulator string and other similar works etc., Use of Mobile fall arrestor for ascending / descending from tower by all workers. The contractor has to provide cotton / leather hand gloves as per requirement, Electrical Resistance Hand gloves for operating electrical installations / switches, Face shield for protecting eyes while doing welding works and Dust masks to workers as per requirement. **The Contractor shall also provide Reflective Jackets to all workmen working on the site including differently coloured such Jackets to the persons working at height.** The Contractor will have to take action against the workers not using Personal Protective Equipment at site and those workers shall be asked to rest for that day and also their Salary be deducted for that day. RECTPCL may issue warning letter to Project Manager of contractor in violation of above norms.

THAT the Contractor shall prepare a detailed list of PPEs, activity wise, to commensurate with manpower deployed, which is enclosed at **Annexure – 3 (SP)** for review and approval of Engineer In-charge/Project Manager. It shall also be

ensured that the sample of these equipment shall be got approved from RECTPCL supervisory staff before being distributed to workers. The contractor shall submit relevant test certificates as per IS / International Standard as applicable to PPEs used during execution of work. All the PPE's to be distributed to the workers shall be checked by RECTPCL supervisory staff before its usage.

The Contractor also agrees for addition / modification to the list of PPE, if any, as advised by Engineer In-Charge/Project Manager.

9. THAT the Contractor shall procure, if required sufficient quantity of Earthing Equipment / Earthing Devices complying with requirements of relevant IEC standards (Generally IECs standards for Earthing Equipments / Earthing Devices are – 855, 1230, 1235 etc.) and to the satisfaction of Engineer In-Charge/ Project Manager and contractor to ensures to maintained them in healthy condition.

THAT the Contractor has prepared / worked out minimum number of healthy Earthing Equipments with Earthing lead confirming to relevant IS / European standards per gang wise during stringing activity/as per requirement, which is enclosed herewith at **Annexure – 4 (SP)** for review and acceptance of Engineer In-Charge/ Project Manager prior to execution of work.

10. THAT the Contractor shall provide communication facilities i.e. Walky – Talkie / Mobile Phone, Display of Flags / whistles for easy communication among workers during Tower erection / stringing activity, as per requirement.
11. THAT the Contractor undertakes to deploy qualified safety personnel responsible for safety as per requirements of Employer/Statutory Authorities.

THAT the Contractor employing more than 250 workmen whether temporary, casual, probationer, regular or permanent or on contract, shall employ at least one full time officer exclusively as qualified safety officer having diploma in safety to supervise safety aspects of the equipment and workmen who will coordinate with Engineer In-charge /Project Manager/Safety Co-ordinator of the Employer. In case of work being carried out through sub contractors the sub – contractor's workmen / employees will also be considered as the contractor's employees / workmen for the above purpose. If the number of workers are less than 250 then one qualified safety officer is to be deployed for each contract. He will report directly to his head of organization and not the Project Manager of contractor He shall also not be assigned any other work except assigning the work of safety. The curriculum vitae of such person shall be got cleared from RECTPCL Project Manager / Construction staff.

The Contractor shall deploy one dedicated Safety Staff(s) for every 200 kms of a Transmission Line Project.

The name and address of such safety officers/staff(s) of contractor will be promptly informed in writing to Engineer In-charge with a copy to safety officer -

In-charge before start of work or immediately after any change of the incumbent is made during the currency of the contract. The list is enclosed at **Annexure – 5A (SP)**.

THAT the Contractor has also prepared a list including details of Explosive Operator (if required), Safety officer / Safety Staff/ Safety supervisor / nominated person for safety for each erection / stringing gang, list of personnel trained in First Aid Techniques as well as copy of organisation structure of the Contractor in regard to safety. The list is enclosed at **Annexure – 5B (SP)**.

12. The Project Manager shall have the right at his sole discretion to stop the work, if in his opinion the work is being carried out in such a way that it may cause accidents and endanger the safety of the persons and/or property, and/or equipment. In such cases, the Contractor shall be informed in writing about the nature of hazards and possible injury/accident and he shall comply to remove shortcomings promptly. The Contractor after stopping the specific work can, if felt necessary, appeal against the order of stoppage of work to the Project Manager within 3 days of such stoppage of work and decision of the Project Manager in this respect shall be conclusive and binding on the Contractor.
13. THAT, if, any Employer's Engineer/ supervisor at site observes that the Contractor is failing to provide safe working environment at site as per agreed Safety Plan / RECTPCL Safety Rule/ Safety Instructions / Statutory safety requirement and creates hazardous conditions at site and there is possibility of an accident to workmen or workmen of the other contractor or public or the work is being carried out in an un safe manner or he continues to work even after being instructed to stop the work by Engineer / Supervisor at site / RHQ / Corp. Centre, the Contractor shall be bound to pay a penalty of Rs. 10,000/- per incident per day till the instructions are complied and as certified by Engineer / Supervisor of Employer at site. The work will remain suspended and no activity will take place without compliance and obtaining clearance / certification of the Site Engineer / Supervisor of the Employer to start the work.
14. THAT, if the investigation committee of Employer observes any accident or the Engineer In-charge/Project Manager of the Employer based on the report of the Engineer/Supervisor of the Employer at site observes any failure on the Contractor's part to comply with safety requirement / safety rules/ safety standards/ safety instruction as prescribed by the Employer or as prescribed under the applicable law for the safety of the equipment, plant and personnel and the Contractor does not take adequate steps to prevent hazardous conditions which may cause injury to its own Contractor's employees or employee of any other Contractors or Employer or any other person at site or adjacent thereto, or public involvement because of the Contractor's negligence of safety norms, the Contractor shall be liable to pay a compensation of Rs. 15,00,000/- (Rupees Fifteen Lakh only) per person affected causing death and Rs. 5,00,000/- (Rupees Five Lakh only) per person for serious injuries / 25% or more permanent disability to the Employer for further disbursement to the deceased family/

Injured persons. The permanent disability has the same meaning as indicated in Workmen's Compensation Act 1923. The above stipulations is in addition to all other compensation payable to sufferer as per workmen compensation Act / Rules

Notwithstanding above, the Contractor shall also be responsible for payment of sum as indicated below additionally which shall be deposited in Safety Corpus Fund pursuant to GCC Sub-Clause 18.3.3.26:

a.	Upon 1st Fatal Accident due to negligence by the Contractor	Rs. 50,00,000/-
b.	Upon 2nd Fatal Accident due to negligence by the Contractor	Rs. 75,00,000/-
c.	Upon 3rd Fatal Accident due to negligence by the Contractor	Rs. 1,00,00,000/-
d.	Re-occurrence of Fatal Accident even after 3rd Fatal Accident due to negligence by the Contractor	Rs. 1,00,00,000/- per fatal accident
e.	Tower Collapse leading to more than one (01) death attributable to the Contractor as per the Accident Enquiry Committee Report	Rs. 1,00,00,000/- per fatal accident in addition to a, b, c or d above, as applicable

THAT as per the Employer's instructions, the Contractor agrees that this amount shall be deducted from their running bill(s) immediately after the accident, That the Contractor understands that this amount shall be over and above the compensation amount liable to be paid as per the Workmen's Compensation Act /other statutory requirement/ provisions of the Bidding Documents.

15. THAT the Contractor shall submit Near-Miss-Accident report alongwith action plan for avoidance such incidence /accidents to Engineer – In-charge/ Project Manager. Contractor shall also submit Monthly Safety Activities report to Engineer – In-charge/ Project Manager and copy of the Monthly Safety Activities report also to be sent to Safety In-charge at RHQ of the Employer for his review record and instructions.
16. THAT the Contractor is submitting a copy of Safety Policy/ Safety Documents of its Company which is enclosed at **Annexure – 6 (SP)** and ensure that the safety Policy and safety documents are implemented in healthy spirit.
17. THAT the Contractor shall make available of First Aid Box [Contents of which shall be as per Building & other construction workers (Regulation of Employment and Conditions of Services Act and Central Rule 1998 / RECTPCL Guidelines)] to the satisfaction of Engineer In-Charge/ Project Manager with each gang at site and not at camp and ensures that trained persons in First Aid Techniques with each gang before execution of work.

18. THAT the Contractor shall submit an 'Emergency Preparedness Plan' for different incidences i.e. Fall from height, Electrocution, Sun Stroke, Collapse of pit, Collapse of Tower, Snake bite, Fire in camp / Store, Flood, Storm, Earthquake, Militancy etc. while carrying out different activities under execution i.e. foundation works including civil works, erection, stringing (as applicable), testing & commissioning, disposal of materials at site / store etc. which is enclosed at **Annexure – 7 (SP)** for approval of the Engineer In-Charge/ Project Manager before start of work.
19. THAT the Contractor shall organise Safety Training Programs on Safety, Health and Environment and for safe execution of different activities of works i.e. foundation works including civil works, erection, stringing (as applicable), testing & commissioning, disposal of materials at site / store etc. for their own employees including sub contractor workers on regular basis.

The Contractor, therefore, submits copy of the module of training program, enclosed at **Annexure – 9 (SP)**, to Engineer In-charge/Project Manager for its acceptance and approval and records maintained.

20. THAT the Contractor shall conduct safety audit, as per Safety Audit Check Lists enclosed at **Annexure – 8 (SP)**, by his Safety Officer(s) every month during construction of Transmission Lines / Sub Stations / any other work and copy of the safety audit report will be forwarded to the Employer's Engineer In-charge / Site In-charge/Project Manager for his comments and feedback. During safety audit, healthiness of all Personal Protective Equipments (PPEs) shall be checked individually by safety officer of contractor and issue a certificate of its healthiness or rejection of faulty PPEs and contractor has to ensure that all faulty PPEs and all faulty lifting tools and tackles should be destroyed in the presence of RECTPCL construction staff. Contractor has to ensure that each gang be safety audited at least once in two months. During safety audit by the contractor, Safety officer's feedback from RECTPCL concerned shall be taken and recorded. The Employer's site officials shall also conduct safety audit at their own from time to time when construction activities are under progress. Apart from above, the Employer may also conduct surveillance safety audits. The Employer may take action against the person / persons as deemed fit under various statutory acts/provisions under the Contract for any violation of safety norms / safety standards.
21. THAT the Contractor shall develop and display Safety Posters of construction activity at site and also at camp where workers are generally residing.
22. THAT the Contractor shall ensure to provide potable and safe drinking water for workers at site / at camp.
23. THAT the Contractor shall do health check up of all workers from competent agencies and reports will be submitted to Engineer In-Charge within fifteen (15) days of health check up of workers as per statutory requirement.

24. THAT the Contractor shall submit information alongwith documentary evidences in regard to compliance to various statutory requirements as applicable which are enclosed at **Annexure – 10A (SP)**.

The Contractor shall also submit details of Insurance Policies taken by the Contractor for insurance coverage against accident for all employees are enclosed at **Annexure – 10B (SP)**.

25. THAT a check-list in respect of aforesaid enclosures alongwith the Contractor's remarks, wherever required, is attached as **Annexure – Check List** herewith.

THE CONTRACTOR shall incorporate modifications/changes in this 'Safety Plan' necessitated on the basis of review/comments of the Engineer In-Charge/Project Manager within fourteen (14) days of receipt of review/comments and on final approval of the Engineer In-Charge/Project Manager of this 'Safety Plan', the Contractor shall execute the works under the Contract as per approved 'Safety Plan'. Further, the Contractor has also noted that the first progressive payment towards Supply of Supply of Services Contract shall be made on submission of 'Safety Plan' alongwith all requisite documents and approval of the same by the Engineer In-Charge/Project Manager.

IN WITNESS WHEREOF, the Contractor has hereunto set its hand through its authorised representative under the common seal of the Company, the day, month and year first above mentioned.

For and on behalf of

M/s.....

WITNESS

1. Signature.....

Signature.....

Name.....

Name.....

Address.....

Address.....

2. Signature.....

Authorised representative

Name.....

(Common Seal)

Address.....

(In case of Company)

Note:

All the annexure referred to in this “Safety Plan” are required to be enclosed by the contractor as per the attached “ Check List “

1. Safety Plan is to be executed by the authorised person and (i) in case of contracting Company under common seal of the Company or (ii) having the power of attorney issued under common seal of the company with authority to execute such contract documents etc., (iii) In case of (ii), the original Power of Attorney if it is specifically for this Contract or a Photostat copy of the Power of Attorney if it is General Power of Attorney and such documents should be attached to this Safety Plan.
2. For all safety monitoring/ documentation, Engineer In-charge / Regional In-charge of safety at RHQ will be the nodal Officers for communication.

CHECK LIST FOR SEFETY PLAN

S. N.	Details of Enclosure	Status of Submission of information/ documents	Remarks
1.	Annexure – 1A (SP) Safe work procedure for each activity i.e. foundation works including civil works, erection, stringing (as applicable), testing & commissioning, disposal of materials at site / store etc. to be executed at site.	Yes/No	
2.	Annexure – 1B (SP) Manpower deployment plan, activity wise foundation works including civil works, erection, stringing (as applicable), testing & commissioning, disposal of materials at site / store etc.	Yes/No	
3.	Annexure – 2 (SP) List of Lifting Machines i.e. Crane, Hoist, Triffor, Chain Pulley Blocks etc. and Lifting Tools and Tackles i.e. D shackle, Pulleys, come along clamps, wire rope slings etc. and all types of ropes i.e. Wire ropes, Poly propylene Rope etc. used for lifting purposes along with test certificates.	Yes/No	
4.	Annexure – 3 (SP) List of Personal Protective Equipment (PPE), activity wise including the following along with test certificate of each as applicable: 1. Industrial Safety Helmet to all workmen at site. (EN 397 / IS 2925) with chin strap and back stay arrangement. 2. Safety shoes without steel toe to all ground level workers and canvas shoes for workers working on tower.	Yes/No	

S. N.	Details of Enclosure	Status of Submission of information/ documents	Remarks
	3. Rubber Gum Boot to workers working in rainy season / concreting job. 4. Twin lanyard Full Body Safety harness with shock absorber and leg strap arrangement for all workers working at height for more than three meters. Safety Harness should be with attachments of light weight such as of aluminium alloy etc. and having a feature of automatic locking arrangement of snap hook and comply with EN 361 / IS 3521 standards. 5. Mobile fall arrestors for safety of workers during their ascending / descending from tower / on tower. EN 353 -2 (Guided type fall arresters on a flexible anchorage line.) 6. Retractable type fall arrestor (EN360: 2002) for ascending / descending on suspension insulator string etc. 7. Providing of good quality cotton hand gloves / leather hand gloves for workers engaged in handling of tower parts or as per requirement at site. 8. Electrical Resistance hand gloves to workers for handling electrical equipment / Electrical connections. IS : 4770 9. Dust masks to workers handling cement as per requirement. 10. Face shield for welder and Grinders. IS : 1179 / IS : 2553 11. Reflective Jackets 12. Other PPEs, if any, as per requirement etc.		
5.	Annexure – 4 (SP) List of Earthing Equipment / Earthing devices with Earthing lead conforming to IECs for earthing equipments are – (855, 1230, 1235 etc.) gang wise for stringing activity/as per requirement	Yes/No	
6.	Annexure – 5A (SP) List of Qualified Safety Officer(s)/Safety Staff(s)	Yes/No	

S. N.	Details of Enclosure	Status of Submission of information/ documents	Remarks
	alongwith their contact details		
7.	Annexure - 5B (SP) Details of Explosive Operator (if required), Safety officer / Safety Staff(s)/ Safety supervisor for every erection / stringing gang, any other person nominated for safety, list of personnel trained in First Aid as well as brief information about safety set up by the Contractor alongwith copy of organisation of the Contractor in regard to safety	Yes/No	
8.	Annexure - 6 (SP) Copy of Safety Policy/ Safety Document of the Contractor's company	Yes/No	
9.	Annexure - 7 (SP) 'Emergency Preparedness Plan' for different incidences i.e. Fall from height, Electrocutation, Sun Stroke, Collapse of pit, Collapse of Tower, Snake bite, Fire in camp / Store, Flood, Storm, Earthquake, Militancy etc. while carrying out different activities under execution i.e. foundation works including civil works, erection, stringing (as applicable), testing & commissioning, disposal of materials at site / store etc.	Yes/No	
10.	Annexure - 8 (SP) Safety Audit Check Lists (Formats to be enclosed)	Yes/No	
11.	Annexure - 9 (SP) Copy of the module of Safety Training Programs on Safety, Health and Environment, safe execution of different activities of works for Contractor's own employees on regular basis and sub contractor employees.	Yes/No	

S. N.	Details of Enclosure	Status of Submission of information/ documents	Remarks
12.	Annexure – 10A (SP) Information alongwith documentary evidences in regard to the Contractor's compliance to various statutory requirements including the following:		
(i)	Electricity Act 2003 _____ <i>[Name of Documentary evidence in support of compliance]</i>	Yes/No	
(ii)	Factories Act 1948 _____ <i>[Name of Documentary evidence in support of compliance]</i>	Yes/No	
(iii)	Building & other construction workers (Regulation of Employment and Conditions of Services Act and Central Act 1996) and Welfare Cess Act 1996 with Rules. _____ <i>[Name of Documentary evidence in support of compliance]</i>	Yes/No	
(iv)	Workmen Compensation Act 1923 and Rules. _____ <i>[Name of Documentary evidence in support of compliance]</i>	Yes/No	
(v)	Public Insurance Liabilities Act 1991 and Rules. _____ <i>[Name of Documentary evidence in support of compliance]</i>	Yes/No	
(vi)	Indian Explosive Act 1948 and Rules. _____ <i>[Name of Documentary evidence in support of compliance]</i>	Yes/No	

S. N.	Details of Enclosure	Status of Submission of information/ documents	Remarks
	<i>compliance]</i>		
(vii)	Indian Petroleum Act 1934 and Rules. _____ <i>[Name of Documentary evidence in support of compliance]</i>	Yes/No	
(viii)	License under the contract Labour (Regulation & Abolition) Act 1970 and Rules. _____ <i>[Name of Documentary evidence in support of compliance]</i>	Yes/No	
(ix)	Indian Electricity Rule 1956 and amendments if any, from time to time. _____ <i>[Name of Documentary evidence in support of compliance]</i>	Yes/No	
(x)	The Environment (Protection) Act 1986 and Rules. _____ <i>[Name of Documentary evidence in support of compliance]</i>	Yes/No	
(xi)	Child Labour (Prohibition & Regulation) Act 1986. _____ <i>[Name of Documentary evidence in support of compliance]</i>	Yes/No	
(xii)	National Building Code of India 2005 (NBC 2005). _____ <i>[Name of Documentary evidence in support of compliance]</i>	Yes/No	
(xiii)	Indian standards for construction of Low/ Medium/ High/ Extra High Voltage	Yes/No	

S. N.	Details of Enclosure	Status of Submission of information/ documents	Remarks
	Transmission Line <i>[Name of Documentary evidence in support of compliance]</i>		
(iv)	Any other statutory requirement(s) <i>[please specify]</i> <i>[Name of Documentary evidence in support of compliance]</i>	Yes/No	
13.	Annexure – 10B (SP) Details of Insurance Policies alongwith documentary evidences taken by the Contractor for the insurance coverage against accident for all employees as below:		
(i)	Under Workmen Compensation Act 1923 and Rules. <i>[Name of Documentary evidence in support of insurance taken]</i>	Yes/No	
(ii)	Public Insurance Liabilities Act 1991 <i>[Name of Documentary evidence in support of insurance taken]</i>	Yes/No	
(iii)	Any Other Insurance Policies <i>[Name of Documentary evidence in support of insurance taken]</i>	Yes/No	

—

**17. FORM OF JOINT DEED OF UNDERTAKING BY THE COLLABORATOR(S)
ALONGWITH THE BIDDER**

NOT APPLICABLE

**18. FORM OF BANK GUARANTEE FOR CONTRACT PERFORMANCE (TO BE
SUBMITTED BY COLLABORATOR / PARENT COMPANY / SUBSIDIARY)**

NOT APPLICABLE

19. FORM FOR INFORMATION TO BE FURNISHED BY THE CONTRACTOR IN RESPECT OF THE PROCUREMENT MADE FROM MSE VENDORS

The Contractor shall furnish the details of items, components, raw materials, services etc. procured from MSEs and consumed for completion of scope of works under the contract directly or through our sub-suppliers/sub-vendors as per the details given herein below:

Sl. No.	Contract Agreement No.	Name of Contractor	Item Description as per contract Agreement	Qty	Total Value (In Rs.)	Executing Region	Items/components/raw materials sourced from MSE vendor for production of item at column 4	Total Value of the items/components/raw materials used for item at column 4 (In Rs.)	Name of MSE Vendor	Category (only Micro or Small)	Whether MSE owned by persons belonging to SC/ST category
1	2	3	4	5	6	7	8	9	10	11	12

Further, we hereby declare and confirm that the information mentioned above is correct and complete to best of our knowledge and the category of MSE vendors, as mentioned in the table above, has been ascertained at our end.

Note:

1. The Contractor shall be required to furnish the aforesaid information (contract-wise) on semi-annual basis i.e for period from 1st April to 30th September and from 1st October to 31st March for each Financial Year.
2. Submission of aforesaid information for the preceding 6 months, in respect of all the contracts in the Corporate Office of RECTPCL, shall be a condition for processing of bills by RECTPCL for payment after 30th September /31st March, as the case may be.
3. Only those items of Contract Agreement may be included which involve sourcing of items/components/raw materials/services from MSEs.

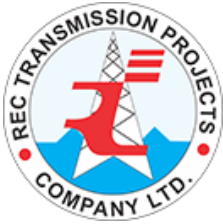
Name of Contractor -----

Name of Authorised Person -----

Designation -----

Signature -----

REC TRANSMISSION PROJECTS COMPANY LIMITED



On Behalf of J&K Power Transmission Corporation Ltd. (JKPTCL erstwhile JKPDD)

As Project Implementation Agency

(Invites bid through e-Tendering mode only)

**FOR
TURNKEY CONTRACT PACKAGE OF**

“Design, Engineering, Supply & Construction of Residential Staff Quarters & associated facilities at 160 MVA, 220/33 kV Gas Insulated Substation (GIS) at Lassipora(Srinagar Region) on Turnkey Basis associated with Strengthening of Transmission System of JKPTCL under PMDP Scheme-15”.

**Tender Specification No- RECTPCL/PIA/JKPTCL/Lassipora-Qtr/01 of 2020 dated:
19-07-2020**

VOL-II

July 2020

REC Transmission Projects Company Limited
(A wholly owned subsidiary of REC, a 'Navratna CPSE'
Under the Ministry of Power, Govt of India)
ECE House, 3rd Floor, Annexe – II,
28 A, K G MARG, NEW DELHI – 110 001
Website: www.rectpcl.in

TECHNICAL SPECIFICATION FOR CIVIL WORKS

1. GENERAL SCOPE OF WORK

Jammu & Kashmir Power Transmission Corporation Ltd. i.e. JKPTCL (erstwhile JKPDD) is responsible for Transmission and distribution of electrical energy in the entire J&K UT. In order to provide reliable Power Supply in Jammu & Kashmir region.

Construction of 220/33kV Lassipora GIS Substation in Srinagar Region has been entrusted to RECTPCL by JKPTCL for complete implementation including Bidding, Engineering, Project Management, Quality assurance and Commissioning of Projects.

RECTPCL has already awarded the work for construction of Substation & work for construction of residential staff quarter is provisioned in this package.

The Ownership of the said substation shall however, remain vested with JKPTCL.

For the above substation, Power development Department desires to implement the Construction of Residential Quarters, Internal Electrifications for Quarters / buildings, RCC roads, Water Supply incl. tube well reservoirs etc., Drainage & Sewerage system and External Electrification at both the substation.

The broad scope of work shall include Design, Engineering, Supply & Construction of Civil Works, Plumbing & Sanitary works, Water supply, Internal and External Electrical works, Road Work, and associated allied works etc.

Scope of Work:

The broad scope of work shall include Design, Engineering, Supply & Construction of Residential Staff Quarters, associated Plumbing & Sanitary works, Water supply, Internal and External Electrical works, Road Work, and associated allied works etc.

The scope of work shall include but not be limited to the following

- a) Construction of Residential staff quarters & other buildings including boundary wall.
- b) Contouring and site leveling (if required)
- c) External water supply arrangement for colony & other buildings etc.
- d) External sewerage system
- e) Supply, Erection, testing & commissioning of lighting poles, panels and control cubicles of equipment (as required in complete).
- f) Construction of underground water storage tank for colony & other buildings
- g) Construction of septic tank & soak pit for control room and residential building
- h) Supply, Erection, Testing & Commissioning of Pole mounted 1 x 100 KVA, 11/0.433 kV (Minimum BEE 4 Star Rating), Three Phase Distribution transformer along with 11kV Gang operated switch, Drop out fuse, Surge arrestors etc. in HV side and Main Township Distribution Board comprising of Two 200A, 20KA MCCB incoming feeders (One from MSB in ACDB Room & other from 100KVA Transformer), 200 Amps, 20KA Bus, One 200A Bus coupler MCCB and Eight outgoing MCCB feeders (2 of 63A & 4 of 32 A & 2 of 25A), LT cable from Transformer to Main Township Distribution Board etc. in LV side.
- i) External lighting and illumination for the Colony Area under present scope including Street Lighting with RCC htp poles with Led Lightning
- j) Internal Electrification of the buildings.
- k) From LT Sub-station - Cable Connection from LT Main Panel outgoing feeders to the Sub-Main Panels distribution box shall be provided by the Contractor as per Bid Price Schedule.
- l) RCC Roads 3.75 Mtr. As per approved layout of township.

m) Any other item required for completion of scope of works

The work to be performed under this specification shall include providing all labour, supervision, materials, storages, inventories, all enabling works like scaffolding, watch and ward for the works, power, fuel, construction equipment, water, tools and plants, supplies, transportation, all taxes and duties, all labour welfare and safety measures, complete and all other incidental items not shown or specified, but reasonably implied or necessary for successful completion of the work including Contractor's supervision and in strict accordance with the drawings and specifications, inspection and testing standards and field quality control and testing as given in the tender documents and the complete execution of the works.

The scope shall also include preparation of reinforcement placement drawings, fabrication drawings and bar bending schedules, based on the drawings released for construction and getting the same approved by the Engineer-in-Charge.

The contractor shall have sole responsibility of co-ordination for construction activities, though he may employ separate sub- contractors. All co-ordination and interfacing with all the sub-contractors shall be done by the contractor.

Details of Residential Quarters: -

S. No.	Particulars	Qty.	Area	Configuration
1.	JE Quarters	4x2 Sets	(Total area- 2500 Sq.ft x 2)	Double story

2. SPECIFICATION FOR WORK, QUALITY AND WORKMANSHIP

Work shall be carried out as per RECTPCL Specification. If any items are not covered in RECTPCL specification, CPWD specifications are to be followed for Civil/Electrical works for all the scheduled/DSR Items. For non-scheduled items the work shall be executed according to the specifications given herein or in its absence the relevant CPWD Specifications, or the best practice recommended by reputed manufacturers, or the best Public Works Department practices or to the recommendations of relevant Indian Standard/ International Practice or according to the instructions of the Engineer-in-Charge. The specifications are intended for the general descriptions of the work, quality and workmanship. The specifications are not, however, intended to cover the minute details and the work shall be executed according to the best Central Public Works Department Practices or to the recommendations of relevant Indian Standard/International Codes like ASTM/DIN or according to the instructions of the Engineer-in-Charge.

All the materials of the project shall be from the approved makes of materials specified in this specification and as approved by RECTPCL. Materials for which approved makes are not available in above, the same shall be decided by the Engineer-in-charge. The procurement of various materials shall be either from the manufacturer or their main authorized dealers to ensure that no duplicate/spurious makes are used in the works. The Contractors are required to submit manufacturer's test certificates for the lots supplied at site with due endorsements by the actual dealers/vendors/sellers. Notwithstanding all the above, the contractor shall be held responsible for the execution of works and use of proper materials as per the tender specifications. Any material shall be approved by the Engineer-in-charge before put to use.

Wherever reference to CPWD/Indian Standard Codes and Practices is made, it shall be to the latest edition/revision of the same, issued up to 7 days prior to the date of opening of this tender.

The tenderer must obtain clarifications, if any, regarding the specifications and all other tender documents before submission of the tender in writing with the Employer in respect of

interpretation of any portions of these documents.

3. TESTS OF MATERIALS/WORKMANSHIP

All mandatory tests shall be carried out as per RECTPCL Standard field quality plan. Test mentioned in individual items/specifications shall also be carried. All tests required for all materials shall be at the Contractor's cost. In case of items not covered in the CPWD specifications and IS code contractor shall arrange testing as per practice of the industry without any additional cost. Manufacture's test certificate of the relevant batch of material procured shall also be submitted for all measure items.

4. LAYOUT AND LEVELS

The layout and levels of all buildings, structures etc. shall be made by the Contractor at his own cost from the general grid of the plot and bench marks as approved by the Engineer-in-Charge. The Contractor shall also assist in the form of instruments, materials and men to Engineer-in-Charge for checking the detailed layout and correctness of the layout and levels, at his own cost. But the Contractor shall be solely responsible for correctness of layout and levels. The levels and heights mentioned in the tender drawings are only tentative. The works shall be carried out as per Construction drawings issued after the award of the works.

5. CONSTRUCTION METHOD

The tenderer shall submit construction schedule, names of specialized agencies/products, list of construction equipment to be deployed and write-up to indicate in a broad outline how he intends to execute the work with the best co-ordination among various sub- packages (or sub-heads). These shall form part of this Tender.

6. DRAWINGS:

Tentative location plan drawings (LUP) for residential staff quarter at Lassipora GIS Substation is enclosed with this Tender Document shall form a part of this specification and supplement the requirement specified herein. The vendor shall finalize the layout plan of the township as per available land and take approval of RECTPCL.

The Contractor is required to furnish a schedule indicating their requirements of 'Release for Construction' drawings compatible with the approved detailed construction program within 10 days of award of the work for scrutiny and approval and subsequent finalization of the Employers. 'Good for Construction' drawings shall be issued to the contractor progressively during the execution of the contract as per actual progress achieved and requirements at site. Based on the 'Released for Construction' drawings, contractor will prepare reinforcement placement drawings including the Bar Bending Schedule, Steel Fabrication Drawings, all other shop drawings etc. and get the same approved by the Engineer-in-Charge before execution of the work.

Any technical clarifications required regarding the drawings/specifications during the progress of works shall be obtained from the Engineer-in-Charge allowing a minimum of four working days for processing. Such "Requests for Information" (RFI) shall be in approved format which can be obtained from Engineer-in-Charge.

The actual terminal point of scope of works under this contract shall be as shown in 'Good for Construction' drawings.

Regarding conduit layout drawings, Point wiring drawing, Plumbing, water supply and sewerage layout drawings, the Contractor will submit the shop drawings (in hard copy and in AutoCAD format) for the approval from RECTPCL.

As Built Drawings should be submitted by the Contractor to Site and at RECTPCL (in hard copy and in AutoCAD format) at the time of Final Bill.

7. APPROVED VENDORS AND MAKES:

The Items which are available in enclosed "Compendium of Vendors", shall be sourced from approved manufacturers. For items which are not available in the "Compendium of Vendors", the decision of Engineer-in-charge shall be final. However, to facilitate procurement, the list of Indicative makes shall be treated as indicative list.

8. Miscellaneous

The contractor shall be responsible for watch and ward of all the works, equipment's and various materials till complete handing over the works and all necessary arrangements to co-ordinate with watch and ward of other contractors working simultaneously and also of the Employers shall be made to the complete satisfaction of the Engineer-in-Charge.

The list of deliverables which are to be submitted to the Employer shall be discussed and finalized by the Employer at the time of award. The Contractor shall necessarily submit all the drawings/documents/other deliverables unless anything is waived. The contractor shall submit 4 (four) sets of drawings/design documents/test reports as may be required for the approval of the Employer.

The contractor shall co-operate with the representatives of the Employer for due verifications of various compliances of various statutory regulations and tax compliances as and when required. All the documents of record shall be made available to the Employers and copies, wherever required, shall be submitted.

Employer reserves the right to inspect all the material before dispatch. However, depending upon nature of material, waiver of inspection may be granted for which the Contractor shall take prior approval of the Employer. This will be done on case to case basis.

The work is located in the premises of existing sub-station. The Contractor shall make arrangements for regulation of traffic by engaging security staff. They shall also make necessary arrangements to prevent unauthorized entry in the premises.

Contractor shall comply with all regulations of local authorities without any financial implication to RECTPCL.

9. Completion Certificate

On completion of the work the Contractor shall obtain completion certificate from local bodies or statutory body for and on behalf of the Owner for the construction as contemplated in this contract. However, the Owner may also help contractor to the extent of writing letters to Local bodies for expediting approval, if required. Further if any fee is required to be paid to the local/statutory bodies, the same shall be reimbursed to contractor by the owner against documentary evidence.

10. ROADS

- a) All the roads as required for the Township area as per approved General Arrangement drawing for the Township area are in the present scope. Adequate turning space for vehicles shall be provided and bend radii shall be set accordingly.
- b) All concrete roads within substation boundary wall shall be with 3.75 m RCC concrete pavement of suitable thickness and 1.3 m wide earthen shoulder on either side of the road. Below RCC concrete pavement, water bound macadam of adequate thickness as per design (WBM) shall be laid.
- c) All roads shall be designed as per relevant Indian standard codes (I S Codes)/ equivalent International Standards. All drawings of road and culverts shall be prepared by the

contractor.

- d) All the culverts and allied structures (required for road/rail, drain, trench crossings etc.) shall be designed as per relevant Indian standard codes (IS Codes)/ equivalent International Standards

11. SITE PREPERATION, EXCAVATION, BACKFILL & DISPOSAL OF SURPLUS EARTH.

11.1. SITE PREPERATION

The layout and levels of all structure etc. shall be made by the Contractor at his own cost from the general grids of the plot and benchmarks set by the Contractor and approved by the Employer. The Contractor shall give all help in instruments, materials and personnel to the Employer for checking the detailed layout and shall be solely responsible for the correctness of the layout and levels.

11.2. SCOPE

This clause covers clearing of the site, maintaining the finished ground level with available surplus excavated suitable back fill material generated from foundation works etc.

11.3. GENERAL

1. The Contractor shall develop the site area to meet the requirement of the intended purpose. The site preparation shall conform to the requirements of relevant sections of this specification or as per stipulations of relevant Indian standard codes (IS Codes)/ equivalent International Standards.
2. The fill material shall be suitable for the above requirement. The fill shall be with such a material that the site so designed shall not be affected by erosion from wind and water from its final compacted position or the in-situ position of undisturbed soil.
3. Material unsuitable for founding of foundations shall be removed and replaced by suitable fill material to be approved by the Employer.
4. Backfill material around foundations or other works shall be suitable for the purpose for which it is used and compacted to the density described under Compaction. Excavated material not suitable or not required for backfill shall be disposed off in areas as directed by engineer- in Charge up to a maximum lead of 2 km.

11.4. EXCAVATION AND BACKFILL SCOPE

This clause covers excavation for foundation works of Buildings/ Staff Quarter etc. backfilling of Foundations Works.

1. Excavation and backfill for foundations shall be in accordance with the relevant Indian standard codes (IS Codes)/ equivalent International Standards.
2. Whenever water table is met during the excavation, it shall be dewatered and water table shall be maintained below the bottom of the excavation level during excavation, concreting and backfilling.
3. When embankments are to be constructed on slopes of 15% or greater, benches or steps with horizontal and vertical faces shall be cut in the original slope prior to placement of embankment material. Vertical faces shall measure not more than 1 m in height.
4. Embankments adjacent to abutments, culverts, retaining walls and similar structures shall be constructed by compacting the material in successive uniform horizontal layers not exceeding 15 cm in thickness. (of loose material before compaction). Each layer shall be compacted as required by means of mechanical tampers approved by the Purchaser. Rocks

larger than 10 cm in any direction shall not be placed in embankment adjacent to structures.

5. Earth embankments of roadways and site areas adjacent to buildings shall be placed in successive uniform horizontal layers not exceeding 20 cm in thickness in loose stage measurement and compacted to the full width specified. The upper surface of the embankment shall be shaped so as to provide complete drainage of surface water at all times.

11.5. COMPACTION

1. The density to which fill materials shall be compacted shall be as per relevant IS and as per direction of Employer. All compacted sand filling shall be confined as far as practicable. Backfilled earth shall be compacted to minimum 95% of the Standard Proctor's density at OMC. The sub grade for the roads and embankment filling shall be compacted to minimum 95% of the Standard Proctor's density at OMC. Cohesion less material sub grade shall be compacted to 70% relative density (minimum).
2. At all times unfinished construction shall have adequate drainage upon completion of the road's surface course, adjacent shoulders shall be given a final shaping, true alignment and grade.
3. Each layer of earth embankment when compacted shall be as close to optimum moisture content as practicable. Embankment material which does not contain sufficient moisture to obtain proper compaction shall be wetted. If the material contains any excess moisture, then it shall be allowed to dry before rolling. The rolling shall begin at the edges overlapping half the width of the roller each time and progress to the centre of the road or towards the building as applicable. Rolling will also be required on rock fills. No compaction shall be carried out in rainy weather.

11.6. REQUIREMENT FOR FILL MATERIAL UNDER FOUNDATION

The thickness of fill material under the foundations shall be such that the maximum pressure from the footing, transferred through the fill material and distributed onto the original undisturbed soil will not exceed the allowable soil bearing pressure of the original undisturbed soil. For expansive soils, the fill materials and other protections etc. to be used under the foundation is to be got approved by the Employer.

11.7. DISPOSAL OF SURPLUS EARTH

The surplus earth generated from foundation work shall be disposed away from levelling area boundary at low lying areas within 2Km lead. The surplus earth if disposed within substation main boundary, the same shall be spread in uniform layers and compacted with suitable compacting equipment to achieve 95% compaction at O.M.C.

12. SITE DRAINAGE

Preparation of overall drainage layout, design, drawing and providing rain water drainage system within the Residential Staff Quarter Colony under the present scope including connection at one or more points to the outfall point located outside the substation boundary wall is in the scope of contractor. Invert level of drainage system at outfall point shall be decided in such a way that the water can easily be discharged outside the substation boundary wall. In case outfall point is more than 50M away from boundary wall, only 50 metre drain outside the boundary wall is in the scope of contractor. Outfall point shall be got approved from Employer before commencement of construction. While designing the drainage system following points shall be taken care of:

- a) The surface of the Residential Staff Quarter Colony shall be sloped to prevent accumulation of water.
- b) Drain shall be constructed at suitable locations in such a way that Residential Staff Quarter Colony is not flooded and roads are not affected with ponding of surface water. In the Residential Staff Quarter Colony maximum spacing between two drains shall not be more than 100 meter. It will be ensured that no area is left undrained.

- c) Open surface drains having 300mm bottom width and 300mm depth at starting point of drain shall be provided. The depth of drain shall be measured with respect to finished ground level of switch yard i.e. from bottom of switch yard stone filling.
- d) Longitudinal slope shall not be less than 1 in 1000.
- e) Open surface drains shall be constructed with brick masonry or concrete blocks. As per design of contractor. PCC (1:2:4) shall be laid over 40mm thick layer of PCC 1:4:8 (1 cement: 4 coarse sand: 8 stone aggregate 20mm nominal size.)
- f) The side wall of the drains shall be 25 mm above the gravel level to prevent falling of gravel into drain. Groove of 125 mm width shall be provided at 2000 mm spacing with suitable mild steel grating.
- g) The maximum velocity for pipe drains and open drains shall be limited to 2.4m/sec and 1.8m/sec respectively. However, minimum non-silting velocity of 0.6m/sec shall be ensured.
- h) Pipe drains shall be provided in areas of switchyard where movement of crane will be necessary in operating phase of the substation.
- i) For pipe drains, concrete pipe of class NP2 shall be used. However, for road crossings etc. higher strength pipe of class NP3 shall be provided. For rail crossings, RCC pipes of class NP4 shall be provided. For design of RCC pipes for drains and culverts, relevant Indian standard codes (IS Codes)/ equivalent International Standards. shall be followed.
- j) Two Nos. of portable pumps of 3 / 5 HP capacity for drainage of water shall be provided by the Contractor.
- k) Pipe drains shall be connected through manholes at an interval of max. 30m.
- l) If the invert level of outfall point is above the last drain point in the substation boundary, sump of suitable size has to be constructed within the substation boundary.
- m) The drainage scheme and associated drawings shall be got approved from Employer before commencement of construction.

13. FOUNDATION / RCC CONSTRUCTION

13.1. GENERAL

1. Work covered under this Clause of the Specification comprises the design, drawing and construction of foundations and other RCC constructions for Residential Staff Quarter Colony, or for any other equipment or service and any other foundation required to complete the work. This clause is as well applicable to the other RCC constructions.
2. Concrete shall conform to the requirements mentioned in relevant Indian standard codes (IS Codes)/ equivalent International Standards. And all the tests shall be conducted as per relevant Indian standard codes (IS Codes)/ equivalent International Standards. However, a minimum grade of M25 (design Mix) concrete shall be used for all foundations and structural/load bearing members as per relevant Indian standard codes (IS Codes)/ equivalent International Standards.
3. If the site is sloppy, the foundation height will be adjusted to maintain the exact level of the top of structures to compensate such slopes.
4. Minimum 75mm thick lean concrete (1:4:8) shall be provided below all underground structures, foundations, trenches etc. to provide a base for construction.
5. Concrete made with Portland slag cement shall be carefully cured and special importance shall be given during the placing of concrete and removal of shuttering.
6. The design and detailing of foundations shall be done based on the approved soil data and sub-soil conditions as well as for all possible critical loads and the combinations thereof. The Spread footings foundation or pile foundation as may be required based on soil/sub-soil conditions and superimposed loads shall be provided.
7. If pile foundations are adopted, the same shall be cast-in-situ driven/bored or pre-cast or under reamed type as per relevant parts of relevant Indian standard codes (IS Codes)/ equivalent International Standards. Only RCC piles shall be provided. Suitability of the adopted pile foundations shall be justified by way of full design calculations. Detailed design calculations shall be submitted by the contractor showing complete details of piles/pile groups proposed to be used. Necessary initial load test shall also be carried out by the bidder at their cost to establish the piles design capacity. Only after the design capacity of piles has been

established, the Contractor shall take up the job of piling. Routine tests for the piles shall also be conducted. All the work (design & testing) shall be planned in such a way that these shall not cause any delay in project completion.

13.2. DESIGN

While designing foundations, following may be taken care of:

- 13.2.1.** All foundations except for external lighting poles shall be of reinforced cement concrete. The external lighting pole shall be embedded in plain cement concrete (1:2:4) foundation. The design and construction of RCC structures shall be carried out as per relevant IS: 456 and minimum grade of concrete shall be M-25 (design Mix). Higher grade of concrete than specified above may be used at the discretion of Contractor without any additional financial implication to the Employer.
- 13.2.2.** Limit state method or any other method as per relevant Indian standard codes (IS Codes)/ equivalent International Standards of design shall be adopted unless specified otherwise in the specification.
- 13.2.3.** For detailing of reinforcement IS: 2502 and SP 34 shall be followed. Cold twisted deformed bars ($F_y=500\text{N/mm}^2$) conforming to relevant Indian standard codes (IS Codes)/ equivalent International Standards shall be used as reinforcement. Two layers of reinforcement (on inner and outer face) shall be provided for wall & slab sections having thickness of 150 mm and above. Clear cover to reinforcement shall be as per relevant Indian standard codes (IS: 456)/ equivalent International Standards.
- 13.2.4.** RCC water retaining structures like storage tanks, etc. shall be designed as un cracked section in accordance with relevant Indian standard codes (IS: 3370 Part I to IV)/ equivalent International Standards. However, water channels shall be designed as cracked section with limited steel stresses as per relevant IS.
- 13.2.5.** The procedure used for the design of the foundations shall be the most critical loading combination of the steel structure and or equipment and/or superstructure and other conditions which produces the maximum stresses in the foundation or the foundation component and as per the relevant Indian standard codes (IS Codes)/ equivalent International Standards of foundation design. Detailed design calculations shall be submitted by the bidder showing complete details of piles/pile groups proposed to be used.
- 13.2.6.** Design shall consider any sub-soil water pressure that may be encountered following relevant standard strictly.
- 13.2.7.** Necessary protection to the foundation work, if required shall be provided to take care of any special requirements for aggressive alkaline soil, black cotton soil or any other type of soil which is detrimental/harmful to the concrete foundations.
- 13.2.8.** RCC columns shall be provided with rigid connection at the base.
- 13.2.9.** All sub-structures shall be checked for sliding and overturning stability during both construction and operating conditions for various combinations of loads. Factors of safety for these cases shall be taken as mentioned in relevant Indian standard codes (IS Codes)/ equivalent International Standards or as stipulated elsewhere in the Specifications. For checking against overturning, weight of soil vertically above footing shall be taken and inverted frustum of pyramid of earth on the foundation should not be considered.
- 13.2.10.** Earth pressure for all underground structures shall be calculated using co-efficient of earth pressure at rest, co-efficient of active or passive earth pressure (whichever is applicable). However, for the design of substructures of any underground enclosures, earth pressure at rest shall be considered.
- 13.2.11.** In addition to earth pressure and ground water pressure etc., a surcharge load of $2T/\text{Sq.m}$ shall also be considered for the design of all underground structures including channels, sumps, tanks, trenches, substructure of any underground hollow enclosure etc., for the vehicular traffic in the vicinity of the structure.
- 13.2.12.** Following conditions shall be considered for the design of water tank in pumps house, channels, sumps, trenches and other underground structures:
 - a)** Full water pressure from inside and no earth pressure & ground water pressure &

surcharge pressure from outside (application only to structures which are liable to be filled up with water or any other liquid).

- b) Full earth pressure, surcharge pressure and ground water pressure from outside and no water pressure from inside.
- c) Design shall also be checked against buoyancy due to the ground water during construction and maintenance stages. Minimum factor of safety of 1.5 against buoyancy shall be ensured ignoring the superimposed loadings.

13.2.13. Base slab of any underground enclosure shall also be designed for empty condition during construction and maintenance stages with maximum ground water table (GWT). Minimum factor of safety of 1.5 against buoyancy shall be ensured ignoring the super-imposed loadings.

13.2.14. Base slab of any underground enclosure like water storage tank shall also be designed for the condition of different combination of pump sumps being empty during maintenance stages with maximum GWT. Intermediate dividing piers of such enclosures shall be designed considering water in one pump sump only and the other pumps sump being empty for maintenance.

13.3. ADMIXTURES & ADDITIVES

13.3.1. Only approved admixtures shall be used in the concrete for the Works. When more than one admixture is to be used, each admixture shall be batched in its own batch and added to the mixing water separately before discharging into the mixer. Admixtures shall be delivered in suitably labelled containers to enable identification.

13.3.2. Admixtures in concrete shall conform to relevant Indian standard codes (IS Codes)/ equivalent International Standards. The water proofing cement additives shall conform to relevant IS. Concrete Admixtures/ Additives shall be approved by Employer.

13.3.3. The Contractor may propose and the Employer may approve the use of a water-reducing set-retarding admixture in some of the concrete. The use of such an admixture will not be approved to overcome problems associated with inadequate concrete plant capacity or improperly planned placing operations and shall only be approved as an aid to overcoming unusual circumstances and placing conditions.

13.3.4. The water-reducing setting-retarding admixture shall be an approved brand as per relevant Indian standard codes (I S Codes)/ equivalent International Standards.

14. BUILDINGS

14.1. GENERAL

The scope includes the design, drawing, engineering and construction including anti-termite treatment, plinth protection, DPC of Building including sanitary, water supply, electrification, false ceiling etc. as applicable ,complete of Residential Staff Quarter Colony. Electrification and air conditioning of building shall be provided as detailed in other sections of electrical portion.

14.2. Residential Staff Quarter GENERAL

The scope includes layout design, engineering and construction, including anti-termite treatment, plinth protection, DPC, peripheral drains, water supply, plumbing, sanitation, fire-fighting, electrification etc. of Residential Staff Quarter.

The building shall be constructed as per the building codes, relevant IS Codes, state Government norms and complete detailed Architecture drawings, structural design and construction drawings to be developed by the contractor. The RCC Roof shall be provided for all the floors and mumty.

Additional Roof with slopes (1 Vertical: 1.5 Horizontal) shall be provided in case the township is in snow bound terrain. This roof shall be MS truss Structure covered with MS

profile sheets as per CPWD Specifications.

Tentative carpet area requirement :

S.No.	Particulars	Qty	Area	Configuration
1.	JE Quarters	4x2 Sets	(Total area- 2500 Sq.ft x 2)	Double storey

It shall be constructed in the area identified in land Utilization plan for Lassipora GIS Substation provided in the tender document.

14.3. DESIGN CRITERIA

The Buildings shall be designed:

- a) To the requirements of the Indian Standards.
- b) For the specified climatic and loading conditions.
- c) To adequately suit the requirements of the equipment's and apparatus contained in the buildings and in all respects to be compatible with the intended use and occupancy.
- d) With a functional and economical space arrangement.
- e) To be aesthetically pleasing. Different buildings shall show a uniformity and consistency in architectural design, as far as possible.
- f) Suitable Expansion joints, wherever required, shall be provided as per Codal Provisions.
- g) All the members of the buildings frame shall be designed for the worst combination of loads as per relevant Indian standard codes (I S Codes)/ equivalent International Standards.
- h) Permissible stresses for different load combinations shall be taken as per relevant Indian standard codes (I S Codes) / equivalent International Standards.
- i) Seismic coefficient Method or Response spectrum method shall be used for seismic analysis of the building for Earthquake forces, as per relevant Indian standard codes (I S Codes)/ equivalent International Standards.

14.4. DESIGN LOADS

- a) Building structure shall be designed for the most critical combinations of dead loads, super-imposed loads, equipment loads, erection loads, wind loads, seismic loads, snow loading, if required etc. Any other incidental load, if anticipated, shall be duly accounted for in the design, and shall be clearly mentioned by the bidder.
- b) Dead loads shall include the weight of structures complete with finishes, fixtures and partitions, and shall be taken as per relevant Indian standard codes (I S Codes)/ equivalent International Standards.
- c) Super-imposed loads in different areas shall include live loads, minor equipment loads, cable trays, small pipe racks/hangers and erection, operation and maintenance loads, wherever these loads are expected. Equipment loads shall constitute, if applicable, all load of equipment's to be supported on the building frame.

AREA	Load
1. For buildings	5.0 kN/m ²
If higher than 5.0 kN/m ²	As per actual Requirement.
2. Staircases & Balconies.	5.0 kN/m ²

3. Toilets.	2.0 kN/m ²
4. Chequered Plate.	4.0 kN/m ²
5. Corridors/Walkways.	3.0 kN/m ²
6. Accessible Roofs.	1.5 kN/m ²
7. Non-accessible Roofs.	0.75 kN/m ²

- d) Wind loads shall be calculated as per relevant Indian standard codes (IS Codes)/ equivalent International Standards. The Factors affecting the wind speed shall be taken based on the site conditions.
- e) Earthquake loads shall be calculated as per relevant Indian standard codes (IS Codes)/ equivalent International Standards.
- f) Wind forces and Seismic forces shall not be considered to act simultaneously.
- g) Snow load shall be computed as per IS:875 part 4 (latest). When snow load is present in roofs, replace imposed load by snow loads in respective load combinations
- h) All the load combinations to create worst combinations of loads shall be as per relevant International standards/Indian Standards.
- i) Floors/ Slabs shall be designed to carry loads imposed by equipment's, cables, piping, movement of maintenance trucks (if required) and any other load associated with the building. In general, floors shall be designed for live loads as per relevant Indian standard codes (I S Codes)/ equivalent International Standards. Cable and piping loads shall also be considered in addition to the live loads for floors where these loads are expected.

14.5. FLOORS, WALLS & ROOFS

- a) All walls shall be non-load bearing in filled panel walls, in brickwork as per the specification. Minimum thickness of external walls shall be 230 mm (one brick) with 1:6 cement sand mortar. Partition walls if any shall be of 115 mm thick brick masonry in cement sand mortar (1:4). Bricks of class 75 Kg/cm sq. shall be used.
- b) All Floor/Roof slabs shall be regular beam slab construction. However, sunken RCC slab shall be provided in toilet areas as per the requirement.
- c) False ceiling as per requirement shall be provided as detailed in Table-1 (Detailed Finish Schedule).
- d) Minimum height of skirting above finished floor level shall be 150 mm. The skirting material shall match with the floor finish.
- e) Minimum height of the parapet walls shall be 750 mm.
- f) Ground floor finish shall be laid over 20 mm thick cement sand mortar, 100 mm thick plain cement concrete (PCC) 1:4:8 (1 cement: 4 sand: 8 stone aggregates), 100 mm thick local sand filling. The earth below ground floor shall be well rammed before laying sand filling.
- g) First floor details shall comprise of finish as per schedule, 20 mm cement sand mortar and 50 mm thick PCC (1:4:8) over RCC slab.

14.6. DETAILS OF ROOF

Roof of the Building shall consist of Cast-in-situ RCC slab treated with a water proofing system which shall be an integral cement based treatment conforming to relevant Indian standard codes (IS Codes)/ equivalent International Standards. The water proofing treatment shall be of following operations:

- a) Applying and grouting a slurry coat of neat cement using 2.75 kg/m² of cement admixed with proprietary water proofing compounds conforming to relevant Indian standard codes (IS Codes)/ equivalent International Standards. Over the RCC slab including cleaning the surface before treatment.

- b) Laying cement concrete using broken stone of size from 25mm to 100mm size with 50% of cement mortar 1:5 (1 cement: 5 coarse sand) admixed with proprietary water proofing compound conforming to relevant Indian standard codes (I S Codes)/ equivalent International Standards over 20mm thick layer of cement mortar of min 1:5 (Cement: 5 coarse sand) admixed with proprietary water proofing compound conforming to relevant Indian standard codes (IS Codes)/ equivalent International Standards to required slope and treating similarly the adjoining walls up to 300mm height including rounding of junctions of walls and slabs.
- c) After two days of proper curing applying a second coat of cement slurry admixed with proprietary water proofing compound conforming relevant Indian standard codes (IS Codes)/ equivalent International Standards.
- d) Finishing the surface with 20mm thick joint less cement mortar of mix 1:4 (1 cement: 4 coarse sand) admixed with proprietary water proofing compound conforming to relevant Indian standard codes (IS Codes)/ equivalent International Standards and finally finishing the surface with trowel with neat cement slurry and making of 300 x 300 square mm.
- e) The whole terrace so finished shall be flooded with water for a minimum period of two weeks for curing and for final test. All above operations to be done in order and as directed and specified by the Executive Engineer In-charge.
- f) Average thickness of water proofing shall be 120 mm and minimum thickness at khurra shall be 65 mm.
- g) Additional Roof with slopes (1 Vertical: 1.5 Horizontal) shall be provided in case the township is in snow bound terrain.** This roof shall be MS truss Structure covered with MS profile sheets as per CPWD Specifications.

14.7. PLASTERING

External surfaces of buildings shall have 18 mm thick plaster in two layers, with the under layer 12mm thick 1:5 cement sand plaster and the top layer 6 mm thick 1:6 cement sand plaster. Inside wall surfaces shall have 12/15 mm thick 1:6 cement sand plaster. Rough surfaces shall have 15mm and smooth surface shall have 12 mm thick cement sand plaster.

All RCC ceilings shall be provided with 6 mm thick cement sand (fine) plaster (1:3) except for areas with false ceiling.

14.8. EXTERNAL PAINTING

External surfaces of the Buildings shall be painted with acrylic exterior flat paint as per manufacturer's specification and approval of Employer.

14.9. DOORS, WINDOWS AND VENTILATORS

The schedule of doors, windows of the Residential Quarter g shall be as per the detailed finish schedule given in Table-1 (Detailed Finish Schedule), and shall conform to the relevant Indian standard codes (IS Codes)/ equivalent International Standards.

14.10. PLINTH PROTECTION

750 mm wide and 50 mm thick plain cement concrete 1:2:4 (1 cement:2 sand:4 graded 20 mm nominal size stone aggregate) shall be laid over 75 mm thick dry stone aggregates well rammed and consolidated with interstices filled with local sand including smooth finishing top.

14.11. PLUMBING & SANITATION

- a) All plumbing and sanitation works shall be executed to comply with the requirements of the appropriate bye-laws, rules and regulations of the Local Authority having jurisdiction over such matters. The Contractor shall arrange for all necessary formalities to be met with regards to the inspection, testing, obtaining approval and giving notices etc.
- b) 'SINTEX' or an equivalent make PVC Roof water tank(s) of 1000 litres shall be provide for every unit
- c) Chlorinated Polyvinyl chloride (CPVC) pipes having thermal stability for hot and cold water supply including all CPVC plain and brass threading conforming to relevant Indian standard codes (IS Codes)/ equivalent International Standards shall be used for internal piping works for water supply.
- d) Sand C.I. pipes with lead joints conforming to relevant Indian standard codes (IS Codes)/ equivalent International Standards shall be used for sanitary works above ground level and RCC pipes shall be used for sanitary works below ground.
- e) Each toilet shall have the following minimum fittings:
 - (i) WC (Western type) 390 mm high along with toilet paper roll holder and all other fittings, in toilets attached to site office; or WC (Indian Type) Orissa Pattern (580 x 440 mm) with all fittings shall be provided in one toilet.
 - (ii) 1 nos. Urinal (430 x 260 x 350 mm size) with all fittings and built-in-sensor for automatic flush after use in the site office.
 - (iii) Wash basin (550 x 400 mm) with all fittings.
 - (iv) Bathroom mirror (600 x 450 x 6 mm thick) with hard board backing.
 - (v) CP brass towel rail (600 x 20 mm) with CP brass brackets.
- f) One no. stainless steel kitchen sink with Drain board (510 x 1040 x 178 mm bowl depth) for pantry shall be provided.
- g) All fittings, fasteners, gratings shall be chromium plated
- h) All sanitary fixtures and fittings shall be of approved quality and type, manufactured by reputed manufacturers. All items brought to site must bear identification marks of the Manufacturer.
- i) **Contractor shall provide necessary nos. of septic tank and soak pit of adequate capacity to treat the sewage/sullage from the buildings.**
- j) **Contractor shall undertake all other activities required to complete and commission the township & office building.**

14.12. BUILDING STORM WATER DRAINAGE

- a. The building design shall provide for the collection of storm water from the roof. This water shall be drained to the main drainage system of the Sub-station.
- b. PVC Rainwater down comer pipes conforming to relevant International standards/Indian Standards.
- c. All drains inside the buildings shall have minimum 40 mm thick grating covers; and in areas where heavy equipment loads are envisaged, Pre-Cast RCC covers shall be provided in place of steel grating.

14.13. DETAILED FINISHING SCHEDULE

The detailed finish schedule for Township is given below:

- a. Internal Finish Schedule

Table- 1: DETAILED FINISH SCHEDULE

Sl. No.	LOCATION	FLOORING & SKIRTING 150 MM HIGH	WALL (INTERNAL)	CEILING	DOOR, WINDOWS, VENTILATORS
1.	Residential Buildings	Vitrified tiles 8mm thick size 600 x 600mm	Non VOC acrylic emulsion paint over 2mm POP putty upto ceiling over approved primer coat	Ceiling painted with Non VOC acrylic emulsion paint to give an even shade.	Door shall have flush door shutter 35 mm thick with commercial ply duly painted & polished as per CPWD specification & as per the approval of Engineer- in- Charge. Door frames should be of sal/hard wood/ Red Marandi as per the as per CPWD specification & as per the approval of Engineer- in- Charge.
2.	Toilets	Ceramic tiles	DADO glazed tile 2100mm high, above that non VOC acrylic emulsion paint over 2 mm thick POP putty along with primer coat.	Non VOC acrylic Emulsion paint over approved primer coat for RCC building / False ceiling shall be provided in-case of PEB building.	Windows should be wooden panel window with glazing as per CPWD specifications & approval of Engineers in Charge Windows frames should be of shawl/hard wood/ Red Marandi as per the as per CPWD specification & as per the approval of Engineer- in- Charge.
3	Office Rooms	~~Vitrified tiles 8mm thick size 600 x 600mm~~	~~Non VOC acrylic emulsion paint over 2mm POP putty upto false ceiling over approved primer coat~~	~~False ceiling painted with Non VOC acrylic emulsion paint to give an even shade.~~	

14.14. WATER PROOFING TREATMENT

Integral cement based water proofing treatment including preparation of surface as required for treatment of roofs, balconies, terraces etc. consisting of following operations:

- Applying a slurry coat of neat cement using 2.75 kg/sq. m. of cement admixed with water proofing compound conforming to IS. 2645 and approved by Engineer-in-charge over the RCC slab including adjoining walls up to 300mm height including cleaning the surface before treatment.
- Laying brick bats with mortar using broken bricks/brick bats 25 mm to 115 mm size with 50% of cement mortar 1:5 (1 cement : 5 coarse sand) admixed with water proofing compound conforming to IS : 2645 and approved by Engineer-in-charge over 20 mm thick layer of cement mortar of mix 1:5 (1 cement :5 coarse sand) admixed with water proofing compound conforming to IS : 2645 and approved by Engineer-in-charge to required slope and treating similarly the adjoining walls up to 300 mm height including rounding of junctions of walls and slabs

- c) After two days of proper curing applying a second coat of cement slurry using 2.75 kg/sq. m. of cement admixed with water proofing compound conforming to IS: 2645 and approved by Engineer-in-charge.
- d) Finishing the surface with 20 mm thick joint less cement mortar of mix 1:4 (1 cement: 4 coarse sand) admixed with water proofing compound conforming to IS: 2645 and approved by Engineer-in-charge including laying glass fibre cloth of approved quality in top layer of plaster and finally finishing the surface with trowel with neat cement slurry and making pattern of 300x300 mm square 3 mm deep.
- e) The whole terrace so finished shall be flooded with water for a minimum period of two weeks for curing and for final test. All above operations to be done in order and as directed and specified by the Engineer-in-Charge
- f) With average thickness of 120mm and minimum thickness at khurra as 65 mm

14.15. SUNKEN WATER PROOFING (RCC):

- a) Water proofing treatment shall be done in sunken portion of WCs, bathroom etc. by applying cement slurry mixed with water proofing cement compound consisting of:
 - i. First layer of slurry of cement @ 0.488 kg/sq. m mixed with water proofing cement compound @ 0.253 kg/ sq. m. This layer will be allowed to air cure for 4 hours.
 - ii. Second layer of slurry of cement @ 0.242 kg/sq. m mixed with water proofing cement compound @ 0.126 kg/sq. m. This layer will be allowed to air cure for 4 hours followed with water curing for 48 hours.
- b) Treatment and sealing of joints, corners, junction of pipes and masonry with polymer mixed slurry shall be carried out as per CPWD specifications.

14.16. SPECIFICATIONS FOR PLUMBING, SANITATION & WATER SUPPLY ETC.

- a) All plumbing and sanitation shall be executed to comply with the requirements of the appropriate bye-laws, rules and regulations of the Local Authority having jurisdiction over such matters. The Contractor shall arrange for all necessary formalities to be met in regard to inspection, testing, obtaining approval and giving notices etc.
- b) Provision for water cooler shall be provided at suitable location.
- c) Each toilet shall be provided with Water Closet, Wash hand basin, health faucet, Mirror, Towel Rail, Paper Holder, Liquid soap dispenser, twin coat holder.
- d) In addition to general requirements of each toilet, 2 nos. Sensor based urinals shall be provided for common Gents toilet.
- e) Pantry shall be provided with stainless steel kitchen sink.
- f) The platform of kitchen sink and wash hand basin shall be provided with 18 mm thick Mirror polished approved granite stone.
- g) The specification of different items, which are to be used for plumbing, sanitation & water supply etc. in are given below, the same shall be used during detailed engineering, unless otherwise mentioned else-where in the tender

S.No.	Items	Description
1	Wall hung Water Closet	Coloured vitreous china extended wall mounting water closet of approved size and shape including providing & fixing white vitreous china cistern with dual flush fitting, of flushing capacity 3 litre/6 litre (adjustable to 4 litre/8 litres), including seat cover, and cistern fittings, nuts, bolts and gasket etc complete
2	Squatting Pan	(Indian type W.C. pan) (white vitreous china Orissa pattern W.C. pan of size 580x440mm with integral type foot rests) shall be with 100mm sand cast iron P or S trap. 10 litre low level white P.V.C flushing cistern with manually controlled device (handle lever) conforming to IS:7231, with all fittings and fixtures complete including cutting and making good the walls and floors wherever required.
3	Wash Basin	Providing and fixing coloured wash basin counter type of (approximate size 630x450mm size under counter or over counter type), in case flat bash hand is required the approximate size shall be 550x400mm and shall be

		provided with C.P. close basin mixer (ISI approved) with CI. Brackets taps with battery based infrared sensor, 32mm C.P. brass waste and bottle trap of standard pattern, including painting of fittings and brackets, cutting and making good the walls wherever required. Other details shall be as per the drawings.
4	Urinal	White vitreous china battery based infrared sensor operated urinal of approx. size 610 x 390 x 370 mm having pre & post flushing with water (250 ml & 500 ml consumption), having water inlet from back side, including fixing to wall with suitable brackets all as per manufacturers specification and direction of Engineer-in-charge.
5	Urinal partition	10mm thk toughened glass partition with frosted film to be fixed in position for urinals on appropriate stainless steel patch fittings of desired shape and size
6	Kitchen sink	Stainless steel AISI 304 (18/8) Kitchen sink of 510x1040 mm bowl with depth of 178mm with drain board shall be provided and fixed as per IS 13983 with C.I brackets, and stainless steel plug 40mm with provision of 2 nos. CP brass long body bib cock conforming to IS Standard and weighing not less than 650 gm for CP bottle trap etc including painting of fittings and brackets, cutting and making good the wall
7	Bib cock	C.P. brass short body and long body bib cock 15mm nominal bore shall be of approved quality conforming to IS: 8931
8	Angle valve	C.P. brass angle valve of 15mm nominal bore provided and fixed in position for basin and cistern points of approved quality conforming IS :8931
9	Towel rail	C.P. brass towel rail of approved make of 600mm length, 25mm dia with a pair of brackets or flanges provided and fixed to wall beside each wash basin/set of wash basin with necessary screws, plugs, etc
10	Mirror	6mm thick beveled edge mirror approximate size 1000x600mm made of superior glass of approved make complete with a backing of 6 mm thick water proof hard board fixed to wooden cleats with 25mm dia SS studs, washers etc complete for each wash basin
11	Hooks	Double type coat & hat hooks with flanges, fixed to wall / shutter, etc. with necessary screws, washers & plugs
12	Liquid soap holder	C.P. brass liquid soap holder of approved make fixed with each wash basin to the wall with necessary CP brackets, CP screws, washers, plugs etc.
13	C.P. Brass or S.S. cockroach trap	Approved C.P. Brass cockroach trap shall be provided in the Kitchen, Toilets and pantry
14	Floor traps	PVC floor traps of self-cleansing design shall be provided & fixed in position with 100 mm dia. inlet and 75mm dia. outlet of approved make, including making connection with PVC soil/waste pipes using rubber gaskets, embedding the trap in 150 mm thick PCC 1:2:4.
15	Internal Soil, waste and vent pipe	Unplasticised rigid PVC pipes of 75mm for waste & 110mm dia. for soil shall be provided conforming to IS:13592 type B and all its fittings like bends, sockets, door bend, Y-tee etc. as per requirement with seal ring conforming to IS: 5382 including jointing with cement solvent conforms to IS:14182. All underground or under floor pipes shall be encased with 1:3:6 concrete. Minimum concrete cover shall be 75 mm thk.
16	Rain Water Pipe and fittings	a) Unplasticised rigid PVC rain water pipes of required dia. shall be provided and fixed on the wall face conforming to IS: 13592 type A as per requirement including jointing with seal ring conforming to IS: 5382 leaving 10mm gap for thermal expansion single socketed pipes including all fittings like bends, bat clamps gratings etc. b) Unplasticised PVC Moulded fittings/accessories including suitable dia. bend & shoes shall be provided and fixed for unplasticised

		rigid PVC rain water pipes conforming to IS:13592 type A including jointing with seal ring conforming to IS: 5382 leaving 10mm gap for thermal expansion. c) Clips of approved design shall be provided and fixed to unplasticised PVC rain water pipes by means of 50x50x50mm hard wood plugs, screwed with MS screws of required length including cutting brick work and fixing in cement mortar 1:4 (1 cement : 4 coarse sand) and making good the wall etc
17	Internal & External water supply	a) All CPVC pipes and fittings shall conform to IS:15778 b) All internal CPVC pipe shall be concealed including cutting of chases and making good the wall. c) Wherever CPVC pipes are buried the same shall be provided and laid in position including trenching, sand cushion and refilling, etc. For trenching, sand cushion and refilling refer CPWD specification applicable for external piping work. d) All internal CPVC pipe shall be concealed including cutting of chases and making good the wall. e) ISI approved CPVC ball valve, non-return valves shall be provided and fixed in position as per requirement and direction of Engineer-in-charge.
18	Water storage tanks	Triple layered Polyethylene water storage tanks shall be provided of approved brand and manufacture with cover and suitable locking arrangement, float valve and making necessary holes for inlet, outlet and overflow pipes. Capacity of water tank shall be 2x1500 litres for control room, 2X2000 litres for Transit Camp.
19	Sluice valve chamber	Masonry chamber for sluice valve shall be 600x600mm size in plan and depth 750mm, or matching with the site condition inside with 50 class designation brick work in cement mortar 1:5 (1 cement : 5 fine sand) with CI surface box 100 mm. Top diameter, 160 mm bottom dia and 180 mm deep (inside) with chained lid and RCC top slab 1:2:4 mix (1cement : 2 coarse sand: 4 graded stone aggregate 20 mm nominal size) necessary excavation foundation concrete 1:5:10 (1 cement : 5 fine aggregate : 10 graded stone aggregate 40 mm nominal size) and inside plastering with cement mortar 1:3 (1 cement : 3 coarse sand) 12 mm thick finished with a floating coat of neat cement complete as per standard design with FPS bricks of class 75.
20	External Sewerage	Glazed stoneware pipes of 100 & 150mm diameter grade 'A' shall be provided, laid and jointed with stiff mixture of cement mortar in the proportion of 1:1 (1cement :1 fine sand) including testing of joints etc. complete. SW pipes shall be encased with Cement concrete 1:5:10 (1 cement: 5 coarse sand: 10 graded stone aggregate 40 mm nominal size) including bed concrete as per CPWD standard design and CPWD specifications. In case of non-availability of SW Pipe, contractor may use UPVC Pipe of similar dia with the prior approval of EIC without any financial implication to RECTPCL.
21	Gully trap	100x100 mm or 150x100 mm size P type Square-mouth S.W. gully trap class SP-1 complete with C.I. grating brick masonry chamber and water tight C.I. cover frame of 300 x300 mm size (inside), the weight of cover to be not less than 4.50 kg and frame to be not less than 2.70 kg as per standard design. FPS Bricks class designation 75 shall be provided for brick masonry chamber.
22	Manholes	FPS brick masonry manhole shall be constructed in cement mortar 1:4 (1 cement : 4 coarse sand) RCC top slab with 1:2:4 mix (1 cement : 2 fine aggregate : 4 graded stone aggregate 20 mm nominal size) foundation concrete 1:4:8 mix (1cement : 4 coarse sand :8 graded stone aggregate 40

		mm nominal size) inside plastering 12 mm thick with cement mortar 1:3 (1 cement : 3 coarse sand) finished with floating coat of neat cement and making channels in cement concrete 1:2:4 (1 cement: 2 coarse sand :4 graded stone aggregate 20 mm nominal size) finished with a floating coat of neat cement complete as per standard design. The size and depth of manhole shall be suitably decided based on requirement of layout in line with CPWD specification. a) Inside size shall be 90 x 80 cm and 60 cm deep including CI cover with frame (light duty) 455 x 610 mm internal dimensions' total weight of cover and frame shall not be less than 38 kg (weight of cover 23 kg and weight of frame 15 kg) and shall be constructed with F.P.S. bricks with class designation 75. b) Inside size shall be 120 x 90 cm and 90 cm or more deep including CI cover with frame (medium duty) 500mm internal diameter total weight of cover and frame to be not less than 116 kg (weight of cover 58 kg and weight of frame 58 kg) with FPS Bricks class designation 75.
23	Foot Rest	Orange colour safety foot rest of minimum 6 mm thick plastic encapsulated as per IS : 10910, on 12 mm dia. steel bar conforming to IS: 1786, having minimum cross section as 23 mmx25 mm and over all minimum length 263 mm and width as 165 mm with minimum 112 mm space between protruded legs having 2 mm tread on top surface by ribbing or chequering besides necessary and adequate anchoring projections on tail length on 138 mm as per standard drawing and suitable to with stand the bend test and chemical resistance test as per specifications and having manufacture's permanent identification mark to be visible even after fixing, fixing in manholes with 30x20x15 cm cement concrete block 1:3:6 (1 cement : 3 fine aggregate : 6 graded stone aggregate 20 mm nominal size) complete.
24	Road Gully Chamber	Brick Masonry road gully chamber of 50x45x60cm shall be provided with FPS brick with cement mortar 1:4 including 500x450mm pre cast RCC Horizontal/vertical grating with frame complete

14.17. ELECTRIFICATION

All electrification shall be executed as per details specified elsewhere in the technical specification. All details shall be as per relevant Indian standard codes (IS Codes)/ equivalent International Standards.

15. WATER SUPPLY

1. The contractor should arrange point for water connection, or arrange water tankers at his own cost, no payment shall be made for this.
2. The contractor shall carry out all the plumbing/erection works required for supply of water in township beyond the single point as at (i) above.
3. The details of tanks, pipes, fittings, fixtures etc. for water supply are given elsewhere in the specification under respective sections.
4. A scheme shall be prepared by the contractor indicating the layout and details of water supply which shall be got approved by Employer before actual start of work including all other incidental items not shown or specified but as may be required for complete performance of the works. All drawings shall be prepared by the contractor for approval of Employer.

16. SEWERAGE SYSTEM

1. Sewerage system shall be provided for all buildings wherever applicable.
2. The Contractor shall construct septic tank and soak pit suitable for 150 users. If septic and soak pit system is not acceptable by local Authority, contractor will have to install suitable sewerage system as per local statutory requirement.

3. The system shall be designed as per relevant Indian standard codes (I S Codes)/ equivalent International Standards. All drawings shall be prepared by the contractor for approval of Employer.

17. GENERAL SPECIFICATIONS FOR BUILDINGS:

These clauses are applicable for the vendor designed buildings,

For the building, most of the finishing items are explained in previous clauses, if any of items are missed or may be required for completion of the same, the below mentioned clauses may also be referred.

- i. The material specification, workmanship and acceptance criteria shall be as per approved standard Field Quality Plan attached with this document. In case certain item is not covered in FQP, it shall be constructed as per CPWD specification.
- ii. Post constructional Anti termite treatment shall be carried out for all buildings as per DSR item no. 2.34 & 2.35. Anti-termite chemical treatment shall be given to column pits, wall trenches, foundations of buildings, filling below the floors etc. as per IS: 6313 and other relevant Indian Standards
- iii. Reinforced cement concrete with controlled water cement ratio as per IS-code shall be used for all underground concrete structures such as pump-house, tanks, and water retaining structures for achieving water-tightness.
- iv. FPS or Modular clay/fly ash based Bricks having minimum 75 kg/cm² compressive strength can only be used for masonry work. Contractor shall ascertain himself at site regarding the availability of bricks of minimum 75 kg/cm² compressive strength before submitting his offer. However, Contractor can propose to use aerated concrete block or solid concrete blocks of compressive strength not less than 75kg/cm² without any cost implication to RECTPCL.
- v. Full brickwork shall be provided with cement mortar 1:6 (1cement: 6 coarse sand). Half brick work masonry shall be provided with cement mortar 1:4 (1cement: 4coarse sand) and two no 6mm dia. MS bar at every third course.
- vi. 12mm cement plaster of mix 1:6 (1cement: 6 fine sand) shall be provided on the smooth side of internal walls. However rough side of walls shall be provided with 15mm cement plaster of mix 1:6 (1cement: 6 fine sand).
- vii. External plaster in two coats - 18mm Cement plaster in two coats under layer 12mm thick cement plaster 1:5 (1 cement: 5coarse sand) finished with a top layer 6mm thick cement plaster (1cement: 6 fine sand). External plastered surface shall be finished with white cement based putty of average thickness 1 mm, of approved brand and manufacturer to prepare the surface even and smooth. After putty the walls shall be finished with Premium Acrylic Smooth exterior paint of approved brand and manufacturer with Silicone additives of required shade (Two or more coats applied @ 1.43 ltr./ 10 sq. m. over and including priming coat of exterior primer applied @ 2.20 kg/ 10 sq. m). 13.8 6 mm thk. Cement plaster of mix 1:3 (1 cement: 3 fine sand) to RCC ceiling shall be done except areas where false ceiling is provided.
- viii. Internal walls shall be finished with Plaster of Paris putty of average thickness 2 mm, of approved brand and manufacture, over the plaster surface to prepare the surface even and smooth complete. In case plastered surface of buildings are covered under wall paneling, dado work, skirting etc. no putty and painting are required.
- ix. Internal Wall shall be painted with minimum two coats of premium acrylic emulsion paint having VOC (volatile organic compound) content less than 50gm per litre of approved brand and manufacture including applying additional coats wherever required, to achieve even shade and colour over priming coat as per manufacturer specification/ recommendation
- x. Non - VOC premium acrylic emulsion paint having volatile organic compound content less than 50gm per litre of approved brand and manufacture shall be used wherever specified.
- xi. Painting with synthetic enamel paint of approved brand and manufacture of required colour to give an even shade shall be provided on the steel doors, flush doors and rolling shutters in various buildings or as specified in the drawings. Two or more coats over an under coat of suitable shade with primer paint of approved brand and manufacture.

- xii. Two or more coats of French spirit polishing with a coat of wood filler shall be provided on the wooden doors and frames.
- xiii. Polished vitrified tiles in 60x60 cm size (thickness to be specified by the manufacturer) in flooring and skirting, with water absorption's less than 0.08% and conforming to IS: 15622 of approved make in all colours and shades, laid on cement mortar 20mm thick min. for flooring & 12mm thick for skirting 1:4 (1 cement: 4coarse sand) including grouting the joints with white cement and matching pigments etc., complete.
- xiv. Glazed Ceramic floor tiles 300x300mm (thickness to be specified by the manufacturer) of 1st quality conforming to IS:15622 of approved make in colours as approved by Engineering- charge in toilet and pantries area on 20mm thick min. cement mortar 1:4 (1 cement: 4coarsesand) including grouting the joints with white cement and matching pigments etc., complete.
- xv. 62 mm thick cement concrete flooring with concrete hardener topping, under layer 50 mm thick cement concrete 1:2:4 (1 cement: 2 fine aggregate: 4 graded stone aggregate 20mm nominal size) and top layer 12mm thick cement hardener consisting of mix 1:2 (1 cement hardener mix: 2 graded stone aggregate, 6mm nominal size) by volume, hardening compound mixed @ 2 litre per 50 kg of cement or as per manufacturer's specifications.
- xvi. Cement plaster skirting (up to 15 cm height) with cement mortar 1:3 (1 cement: 3 coarse sand) mixed with metallic concrete hardener in same ratio as for floor finished with a floating coat of neat cement. 21 mm thick in ACDB/DCDB room.
- xvii. Granite stone of 18mm thick gang saw cut mirror polished pre-molded and pre-polished, machine cut for of required size of approved shade, colour and texture laid over 20mm thick base cement mortar 1:4 (1 Cement: 4 coarse sand) with joints treated with white cement, mixed with matching pigment, epoxy touch ups, including rubbing, curing molding and polishing to edge to give high gloss finish etc. complete for staircase.
- xviii. Granite stone of flooring with 18mm thick gang saw cut mirror polished premoulded and prepolished, machine cut for of required size of approved shade, colour and texture laid over 20mm thick cement mortar 1:4. The joints are filled with jointing compound matching to the granite. Wherever granite is specified for the floor, 100mm granite skirting shall be provided with the walls. The granite outer surface shall be flushed to the plaster finish of the wall by molding / beveling of granite at top edge.
- xix. Granite counter of approved shade shall be provided and fixed with 18mm thick gang saw cut, mirror polished, premoulded and pre-polished, machine cut for pantry & kitchen platform facias and similar locations of required size, approved shade, colour & texture laid over 20mm thick base cement mortar 1:4 (1cement : 4 Coarse sand) joints treated with white cement, mixed with matching pigment, epoxy touch ups, including rubbing, curing moulding and polishing to edges to give high gloss finish etc. complete at all levels.
- xx. Ceramic glazed wall tiles of 1st quality conforming to IS: 15622 (thickness to be specified by the manufacture) of approved make in all colours, shades as approved by Engineer-in- Charge in dados over 12mm thick bed of cement Mortar 1:3 (1 Cement: 3 Coarse sand) and jointing with grey cement slurry @ 3.3kg per sq. m including pointing in white cement mixed with pigment of matching shade complete. Height of dado shall be 2.1m high in toilet, kitchen and pantry or elsewhere specified in the drawings or TS.
- xxi. Circular/hexagonal M.S. sheet ceiling fan box shall be provided in the ceiling with clamp of internal dia. 140 mm, 73 mm height, 3 mm thick rim, top and bottom lid of 1.5 mm M.S. Sheet. Lids shall be screwed in to M. S. box by means of 3 mm round headed screws, clamps shall be made of 12 mm dia. M. S. bar bent to shape as per standard drawing with overall length as 80 cm.
- xxii. All doors except for toilet shall have 100mm 6 lever CP Brass mortice lock. Anodized aluminum handles of ISI marked and approved size shall be provided for all doors and windows as per requirement and instruction of E.I.C.
- xxiii. Cylindrical keyless lock of 25 mm diameter and 50mm diameter knob on both sides (ISI marked) shall be provided for toilets.
- xxiv. Kitchen door shall have 250x16mm C.P. brass sliding door bolt.
- xxv. Door shall be provided with anodized aluminum tower bolt (barrel type) 250x10mm wherever door closers are not provided.
- xxvi. All windows shall have aluminum tower bolt (barrel type) 150x10mm as per requirement.

- xxvii. Plinth protection 50 mm thick of cement concrete 1:2:4 (1 cement: 2 fine aggregate : 4 graded stone) aggregate 20 mm nominal size) shall be laid over 75 mm bed of dry brick ballast 40 mm nominal size well rammed and consolidated and shall be grouted with fine sand including finishing the top smooth. Minimum width of plinth protection shall be 1000 mm.
- xxviii. Ward Robes of required height and about 600 mm deep shall be made out of 18 mm. thk anti termite treated commercial board ISI marked at end verticals, top and bottom, shutters, partition etc. complete. The rear side of the unit shall be made with 6mm thk commercial ply ISI marked, which shall have French spirit polish on the exterior face. Inner surface of the storage cabinet shall be finished with 0.8mm thk approved laminate. The horizontal partition shall be of removable type fixed with necessary SS fittings and hardware. All external surfaces shall be finished with 4.0 mm thk approved veneer with melamine including making necessary grooves, teak wood moulding as per approved drawings. Each shutter shall have piano type stainless steel hinges and C.P. Brass or SS 125mm long handle. The unit shall have necessary fittings such as tower bolts, 4 lever CB locks etc. complete.
- xxix. Angles 50x50x6 mm (minimum) with lugs shall be provided for edge protection all round cut outs/openings in floor slab.
- xxx. Item/ components of buildings not explicitly covered in the specification but required for completion of the project shall be deemed to be included in the scope.

18. SUBMISSIONS

The following information/documents/drawings shall be submitted for review and approval

1. Structural design calculations, Structural drawings (including construction/ fabrication), both in hard and soft copies, for all reinforced concrete and structural steel structures.
2. Fully dimensioned and detailed floor plans, cross-sections, longitudinal sections and elevations identifying the major building components.
3. Product information of building components and materials, including walls, partitions, flooring, ceilings, roofing, doors, wall panelling and windows and building finishes along with BOQ.
4. A detailed schedule of building finishes including colours schemes along with item description.
5. A door & window schedule showing door & window types and locations, lock sets and latch sets and other door hardware along with item details. Approval of the above information shall be obtained before ordering materials or starting construction/fabrication, as applicable.

19. MISCELLANEOUS REQUIREMENTS

- i. The material specification, workmanship and acceptance criteria shall be as per approved standard Field Quality Plan attached with this document. In case certain item is not covered in FQP, it shall be constructed as per CPWD specification.
- ii. Items/ components of buildings not explicitly covered in the specification but required for completion of the project shall be deemed to be included in the scope.

20. INTERFACING

The proper coordination & execution of all interfacing civil works activities like fixing of conduits in roofs/walls/floors, fixing of foundation bolts, fixing of lighting fixtures, fixing of supports/embedment, provision of cut outs etc. shall be the sole responsibility of the Contractor. He shall plan all such activities in advance and execute in such a manner that interfacing activities do not become bottlenecks and dismantling, breakage etc. is reduced to minimum.

21. STATUTORY RULES

- i. Contractor shall comply with all the applicable statutory rules pertaining to factories act (as applicable for the State), Fire Safety Rules of Tariff Advisory Committee, Water Act for pollution control etc.
- ii. Statutory clearance and norms of State Pollution Control Board shall be followed as per
- iii. Water Act for effluent quality from plant.
- iv. Requirement of sulphate resistant cement (SRC) for sub structural works shall be decided in accordance with the Indian Standards based on the findings of the detailed soil investigation. In case sulphate resistant cement is used as per requirement, differential cost between sulphate resistant cement and PPC cement shall be payable as an extra item.
- v. All building/construction materials shall conform to the best quality specified in CPWD specifications if not otherwise mentioned in this specification.
- vi. All tests as required in the standard field quality plans have to be carried out without any financial implication to employer

VOLUME-II

TECHNICAL SPECIFICATION FOR INTERNAL AND EXTERNAL ELECTRIFICATION OF TOWNSHIP

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TECHNICAL SPECIFICATIONS

1. Preamble

Jammu & Kashmir Power Transmission Corporation Ltd. i.e. JKPTCL (erstwhile JKPDD) is responsible for Transmission and distribution of electrical energy in the entire J&K UT. In order to provide reliable Power Supply in Jammu & Kashmir region.

Construction of 220/33kV Lassipora GIS Substation in Srinagar Region has been entrusted to RECTPCL by JKPTCL for complete implementation including Bidding, Engineering, Project Management, Quality assurance and Commissioning of Projects.

RECTPCL has already awarded the work for construction of Substation & work for construction of residential staff quarter is provisioned in this package.

The Ownership of the said substation shall however, remain vested with JKPTCL.

2. Intent of Specification

The equipment and work shall conform in all respect to high standards of engineering, design and workmanship and shall be capable of performing in continuous operation in a manner acceptable to the owner who will interpret the meaning of the specifications and drawings and shall have right to reject or accept any equipment or work which in his assessment is not complete to meet the requirements of this specification and/or applicable codes and standards mentioned elsewhere in the specifications.

3. General Design Criteria

The illumination system shall be designed on the basis of best engineering practice and shall ensure uniform, reliable, aesthetically pleasing and glare free illumination. The finish of the fixtures shall be such that no bright spots are produced either by direct light source or by reflection. The diffusers/ louvers used in the lighting fixtures shall be made of impact resistant polystyrene sheet and shall have no yellowing property over a prolonged period illumination. The type of Lighting Fixture to be used in different areas shall be as per Annexure-1.

For Indoor and Outdoor Illumination, detailed drawings showing the lighting layout and electrical distribution diagram shall be prepared by the Contractor and submitted for approval. The above layout drawings will include disposition and location of lighting fixtures, receptacles, lighting panels etc. while finalizing the detailed layout of lighting fixtures, the position/location and layout of equipment should be taken into account to have adequate illumination at desired locations.

Indoor Illumination

Indoor illumination shall be done by LED Luminaries as per the requirement of buildings.

Outdoor Illumination

Outdoor illumination shall be done by LED luminaries as per the requirement. For Street Lighting, lighting poles & nearby buildings (if any) shall be used for installation of LED fixtures, Mounting Structures/Accessories for Mounting of LED Lighting Fixtures will be prefabricated and will be hot dip galvanized.

4. SCOPE of work

The tender includes the supply, erection, testing and commissioning of electrical installation work in complete as required for the electrification of township ~~including all associated buildings~~ and shall cover but not limited to the following items of work:

- a. Supply and Laying of cable from ACDB room in CR Building to the Main Township Distribution Board, from Main Township Distribution Board to Sub-main panel and from Sub-main panels to Distribution boards, and within the Colony/substation area if required for completion of the work.
- b. Supply, Erection, Testing & Commissioning of Pole mounted 1 x 100 KVA, 11/0.433 kV, (Minimum BEE 4 Star Rating) Three Phase Distribution transformer along with 11kV Gang operated switch, Drop out fuse, Surge arrestors etc. in HV side and Main Township Distribution Board comprising of Two 200A, 20KA MCCB incoming feeders (One from MSB in ACDB Room & other from 100KVA Transformer), 200 Amps, 20KA Bus, One 200A Bus coupler MCCB and Eight outgoing MCCB feeders (2 of 63A & 4 of 32 A & 2 of 25A), LT cable from Transformer to Main Township Distribution Board etc. in LV side.
- c. Complete concealed conduiting and wiring for Light, Fan, Call Bell, all power Plug/Socket for Heater, Geyser, Air Conditioner etc., exhaust fan, sub-mains points etc.
- d. Concealed conducting and wiring of Telephone points & TV Cable points.
- e. Providing and fixing of Switch Boards, metal boxes, prewired MCB distribution boards, meter panel including all external and Internal Wiring.
- f. Fixing of light fittings/fixtures/fans, bells, multi-function energy meters with RS - 485 communication port, exhaust fans in all buildings as per BOQ/drawing.
- g. Providing and fixing of Distribution Board, Meter Board complete with Internal Wiring.
- h. Earthing Stations and earth connections as required for the various electrical Installations and Lightening Arrestor as per standard practice.
- i. Any other work required for the complete electrification of the housing complex.
- j. Wirings shall be done in concealed conduits.
- k. Providing and fixing external lighting /Compound Lighting / street lighting considering power saving and colony beautification.
- l. Providing automatic Lighting control for the external lighting system through the timer/contacter. The Timer should have provision for multiple user defined setting in control of lighting.
- m. Laying of cable for external electrification.

5. Lighting System Description

The scope of work comprises of design, engineering, testing, supply, installation, testing and commissioning of 415V, Main Township Distribution board / Energy meter Boards/Flat DBs etc., Power and Control cables, various lighting fixtures complete with LED lamps, supports and accessories, automatic control of Lighting system through automation, ceiling fans complete with electronic regulators, exhaust fans for toilets and pantry & accessories, lighting panels, lighting poles complete with distribution boxes, galvanized rigid steel/PVC conduits, lighting wires, G.I. Earth wire , tag block & telephone socket, bells, boxes for telephone/ television & Air conditioners points, switchboards, switches, junction boxes, pull out boxes complete with accessories as outlined in

electrical drawings enclosed with tender documents for various type of quarters, parking, pump house, ~~recreation center and transit camp~~ associated with township.

External Electrification Works

The entire External Electrification work including connection to various quarters, ~~recreation centers & transit camp~~ associated with township including street lighting of township shall be in the scope of the contractor. 415V, 200A Main Township distribution board shall be fed from 415V, 630A MSB (being supplied under LT switchgear package) located in ACDB/DCDB Room of CR Building through 3 ½ x300 sq.mm XLPE insulated power cable. Supply of Main Township DB & associated 3 ½ x300 sq.mm XLPE cable along with its interconnection, installation etc. shall be as per BPS.

The entire external electrification work comprising of feeder pillars, Cables and associated glands and lugs, steel tubular poles, street lights, MS junction boxes, GI pipes for cable protection, danger plates, Hume pipes, fire extinguishers, cable route markers etc. as required shall be in the scope of the contractor. The exact location of quarters, recreation center, transit camp, streets etc. shall be intimated to successful bidder during detailed engineering. The bidder shall quote unit prices for items under external electrification work as per bill of quantity indicated in BPS.

Internal Electrification Works

~~Typical Electrical drawings for various type of quarters, recreation center and transit camp associated with township is enclosed with tender documents.~~

The scope shall broadly consist of entire concealed conduit work with all accessories and junction boxes, Copper wiring for lights/power points /fans/telephones/ TV cables & air-conditioners, supply and fixing of metal boxes, plates, modular switches, modular sockets, call bells, buzzers, exhaust fans, ceiling fans with electronic regulator modular type, MCBs etc.

Technical Specification for Internal and External Lighting system for Township and MCCBs, light fittings, energy meters' boards & flat DBs etc. shall be as per the requirements of various quarters, recreation centers and transit camps.

In addition to above complete Earthing (through separate earth pit) and lighting protection for each type of quarters recreation center and transit camp shall be provided as per standard guidelines given in relevant Indian standards and code of practices. The complete drawing for Earthing and lightning protection shall be submitted to owner for approval. The loop Earthing inside the buildings shall be carried out with minimum 1 C x 1.5 sq.mm PVC stranded Copper wire. All materials required or Earthing and lightning protection of township buildings shall be in the scope of contractor.

6. Specifications/ General Information

The specifications generally applicable to this work shall be as per the section: civil works and following standard sections enclosed herewith. In case of any ambiguity between the standard sections and the section: Civil works, the provisions of the section: Civil Works shall prevail. Where the technical specifications are not available, the requirements of C.P.W.D. requirements/Specification

shall be followed by the Contractor. The requirements of these specifications including those of C.P.W.D. requirements/specifications shall be fulfilled by the contractor within his tendered cost and without extra charges/ claims. The amount quoted shall be deemed to have taken these specifications into account irrespective of item description in BOQ. The specification, drawings & BOQ are to be followed together and RECTPCL/JKPDD decision shall be final in case of any contradiction.

RECTPCL Specifications

1. Section: Civil Works
2. Power and control cables
3. LT Switchgear

C.P.W.D. Specification (Where RECTPCL Specification is not available)

1. Electrical Works - Part I (for internal Lighting) in Central Government buildings while complying in all respects
2. Electrical works - Part II (for external Lighting) in Central Government buildings while complying in all respects

In addition to above, the requirement of the latest Indian Electricity Rules in force for the time being shall also be complied in all respects.

7. Authorities/ Rules

The contractor, while executing the work, shall conform to the provisions of Government act relating to the work and to the Regulations and bye-laws of the local authorities and of the Company to whose system of supply the installation is proposed to be connected. The contractor shall give all notices required by the Acts, Regulations or Bye-laws. He will also undertake to provide Test Certificate, Statutory clearance etc. for the electrical installations also carried out by him. The Contractor shall also obtain all approval for the items of work done under this contract from the appropriate competent authorities. All inspection fees or submission fees paid by the Contractor will be reimbursed by the owner against valid official receipts. The contractor shall be responsible for providing type tested equipment.

The Contractor and his licensed Electrical Contractor will be responsible for any approvals/sanctions and obtaining connections for the main and individual flats from JK, PDD and any other Government Agency of the Electrical Installation work carried out by him. Test Certificates of the Elect. Installations for individual flats shall be given by the Contractor on the prescribed forms of JK, PDD authority as applicable for installation of KWH meters by them.

8. Manpower & Supervision of Work

Contractor shall provide adequate and capable manpower and supervision for electrical installation work covered under this contract. The staff provided shall be adequate to provide detailed supervision at each stage/site of the work and shall be licensed to handle respective jobs to satisfy the requirements of the electric supply and other connected authorities. The contractor shall submit a list of the staff available for electrical work along with the tender. The contractor shall employ at least one qualified Degree/ Diploma Holder Electrical Engineer having minimum five years' experience in

similar works to supervise the execution of electrical work. He will be available at site of work to take instructions from the RECTPCL/ Engineer in charge of the work.

9. Description of Items

9.1 Lighting Panels

9.1.1 Constructional Features of Lighting Panels

- i. The Lighting panels shall conform to IS-8623.
- ii. All Outdoor Lighting Panels shall be of Stainless sheet steel of Grade 304 and shall be dust, weather and vermin proof. Panels shall be of thickness not less than 2.0 mm smoothly finished, leveled and free from flaws. Stiffeners shall be provided wherever necessary.
- iii. The panels shall be of front single door hinged construction, suitable for either floor mounting on channels, sills or on walls/columns by suitable M.S. brackets. Indoor Lighting panels shall be modular flush mounted and wall embedded of slim depth.
- iv. All panels shall have a dead front assembly provided with hinged door(s) and with suitable locking arrangement.
- v. All Outdoor panel's removable covers and doors shall be gasketed all around with neoprene/EPDM gaskets/ puff arrangement.
- vi. The outdoor panels shall be suitable for cable/conduit entry from the bottom. Suitable removable cable gland-plate shall be provided in the bottom of panels. For indoor lighting panels the provision of cable/conduit entry shall be from both top and bottom side with suitable removable gland plate. The thickness of the gland plate shall be 3 mm. Necessary number of double compression brass type cable gland shall be supplied, fitted on to these gland plates.
- vii. The panels shall be so constructed as to permit free access to connection of terminals and easy replacement of parts.
- viii. Each panel shall have a caution notice fixed on it.
- ix. Each panel will be provided with laminated as built circuit diagram suitably pasted in the panel. The panel shall be metal enclosed, single front, indoor, floor/wall mounted, free standing type with compartmentalized construction. The panel shall be designed for a degree of protection of IP 52.
- x. All cutouts & covers shall be provided with synthetic rubber gaskets.
- xi. The panel shall be divided into distinct vertical sections each comprising of:
 - a) A completely enclosed bus bar compartment for running horizontal and vertical bus bars.
 - b) Completely enclosed switchgear compartment one for each circuit for housing switch fuse unit etc.
 - c) A compartment alley for power and control cables of at least 175mm width covering entire height.
- xii. The panel shall be provided with three phase horizontal and vertical bus bars & neutral bus bar of uniform aluminum sections of electrical grade E-91E as per IS:5082 - 1981 throughout the length of switchgear panel and shall be adequately supported and braced. Maximum temperature rise of bus bars and bus bar connections while carrying rated current shall not exceed 35°cover an ambient of 50°C.

- xiii. The minimum clearance in air between phases and between phase and earth for the entire run of bus bars, bus bar connections shall be 35 mm. Bus bar support insulators shall be made of non-hygroscopic non-combustible track resistant & high strength type DMC or SMC material. Materials such as hylam are not acceptable.
- xiv. A galvanized steel earth bus shall be provided at the bottom of the panel throughout the length. The size of GI bus shall be equal to half the cross sectional area of phase bus.
- xv. All fuses shall be of HRC cartridge plug in type and shall be 80 KA rms breaking capacity.
- xvi. The neutral link shall be provided for each circuit.
- xvii. Indicating lamps shall be of panel mounting, filament type and shall have plates marked with its function wherever necessary. The colour of lamp cover shall be RED for 'ON' and Green for 'OFF'. Indicating lamp shall be provided with series resistor.
- xviii. All Outdoor Lighting Panels shall be erected such that a minimum height of 1000mm is maintained between FGL & bottom of the Lighting Panel. Size of Outdoor Lighting panels shall be such that cables are properly terminated and wires are dressed with provision of loops.

Distribution Boards:

Prewired MCB distribution boards should be as per enclosed RECTPCL/CPWD's latest technical specification. Distribution Boards shall comprise of outgoing MCBs, neutral links and a controlling TPN/SPN, switch/MCB isolator/ELCB as detailed in the schedule of quantities. The above shall be housed in a sheet metal box of sample dimension made out of 2mm thick M.S. sheet and shall have a hinged metal cover suitably painted after necessary rust treatment. All components shall be mounted on a stout framework. All the internal connections will be concealed by providing suitable bakelite back paneling as per sample approved.

Suitable arrangements shall be made to close and lock the metal box. All Distribution Boards shall be fitted with MCBs connected on the live side of the bus bar and shall be such that the circuits could be isolated easily. The capacity of the MCBs/fuses will be as detailed in the Schedule of quantities.

All distribution boards shall be painted with approved shade of paint. Each circuit shall have an independent neutral and shall be numbered and marked as required by the Engineer in charge. Sample of complete board should be got approved before fabrication. All MCB type DBs will be of the approved make as specified and approved by the RECTPCL.

The rate per item will include all the above mentioned material and labour required. Measurement will be in numbers of complete sets as described in the Schedule of quantities.

Main Bus Bars

Bus bars shall be of Copper/aluminum alloy conforming to IS: 5082 and shall have adequate cross-section to carry the rated continuous current and withstand short circuit currents. Maximum operating temperature of the bus bars shall not exceed 85 deg. C. The bus bars shall be able to withstand a fault level of 9 kA for 1 sec. for AC panels and 4 kA for 1 sec. for DC panels.

9.1.2 Auxiliary Items for Lighting Panels

MCBs

The miniature circuit breakers shall be suitable for manual closing, opening, automatic tripping under overload and short circuit. The MCBs shall also be trip free. MCB of Type C tripping characteristics as per IS 8828 will be used for Illumination purposes.

The terminals of the MCBs and the 'open/trip' and 'close' conditions shall be clearly and indelibly marked

Contactors:

Contactors shall be of the full voltage, direct-on line air break, single throw, electromagnetic type. They shall be provided with at least 2'NC' and 2'NO' auxiliary contacts 3-phase contractor shall be provided with the three elements positive acting ambient temperature compensated time lagged, hand reset type thermal overload relay with adjustable settings to suit the rated current. Hand reset button shall be flush with the front of the cabinet and suitable for resetting with starter compartment door closed. The Contactor shall check the adequacy of the Contactors rating, wires with respect to lighting load.

Push Buttons

All push buttons shall be of push to actuate type having 2 'NO' and 2 'NC' self-reset contacts. They shall be provided with integral escutcheon plates engraved with their functions. Push buttons shall be of reputed make.

Labels

Designation labels shall be provided on the front of lighting Panels. The panel designation labels shall be of 3 mm thick plastic plate. The letter shall be black engraved on white back ground.

All incoming and outgoing circuits shall be provided with labels. Labels shall be made of non-rusting metal or 3 ply lamicaid. Labels shall have white letters on black or dark blue background.

Earthing Terminals

Outdoor Panels shall be provided with two separate and distinct earthing terminals suitable to receive the earthing conductors of size 50x6 G.S. Flat.

9.2 Lighting Accessories

Mains and Sub-mains

Mains and Sub-mains shall consist of wires, cables and M.S. conduits, bends, junction boxes, PVC/rubber bushes, checknuts etc. as specified. The sizes and capacities of conduits and wires shall be as stated in the schedule of quantities and will commence from the main switches to various distribution boards. Wires shall be drawn in the recess or surface conduits as required without being damaged. For this purpose, draw boxes shall be located at convenient places to facilitate easy drawing. Every main and sub main will run in an independent conduit with an earth wire of 4.0mm dia. G.I. wire running along the entire run of conduit. For single phase one earth wire shall run and for three phase 2 earth wires shall run. Necessary provisions of wire lengths entering and emerging from the conduit must be made for connections. Termination of the sub main at both ends shall be done with crimped cable end sockets.

Measurements will be taken of the actual conduit run containing the wires from one switchgear to another. Per meter rate shall include all materials, connections, labour etc. as specified above.

Switch and Switchboard

All Switch board/boxes and electronic fan regulators located in office/building areas shall be modular flush mounted type.

Switch boards/boxes shall have conduit knock outs on all the sides.

The exact number of Switches including regulator for fans and layout of the same in the switchboard shall be suitable as per the requirement during installation.

The maximum number of luminaries controlled by one no. 5 Amp Switch shall be 8 nos. However, each Switchboard shall have minimum 2 Nos. of 5A Switches to control the Luminaries. For DC fixtures there will be no switch and the same shall be directly controlled from DCP.

The Luminaries shall be wired in such a fashion that luminaries on each phase are evenly distributed all over the room.

5/15A, 240V AC modular flush mounted socket with switch outlet shall be provided in indoor areas as per drawing. 25A, 240V AC modular flush mounted socket with switch shall be provided at strategic locations in as per drawing.

Ceiling, Wall Mounted & Exhaust Fans and Regulators

The Contactor shall supply and install 1400 mm sweep ceiling fans complete with electronic regulator and board for mounting switch, suspension rod, canopy and accessories. The electronic regulator for Ceiling fans will be housed in common switchboard for lighting and shall be of similar make and model as that of modular switches. The wall mounted fans shall be of 400 mm sweep. Exhaust fans shall be of 300mm size.

Winding of the fans shall have Class-E insulating material. Winding shall be of copper wire.

Wall Socket

Wall socket will be of the following type: -

- a) For light socket point - 5 amps capacity 5 pin type
- b) b) For Power Plug Point 15/5 amps capacity 6 pin type.

The rate for the above will be included in point wiring rate and the make will be as specified.

Lighting Wires

Wiring from Lighting/Sub-Lighting Panels to junction boxes / Switchboards/ fixtures etc. is covered under Lighting Wires. The wiring used for lighting shall be standard products.

The wires shall be of 630V grade (Phase to ground), PVC insulated products.

The conductor sizes for wires used for point wiring shall be 1.5 sq.mm, 2.5 sq.mm, 4 sq.mm and 6 sq.mm stranded copper wire as required.

The wires used for connection of a lighting fixture from a nearest junction box or for loop-in loop-out connection between two fixtures shall be single core copper stranded conductor, 630V grade (Phase to ground) flexible PVC insulated cords, unsheathed, conforming to IS:694 with nominal conductor cross sectional areas of 2.5 sq. mm.

The wires shall be colour coded as follows:

- Red for R - Phase
- Yellow for Y - Phase
- Blue for B - Phase
- Black for Neutral
- Green for Earth

Conduits & Accessories

The conduits shall be Rigid PVC conduits of 20/25 /32 mm diameter for Lighting, Telephone wiring & LAN Cabling and shall be ISI marked.

Flexible conduits wherever required shall be PVC type.

All conduits accessories shall be ISI marked.

All accessories required for making the conduits installation complete, including but not limited to couplers, bends, ordinary and inspection tees and elbow, reducers, enlargers, male and female bushings. G.I. wires for cable/wire pulling, terminal boxes pull outboxes, saddles, clips, spacing plates, nuts-bolts and screws, other clamping materials and all necessary supporting work shall be supplied by the contractor along with the conduits. The price of the accessories/ fittings shall be deemed to be included in the price of wiring/conduit items quoted.

Pull Out Boxes

The pull out boxes shall be concealed type for indoor lighting and suitable for mounting on column, structures etc., for outdoor lighting.

The pull out boxes shall be circular of minimum 16 SWG sheet steel and shall have cover with good quality gasket lining.

The pull out boxes shall be completed with conduit knock outs/threaded hubs and provided at approximately 3 meters intervals in a conduit run.

Junction Boxes

The Indoor junction boxes shall be provided with 4 way knockouts suitable for two numbers 10 sq. mm. wire/ Cable. These junction boxes shall be concealed type for indoor lighting.

The outdoor junction boxes shall be complete with conduit knockouts/threaded nuts and provided with terminal strips. The junction boxes shall be suitable for termination of Cable glands of required size. The junction boxes shall be provided with 4 way knockouts suitable for street lighting/switchyard lighting terminals suitable for 2 numbers 4C x 16 Sq.mm Al. cable or as per requirement. All Outdoor Junction boxes shall be of Stainless Steel of thickness 1.5mm of grade 304. Outdoor Junction Boxes shall be suitable for mounting on columns, structures etc. for Outdoor Lighting. The outdoor Junction shall have IP 55 protection.

The junction boxes shall have the following indelible markings

- i. Circuit Nos. on the top.
- ii. Circuit Nos. with ferrules (inside) as per drawings.
- iii. DANGER sign in case of 415-volt junction box

9.3 Lighting Poles

The Contactor shall supply, store and install the following types of galvanized steel tubular lighting poles required for street lighting and decorative lighting, as per the attached drawing of poles.

- i. Type L 1 Street Lighting Pole of 6 meter - for SL-L 1 type fixture

"L 1" type poles shall be used for street lighting. "D 1" type (Decorative post top lantern) poles and Bollards shall be installed as finalized during detailed engineering.

Lighting poles shall be complete with fixing brackets. Cable termination box will be built inside the pole itself as per drawing enclosed.

Poles and its Cable termination box shall be hot dip galvanized and PU (Polyurethane) coated in Suzuki silver color and inside with bituminous paint.

Terminal strips provided in street - lighting poles shall be suitable for terminating up to 2 nos. 4C x 16 sq. mm aluminum cables.

Wiring from junction box at the bottom of the pole to the fixture at the top of the pole shall be done through 2.5 sq. mm Copper wire laid inside the tubular pole.

Distance of center of pole from street edge should be approximately 1000 to 1200 mm or as per site conditions.

Earthing of the poles should be connected to the switchyard main earth mat wherever it is available, else, the same should be earthed through 3M long, 20 mm dia, earth electrode

9.4 415V, 200 Amp Main Township Distribution Board and Sub-Main Distribution Board with Each type of Apartment/recreation center

200 Amp Main Township Distribution Board required for township lighting system shall conform to standard technical specification for LT switchgear, Sec- LT Switchgear annexed with bidding documents..

9.5 LED Luminaires

LED Luminaries shall be used for the lighting of all the indoor and outdoor areas. The LED luminaries shall be surface mounting type.

Suitable heat sink with proper thermal management shall be provided in the luminaries. All LED Luminaries shall be RECTPCL approved make. The making on luminaries & safety requirements of luminaries shall be as per IS standards.

Necessary Care shall be taken so that there is no water stagnation anywhere in the Luminaries. The entire housing shall be dust and water proof protection as per IS 12063.

Parameters of outdoor & indoor Lighting fixtures are detailed in Annexure-11.

9.6 Wires and cables:

The design, manufacture, testing & supply of wires for point, circuit wiring & submain wiring etc. shall be 1100 volts grade PVC insulated copper conductor cable/wire of size specified in the schedule of quantities and shall conform to IS:694. The wires shall be colour coded for RYB phases & neutral. Twin flexible cables wherever specified shall have cross sectional area of 0.001 sq. in (equivalent to 23/0076) or larger, and insulated in accordance with relevant IS specifications.

Power and Control cables required under township lighting shall conform to standard technical specification, Section-Power and Control cables.

- i. Wires in a conduit shall be drawn simultaneously, no subsequent drawing is permissible.
- ii. Wires shall not be pulled through more than two equivalent 90° bends in a single conduit run. Wherever required, suitable pull boxes shall be provided.
- iii. Wiring shall be spliced only at switch/fan box.
- iv. Wiring of same phase shall be drawn in same conduit in case of general light and power wiring. Separate conduit shall be laid for each service such as light/power/emergency light/power, telephone, T.V. No extra payment other than point rate will be made to the contractor.

9.7 Earthing:

Earthing and lightning protection system installation shall be in strict accordance with the latest editions of Indian Electricity Rules, relevant Indian Standards and Codes of practice and Regulations existing in the locality where the system is installed.

- a) Code of practice for Earthing IS: 3043
- b) Code of practice for the protection of Building and allied structures against lightning IS: 2309.

- c) Indian Electricity Rules 1956 with latest amendments.

Lighting Fixtures & Miscellaneous Items for Township Lighting: - Please refer Annexure-I

Types of Earth Electrodes:

- a) Pipe earth electrode.
- b) Plate-earth electrode.
- c) Strip or conductor earth electrode

9.8 Automation

The meter panels will be supplied with multi-function energy meters having RS-485 ports.

Automatic control of External Lights

The street Lights shall be provided with timers having adequate range to ensure the automatic operation of street lights. The lights shall be automatically ON and OFF at predefined time setting.

Automatic Operation of Pumps

The pumps shall be provided with the arrangement of automatic control of operation. The Pumps shall be automatically ON and OFF at pre-set time. Further, the pumps shall also be made ON by sensing the low water level in water tank.

10. Type Test Requirements:

Lighting Panels, Receptacles, and Junction Boxes etc. shall conform to following degree of protection:

- Installed outdoor: IP- 55
- Installed indoor in air conditioned area: IP-31
- Installed in covered area: IP-52
- Installed indoor in non-air conditioned area where possibility of entry of water is limited: IP-41.

11. ERECTION

11.1 General

- In accordance with the specified installation instructions as shown on manufacturer's drawings or as directed by Employer, Contractor shall unload, erect, install, test and put into commercial use all the electrical equipment included in the contract. Equipment shall be installed in a neat, workmanship manner so that it is level, Plumb Square and properly aligned and oriented. Tolerances shall be as established in manufacturers drawing or as stipulated by Purchaser.
- The work will be carried out in the best workman - like manner and any defect in the work or changes in the design etc., if pointed out, shall be carried out by the Contractor without any extra charge.
- The Electrical work will be carried out simultaneously with the building work and will be continued till it is completed satisfactorily along with the completion of essential portions of Building work.

- All apparatus, connections and cabling shall be designed so as to minimize risk of fire or any damage which will be caused in the event of fire. All Lighting accessories mentioned in Clause 9.2 shall be supplied and erected as a part of Lighting System Installation works.

During the progress of work, completed portions of the building may be occupied and put to use by the owner but Contractor will remain fully responsible, for maintenance of the Electrical installations till the entire work covered by this Contract is satisfactorily completed by him and taken over by the owner.

11.2 Conduit System

- Contractor shall supply, store and install conduits required for the lighting installation as specified. All accessories/fittings required for making the installation complete, including but not limited to pull out boxes (as specified in specification ordinary and inspection tees and elbow, check nuts, male and female bushings (brass or galvanized steel), caps, square headed make plugs, nipples, gland sealing fittings, pull boxes, conduits terminal boxes, glands, gaskets and box covers, saddle terminal boxes, and all steel supporting work shall be supplied by the Contractor. The conduit fittings shall be of the same material as conduits. Separate Conduit should be laid for Communication purpose. The contractor shall also supply & install 20 mm PVC conduit and accessories for telephone wiring and LAN Cabling wherever feasible, telephone and LAN cabling can be laid in the same conduit.
- The conduits shall be laid before casting in the upper portion of a slab or otherwise, as may be instructed in accordance with approved drawings, so as to conceal the entire run of conduits and ceiling outlet boxes. Vertical drops shall be buried in columns or walls. Wherever necessary, chases will be cut by the contractor to sufficient depth to allow full thickness of plaster over conduits. Width of the chases will be made to accommodate the required number of conduits. The chases will be filled with cement coarse sand mortar (1 :3) and shall be properly cured by watering. If a chase is cut in an already finished surface the contractor shall fill the chase and finish it to match the existing finish within the tendered rates. When the conduit is to be embedded in a concrete member it shall adequately be tied to the reinforcement to prevent displacement during casting. The contractor shall provide cover blocks bound with reinforcement steel at suitable place as per direction of Engineer-In Charge. Conduits in chases or laid above the slab shall be held by hooks at maximum of 1.0 M centers.
- When the conduit is laid above on the slab the same shall be covered with cement concrete mixture I: 3:6 using W' thick stone aggregate and coarse sand.
- Suitable expansion joint with PUCA flexible conduit/fittings shall be provided at all the points where the conduit crosses any expansion joint in the building.
- The entire conduit system, whether embedded or exposed, shall be electrically continuous and thoroughly grounded.
- All unarmored cables/wires shall run within the conduits from lighting panels to lighting fixtures, receptacles etc.
- Size of conduit shall be suitably selected by the contractor.

- Conduit support shall be provided at an interval of 750 mm for horizontal runs and 1000 mm for vertical runs.
- Conduit supports shall be clamped-on spacer plates or brackets by saddles or U-bolts. The spacer plates or brackets in turn, shall be securely fixed to the building steel by welding and to concrete or brick work by grouting or by nylon raw plugs. Wooden plug inserted in the masonry or concrete for conduit support is not acceptable.
- For directly embedding in soil, the conduits shall be coated with an asphalt-base compound. Concrete pier or anchor shall be provided wherever necessary to support the conduit rigidly and to hold it in place.
- For long conduit run, pull boxes shall be provided at suitable intervals to facilitate wiring.
- Conduit shall be securely fastened to junction boxes or cabinets, each with a lock nut inside and outside the box.
- Conduits joints and connections shall be made through water-tight and rust proof by application of a thread compound which insulates the joints. White lead is suitable for application on embedded conduit and red lead for exposed conduit.
- Conduits and fittings shall be properly protected during construction period against mechanical injury. Conduit ends shall be plugged or capped to prevent entry of foreign material.
- Where conduit terminate at a drilled hole entry connection shall be made by means of coupler & checknuts.
- All wires in a conduit shall be drawn simultaneously.
- Conduits shall run along wall, floor, ceiling, on steel structures, embedded in wall, floor or ceiling, in accordance with relevant layout drawings. The contractor shall closely co-ordinate his work with the civil contractor. Exposed conduits shall be run in straight lines parallel to a building columns, beams and walls. Unnecessary bends and crossings shall be avoided to present a neat appearance.
- Spacing of embedded conduits shall be such as to permit flow of concrete between them and in no case shall be less than 40mm.
- Conduits shall be kept, wherever possible, at least 300mm away from hot pipes, heating devices etc.

11.2A Cross Sections

The conduits shall be of ample sectional area to facilitate the drawing of cable. In no case shall be the total cross section of cables measured overall, be more than half the area of the conduit. For the wires to be drawn in conduit the contractor will follow RECTPCL/ latest C.P.W.D. specifications for internal

electrical installations. For the sub-mains the size of the conduits will be as specified in the schedule of quantities.

The size of the conduit shall be governed by the number & size of wires to be drawn through it & shall be as per following table.

Table except for variations specified in Spec's/ Dwg. / BOQ for Max. No. of wires to be drawn in one conduit.

Size of Wires	20mm	25mm	32mm
1.5 sq.mm.	4	8	12
2.5 sq.mm.	3	6	10
4.0 sq.mm.	2	5	08
6.0 sq.mm.	-	4	07
10.0 sq.mm.	-	3	05

The above table shows the maximum capacity of conduits for simultaneous drawing of wires.

Ceiling outlet boxes:

C.I. outlet boxes with 12mm projected, threaded collars to receive conduits having 7.0cm depth shall be so installed as to maintain continuity throughout. These shall, be so protected at the time of laying that no mortar finds its way inside during concrete filling or Plastering. For each fluorescent light fitting two outlet boxes shall be provided one foot off center for a four feet 40W fitting and 6" off center for two feet 20W fitting.

Draw Boxes:

M.S. Draw boxes of ample dimensions shall be provided at convenient points on walls/ceiling to facilitate pulling of long runs of cables.

They will be completely concealed and covered with White Bakelite sheet 3mm covers flush with plaster work. These boxes will be as few as possible. All the M.S. boxes used for housing switches, plugs, drawings of wires etc. shall have five sides.

The entire conduit system including outlets and boxes shall be thoroughly cleared after completion of erection and before drawing of cables.

11.3 Wiring

- The scope also includes wiring from nearest Lighting/Sub-Lighting Panel to the Controlling Switch/MCB/Lighting Fixtures.
- Wiring shall be generally carried out by PVC insulated wires in conduits. All wires in a conduit shall be drawn simultaneously. No subsequent drawing of wires is permissible.

- Wires shall not be pulled through more than two equivalent 90 deg. bends in a single conduit run. Where required, suitable junction boxes shall be used.
- Wiring shall be spliced only at junction boxes.
- For lighting fixtures, connection shall be teed off through suitable round conduit or junction box, so that the connection can be attended without taking down the fixture.
- Maximum two wires can be terminated to each way of terminal connections.
- AC and DC wiring should run through the separate conduits. Similarly, Communication & LAN cables shall run in separate conduit than that of AC & DC Conduits.

11.3A Point Wiring

The point wiring shall include all work necessary for complete wiring of a switch circuit/point of any length from the tapping point on the distribution board via switch up to respective point with specified size of Copper wires, deemed to be included in the point wiring.

- Switch (Modular type)
- Ceiling rose or connector as required.
- Fan box with fan hook and 3mm thick white bakelite cover for fan box, including supply and fixing of Electronic regulator in case of fan points.
- Conduit with all accessories and junction boxes.
- Switchboard/box of M.S. sheet with 3.0mm thick white bakelite sheet.
- Earth wire from S pin socket outlet/fan regulator to the common earth including connections.
- All M.S. sheet/boxes of 1.6mm thick to be recessed for mounting switches, fan regulator and socket outlets but excluding those under main & distribution switch gear.
- Circuit wiring from DB to switch board/box including G.I. earth wire.
- Suitable Terminal for lopping of wires block.
- SA Socket outlet & SA Modular type switch in case of SA-S pin plug points.
- IS/SA socket outlet and ISA Modular type switch in case of ISA-6 pin power plug points.
- Bell push with switch board/box.
- All fixing accessories such as screws, rail plugs, clamps and other hardware as required. Wooden plugs are not accepted for any fixing.

11.3B Position of Light/Fan Switchboards, Dbs., Meterboards Etc.

Mounting Height of the Switchboard/boxes, DBs, Light points, Light & Power plug points from the finished floor level shall be as given below.

Switchboard with Light/Fan Switches	+ 1200mm	from FFL
Distribution Board	+ 1500mm	-do-
Meter Board (wall mounted)	+ 1200mm	-do-
SA Socket outlets (Separate Pts)	+ 200mm	-do-
5 / 15 A Power socket outlet	+ 200mm	-do-
Power Socket outlet for Geyser in Bathroom	+ 1500mm	-do-
T/L Bracket Light on wall	+2100mm	-do-

11.3C Switch Boxes

M.S. Boxes of required sizes shall be provided to house speed regulators, switches, and sockets. These will be so designed that accessories could be flush mounted on the cover plate or mounting sheet leaving ample space at the back and on the sides for accommodating wires and checkout entries. These shall be completely concealed leaving edges flush with wall surfaces. Cover plates shall be fixed to these by means of brass machine screws. No timber shall be used for any support. The boxes shall be painted with 2 coats of Red Oxide before and one coat after erection. The switchboxes shall be fabricated out of 1.6mm thick M.S. sheet and shall have conduit knockouts on two sides. The switch box shall be provided with 3.0mm thick white Bakelite sheet cover.

11.3D Fan Box:

Fan boxes with fan hooks shall be made out of sheet steel not less than 2.0mm thick and hexagonal in shape with one 'U' shape 12mm dia. rod inside held tightly with the top reinforcement of the roof. 3.0mm thick-white Bakelite sheet cover as approved by the Engineer-in-charge shall be provided. Over the fan boxes, the boxes shall be as per drawing and specifications.

11.4 Lighting Panels

- The lighting panels shall be erected at the locations to be finalized during detailed engineering.
- Suitable foundations/supporting structures for all outdoor type lighting panels shall be provided by the Contractor.
- The Sub lighting Panel shall be provided where independent switch of fixtures is required.

11.5 General Requirements for Cabling Work

- Each cable run shall be tagged with number that appears in the cable schedules. Cables shall be tagged at their entrance and/or exit from any piece of equipment, junction or pull box, floor opening etc.
- The tag shall be made up of aluminum with the number punched on it and securely attached to the cable by not less than two turns of G.I. wire. Cable tags shall be rectangular in shape for power cables and circular shape for control cables.
- Location of cables laid directly under ground shall be indicated clearly by cable marker made of galvanized iron plate embedded in concrete block.
- The location of underground cable joints if any shall be clearly indicated with cable marker with an additional inscription "cable joint".
- The marker, which is a concrete block, shall project 150 mm above ground and shall be spaced at an interval of 30 meters and at every change of direction. It shall also be located on both sides of the road or drain crossing.
- Road crossing of cables through suitable size of GI pipe/Hume pipe as required at site.
- Cable termination arrangement for power cables shall be suitable for stranded Aluminium conductors, armoured; PVC insulated and sheathed 1100 V grade cables.
- The gland plates shall be removable type and shall cover the entire cable alley. Bidder shall ensure that sufficient space is provided for all cable glands.

11.6 Earthing

Pipe Earth Electrode:

G.I. pipe shall be of medium class, 40mm dia. and 4.5m length. Galvanizing of the pipe shall conform to relevant Indian Standards. G.I. pipe electrode shall be cut tapered at the bottom and provided with holes of 12mm dia. drilled not less than 7.5cm from each other up to 2.5 m of length from bottom. The electrode shall be buried in the ground vertically with its top not less than 20cm below ground level. Watering funnel attachment shall be housed in a masonry enclosure of not less than 300mm x 300mm x 300mm - complete with C.1. /M.S. Frame with cover having locking arrangement to be embedded in the masonry enclosure.

Plate Earth Electrode:

The electrode shall be buried in the ground with its faces vertical and top not less than 3m below ground level. The connection between the main bar and the plate shall be made by means of 2 Nos. 3/8" dia. G.I. nuts and bolts fixed at 150mm centers. The pit shall be filled with coke/charcoal and salt in layers around the electrode as directed.

Method of Installing Watering Arrangement:

- a) In the case of plate earth electrode, a watering pipe of 20mm dia of medium class G.I. pipe shall be provided and attached to the electrode. A funnel with mesh shall be provided on the top of this pipe for watering the earth. In the case of pipe electrode, a 40mm x 20mm reducer shall be used for fixing the funnel. The watering funnel attachment shall be housed in masonry enclosure of not less than 300x300x300mm.
- b) A cast iron/M.S. frame with cover having locking arrangement shall be suitably embedded in the masonry enclosure.

Location of Earth Electrode:

- i. Normally an earth electrode shall not be situated less than 1.5m from any building. Care shall be taken that the excavations for electrode may not affect the column footings or foundations of the building; in such cases electrode may be further away from the building.
- ii. The location of the earth electrode will be such where the soil has reasonable change of remaining moist, as far as possible. Entrances, pavements and roadways are definitely avoided for locating the earth electrode.

Method of Connecting Earthing Lead to Earth Electrode

- i. In the case of plate earth electrode, the Earthing lead shall be securely bolted to the plate with the two bolts, nuts, checknuts and washers. In the case of pipe earth electrode, it shall be connected by means of a through bolt and nut and washers and cable socket.
- ii. All materials used for connecting the earth lead with electrode shall be G.I. in case of G.I. pipe and G.I. plate earth electrode and of tinned brass in case of Copper plate electrode.
- iii. Loop Earthing shall be provided for all mounting on main board and other metal clads switches and distribution fuse boards with not less than 14 SWG G.I. or 4 sq.mm. Aluminium wire.

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

Protection of Earthing Lead

The Earthing lead from electrode onwards shall be suitably protected from mechanical injury by a 15mm dia. G.I. pipe in case of wire and by 40mm dia. medium class G.I. pipe in case of strip. Portion of this protection pipe within ground shall be buried at least 30cm deep (to be increased to 60 cm in case of road crossing or pavements). The portion within the building shall be recessed in walls and floors to adequate depth.

11.7 Lightning Conductor

Installation of Lightning conductor shall be done in accordance with I.S.2309-1969.

The materials of Lightning conductors, down conductors, Earth terminations etc. of the protective system shall reliably resistant to corrosion or be adequately protected against corrosion. with hot dipped galvanizing steel. The entire lightning protection system shall be mechanically strong to withstand the mechanical forces produced in case of a lightning stroke. The system shall be so installed that it does not spoil the Architectural or Aesthetic beauty of the building and painted to matching color of the building.

The vertical Air Termination shall project at least 30cms above the highest point of project, salient point or network on which it is fixed. All metallic finials chimneys ducts, vent pipes, railings, gutters etc. on or above the main surface of the roof of the structure shall be bonded to and shall form part of the Air termination network.

All air terminals shall be effectively secured against overturning either by attachment to the object to be protected by means of substantial braces and fixing which shall be rigidly and permanently attached to the building. The method and nature of fixing shall be simple, solid, and permanent, due attention being given to climatic conditions and possible corrosion.

The lightning protective system shall have as few joints as possible. Wherever joints in the down conductors above ground level are necessary they shall be mechanically and electrically effective. The joints shall be revetted, sweated or welded.

Conductor shall be securely attached to the building or other object by fasteners which shall be substantial in construction not subject to breakage and shall be galvanized steel or other suitable materials with suitable precautions to avoid corrosion. The lightning conductors shall be secured at not more than 1.20m apart for horizontal run and 1 m for vertical run.

Each down conductor shall have an independent earth termination.

Earth electrode shall be constructed and installed as laid down in the Earthing specification.

11.8 Painting of All Steel Work

The steel used for fabrication of electrical equipment should be stove enameled/treated as per IS:6005. The process shall be as follows:

- a) Degreasing: All the steel components, to be painted should be effectively cleaned by alkaline degree.
- b) Pickling: Oxide scale rust formation are to be removed in a hot bath of sulphuric acid. Pitting of the surface is to be prevented by the use of pickling.
- c) Cold Rinsing: The parts are then washed with cold water to remove all traces of acidic solution.
- d) Phosphating: In order to attain durable paint coating the metal surface is to be given phosphating treatment by development and phosphate layer of class 'C' on the surface. Preferably, hot granodine solution is to be used in the phosphating plant.
- e) Passivating: This process is to be carried out by using deodilate solution.
- f) Drying: The treat parts should then be dried in a hot chamber in dust free atmosphere to ensure that they are absolutely clear and dry before the paint is applied.
- g) Primer Coating: The treated and dried parts are to be sprayed with high corrosion resistance primer.
- h) Stove Drying: The primer coating is to be baked in an electrical heated, circulated area type storing oven.
- i) Finishing Coat: The finishing painting coat is to be applied by spraying two coats each of 25-micron thickness synthetic enamel of shade as specified elsewhere.

12.0 Completion tests:

On completion of the installations the following tests shall be carried out:

- 1. Insulation resistance test.
- 2. Polarity test of switch.
- 3. Earth continuity test.

12.1 Insulation Resistance Test

The insulation resistance will be measured by applying between earth and the whole system of conductors or any section thereof with all fuses in place and all switch closed and except in earthed concentric wiring all lamps in position or both poles of the installation otherwise electrically connected together, a direct current pressure of not less than twice the working pressure provided that it need not exceed 500 volts for medium voltage circuit. Where the supply is derived from the three wire D.C. or a poly phase A.C. system, the neutral pole of which is connected to earth either direct or through added resistance, the working pressure shall be deemed to be that which is maintained between the phase conductor and the neutral.

The insulation resistance shall also be measured between all conductors connected to one pole or phase conductor of the supply and all connectors connected to the neutral or to the other pole or phase conductors of the supply with all lamps in position and switches in 'OFF' position and its value shall be, not less than the specified in sub clause below.

The insulation resistance in mega ohms measured as above shall not be less than 50 Mega ohms by the number of outlets of when PVC insulated cables are used for wiring 12.5 Mega ohms divided by number of outlets. Where a whole installation is being tested, a lower value than that given by the formula, subject to a minimum of 1 Mega ohm, is acceptable.

A Preliminary and similar test may be made before lamps etc. are installed and in this event the insulation resistance to earth should not be less than 100 Mega ohm divided by the number of outlets or when PVC insulated cables are used for wiring 25 Mega ohms divided by the number of outlets.

The terms "Outlet includes every point along with every switch except that a switch combined with a socket outlet, appliance or light fitting is regarded as one outlet, Control rheostat, heating and power appliances and electric signs may, if required be disconnected from the circuit during the test, but in that event the insulation resistance between the case of framework, and all live parts of each rheostat, appliance and sign, shall be not less than half a mega ohm.

12.2 Polarity Test of Switch:

- a) In a two wire installation a test shall be made to verify that all switches in every circuit have been fitted in the same conductor throughout and such conductor shall be labelled or marked for connection to the phase conductor or to the non-earthed conductor of the supply.
- b) 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 which is labelled or marked for connection to one of the phase conductor of the supply.
- c) The installation shall be connected to the supply for testing. The terminals of all switches shall be tested by a test lamp, one lead of which is connected to earth. Glowing of test lamp to its full brilliance when the switch is in 'ON' position irrespective of appliance in position or not shall indicate that the switch is connected to the right polarity.

12.3 Testing of Earth Continuity Path:

The earth continuity conductor including metal conduits and metallic envelope of cable in all cases shall be tested for electric continuity and the electrical resistance of the same along with the Earthing load but excluding any added resistance of the earth leakage circuit breaker measured from the connection with the earth electrode to any point in the earth continuity conductor in the complete installation shall not exceed one ohm.

The contractor shall notify in writing to the Architects/Engineer-in-charge about the completion of the work within 7 days from the date of this notification. The Architects/Engineers-in-charge shall send their representative to remain present at the time of carrying out of the tests by the Contractor. The contractor will fix up this date in consultation with the RECTPCL for such tests.

Should the above tests not comply with limits and requirements as above the conductor shall rectify the faults until the required results are obtained.

The contractor shall be responsible for providing the necessary instruments and subsidiary earths for carrying out the tests. The above tests will be carried out by the Contractor without any extra charge.

13.0 General Requirements:

- 13.1 The Bidders are advised to visit Sub-stations site and acquaint themselves with the topography, infrastructure, etc.
- 13.2 The bidder shall be responsible for safety of human and equipment during the working. It will be the responsibility of the Contractor to co-ordinate and obtain Electrical Inspector's clearance before commissioning. Any additional items, modification due to observation of such statutory authorities shall be Provided by the Contractor at no extra cost to the Owner.
- 13.3 The tentative total requirements of various items given in schedule of quantities are for bidding purposes only. The quantities may vary at the time of actual execution of work. Owner reserves the right to vary the quantities as may be necessary during the execution of contract.
- 13.4 Materials and components not specifically stated in these specification but are necessary for operation of the system or complete the scope as per BOQ, deemed to have been included in the scope of work and cost of these shall be included in unit rates quoted by the contractor
- 13.5 The contractor shall furnish all relevant drawings, data catalogues, test reports, instructions manuals of the equipment supplied by him as per the requirements of the contract.
- 13.6 Only RECTPCL approved makes of the material shall be used for the Electrical Installation work. Samples and fabrication drawings will be submitted by the contractor according to the schedule/specifications. Any deviation from the schedule/specifications will have the written consent of the owner. The items for which make is not specified in the specifications/schedule, the contractor shall submit the samples of the material along with type test reports (if applicable) for approval of the owner as per applicable standards
- 13.7 Circuit wiring from DB to first switch board/ boxes with 2x2.5 sq.mm. insulated copper conductor wires shall not be paid separately within flats. The rates for the wiring of points shall be inclusive of the circuit wiring.
- 13.8 In case of group controlled light points the first point shall be wired from DB or switchboard & subsequent points shall be looped from the first point but for measurement purposes the number of points shall be counted.
- 13.9 Any change in layout of electrical points at any stage during execution of the contract shall have to be carried out by the contractor irrespective of change in location / length of point / ckt. without any cost adjustments/ commercial implication.
- 13.10 The recommended positions of the lighting points, control switches, distribution boards and switchgears etc., ~~as shown on the layout drawings will be generally adhered to~~ shall be finalized by Contractor in consultation/approval of RECTPCL

- 13.11 The vendor shall submit the detailed drawings and documents for approval to RECTPCL engineering, indicating the SLD and Layout, wiring diagram, control and automation drawing, catalogues of the electrical fittings/appliances/components etc., any other drawing as required by employer during execution, and the work shall be carried out accordingly.
- 13.12 Should there be any discrepancy or incomplete description, ambiguity or omission in the drawings and other documents; whether original or supplementary, forming the contract, completion or maintenance of the installation, the contractor shall immediately on discovering the same draw attention of the RECTPCL.
- 13.13 Prior to the installation of lighting, fan and plug points and the distribution boards, switches etc., final positions shall be ascertained by the contractor with the RECTPCL.
- 13.14 The dimensions and other details of the electrical drawings shall be compared with the civil drawings at site before executions of the work.
- 13.15 Any other items not specifically mentioned in the specification but which are required for erection, testing and commissioning and satisfactory operation of the substation are deemed to be included in the scope of the specification unless specifically executed.
- 13.16 Owner has standardized its technical specification for various equipment and works for different voltage levels. Items which are not applicable for the scope of this package as per schedule of quantities described in BPS (Vol-III), the technical specification for the items should not be referred to.
- 13.17 For execution of the work, the checklist points for Internal and External electrification has been enclosed at Annexure-IV and V respectively for reference purpose. However, the inspection points shall not be limited to the checklist items/Points only. The work at site shall be executed in consultation with site In charge and any other point, in addition to the checklist, shall be inspected /measured as required by RECTPCL.

TOWNSHIP ILLUMINATION

Annexure I

Sr. No.	Locations	Type & No of Lighting Fixture	Anti-Glare Film Requirement	Type of Fans
01.	Township Quarters			
(i)	Bed Room	SL-I : 1 Nos. and SC: 2 Nos.	Yes	Ceiling Fan

(ii)	Drawing Room	SSQ-I: 2Nos. and SC 2 Nos.	Yes	Ceiling Fan
(iii)	Dining Room	SSQ-I: 2 Nos.	Yes	Ceiling Fan
(iv)	Kitchen	SL-I: 1 Nos. and SC: I Nos.	Yes	Exhaust Fan
(v)	Lobby	SSQ-I and SC 2 Nos.	Yes	---
(vi)	Toilet	SC-I: 1 Nos.	Yes	Exhaust Fan
(vii)	Servant room	SC-I: 1 Nos.	Yes	Ceiling Fan
(viii)	Car Parking	BL-I: 1 Nos.	No	----
(ix)	Stair	SC-I: 4 Nos.	No	-----
(x)	Terrace/Balcony	BL-I: 1 Nos.	No	----

Annexure II

Details of Lighting Fixture

(a) Indoor Application

Sr. No	Technical Specification	SL-1 (Surface Mounted Linear LED Tube with Box)	RL-1 (Recessed Mounted 4X1 Feet LED Panel)	SC-1 (Recessed Mounted Circular LED Down light Luminaires)	Type RC-1 (Recessed Mounted Circular LED Down light Luminaires)	Type SSQ-1 (Surface mounted 2x2 LED Luminaires)	Type RSQ-1 (Recessed mounted 2x2 LED Luminaires)	Type IIIB (LED Indoor High Bay)
1	System Wattage	≤ 2 X 20 W	≤ 40 W	≤ 15 W	≤ 15 W	≤ 40 W	≤ 40 W	≤ 150 W
2	System Lumen Output	≥ 3600	≥ 3600	≥ 1200	≥ 1200	≥ 3400	≥ 3600	≥ 14000
3	System Efficiency (Lumens/watt)	≥ 100	≥ 100	≥ 80	≥ 80	≥ 85	≥ 85	≥ 100
4	Housing	CRCA Housing	CRCA Housing	Pressure Die Cast Housing	Pressure Die Cast Housing	CRCA Housing	CRCA Housing	Pressure Die Cast Aluminum Housing
5	Ingress Protection	IP 20	IP 20	IP 20	IP 20	IP 20	IP 20	IP 65
6	Surge Protector	2 kV	2 kV	2 kV	2 kV	2 kV	2 kV	4 kV (Internal) & 10kV (External)
7	Mounting	Surface Mounted	False Ceiling	Surface Mounted	False Ceiling	Surface Mounted	False Ceiling	Hanging type under shed

8	THD	< 10 %	< 10 %	< 10 %	< 10 %	< 10 %	< 10 %	< 10 %
9	CRI	>80	>80	>80	>80	>80	>80	>70
10	CCT	5700k±300k	5700k±300k	5700k±300k	5700k±300k	5700k±300k	5700k±300k	5700k±300k
11	Power Factor	>0.95	>0.95	>0.95	>0.95	>0.95	>0.95	>0.95
12	IK Protection	NA	NA	NA	NA	NA	NA	IK-05
13	Operating Humidity	90% RH	90% RH	90% RH	90% RH	90% RH	90% RH	90% RH
14	Burning Hours	50000	50000	50000	50000	50000	50000	50000
15	Operating Temperature	-5 deg C to 45 deg C						
16	Lumen Maintenance	70% at the End of Burning Hours						

(b) Outdoor Application

Sr. No	Technical Specification	BL-1(Surface Mounted Bulk Head)	Type SL-L1 (LED street light Luminaire)	Type SL-D1 (Pole mounted LED Post Top Luminaire)	Type FL-1 (LED Flood light Luminaire)	Type FL-2 (LED Flood light Luminaire)
1	System Wattage	≤ 10 W	≤ 45 W	≤ 30 W	≤ 150 W	≤ 250 W
2	System Lumen Output	≥ 800	≥4000	≥ 2600	≥ 14000	≥ 23000
3	System Efficiency (Lumens/watt)	≥ 80	≥ 100	≥ 90	≥ 100	≥ 100
4	Housing	Pressure Die Cast Housing and with polycarbonate diffuser	Pressure Die Cast	Die Aluminum Cast	Pressure Die Cast Housing	Pressure Die Cast Housing
5	Ingress Protection	IP65	IP 65	IP 65	IP 65	IP 65
6	Surge Protector (Internal)	3 kV	3 kV	3 kV	3 kV	3 kV
7	Surge Protector (External)	10 kV	10 kV	10 kV	10 kV	10 kV
8	Mounting	Wall Mounting	Pole mounting	Suitable for 60 mm max O.D	On Lattice structure	On Lattice structure

			for 40mm max O.D			
9	THD	< 20 %	< 10 %	< 10 %	< 10 %	< 10 %
10	CRI	>70	>70	>70	>70	>70
11	CCT	5700k±300k	5700k±300k	5700k±300k	5700k±300k	5700k±300k
12	Power Factor	>0.95	>0.95	>0.95	>0.95	>0.95
13	IK Protection	IK-09	IK-05	IK-05	IK-05	IK-05
14	Operating Humidity	90% RH	90% RH	90% RH	90% RH	90% RH
15	Burning Hours	50000	50000	50000	50000	50000
16	Operating Temperature	-5 deg C to 45 deg C				
17	Lumen Maintenance	70% at the End of Burning Hours				

Annexure-III

CODE AND STANDARDS

Distribution Boards/ Meter Boards & components shall conform to the requirements of the latest revision including amendments of the following codes and standards.

IS: 8623	Specification for factory built assemblies of switchgear and control gear for voltages up to and including 1000V AC/1200V DC.
IS: 4237	General requirements for switchgear and control gear for voltages not exceeding 1000V.
IS: 2147	Degree of protection provided by enclosures for low voltage switchgear and control gear.
IS: 10118	Switchgear & Control gear selection/ Installation maintenance.
IS: 9224	HRC cartridge fuses.
IS: 4064	Air break switches and fuse combination units for voltages not exceeding 1000V AC or 1200V DC.
IS: 6005	Code of Practice for Phosphating of Iron & Steel

Annexure IV

Checklist Points and procedures for checking (Internal Electrification)

Sl. No.	Components/Operations & Description of test	Sampling Plan	Ref. Document & Acceptance norms	Testing Agency	Type of Check	Remarks
1	GENERAL					

I	DOCUMENTATION					
I	Check availability of approved construction drawing(s)	100%	Approved drg of RECTPCL	Jointly with RECTPCL	Review	
li	Approval of MAKE, for all the items to be supplied	100%	As approved by RECTPCL	-do-	Review	
iii	Source of purchase (Authorized Dealership Certificate etc.) of materials	100%	-do-	-do-	Review	
2	STORAGE					
i	To be stored in a dry place and not in direct contact with water/soil	100%	-do-	-do-	Visual	
ii	Primary packing should be retained till erection/installation	100%	-do-	-do-	Visual	
II	ITEMS					
I	Lamps, Fitting & Ceiling Fan					
A	Receipt of Materials					
I	Any Physical damage	100%	As per RECTPCL Specifications/BOQ	-do-	Visual	
B	ERECTION					
i	check for mounting arrangement / bracket	100%	-do-	-do-	Visual	
ii	Check for physical alingment	100%	--do--	--do--	Visual	
iii	Check for earth continuity	100%	--do--	--do--	Meggering	
2	Lighting Pannels					
A	Receipt of Material					
i	Any physical damage	100%	--do--	--do--	Visual	
ii	Painting & Physical diemensions	100%	--do--	--do--	Visual	
B	Erection					
i	Proper placement, alignment & component tightening	100%	As per RECTPCL Specifications/BOQ	--do--	Visual	
C	Pre-Commissioning					
i	Check earthing	100%	As per RECTPCL Specification	--do--	By meggering	
li	Check Incoming/ Outgoing with Ckt. Diagrams	100%	--do--	--do--	Visual	
iii	Check component working	100%	--do--	--do--	physical	
D	Commissioning					
	Energise lighting pannels check voltage, current	100%	As per RECTPCL Specifications/BOQ	--do--	By measuring instrument	
3	Conduit Wiring					
A	Receipt of Materials					
i	Check Conduit Diemensions	100%	As per RECTPCL Specifications/BOQ	Jointely with RECTPCL representative	By Micrometer /Callipers	

ii	Check Conduit surface finish	Random	--do--	--do--	Visual	
B	Erection					
I	Ensure that small pieces of wire are not joined to run through the conduit	100%	As per RECTPCL Specifications	--do--	Visual	
ii	Ensure that conduit are plugged to prevent entry of any foreign materials	100%	--do--	--do--	Visual	
iii	Ensure for electrical continuity of GI conduits & ensure that they are permanently Earthed	100%	--do--	--do--	Visual	
iv	Ensure that all bends are smooth & undamaged	100%	--do--	--do--	Visual	
4	Wires & Cables					
A	Receipt					
i	Check					
a	Size of the Cables/Wires as written on the surface insulation	100%	As per RECTPCL Specs/BOQ	--do--	Visual	
b	Any damage during transit	100%	--do--	--do--	Visual	
c	Check for end seals	100%	--do--	--do--	Visual	
d	Check continuity	100%	--do--	--do--	By mongering/ continuity tester	
e	Review manufacturers test certificate	100%	--do--	--do--	Visual	
f	Check IR values & Continuity	100%	--do--	--do--	By meggering	
B	Erection & Termination					
i	Ensure Correct color coding and correct connection for each circuit	100%	As per RECTPCL Specs/BOQ	--do--	Visual	
ii	Ensure proper Lugging & Glanding. Wherever applicable	100%	--do--	--do--	Visual	
iii	Check IR values & Continuity	100%	--do--	--do--	By meggering	
5	RECEPTACLES					
A	RECEIPT					
I	Any damage during Transit	100%	As per RECTPCL Specs.	--do--	Visual	
II	Whether all fasteners/Washers/Neoprene Etc are included	random	--do--	--do--	Visual	
B	ERECTION					
I	check that Receptacle is securely fixed	100%	As per RECTPCL Specs.	Jointly with RECTPCL	Visual	

II	Check the alignment of Receptacles	100%	--do--	--do--	Visual	
III	Ensure that Earth line is connected	100%	--do--	--do--	Visual	
IV	Check that the connection/ Looping to the panel Sub-circuit is in line with the approved drawing	100%	--do--	--do--	Visual	
6	Main township Distribution BOX					
A	RECEIPT					
I	Check Dimensions	100%		--do--	Visual	
B	PRE-ERECTION			--do--		
I	Check switch operation	100%	--do--	--do--	Physical	
ii	Check Mechanical interlock	100%	--do--	--do--	Physical	
iii	Check Fuse unit	100%	--do--	--do--	Visual	
C	ERECTION			--do--		
I	Check location & mounting as per Approved. Drg.	100%	--do--	--do--	Visual	
II	Check Incoming/ Outgoing connections	100%	--do--	--do--	Visual	
III	Check earthing & earthing connection	100%	--do--	--do--	Visual	
D	PRE -COMMISSIONING					
I	Check component tightening	100%	--do--	--do--	Visual	
ii	Check earthing connection	100%	--do--	--do--	Visual	
iii	Check earth continuity from MDB earth point & to each switch board	100%	--do--	--do--	By Meggering	
7	SUR-DISTRIBUTIONROAD					
A	RECEIPT					
i	Check for any damage during transit	100%	As per RECTPCL Specs/BOQ	--do--	Visual	
B	ERECTION					
i	Check cable identification tags	100%	As per RECTPCL Specs/BOQ	--do--	Visual	
ii	Check fur cable glands, lugs & terminations	100%	--do--	--do--	Visual	
iii	Check earthing	100%	--do--	--do--	Visual	
iv	Check final IR value	100%	--do--	--do--	By meggering	
v	Check position of cable markers	100%	--do--	--do--	Visual	
11	EARTHING					
A	RECEIPT					
i	Cable size & gauge	100%	--do--	--do--	Visual	
B	ERECTION					
I	Check tightening Etc. at	100%	--do--	--do--	Visual	

	technical points with proper washers					
li	Check cable identification tags	100%	--do--	--do--	Visual	
lii	Check for proper lug crimping	100%	--do--	--do--	Visual	
Iv	Check continuous running of E/W with wiring	100%	--do--	--do--	Visual	
V	Check depth of pit, length of electrode & items to be poured into the pits	100%	--do--	--do--	Visual	
vi	Check earth electrode installation	100%	--do--	--do--	Visual	
C	PRE -COMMISSIONING					
I	Earthing continuity Check	100%	--do--	--do--	By Multimeter	
ii	Check earth resistance value	100%	--do--	--do--	By meggering	
12	AUTOMATION SYSTEM					
A	RECEIPT					
i	Check for supply of complete items as per Technical specification, Approved drawing, BOQ					
ii	Check for damage during transit					
B	ERECTION					
i	Check location & mounting as per Approved Dwg.					
C	COMMISSIONING					
i	Check whether all desired data as per TS/Approved drawing /BOQ are available in SCADA					
8	TESTING & COMMISSIONING					
	TESTING & COMMISSIONING shall be done as per the applicable and relevant standards. Codes of practice of Indian Electricity Rules. The following test MUST be done for the installations					
I	insulation resistance test	100%	-	Jointly with RECTPCL	By meggering	
II	Earth continuity test	100%	-	-do-	By meggering	
III	Polarity test on the single pole switch/MCB	60%	-	-do-	By test lamp	

IV	Check that Phase wire is connected to switch	Random	-	--do-		
V	For Lighting circuit					
a	All switches in ON position, along with the light fitting in circuit, both poles connected together and the resistance to earth measured	100%	-	-do-	By meggering	
b	Check tripping of MCBs, MCCBs/ELCBs	100%	-	-do-	By stimulating fault	
c	Resistance between the poles & the clamps, with Light fitting removed & switch in ON position	40%	-	-do-	By meggering	
d	Resistance as above (C), but with the switch in OFF position & light fitting included	40%	-	-do-	By meggering	
1. All the Tests/Cheeks mentioned here are Mandatory. The Test which are not covered here, but felt essential by the RECTPCL site-in-charge for successful commissioning, shall be carried out at site. 2. This is a general checklist for reference purpose. However, it is to be ensured that the work has been executed in line with Technical specification/Approved drawing.						

Sl. No.	Components/Operations & Description of test	Sampling Plan	Ref. Document & Acceptance norms	Testing Agency	Type of Check	Remarks
1	DOCUMENTATION					
I	Check availability of approved construction drawing	100%	Approved drg of RECTPCL	Jointly with RECTPCL	Review	
Ii	Approval of MAKE, for all the items to be supplied	100%	As per RECTPCL Specifications	-do-	Review	
Iii	Source of purchase (Original Bill) of materials	100%	-do-	-do-	Review	
Iv	Copy of Manufacturer's test certificate	100%	-do-	-do-	Review	
v	Packing list &. MJCC (for all the items, wherever the items are cleared after inspection)	100%	-do-	-do-	Review	
2	STORAGE					
	To be stored in a dry place and not in direct contact with water/soil	100%	-do-	-do-	Visual	
	Primary packing should be retained till erection/installation	100%	-do-	-do-	Visual	
3	RECEIPT					
A	LIGHTING POLES					
I	Type of pole	100%	As per RECTPCL Specs/BOQ	-do-	Visual	
Ii	Dimension of pole: Outer dia of Top, Middle and bottom section. Length of Pole & Thickness of pipe at the Top and Bottom	Randomly for 10% of total qty	-do-	-do-	By measurement	
Iii	Dimension of Base plate	-do-	-do-	-do-	By measurement	
Iv	Painting of poles	100%	-do-	-do-	Visual	
V	Straightness of Pole	100%	-do-	-do-	Visual	
vi	Provision of earthing bolt	100%	-do-	-do-	Visual	
C	CABLE(S)					
I	Type of cable	100%	-do-	-do-	Visual	
Ii	Dimensions	100%	-do-	-do-	By measurement	
Iii	Continuity Check	100%	-do-	-do-	By meggering	
Iv	Intactness of end sealing	100%	-do-	-do-	Visual	
V	Check. IR before installation	100%	-do-	-do-	By meggering	

vi	Any Physical damage	100%	-do-	-do-	Visual	
D	JUNCTION BOX & ACCESSORIES (Al Lugs, Cable Glands, Cable Route Marker)					
i	Dimension(s)	100%	As per RECTPCL Specs/BOQ	Jointly with RECTPCL	Visual	
E	LUMINARIES					
I	Type	100%	-do-	-do-	Visual	
Ii	Completeness with fittings	100%	-do-	-do-	Visual	
Iii	Manufacturer's test certificate	100%	-do-	-do-	Review	
Iv	Any damage in transit	100%	-do-	-do-	Visual	
V	Checking luminaries outting, on ckt	100%	-do-	-do-	Visual	
vi	Checking automatic timer operation of ckt	100%	-do-	-do-	Visual	
F	PANELS					
I	Dimension(s)	100%	-do-	-do-	By measurement	
Ii	Provisions of components as per BOQ	100%	-do-	-do-	Visual	
Iii	Any damage during transit	100%	-do-	-do-	Visual	
Iv	Painting of panels after erection	100%	-do-	-do-	Visual	
v	Test report of Energy meters	100%	-do-	-do-	Review	
G	EARTHING					
I	Dimension of GI pipe	100%	-do-	-do-	By measurement	
Ii	Dimension of GS Flat for earthing	100%	-do-	-do-	By measurement	
Iii	Completeness of Earthing sets	100%	-do-	-do-	Visual	
iv	Dimension of GI wire	100%	-do-	-do-	By measurement	
4	ERECTION					
	Check					
I	Dimension of Burried Cable Trench	Randomly	As per RECTPCL Specs/BOQ	Jointly with RECTPCL	By measurement	
Ii	Cable laying JB connections. Cable tags	100%	-do-	-do-	Visual	
Iii	slump test of Cone Mix for Pole foundation	Randomly 10% of Total Qty	-do-	-do-	By measurement	
Iv	Mounting of Panels	100%	-do-	-do-	Visual	
V	Continuity of cables	100%	-do-	-do-	By meggering	

Vi	IR Value measurement of the cabling	100%	-do-	-do-	By meggering	
Vii	Fixing & tightness of lugs & Glands	100%	-do-	-do-	Physical	
Viii	Operation of components	100%	-do-	-do-	Physical	
Ix	Erection of Pole(s): Foundation Concreting, Alignment/ verticality of pole. Painting of poles, Fixing of Pole caps etc.	100%	-do-	-do-	Visual	
X	Fixing cable route marker	100%	-do-	-do-	Visual	
Xi	Bituminous painting at the Bottom section.	100%	-do-	-do-	Visual	
xii	Painting of poles after erection	100%	-do-	-do-	Visual	
xiii	Check IR before installation	100%	-do-	-do-	By meggering	
5	TESTING & COMMISSIONING					
	Check					
I	IR Value & Continuity of the complete system	100%	-do-	-do-	By meggering	
Ii	Earth continuity test	100%	-do-	-do-	By meggering	
Iii	Polarity check of MCB	100%	-do-	-do-	Physical	
Iv	Circuit Operation	100%	-do-	-do-	By Energisation	
v	Voltage of the system	100%	-do-	-do-	By measurement	

NOTE:

1. All the Tests/Cheeks mentioned here are Mandatory. The Test which are not covered here, but felt essential by the RECTPCL site-in-charge for successful commissioning, shall be carried out at site.
2. This is a general checklist for reference purpose. However, it is to be ensured that the work has been executed in line with Technical specification/Approved drawing.

Checklist Points and procedures for checking (External Electrification) Annexure V

1. As per the approved specification by RECTPCL /CPWD Specification.

LIST OF APPROVED MAKES OF MATERIALS

INDICATIVE LIST OF MAKES OF MATERIALS -CIVIL WORKS

Sr. No.	DESCRIPTION	MAKES
1	CHEMICAL USED FOR ANTI TERMITE TMENT A) CHLORPYRIPH'OS 20% EC	NOCIL (DURBAN TC) LUPIN (CLASSIC 20) MONTARI INDUSTRIES (PYRAMID) CYNAMID (DURAMET),PEST CONTROL INDIA LTD, PEST CON INDIA, PEST CONTROL INCORPORATED
2	WATER PROOFING COMPOUND AS ADMIXTURES IN CONCRETE	M. C. BAUC HM IE, STRUCTURAL WATER PROOFING CO., ACC, SUNANDA, PIDILITE
3	BITUMEN	INDIAN OIL, HINDUSTAN PETROLEUM, BHARAT PETROLEUM
4	PVC STRIPS, PVC NOSING, PVC WATER STOPS, PVC HAND RAIL	FIXOPAN ENGINEERS, CALIPLAST, WAVIN, FIXOPAN OR APPROVED EQUIV
5	ORDINARY PORTLAND CEMENT (AS PER IS:269) POZZOLANA PORTLAND CEMENT AS PER IS 1489 (Part 1): 2015	ULTRATECH, VIKRAM, AMBUJA , ACC, JK, JP, BIRLA, SHREE or as approved by RECTPCL
6	WHITE PORTLAND CEMENT	BIRLA WHITE, JK WHITE
7	REINFORCEMENT BARS (IS PER FE 500 D) (may be procured either from main producer directly or through the authorised dealers who can produce mtc from main producer with tracebility)	TATA , SAIL, RASTRIYA ISPAT NIGAM or as approved by RECTPCL
8	DISTEMPER (DRY/OIL BOUND) WATER PROOFING PAINT	NEROLAC , BERGER PAINTS, AKZONOBEL INDIA (ICI), ASIAN PAINT
9	SYNTHETIC ENAMEL PAINT/ACRYLIC EMULSION	NEROLAC , BERGER PAINTS, AKZONOBEL INDIA (ICI), ASIAN PAINT, SUNANDA SPECIALTY COATINGS, JOHNSON & NICHOLSON
10	EPOXY PAINT	FOSROC, APURVA BUILD CARE, MC BAUCHEMIE
11	CERAMIC TILES & VITRIFIED TILES	RAK, H&R JOHNSON. KAJARIA, ORIENT, SOMANI, MARBITO
12	EXPANSION BOLT	HILTI FISHNER
13	GLAZING SEALANT	DOW CORNING , GE SEALANT, WACKER
14	COMMERCIAL BOARD/PLYBOARD/ FLUSH DOOR	JWALA ,DUROPLY,CENTURY, NATIONAL BOARD, ALPRO , GREENPLY, ARIN, DURO
15	SHEET GLASS , FLOAT GLASS , MIRROR GLASS	MODI GUARD, ASAHI , TATA, ST GOBAIN
16	RCC HUME PIPE	INDIAN HUME PIPE, JAIN HUME PIPE, HINDUTAN PIPES
17	WELDING ELECTRODE	ADVANI OERLINKON
18	WELDESH MESH	SHAKTI WELD MESH, IRC, MULTIWELD WIRE

LIST OF APPROVED MAKES OF MATERIALS

		CO.
19	PUTTY	SHALIMAR, ASIAN PAINT, SNOWCEM INDIA LTD., BERGER PAINTS. JK WALL PUTTY
20	STAINLESS STEEL	SALEM STAINLESS STEEL (SAIL), JINDAL
21	ROLLING SHUTTERS	DIANA , RAMA , SARTAJ
22	SILICONE	NISIWA, COATSI L, PERMACOTE
23	WATER PROOF CEMENT PAINT	ASIAN PAINT ,SNOWCEM INDIA, BERGER PAINT, AKZONOBEL INDIA (ICI), NEROLAC
24	IMPREGNATED FIBRE BOARD	SHALITEX BY SHALIMAR TAR PRODUCTS
25	UPVC & OTHER PVC PIPES AND FITTINGS. PVC FITTINGS	SUPREME, AJAY , PRINCE , PRAYAG, FINOLEX OR EQUIVALENT ISI MAKE
26	MILD STEEL PIPES, PLATES, CHEQUERED PLATE, BEAMS, STRIPS ETC.	TISCO, SAIL, RASHTRIYA ISPAT, ASTL
27	NON-METALIC MINERAL BASED FLOOR HARDENER	MC BRAUCHMIE, FOSROC, SUNANDA CHEMICALS, PIDILITE
28	POLYSULPHIDE SEALANT FOR EXPANSION JOINTS AND WATER PROOFING	CHOCKSEYCHEMICALS, STRUCTURAL WATERPROOFING CO., SHALIMAR PRODUCTS SUNANDA SPECIALTY COATINGS PVT LTD
29	POLYMER MODIFIED CONCRETE	MS BRAUCHEMIE, FOSROC, PIDILITE, STRUCO, ACC, SUNANDA SPECIALTY COATINGS LTD
30	DOOR SENSORS	DORMA. GODREJ, HCL
31	LIFT	OTIS, SCHINDLER, KONE, MITSUBUSHI, THYSENKRUPP ELEVATOR
32	CONNOR MEMA SPORTS FLOORING	FREE WILL INFRASTRUCTURE PVT. LTD, PUNE
33	TERAFLEX 5MM/7MM THICK SPORTS FLOORING	UNIFLEX SPORTS FLOORING, UNITED BOGER & BENTA SPORTS FLOORING
34	CREATION CLIC FLOORING	TERAFLEX SPORTS FLOORING
35	STRUCTURAL GLASS	SAINT GOBAIN, GLAVERBELL, PILKINGTON, ASAHI INDIA
36	PAVER BLOCKS & PAVER TILES	DURACRETE, EUROCON , JOHNSON
37	PATCH FITTINGS	DORMA, HETTICH, KITCH, GODREJ , OZONE, HAFELE
38	TEAK WOOD	NAGPUR , GHANA
39	ENEERS	DURO, ARIN, GREEN PLY
40	LAMINATES	MERINO , FORMICA, GRRENLAM
41	ADHESIVE FOR WOOD WORK	FEVICOL , VAMICOL
42	GYPSUM BOARD	GYPSUM INDIA LIMITED
43	ALUMINIUM EXTRUSIONS	JINDAL, HINDALCO, NARMADA , BHARUKA, INDAL, MAHAVIR
44	GLASS WOOL TILES	DECOPHON, ECHOPHON
45	45 TEXTURE PAINT	HERITAGE, ACRO, UNILITE

LIST OF APPROVED MAKES OF MATERIALS

46	TILES ADESIVE/GROUT	LATECREAT, FERROUS, BAL ENDURA
47	POLISH	ICI, ASIAN, BERGER
48	ALUMINIUM SECTION	HINDALCO JINDAL
49	BLINDS	TRAC. VISTA, HUNTERDOUGLAS
50	GLASS MOSIAC TILE	PILLADIO, BIZASA
51	PLASTER OF PARIS	JK LAKSHMI, SAKRANI

A. INDICATIVE LIST OF MAKES OF MATERIALS:-PUBLIC HEALTH WORKS:

Sr. No.	DESCRIPTION	MAKES
1	CENTRIFUGAL CAST (SPUN) IRON S&S FITTINGS	NECO, RIF,
2	G.I. PIPES/ M.S. PIPES	GUJARAT TUBES, TATA, SURYA, JINDAL, ITC, PRAKASH, RAVINDRA
3	G.I. FITTINGS BRAND (MALLEABLE CAST IRON)	KENT, UNIK, ZOLOTO OR EQUIVALENT ISI MAKE
4	GUN METALS/BALL VALVES (FULL WAY, NON-RETURN AND GLOBE VALVES)	ZOLOTO, LEADER , AUDCO
5	BALL VALVES	ZOLOTO,LEADER,AUDCO
6	STOPCOCK	ZOLOTO, LEADER, PARKO, JAQUAR
7	STAINLESS STEEL SINK	NEELKANT, SALEM STEEL, AMC, NIRALI, JAYNA, KINGSTON
8	PVC FLUSHING	HINDUSTAN, CERA
9	STONEWARE PIPES & GULLY TRAP	PERFECT, BURN
10	RCC PIPES	HINDUSTAN PREFAB, INDIAN, HUMEPIPES, JAIN
11	C.I. MANHOLE COVERS AND FRAMES C.I. GRATINGS	NECO, RIF
12	SLUICE VALVE	KARTAR, KALPANA, GEETA, KIRLOSKAR
13	BUTTERFLY VALVE	IVC, GEETA, KIRLOSKAR
14	SENSORS	JAQUAR, AOS, HINDWARE , PARRYWARE
15	HAND DRYER	KIMBERLY CLARK,ASKON, AOS, KOPAL, ATMAS, UTEC SYSTEM, TOSHI
16	CENTRIFUGAL & SUBMERSIBLE PUMPS	KIRLOSKAR, CUMMINS, CGL
17	VITREOUS CHINA SANITARY WARE	HINDUSTAN SANITARY WARE ,CERA, PARYWARE
18	WC CONNECTORS	MULTIKWIK (UK) , SUPREME
19	SHOWER TRAY	WOVEN GOLD, EUROSPA, AQUABATCH
20	CP BRASS FITTINGS AND	GEM, LAURET, AQUA PLUS, JAQUAR

LIST OF APPROVED MAKES OF MATERIALS

	TOILET ACCESSORIES	
21	ANGLE VALVE WITH FILTER	ARCO, AQUA PLUS, PARKO, SEIKO
22	C.P. GRATING FOR FLOOR TRAP	SEIKO, COBRA, NEALKANTH
23	PIPE CLAMPS	CHILLY OR EQUIVALENT ISI MAKE
24	PRESSURE REDUCING VALVE	LEADER, ZOLOTO, RBM
25	T/Y STRAINER	LEADER,ZOLOTO,ADVANCE
26	CPVC PIPE FITTING	FINOLEX,SU PREME,ASTRAL,PRINCE
27	SWR PIPE FITTINGS	FINOLEX,SUPREME,ASTRAL,PRINCE

INDICATIVE LIST OF MAKES OF MATERIAL, -ELECTRICAL AND OTHER WORKS

Sr. No.	DESCRIPTION	MAKES
1	LOW TENSION, XLPE ARMOURED, 1.1KV GRADE, ALUMINIUM/COPPER CONDUCTOR CABLES, TYPE A2XFY/YRY	KEI / GEMSCAB / CORDS CABLE INDUSTRIES LTD/ KEC International Ltd / VIKAS CABLE COMPANY/ Ravin Cables Ltd / Polycab/ Special Cables Pvt Ltd/ Havells / Suyog
2	LOW TENSION, TPN SFU WITH HRC FUSES, 415 VOLTS, AC, 3 PHASE, 50 HZ.	ABB/ GE POWER, SIEMENS, L&T
3	LOW TENSION,TP, MOULDED CASE CIRCUIT BREAKER, 415 VOLTS AC, 3 PHASE 50 HZ50 KA-STR. MICROPROCESSOR / THERMAL RELEASE	GE POWER CONTROLS INDIA PRIVATE LIMITED/ ABB LIMITED / CROMPTON GREAYES LIMITED / M&G/ KM / LARSEN & TOUBRO(L&T) / C&S ELECTRIC LTD / BCH ELECTRIC LIMITED / ERA ELECTRICALS PVT LTD / AREYA T&D INDIA LIMITED/ SPACEAGE SWITCHGEARS LIMITED/ Havells India Limited
4	LOW TENSION, DRY TYPE CAPACITORS, 440 VOLTS, 50 HZ 3 PHASE WITH APFC PANEL	POWER MATRIX, VISA,L&T, POWERTECH, SIEMENS, CROMPTON KHATAU
5	INDICATING LAMPS HOLDERS WITH LED TYPE LAMPS	GE / VAISHNO / TEKNIC / VENSON ELECTRIC PRIVATE LIMITED/ LARSEN & TOUBRO(L&T) / GROUPE SCHINEDER / C&S ELECTRIC LTD / SPRECHER & SCHUH (S&S) / SRI TULSI SWITCHGEAR / SIEMENS / EAO / ESSEN DIENKI/ (Indicating, lamp)
6	SELECTOR SWITCHES FOR AMMETER/VOLTMETER	GE/KAYCEE/RECOM/SWITRON/SALZER CONTROLS,

LIST OF APPROVED MAKES OF MATERIALS

7	LOAD MANAGERS, DIGITAL TYPE AMMETERS, VOLTMETERS, PF METERS, FREQUENCY METERS.	MERIN GERIN, ENERCON, TRINITY/ CONSERVE, L&T, AUTOMATIC ELECTRIC, RISHABH, DUCATI BHARAT ELECTRONICS & ELECTRICALS/ NIPPEN ELECTRICAL INSTRUMENTS CO / NIPPEN ELECTRICAL INSTRUMENTS CO (Indicating meter)
8	DIGITAL ENERGY METERS	MERLIN GERIN, L&T, HAVELL ' S, SECURE, BENTEC
9	MICRO PROCESSOR RELAYS	ABB SEGC, SIEMENS, L&T
10	PANEL WIRES, GRAY / BLACK COLOUR IN 660/1100 VOLTS. GRADE (FR).	RR KABEL, POLYCAB, FINOLEX, HENSEL
11	CABLE GLANDS - SINGLE COMPRESSION TYPE	STANDARD METAL INDUSTRIES/ CENTRAL HARDWARE/ SUNIL & COMPANY/ COMET BRASS PRODUCTS (COMET BRAND)/COMET INDUSTRIES (BRAND COSMOS)/Hex Cable Accessories Pvt Limited
12	LUGS, CRIMPING TYPE, TINNED COPPER HEAVY DUTY ONLY	DOWEL'S
13	HRC CONTROL FUSES WITH BAKELITE I TYPE MOULDED FUSE HOLDERS	GE, SIEMENS, L&T
14	PUSH BUTTON STATIONS TYPE, IN DIFFERENT COLOUR CODES.	VAISHNO/TEKNIK/SIEMENS/LARSEN & TOUBRO(L&T) / VENSON ELECTRIC PRIVATE LIMITED/ BCH/ CONCORD/ ESSEN DIENKI
15	TERMINAL BLOCKS, PUSH ON TYPE	CONNECTWELL/ PHOENIX CONTACT (INDIA) PRIVATE LIMITED/ ESSEN DIENKI
16	MS FABRICATED PANELS	ANAND CONTROL GEAR, RISHA CONTROL, BOE SWITCHGEAR, VIDHUT CONTROL, TRICOLITE
17	STARTERS, CONTACTOR, TIMERS	MERLIN GERIN, SIEMENS
18	MINIATURE CIRCUIT BREAKER OF 10 KA BREAKING CAPACITY AND BOARDS	STANDARD ELECTRICALS LIMITED/ SCHNEIDER ELECTRIC INDIA PRIVATE LIMITED/ LEGRAND (INDIA) PRIVATE LIMITED/ INDO KOPP/ CROMPTON GREAVES LIMITED/ M&G/ MERLIN GERIN (MGE)/ ABB LIMITED/ MERLIN GERIN (MGE)/ SPRECHER & SCHUH (S&S)/ MOS/ C&S ELECTRIC LTD
19	CTS 1100 VOLTS GRADE CAST RESIN ONLY	AUTOMATIC ELECTRIC KAPPA/RECO
20	AUTOMATIC POWER FACTOR PANEL MICROPROCESSOR BASED WITH 3 PHASE CT SENSING	POWERMATRIX, VISAPOWERTECH, L&T, GE POWER
21	LOAD MANAGER WITH RS 485 PORT & SOFTWARE	MERLIN GERIN, ENERCON, CONSERVE

LIST OF APPROVED MAKES OF MATERIALS

22	ALL LIGHT FITTINGS	CROMPTON GREAVES LIMITED/ PHILIPS INDIA LIMITED/ PHILIPS INDIA LIMITED/ APEX LUMINAIRES (P) LIMITED/ Crompton Greaves Consumer Electricals Limited/ CGL/HAVELS/PHILIPS/INSTA POWER/BAJAJ
23	GI CONDUITS	MANUFACTURER HAVING VALID BIS LICENCE/ BEC LIMITED/ JHAVERI INDUSTRIES/ KK INDUSTRIES
24	GI CONDUIT ACCESSORIES	VIMCO/P&I
25	FR WIRES IN 660/1100 VOLTS GRADE FOR POINT WIRING.	RR KABLE, FINOLEX , POLYCAB, SKY LINE
26	SINGLE POLE SWITCHES AND SOCKETS 6/16 AMPS. MODULAR TYPE	CRABTREE, MOS- LEGRAND, MK, SCHNIDER, ANCHOR, ROMA
27	CEILING FAN	CROMPTON, USHA, ORIENT, BAJAJ, HAYELLS, GE, PHILLIPS
28	EXHAUSTAXIAL FLOW / VENTILATION FAN	CROMPTON, USHA, GE ALSTOM, G.E, CROMPTON GREAYES, BAJAJ
29	LAMPS, TUBES	PHILIPS, OSRAM, CROMPTON, HAYELLS, INSTA, CGL, BAJAJ
30	TELEPHONE SOCKETS	D-LINK, AMP, SYSTMEX
31	DATA CABLES, CAT-6	D-LINK, AMP. SYSTMEX
32	COMPUTER DATA SOCKETS AND RELATED HARDWARE. CABLES (TELEPHONES)	D-LINK, AMP, SYSTMEX
33	ELECTRONIC REGULATING BALLAST FOR LIGHT FITTINGS	WIPRO, PHILIPS, ATCO, CROMPTON
34	TELEPHONE TAG BLOCK	KRONE
35	SPEAKERS FOR ADDRESS SYSTEM	BOSCH, AHUJA, BOSE
36	AMPLIFIERS	ATIS, BOSCH, AHUJA
37	3 CD/DVD PLAYERS	SONY, PHILIPS, TECHNIC, PANASONIC, SAMSUNG
38	MICROPHONES	ATIS , AUDIO , TECHNICA, AHUJA
39	CRCA SHEETS FOR PANELS/ BUS DUCT/RISING MAINS	JINDAL, TATA, RAYMOND
40	PAINTS & PRIMERS	ASIAN, DUCO
41	INDUSTRIAL PLUGS & SOCKETS	LEGRAND, SIEMENS, MERIN GERIN
42	NI-CD BATTERY	EXIDE, HBL
43	WOOD SCREWS	NITTLE FOLD, HILTI, FISCHER
44	CABLE TRAYS, JUNCTION BOXES, RACEWAYS & PERFORATED TRAYS	PROFAB, RICO, INDIA TECH, METALAM
45	RIGID PVC PIPES WALL THICKNESS AND ACCESSORIES	PERCISION, SUPREME, DIAMOND
46	11 KV VCB PANELS	CROMPTON, MELIN GERIN, GE, ABB

LIST OF APPROVED MAKES OF MATERIALS

47	11/0.433 KV, 100KVA DISTRIBUTION TRANSFORMER	CG, ABB, SIEMENS, SCHNEIDER, AREYA
48	HT CABLES	UNIVERSAL, HAYELLS, POLYCAB, FINOLEX
49	HT TERMINATION KITS	M-SEAL
50	FIRE ALARM SYSTEM	SECUTRON NOTIFIER, GE MORLEY
51	WATER LEAK SYSTEM	STAR ELECTRONICS, EMNET, SONTEY
52	RODENT REPELLENT	MESER ELECTRONICS
53	HIGH SENSIVITY SYSTEM	VESDA, ICAM, VISTA
54	LIGHTING CONTROL	GODREJ, PHILLIPS CLIPCEL, ATCO, LUTRON , WIPRO
55	D.G. SET	KIRLOSKAR, CUMINS, CATTER PILLER
56	FIRE DETECTORS MODULE	SIEMENS, NOTIFIER, ESSAR, HONEYWELL, CEASEFIRE
57	PVC CONDUIT	BEC/AGK /PRECISION
58	FLEXIBLE CONDUIT	HENSEL/LEGRAND/TRINITY TOUCH/LAPP
59	TELEPHONE CABLE	DELTON/SKY LINE/ VINAYI FINOLEX/SKY TONE
60	MCB ISOLATOR, RCCB, ELCB (OF ALL RATINGS)	L&T /HAVELLS /SCHNIDER/ANCHOR
61	LIGHTFIXTURES/FITTINGS	PHILIPS /CGL/ HAYELLS/HAYELLS/BAJAJ
62	TV COAXIAL CABLE	DELTON/SKY LINE/NATIONAL/ SHYAM/ ANCHOR
63	MCCB	L&T/HAVELLS/SCHNIDER
64	MCB DISTRIBUTION BOARD	L&T / HAYELLS/SCHNIDER
65	CONTROL & instrumentation CABLE	DELTON / SKYLINE / NATIONAL/ GR[NDLAY/ LAPP/ ANCHOR
66	ACCESS SYSTEM	SIEMENS OR EQUIV
67	PA SYSTEM	JBC, PHILIPS, BOSS , AHUJA
68	AUDIONIDEO SYSTEM	PHILIPS, PANASONIC. SONY, LG. SAMSUNG
69	CABLE	HAYELLS/FENOLEX/ANCHOR

GENERAL NOTES-

1. ALL MATERIALS & ITEMS SHALL COMPLY WITH THE RELEVANT BIS CODES AND SHALL BE BIS MARKED WHEREVER APPLICABLE.
2. THE CONTRACTOR SHALL PRODUCE THE SAMPLES FOR MATERIALS AND ITEMS BEFORE PROCUREMENT OF THE SAME FOR APPROVAL OF THE ENGINEER-IN-CHARGE.
3. THE MAKES ARE ONLY INDICATIVE FOR REFERENCE PURPOSE. THE VENDOR SHALL SUBMIT THE LIST OF OFFERED MAKE ALONGWITH THE PROPOSAL.
4. CONTRACTOR MAY PROPOSE NEW MAKE/SUB-VENDOR MEETING TECHNICAL (QUALIFYING) REQUIREMENT AS STIPULATED IN TECHNICAL SPECIFICATION FOR ABOVE MENTIONED BROUGHT-OUT ITEMS WITHIN 90 DAYS FROM THE DATE OF NOA

LIST OF APPROVED MAKES OF MATERIALS

FOR APPROVAL OF RECTPCL. THE COST OF ASSESSMENT SHALL BORNE BY CONTRACTOR IN CASE OF NEW VENDORS AS PER RECTPCL REQUIREMENT.

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Validity	Till next revision

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Project Name	Construction of Township at Lassipora GIS Substations
LOA No	

S.N	Description of activity	Items to be checked	Test/check to be done	Ref. Document	Checking/Testing		Counter Check/Test by RECTPCL	Accepting Authority in RECTPCL
					Agency	Extent		
1.	Detailed Soil Investigation	a) Bore log	1. Depth of bore log 2. SPT Test 3. Collection of samples	As per RECTPCL Specification	Contractor	100% at Field	To witness 20% at Field	RECTPCL HO based upon report of Soil Investigation submitted
		b) Tests on samples	As per tech. Specs.	As per RECTPCL Specification	Contractor (Testing in RECTPCL approved Lab/ Govt Approved Lab/ Govt technical Educational Institutes)	100% by testing lab (Reports to be signed by Testing person & Checking person)	Review of lab test results (All soil reports to have signature of RECTPCL executive reviewing the report)	
2.	Earth Work (site leveling)	1. Mandatory testing for filling						
			1. Proctor compaction test for maximum dry density	IS:2720 (Part-7) & RECTPCL Specification	Contractor (Testing in RECTPCL approved Lab/ Govt Approved Lab/ Govt technical Educational Institutes).	One sample for every 25x25 sqmtr of filling area	100% review of lab test results	Site In charge
			2. Optimum Moisture Content	do	do	do	do	do
		2. Field Compaction Test	1. Field dry density & Moisture content test for each layer of compaction	IS:2720 (Part-29) & RECTPCL Specification	Contractor Field lab./ RECTPCL approved Lab.	One sample for every 2500 Sqm. or part thereof for compacted soil for each compacted layer.	do	do

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3	Checking of foundation material							
	A. Materials	1. Cement	1. Brand approval	Major Brands as per RECTPCL approved brands	Contractor	As proposed by Contractor	Cement of approved brands as per RECTPCL approval.	RECTPCL
			2. Physical tests	As per document at Annexure-1 of this FQP	Material to be jointly inspected by RECTPCL and contractor	Review of 100% MTC's.	100% review of lab test results and MTC.	Site in charge
			3. Chemical Tests Chemical composition of Cement	-do-	Contractor to submit MTC	Review of all MTC's	100% review of MTC results	Site in charge
		2. a) Reinforcement Steel	1. Source approval	May be procured either from producers directly or through the authorized dealers who can produce MTC from producers with traceability.	Contractor	As proposed by Contractor	Material shall be supplied from producers / authorized dealers.	Site in charge
			2. Physical and Chemical analysis test	As per document at Annexure-2 of this FQP	Contractor to submit MTC	100% MTC's One sample*/ 300 MT /Manufacturer shall be jointly sealed by RECTPCL and Testing in RECTPCL approved Lab/ * Note: All sizes of 10mm and above shall be taken for testing in every 300MT	100% review of MTC and embossing. 1) Review of test lab results shall be sent by the Lab, directly to RECTPCL;	Site in charge

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		2. b) Miscellaneous structural steel excluding cable trench, transformer & reactor foundation.	Source to be proposed by contractor.	Source with material meeting RECTPCL Specification	Contractor	As proposed by contractor	To verify documents.	Site In charge
			1. Dimensional check 2. Visual check for damages rusting pitting etc.	RECTPCL specification and approved drawing.	Contractor	100%	Random	Site Engineer
		2. c) Structural steel used in cable trench, transformer & reactor foundation.	Source to be proposed by contractor.	RECTPCL Specification	Contractor	As proposed by contractor	To verify documents.	
			1. Dimensional check	RECTPCL specification and approved drawing	Contractor	100%	Random	Site Engineer
			2. Visual check for damages rusting pitting etc.	RECTPCL specification and approved drawing	Contractor	100%	Random	Site Engineer
			3. Visual check for welding defects primer coating and painting/ galvanizing as applicable	RECTPCL specification and approved drawing	Contractor	100%	Random	Site Engineer
			4. Physical properties of Structural steel	IS 2062: 2011, reaffirmed 2016 RECTPCL specification and approved drawing	Contractor	1 sample per lot of 40MT or part thereof for tensile tests and 1 sample per lot of 20MT or part thereof for bend test of each size.	Review of lab test results by RECTPCL.	Site Engineer
		3.Coarse Aggregate						
		a.	Source approval	Source meeting RECTPCL	Siemens / Sub-vendor	Proposed by Contractor,	To review the proposal based on the documents.	Site in charge RECTPCL

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					Agency	Extent		
				Specification		indicating the location of the quarry & based on the test results of Joint samples tested in RECTPCL approved lab.		
		b.	Physical tests	As per document at Annexure-3 of this FQP	Samples to be tested in site test lab	One sample per lot of 1000 cum or part thereof per source.	100% review of site - lab test results	Site in charge RECTPCL
		4.Fine Aggregate						
		a.	Source approval	Source meeting RECTPCL Specification	Siemens / Sub-vendor	Proposed by the Contractor, indicating the location of the quarry & based on the test results of Joint samples tested in site test lab.	To review the proposal based on the documents.	Site in charge RECTPCL
		b.	Physical tests	As per document at Annexure-4 of this FQP	Samples to be tested in site test lab	One sample per lot of 500 cum or part thereof per source.	100% review of site - lab test results	Site in charge RECTPCL
		5. Water	1. Cleanliness	RECTPCL Specification (Water shall be fresh and clean)	Contractor	100% visual check at Field	Verification at random	Site Engineer
			2.PH Value	-do-	Contractor	One sample per	100% review of the test results	Site Engineer

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					Agency	Extent		
						source	Ph value not less than 6	
		6.Finishing materials of building	Physical verification of Different items as per specification	As per Specification.	Contractor	100%	MTC/Manufacturer catalogue To be reviewed by RECTPCL.	Site In charge in consultation with HQ.
	B. Concrete Work a) Before concreting							
		1. Dimensions of excavation	Dimension & Depth of foundation	Approved Drawing.	Contractor	100% at Field	100% check by RECTPCL	Site In charge.
		2. Stub Setting/Setting of Foundation Bolts, Embedment etc.	1) Centre Line	-do-	-do-	-do-	-do-	-do-
			2) Diagonals	-do-	-do-	-do-	-do-	-do-
			3) Level of stubs./ Foundation bolts	-do-	-do-	-do-	-do-	-do-
		3. Reinforcement steel	Placement	bar bending schedule	-do-	-do-	-do-	-do- *-At least 5% locations shall be cross verified by immediate Reporting officer, at Random with respect to stub setting and reinforcement steel placement
		4. Concrete mix proportion (Applicable for Design Mix)	ration of mix proportion	Approval of Design Mix submitted by contractor based on inputs furnished by RECTPCL	-do-	-do-	-do-	Site In charge.
	b) During concreting	1. Workability	Slump test	Range 25 mm to 75 mm refer document at	Contractor	Minimum 01 sample per day	20% check at random	Site In charge.

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					Agency	Extent		
				Annexure-5 of this FQP				
		2. Concrete Strength	Cubes Compressive Strength	As per RECTPCL Specifications & Annexure-5 of this FQP	Contractor Casting of cubes at site. Cubes to be tested for 7& 28 days strength at RECTPCL approved Lab / At site (if testing machine installed by contractor is duly calibrated. Cubes at 100% location are to be taken in presence of RECTPCL officials	10% of total concrete volume as mentioned below:- a) GIS halls (400cum)- 40 samples b) 220/ 33kV Tower- (434cum)-44 samples c) 220/ 33kV Equip- (88.34 cum)- 9 samples d) Trafo and firewall – (652 cum)- 65 samples e) LT Trafo (15.33 cum)- 2 samples) f) CRB (590.50 cum)-60 samples g) 33kV GIS (150cum)-15 samples h) Road- 135 Cum	100% review of Lab test results. Cubes at 100% location are to be taken in presence of RECTPCL officials. Samples shall be tested at RECTPCL approved Labs. In this case, test results shall be sent by the Lab, by E mail & post directly to RECTPCL.	M/s Siemens shall establish a duly calibrated UTM at site for testing of concrete cubes. Which shall be witnessed by site manager, however site incharge of RECTPCL shall also witness at least 50% of tests. 10% of samples shall be test checked at TPL to be witnessed by RECTPCL Site Engineer.

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					Agency	Extent		
						(14 Samples) Total Qty approximately (2465 cum) breakup		
	c) After Concreting	Backfilling	a)water & ramming for compaction	RECTPCL specification	Contractor	100%	random	Site Engineer
			b)compaction test	RECTPCL specification	Contractor at site/ RECTPCL approved lab	a) Tower Locations - One Sample of three specimen for 50% of tower location b) Equipment foundation - One Sample of three specimen for 20% of Equipment Foundation location c) Buildings- 3 Samples (three specimen for one sample) for every Building	Physically at Random & 100% review of Test results	Site In charge
4.	Brick Masonry							
		a) BRICKS	1. Dimension tolerance	RETPCL Specification/ enclosed Annexure 6	Contractor (samples to be taken jointly and tested in RECTPCL accepted lab	Enclosed Annexure 6	Review 100% of test results	Site In charge
			2. Compressive Strength	RETPCL Specification/ enclosed Annexure 6	-do-	-do-	-do-	Site In charge

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			3. Water Absorption	RETPCL Specification/ enclosed Annexure 6	-do-	-do-	-do-	Site In charge
			4. Efflorescence	RETPCL Specification/ enclosed Annexure 6	-do-	-do-	-do-	Site In charge
		b) Mortar Mix	Cement sand Proportion	RETPCL Specification	Contractor	100%	random	Site In charge
5.	P.C.C.	Grade, thickness, plan, dimension	completeness	IS 456: 2000, reaffirmed 2016 and RECTPCL approved foundation drawings & specification	Joint Inspection by RECTPCL and CONTRACTOR	For all locations	Joint Inspection by RECTPCL and CONTRACTOR	Site In charge
6.	PLASTERING							
		1. Plastering	thickness and evenness	RECTPCL specification	Contractor	100%	Random	Site In charge
		2. Ingredient	Mortar Mix/ Proportion	RECTPCL specification	Contractor	100%	Random	Site In charge
7.	Switchyard earthing							
		1. Check for dimension of earth mat	Physical check	RECTPCL spec & approved drawings	Contractor	100%	Random	Site In charge
		2. Depth of excavation	Physical check	RECTPCL spec & approved drawings	Contractor	100%	Random	Site In charge
		3. Check for weld joints and anti-corrosion treatment	Physical check	RECTPCL spec & approved drawings	Contractor	100%	Random	Site In charge
8.	Site Surfacing (Gravelling)							

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					Agency	Extent		
		1. Leveling, Level & Height & evenness	Physical check	RECTPCL spec & approved drawings	Contractor	100%	Random	Site In charge
		2. Soil sterilization : spraying of chemicals	Physical check	RECTPCL spec & manufacturers recommendation	Contractor	100%	Random	Site In charge
		3. P.C.C (Grade, thickness & Size) a) PCC 1:5:10	Physical check	RECTPCL specifications	Joint inspection by RECTPCL & Contractor	100%	Random	Site In charge
		4. 20/40mm stone aggregate	Grading	IS 383: 2016, IS: 2386: Part 1, reaff. 2016 and RECTPCL Specification. The grading shall be as per single sized nominal size.	RECTPCL accepted lab)	1 sample per lot of 500 Cubic Meter or part thereof from each source for each size.	100% review of test report	Site In charge
		5. Resistivity of 20/40mm stone aggregate.	Electrical Check	RECTPCL Technical Specification. (resistivity of the stone for spreading over the ground shall be minimum 3000 ohm-m under wet condition)	Contractor	1 sample of stone from each source (in case stones are supplied from more than one source)	100% review of test report.	Site In charge
		6. Compacted thickness of 40mm stone layers as applicable	Physical	RECTPCL specification & approved drawings	Contractor	100%	Random	Site In charge
9.	Road (WBM)							
		1. Alignment & level	Physical check	RECTPCL specification & approved drawings	Contractor	100%	Random	Site In charge
	Material	A. Coarse Aggregates	1. Source approval	Source with	Contractor	Proposed by the	To review the proposal based on	RECTPCL

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				materials meeting RECTPCL Specification		Contractor indicating the location of the quarry and based on the test results of Joint samples tested in RECTPCL approved lab.	the documents	
			2. Physical tests	As per document at Annexure-7 of this FQP	Samples to be taken jointly and tested in RECTPCL approved lab	One sample per lot of 200 cum or part thereof per source	100% review of lab test results	Site In charge
		B. Stone Screening						
			1. Source approval	Source with materials meeting RECTPCL Specification	Contractor	Proposed by the Contractor, indicating the location of the quarry and based on the test results of Joint samples tested in RECTPCL accepted lab	To review the proposal based on the documents	RECTPCL
			2. Grading	As per document at Annexure-7 of this FQP	Samples to be taken jointly and tested in RECTPCL approved lab	One sample per lot of 200 cum or part thereof	100% review of lab test results	Site In charge
		C. Binding material	Plasticity Index	As per document at Annexure-7 of this FQP	Contractor	One sample per lot of 25 cum or part thereof	100% review of lab test results	Site In charge
		D. Laying of sub-base course	Physical check	As per CPWD spec clause 17.7.2	Contractor	100%	Random	Site Engineer
		E. Laying of base Course	Physical check	As per CPWD spec clause 17.8.1	Contractor	100%	Random	Site Engineer

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10.	Drain	Alignment and invert level	Physical	RECTPCL Spec and approved drawing	Contractor	100%	Random	Site Engineer

Note: Third Party Test Lab means (Testing in RECTPCL approved Lab/ Govt Approved Lab/Govt technical Educational Institutes).

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ACCEPTANCE CRITERIA AND PERMISSIBLE LIMITS FOR CEMENT

Annexure-1 (page 1 of 3)

ORDINARY PORTLAND CEMENT					
S.No.	Name of the test	Ordinary Portland Cement 33 grade as per IS 269: 2015	Ordinary Portland Cement 43 grade as per IS 269: 2015	Ordinary Portland Cement 53 grade as per IS 269: 2015	Remarks
a)	Physical tests				To be conducted in approved lab.
(i)	Fineness	Specific surface area shall not be less than 225 sq.m. per kg. or 2250 cm ² per gm.	Specific surface area shall not be less than 225 sq.m. per kg or 2250 cm ² per gm	Specific surface area shall not be less than 225 sq.m. per kg or 2250 cm ² per gm.	Blaine's air permeability IS 4031 (Part-2):1999, Reaffirmed 2013
(ii)	Compressive strength	72 ± 1 hour : Not less than 16 Mpa (16 N/mm ²) 168 ± 2 hour : Not less than 22 Mpa (22 N/mm ²) 672 ± 4 hour : Not less than 33 Mpa (33 N/mm ²), <i>Not more than 48Mpa (48 N/mm²)</i>	72 ± 1 hour : Not less than 23 Mpa (23 N/mm ²) 168 ± 2 hour : Not less than 33 Mpa (33 N/mm ²) 672 ± 4 hour : Not less than 43 Mpa (43 N/mm ²), <i>Not more than 58Mpa (58N/mm²)</i>	72 ± 1 hour : Not less than 27 Mpa (27 N/mm ²) 168 ± 1 hour : Not less than 37 Mpa (37 N/mm ²) 672 ± 1 hour : Not less than 53 Mpa (53 N/mm ²)	As per IS 4031(Part-6): 1988, Reaffirmed 2014
(iii)	Initial & Final setting time	Initial setting time : Not less than 30 minutes Final setting time : Not more than 600 minutes	Initial setting time : Not less than 30 minutes Final setting time : Not more than 600 minutes	Initial setting time : Not less than 30 minutes Final setting time : Not more than 600 minutes	As per IS 4031 (Part-5): 1988 Reaffirmed 2014. -do-
(iv)	Soundness	Un-aerated cement shall not have an expansion of more than 10mm when tested by Le Chatelier and 0.8% by Autoclave test.	Un-aerated cement shall not have an expansion of more than 10mm when tested by Le Chatelier and 0.8% by Autoclave test	Un-aerated cement shall not have an expansion of more than 10mm when tested by Le Chatelier and 0.8% by Autoclave test.	Le Chatelier and Autoclave test as per IS4031 (Part-3): 1988, Reaffirmed 2014.

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ACCEPTANCE CRITERIA AND PERMISSIBLE LIMITS FOR CEMENT

Annexure-1 (page 2 of 3)

S.No.	Name of the test	Ordinary Portland Cement 33 grade as per IS 269: 2015	Ordinary Portland Cement 43 grade as per IS 269: 2015	Ordinary Portland Cement 53 grade as per IS 269: 2015	Remarks
b)	Chemical Composition tests				Review of MTC only
		a) Ratio of percentage of alumina to that of iron oxide Minimum 0.66%	a) Ratio of percentage of alumina to that of iron oxide Minimum 0.66%	a) Ratio of percentage of alumina to that of iron oxide Minimum 0.66%	
		b) Insoluble residue, percentage by mass, Max. 5.00%	b) Insoluble percentage by mass, Max. 5.00%	b) Insoluble percentage by mass, Max. 5.00%	
		c) Magnesia percentage by mass Max. 6%	c) Magnesia percentage by mass Max. 6%	c) Magnesia percentage by mass Max. 6%	
		d) Total sulphur content calculated as sulphuric anhydride (SO ₃), percentage by mass not more than 3.5%.	d) Total sulphur content calculated as sulphuric anhydride (SO ₃), percentage by mass not more than 3.5%.	d) Total sulphur content calculated as sulphuric anhydride (SO ₃), percentage by mass not more than 3.5%.	
		e) Total loss on ignition shall not be more than 5 percent	e) Total loss on ignition shall not be more than 5 percent	e) Total loss on ignition shall not be more than 4 percent	
		f) Chloride content, percent by mass, max 0.1%	f) Chloride content, percent by mass, max 0.1%	f) Chloride content, percent by mass, max 0.1%	

ACCEPTANCE CRITERIA AND PERMISSIBLE LIMITS FOR CEMENT

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Annexure-1 (page 3 of 3)				
S. No.	Name of the test			Remarks
2.	POZZOLANA PORTLAND CEMENT AS PER IS 1489 (Part 1): 2015			
a)	Physical Tests			
		i. Fineness	Specific surface area shall not be less than 300m ² /Kg. or 3000 cm ² /gm.	IS 4031 (Part-II)
		ii. Compressive strength	a) 72 ± 1 hour : Not less than 16 Mpa (16 N/mm ²) b) 168 ± 2 hour : Not less than 22 Mpa (22 N/mm ²) c) 672 ± 4 hour : Not less than 33 Mpa (33 N/mm ²)	IS 4031 (Part-VI)
		iii. Initial & Final setting time	Initial setting time : Not less than 30 minutes Final setting time : Not more than 600 minutes	IS 4031 (part-V)
		iv. Soundness	Unaerated cement shall not have an expansion of more than 10mm when tested by Le Chatlier test and 0.8% by Autoclave test as per IS 4031 (Part-3)	
b)	Chemical composition test			
		a) Magnesia percentage by mass	Max. 6%	Review at MTC only
		b) Insoluble residue, percent by mass, (a) Maximum {x + 4 (100-x)/100} (b) Minimum 0.6x, where x is the declared % of fly ash in the given Portland pozzolana cement.		-do-
		c) Total sulphur content calculated as sulphuric anhydride (SO ₃), percentage by mass	not more than 3.5	-do-
		d) Total loss on ignition	shall not be more than 5 percent	
		e) Chloride content, percent by mass,	max 0.1%	

ACCEPTANCE CRITERIA AND PERMISSIBLE LIMITS FOR REINFORCEMENT STEEL

AS PER IS 1786-2008 (Reaffirmed 2013), Amendment No. 1

Annexure-2

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S.No.	Name of the test	Fe 415	Fe 500	Fe 500D
i)	Chemical analysis Test	0.30 Percent Maximum	0.30 Percent Maximum	0.25 Percent Maximum
	Carbon			
	Sulphur	0.060 Percent Maximum	0.055 Percent Maximum	0.040 Percent Maximum
	Phosphorous	0.060 Percent Maximum	0.055 Percent Maximum	0.040 Percent Maximum
	Sulphur & Phosphorous	0.110 Percent Maximum	0.105 Percent Maximum	0.075 Percent Maximum
	Carbon Equivalent	0.42 Percent Maximum	0.42 Percent Maximum	0.42 Percent Maximum
ii)	Physical Test			
	a) <i>Tensile Strength/Yield stress ratio,</i>	<i>≥1.10, but tensile strength not less than 485.0 N/mm²</i>	<i>≥1.08, but tensile strength not less than 545.0 N/mm²</i>	<i>≥1.10, but tensile strength not less than 565.0 N/mm²</i>
	b) 0.2% of proof stress/Yield stress Minimum, N/mm ²	415	500	500
	c) <i>Elongation percent , Minimum</i>	14.5	12	16
	d) <i>Total elongation at maximum force, percent, Minimum</i>	---	---	5
iii)	Bend & Rebound Tests	Pass	Pass	Pass

ACCEPTANCE CRITERIA AND PERMISSIBLE LIMITS FOR COARSE AGGREGATES AS PER IS 383: 2016

Annexure-3

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3. Coarse Aggregates											
i) Physical Tests											
a. Determination of particles size	a. IS Sieve Designation	%age passing for Single-Sized Aggregate of nominal size					Percentage Passing for grades Aggregate of nominal size				
		40 mm	20 mm	16 mm	12.5 mm	10 mm	40 mm	20 mm	16 mm	12.5 mm	
	63 mm	100	-	-	-	-	-	-	-	-	-
	40 mm	85 to 100	100	-	-	-	90 to 100	100	-	-	-
	20 mm	0 to 20	85 to 100	100	-	-	30 to 70	90 to 100	100	100	100
	16 mm	-	-	85 to 100	100	-	-	-	90-100	-	-
	12.5 mm	-	-	-	85 to 100	100	-	-	-	90 to 100	-
	10 mm	0 to 5	0 to 20	0 to 30	0 to 45	85 to 100	10 to 35	25 to 55	30 to 70	40 to 85	-
	4.75 mm	-	0 to 5	0 to 5	0 to 10	0 to 20	0 to 5	0 to 10	0 to 10	0 to 10	-
	2.36 mm	-	-	-	-	0 to 5	-	-	-	-	-
b. b. Combined Flakiness and Elongation index	<i>Not to exceed 40%</i>										
c. Crushing Value	<i>Not to exceed 30%</i>										
d. Presence of deleterious material	<i>Total presence of deleterious materials not to exceed 5% for uncrushed, 2% for crushed and manufactured coarse aggregates as per Annexure- 3A.</i>										
e. Hardness	<i>Abrasion value not more than 50%, Impact value not more than 45%</i>										
f. Soundness test (for concrete work subject to frost action)	<i>12% when tested with sodium sulphate and 18% when tested with magnesium sulphate</i>										

Annexure-3A

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<i>Deleterious Substance</i>	<i>Percentage by Mass, Max</i>		
	<i>Uncrushed</i>	<i>Crushed</i>	<i>Manufactured</i>
<i>a. Coal and lignite</i>	<i>1.0</i>	<i>1.0</i>	<i>1.0</i>
<i>b. Clay lumps</i>	<i>1.0</i>	<i>1.0</i>	<i>1.0</i>
<i>c. Materials finer than 75 micron</i>	<i>1.0</i>	<i>1.0</i>	<i>1.0</i>
<i>d. Soft fragments</i>	<i>3.0</i>	<i>--</i>	<i>3.0</i>
<i>e. Shale</i>	<i>--</i>	<i>--</i>	<i>--</i>
<i>f. Total of percentages of all deleterious materials(except mica) including S. No. a) to e) for uncrushed and crushed aggregates</i>	<i>5.0</i>	<i>2.0</i>	<i>2.0</i>

ACCEPTANCE CRITERIA AND PERMISSIBLE LIMITS FOR FINE AGGREGATES AS PER IS 383: 2016

Annexure-4

4.	Fine aggregates	IS Sieve	Percentage passing for graded aggregate of

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		Designation	nominal size		
i)	Physical Tests		F.A. Zone I	F.A. Zone II	F.A. Zone III
	a. Determination of particle size	10 mm	100	100	100
		4.75 mm	90-100	90-100	90-100
		2.36 mm	60-95	75-100	85-100
		1.18 mm	30-70	55-90	75-100
		600 microns	15-34	35-59	60-79
		300 microns	5 to 20	8 to 30	12 to 40
		150 microns	0-10	0-10	0-10
	b. Silt content		Not to exceed 8%	Not to exceed 8%	Not to exceed 8%
	c. Presence of deleterious material	<i>Total presence of deleterious materials not to exceed 5% for uncrushed, 2% for crushed/Mixed and manufactured fine aggregates as per Annexure- 4A.</i>			
	d. Soundness Applicable to concrete work subject to frost action	<i>10% when tested with sodium sulphate and 15% when tested with magnesium sulphate</i>			

Annexure-4A

<i>Deleterious Substance</i>	<i>Percentage by Mass, Max</i>

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	<i>Uncrushed</i>	<i>Crushed/Mixed</i>	<i>Manufactured</i>
<i>a. Coal and lignite</i>	<i>1.0</i>	<i>1.0</i>	<i>1.0</i>
<i>b. Clay lumps</i>	<i>1.0</i>	<i>1.0</i>	<i>1.0</i>
<i>c. Materials finer than 75 micron</i>	<i>3.0</i>	<i>15.0 (for crushed sand)</i> <i>12.0 (for mixed sand)</i>	<i>10.0</i>
<i>d. Soft fragments</i>	<i>--</i>	<i>--</i>	<i>--</i>
<i>e. Shale</i>	<i>1.0</i>	<i>--</i>	<i>1.0</i>
<i>f. Total of percentages of all deleterious materials (except mica) including S. No. a) to e) for uncrushed/mixed and manufactured aggregates</i>	<i>5.0</i>	<i>2.0</i>	<i>2.0</i>

ACCEPTANCE CRITERIA AND PERMISSIBLE LIMITS CONCRETE WORKS

Annexure-5

1)	Concrete	a) Workability	Slump shall be recorded by slump cone method and it shall be between 25-75 mm. depending upon workability requirement as per IS 456: 2000, reaffirmed 2016.

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		b) Compressive strength	For Design mix as per IS:456 for Grade M15 or above For nominal (volumetric) concrete mix compressive strength for 1:1.5:3 (Cement : Fine aggregates : Coarse aggregates) concrete 28 days strength shall be min 265Kg/cm ² and for 1:2:4 (Cement: Fine Aggregate: Coarse aggregate) nominal mix concrete 28 days strength shall be min 210Kg/cm ² .

Notes:

1) ACCEPTANCE CRITERIA BASED ON 28 DAYS COMPRESSIVE STRENGTHS FOR NOMINAL MIX CONCRETE: As per clause 5.4.10.4 of CPWD Specifications, Volume 1

- (a) The average of the strength of three specimen be accepted as the compressive strength of the concrete provided the strength of any individual cube shall neither be less than 70% nor higher than 130% of the specified strength.
- (b) If the strength of any individual cube exceeds more than 30% of specified strength, it will be restricted to 130% only for computation of strength.
- (c) If the actual average strength of accepted sample is equal to or higher than specified strength upto 30% then strength of the concrete shall be considered in order and the concrete shall be accepted at full rates.
- (d) If the actual average strength of accepted sample is less than specified strength but not less than 70% of the specified strength, the concrete may be accepted at reduced rate after reconfirmation by NDT/Core test on the location portion represented by the cube samples.
- (e) If the actual average strength of accepted sample is less than 70% of specified strength, the Engineer-in-Charge shall reject the defective portion of work represented by sample and nothing shall be paid for the rejected work. Remedial measures necessary to retain the structure shall be taken at the risk and cost of contractor. If, however the Engineer-in-Charge so desires, he may order additional tests to be carried out to ascertain if the structure can be retained. All the charges in connection with these additional tests shall be borne by the contractor.

2) 53 Grade cement shall be used after obtaining specific approval of the Engineer in charge.

3) Portland slag cement conforming to IS 455:2015 may be used as per Technical Specification.

4) All Design Mix concrete shall be as per IS 456: 2000, reaffirmed 2016

5) ACCEPTANCE CRITERIA BASED ON 28 DAYS COMPRESSIVE STRENGTHS FOR DESIGN MIX CONCRETE: As per Table-11, given below:

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Specified Grade	Case No.	Sampling	Acceptance Criteria for Mix Design as per Is 456:2000	Remarks
M15 and above	A1	Mean of Group of 4 non-overlapping consecutive test results.	Shall greater than or equal to $f_{ck} + 0.825 \times \text{established standard deviation (rounded off to nearest 0.5 N/sq. mm)}^*$ Or $f_{ck} + 3 \text{ N/sq. mm}$, whichever is greater	
	A2	Individual test result out of A 1.	Greater than or equal $(f_{ck} + 3) \text{ N/sq. mm}$	Out of four non overlapping consecutive test results, one individual test result only.
	B1	Group of non-overlapping consecutive if test results are less than 4	$f_{ck} + 4, \text{ N/sq. mm}$, minimum	
	B2	Individual test result out of B 1.	$f_{ck} - 2, \text{ N/sq. mm}$, minimum	Out of less than four non-overlapping consecutive test results, one individual test result only.
	C1	When number of sample is only one.	$f_{ck} + 4, \text{ N/sq. mm}$, minimum	

Established value of standard deviation shall be determined based on Note of Table-11 of IS 456

SAMPLING PLAN FOR BRICK WORK

**Annexure-6
(Page 01 of 02)**

Scale of sampling and permissible number of defectives for visual and dimensional characteristics.

No of Bricks in the lot	For characteristics specified for individual bricks	For Dimensional characteristics for group of 20 bricks

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	No of bricks to be selected	Permissible no of defective in the sample.	No of bricks to be selected
(1)	(2)	(3)	(4)
2001-10000	20	1	40
10001-35000	32	2	60
35001-50000	50	3	80

Note: In case the lot contains 2000 or less bricks the sampling shall be as per decision of the Engineer – in-charge

Scale of sampling for physical characteristics

Lot size	Sampling size for compressive strength, water absorption and efflorescence	Permissible No of defectives for efflorescence
(1)	(2)	(3)
2001-10000	5	0
10001-35000	10	0
35001-50000	15	1

SAMPLING PLAN FOR BRICK WORK

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ACCEPTABLE CRITERIA FOR BRICK WORK

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- 1) Dimensional Tolerances: The dimensions of modular/ Non modular bricks when tested shall be within the following limits per 20 bricks.

S. No	DESCRIPTION	MODULAR BRICKS	NON-MODULAR BRICKS
1	LENGTH	372 to 388 cm (380± 8 cm)	452 to 468 cm (460± 8 cm)
2	WIDTH	176 to 184 cm (180± 4 cm)	216 to 224 cm (220± 4 cm)
3	HEIGHT	176 to 184 cm (180± 4 cm)	136 to 144 cm (140± 4 cm)

- 2) Compressive strength: the bricks shall have a minimum average compressive strength as specified in RECTPCL specification. The compressive strength of any individual brick tested shall not fall below the min. average compressive strength specified for the corresponding class of brick by more than 20%. in case compressive strength of any individual brick tested exceeds the upper limit specified for the corresponding class of bricks, the same shall be limited to upper limit of the class as specified for the purpose of calculating the average compressive strength.
- 3) Water Absorption: The average water absorption of bricks shall not be more than 20% by weight.
- 4) Efflorescence: The rating of efflorescence of bricks shall not be more than moderate.

PHYSICAL REQUIREMENT OF COARSE AGGREGATE

Annexure-7
(Page 01 of 02)

S.No.	Type of Constn.	Type of W.B.M	Test Method	Requirements

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1.	Sub-base	Los Angeles Abrasion Value or Aggregate Impact value	IS 2386 (Part-IV) IS 2386 (Part-IV) IS 5640***	60% max. * 50% max
2.	Base	a) Los Angeles Abrasion Value or Aggregate Impact value b) Flakiness Index	IS 2386 (Part-IV) IS 2386 (Part-IV) IS 5640*** IS 2386(Part-I)	50% max. * 40% max **15% max
3.	Surface Course	a) Los Angeles Abrasion Value or Aggregate Impact value b) Flakiness Index	IS 2386(Part-IV) IS 2386(Part-IV) IS 2386(Part-I)	40% max. 30% max **15% max
4	Binding Material	Plasticity index	IS 2720 (Part-V)	Less than 6

*Aggregates may satisfy requirements of either of the two tests

** The requirements of flakiness index shall be enforced only in case of crushed/broken stone and crushed slag.

***Aggregates like brick metal, kankar and laterite which get softened in presence of water, shall be tested for impact value under wet conditions in accordance with IS 5640.

PHYSICAL REQUIREMENT OF COARSE AGGREGATE	Annexure-7 (Page 02 of 02)

GRADING REQUIREMENT OF COARSE AGGREGATE FOR W.B.M

Grading No.	Size Range	Sieve designation	% by weight passing the sieve
1	90mm to 45mm (Suitable for sub base courses of compacted layer of not less than 90mm thickness).	125mm 90mm 63mm	100 90-100 25-60

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		45mm 22.4mm	0-15 0-5
2.	63mm to 45mm	90mm 63mm 53mm 45mm 22.4mm	100 90-100 25-75 0-15 0-5
3.	53mm to 22.4mm	63mm 53mm 45mm 22.4mm 11.2mm	100 95-100 65-90 0-10 0-5
4	Screening		
	A) 13.2 mm	13.2 mm 11.2 mm 5.6 mm 180 micron	100 95-100 15-35 0-10
	B) 11.2 mm	11.2 mm 5.6 mm 180 micron	100 90-100 15-35

General Notes:

1. This Field Quality Plan is not to limit the supervisory checks which are otherwise required to be carried out during execution of work as per drawings/Technical specifications etc.
2. All materials under supply contract should have Cat-A CIP before they are erected.
3. Contractor shall be responsible for implementing/documenting the FQP. Documents shall be handed over by the contractor to RECTPCL after the completion of the work.

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4. Project incharge means over all incharge of work. Site Incharge means incharge of the Site. Site Engineer means in charge of the section. Site Engineer' responsibility may be allocated to Site JE, with the approval of HO Head, only in such cases where, Site Engineer is not in position.
5. In case of deviation the approving authority will be one step above the officer designated for acceptance in this quality plan subject to minimum level of Site incharge.
6. Acceptance criteria and permissible limits for tests are indicated in the Annexures. However for further details/tests RECTPCL specification and latest relevant Indian standards shall be referred.
7. Tests as mentioned in this FQP shall generally be followed. However E.I.C. reserves the right to order additional tests wherever required necessary at the cost of the agency.
8. All counter checks/tests by RECTPCL shall be carried out by RECTPCL official's atleast at the level of Site Engineer. .
9. The authorized dealer of reinforcement steel means the dealer whose are approved by RECTPCL Authority
10. Accepting Authority for testing Laboratory shall be HO Head.
11. READYMIX CONCRETE (RMC) IS ACCEPTABLE FOR USE. HOWEVER, SITE INCHARGE SHALL APPROVE THE SOURCE OF MATERIALS TO BE USED FOR RMC .The documentation to be maintained shall be as per IS 4926:2003, Reaffirmed 2012 i.e.
 - i) Information to be supplied by the purchaser (clause 7)
 - ii) Information to be supplied by the producer (clause 8)
 - iii) Sampling for concrete strength should be one set of 3 nos. of cubes for every 50 cum or part thereof for each day of concreting and 28 days compressive strength shall be tested in line with IS 456: 2000, Reaffirmed 2016.
12. Epoxy coating on reinforcement steel wherever required shall be done as per IS 13620: 1993, Reaffirmed 2015.
13. Cement is to be used in the order; it is delivered (i.e. First in First Out). In case the cement remains in storage for more than 3 months, the cement shall be retested before use and shall be rejected, if it fails to conform to any of the requirements given in the relevant Indian Standard. Cement shall be packed in bags and stored in accordance with the provisions in IS 4082:1996, Reaffirmed 2003.
14. Three samples of each size of steel (all sizes of 10mm & above) out of 100MT steel Lot need to be physically weighted to ascertain their acceptance as per technical specification. The weighted samples at site may be kept under custody for three months.
15. If e-mail facility is not available in RECTPCL approved Lab, report may be collected directly by RECTPCL /Speed Post / Register Post / UPC.

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16. In case any Laboratory refuses to allow RECTPCL representative for witnessing the test, same shall be taken in writing and approved by HO Head.
17. Latest IS codes shall be followed.
18. Standard marking of ISI mark along with license number (Seven digit no., represented as CM/L-----) should be verified for construction materials.
19. The mix design shall be approved in line with standard format for mix design concrete and final approval of mix design shall be done in consultation with HO engineering department.
20. Tolerance of cement weight shall be governed by clause no. 10.1.1 of IS 269:2015 for OPC and by clause no. 10.1.1 of IS 1489 (Part 1):2015 for PPC.
21. Digital Photographs during major construction activities shall be taken and kept in record.

MODEL TECHNICAL SPECIFICATION

SECTION: LT SWITCHGEAR

SECTION: LT SWITCHGEAR

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SECTION: LT SWITCHGEAR

1.1. CONSTRUCTIONAL DETAILS OF SWITCHBOARDS AND DISTRIBUTION BOARDS

- 1.1.1. All boards shall be of metal enclosed, indoor floor mounted, compartmentalized double front construction and freestanding type.
- 1.1.2. All board frames, shall be fabricated using suitable mild steel structural sections or pressed and shaped cold-rolled sheet steel of thickness not less than 2.0 mm. Frames shall be enclosed in cold-rolled sheet steel of thickness not less than 1.6 mm. Doors and covers shall also be of cold rolled sheet steel of thickness not less than 1.6 mm. Stiffeners shall be provided wherever necessary. ***Gland plate shall be cold rolled sheet steel having thickness not less than 3 mm in all cases. However, in case of termination of single core power cables, gland plate shall be of non-magnetic material of at least 4mm thickness.***
- 1.1.3. All panel edges and cover/door edges shall be reinforced against distortion by rolling, bending or by the addition of welded reinforcement members.
- 1.1.4. The complete structures shall be rigid, self-supporting, and free from flaws, twists and bends. All cut-outs shall be true in shape and devoid of sharp edges.
- 1.1.5. All boards shall be of dust and vermin proof construction and shall be provided with a degree of protection of IP: 52, ***for category I enclosure*** as per IS 13947 (Part-1). However, the busbar chambers having a degree of protection of IP: 42, in accordance with IS 13947 (Part-1), are also acceptable where continuous busbar rating exceeds 1000 Amp. Provision shall be made in all ***draw out Air Circuit Breaker*** compartments for providing IP: 52 degree of protection, when Circuit breaker trolley, has been removed. ***Panels with lighting transformers shall have IP 31 degree of protection in accordance with IS 13947 (Part-1). Door frame of panels, meters, relays, Breaker cut-outs shall be provided with neoprene rubber gaskets generally conforming to Type-II, Class 2A as per IS: 11149.***
- 1.1.6. Provision of louvers on boards would not be preferred. However, louvers backed with metal screen are acceptable on the busbar chambers where continuous busbar rating exceeds 1000 Amps. ***Panels with lighting transformers in lighting distribution boards shall have louvers.***
- 1.1.7. All boards shall be of uniform height not exceeding 2450 mm.
- 1.1.8. Boards shall be easily extendible on both sides, by the addition of the vertical sections after removing the end covers ***of bus bar chambers.***
- 1.1.9. Boards shall be supplied with base frames made of structural steel sections, alongwith all necessary mounting hardware required for welding the base frames to the insert plates.
- 1.1.10. a) All boards shall be of double front construction and shall have: -
(i) A completely enclosed busbar compartment for running horizontal busbars and vertical busbars. Busbar chambers shall be completely enclosed with metallic portions. Bolted covers shall be provided for access to horizontal and Vertical busbars for repair and maintenance, which shall be feasible without disturbing feeder compartment. Vertical bus bar chambers shall be accessible from front as well as back side of the panel ***and shall be of at least 350 mm width.*** One set of

vertical busbars shall be used in between two adjacent sections for switchgear connections. In case of ACB feeders, ***the panel shall have single front without any vertical busbar chamber, however*** vertical busbars ***associated with ACBs shall be*** located in rear side ***and*** shall be additionally covered with metallic perforated/***transparent acrylic or polyvinyl*** bolted sheets to avoid direct access after opening rear door of chamber.

- (ii) Completely enclosed switchgear compartment(s) one for each circuit for housing circuit breaker or MCCB or motor starter.
- (iii) A distinct compartment or alley for power and control cables on each side of panel. Cable alley compartment shall have a through metallic partition for segregating cables on both sides. Cable alley door shall preferably be hinged. Cable alley shall have no exposed live parts. Any live terminals shall be fully shrouded/insulated from safety aspects. However, it shall be of atleast 350mm width.
- (iv) A compartment for relays and other control devices associated with a circuit breaker.

- b) Distribution transformers shall be supplied in separate and distinct panel completely assembled for incoming cable connection from bottom and outgoing connection through busbar with adjacent associated lighting distribution board. Lighting transformers shall have provision of base channel with rollers for taking in and out from the panel in case of maintenance after disconnecting incoming and outgoing connections. Provision of single phase fans at least two (2) numbers of suitable ratings shall be made in the panel for ventilation. These fans shall run in sequential mode at suitable time interval to be controlled by thermostat and timer. The offered design of panel should be such that in no case, temperature rise of lighting transformers shall exceed the permissible limits for the class of insulation of lighting transformer.***

- 1.1.11. Sheet steel barriers shall be provided between two adjacent vertical panels running to the full height of the switchboard, except for the horizontal busbar compartment. Each shipping section shall have full metal sheets at both ends for transport and storage.
- 1.1.12. All equipments associated with a single circuit except MCB circuits shall be housed in a separate compartment of the vertical section. The Compartment shall be sheet steel enclosed on all sides with the withdrawal units in position or removed. The front of the compartment shall be provided with the hinged single leaf door, with locking facilities. In case of circuits controlled by MCBs, group of MCB feeders can be offered in common compartment. In such case number of MCB feeder to be used in a common compartment shall not exceed 4 (four) and front of MCB compartment, shall have a viewing port of toughen glass sheet for viewing and sheet steel door of module shall be lockable with star knob/panel key.
- 1.1.13. After isolation of power and control circuit connections it shall be possible to safely carryout maintenance in a compartment with the busbar and adjacent circuit live. Necessary shrouding arrangement shall be provided for this purpose over the cable terminations located in cable alley.
- 1.1.14. The minimum clearance in air between phases and between phase and earth for the entire run of horizontal and vertical busbars, shall be 25 mm. For all other components, the

clearance between "two live parts", " A live part and an earthed part" and isolating distance shall be atleast ten (10) mm throughout. Wherever it is not possible to maintain these clearances, insulation shall be provided by sleeving or barriers. However, for horizontal run of busbar minimum clearance of 25 mm should be maintained even if they are sleeved.

- 1.1.15. The temperature rise of horizontal & vertical busbars when carrying rated current along its full run shall in no case exceed 55°C, with silver plated joints and 40°C with all other type of joints over an outside ambient temperature of 50°C.
- 1.1.16. All busbar chambers shall be provided with removable bolted covers. The covers shall be provided with danger labels.
- 1.1.17. All identical circuit breakers and module chassis of same test size shall be fully interchangeable without having to carryout modifications.
- 1.1.18. All Circuit breaker boards shall be of Single Front type, with fully drawout circuit breakers, which can be drawn out without having to unscrew any connections. The circuit breakers shall be mounted on rollers and guides for smooth movement between SERVICE, TEST and ISOLATED positions and for withdrawal from the Switchboard. Testing of the breaker shall be possible in the TEST position.
- 1.1.19. Wherever two breaker compartments are provided in the same vertical section, insulating barriers and shrouds shall be provided in the rear cable compartment to avoid accidental touch with the live parts of one circuit when working on the other circuit.
- 1.1.20. All disconnecting contacts for power circuits shall be of robust design and fully self-aligning. Fixed and moving contacts of the power drawout contact system shall be silver plated. Both fixed and moving contacts shall be replaceable.
- 1.1.21. All AC & DC boards shall be of double Front type.
- 1.1.22. All module shall be fixed type except air circuit breaker module, which shall be drawout type.
- 1.1.23. The connections from busbars to the main switch shall be fully insulated/shrouded, and securely bolted. The partition between the feeder compartment and cable alley may be non-metallic and shall be of such construction as to allow cable cores with lugs to be easily inserted in the feeder compartment for termination.
- 1.1.24. All equipment and components shall be neatly arranged and shall be easily accessible for operation and maintenance. The internal layout of all modules shall be subject to PURCHASER approval. Bidder shall submit dimensional drawings showing complete internal details of Busbars and module components, for each type and rating for approval.
- 1.1.25. The tentative power and control cable entries shall be from bottom. However, Purchaser reserves the right to alter the cable entries, if required, during detailed engineering, without any additional commercial implication.
- 1.1.26. Adopter panels and dummy panels required to meet the various busbar arrangements and layouts required shall be included in Bidder's scope of work.

1.2. DERATING OF EQUIPMENTS

- 1.2.1. The current ratings of all equipments as specified in the ***Single Line Diagram For AC & DC System*** are the minimum standards current ratings at a reference ambient temperature as per relevant Indian Standards.

1.3. POWER BUS BARS AND INSULATORS

- 1.3.1. All AC Distribution Boards shall be provided with three phase buses and neutral bus bars and the DC Distribution Boards shall be provided with two busbars.
- 1.3.2. All busbars and jumper connections shall be of high conductivity aluminium/copper of adequate size.
- 1.3.3. The Cross-Section of the busbars shall be uniform through out the length of Switchgear and shall be adequately supported and braced to withstand the stresses due to the specified short circuit currents.
- 1.3.4. All busbars shall be adequately supported by ***adequate numbers of*** high strength type Polyester fibre glass Moulded Insulators ***to withstand short circuit withstand capability of panel***. Separate supports shall be provided for each phase and neutral busbar. If a common support is provided anti-tracking barriers shall be provided between the supports.
- 1.3.5. All busbars joints shall be provided with high tensile steel bolts. Belleville/spring washers and nuts, so as to ensure good contacts at the joints. Non-silver plated Busbars joints shall be thoroughly cleaned at the joint locations and a suitable contact grease shall be applied just before making a joint.
- 1.3.6. All busbars shall be colour coded as per IS: 11353-1985: ***Guide for Uniform System of Marking and Identification of Conductors and Apparatus Terminals***.
- 1.3.7. The Bidder shall furnish calculations, establishing the adequacy of busbar sizes for specified current ratings, On the basis of short circuit current and temperature rise consideration at specified ambient temp.

1.4. EARTH BUS

- 1.4.1. A galvanised steel earthing shall be provided at the bottom of each panel and shall extend throughout the length of each switchboard. It shall be welded/bolted to the frame work of each panel and breaker earthing contact bar vertical bus shall be provided in each vertical section which shall in turn be bolted/welded to main horizontal ground bus.
- 1.4.2. The earth bus shall have sufficient cross-section to carry the momentary short circuit and short time fault currents to earth without exceeding the allowable temperature rise.
- 1.4.3. Suitable arrangements shall be provided at each end of the horizontal earth bus for bolting to Purchaser's earthing conductors. The horizontal earth bus shall project out the switchboard ends and shall have predrilled holes for this connection. A joint spaced and taps to earth bus shall be made through at least two bolts.
- 1.4.4. All non-current metal work of the Switchboard shall be effectively bonded to the earth bus. Electrical conductivity of the whole switchgear enclosures frame work and the truck shall be maintained even after painting.

- 14.5. The truck and breaker frame shall get earthed while the truck is being inserted in the panel and positive earthing of the truck and breaker frame shall be maintained in all positions. SERVICES & ISOLATED, as well as through out the intermediate travel.
- 14.6. **Air Circuit Breaker (ACB)** module frame shall get engaged to the vertical earth bus, before the disconnecting contacts on these module are engaged to the vertical busbar.
- 14.7. All metallic cases of relays, instruments and other panel mounted equipments shall be connected to earth by independent stranded copper wires of size not less than 2.5 mm². Insulation colour code of earthing wires shall be green. Earthing wires shall be connected to terminals with suitable clamp connectors and soldering is not acceptable. Looping of earth Connection which would result in loss of earth connection to the devices when a device is removed is not acceptable. However, looping of earth connections between equipment to provide alternative paths or earth bus is acceptable.
- 14.8. VT and CT secondary neutral point earthing shall be at one place only, on the terminal block. Such earthing shall be made through links so that earthing of one secondary circuit shall be removed without disturbing the earthing of other circuit.
- 14.9. All hinged doors shall be earthed through flexible earthing braid.
- 14.10. Caution nameplate 'Caution-Live Terminals' shall be provided at all points where the terminals are like to remain live and isolation is possible only at remote end.

1.5. **AIR CIRCUIT BREAKERS**

- 1.5.1. Circuit breakers shall be three-pole air break horizontal drawout type and shall have inherent fault making and breaking capacities as specified in "Technical Parameters". The circuit breakers which meet specified parameter only after provision of releases or any other devices shall not be acceptable.
- 1.5.2. Circuit breakers shall be mounted along with its operating mechanism on a wheeled carriage. Suitable guides shall be provided to minimise misalignment of the breaker.
- 1.5.3. There shall be 'Service', 'Test' and 'Fully withdrawn positions for the breakers. In 'Test' position the circuit breaker shall be capable of being tested for operation without energising the power circuits i.e. the power Contacts shall be disconnected while the Control circuits shall remain undisturbed. Locking facilities shall be provided so as to prevent movement of the circuit breaker from the 'SERVICE', 'TEST' OR FULLY WITHDRAWN' position. It shall be possible to close the door in TEST position.
- 1.5.4. All circuit breakers shall be provided with 4 NO and 4 NC potentially free auxiliary contacts. These contacts shall be in addition to those required for internal mechanism of the breaker. Separate limit switches each having required number of contacts shall be provided in both 'SERVICE' & 'TEST' position of the breaker. All contacts shall be rated for making continuously carrying and breaking 10 Amps at 240V AC and 1 Amp (Inductive) at 220V DC.
- 1.5.5. Suitable mechanical indications shall be provided on all circuit breakers to show 'OPEN', 'CLOSE', 'SERVICE', 'TEST' and 'SPRING CHARGED' positions.
- 1.5.6. Main poles of the circuit breakers shall operate simultaneously in such a way that the

maximum difference between the instants of contacts touching during closing shall not exceed half cycle of rated frequency.

- 1.5.7. All circuit breakers shall be provided with the interlocks as explained in further clauses.
- 1.5.8. Movement of a circuit breaker between SERVICE AND TEST positions shall not be possible unless it is in OPEN position. Attempted with drawl of a closed circuit breaker shall trip the circuit breaker.
- 1.5.9. Closing of a circuit breaker shall not be possible unless it is in SERVICE, TEST POSITION or in FULLY WITHDRAWN POSITION.
- 1.5.10. Circuit breaker cubicles shall be provided with safety shutters operated automatically by the movement of the circuit breaker carriage to cover the stationary isolated contacts when the breaker is withdrawn. It shall however, be possible to open the shutters intentionally, against spring pressure for testing purpose.
- 1.5.11. A breaker of particular rating shall be prevented from insertion in a cubicle of a different rating.
- 1.5.12. Circuit breakers shall be provided with electrical anti-pumping and trip free feature, even if mechanical antipumping feature is provided.
- 1.5.13. Mechanical tripping shall be possible by means of front mounted RED 'Trip' push- button. In case of electrically operated breakers these push buttons shall be shrouded to prevent accidental operation.
- 1.5.14. Breaker controlled motors shall operate satisfactorily under the following conditions:
 - (i) Direct on-line starting of Induction Motors rated 110 kW to 220 kW with a locked rotor current of seven times the rated current, and starting time of up to 30 seconds.
 - (ii) Breaking on-load, full load and locked rotor currents of Induction Motors for rated 100 kW to 220 kW.
- 1.5.15. Means shall be provided to slowly close the circuit breaker in withdrawn position. If required for inspection and setting of Contacts, in service position slow closing shall not be possible.
- 1.5.16. Power operated mechanism shall be provided with a universal motor suitable for operation 220V DC Control supply with voltage variation from 90% to 110% rated voltage. Motor insulation shall be class 'E' or better.
- 1.5.17. The motor shall be such that it requires not more than 30 seconds for fully charging the closing spring.
- 1.5.18. Once the closing springs are discharged, after the one closing operation of circuit breaker, it shall automatically initiate, recharging of the spring.
- 1.5.19. The mechanism shall be such that as long as power is available to the motor, a continuous sequence of closing and opening operations shall be possible. After failure of power supply at least one open-close-open operation shall be possible.

- 1.520. Provision shall be made for emergency manual charging and as soon as this manual charging handle is coupled, the motor shall automatically get mechanically decoupled.
- 1.521. All circuit breakers shall be provided with closing and trip coils. The closing coils shall operate correctly at all values of Voltage between 85% to 110% at rated control voltage. The trip coil shall operate satisfactorily under all values of supply voltage between 70% to 110% of rated control voltage.
- 1.522. Provision for mechanical closing of the breaker only in 'TEST' and 'WITHDRAWN' positions shall be made.
- 1.523. PROTECTION CO-ORDINATION**
- 1.5.23.1. It shall be the responsibility of the Contractor to fully co-ordinate the overload and short circuit tripping of the circuit breakers with the upstream and downstream circuit breakers/fuses/motor starters, to provide satisfactory discrimination.
- 1.6. MOULDED CASE CIRCUIT BREAKER (MCCB) and MCB**
- 1.6.1.** MCCB shall in general conform to IS: 13947 Part-2. All MCCB *offered* shall ***have Ics = 100% Icu rating. Type test reports for offered model of MCCB shall be submitted during detailed engineering for owner's acceptance.***
- 1.6.2.** MCCB shall be flush mounted on the AC/DC distribution boards ***and shall have extended handle.***
- 1.6.3 MCCBs shall be provided with thermo-magnetic type release for over current and short circuit protection. The setting of the thermal release shall be adjustable between ***80%*** to 100% of the rated current. The MCCB shall have breaking capacity not less than 20kA.
- 1.6.4 MCCBs used for ACDB incomers and Bus coupler shall be equipped with stored energy mechanism for electrical closing and tripping. All other MCCBs shall be manually operated. The operating handle should give a clear trip indication.
- 1.6.5 Miniature circuit breaker (MCB) shall conform to IEC: 898-1987 and IS: 8828.
- 1.7 RELAYS**
- 1.7.1 All relays and timers in protective circuits shall be flush mounted on panel front with connections from the inside. They shall have transparent dust tight covers removable from the front. All protective relays shall have a drawout construction for easy replacement from the front. They shall either have built-in test facilities, or shall be provided with necessary test blocks and test switches located immediately below each relay. The auxiliary relays and timers may be furnished in non-drawout cases.
- 1.7.2 All AC relays shall be suitable for operation, at 50 Hz with 110 volts VT secondary and 1 amp or 5 amp CT secondary.
- 1.7.3 All protective relays and timers shall have at least two potentially free output contacts. Relays shall have contacts as required for protection schemes. Contacts of relays and timers shall be silver faced and shall have a spring action. Adequate number of terminals shall be available on the relay cases for applicable relaying schemes.

- 174 All protective relays auxiliary relays and timers shall be provided with hand reset operation indicators (Flags) for analysing the cause of operation.
- 175 All relays shall withstand a test voltage of 2 KV (rms) for one minute.
- 176 Motor starters shall be provided with three element, ambient temperature compensated, time lagged, hand reset type overload relays with adjustable settings. The setting ranges shall be properly selected to suit the motor ratings. These relays shall have a separate black coloured hand reset push button mounted on compartment door and shall have at least one changeover contact.
- 177 All fuse-protected contactor-controlled motors shall have single phasing protection, either as a distinct feature in the overload relays (by differential movement of bimetallic strips), or as a separate device. The single phasing protection shall operate even with 80% of the set current flowing in two of the phases.
- 1.8 CONTACTORS**
- 181 Motor starter contactors shall be of air break, electromagnetic type rated for uninterrupted duty as per IS:13947 (Part 4).
- 182 Contactors shall be double break, non-gravity type and their main contacts shall be silver faced.
- 183 Direct on line starter contactors shall be of utilisation category AC2. These contactors shall be as per IS:13947 (Part 4).
- 184 Each contactor shall be provided with two (2) normally open (NO) and two (2) normally close (NC) auxiliary contacts.
- 185 Operating coils of contactors shall be of 240V AC Unless otherwise specified elsewhere. The Contactors shall operate satisfactorily between 85% to 110% of the rated voltage. The Contactor shall drop out at 70% of the rated voltage.
- 1.9 INSTRUMENT TRANSFORMERS**
- 191 All current and voltage transformers shall be completely encapsulated cast resin insulated type suitable for continuous operation at the temperature prevailing inside the switchgear enclosure, when the switchboard is operating at its rated condition and the outside ambient temperature is 50°C.
- 192 All instrument transformers shall be able to withstand the thermal and mechanical stresses resulting from the maximum short circuit and momentary current ratings of the associated switchgear.
- 193 All instrument transformer shall have clear indelible polarity markings. All secondary terminals shall be wired to a separate terminal on an accessible terminal block where star-point formation and earthing shall be done.
- 194 Current transformers may be multi or single core type. All voltage transformers shall be single phase type. The Bus VTs shall be housed in a separate compartment.
- 195 All VTs shall have readily accessible **MCBs** on both primary and secondary sides.

1.10 INDICATING INSTRUMENTS

- 1.10.1 All indicating and integrating meters shall be flush mounted on panel front. The instruments shall be of at least 96 mm square size with 90 degree scales, and shall have an accuracy class of 2.5 or better. The covers and cases of instruments and meters shall provide a dust and vermin proof construction.
- 1.10.2 All instruments shall be compensated for temperature errors and factory calibrated to directly read the primary quantities. Means shall be provided for zero adjustment without removing or dismantling the instruments.
- 1.10.3 All instruments shall have white dials with black numerals and lettering. Black knife edge pointer with parallax free dials will be preferred.
- 1.10.4 Ammeters provided on Motor feeders shall have a compressed scale at the upper current region to cover the starting current.
- 1.10.5 Watt-hour meters shall be of 3 phase three element type, Maximum demand indicators need not be provided.

1.11 CONTROL & SELECTOR SWITCHES

- 1.11.1 Control & Selector switches shall be of rotary type with escutcheon plates clearly marked to show the function and positions. The switches shall be of sturdy construction suitable for mounting on panel front. Switches with shrouding of live parts and sealing of contacts against dust ingress shall be preferred.
- 1.11.2 Circuit breaker selector switches for breaker Controlled motor shall have three stay put positions marked 'Switchgear', 'Normal' and 'Trial' respectively. They shall have two contacts of each of the three positions and shall have black shade handles.
- 1.11.3 Ammeter and voltmeter selector switches shall have four stayput position with adequate number of contacts for three phase 4 wire system. These shall have oval handles Ammeter selector switches shall have make before break type contacts to prevent open circuiting of CT secondaries.
- 1.11.4 Contacts of the switches shall be spring assisted and shall be of suitable material to give a long trouble free service.
- 1.11.5 The contact ratings shall be at least the following :
- | | | |
|-------|-----------------------------|---------------------------|
| (i) | Make and carry continuously | 10 Amp. |
| (ii) | Breaking current at 220V DC | 1 Amp (Inductive) |
| (iii) | Breaking current at 240V AC | 5 Amp (at 0.3 pf lagging) |

1.12 AIR BREAK SWITCHES

- 1.12.1** Air breaker switch shall be of the heavy duty, single throw group operated, load break, fault make type complying with IS:13947,Part-3.
- 1.12.2 The Bidder shall ensure that all switches are adequately rated so as to be fully protected by the associated fuses during all abnormal operating conditions such as overload, locked

motor, short circuit etc.

- 1.123 Switch operating handles shall be provided with padlocking facilities to lock them in 'OFF' position.
- 1.124 Interlocks shall be provided such that it is possible to open the cubicle door only when the switch is in 'OFF' position and to close the switch only when the door is closed. However suitable means shall be provided to intentionally defeat the interlocks explained above.
- 1.125 Switches and fuses for AC/DC control supply and heater supply wherever required shall be mounted inside and cubicles.

1.13 PUSH BUTTONS

- 1.131 Push-buttons shall be of spring return, push to actuate type. Their contacts shall be rated to make, continuously carry and break 10A at 240V and 0.5A (inductive) at 220V DC.
- 1.132 All push-buttons shall have one normally open and one normally closed contact, unless specified otherwise. The contact faces shall be of silver or silver alloy.
- 1.133 All push-buttons shall be provided with integral escutcheon plates marked with its function.
- 1.134 The colour of the button shall be as follows :
- | | | | |
|-------|-------|---|--------------------------------|
| (i) | GREEN | : | For motor START, Breaker CLOSE |
| (ii) | RED | : | For motor TRIP, Breaker OPEN |
| (iii) | BLACK | : | For overload reset. |

- 1.135 All push-buttons on panels shall be located in such a way that Red-push-buttons shall always be to the left of green push-buttons.

1.14 INDICATING LAMPS

- 1.141 Indicating lamps shall be of the panel mounting cluster LED type. The lamps shall have escutcheon plates marked with its function, wherever necessary.
- 1.142 Lamps shall have translucent lamp-covers of the following colours, as warranted by the application :
- | | | | |
|-------|-------|---|--|
| (i) | RED | : | For motor ON, Breaker CLOSED |
| (ii) | GREEN | : | For motor OFF, Breaker OPEN |
| (iii) | WHITE | : | For motor Auto-Trip |
| (iv) | BLUE | : | For all healthy conditions (e.g. control supply, and also for 'SPRING CHARGED" |
| (v) | AMBER | : | For all alarm conditions (e.g. overload) Also for 'SERVICE' and 'TEST' positions indicators. |
- 1.143 Lamps shall be easily replaceable from the front of the cubicle.
- 1.144 Indication lamps should be located just above the associated push buttons/control switches. Red lamps shall invariable be located to the right of green lamps. In case a white lamp is also

provided, it shall be placed between the red and green lamps along with the centre line of control switch/push button pair. Blue and Amber lamps should normally be located above the Red and Green lamps.

- 1.145 When associated with push-buttons, red lamps shall be directly above the green push button, and green lamps shall be directly above the red push-button. All indicating lamps shall be suitable for continuous operation at 90 to 110% of their rated voltage.

1.15 FUSES

- 1.151 All fuses shall be of HRC cartridge fuse link type. Screw type fuses shall not be accepted. Fuses for AC Circuits shall be of class 2 type, 20 kA (RMS) breaking current at 415 AC, and for DC circuits Class 1 type 4 kA breaking current.

- 1.152 Fuses shall have visible operation indicators.

- 1.153 Fuses shall be mounted on fuses carriers, which are mounted on fuse bases, wherever it is not possible to mount fuses on carriers fuses shall be directly mounted on plug in type of bases. In such cases one set of insulated fuse pulling handles shall be supplied with each switchgear.

- 1.154 Fuse rating shall be chosen by the Bidder depending upon the circuit requirements and these shall be subject to approval of PURCHASER.

1.16 TERMINAL BLOCKS

- 1.161 Terminal blocks shall be of 750 volts grade and have continuous rating to carry the maximum expected current on the terminals. It shall be complete with insulating barriers, clip-on-type/stud type terminals for Control Cables and identification strips. Marking on terminal strip shall correspond to the terminal numbering on wiring on diagrams. It shall be similar to 'ELEMEX' standard type terminals, cage clamp type of Phoenix or WAGO or equivalent

- 1.162 Terminal blocks for CT and VT secondary leads shall be provided with test links and isolating facilities. CT secondary leads shall be provided with short circuiting and earthing facilities. It shall be similar to 'Elem.' 'CATD' - Type.

- 1.163 In all circuit breaker panels at least 10% spare terminals for external connections shall be provided and these spare terminals shall be uniformly distributed on all terminal blocks. Space for adding another 10% spare terminals shall also be available.

- 1.164 All terminal blocks shall be suitable for terminating on each side, two (2) Nos. of 2.5 mm square size standard copper conductors.

- 1.165 All terminals shall be numbered for identification and grouped according to the function. Engraved white-on-black labels shall be provided on the terminal blocks.

- 1.166 Wherever duplication of a terminal block is necessary it shall be achieved by solid bonding links.

- 1.167 Terminal blocks shall be arranged with at least 100 mm clearance between two sets of terminal block. The minimum clearance between the first row of terminal block and the

associated cable gland plate shall be 250 mm.

1.17 NAME PLATES AND LABELS

1.17.1 All switchgears, AC/DC distribution boards, shall be provided with prominent, engraved identification plates. The module identification plate shall clearly give the feeder number and feeder designation. For single front switchboards, similar panel and board identification labels shall be provided at the rear also.

1.17.2 All name plates shall be of non-rusting metal or 3-ply lamincoid with white engraved lettering on black back ground. Inscriptions and lettering sizes shall be subject to PURCHASER approval.

1.17.3 Suitable plastic sticker labels shall be provided for easy identification of all equipments, located inside the panel/module. These labels shall be positioned so as to be clearly visible and shall give the device number as mentioned in the module wiring drawings.

1.18 SPACE HEATER

1.18.1 Space heater shall be provided in all the boards for preventing harmful moisture condensation.

1.18.2 The space heaters shall be suitable for continuous operation on 240V AC, 50 Hz, single phase supply, and shall be automatically controlled by thermostats. Necessary isolating switches and fuses shall also be provided.

1.19 CONTROL AND SECONDARY WIRING

1.19.1 All switchboards shall be supplied completely wired internally upto the terminal blocks ready to receive Purchaser's control cables.

1.19.2 All inter cubicle and inter panel wiring and connections between panels of same switchboard including all bus wiring for AC and DC supplies shall be provided by the bidder.

1.19.3 All internal wiring shall be carried out with 1100 V grade, single core, 1.5 square mm or larger stranded copper wires having colour coded, PVC insulation. CT circuits shall be wired with 2.5 square mm copper wires. Voltage grade and insulation shall be same as above.

1.19.4 Extra-flexible wires shall be used for wiring to device mounted on moving parts such as hinged doors.

1.19.5 All wiring shall be properly supported, neatly arranged, readily accessible and securely connected to equipment terminals and terminals blocks.

1.20 POWER CABLES TERMINATION

1.20.1 Cable termination compartment and arrangement for power cables shall be suitable for stranded aluminium conductor, armoured XLPE/PVC insulated and sheathed, single core/three core, 1100 V grade cables.

1.20.2 All necessary cable terminating accessories such as Gland plates, supporting clamps and brackets, power cable lugs, hardware etc. shall be provided by the successful bidder, to suit the final cable sizes which would be advised later.

1203 The gland plate shall be of removable type and shall cover the entire cable alley. Bidder shall also ensure that sufficient space is provided for all cable glands. For all single core cables, gland plates shall be of non-magnetic Material.

1.21 TYPE TESTS

121.1 Type tests reports on Panels (Switchgear and Control gear assemblies) as per IS 8623 Part-I shall be submitted for the following tests in line with clause 9.0 of Section GTR :

- i) Verification of temperature rise limits
- ii) Verification of the dielectric properties
- iii) Verification of short circuit strength
- iv) Verification of the continuity of the protective circuit
- v) Verification of clearances and creepage distances
- vi) Verification of mechanical operation
- vii) Verification of degree of protection

121.2 Contractor shall submit type test reports for the following Switchgear and Control gears before the fabrication of switchgear is started:

1. Circuit breakers/MCCB as per IS 13947 Part-II
2. Protective Relays as per IEC: 60255.
3. **Lighting transformers as per IS:2026**

For above equipments, test conducted once are acceptable (i.e. The requirement of test conducted within last **ten** years shall not be applicable)

1.22 ERECTION, TESTING AND COMMISSIONING

122.1 The Contractor shall unload, erect, install, test and put into commercial use all electrical equipment included in this specification.

122.2 Equipment shall be installed in a neat, workman like manner so that it is level, plumb, square and properly aligned and oriented. Tolerance shall be as established in Contractor's drawings or as stipulated by purchaser. No equipment shall be permanently bolted down to foundations until the alignment has been checked and found acceptable by the purchaser.

122.3 Contractor shall furnish all supervision, labour tools equipment rigging materials, bolts, wedges, anchors, concrete inserts etc. in proper time required to completely install, test and commission the equipment.

122.4 Manufacturer's and purchaser's instructions and recommendations shall be correctly followed in handling, setting, testing and commissioning of all equipment.

122.5 Contractor shall move all equipment into the respective room through the regular door or openings specifically provided for this purpose. No part of the structure shall be utilised to lift or erect any equipment without prior permission of Purchaser.

122.6 All boards shall be installed in accordance with **relevant code of practices** and at Purchaser's instructions. All boards shall be installed on finished surfaces, concrete or steel stills. Contractor shall be required to install and align any channel sills which form part of foundations. In joining shipping sections of switchboards together adjacent housing of panel sections or flanged throat sections shall be bolted together after alignment has been completed. Power bus, enclosures ground and control splices of conventional nature shall

be cleaned and bolted together being drawn up with torque spanner of proper size or by other approved means.

- 1227 All boards shall be made completely vermin proof.
- 1228 Contractor shall take utmost care in holding instruments, relaying and other delicate mechanism wherever the instruments and relays are supplied separately they shall be mentioned only after the associated panels have been erected and aligned. The packing materials employed for safe transit of instrument and relays shall be removed after ensuring that panel have been completely installed and to further movement of the same should be necessary. Any damage shall be immediately reported to Purchaser.
- 1229 Equipment furnished with finished coats of paint shall be touched by up Contractor if their surface is specified or marred while handling.
- 12210 After installation of panels, power and control wiring and connections, Contractor shall perform operational tests on all switchboards, to verify proper operation of switchboards/panels and correctness of all equipment in each and every respect. The cable opening and cables entries for cables terminating to the panels shall be sealed with fire sealing materials.

1.23 COMMISSIONING CHECK TESTS

The Contractor shall carry out the following commissioning checks, in addition to the other checks and tests recommended by the manufacturers.

1.23.1 General

- 1.23.1.1 Check name plate details according to the specification.
- 1.23.1.2 check for physical damage.
- 1.23.1.3 Check tightness of all bolts, clamps, joints connecting terminals.
- 1.23.1.4 Check earth connection.
- 1.23.1.5 Check cleanliness of insulators and bushings.
- 1.23.1.6 Check all moving parts for proper lubrication.
- 1.23.1.7 Check settings of all the relays.

1.23.2 Circuit Breakers

- 1.23.2.1 Check alignment of breaker truck for free movement.
- 1.23.2.2 Check correct operation of shutters.
- 1.23.2.3 Check control wiring for correctness of connections, continuity and IR values.
- 1.23.2.4 Manual operation of breaker completely assembled.
- 1.23.2.5 Power closing/opening operation, manually and electrically.

- 1.23.2.6 Breaker closing and tripping time.
- 1.23.2.7 Trip free and anti-pumping operation.
- 1.23.2.8 IR values, minimum pick up voltage and resistance of coils.
- 1.23.2.9 Contact resistance
- 1.23.2.10 Simultaneous closing of all the three phases.
- 1.23.2.11 Check electrical & mechanical interlocks provided.
- 1.23.2.12 Check on spring charging motor, correct operation of limit switches, and time of charging.
- 1.23.2.13 All functional checks.

1.23.3 Current Transformers

- 1.23.3.1 Megger between winding and winding terminals to body.
- 1.23.3.2 Polarity test
- 1.23.3.3 Ratio identification checking of all ratios on all cores by primary injection of current.
- 1.23.3.4 Spare CT cores, if available, to be shorted and earthed.

1.23.4 Voltage Transformer

- 1.23.4.1 Insulation resistance test
- 1.23.4.2 Ratio test on all cores.
- 1.23.4.3 Polarity test.
- 1.23.4.4 Line connections as per connection diagram.

1.23.5 Cubicle Wiring

- 1.23.5.1 Check all switch developments.
- 1.23.5.2 Each wire shall be traced by continuity tests and it should be made sure that the wiring is as per relevant drawing. All interconnections between panels/equipment shall be similarly checked.
- 1.23.5.3 All the wires shall be meggered to earth.
- 1.23.5.4 Functional checking of all control circuit e.g. closing, tripping control, interlock, supervision and alarm circuit.

1.23.6 Relays

- 1.23.6.1 Check connections and wiring.

- 1.23.6.2 Megger all terminals to body.
- 1.23.6.3 Megger AC to DC terminals.
- 1.23.6.4 Check operating characteristics by secondary injection.
- 1.23.6.5 Check minimum pick up voltage of DC coils.
- 1.23.6.6 Check operation of electrical/mechanical targets.
- 1.23.6.7 Relays settings.
- 1.23.6.8 Check CT and VT connections with particular reference to their polarities for directional relays, wherever required.

1.23.7 Meters

- 1.23.7.1 Check calibration by comparing it with a sub-standard.
- 1.23.7.2 Megger all insulated portions.
- 1.23.7.3 Check CT and VT connections with particular reference to their polarities for power type meters.

1.24 SPECIAL TOOLS AND TACKLES

- 1.24.1 The Bidder shall include in his proposal any special tools and tackles required for erection, testing commissioning and maintenance of the equipments offered.
- 1.24.2 The list of these special tools and tackles shall be given in the bid proposal sheets alongwith their respective prices.
- 1.24.3 The total price of the special tools and tackles shall be included in proposal sheets.

1.25 EQUIPMENT TO BE FURNISHED

- 1.25.1 The Bidder shall quote for various AC/DC distribution boards in accordance with this specification.
- 1.25.2 Standard scheme of interconnection of switchboards and distribution boards alongwith tentative feeder disposition for each board is indicated in Standard SLD of AC & DC system enclosed alongwith bid documents. The bidder shall quote board prices on the basis of standard SLD and their estimation of feeders for entire present and future baysrequirement. Any other feeder required as per system requirement for efficient and reliable operation shall be deemed to be included in bidder's scope.
- 1.25.3 The Bill of Materials for each type of module shall be as under. These are minimum indicative requirement of the system. The necessary auxiliary relays, push buttons and indicating lamps shall be provided as per scheme requirement. Any other item/component required with in a module for efficient and reliable operation shall be deemed to be included in bidder's scope.

1.25.4 Module Type AE (Electrically controlled circuit breaker for incoming and Bus Coupler Circuit).

(i)	One (1)	Triple pole air circuit breaker complete with all accessories and power operated mechanism as specified.
(ii)	Two (2)	Neutral link.
(iii)	Three (3)	Current Transformer for metering.
(iv)	One (1)	Ammeter with selector switch.
(v)	Three (3)	Current Transformer for relaying.
(vi)	One (1)	Triple pole instantaneous over-current relay having the setting range of 200-800% or 500-2000% of CT secondary and adjustable definite minimum time.
(vii)	One (1)	Instantaneous earth fault relay having an adjustable setting range of 10-40% or 20 - 80% of CT secondary current and adjustable definite minimum time. The earth fault relay shall be provided with a stabilising resistor.
(viii)	One(1) set	Current and Voltage transducers.
(ix)	One(1) set	High speed tripping relays.

1.25.5 Module Type - M1 (Circuit Breaker Controlled Motor Feeder)

(i)	One (1)	Triple pole Air Circuit Breaker complete with accessories, and power operated mechanism as specified.
(ii)	One (1)	Three position 6 pole selector switch 'SWITCHGEAR/NORMAL /TRIAL'.
(iii)	Three (3)	Current Transformer for metering.
(iv)	One (1)	Ammeter with Ammeter Selector Switch
(v)	Three (3)	Current Transformer for relaying.
(vi)	One (1)	Triple pole instantaneous over-current relay for providing positive sequence current protection in all the three phases. The relay setting range shall be continuously adjustable between 200-800% or 400-1600% of CT secondary rated current as required.
(vii)	One (1)	Double pole inverse definite minimum time over current relays connected in R & B phases for over current protection of motor rated 110 kW - 200 kW. The relay shall have an adjustable setting range of 50% - 200% of CT Secondary current and time setting range of 0-30 Second. The relay shall be CDGM-22 of EE or equivalent.

(viii)	One (1)	Single pole adjustable definite time delay relay for motor overload alarm connected in Y-phase only. The relay shall have resetting ratio of not less than 90%. The relay shall have continuously adjustable time delay range of 2.5 to 25 Sec.
(ix)	One (1)	Instantaneous earth fault relay having an adjustable setting range of 10-40% or 20-80% of CT secondary current. The earth fault relay shall be provided with a stabilising resistor.
(x)	One(1) set	Current and Voltage transducers.
(xi)	One(1) set	High speed tripping relay.

1.25.6 Module Type E

- (i) One (1) Four pole MCCB

1.25.7 Module G-1 (VT Module with under Voltage Relay)

/

(i)	Three (3)	415 / 110 volts single phase voltage transformer star/star 3 3 connect with star point solidly earthed mounted on common draw out chassis. Accuracy Class 0.5 for protection and metering with 50VA Burden.
(ii)	Six (6)	HRC Fuses mounted on the above chassis.
(iii)	One (1)	Four position voltmeter selector switch.
(iv)	One (1)	Voltmeter (0-500V)
(v)	One (1)	Double pole instantaneous under voltage relays with continuous variable setting range of 40-80% of 110 Volts.
(vi)	One (1)	Time delay pick up relay having a time setting range of 0.5 to 3 secs. with 3 'NO'. Self reset contacts, suitable for 220V DC.
(vii)	One (1)	Auxiliary relay 220V DC with 2 NO. self reset contacts.
(viii)	Three (3)	Indicating lamps with series resistor and colour lenses (Red, Blue & Yellow).

1.25.8 Module Type G-2

(i)	Three (3)	HRC Fuse Voltmeter (0-
(ii)	One (1)	500V)
(iii)	One (1)	Voltmeter selector switch four position (R-Y, Y-B, B-R OFF).
(iv)	Three (3)	Indication lamps (Red, Blue & Yellow)

1.25.9 Module Type H & H (BC) (Isolating Switch Controlled Incoming Circuit)

(i)	One (1)	Four pole MCCB
(ii)	One (1)	Red Indicating lamp to indicate isolating switch closed position.

1.25.10 Module Type S : (DC Metering and Protection Module)

(i)	One (1)	Voltmeter 300-0-300V DC for 220V DC DB/Voltmeter 0- 75V DC for 50V DCDB
(ii)	One (1)	Three (3) position voltmeter selector switch
(iii)	One (1)	Instantaneous under voltage relay with 95% of 220V DC. The resetting ratio of relay of relay should not be more than 1.25. The relay shall be provided with a series resistor and a push button across if for resetting (pick up) the relay at about 105% of the drop out voltage.
(iv)	One (1)	Instantaneous over voltage relay with setting range of 110% of 220V DC. The resetting ratio of relay should not be less than 0.8. the relay shall have a push button in series of resetting the relay at about 95% of the operating voltage
(v)	One (1)	Earth leakage relay only for 220 V DC system having adjustable pickup range b/w 3 to 7 mili amps. The relay shall be suitable for 220 V DC /240 Volt AC auxiliary supply

1.25.11 Module Type X

One (1) Double pole 250 V MCB

1.25.12 Module Type-DC (Incomer from Battery & Chargers)

(i)	One (1)	Double pole 250V DC MCCB for incomer from Battery.
(ii)	One (1)	DC ammeter with shunt and range of 90-0-400 Amps. For 220V DC DB and 90-0-200 Amp for 50V DC DB.
(iii)	Two (2)	Double pole 250V DC MCCB/MCB

(iv)	One (1)	Double pole single throw 250V DC air break switch connecting battery & charger sections to DC DB.
(v)	One(1) set	Voltage and Current Transducers

1.25.13 Module Type DG-1 (Electrically Controlled Circuit Breaker for Incomer from DG Set)

a)	One (1)	Triple pole circuit breaker complete with all accessories and power operated mechanism as specified.
b)	One (1)	Frequency meter.
c)	One (1)	Voltmeter with selector switch.
d)	One (1)	Remote/Local Selector switch.
e)	Three (3)	Current transformer for metering.
f)	Six (6)	Current Transformers for differential protection (out of this 3 Nos. will be supplied loose for mounting in DG set panel).
g)	Three (3)	Current transformer for relaying.
h)	One (1)	Ammeter Selector Switch.
i)	One (1)	Ammeter
j)	One (1)	Wattmeter of range 0-300 KW.
k)	One (1)	Three pole voltage controlled definite time delay relay having current setting range of 50-200% of CT secondary current and adjustable time delay 0.3 to 3 secs.
l)	One (1)	Watt hour meter with six (6) digits and minimum count of one (1) kwh.
m)	One (1)	Single pole definite time over current relay having a continuous setting range of 50-200% of CT secondary current and a time delay of 2.5-25 secs connected in CT of Y phase for overload alarm. The relay shall have a setting ratio of not less than 90%.
n)	One (1)	Three pole differential protection relay having an operating current setting range of 10-40% of generator full load current. The relay shall be of high impedance type, with necessary stabilizing resistors.
o)	Two (2)	Push buttons for Remote starting & stopping of DG Set (Red, Green).
p)	One(1) set	Current and Voltage transducers.
q)	One(1) set	High speed tripping relays.

1.25.14 Module Type H1

One (1) Double pole DC Switch with pad locking facility in off position.

1.25.15 Module Type EL

(i) One (1) Four pole MCCB

(ii) One (1) Contactor

(iii) Electronic Timer suitable for continuous operation, push button and selector switch be as per scheme requirement

1.26 PARAMETERS**1.26.1 Power Supply**

1.26.1.1 AC System 3 phase, 4 wire, solidly earthed

a) Voltage 415 Volts, $\pm 10\%$

b) Frequency 50 Hz $\pm 5\%$

c) Combined variation $\pm 10\%$ Absolute Sum in Voltage & frequency

d) Fault Level 20 kA (rms)

1.26.1.2 DC System 2 Wire, unearthed

a) System voltage 220V $\pm 10\%$

b) Fault Level 4 kA

c) System Voltage **48 V** $\pm 10\%$

d) Fault Level --

1.26.2 Control Supply Voltage

a) Trip and closing coils 220V DC Unearthed

b) Spring charging 220V DC Unearthed

1.26.3 Cubicle Data**1.26.3.1 Busbar Rating**

a) Continuous As specified in **Standard SLD**

for Vertical panels.

For AC & DC system.

b)	Short time (1 sec. kA (rms)	20 kA
c)	Momentary (kA) PEAK	45 kA
d)	Ambient Temperature	50°C
e)	One Minute Power Frequency Withstand	
	I. Power Circuit	2500 Volts (rms)
	II. Control Circuit	2500 Volts (rms)

1.26.3.2 Cubicle Colour Finish

a)	Interior	Smoke Grey shade No.692 of IS:5
b)	Exterior	Smoke Grey shade No.692 of IS:5

1.26.4 Circuit Breaker

a)	Type	Air Break
b)	No. of poles	3
c)	Voltage & Frequency	415 ± 10%, 50 HZ + 5%
d)	Rated Operating Duty	As per IS
e)	Rated service short-circuit Breaking capacity (Ics)	20 kA (RMS)
f)	Short Circuit making current	45 kA (Peak)
g)	Short time withstand current for 1 sec. duration.	20 kA (RMS) for 1 sec.
h)	Operating Mechanism current for 1 sec. duration.	20 kA (RMS) for 1 sec.
i)	No. of auxiliary contacts	4 NO & 4 NC contacts for Purchaser's use on fixed portion of the cubicle
j)	Short Circuit breaking current	
	I. AC Component	20 kA (RMS)
	II. DC Component	As per IS: 13947 (Part 2)

1.26.5

MOULDED CASE CIRCUIT BREAKER

		AC System	DC System
a)	No. of poles	4	2
b)	Voltage & Frequency	415 $\pm$ 10%, 50 HZ $\pm$ 5%	250V
c)	Rated Operating Duty	As per IS	
d)	Rated service short-circuit Breaking capacity (Ics)	20 kA (RMS)	4 kA
e)	Short Circuit making current	45 kA (Peak)	-
f)	No. of auxiliary Contacts (<i>only for incomer And bus-coupler MCCBs</i>)	1 NO & 1 NC	1 NO & 1 NC
g)	Rated Ultimate Short Circuit breaking capacity		
	I. AC Component	20 kA (RMS)	As per IS
	II. DC Component	As per IS 13947	As per IS 13947

1.26.6

Meters

a)	Accuracy class	2.5
b)	One minute power frequency withstand test voltage in KV	2.0

1.26.7

Current Transformers

a)	Type	Cast resin, Bar primary
b)	Voltage class and frequency	650V, 50 Hz
c)	Class of Insulation	E or better
d)	Accuracy class metering CT	Class 1, VA adequate for application but not less than 7.5 VA.
e)	Accuracy class protection CT	5 P 15, VA adequate for application, but not less than 7.5 VA.
f)	Accuracy class differential protection	PS, KPV = 300V

g)	Short Time Current Rating (for CTs Associated with circuit breakers)	
I.	Current	20 kA (RMS)
II.	Duration	One Second
III.	Dynamic Rating	45 kA (Peak)
IV.	One minute power frequency withstand test voltage.	2.5 kV (rms)

1.26.8 **Voltage Transformer**

a)	Type	Cast Resin
b)	Rated Voltage	
	Primary	415/√3 V
	Secondary	110/√3 V
c)	Method of connection	
	Primary	Star
	Secondary	Star
d)	Rated voltage factor	1.1 continuous, 1.5 for 3 seconds
e)	Class of insulation	E or better
f)	One minute power frequency withstand voltage	2.5 KV (RMS)
g)	Accuracy class	0.5, not less than 20VA

1.26.9 **Relay**

a)	One minute power Frequency withstand test	2 kV (rms)

1.26.10	<i>Transducers (1 phase)</i>	<i>Current</i>	<i>Voltage</i>
	<i>a) Operating Voltage</i>	<i>220 V DC</i>	<i>220V DC</i>
	<i>b) I/P</i>	<i>1A.</i>	<i>110V AC</i>
	<i>c) O/P</i>	<i>4-20 mA</i>	<i>4-20 mA</i>
	<i>d) Type</i>	<i>Analogue</i>	<i>Analogue</i>

1.26.11 **Lighting Transformers**

Lighting transformers shall be of 300 KVA rating (in case of substations where highest voltage is 765 kV)/ 100 KVA rating (in case of substations where highest voltage is 400 kV)/ 25 KVA rating (in case of substations where highest voltage level is 132kV), 415/415 V, 3 phase, 50 Hz Dry type natural air cooled *type*. The technical parameters of these lighting transformers are as follows:

Technical Parameters of Lighting Transformer

Type of transformer	:	Dry type natural air cooled
Rating	:	300 KVA , 100 KVA or 25 KVA (as applicable)
Voltage ratio	:	415/415 volts
No. of phases	:	Three
Frequency	:	50 Hz
Winding connection	:	Dyn-1
Class of insulation	:	'B' class
Impedance	:	4% $\pm$ 10%
No. of taps & steps	:	5, $\pm$ 5% in steps of 2.5%
Ref. standard	:	IS:2026

1.27 **AUTOMATIC CONTROL OF OUTDOORLIGHTING**

1.27.1 EL-type module of 415V Main lighting distribution board and Emergency lighting distribution board and shall be controlled by timer and contactor module to facilitate its operation automatically.

1.28 **AUTOMATIC SUPPLYCHANGEOVER**

Automatic changeover between Incomer I, Incomer II, and DG set is to be carried out during the failure of supply in one/or both the incomers. After the restoration of the supply, system shall be restored to normal condition automatically. The requirement of changeover under various conditions are as below:

- (i) Under normal conditions i.e. when supply is available in both the incomers, incomers I&II of 415 V Main switchboard, ACDB shall be in closed condition and Bus couplers and DG set breaker shall be in open condition.
- (ii) In case of failure of either of the sources, the incomer of that source shall trip and Bus coupler shall get closed. On restoration of supply, normal conditions described above are to be established automatically.
- iii) In case of failure of supply in both the sources, both incomers, incomers of ACDBs and ACDB Bus coupler shall trip and DG set breaker switched on.
On restoration of one or both sources, DG set breaker shall trip, DG set stopped and conditions described in paragraph (i) /(ii) shall be restored.

To avoid unnecessary operation of switchgear for momentary disturbances all changeovers from one state to another shall be initiated after a time delay, after the conditions warranting such change has been detected.

1.29

ANALOGUE INPUTS

LT System shall have provision of following analogue inputs for owner's substation automation purpose. These analogue inputs shall be generated by distinct transducers to be provided in respective modules. These inputs shall be wired up to respective terminal blocks.

ANALOGUE INPUTS:

- i) Voltage R-Y, Y-B, B-R of Main Switch Board section-I
- ii) Voltage R-Y, Y-B, B-R of Main Switch Board section-II
- iii) Current from LT transformer-I
- iv) Current from LT transformer-II
- v) Voltage of 220V DCDB-I
- vi) Voltage of 220V DCDB-II
- vii) Current from 220V Battery set-I
- viii) Current from 220V Battery set-II
- ix) Voltage of 48V DCDB-I
- x) Voltage of 48V DCDB-II
- xi) Current from 48V Battery set-I
- xii) Current from 48V Battery set-II

1.30

DIGITAL (Potential Free) INPUTS:

LT System shall have provision of following digital inputs for owner's substation automation purpose. These digital inputs shall be made available in the form of potential free contacts to be provided in respective modules. These potential free contacts shall be wired up to respective terminal blocks.

- i) Main (MSB) Incomer-I breaker On/Off
- ii) Main (MSB) Incomer-II breaker On/Off
- iii) Main(MSB) 415V Bus-I/II U/V
- iv) Main (MSB) bus coupler breaker on/off
- v) DG set breaker on/off
- vi) LT transformer-I Buchholz Alarm & trip
- vii) LT transformer-II Buchholz Alarm & trip
- viii) LT transformer-I WTI Alarm & trip
- ix) LT transformer-II WTI Alarm & trip
- x) LT transformer-I OTI Alarm & trip
- xi) LT transformer-II OTI Alarm & trip
- xii) 220 V DC-I earth fault
- xiii) 220V DC-II earth fault

SECTION: POWER AND CONTROL CABLE

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SECTION: POWER & CONTROL CABLES

1. POWER & CONTROL CABLES[FOR WORKING VOLTAGES UP TO AND INCLUDING 1100 V]

CRITERIA FOR SELECTION OF POWER & CONTROL CABLES

- 1.1.1. Aluminium conductor XLPE insulated armoured cables shall be used for main power supply purpose from LT Aux. Transformers to control room, between distribution boards, **supply to oil filtration units, DG supply to AC distribution board** and for supply for colony lighting from control room.
- 1.1.2. Aluminium conductor PVC insulated armoured power cables shall be used for various other applications in switchyard area/control room except for control/protection purposes.
- 1.1.3. For all control/protection purposes, PVC insulated armoured control cables of minimum 2.5 sq. mm. size with stranded Copper conductors shall be used.
- 1.1.4. Employer has standardised the sizes of power cables for various feeders. Bidders are to estimate the quantity of cables and quote accordingly. The sizes of power cables to be used per feeder in different application shall be as follows:

S.No.	From	To	Cable size	Cable type
1.	Main Switch Board	LT Transformer	2-1C X 630 mm ² per phase 1-1C X 630 mm ² for neutral	XLPE
2.	Main Switch Board	AC Distribution Board	2-3½C X 300 mm ²	XLPE
3.	Main Switch Board	Oil Filtration Unit & looping to other oil filtration units.	1-3½C X 300 mm ²	XLPE
4.	Main Switch Board	Colony Lighting	1-3½C X 300 mm ²	XLPE

5.	Main Switch Board	HVW pump LCP	1-3½C X 300 mm ²	XLPE
6.	Main Switch Board	Main Lighting distribution board	1-3½C X 300 mm ²	XLPE
7.	AC Distribution Board	D.G. Set AMF Panel	2-3½C X 300 mm ²	XLPE
8.	AC Distribution Board	Emergency Lighting distribution board	1-3½C X 70 mm ²	PVC
9.	AC Distribution Board	ICT MB	1-3½C X 70 mm ²	PVC
10.	AC Distribution Board	Bay MB	1-3½C X 70 mm ²	PVC
11.	Bay MB	AC Kiosk	1- 3 ½ x 35 mm ²	PVC
12.	AC Distribution Board	Battery Charger	1-3½C X 70 mm ²	PVC
13.	DCDB	Battery	2-1C X 150 mm ²	PVC
14.	DCDB	Battery Charger	2-1C X 150 mm ²	PVC
15.	DCDB	Protection/PLCC panel	1-4C X 16 mm ²	PVC
16.	Main Lighting DB	Lighting panels(Indoor)	1-3½C X 35 mm ²	PVC
17.	Main Lighting DB	Lighting panels (outdoor)	1-3½C X 70 mm ²	PVC
18.	Main Lighting DB	Receptacles (Indoor)	1-3½C X 35 mm ²	PVC
19.	Main Lighting DB	Receptacles (Outdoor)	1-3½C X 70 mm ²	PVC
20.	Lighting Panel	Sub lighting panels	1-4C X 16 mm ²	PVC
21.	Lighting Panel	Street Lighting Poles	1-4C X 16 mm ²	PVC
22.	Lighting Panel/ Sub lighting panels	Lighting Fixtures (Outdoor)	1-2C X 6 mm ²	PVC
23.	Bay MB	Equipments	1-4C X 16 mm ² /1-4C X 6 mm ² /1-2C X 6 mm ²	PVC

- 1.1.5** Bidder may offer sizes other than the sizes specified in clause 1.1.4. In such case and for other application where sizes of cables have not been indicated in the specification, sizing of power cables shall be done keeping in view continuous current (*including future bays/load requirement*), voltage drop & short-circuit consideration of the system. Relevant calculations shall be submitted by bidder during detailed engineering for purchaser's approval. **The entire power and control cables & special cables (if any) required shall be executed by contractor for completion of present scope of work.**
- 1.1.6 Cables shall be laid conforming to IS : 1255.
- 1.1.7 While preparing cable schedules for control/protection purpose, following shall be ensured:
- 1.1.7.1 Separate cables shall be used for AC & DC.
- 1.1.7.2 Separate cables shall be used for DC1 & DC2.
- 1.1.8 For different cores of CT & CVT separate cable shall be used
- 1.1.9 At least one (1) cores shall be kept as spare in each copper control cable of 4C, 5C or 7C size whereas minimum no. of spare cores shall be two (2) for control cables of 10 core or higher size.
- 1.1.10 For control cabling, including CT/VT circuits, 2.5 sq.mm. size copper cables shall be used per connection. However, if required from voltage drop/VA burden consideration, additional cores shall be used. Further for potential circuits of energy meters, separate connections by 2 cores of 2.5 sq.mm. size shall be provided.
- 1.1.11** Standard technical data sheets for cable sizes up to and including 1100V are enclosed at Annexure. Cable sizes shall be offered/manufactured in accordance with parameters specified in standard technical data sheets. Technical data sheet for any other cores/sizes required during detailed engineering shall be separately offered for owner's approval by the contractor/supplier. ***Submission of standard technical data sheets for these cable sizes are not required for approval. Contractor/supplier shall intimate name of proposed approved cable manufacturer along with cable sizes, its quantity required during detailed engineering for purchaser's information and acceptance.***

1.2. TECHNICAL REQUIREMENTS

1.2.1. General

- 1.2.1.1. The cables shall be suitable for laying in racks, ducts, trenches, conduits and underground buried installation with uncontrolled back fill and chances of flooding by water.
- 1.2.1.2. They shall be designed to withstand all mechanical, electrical and thermal stresses under steady state and transient operating conditions. The XLPE /PVC insulated L.T. power cables of sizes 240 sq. mm. and above shall withstand without damage a 3 phase fault current of at least 45 kA for at least 0.12 second, with an initial peak of 105 kA in one of the phases at rated conductor temperature (70 degC for PVC insulated cables and 90 degC for XLPE insulated cables). The armour for these power cables shall be capable of carrying 45 kA for at least 0.12 seconds without exceeding the maximum allowable temperature of PVC outer sheath.
- 1.2.1.3. The XLPE insulated cables shall be capable of withstanding a conductor temperature of 250°C during a short circuit without any damage. The PVC insulated cables shall be capable of withstanding a conductor temperature of 160°C during a short circuit.
- 1.2.1.4. The Aluminium/Copper wires used for manufacturing the cables shall be true circular in shape before stranding and shall be uniformly good quality, free from defects. All Aluminium used in the cables for conductors shall be of H2 grade. In case of single core cables armours shall be of H4 grade Aluminium.
- 1.2.1.5. The fillers and inner sheath shall be of non-hygroscopic, fire retardant material, shall be softer than insulation and outer sheath shall be suitable for the operating temperature of the cable.
- 1.2.1.6. Progressive sequential marking of the length of cable in metres at every one metre shall be provided on the outer sheath of all cables.
- 1.2.1.7. Strip wire armouring method (a) mentioned in Table 5, Page-6 of IS : 1554 (Part 1) – 1988 shall not be accepted for any of the cables. For control cables only round wire armouring shall be used.
- 1.2.1.8. The cables shall have outer sheath of a material with an oxygen index of not less than 29 and a temperature index of not less than 250°C.
- 1.2.1.9. All the cables shall pass fire resistance test as per IS:1554 (Part-I)
- 1.2.1.10. The normal current rating of all PVC insulated cables shall be as per IS:3961.
- 1.2.1.11. Repaired cables shall not be accepted.
- 1.2.1.12. Allowable tolerance on the overall diameter of the cables shall be plus or minus 2

mm.

1.2.2. XLPE Power Cables

- 1.2.2.1. The XLPE (90°C) insulated cables shall be of FR type, C1 category conforming to IS:7098 (Part-I) and its amendments read alongwith this specification. The conductor shall be stranded aluminium circular/sector shaped and compacted. In multicore cables, the core shall be identified by red, yellow, blue and black coloured strips or colouring of insulation. A distinct inner sheath shall be provided in all multicore cables. For XLPE cables, the inner sheath shall be of extruded PVC of type ST-2 of IS:5831. **All cables shall be of armoured type.** For single core cables, the **armouring** shall consist of aluminium wires/strips. The outer sheath shall be extruded PVC of Type ST-2 of IS:5831 for all XLPE cables.

1.2.3. PVC Power Cables

- 1.2.3.1. The PVC (70°C) insulated power cables shall be of FR type, C1 category, conforming to IS: 1554 (Part-I) and its amendments read alongwith this specification and shall be suitable for a steady conductor temperature of 70°C. The conductor shall be stranded aluminium. The Insulation shall be extruded PVC to type-A of IS: 5831. A distinct inner sheath shall be provided in all multicore cables. **All cables shall be of armoured type.** For multicore armoured cables, the inner sheath shall be of extruded PVC. The outer sheath shall be extruded PVC to Type ST-1 of IS: 5831 for all cables.

1.2.4. PVC Control Cables

- 1.2.4.1. The PVC (70°C) insulated control cables shall be of FR type C1 category conforming to IS: 1554 (Part-1) and its amendments, read alongwith this specification. The conductor shall be stranded copper. The insulation shall be extruded PVC to type A of IS: 5831. A distinct inner sheath shall be provided in all cables. **All cables shall be of armoured type.** The over sheath shall be extruded PVC to type ST-1 of IS: 5831 and shall be grey in colour.
- 1.2.4.2. Cores shall be identified as per IS: 1554 (Part-1) for the cables up to five (5) cores and for cables with more than five (5) cores the identification of cores shall be done by printing legible Hindu Arabic Numerals on all cores as per clause 10.3 of IS 1554 (Part-1).

2. HV POWER CABLES[FOR WORKING VOLTAGES FROM 3.3 kV AND INCLUDING 33 kV]

2.1. HV POWER CABLE FOR AUXILIARY POWERSUPPLY

- (a) The HV cable of $1\text{C}\times 185\text{ mm}^2$ (Aluminium Conductor) or $1\text{C}\times 120\text{mm}^2$ (Copper Conductor) of voltage class as specified for 630 kVA **and 800 kVA** LT transformer for interconnecting 630kVA **and 800 kVA** LT transformer to the SEB feeder shall be, XLPE insulated, armoured cable conforming to IS 7098 (Part-II) or IEC 60502-2 1998. Terminating accessories shall conform

to IS 17573- 1992 or IEC 61442-1997/IEC60502-4 1998.

- (b) The HV cable of $3\text{Cx}95\text{ mm}^2$ (Aluminium Conductor) or $3\text{Cx}70\text{mm}^2$ (Copper Conductor) of voltage class as specified for 250kVA LT transformer for interconnecting 250kVA LT transformer to the SEB feeder shall be, XLPE insulated, armoured cable conforming to IS 7098 (Part-II) or IEC 60502-2 1998. Terminating accessories shall conform to IS 17573-1992 or IEC 61442-1997/IEC60502-4 1998.

2.2. Only overhead connection has been foreseen for interconnecting **630 kVA and** 800 kVA, LT transformer to the tertiary of the ICT. However, HV cable connections in place of overhead connection, if necessary shall also be in the scope of contractor. In this case contractor shall provide $1\text{C} \times 185\text{ mm}^2$ (Aluminium Conductor) or $1\text{C} \times 120\text{mm}^2$ (Copper Conductor), 38/66kV HV cable along with necessary terminating accessories. The construction of XLPE insulated, armoured HV cable shall be generally conforming to IS 7098 (Part-III). Terminating accessories shall conform to IEC60840 1999.

2.3. Bidder may offer sizes other than the sizes specified in clause 2.1 and 2.2. In such case sizing of power cables shall be done keeping in view continuous current, voltage drop & short-circuit consideration of the system. Relevant calculations shall be submitted by bidder during detailed engineering for purchaser's approval.

2.4. Constructional Requirements

Cable shall have compacted circular Aluminium conductor, Conductor screened with extruded semi conducting compound, XLPE insulated, insulation screened with extruded semi conducting compound, ***distinct extruded PVC inner sheath (Type ST-2) with FR properties***, armoured with non-magnetic material ***for single core cables and galvanized steel wire/strip for multicore cables***, followed by extruded PVC outer sheath(Type ST-2), with FR properties . ***The armour shall be capable of withstanding rated short time current of conductor.***

2.5 Progressive sequential marking of the length of cable in metres at every one metre shall be provided on the outer sheath of the cable.

2.6 The cables shall have outer sheath of a material with an Oxygen Index of not less than 29 and a Temperature index of not less than 250°C.

2.7 Allowable tolerance on the overall diameter of the cables shall be plus or minus 2 mm.

3. EHV XLPE POWER CABLE [FOR WORKING VOLTAGES FROM 66 kV UP TO AND INCLUDING 500 kV]

3.1 TECHNICAL REQUIREMENTS

The XLPE insulated, EHV cable shall conform to the requirements of IEC 60502-2 (applicable clauses only) for construction and IEC 60840/ IEC62067 (as applicable)

for testing. The terminating accessories shall conform to IEC 60840 / IEC62067 (as applicable).

- 3.2 The cable shall be of specified EHV grade, single core, unarmoured, stranded compacted Copper conductor, core screening by a layer of semiconducting tape followed by a layer of semiconducting compound, cross linked polyethylene (XLPE) dry cured insulation, insulation screening with semiconducting compound extruded directly over the insulation, longitudinal sealing by a layer of non woven tape with water swellable absorbent over insulation screen, followed by radial sealing (Metal sheath of Lead alloy 'E'), metallic screening by concentric layer of plain copper wire followed by an open helix of copper & overall **HDPE** sheathed & graphite coated and conforming to the technical particulars of specification.
- 3.3 The construction of cable shall generally conform to the description mentioned in above mentioned clause of the specification. Bidder may offer necessary layers such as separation tape, binder tapes etc additionally as per their manufacturing practices for meeting required performance of the offered cable. The bidder shall enclose with the bid, drawing showing cross section of the cable. The conductors screen (non- metallic semi-conductive) shall be extruded in a single one-time process to ensure homogeneity and absence of voids.
- 3.4 The conductors screen (non-metallic semi-conductive) shall be extruded in a single one-time process to ensure homogeneity and absence of voids.
- 3.5 They shall be designed to withstand all mechanical, electrical and thermal stresses under steady state and transient operating conditions.
- 3.6 Progressive sequential marking of the length of cable in metres at every one metre shall be provided on the outer sheath of the cable.
- 3.7 The cables shall have outer sheath of a **HDPE** material.
- 3.8 Repaired cables shall not be accepted.
- 3.9 Allowable tolerance on the overall diameter of the cables shall be plus or minus 2 mm.

4 CABLE DRUMS

- 4.1 Cables shall be supplied in returnable wooden or steel drums of heavy construction. Wooden drum shall be properly seasoned sound and free from defects. Wood preservative shall be applied to the entire drum. ***Drums offered shall conform to relevant standards. Drum drawings are not required to be submitted for approval.***
- 4.2 Standard lengths for each size of power and control cables shall be 500/1000 meters. The cable length per drum shall be subject to a tolerance of plus or minus 5% of the standard drum length. The owner shall have the option of rejecting cable drums with shorter lengths. Maximum, One (1) number non standard length of cable

size(s) may be supplied in drums for completion of project.

- 4.3 A layer of water proof paper shall be applied to the surface of the drums and over the outer most cable layer.
- 4.4 A clear space of at least 40 mm shall be left between the cables and the lagging.
- 4.5 Each drum shall carry the manufacturer's name, the purchaser's name, address and contract number and type, size and length of the cable, net and gross weight stencilled on both sides of drum. A tag containing the same information shall be attached to the leading end of the cable. An arrow and suitable accompanying wording shall be marked on one end of the reel indicating the direction in which it should be rolled.
- 4.6 Packing shall be sturdy and adequate to protect the cables, from any injury due to mishandling or other conditions encountered during transportation, handling and storage. Both cable ends shall be sealed with PVC/Rubber caps so as to eliminate ingress of water during transportation and erection.

5 TYPE TESTS

- 5.1 All cables shall conform to all type, routine and acceptance tests listed in the relevant IS.

5.2 *XLPE INSULATED POWER CABLES (For working voltages up to and including 1100V):-*

- 5.2.1 Following type tests (on one size in a contract) as per IS: 7098 (Part 1) – 1988 including its amendments shall be carried out as a part of acceptance tests on XLPE insulated power cables for working voltages up to and including 1100 V:

- a) Physical tests for insulation
 - i) Hot set test
 - ii) Shrinkage test
- b) Physical tests for outer sheath
 - i) Shrinkage test
 - ii) Hot deformation
 - iii) Heat shock test
 - iv) Thermal stability

- 5.2.2 Contractor shall submit type test reports as per clause no. 9.2 of Technical Specification, Section: GTR for the following tests-

- a) Water absorption (gravimetric) test.
- b) Ageing in air oven
- c) Loss of mass in air oven
- d) Short time current test on power cables of sizes 240 sqmm and above on
 - i) Conductors.
 - ii) Armours.

- e) Test for armouring wires/strips.
- f) Oxygen and Temperature Index test.
- g) Flammability test.

5.3 *PVC INSULATED POWER & CONTROL CABLES (For working voltages up to and including 1100V)-*

5.3.1 Following type tests (on one size in a contract) as per IS: 1554 (Part 1) - 1988 including its amendments shall be carried out as a part of acceptance tests on PVC insulated power & control cables for working voltages up to and including 1100 V:

- a) Physical tests for insulation and outer sheath
 - i) Shrinkage test
 - ii) Hot deformation
 - iii) Heat shock test
 - iv) Thermal stability
- b) High voltage test (water immersion test only a.c. test as per clause no. 16.3.1).

5.3.2 Contractor shall submit type test reports as per clause no. 9.2 of Technical Specification, Section: GTR for the following-

- a) High voltage test (water immersion d.c. test as per clause no. 16.3.2 of IS: 1554 (Part 1) - 1988).
- b) Ageing in air oven.
- c) Loss of mass in air oven.
- d) Short time current test on power cables of sizes 240 sqmm and above on
 - i) Conductors.
 - ii) Armours.
- e) Test for armouring wires/strips.
- f) Oxygen and Temperature Index test.
- g) Flammability test.

5.4 *XLPE INSULATED HV POWER CABLES(For working voltages from 3.3 kV and including 33 kV)-*

5.4.1 Contractor shall submit type test reports as per clause no. 9.2 of Technical Specification, Section: GTR for XLPE insulated HV power cables (as per IS 7098 Part-II including its amendment or as per IEC).

5.5 *XLPE INSULATED EHV POWER CABLES (For working voltages from 66kV up to and including 500 kV)-*

5.5.1 Contractor shall submit type test reports as per clause no. 9.2 of Technical Specification, Section: GTR for XLPE insulated EHV cables (as per IEC60840 for cables up to 150 kV & IEC 62067 for cables above 150 kV).

5.6 *TERMINATING & JOINTING ACCESSORIES-*

5.6.1 Contractor shall submit type test reports as per clause no. 9.2 of Technical Specification, Section: GTR for Terminating/jointing accessories as per IS 17573:1992/ IEC 60840:1999/ IEC62067.

**STANDARD TECHNICAL DATA SHEET
(1.1 kV GRADE XLPE POWER CABLES)**

	CUSTOMER :	RECTPCL	
SN	Name of manufacturer :	As per approved list	
	Cable Sizes	1 C x 630	3½ C x 300
1	Manufacturer's type designation	A2XWαY	A2XWY
2	Applicable standard	IS: 7098/PT-I/1988 & its referred specifications	
3	Rated Voltage(volts)	1100 V grade	
4	Type & Category	FR & C1	FR & C1
5	Suitable for earthed or unearthed system	for both	
6	Continuous current rating when laid in air in a ambient temp. of 50°C and for maximum conductor temp. of 70 °C of PVC Cables[For information only]	732	410
7	Rating factors applicable to the current ratings for various conditions of installation:	As per IS-3961-Pt-II-67	
8	Short circuit Capacity		
	a) Guranteed Short Circuit Amp. (rms)KA for 0.12 sec duration at rated conductor temperature of 90 degree C, with an initial peak of 105 KA.	45 KA	45 KA
	b) Maximum Conductor temp. allowed for the short circuit duty (deg C.) as stated above.	250 °C	
9	Conductor		
	a) Material	Stranded Aluminium as per Class 2 of IS : 8130	
	b) Grade	H 2 (Electrolytic grade)	
	c) Cross Section area (Sq.mm.)	630	300/150
	d) Number of wires(No.)minimum	53	30/15
	e) Form of Conductor	Stranded and compacted circular	Stranded compacted circular/sector shaped
	f) Direction of lay of stranded layers	Outermost layer shall be R.H lay & opposite in successive layers	
10	Conductor resistance (DC) at 20 °C per km-maximum	0.0469	0.1 / 0.206
11	Insulation		
	a) Composition of insulation	Extruded XLPE as per IS-7098 Part(1)	
	b) Nominal thickness of insulation(mm)	2.8	1.8/1.4
	c) Minimum thickness of insulation	2.42	1.52/1.16
12	Inner Sheath		
	a) Material	Extruded PVC type ST-2 as per IS-5831-84	
	b) Calculated diameter over the laid up cores,(mm)	NA	52
	c) Thickness of Sheath (minimum)mm	NA	0.6
	d) Method of extrusion	NA	Pressure/Vacuum extrusion
13	Armour		
	a) Type and material of armour	Al. Wire[H4 grade]	Gal. Steel wire
	b) Direction of armouring	left hand	
	c) Calculated diameter of cable over inner sheath (under armour), mm	33.9	53.2
	d)Nominal diameter of round armour wire (minimum)	2	2.5
	e)Guranteed Short circuit capacity of the armour for 0.12 sec at room temperature.	45 KA	45 KA
	f) DC resistance at 20 °C (Ω/Km)	\$	0.577
14	Outer Sheath		
	a) Material (PVC Type)	ST-2& FR	ST-2& FR
	b) Calculated diameter under the sheath	38.3	59.50
	c) Min.thickness of sheath(mm)	1.72	2.36
	d) Guaranteed value of minimum oxygen index of outer sheath at 27 °C	Min 29.0	Min 29.0
	e) Guranteed value of minimum temperature index at 21 oxygen index	Min 250	Min 250
	f) colour of sheath	Black	Black
15	a) Nominal Overall diameter of cable	\$	\$
	b) Tolerance on overall diameter (mm)	+2/-2 mm	
16	Cable Drums	shall conform to IS 10418 and technical specification	
	a) Max./ Standard length per drum for each size of cable (single length) with ±5% Tolerance (mtrs)	1000/500	1000/500
	b) Non standard drum lengths	: Maximum one(1) non standard lengths of each cable size may be supplied in drums only over & above the standard lengths asspecified above.(if required for completion of project).	
17	Whether progressive sequential marking on outer sheath provided at 1 meter interval	YES	
18	Identification of cores		
	a) colour of cores	As per IS 7098 Part(1)	
	b) Numbering	NA	
19	Whether Cables offered are ISI marked	YES	
20	Whether Cables offered are suitable for laying as per IS 1255	YES	

\$'- As per manufacturer design data

**STANDARD TECHNICAL DATA SHEET
(1.1 kV GRADE PVC POWER CABLES)**

SN	CUSTOMER :	RECTPCL					
	Name of manufacturer :	As per approved list					
	Cable Sizes	1 c x 150	3.5 cx 70	3.5 cx 35	4 c x 16	4c x 6	2 c x 6
1	Manufacturer's type designation	: AYWaY	AYFY	AYFY	AYFY	AYWY	AYWY
2	Applicable standard	: -----IS: 1554/PT-I/1988 & its referred standards-----					
3	Rated Voltage(volts)	: -----1100 V grade-----					
4	Type & Category	: FR & C1	FR & C1	FR & C1	FR & C1	FR & C1	FR & C1
5	Suitable for earthed or unearthed system	: -----for both-----					
6	Continuous current rating when laid in air in a ambient temp. of 50°C and for maximum conductor temp. of 70 °C of PVC Cables[For information only]	: 202	105	70	41	24	28
7	Rating factors applicable to the current ratings for various conditions of installation:	: x-----As per IS-3961-Pt-II-67-----					
8	Short circuit Capacity						
	a) Short Circuit Amp. (rms)KA for 1 sec duration	: 11.2	5.22	2.61	1.19	0.448	0.448
	b) Conductor temp. allowed for the short circuit duty (deg C.)	: -----160 °C-----					
9	Conductor						
	a) Material	: -----STRANDED ALUMINIUM -----					
	b) Grade	: -----H 2 (Electrolytic grade) -----					
	c) Cross Section area (Sq.mm.)	: 150	M-70 N-35	M-35 N-16	16	6	6
	d) Number of wires(No.)	: -----as per Table 2 of IS 8130 -----					
	e) Form of Conductor	Non-compacted Standed circular	shaped conductor	shaped conductor	shaped conductor	Non-compacted Standed circular	Non-compacted Standed circular
	f) Direction of lay of stranded layers	: ----- Outermost layer shall be R.H lay & opposite in successive layers -----					
10	Conductor resistance (DC) at 20 °C per km-maximum	0.206	0.443/ 0.868	0.868/ 1.91	1.91	4.61	4.61
11	Insulation						
	a) Composition of insulation	: -----Extruded PVC type A as per IS-5831-84-----					
	b) Nominal thickness of insulation(mm)	: 2.1	1.4/1.2	1.2/1.0	1.0	1.0	1.0
	c) Minimum thickness of insulation	: 1.79	1.16/0.98	0.98/0.8	0.8	0.8	0.8
12	Inner Sheath						
	a) Material	: -----Extruded PVC type ST-1 as per IS-5831-84-----					
	b) Calculated diameter over the laid up cores,(mm)	: N.A	27.6	20.4	15.7	11.6	9.6
	c) Thickness of Sheath (minimum)mm	: N.A	0.4	0.3	0.3	0.3	0.3
13	Armour	: ----- as per IS 3975/88 -----					
	a) Type and material of armour	: Al. Wire[H4 grade]	Gal.steel strip	Gal.steel strip	Gal.steel strip	Gal. Steel wire	Gal. Steel wire
	b) Direction of armouring	: -----left hand-----					
	c) Calculated diameter of cable over inner sheath (under armour), mm	: 18	28.4	21	16.3	12.2	10.2
	d) Nominal diameter of round armour wire/strip	: 1.6	4 x 0.8	4 x 0.8	4 x 0.8	1.4	1.4
	e) Number of armour wires/strips	: -----Armouring shall be as close as practicable-----					
	f) Short circuit capacity of the armour along for 1 sec-for info only	: --K x A ^{0.5} t (K Amp)(where A = total area of armour in mm ² & t = time in seconds), K=0.091 for Al & 0.05 for steel					
	g) DC resistance at 20 °C (Ω/Km)	: 0.44	2.57	3.38	3.99	3.76	4.4
14	Outer Sheath						
	a) Material (PVC Type)	: ST-1& FR	ST-1& FR	ST-1& FR	ST-1& FR	ST-1& FR	ST-1& FR
	b) Calculated diameter under the sheath	: 21.2	30.1	22.6	17.9	15	13
	c) Min.thickness of sheath(mm)	: 1.4	1.56	1.4	1.4	1.4	1.24
	d) Guaranteed value of minimum oxygen index of outer sheath at 27°C	: Min 29.0	Min 29.0	Min 29.0	Min 29.0	Min 29.0	Min 29.0
	e) Guranteed value of minimum temperature index at 21 oxygen index	: Min 250	Min 250	Min 250	Min 250	Min 250	Min 250
	f) colour of sheath	: Black	Black	Black	Black	Black	Black
15	a) Overall diameter of cable	: -----S-----					
	b) Tolerance on overall diameter (mm)	: -----+2/-2 mm-----					
16	Cable Drums	: ----- shall conform to IS 10418 and technical specification					
	a) Max./ Standard length per drum for each size of cable (single length) with ±5% Tolerance (mtrs)	1000/500	1000/500	1000/500	1000/500	1000/500	1000/500
	b) Non standard drum lengths	: Maximum one(1) non standard lengths of each cable size may be supplied in drums only over & above the standard lengths as specified above.(if required for completion of project).					
17	Whether progressive sequential marking on outer sheath provided	: ----- YES -----					
18	Identification of cores						
	a) colour of cores	: Red	R,Y,Bl &Bk	R,Y,Bl &Bk	R,Y,Bl &Bk	R,Y,Bl &Bk	Red & Bk
	b) Numbering	: ----- N.A -----					
19	Whether Cables offered are ISI marked	: ----- YES -----					
20	Whether Cables offered are suitable for laying as per IS 1255	: ----- YES -----					

\$'- As per manufacturer design data

TECHNICAL DATA SHEET
(1.1 kV GRADE PVC CONTROL CABLES)

CUSTOMER :	RECTPCL							
SN Name of manufacturer :	As per approved list							
Cable Sizes	2c x 2.5	3c x 2.5	5c x 2.5	7c x 2.5	10c x 2.5	14c x 2.5	19c x 2.5	27c x 2.5
1 Manufacturer's type designation	YWY	YWY	YWY	YWY	YWY	YWY	YWY	YWY
2 Applicable standard	IS: 1554/PT-I/1988 & its referred standards							
3 Rated Voltage(volts)	1100							
4 Type & Category	FR & C1							
5 Suitable for earthed or unearthed system	for both							
6 Continuous current rating when laid in air in a ambient temp. of 50°C and for maximum conductor temp. of 70°C of PVC Cables[For information only]	22	19	19	14	12	10.5	9.7	8
7 Rating factors applicable to the current ratings for various conditions of installation:	As per IS-3961-Pt-II-67							
8 Short circuit Capacity								
a) Short Circuit Amp. (rms)KA for 1 sec-for information only	0.285	0.285	0.285	0.285	0.285	0.285	0.285	0.285
b) Conductor temp. allowed for the short circuit duty (deg C.)	160 °C							
9 Conductor								
a) Material	Plain annealed High Conductivity stranded Copper (as per IS 8130/84)							
b) Grade	Electrolytic							
c) Cross Section area (Sq.mm.)	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
d) Number of wires(No.)	as per Table 2 of IS 8130							
e) Form of Conductor	Non-Compacted stranded circular conductor							
f) Direction of lay of stranded layers	Outermost layer shall be R.H lay							
10 Conductor resistance (DC) at 20 °C per km(maxm	7.41	7.41	7.41	7.41	7.41	7.41	7.41	7.41
11 Insulation								
a) Composition of insulation	Extruded PVC type A as per IS-5831-84							
b) Nominal thickness of insulation(mm)	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
c) Minimum thickness of insulation	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71
12 Inner Sheath								
a) Material	Extruded PVC type ST-I as per IS-5831-84							
b) Calculated diameter over the laid up cores,(mm)	7.2	7.8	9.7	10.8	14.4	15.9	18	22.1
c) Thickness of Sheath (minimum)mm	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
13 Armour	as per IS 3975/99							
a) Type and material of armour	Gal. Steel wire	Gal. Steel wire	Gal. Steel wire	Gal. Steel wire	Gal. Steel wire	Gal. Steel wire	Gal. Steel wire	Gal. Steel wire
b) Direction of armouring	left hand							
c) Calculated diameter of cable over inner sheath (under armour), mm	7.8	8.4	10.3	11.4	15	16.5	18.6	22.7
d) Nominal diameter of round armour wire / dimensions of armour strip	1.4	1.4	1.4	1.4	1.6	1.6	1.6	1.6
e) Number of armour wires	Armouring shall be as close as practicable							
f) Short circuit capacity of the armour and duration-for info only	--0.05 x A ^{0.5} t (K Amp)(where A = total area of armour in mm ² & t = time in seconds)---							
g) DC resistance at 20 °C (Ω/Km) & Resistivity of armour	As per IS 1554 Part(1), wherever applicable & IS 3975-1999							
14 Outer Sheath								
a) Material (PVC Type)	ST-1 & FR ST-1 & FR ST-1 & FR ST-1 & FR ST-1 & FR ST-1 & FR ST-1 & FR ST-1 & FR							
b) Calculated diameter under the sheath	10.6	11.2	13.1	14.2	18.2	19.7	21.8	25.9
c) Min.thickness of sheath(mm)	1.24	1.24	1.24	1.24	1.4	1.4	1.4	1.56
d) Guaranteed value of minimum oxygen index of outer sheath	Min 29.0	Min 29.0	Min 29.0	Min 29.0	Min 29.0	Min 29.0	Min 29.0	Min 29.0
e) Guaranteed value of minimum temperature index at 21 oxygen index	Min 250	Min 250	Min 250	Min 250	Min 250	Min 250	Min 250	Min 250
f) colour of sheath	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey
15 a) Overall diameter of cable	S							
b) Tolerance on overall diameter (mm)	+2/-2 mm							
16 Cable Drums	shall conform to IS 10418 and technical specification							
a) Max./ Standard length per drum for each size of cable (single length) with ±5% Tolerance (mtrs)	1000/500	1000/500	1000/500	1000/500	1000/500	1000/500	1000/500	1000/500
b) Non standard drum lengths	Maximum one(1) non standard lengths of each cable size may be supplied in drums only over & above the standard lengths as specified above.(if required for completion of project).							
17 Whether progressive sequential marking on outer sheath provided	YES							
18 Identification of cores								
a) colour of cores	R & Bk	R,Y & Bl	Y,Bl,Bk&	Grey	Grey	Grey	Grey	Grey
b) Numbering	N.A.	N.A.	N.A.	Numerals in black ink	Numerals in black ink	Numerals in black ink	Numerals in black ink	Numerals in black ink
19 Whether Cables offered are ISI marked	YES							
20 Whether Cables offered are suitable for laying as per IS 1255	YES							

\$'- As per manufacturer design data

VOLUME-II, SECTION-VII
DISTRIBUTION TRANSFORMER

Table of contents

Clause No.	Description
1.0	INTENT
2.0	SCOPE OF WORK
3.0	GENERAL INFORMATION
4.0	TECHNICAL REQUIREMENT
5.0	INSPECTION AND TESTING
6.0	INSPECTION
7.0	FACTORY TEST
8.0	FITTINGS
9.0	SPARE PARTS
10.0	TECHNICAL SPECIFICATION

SECTION DISTRIBUTION TRANSFORMER

1.0 INTENT

This specification is intended to cover outdoor type oil filled 11/0.433KV, 100 KVA/160 KVA transformers.

2.0 SCOPE OF WORK

2.1 Scope of Supply

- Transformers as listed above, with insulating oil, all materials and accessories, and complete in all respects.
- Gland plates, power cable, lugs, anchor bolts and hardwares.
- Mandatory & optional spares and special maintenance equipment's if any.

2.2 Scope of Service

The scope includes but is not limited to the following items of work to be performed for all equipment and materials furnished under this Section:

- a) Design, manufacturing, shop testing, packing & dispatch
- b) Transportation inclusive of insurance and delivery, FOR site basis
- c) Unloading, handling, storing, transportation at site up to foundations, oil filling and treatment, erection, testing and commissioning
- d) Civil Works
- e) Supply of external cables and termination as required.
- f) Fire protection system.

3.0 General Information

- 3.1 All temperature indicators, Buchholz relays and other auxiliary devices shall be suitable for 220/110 V DC Control supply. All alarm and trip Contacts shall also be suitable for connection in 220/110V DC Circuits.

- 3.2 Bidders may specifically note that transformers offered shall conform to dynamic short circuit test and dielectric test as per IEC: 60076. Test report for the same shall be submitted during detail engineering for approval.

4.0 **TECHNICAL REQUIREMENTS**

4.1 **Core**

The core shall be constructed from high grade, non-aging, cold rolled grain-oriented silicon steel laminations. The maximum flux density in any part of the cores and yoke at normal voltage and frequency shall be such that the flux density at any tap position with 12.5% combined voltage & frequency variation from the rated voltage & frequency corresponding to the tap shall not exceed 1.9 Wb/sq-m.

4.2 **Windings**

HV and LV windings shall be wound from Super Enamel covered / Double Paper covered Electrolytic Copper conductor, free from scales and burrs.

4.3 **Insulating Oil**

The oil supplied with transformer shall be unused and have the parameters for unused new oil conforming to IEC: 60296 while tested at oil Contractor's premises. No inhibitors shall be used in oil. Ten percent extra oil shall be supplied for topping up after commissioning in nonreturnable containers suitable for outdoor storage. Oil shall be filtered and tested for break down voltage (BDV) and moisture content before filling. The oil shall be filled under vacuum.

4.4 **Terminal Arrangement**

- a) Bushing terminals shall be provided with suitable terminal connectors of approved type and size for cable/overhead conductor's termination of HV side and cable termination on LV side.
- b) The neutral terminals of 433V winding shall be brought out on a bushing along with the 433 volt phase terminals to form a 4 wire system for the 250 volt. Additional neutral bushing shall also be provided for earthing.

4.5 **Off Circuit Tap Changing Equipment**

The tap Change switch is required for **100/160 KVA DT**. The tap change switch shall be three phase, hand operated for simultaneous switching of similar taps on the three phases by operating an external hand wheel. The Tapping shall be as per provisions of IS: 1180 Part – I

(2014). Each tap change shall result in variation of 2.5% in voltage. Arrangement for pad locking shall be provided. Suitable aluminium anodized plate shall be fixed for tap changing switch to know the position number of tap.

4.6 Marshalling Box

A metal enclosed, weather, vermin & dust proof marshalling box shall be provided with each transformer to accommodate temperature indicators, terminal blocks etc. It shall have a degree of protection of IP 55 as per IS: 13947 / IEC: 60947 Part-1.

4.7 Cable boxes

Whenever cable connections are required, suitable cable boxes shall be provided and shall be air insulated. They shall be of sufficient size to accommodate Employer's cables and shall have suitable removable side/top cover to facilitate cable termination and inspection. Cable boxes shall be dust & vermin proof.

5.0 Inspection and Testing

- a) The Contractor shall draw up and carry out a comprehensive inspection and testing program during manufacture and commissioning of the transformer. The programme shall be duly approved by the Employer.
- b) The Contractor shall carryout all routine tests on all the transformers as per relevant standards. Type test report shall be submitted for approval during detail engineering.

6.0 Inspection

6.1 Tank and Accessories

- a) Physical and dimensional check of transformer tank and accessories.
- b) Crack detection of major strength weld seams by dye penetration test.

6.2 Core

- a) Physical inspection and check of quality of varnish, if used.
- b) Sample testing of core material for checking specific loss, bend properties, magnetization characteristics and thickness.

- c) Check on completed core for measurement of iron loss and check for any hot spot by exciting the core so as to induce the designed value of flux density in the core.
- d) HV Test

6.3 **Insulating Material**

- a) Sample checks for physical properties of the material
- b) Check for dielectric strength
- c) Check for the reaction of hot oil on insulating material

6.4 **Winding**

- a) Sample check on winding conductor for mechanical properties and electrical conductivity and on installation covering.
- b) Sample check on insulation paper for pH value, Bursting strength, Electric strength.

6.5 **Assembled Transformer**

- a) Check complete transformer against approved outline drawing provision for all fittings, finish etc.
- b) Jacking test on all the assembled transformers.

6.6 **Oil**

All Standard tests in accordance with relevant Standards shall be carried out on oil samples taken from the transformer before and after testing of the transformer.

The contractor shall also prepare a comprehensive inspection and testing programme for all bought out sub-contracted items and shall submit the same to the Employer for approval. Such programme shall include the following components:

- a) Buchholz Relay
- b) Winding temperature Indicator
- c) Bushings
- d) Marshaling Box
- e) Tap changer switch
- f) Oil temperature indicator

7.0 **Factory Test**

- 7.1 All standard routine tests in accordance with latest issue of IS: 1180 / IS: 2026 / IEC: 60076 shall be carried out on each transformer.
- 7.2 The transformer shall conform to all the type tests in accordance with latest issues of IS: 1180 / IS: 2026 / IEC: 60076. The manufacturer shall submit type tests & additional test reports as listed above as already carried out on transformers of identical design for owner's acceptance. In such a case validity of type test reports shall be in line with clause 9.2 of Section 2-GTR of technical specifications. Following parameters in general shall be ensured for establishment of identical design as per IEC: 60076, Part-V.
- a) Same Voltage ratio, KVA rating, vector group & impedance.
 - b) Same conceptual design of core and winding.
 - c) Same arrangement and geometrical sequence of the main windings.
 - d) Same type of winding conductors.
 - e) Same type of main windings.
 - f) Absorbed power at short circuit (i.e. rated power/per unit short circuit impedance) between 30% and 130% of that relating to the reference transformer.
 - g) Axial forces and winding stresses occurring at short circuit not exceeding 120% of those relating to the reference transformer.
 - h) Same manufacturing process.
 - i) Same Clamping and winding support arrangement.
- 7.3 In addition to all type and routine tests, transformer shall also conform to following additional type tests as per IS: 1180 / IS: 2026 / IEC: 60076.
- a) Measurement of zero sequence impedance
 - b) Short circuit test
 - c) Measurement of acoustic noise level. This shall conform to NEMA standard publication TR-1.
 - d) Measurement of capacitance and tan delta of transformer winding.
 - e) Test on oil samples as per IS: 60296
- 7.4 All auxiliary equipment shall be tested as per the relevant IS Test Certificates shall be submitted for bought out items.
- 7.5 High voltage withstand test shall be performed on auxiliary equipment and wiring after complete assembly.

7.6 Tank Tests:

- i) Routine Tests: As per IEC: 60076 Part-1 including
- ii) Vacuum Tests: As per IEC: 60076 Part-1
- iii) Pressure Test: As per IEC: 60076 Part-1

7.7 In addition to the above, the following checks should be carried out at manufacturer's works before despatch for all transformers:

- a) Check for interchangeability of components of similar transformers and for mounting dimensions.
- b) Check for proper packing and preservation of accessories like radiators, bushings explosion vent, dehydrating breather, Buchholz relay, conservator etc.
- c) Check for proper provision of bracings to arrest the movements of core and winding assembly inside the tank.
- d) Test for gas tightness and derivation of leakage rate. To ensure adequate reserve gas capacity during transit and storage.

7.8 The Contractor shall submit a detailed inspection and testing programme for field activities, covering areas right from the receipt of material stage up to commissioning stage as per IS: 1886 - Code of practice for installation and maintenance of transformers. The indicative checks and tests are given below.

- a) Physical checks on each transformer on receipt at site for any damage or short supply.
- b) Tests on oil samples
- c) Oil leakage test
- d) Physical checks for colour of silica in breather
- e) Check for oil level in breather housing, conservator tank, etc.
- f) Check for correct operation of all protections and alarms.
- g) Insulation Resistance Measurement for Main Winding, control wiring etc.
- h) Continuously observe the transformer operation at no load for 24 hours.

8.0 **Fittings**

The following fittings shall be provided with each transformer covered under this specification.

- i) Conservator with drain plug and oil filling hole with blanking plate
- ii) Plain oil Gauge
- iii) Silica gel Breather
- iv) Pressure Relief vent

- v) Pocket on tank cover for Thermometer
- vi) Valves
- vii) Earthing Terminals
- viii) Rating & Terminal Marking Plates
- ix) Lifting Lugs
- x) Rollers
- xi) Air Release Plug

The fittings listed above are only indicative and any other fittings which generally are required for satisfactory operation of transformer are deemed to be included.

9.0 Spare Parts

- 9.1 The list of spares for outdoor type transformers covered under this Section shall be as specified below:

Sr. No.	Item Description	Unit	Quantity
1	2	3	4
	LT Transformer (100 kVA)		
1	Bushings	No.	1no. of each type
2	OTI & WTI with sensing device	No	1no. of each type
3	Diaphragm for pressure relief vent	No.	1
4	Silica gel container	No.	1
5	Set of Valves	No.	1no. of each type
6	Buchholz relay (if applicable)	No.	1

- 9.2 In addition, the Bidder shall also recommend optional spare parts and maintenance equipment necessary for three (3) years of successful operation of the equipment. The prices of these shall be indicated in respective schedules and these shall not be considered for the purpose of evaluation.

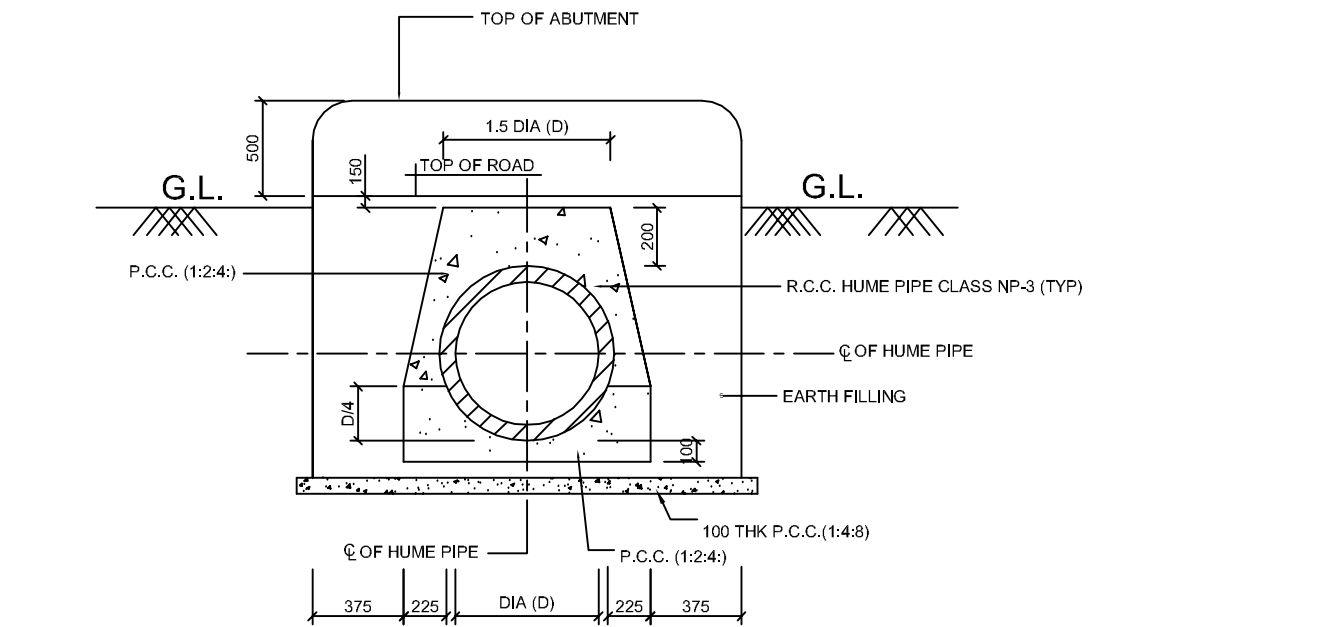
10.0 Technical Specification

S No	Description	Unit	Parameters
1	Rated Capacity	kVA	100/160
2	Rated Voltage		
a)	HV	kV	11
b)	LV	kV	0.433

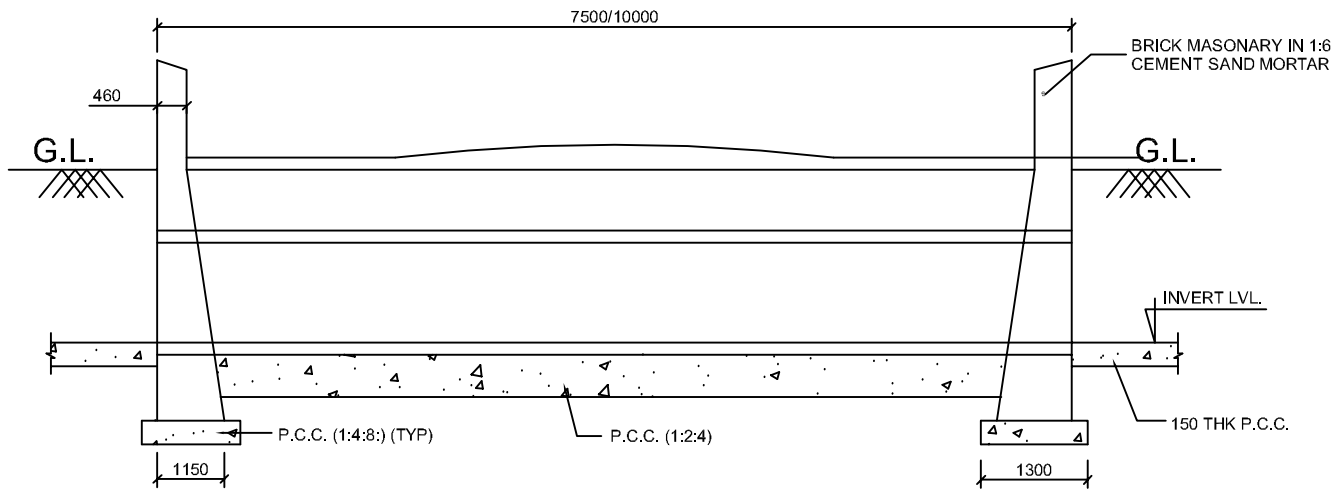
S No	Description	Unit	Parameters
3	Type of Winding		Two Winding
4	Service		Outdoor
5	No of Phases	No.	Three
6	Frequency	Hz	50
7	Type of Cooling		ONAN
8	Impedance at 75 Deg C	%	4.5
9	Tolerance on Impedance	%	±10
10	Duty		Continuous
11	Overload		IS:6600
12	Max. Temp. Rise over an ambient of 50 Deg C		
a)	Oil (Temperature rise measurement by thermometer)	°C	35
b)	Winding Temperature rise measurement by resistance method)	°C	40
13	Windings		
a)	System Apparent Short circuit level (kA)		As per IEC: 60076-Part 1
b)	Winding Connection		
(i)	HV		Delta
(ii)	LV		Star
14	Vector Group		Dyn1
15	Insulation		Uniform
16	Insulation Level	kVrms	
a)	Power Frequency Test Level		
(i)	HV	kVrms	28
(ii)	LV	kVrms	3
17	Basic Impulse Level		
(i)	HV	kVp	75

S No	Description	Unit	Parameters
(ii)	LV	kVp	-
18	Highest voltage (kV) for each winding	kV	12
19	Method of earthing		Solidly earthed
20	Tap changer		
a)	(i) Tap Change		+2.5% to -5% in step of 2.5% on HV side
b)	(ii) Tap control		Off Circuit Tap Change Switch
21	HV Bushing		
a)	Rated Voltage	kV	17.5
b)	Rated current	A	100
c)	Basic Impulse Level (kVp)	kVp	95
d)	Wet & Dry Power frequency Withstand Voltage	kVrms	38
e)	Min. Total Creepage Distance	mm	437.5
f)	Mounting		Tank / Transformer Body
22	LV & Neutral Bushing		
a)	Rated Voltage	kV	1.1
b)	Rated current	A	630
c)	Basic Impulse Level (kVp)	kVp	-
d)	Wet & Dry Power frequency Withstand Voltage	kVrms	10 & 12
e)	Mounting		Tank / Transformer Body
23	Terminal Details		
a)	HV		Suitable for 11kV Cable or Over Head Conductor
b)	LV & Neutral		Cable Box
24	Min. Clearance in Air	mm	
a)	Ph-Ph (HV/LV)	mm	255/75

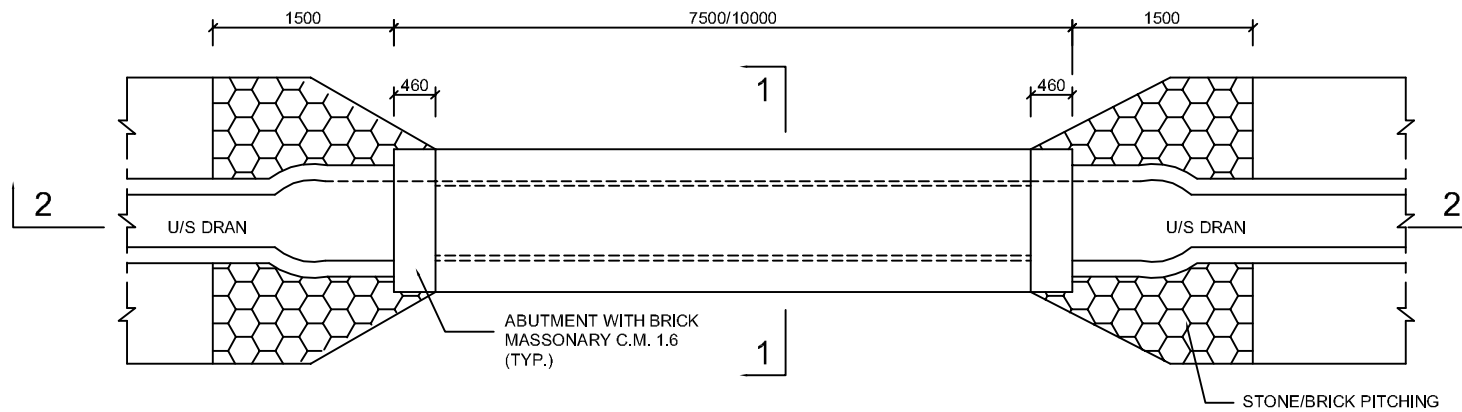
S No	Description	Unit	Parameters
b)	Ph-Earth (HV/LV)	mm	140/40
24	Losses		
	-Total loss (No load loss + load loss at 75degC) at 50% of rated load		Should not be more than 475W
	-Total loss at 100% of rated load		Should not be more than 1650W
25	Audible noise at rated voltage & frequency		51 decibels



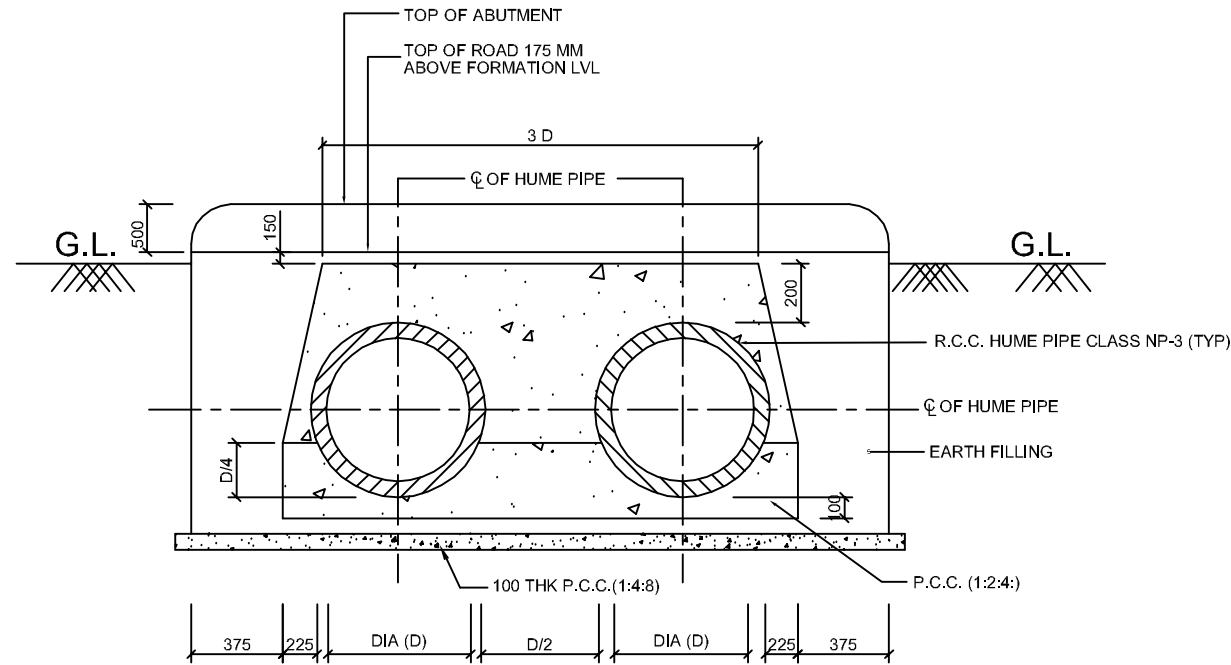
SECTION 1-1 FOR SINGLE PIPE



SECTION 2-2



PLAN OF PIPE CULVERT



SECTION 1-1 FOR DOUBLE PIPE CULVERT

NOTES:-

1. ALL DIMENSIONS ARE IN MM.
2. DO NOT SCALE THE DRG.
3. WORK SHALL BE DONE AS PER C.P.W.D. SPECIFICATION.

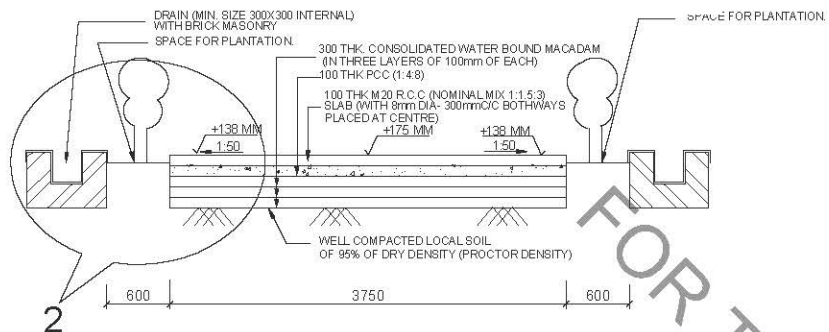
RELEASED FOR TENDER

REC TRANSMISSION PROJECTS COMPANY LIMITED

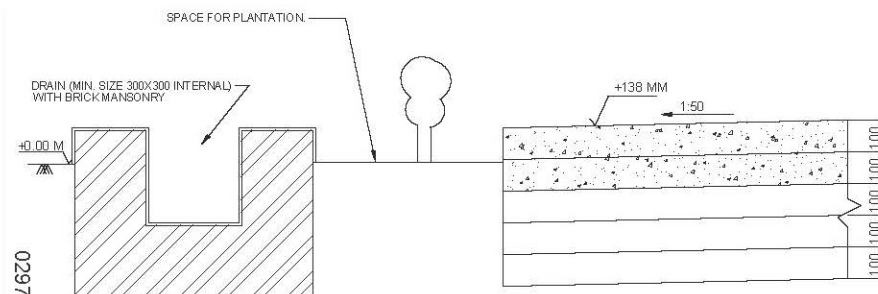
PROJECT : Residential Staff Quarter of Lassipora GIS Substation

TITLE : DETAIL OF ROAD CULVERTS

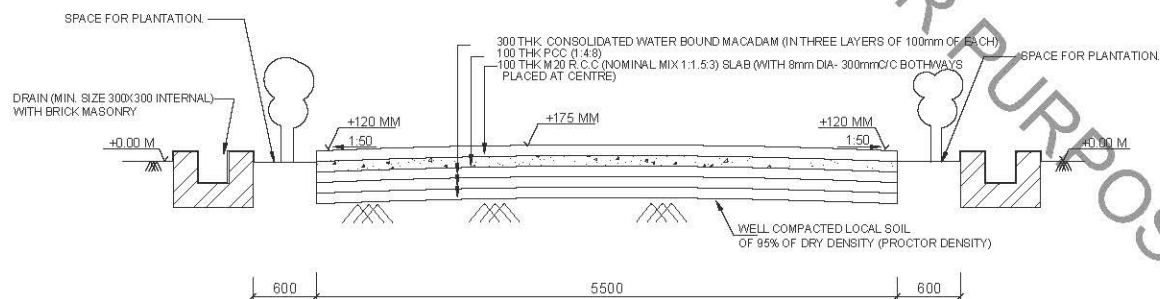
SHEET 1 OF 1



TYP. CROSS SECTION OF 3.75 M WIDE ROAD
(VALID FOR SWITCHYARD INTERNAL ROADS)



DETAIL - 2



TYP. CROSS SECTION OF 5.5 M WIDE ROAD
(VALID FOR APPROACH TO SWITCHYARD)

NOTES:

1. ALL DIMENSION ARE IN MM UNLESS NOTED OTHERWISE
2. CAMBER OF 1:50 SHALL BE PROVIDED
3. EXPANSION JOINT (12 MM THICK) SHALL BE PROVIDED AT EVERY 80M.
4. EXPANSION JOINT SHALL ALSO BE PROVIDED AT CENTRE
5. POLYTHENE SHEET OF 125 MICRONS SHALL BE PLACED BETWEEN THE PCC AND RCC SLAB. (TOP SLAB)
6. 100MM DIA. RCC HUME PIPE (NP-3) SHALL BE PLACED ACROSS THE ROAD AT EVERY 100M INTERVAL ALONG THE ROAD.
6. FINISHED TOP OF ROAD CREST SHALL BE 175 MM (MIN.) ABOVE F.G.L. (SWITCHYARD FORMATION LEVEL)

RELEASED FOR TENDER

REC TRANSMISSION PROJECTS COMPANY LTD.

PROJECT : 765 / 400 / 220 Kv SUBSTATIONS

TITLE : DETAIL OF CONCRETE ROAD (RIGID PAVEMENT)

REC TRANSMISSION PROJECTS COMPANY LIMITED



On Behalf of J&K Power Transmission Corporation Ltd. (JKPTCL erstwhile JKPDD)

As Project Implementation Agency

(Invites bid through e-Tendering mode only)

**FOR
TURNKEY CONTRACT PACKAGE OF**

“Design, Engineering, Supply & Construction of Residential Staff Quarters & associated facilities at 160 MVA, 220/33 kV Gas Insulated Substation (GIS) at Lassipora(Srinagar Region) on Turnkey Basis associated with Strengthening of Transmission System of JKPTCL under PMDP Scheme-15”.

**Tender Specification No- RECTPCL/PIA/JKPTCL/Lassipora-Qtr/01 of 2020 dated:
19-07-2020**

VOL-III

July 2020

REC Transmission Projects Company Limited
(A wholly owned subsidiary of REC, a 'Navratna CPSE'
Under the Ministry of Power, Govt of India)
ECE House, 3rd Floor, Annexe – II,
28 A, K G MARG, NEW DELHI – 110 001
Website: www.rectpcl.in

General guidelines for filling up the Attachments	
"Design, Engineering, Supply & Construction of Residential Staff Quarters & associated facilities at 160 MVA, 220/33 kV Gas Insulated Substation (GIS) at Lassipora(Srinagar Region) on Turnkey Basis associated with Strengthening of Transmission System of JKPTCL under PMDP Scheme-15".	
Tender Pakage No.:-RECTPCL/PIA/JKPDD/QTR/01	
1	Fill up only green shaded cells in the relevent attachments.
2	Attachments 3(IV),3(QR), 4, 5, 5(A) 6, 7, 8, 10, 12, 13 Bid Form for 1st Envelope are included here.
3	Attachment 1 Bid Security : To be submitted as per performa provided in the Bidding Document.
4	Attachment 2 Power of Attorney : Bidder shall use prescribed format as provided in Section IX, Vol-I
6	Attachment 09 Integrity Pact : To be submitted as per ITB Clause No. 9.3(o) and as per remarks in the Attach 09.
7	Attachment 11 Safety Pact : To be submitted as per ITB Clause No. 9.3 (s) and as per remarks in the Attach 11.
Click for Detailed General Instructions	Click to skip Instructions & Proceed
REC Transmission Projects Company Limited (A wholly owned subsidiary of REC, a 'Navratna CPSE' Under the Ministry of Power, Govt of India) ECE House, 3rd Floor, Annexe – II, 28 A, K G MARG, NEW DELHI – 110 001 Website: www.rectpcl.in	

“Design, Engineering, Supply & Construction of Residential Staff Quarters & associated facilities at 160 MVA, 220/33 kV Gas Insulated Substation (GIS) at Lassipora (Srinagar Region) on Turnkey Basis associated with Strengthening of Transmission System of JKPTCL under PMDP Scheme-15”.

Tender Pakage No.:- RECTPCL/PIA/JKPDD/QTR/01

Enter following details of the bidder

Specify type of Bidder
[Select from drop down menu]

Sole Bidder

Name of the Sole Bidder

Address of the Sole Bidder

Name of other Partner - 2

Address of other Partner-2

Printed Name

Designation

Date :

Place :

Tender Package No.:-RECTPCL/PIA/JKPTCL/Lassipora-Qtr/01		Attachment-3(IV)	
Design, Engineering, Supply & Construction of Residential Staff Quarters & associated facilities at 160 MVA, 220/33 kV Gas Insulated Substation (GIS) at Lassipora(Srinagar Region) on Turnkey Basis associated with Strengthening of Transmission System of JKPTCL under PMDP Scheme-15.			
(Joint Venture Agreement and Power of Attorney for Joint Venture*)			
Bidder's Name and Address:		To,	
Name :		REC Transmission Projects Company Limited (A wholly owned subsidiary of REC, a 'Navratna CPSE' Under the Ministry of Power, Govt of India) ECE House, 3rd Floor, Annexe - II, 28 A, K G MARG, NEW DELHI - 110 001 Website: www.rectpcl.in	
Address :			



Dear Sir,

The Joint Venture Agreement (as per the proforma attached at no. 13 in Section-IX, Sample Forms and Procedures, Conditions of Contract, Vol.- I of the Bidding Documents) and Power of Attorney for Joint Venture (as per the proforma attached at no. 12 in Section-IX, Sample Forms and Procedures, Conditions of Contract, Vol.- I of the Bidding Documents) are enclosed herewith.

Date :	0	Printed Name :	0
Place :	0	Designation :	0

Tender Pakage No.:-RECTPCL/PIA/JKPTCL/Lassipora-Qtr/01		Attachment-3(QR)	
"Design, Engineering, Supply & Construction of Residential Staff Quarters & associated facilities at 160 MVA, 220/33 kV Gas Insulated Substation (GIS) at Lassipora(Srinagar Region) on Turnkey Basis associated with Strengthening of Transmission System of JKPTCL under PMDP Scheme-15".			
(Qualifying Requirement Data)			
Bidder's Name and Address:		To, REC Transmission Projects Company Limited (A wholly owned subsidiary of REC, a 'Navratna CPSE' Under the Ministry of Powe, Govt of India) ECE House, 3rd Floor, Annexe - II, 28 A, K G MARG, NEW DELHI - 110 001 Website: www.rectpclin	
Name :			
Address :			
For our Qualifying Requirements Data, please refer Schedule-QR of this VOLUME			
Date :	0	Printed Name :	0
Place :	0	Designation :	0



Tender Package No.:RECTPCL/PIA/JKPTCL/Lassipora-Qtr/01		ATTACHMENT-4	
"Design, Engineering, Supply & Construction of Residential Staff Quarters & associated facilities at 160 MVA, 220/33 kV Gas Insulated Substation (GIS) at Lassipora(Srinagar Region) on Turnkey Basis associated with Strengthening of Transmission System of JKPTCL under PMDP Scheme-15".			
(Alternative, Deviations and Exceptions to the Provisions)			
Bidder's Name and Address:		To,	
Name :		REC Transmission Projects Company Limited (A wholly owned subsidiary of REC, a 'Navratna CPSE' Under the Ministry of Power, Govt of India)	
Address :		ECE House, 3rd Floor, Annexe – II, 28 A, K G MARG, NEW DELHI – 110 001 Website: www.rectpcl.in	
Dear Sir,			
The bidder shall itemize any deviation from the Specifications included in his bid. Each item shall be listed (separate sheets may be used and enclosed with this Attachment) with the following information:			
Sl. No.	Reference clause in the Specifications	Deviation	Cost of withdrawal of the deviation
1	NOT APPLICABLE		
2			
We agree that any deviations, conditionality or reservation introduced in this Attachment-6 will be reviewed by RECTPCL to conduct a determination of the substantial responsiveness of the bid.			
Date :	0	Printed Name :	0
Place :	0	Designation :	0



Click here for next attachment

Tender Package No.:-RECTPCL/PIA/JKPTCL/Lassipora-Qtr/01		Attachment 5	
"Design, Engineering, Supply & Construction of Residential Staff Quarters & associated facilities at 160 MVA, 220/33 kV Gas Insulated Substation (GIS) at Lassipora(Srinagar Region) on Turnkey Basis associated with Strengthening of Transmission System of JKPTCL under PMDP Scheme-15".			
(Information regarding Ex Employees of Employer in Bidder Firm)			
Bidder's Name and Address :		To,	
Name :		REC Transmission Projects Company Limited (A wholly owned subsidiary of REC, a 'Navratna CPSE' Under the Ministry of Power, Govt of India)	
Address :		ECE House, 3rd Floor, Annexe - II, 28 A, K G MARG, NEW DELHI - 110 001 Website: www.rectpcl.in	
Dear Sir, 1.We hereby furnish the details of Information regarding Ex Employees of Employer in Bidder Firm :			
Sl. No.	Name	Designation	Concern Project
1			
2			
3			
Date :	0	Printed Name :	0
Place :	0	Designation :	0



Tender Package No.:RECTPCL/PIA/JKPTCL/Lassipora-Qtr/01			ATTACHMENT-5A	
"Design, Engineering, Supply & Construction of Residential Staff Quarters & associated facilities at 160 MVA, 220/33 kV Gas Insulated Substation (GIS) at Lassipora(Srinagar Region) on Turnkey Basis associated with Strengthening of Transmission System of JKPTCL under PMDP Scheme-15".				
(Items, Components, Raw Material, Services proposed to be sourced from Micro and Small Enterprises)				
Bidder's Name and Address :			To:	
Name :			REC Transmission Projects Company Limited (A wholly owned subsidiary of REC, a 'Navratna CPSE' Under the Ministry of Power, Govt of India)	
Address :			ECE House, 3rd Floor, Annexe - II, 28 A, K G MARG, NEW DELHI - 110 001 Website: www.rectpcl.in	
Dear Sir,				
1. We hereby furnish the details of the items, components, raw material, services which we propose to buy/avail from Micro and Small Enterprises (MSEs) for the purpose of completion of works under the subject package :				
Sl. No.	Item Description	Quantity proposed to be brought/sub-contracted	Name of Micro and Small Enterprises (MSEs)	
			Name	Category (Micro or Small)
1				
2				
3				
4				
5				
2. The above is a list of items we propose to procure from MSEs. However, based on the situations during the execution of the contract, the above list may undergo changes. We hereby confirm that the details regarding actual procurement from MSEs carried out by us, as per the format provided at Section IX, Forms and Procedures, Volume-I of bidding documents, shall be submitted along with the bills for payment against supplies made/works done during execution of contract.				
Date :	0	Printed Name :	0	
Place :	0	Designation :	0	



Click here for next

Tender Package No.:-RECTPCL/PIA/JKPTCL/Lassipora-Qtr/01		Attachment-6	
"Design, Engineering, Supply & Construction of Residential Staff Quarters & associated facilities at 160 MVA, 220/33 kV Gas Insulated Substation (GIS) at Lassipora(Srinagar Region) on Turnkey Basis associated with Strengthening of Transmission System of JKPTCL under PMDP Scheme-15".			
(Work Completion Schedule)			
Bidder's Name and Address:		To, REC Transmission Projects Company Limited (A wholly owned subsidiary of REC, a 'Navratna CPSE' Under the Ministry of Power, Govt of India) ECE House, 3rd Floor, Annexe – II, 28 A, K G MARG, NEW DELHI – 110 001 Website: www.rectpcl.in	
Name :			
Address :			
Dear Sir, We hereby declare that the following Work Completion Schedule shall be followed by us in furnishing and installation of the subject Package i.e., "Design, Engineering, Supply & Construction of Residential Staff Quarters & associated facilities at (a) 160 MVA, 220/33 kV Gas Insulated Substation (GIS) at Lassipora(Srinagar Region) and (b) 100 MVA, 220/33 kV AIS at Nagrota (Jammu Region) on Turnkey Basis associated with Strengthening of Transmission System of JKPTCL under PMDP Scheme-15"			
Sl. No.	Description of Work	Period in months from the effective date of contract	
1	Detailed Engineering and drawing submission		
	a) commencement		
	b) completion		
2	Procurement of equipment/ components & assembly		
	a) commencement		
	b) completion		
3	Type Tests		
	a) commencement		
	b) completion		
4	Manufacturing		
	a) commencement		
	b) completion		
5	Shipments & Delivery		
	a) commencement		
	b) completion		
6	Establishment of site office		
7	Installation at Site		
	a) commencement		
	b) completion		
8	Testing & Pre-commissioning		
	a) commencement		
	b) completion		
9	Trial Operation		
	a) commencement		
	b) completion		
Date :	0	Printed Name :	0
Place :	0	Designation :	0
Note :	Bidders to enclose a detailed network covering all the activities to be undertaken for completion of the project indicating key dates for various milestones for each phase constituent-wise.		

Tender Package No.:RECTPCL/PIA/JKPTCL/Lassipora-Qtr/01		Attachment-7	
"Design, Engineering, Supply & Construction of Residential Staff Quarters & associated facilities at 160 MVA, 220/33 kV Gas Insulated Substation (GIS) at Lassipora(Srinagar Region) on Turnkey Basis associated with Strengthening of Transmission System of JKPTCL under PMDP Scheme-15".			
(Declaration regarding Social Accountability)			
Bidder's Name and Address:		To, REC Transmission Projects Company Limited (A wholly owned subsidiary of REC, a 'Navratna CPSE' Under the Ministry of Power, Govt of India) ECE House, 3rd Floor, Annexe – II, 28 A, K G MARG, NEW DELHI – 110 001 Website: www.rectpcl.in	
Name :			
Address :			
Dear Sir, We conform that we stand committed to comply to all requirements of Social Accountability Standards i.e., SA8000 (latest Standard available at www.sa-intl.org) and maintain the necessary records.			
Date :	0	Printed Name :	0
Place :	0	Designation :	0

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attachment

Tender Package No.: REC/TPL/PLA/BP/CL/Lampara/Qtr/01		Attachment 0	
"Design, Engineering, Supply & Construction of Residential Staff Quarters & associated facilities at 1.66 MW, 220/23 KV Gas Insulated Substation (GIS) at Lampara/Chiranga Region on "Tender Basis" associated with Strengthening of Transmission System of BPPL, under PMSP Scheme-02"			
Price Adjustment: Nil			
Bidder's Name and Address:		To:	
Name :		REC Transmission Projects Company Limited (A wholly owned subsidiary of REC, a "Navratna CPSE" Under the Ministry of Power, Govt of India)	
Address:		REC House, 3rd Floor, Annex - II, 2nd & R.C. ROAD, NEW DELHI - 110 001 Website: www.recpl.in	
NOT APPLICABLE			
Date :	0	Printed Name :	0
Place :	0	Designation :	0

Click Here for next attachment

Tender Package No.:-RECTPCL/PIA/JKPTCL/Lassipora-Qtr/01		Attachment-9	
"Design, Engineering, Supply & Construction of Residential Staff Quarters & associated facilities at 160 MVA, 220/33 kV Gas Insulated Substation (GIS) at Lassipora(Srinagar Region) on Turnkey Basis associated with Strengthening of Transmission System of JKPTCL under PMDP Scheme-15".			
Integrity Pact			
Bidder's Name and Address:		To, REC Transmission Projects Company Limited (A wholly owned subsidiary of REC, a 'Navratna CPSE' Under the Ministry of Power, Govt of India) ECE House, 3rd Floor, Annexe - II, 28 A, K G MARG, NEW DELHI - 110 001 Website: www.rectpcl.in1	
Name :			
Address :			
Bidders are requested to refer Section-IX of VOL-I for the format of			
Date :	0	Printed Name :	0
Place :	0	Designation :	0

Click here for next attachment



Tender Package No.:-RECTPCL/PIA/JKPTCL/Lassipora-Qtr/01		Attachment-10		
"Design, Engineering, Supply & Construction of Residential Staff Quarters & associated facilities at 160 MVA, 220/33 kV Gas Insulated Substation (GIS) at Lassipora(Srinagar Region) on Turnkey Basis associated with Strengthening of Transmission System of JKPTCL under PMDP Scheme-15".				
(Additional Information)				
Bidder's Name and Address (Sole Bidder) :		To, REC Transmission Projects Company Limited (A wholly owned subsidiary of REC, a 'Navratna CPSE' Under the Ministry of Power, Govt of India) ECE House, 3rd Floor, Annexe - II, 28 A, K G MARG, NEW DELHI - 110 001 Website: www.rectpcl.in		
Name :				
Address :				
Dear Sir In support of the additional information required as per ITB Sub-Clause 9.3 (p) of the Bidding Documents, we furnish herewith our data/details/documents etc., alongwith other information, as follows (the stipulations have been reproduced in italics for ready reference):				
1.0	The Bidder shall furnish a certificate from their Banker(s) (as per prescribed formats in Form 16, Section-IX: Sample Forms and Procedures) indicating various fund based/non fund based limits sanctioned to the Bidder and the extent of utilization as on date. Such certificate should have been issued not earlier than three months prior to the date of bid opening. Wherever necessary the Employer may make queries with the Bidders' Bankers. [Reference ITB clause 9.3(p)(i)]			
1.1	In accordance with 1.0, certificate(s) from banker as per requisite format, indicating various fund based/non fund based limits sanctioned to the bidder or each member of the joint venture and the extent of utilization as on date is/are enclosed, as per the following details:			
	Name of the Bidder (Sole Bidder)			
	Name of the Banker by whom certificate issued			
	Date of certificate (should not be earlier than 3 months prior to date of bid opening)			
	Whether fund based/non fund based limits are indicated in the certificate			
	Whether extent of utilization is indicated in the certificate			
1.2	The Bidder should accordingly also provide the following information/documents			
(i) Details of Banker:				
	Name of Banker			
	Address of Banker			
	Telephone No.			
	Contact Name and			
	Fax No.			
	E-mail ID			
(ii) As per para 1.0, Authorization Letter(s) from the bidder (in case of JV bidder, from all the partners) addressed to the Banker(s), authorizing POWERGRID to seek queries about the bidder with the Banker(s) and advising the Banker(s) to reply the same promptly, is/are enclosed as per following details:				
	Sl.	Letter Ref.	Date	Addressed to (name of the Bank)
	1			
	2			
(iii) As per para ITB clause 9.3 q, Bidder shall furnish the details of their Provident Fund Code Number				
	Sl. No.	Name of Bidders/JV Partners	Provident Fund Code	Details
	1			
	2			
2.0	Litigation History			
The bidder should provide detailed information on any litigation or arbitration arising out of contracts completed or under execution by it over the last five years. A consistent history of awards involving litigation against the Bidder or any partner of JV may result in rejection of Bid. [Reference ITB clause 9.3(p)(ii)]				
2.1	Details of litigation history resulting from Contracts completed or under execution by the bidder over the last five years			

Click here for next attachment

	Year	Name of client, cause of litigation/arbitration and matter in dispute				Details of Contract and date		Award for or against the bidder		Disputed amount		
	1											
	2											
	3											
	4											
	5											
3.0	OTHER INFORMATION											
3.1	Current Contract Commitments of works											
	Bidders (individual firms or each partners of JV) should provide information on their current commitments on all contracts that have been awarded, or for which a letter of intent or acceptance has been received, or for contracts approaching completion, but for which an unqualified, full completion certificate has yet to be issued.											
	Details of Contract				Value of outstanding work (Rs.)				Estimated completion date			
3.2	Financial Data:											
	Figures Rs in											
	Details		Actual (Previous five years)					Projection for next five years				
		2016 - 2017	2015 - 2016	2014- 2015	2013 - 2014	2012 - 2013	2017- 2018	2018- 2019	2019- 2020	2020- 2021	2021-2022	
	Total Assets											
	Current Assets											
	Total Liability											
	Current Liability											
	Profit before taxes											
	Profit after taxes											
4	Details of provident fund for no. of the bidder (ref. ITB9.3(q))											
Date :	0				Printed Name :				0			
Place :	0				Designation :				0			

Tender Package No.: RECTPCL/PIA/JKPTCL/Lassipora-Qtr/01		Attachment-11	
"Design, Engineering, Supply & Construction of Residential Staff Quarters & associated facilities at 160 MVA, 220/33 kV Gas Insulated Substation (GIS) at Lassipora(Srinagar Region) on Turnkey Basis associated with Strengthening of Transmission System of JKPTCL under PMDP Scheme-15".			
(Safety Pact)			
Bidder's Name and Address:		TO,	
Name :		REC Transmission Projects Company Limited	
		(A wholly owned subsidiary of REC, a 'Navratna CPSE'	
		Under the Ministry of Power, Govt of India)	
		ECE House, 3rd Floor, Annexe – II,	
		28 A, K G MARG, NEW DELHI – 110 001	
Address :		Website: www.rectpcl.in	
Dear Sir,			
Bidders are requested to refer Section-IX of VOL-I for the format of SAFETY PACT			
Date :	0	Printed Name :	0
Place :	0	Designation :	0

Click here for next attachment



Tender Package No.:-RECTPCL/PIA/JKPTCL/Lassipora-Qtr/01		Attachment-12	
"Design, Engineering, Supply & Construction of Residential Staff Quarters & associated facilities at 160 MVA, 220/33 kV Gas Insulated Substation (GIS) at Lassipora(Srinagar Region) on Turnkey Basis associated with Strengthening of Transmission System of JKPTCL under PMDP Scheme-15".			
(Declaration)			
Bidder's Name and Address:		To,	
Name :		REC Transmission Projects Company Limited (A wholly owned subsidiary of REC, a 'Navratna CPSE' Under the Ministry of Power, Govt of India) ECE House, 3rd Floor, Annexe - II, 28 A, K G MARG, NEW DELHI - 110 001 Website: www.rectpcl.in	
Address :			
Dear Sir, We confirm that Bid Form and Price Schedules in the Second Envelope have been filled up by us as per the provisions of the Instruction to Bidders. Further, we have noted that the same shall be evaluated as per the provisions of the Bidding Documents. Further, we hereby confirm that except as mentioned in the Attachment - 4 (Alternative, Deviations and Exceptions to the Provisions) hereof forming part of our First Envelope : (i) there are no discrepancies/inconsistencies and deviations/omissions/ reservations to the Bidding Documents, in the Second Envelope bid; (ii) the description of items and the unit thereof in the price schedules in the Second Envelope bid are in conformity with those indicated in the price schedule of the Bidding Documents without any deviation to the specified scope of work. We also confirm that in case any discrepancies/ inconsistencies and deviations/ omissions/ reservations, as referred to in para (i) and (ii) above, is observed in the Second Envelope, the same shall be deemed as withdrawn/rectified without any financial implication, whatsoever to RECTPCL. However, in case of any arithmetical errors, the same shall be governed as per the provision of ITB Sub-Clause 27.2 .			
Date :	0	Printed Name :	0
Place :	0	Designation :	0

Click here for next attachment

Tender Pakage No.:-RECTPCL/PIA/JKPTCL/Lassipora-Qtr/01		Attachment-13	
"Design, Engineering, Supply & Construction of Residential Staff Quarters & associated facilities at 160 MVA, 220/33 kV Gas Insulated Substation (GIS) at Lassipora(Srinagar Region) on Turnkey Basis associated with Strengthening of Transmission System of JKPTCL under PMDP Scheme-15".			
(AFFIDAVIT)			
		To, REC Transmission Projects Company Limited (A wholly owned subsidiary of REC, a 'Navratna CPSE' Under the Ministry of Power, Govt of India) ECE House, 3rd Floor, Annexe - II, 28 A, K G MARG, NEW DELHI - 110 001 Website: www.rectpcl.in	
Name :			
Address :			
Dear Sir, Bidder has to submit the signed and stamped Affidavit with company seal by a full time Director/ CEO/ Chairman-cum-Managing Director and attested/ notarized by a Magistrate/ Notary for correctness of all the information/details/data/documentary evidences etc. as submitted by the bidder are correct.			
Date :	0	Printed Name :	0
Place :	0	Designation :	0



LEGENDS

Service Unit Description		
S.No	Legend	Description
1	B50	BAG PER 50 KG OF CEMENT
2	CM	Centimeter
3	EA	each
4	JHR	Years
5	KG	Kilogram
6	KL	Kilolitre
7	KM	Kilometer
8	L	Liter
9	LOT	LOT
10	LS	LUMP SUM
11	M	Meter
12	M2	Square meter
13	M3	Cubic meter
14	MND	MAN DAYS
15	MNW	MAN WEEKS
16	MT	Metric Ton
17	PAA	Pair
18	QTL	QUINTAL
19	RM	RUN. MTR.
20	SET	SET
21	STD	Hours
22	TAG	Days
23	DAY	Days
24	YR	Years

Material Unit Description		
S.No	Legend	Description
1	EA	each
2	FT	Foot
3	FT2	Square foot
4	G	Gram
5	H	Hour
6	KG	Kilogram
7	KL	Kilolitre
8	KM	Kilometer
9	L	Liter
10	LOT	LOT
11	LS	LUMP SUM
12	M	Meter
13	M2	Square meter
14	ML	Milliliter
15	MON	Months
16	MT	Metric Ton
17	PAA	Pair
18	RM	RUN. MTR.
19	ROL	Role
20	SET	SET
21	PAK	Pack
22	CS	Case
23	TAG	Days

TENDER PACKAGE No.:-RECTPCL/PIA/JKPTCL/Lassipora-Qtr/01								Schedule 1			
Tender Package: "Design, Engineering, Supply & Construction of Residential Staff Quarters & associated facilities at 160 MVA, 220/33 kV Gas Insulated Substation (GIS) at Lassipora(Srinagar Region) on Turnkey Basis associated with Strengthening of Transmission System of JKPTCL under PMDP Scheme-15".											
(SCHEDULE OF RATES AND PRICES)											
Bidder's Name and Address :							To: REC Transmission Projects Company Limited (A wholly owned subsidiary of REC, a 'Navratna CPSE' Under the Ministry of Power, Govt of India) ECE House, 3rd Floor, Annexe – II, 28 A, K G MARG, NEW DELHI – 110 001 Website: www.rectpcl.in				
Name :											
Address :											
Schedule 1											
All Prices are in Indian Rupees.											
Sl. No.	HSN/SAC Code	Whether HSN in column'2' is confirm. If not indicate applicable HSN*	Rate of GST Applicable (%)	Whether rate of GST in column'4' is confirm. If not indicate applicable GST*	Activity Description	Item Description	Unit	Qty.	Unit price(excludin g GST)	Total price(excluding GST)	GST Tax as Confirmed by Bidder
1	2	3	4	5	6	7	8	9	10	11=10x9	12
Construction of Residential Staff Quarters & associated facilities at 160 MVA, 220/33 kV Gas Insulated Substation (GIS) at Lassipora (Srinagar Region)											
1						Civil Works- Architecture,Design, Engineering, including procurement and subcontracting (if any), delivery, construction, Contouring and site leveling (if required).					
a.	995424		18%		Civil Works	JEs Quarter -total 8 Nos. in 2 Blocks. Each Block having 2 Units of GF and 2 units of FF with Common Stairs)	Sq. ft	5000		0.00	0.00
b	995424		18%		Civil Works	Septic tank and soakpit for township	LS	1		0.00	0.00
c	995424		18%		Civil Works	Providing & Laying of SW pipes for external sewerage system as per technical specification & approved design all sizes 100 mm, 200 mm, 300 mm including construction of inspection chambers as per approved design.	LS	1		0.00	0.00
d.	995424		18%		Civil Works	External water supply arrangement as per approved design for colony & other buildings etc	LS	1		0.00	0.00
g.	995424		18%		Civil Works	Underground water storage tank of approved size & capacity for colony & other buildings	LS	1		0.00	0.00
h.	995424		18%		Civil Works	RCC Road as per approved layout	LS	1		0.00	0.00
2						Electrical Works- Design, Engineering, procurement, subcontracting (if any), delivery, erection, testing and commissioning of the facilities for following job works including manadatory spare:-					
a.	998731		18%		Electrical Works	Construction of 1 x 100 KVA, 11/0.433 kV Distribution transformer along with11kV isolator, horn gap fuse , Bus Post Insulator and Surge arrestors for LT Station alongwith 415 V, 400A Township DB etc in complete as required including spares.	LS	1		0.00	0.00
b.	998731		18%		Electrical Works	Electrical Panel/Sub- Panel as per the works requirement in complete.	LS	1		0.00	0.00
c.	998731		18%		Electrical Works	Internal & External Wiring for Power & light points including DB, switchboard etc in complete with proper earthing as per works requirement.	LS	1		0.00	0.00
d.	998731		18%		Electrical Works	Ceiling Fan, 1400 mm sweep in complete.	LS	1			
e.	998731		18%		Electrical Works	Lighting Fixture LED Luminaires type as per illumination level required for the indoor building lightening etc in complete.	LS	1		0.00	0.00
f.	998731		18%		Electrical Works	LED Street Light Luminaire as per illumination level required for the street in complete as required.	LS	1		0.00	0.00

[illegible]

Sl. No.	HSN/SAC Code	Whether HSN in column'2' is confirm. If not indicate applicable HSN*	Rate of GST Applicable (%)	Whether rate of GST in column'4' is confirm. If not indicate applicable GST*	Activity Description	Item Description	Unit	Qty.	Unit price(excluding GST)	Total price(excluding GST)	GST Tax as Confirmed by Bidder
1	2	3	4	5	6	7	8	9	10	11=10x9	12
Note : Specify amount of GST on the transaction between contractor and employer.											
1) To facilitate the bidders, Employer has indicated an HSN/SAC code and rate of GST against each item in the Price Schedule except for some of lumpsum quantities/lot/Set as mentioned at ITB 11.3.2. It shall entirely be the responsibility of the bidder to check the HSN/SAC code and rate of GST given against each item. The bidder may either confirm the HSN/SAC and rate of GST or if the bidder opts to classify the item in question under a different HSN/SAC code or opts to indicate a different rate of GST, bidder may indicate the same in the columns provided. The bidder shall solely be responsible for HSN/SAC classification and the rate of GST for each item. Employer's liability for reimbursement/payment of GST shall be lower of the GST applicable at the rate as confirmed/deemed confirmed in the bid or actual GST paid/payable by the bidder for that item.											
2) For Supply of plants & equipment and Services from within India, HSN/SAC has not been indicated for some of lumpsum quantities/lot/Set as each of these consists of many items for which billing break up shall be furnished during contract execution. For the purpose of evaluation, the bidder has to indicate the rate of GST applicable on these items. As it is possible that the incidence of GST on each of these items may be different, provision has been made in the price schedules for quoting the bid price in different categories based on the incidence of GST. The bidder shall accordingly quote price in different tax categories. HSN /SAC for these items shall be furnished along with billing breakup prior to payment for these items. Employer's liability for reimbursement/payment of GST shall be lower of the GST applicable at the rate as confirmed/deemed confirmed in the bid or actual GST paid/payable by the bidder for that item.											
3) In case the bidder leaves the cell of confirmation of the HSN code and/or GST rate "blank", the HSN code and corresponding GST rate indicated by the Employer shall be deemed to be the one confirmed by the Bidder.											
4) HSN stands for Harmonized System of Nomenclature and SAC stands for Service Accounting Code, used for classification of Goods for GST purpose..											
Date :						Printed Name :					
Place :						Designation:					