



# **MMRC**

**MUMBAI METRO RAIL CORPORATION LTD**

**e-TENDER FOR**

**“Design, Supply, installation, testing and commissioning of 16 kWp Grid Export (On-Grid) Roof Top Mounted Solar PV Plant” at MMRC, NaMTTRI Building, BKC, Bandra(E), Mumbai.**

**ESTIMATED COST: ₹19 Lacs.**

**TENDER FEE: ₹ 2500 /- (Non-Refundable)**

**BID DOCUMENT**

**Mumbai Metro Rail Corporation Limited**

4<sup>th</sup> floor, NaMTTRI Building, Behind MMRC ,Plot No R-13,E Block,

Bandra-Kurla Complex, Bandra (E), Mumbai – 400 051.

e- Tender Notice

**Mumbai Metro Rail Corporation Limited**  
 4<sup>th</sup> floor, NaMTTRI Building, Behind MMRC ,Plot No R-13,E Block,  
 Bandra-Kurla Complex,Bandra (E), Mumbai – 400 051.  
E- Tender Notice

Mumbai Metro Rail Corporation Limited (MMRC) invites **Percentage rate** bids through E-Tendering portal from agencies fulfilling the criteria given in details tender notice.

Parameters	Details		
Name of work	“Design, Supply, installation, testing and commissioning of 16 kWp Grid Export (On-Grid) Roof Top Mounted Solar PV Plant”.		
Estimated Cost	<b>₹19 Lacs (Including Taxes)</b>		
Contact details	Mr. Sushil Bhavthankar (AGM/Elect.), <u>022-26597674.</u>		
Important dates	Milestone	From date/time	To date/time
	Tender release	6/10/2016 10.00 am	7/10/2016 06.00 pm
	Tender document download	8/10/2016 10.00 am	18/10/2016 03.00 pm
	Last date of Online submission	20/10/2016 03.00 pm	3/11/2016 03.00 pm

The e-Tender can be downloaded on registration on <https://etendermmrda.maharashtra.gov.in> as per above mentioned dates. Any additional information & help for uploading & downloading the e-tender, may be availed by contacting MMRC's e-tendering service desk at the following [etendersupport@mailmmrda.maharashtra.gov.in](mailto:etendersupport@mailmmrda.maharashtra.gov.in) or call us on 022 - 26597445.

Date:  
Place : Mumbai

**Sd/-**  
Executive Director/Elect.  
MMRC

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**CHAPTER-I**  
**E-TENDER NOTICE AND GUIDELINES FOR SUBMISSION OF TENDER**

E-Tendering Portal: <https://etendermmrda.maharashtra.gov.in>

Mumbai Metro Rail Corporation Ltd (MMRC) invites **Percentage rate** bids through E-tendering portal for “Design, Supply, installation, testing and commissioning of 16 kWp Grid Export (On-Grid) Roof Top Mounted Solar PV Plant”, from agencies/firms fulfilling conditions as under:

1. Bidders should have experience of successfully completed similar kind of works during 3 years ending with last day of the month previous to the one in which the bids are invited, should be either of the following –
  - i. *Three similar completed works costing not less than the amount equal to 40% of the estimated cost.*
  - Or
  - ii. *Two similar completed works costing not less than the amount equal to 50% of the estimated cost.*
  - Or
  - iii. *One similar completed work costing not less than the amount equal to 80% of the estimated cost.*

‘Similar Works’ are defined as: Any Solar PV (Grid connected) system work done in Central or State Govt. Department /PSU/Reputed Private Firms.

2. Contractor should upload scanned copy of PAN Card as well as Solvency certificate for an amount of 30% of the estimated cost as per Pro-forma given in Tender Document.
3. The tenders will be received online on above mentioned MMRDA’s official E-Tendering portal and will be opened by ED-Electrical or his authorized representative on scheduled date and time.
4. Details of tender:
  - a. Name of Work:  

**“Design, Supply, installation, testing and commissioning of 16 kWp Grid Export (On-Grid) Roof Top Mounted Solar PV Plant”.**
  - b. Estimated Cost of Work : Rs.19 Lacs.
  - c. EMD / Bid Security : Rs.19000/-
  - d. Period of Completion : 2 months.

## 5. Online E-Tender Schedule:

Sr.No.	Tender Schedule	Bidder Schedule	Start Date & Time	End Date & Time
1	Tender Authorization and Publishing	-----	6/10/2016 10.00 am	7/10/2016 06.00 pm
2	-----	Tender Document Download	8/10/2016 10.00 am	18/10/2016 03.00 pm
3	Pre-Bid meeting	Pre-Bid Meeting	19/10/2016 11:00 am	19/10/2016 12:00 pm
4	-----	Bid Preparation and Submission	20/10/2016 03.00 pm	3/11/2016 03.00 pm
5	Tender Closing	-----	4/11/2016 03.00 pm	4/11/2016 06.00 pm
6	-----	Online Control Transfer of Bid	7/11/2016 10.00 am	7/11/2016 06.00 pm
7	Opening Envelope A-Tender Fees, EMD	-----	8/11/2016 10.00 am	8/11/2016 06.00 pm
8	Opening Envelope B - Technical Bid	-----	9/11/2016 10.00 am	11/11/2016 06.00 pm
9	Opening Envelope C - Financial Bid	-----	To Be Notified Later	

6. Bidders should have valid class 2 or 3 Digital Signature Certificate (DSC) having both Signing and Encryption Certificates obtained from any Certifying Authorities empanelled by Controller of Certifying Authorities India. In case of requirement of DSC, Bidders should go to <https://etendermmrda.maharashtra.gov.in/files/mmrda/misc/Digital%20Certificate.rar> and follow the procedure mentioned in the document procedure for Digital Certificate. Bidders who are participating in e-tendering for the first time shall have to obtain User ID & password from the above mentioned portal.
7. Tender Document and Supporting can be downloaded for reference purpose from the e-Tendering Portal of MMRDA during the period mentioned in the tender notice. Interested Bidders have to make online payment of Rs. 2,500/- (Rupees Two Thousand Five Hundred only) inclusive of MVAT (non-refundable) as Tender Processing Fee using online payment gateway during bid preparation using Debit Card/Credit Card/Net Banking. Tender Fee receipt will be system generated during bid preparation.
8. Tender Fee receipt must be uploaded during bid preparation by the bidder.
9. The competent authority reserves the right to reject any or all of the tender offers, without assigning any reasons thereof.
10. The bids shall be received online on above mentioned MMRDA's official e-Tendering portal.
11. Validity period of the offer of the bidder will be 180 days from the date of opening of the financial bid of the e-tender.
12. The lowest bidder will have to submit the rate analysis of all major items, if called for.
13. Bidder should upload scanned attested photocopies of all documents on above mentioned MMRDA official e-Tendering portal & produce in original on request by MMRDA at any stage.

14. A statement showing names of partners, Directors, etc. of the firm with complete address of each one of them should be uploaded to above mentioned MMRDA official e-Tendering portal along with name & address of authorized person on the behalf of firm who will sign e-tender using Digital Signature Certificate.
15. The acceptance of bid will be intimated by email or otherwise by the authority competent to accept the tender or by the higher Authority of MMRC, to the Contractor, which shall be deemed to be an intimation of the tender given by the Authority Competent to accept the tender.
16. The lowest bidder shall be responsible for executing, completing the work as per specifications & scope of work.
17. Successful bidder shall have to submit signed copy of tender manually to the Electrical department.
18. If there is any amendment in the tender the same shall be published on following official e-Tender portals / website:
19. E-tender Portal: <https://etendermmrda.maharashtra.gov.in>
20. MMRC Website: <https://mmrda.maharashtra.gov.in>
21. The bidder may visit the site prior to submission of tender and ascertain the local site condition, working restrictions, constraints, conditions in tender document regarding necessary approvals, NOC required for the work from the local Authorities and shall quote the offer inclusive of all such expenses likely to be incurred while execution of the work. No claim or compensation for any extra payments incurred by the bidders towards the approvals/ NOC's/ permissions will be entertained by MMRC, which shall be noted.
22. In case of any queries, Bidders may contact MMRC's e-tendering service desk at [etendersupport@mailmmrda.maharashtra.gov.in](mailto:etendersupport@mailmmrda.maharashtra.gov.in) on any working day from 10 am to 5.30 pm.

**-Sd-**  
Executive Director/Elect.  
MMRC

## INSTRUCTIONS TO BIDDERS

### 1. GENERAL INSTRUCTIONS

#### i. Location of the work:

**6<sup>th</sup> floor, NaMTTRI Building, Behind MMRC ,Plot No R-13,E Block,Bandra-Kurla Complex,Bandra (E), Mumbai – 400 051.**

#### ii. Scope of work in brief:

“Design, Supply, installation, testing and commissioning of 16 kWp Grid Export (On-Grid) Roof Top Mounted Solar PV Plant”, consisting of items as given in the schedule A.

#### 1.1 Time limit for completion of work:

The work shall be completed within two (2) month from the date of Work Order to commence the work.

#### 1.2 Details of Earnest Money:

Earnest Money Deposit (Bid security) for this work will be Rs.19000/-

EMD Payment as mentioned above has to be made through RTGS / NEFT mode using the System Generated Challan. Bidders should ensure that the payment of the EMD is made at least 5 working days prior to the last date of Bid Preparation and Hash Submission of the Tender Schedule to have seamless submission.

Bidders need to upload scanned copy of EMD paid receipt during bid preparation.

Bidders should mention the beneficiary details for EMD refund in the Earnest Money Deposit Form for fields marked as details required for Refund. MMRC/MMRDA or e-Tendering Service Provider will not be liable for delays caused in EMD refund due to incorrect beneficiary details. The earnest money deposit of unsuccessful bidders will be refunded through RTGS, / NEFT mode only after finalization of the tender for which the above refund details are required. Bidders should also upload scanned copy of cancelled cheque along with refund letter for refund of their EMD payment. In case of successful bidder, amount of the earnest money deposit may be transferred towards part of the security deposit to be paid after the award of the work, if he intends to do so in writing.

Bidders failing to complete the payment of EMD using the above mentioned process of RTGS / NEFT after downloading the system generated challans will not be able to submit their bids.

Note: Kindly note that transfer of funds to MMRDA's account through NEFT / RTGS mode, from the Bidders' ICICI accounts is currently not possible. In case of funds transfer through NEFT / RTGS, Bidders are requested to transfer from any other bank (excluding ICICI Bank).

#### 1.5 Details of Security Deposit:

The successful tenderers shall have to pay a sum of ₹95,000 /- (Rupees Ninety-five Thousand Only) towards Security Deposit. The initial Security Deposit of ₹47,500 /- (Rupees Forty-Seven thousand five hundred Only) shall be paid in the form of Demand Draft or Bank Guarantee of any Nationalized Bank or Scheduled Bank payable at Mumbai in format acceptable to MMRC. The balance Security Deposit of ₹47,500/- (Rupees Forty-Seven thousand five hundred Only) shall be recovered by deducting from the remaining Running Account Bills at the discretion of



the Engineer-in-charge so that, the total deposit equivalent ₹95,000 /- (Rupees Ninety-five Thousand Only) is made up and held by MMRC.

1.5. (i) The Contractor shall be responsible to pay stamp duty as payable under Bombay Stamp Duty Act 1978 for Deposit paid in form of Demand Draft / Bank Guarantee etc. and shall furnish a copy of challan having paid the same to Government. Failure to furnish the same within 1 month from the date of work order will entail its recovery at the rates in prevalence as per Stamp Duty Act from the bills for the onward submission to Government.

1.6 Additional Security Deposit:

Additional Security to be paid by the Contractor towards unbalanced tender shall be calculated as follows:

No additional performance security will be required to be paid, if the quoted percentage is up to and inclusive of 10 % below the cost put to tender.

If the tender offer is anything more than 10% below compared to the cost put to tender, additional security deposit will be worked out by taking 100% difference between the 90% of cost put to tender and that of offer of the tenderer. The payment of additional security towards unbalanced tender shall be in the form of DD/ Bank Guarantee of any Nationalized Bank or Scheduled Bank in format acceptable to MMRC.

Additional Security deposit shall be released along with the final bill on satisfactory completion of work.

1.7 Revision or Amendment in Tender Document:

The Competent Authority, may omit or suspend certain items of work, revise or amend the tender document before online submission of tender. Such revisions or amendments or extension, if any, shall be communicated to all concerned by email on above mentioned MMRC/MMRDA official E-Tendering portal which will be issued at least 7 days before the due date of receipt of tender.

1.7.1 Tender Rates:

The rates quoted in schedule 'A' are for finished and completed items and no extra amount for carting or transporting material, labour etc. shall be paid unless specifically so mentioned or provided for in the tender. The rates are inclusive of all leads and lifts for all materials in the completed items and also include all taxes, duties, royalties etc. including VAT/Works Contract Tax, GST etc. No payment on this account will be made. The Income Tax, Works Contract Tax, Labour cess etc shall be deducted at source at the rate that will be in force from time to time.

1.8 The successful tenderer will have to sign an agreement as required. The necessary stamp fees, etc. required for completing the agreement will have to be borne by the tenderer.

- 1.9 The tenderer may visit the site of the work and see for himself the site conditions regarding layout and all other matters, affecting the work before filling in the percentage above/below the estimated rates. Submission of a tender by a tenderer implies that they had read these instructions and has made itself aware of the scope of the work, conditions at work site, conditions of contract and MMRC will not, therefore, bear any extra charges on any account, in case it finds to have misjudged the site conditions or specifications.
- (a) Conditional tender shall not be accepted.
  - (b) The right to reject all or any of the tenders without assigning any reason, whatsoever, is reserved with the Competent Authority.
  - (c) Executive Director/Elect. or his representative in MMRC shall be the Competent Authority for accepting the tender.
  - (d) The tenderer shall have to enter into regular agreement on the receipt of acceptance of the tender and shall abide by all the rules and regulations embodied in Conditions of Contract and pay the initial security deposit as shown in the schedule, failing which the MMRC shall be entitled to forfeit the full amount of earnest money deposited by the tenderer.
  - (e) The successful tenderer shall have to work in co-ordination and co-operation with any other contracting agencies appointed by the MMRC to work simultaneously in the same or adjoining area. The decision of the MMRC in case of any dispute between the different agencies appointed by the MMRC shall be final and binding.
  - (f) Income tax, Works Contract Tax, VAT, Service tax, labour cess and any other central, state, local tax ordered by the competent authority at the rates in force during the progress of contract or the percentage that will be in force from time to time shall be recovered / deducted from the gross amount of the bill whether for measured work or advance payment or secured advance.
  - (g) The Contractor shall have to make his own arrangement at no extra cost to the MMRC for water supply, sanitation and electric supply etc. at the site of work. If temporary / permanent water connection is taken for construction purpose through Municipal Corporation's water line, then water charges to be paid to Municipal Corporation are to be borne by the Contractor. Contractor has to submit no dues certificates from Municipal Corporation in this regard before preparation of final bill failing which such charges will be paid by MMRC and shall be recovered from amount due to the Contractor with MMRC.
  - (h) The detailed E -tender notice along with the subsequent corrigendum, addendum etc. shall form part of the tender document.
  - (i) The Contractor shall furnish all tools plants, instruments, supervisory staff, labour, materials, any temporary works, consumable and everything necessary whether or not such items are specifically stated herein, for completion of the job in accordance with the specification requirements.
  - (j) The Contractor shall carry out the necessary surveys of the site required for above work before starting the work.
  - (k) The Contractor may familiarize himself with the site where he is expected to execute the work and quote his percentage above/below the estimated rates considering all the hurdles likely to face during execution.
  - (l) The Contractor whose tender is accepted will be required to produce to satisfaction of the Concerned Authority valid and current license issued in his favour under the provision of the contract labour (Regulations and abolition) Act 1970 and in case of failure to do so the acceptance of the tender would be liable to be withdrawn and earnest money forfeited.
  - (m) Contractor shall take out necessary Insurance Policy/Policies so as to provide adequate insurance cover for execution of the awarded contract work from the "Directorate of Insurance, Maharashtra State, Mumbai - 400 051" only. Insurance Policy / Policies taken out from any other insurance Company will not be accepted. However, if the Contractor desires to effect insurance with the local office of any insurance company, the same

should be under the co-insurance-cum-servicing arrangements (with G.I.F.'s share at 60% and insurance Company's share at 40%) approved by the Directorate of Insurance. If the policy taken out by the Contractor is not on co-insurance basis the same will not be accepted and the amount of premium calculated by the Directorate of Insurance will be recovered directly from the amount payable to the Contractors for the executed contract work.

(n) Bids from joint ventures are not accepted.

## 2. GUIDELINES FOR SUBMISSION OF E-TENDER

2.1 Tenderer shall follow the instructions on the portal for submission of e-tender.

2.2 Tender shall be submitted online on the e-tendering portal in 'three electronic envelopes system' within prescribed schedule

2.3 Correction of Errors:

- i. If there is any discrepancy in rates and figures and in words, the lower of the two will govern and where there is discrepancy between the unit rate and the item total resulting from multiplying unit rate by the quantity, the unit rate as quoted shall govern
- ii. If there is any arithmetical error in totalling of items, the correct total shall be computed by the Employer and the same shall govern
- iii. The amount stated in the bid will be adjusted by the employer in accordance with above procedure for the correction of error and with the concurrence of the bidders, shall be considered as binding upon the bidder.
- iv. If the bidder does not accept the corrected bid price, the bid will be rejected and the bid security will be forfeited.

### 2.4 **E-Envelope A (General)**

Bidder should generate and upload scanned copies of Receipt for the following:

- i. Generate Receipt for e-tender fee.
- ii. Upload Receipt of Earnest Money Deposit.

### 2.5 **E-Envelope B (Technical bid)**

Tenderer shall upload scanned copies of the following:

- a) Attested copy of valid Certificate of registration.
- b) List of works executed by the agency during recent last 3 financial years (APPENDIX-B) and works in hand (APPENDIX-A)
- c) Copy of 'work completion certificate' of similar nature and magnitude for Central & State Govt. / Semi Govt. offices/PSU/Reputed Private firms etc. issued by the client.
- d) Copy of Solvency Certificate /banker's certificate for the Contractor's financial stability (30% of amount put to tender), (BANK Certificate).

### 2.6 **E-Envelope C (Financial bid)**

- a) Tenderer shall quote his offer as percentage below or above the estimated cost as per Schedule-A both in figures & words in E-Envelope C. The amount quoted by the bidder by the system.
- b) Upload the digitally signed copy of Tender document and Price bid Cover letter.

### 2.7 **Procedure for Tender opening**

Contents of e-Envelope A will be scrutinized and only those tenderers who have fulfilled the requirements shall be eligible for opening of E-Envelope B. Similarly, contents of E-Envelope B will be scrutinized and only those tenderers who have fulfilled the requirements shall be eligible for opening of E-Envelope C.

Tenderer may remain present in the office of the tender opening authority at the time of opening of financial bids. However, the results of the financial bids of all bidders shall be available on the E-Tendering portal immediately after completion of the opening process.

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**CHAPTER-II**  
**FORM OF BANK GUARANTEE BOND FOR SECURITY DEPOSIT**

1. In Consideration of the Mumbai Metro Rail Corporation Limited (hereinafter called "the MMRC") having agreed to exempt \_\_\_\_\_ (hereinafter called "the said Contractor(s)" from the demand, under the terms and conditions of an Agreement dated \_\_\_\_\_ made between the Sr. Deputy General Manager , MMRC and \_\_\_\_\_ for \_\_\_\_\_ (hereinafter called "the said Agreement"), of security deposit for the due fulfilment by the said Contractor(s) of the terms and conditions contained in the said Agreement, on production of a Bank Guarantee for Rs. \_\_\_\_\_ (Rupees \_\_\_\_\_).

We, \_\_\_\_\_ (hereinafter referred to as "the Bank") at the request of \_\_\_\_\_ (Contractor(s) do hereby undertake to pay to the MMRC an amount of not exceeding Rs. \_\_\_\_\_ against any loss or damage caused to or suffered or would be caused to or suffered by the MMRC by reasons of any breach by the said Contractor(s) of any of the terms and conditions contained in the said Agreement.

2. We, \_\_\_\_\_ (indicate name of the bank) do hereby undertake to pay the amounts due and payable under this guarantee without any demur merely on a demand from the MMRC stating that the amount claimed is due by way of loss or damage to or would be caused to or suffered by the MMRC by reason of breach by the said Contractor(s) of any of the terms or conditions contained in the said Agreement or by reasons of the Contractor(s) failure or repudiation to perform the said Agreement. Any such demand made on the bank shall be conclusive as regards the amount due and payable by the Bank under this guarantee. However, our liability under this guarantee shall be restricted to an amount not exceeding Rs. \_\_\_\_\_ .

3. We undertake to pay the MMRC any money so demanded notwithstanding any dispute or disputes raised by the Contractor(s) in any suit or proceeding pending before any court or Tribunal relating thereto, our liability under these presents being absolute and unequivocal. The payment so made by us under this bond shall be a valid discharge of our liability for payment there under and the Contractor(s) shall have no claim against us for making such payment.

4. We, \_\_\_\_\_ (indicate name of the Bank) further agree that the guarantee herein contained shall remain in full force and effect during the period that would be taken for the performance of the said Agreement and that it shall continue to be enforceable till all the dues of the MMRC under or by virtue of the said Agreement have been fully paid and its claims satisfied or discharged or till the Executive Director/Elect., Project Division of MMRC \_\_\_\_\_ (indicate the name of Administrative Department) certified that the terms and conditions of the said Agreement have been fully and properly carried out by the said Contractor(s) and accordingly discharges this guarantee. Unless a demand or claim under this guarantee is made on to us in writing on or before the \_\_\_\_\_ we shall be discharged from all liability under this guarantee thereafter.

5. We, \_\_\_\_\_ (indicate the name of Bank) further agree with the MMRC that the MMRC shall have the fullest liberty without our consent and without affecting in any manner our obligation hereunder to vary any of the terms

and conditions of the said Agreement or to extend time of performance by the said Contractor(s) from time to time or to postpone for any time or from time to time any of the powers exercisable by the MMRC against the said Contractor(s) and to forbear or enforce any of the terms and conditions relating to the said agreement and we shall not be relieved from our liability by reasons of any such variation, or extension being granted to the said Contractor(s) or for any forbearance, act or commission on the part of the MMRC or any indulgence by the MMRC to the said Contractor(s) or by any such matter or thing whatsoever which under the law relating to sureties would, but for this provision, have effect of so relieving us.

6. This guarantee will not be discharged due to the change in the constitution of the Bank or the Contractor(s) / Supplier(s).

8. We, \_\_\_\_\_  
(indicate the name of Bank) lastly undertake not to revoke this guarantee during its currency.

Dated \_\_\_\_\_ Day of \_\_\_\_\_ 2016

For \_\_\_\_\_  
(Indicate the name of the Bank)

**CHAPTER-III**  
**DETAILS TO BE SUBMITTED BY TENDERER**

**APPENDEX – A**

Particulars of the Tenderer:

Name and address of the Tenderer: -----  
-----

List of important project works in HAND costing..... above:

Sr. No.	Name & full postal address of the Client. Also indicate whether Govt. or Private body with full postal address.	Department	Contract Amount (Rs.)	Progress of work along with stipulated date of completion of work	Remark

Note: True copies of testimonials may be attached

Signature of Tenderer

Address

**APPENDIX-B**

1. Work performed as a prime Contractor on works of similar nature in the last Three years (2013-2016). \*

Sr No	Name of the employer*	Description of work	Contract No.	Value of contract (Rs. Lacks)	Date of issue of work order	Stipulated period of completion	Actual date of completion*	Remarks explaining reasons for delay and work completed

***\* Attach Completion Certificate from client.***



**SOLVENCY CERTIFICATE**  
(To be issued by Bank)

This is to certify that M/s.....  
.....is a reputed company  
with a good financial standing.

If the contract for the work, namely .....  
is awarded to the above firm, we shall be able to provide overdraft/credit facilities to  
the extent of Rs. \_\_\_\_\_ to meet their working capital requirements for  
executing the above contract.

\_\_\_ **Sd.** \_\_\_  
Name of Bank  
Senior Bank Manager  
Address of the Bank  
(With Seal)



**CHAPTER-IV**  
**GENERAL CONDITIONS OF CONTRACT**

1. The system of recording, measurements and payments will be based on the P.W.D. practice in vogue.
2. It is presumed that the Contractor has gone carefully and thoroughly through the standard and special specifications of the individual items before arriving at the percentage above / below the estimated cost quoted by him.
3. In all cases of errors, omissions or doubts or discrepancies in dimensions or description in drawings or in specifications etc., a reference shall be made by the Contractor to the Engineer-in-charge, whose elucidations, elaborations or decisions shall be treated as authentic and final and Contractor shall be liable to be held responsible for any errors or omissions arising out of his not referring the doubts in advance to the Engineer-in-charge for clarifications.
4. If the Contractor has any doubts, whatsoever, as to the contents of the contract he shall in good time i.e. before submitting his tender, get his doubts clarified authoritatively from the Assistant General Manager (Electrical) / Sr. DGM (Electrical) in writing. Once the tender is submitted by him the matter will be decided according to the tender stipulations in the absence of such authentic pre-clarifications from the Engineer-in-charge and Contractor shall in that case be bound by the decisions of the Assistant General Manager.
5. All the items and their rates in Schedule - A of the tender are for completed items of work and no extra claims shall be accepted as regards specifications, labour, materials, all taxes (Sales Tax, Works Contract Tax, VAT etc.), royalties, and any other charges etc. Contractor shall submit his methodology for approval of Engineer in Charge. On Approval from Engineer-in-Charge, Contractor shall commence the work.
6. The Contractor shall have to make his own arrangements for procuring all materials and machinery required for the work & adopts necessary safety measures for protection of men and materials and nearby MMRC / Public or private properties against any accidental damages to life or property arising out of activities on his work.
7. The successful bidder shall have to chalk out a programme for execution of the work with reference to the time limit stipulated for completion of the work and furnish the same to the Engineer-in-charge as soon as he received work order. Review of progress achieved with reference to the approved programme shall be taken by the Engineer-in-charge at regular intervals and shortfall if any shall be compiled by the Contractor within the allowable period by accelerating his progress to bring it as per with the approved programme. The Contractor shall update this programme from time to time as and when called upon to do so, failing which the same shall be drawn up by the Engineer-in-charge and shall be enforced by him and no representation in that case shall be entertained from the Contractor.
8. Materials which are not approved shall not be allowed to be brought on site. Materials once brought to the site shall not be allowed to be removed from the site without the prior approval of the Engineer-in-charge.

9. The Contractor shall permit the Engineer-in-charge or his representative to inspect whenever required the stock of controlled materials.
- a. All materials used in the construction of the work shall be of the best and approved quality only as per the relevant Indian Standard Specifications. Samples of all the materials as ordered by the Engineer-in-charge shall be kept in his office for check and proper control towards the use of such materials. The Engineer-in-charge shall have the right to ask the Contractor to rest the materials brought by him before using them on the work from an approved Engineering Institute and also to carry out in-situ or laboratory tests of the materials before / after their use in the work. Testing charges including conveyance of materials to laboratories for all such tests shall be borne by the Contractor. If the materials are found sub-standard or giving sub-standard test results, such materials shall be rejected and shall be removed forthwith from the site by the Contractor at his own cost as directed by the Engineer-in-charge.
  - b. On receipt of the work order, the Contractor's authorized site Engineer shall immediately start operations like clearing the site, constructing approach to site of the work under the directions of the Engineer-in-charge and shall provide all the necessary materials, labour, tools, and instruments, as required for the purposes of field surveys. The Contractor will be responsible for the correctness of the locations, dimensions and alignments etc. of all the component parts of the work. If at any time during the course of the execution, any error is noticed, the same should be got rectified by the Contractor at his own cost. Checking by the departmental staff shall not absolve in any way responsibility of the Contractor in this respect.
  - c. The Contractor shall construct and maintain suitable inspection pathways within the limits of the work at his own cost as directed by the Engineer-in-charge.
  - d. The Engineer-in-charge shall have full rights to ask for any additions or deletions in the supervisory staff and labour force of the Contractor and this should be done immediately by the Contractor to his full satisfaction. The Contractor shall regularly submit to the Engineer-in-charge weekly reports of the people employed on his work and medical reports etc. Reports on accidents should be submitted within 24 hours.
  - e. Work Order Book shall be maintained on site and it shall be the property of the MMRC. The Contractor shall promptly sign the orders written in it by the Engineer-in-charge or his authorized representative or his superior officers and comply with the same promptly and correctly.
  - f. The Contractor should report compliance of all such orders recorded in the Work Order Book from time to time to the Engineer-in-charge for his verifications. First carbon copy of the extract from the Work Order Book shall be supplied to the Contractor as soon as the entry is made in it by the officers of the MMRC. The Contractor should sign in this Work Order Book to acknowledge receipt of his copy.
10. **Initial measurement for record:**
- a. Where for proper measurement of the work, it is necessary to have an initial set of levels or other measurements taken, the same as recorded in the authorized field book, measurement book of the MMRC, by the Engineer-in-charge or his authorized representatives and will be signed by the Contractor or his authorized representative who will be entitled to have a true copy of the same made at his cost. Any failure on the part of the Contractor to get such levels etc. recorded before starting the work will render him liable to accept the decision of the Engineer-in-charge as to the basis of taking measurements. Likewise, the Contractor will not cover any work which will render its subsequent measurements difficult or impossible, without first getting the same jointly measured by himself and the Authorized representative of the Engineer-in-charge. The record of such measurements on behalf of the MMRC will be signed by the Engineer-in-charge or his representative and the Contractor and will be entitled to have a true copy of the same made at his cost.

- b. The Contractor can have copies of the measurements as stated in the paragraph above and of the bills paid to him at his own cost and at his own responsibility to do so by attending the MMRC office. He or his agent may copy down the same in consultation with the Officer concerned.
- c. The Contractor shall engage an authorized and full time qualified technical representative on the work capable of managing and guiding the work and understanding all the specifications and contract conditions who will take orders as shall be given by the Engineer-in-charge or his representative from time to time and shall be responsible for carrying out the work promptly and correctly. His technical representative should be posted at the site with prior approval of the Engineer-in-charge and should not be removed from the site without his prior approval.

**11. Treasure Trove:**

In the event of discovery by the Contractor or his employees during the progress of the works of any treasure, fossils, minerals or any articles of value of interest, the Contractor shall give immediate information thereof to the Engineer-in-charge and forthwith hand over to the Engineer-in-charge such treasure or things which shall be the property of the MMRC and shall not be removed by the Contractor under any circumstances.

**12. Permits and Licenses:**

The Contractor shall procure at his own expenses all permits & licenses comply with rules & regulations laid down by the concerned authority & pay all charges, fees & give all notices necessary & pay all dues in connection with lawful execution of the work.

**13. Patented Devices, Materials and Processes:**

Whenever the Contractor desires to use any designed devices, materials or processes covered by letter of Patent or Copy Right, the right for such use shall be secured by suitable legal arrangement with the patent owners and the copy of their agreement shall be supplied to the Engineer-in-charge if so desired by him. It shall be the responsibility of the Contractor to observe all legal formalities for use of such patents and consequences, if any, due to failure on his part to do so shall be the sole responsibility of the Contractor.

**14. Indemnity:**

The Contractor shall indemnify the MMRC against all actions, suits, claims, damages and demands brought or made against him in respect of anything done or omitted to be done by the Contractor in execution of or in connection with the work of this contract and against any loss or damage to the MMRC in consequences of any action or suit being brought against the Contractor for anything done or omitted to be done in execution of the work of this contract.

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## **CHAPTER-V**

### **ADDITIONAL GENERAL CONDITIONS**

1. These are to apply as additional specifications and conditions, unless otherwise already provided for contrary elsewhere in this contract.

2. **DEFINITIONS:**

Unless excluded by or repugnant to the context,

- a) The expression "Government" as used in the tender papers shall mean the MMRC.
- b) The expression "MMRC" as used in the tender papers shall mean the Mumbai Metro Rail Corporation Limited.
- c) The expression "Executive Director/Elect." as used anywhere in the tender papers shall mean Executive Director of MMRC.
- d) The expression "C" as used in the tender papers shall mean `an officer of ED-Electrical rank (by whatever designation he may be known) under whose control the work lies for the time being.
- e) The expression "Engineer" or "Engineer-in-charge" as used in the tender Papers shall mean the Assistant General Manager/Sr. DGM (Elect.) of the work for the time being.
- f) The expression "Contractor" used in the tender papers shall mean the successful tenderer or bidder whose tender has been accepted, and who has been authorized to proceed with the work.
- g) The expression "Contract" as used in the tender papers shall mean the deed to contract together with its original accompaniment and those latter incorporated in it by mutual consent.
- h) "Drawings" shall mean the drawings referred to in the specifications and any modifications of such drawings approved in writing by Engineer and such other drawings as may from time to time be furnished or approved in writing by the Engineer.
- i) "Engineer's representative" shall mean an Assistant of the Engineer notified in writing to the Contractor by the Engineer.
- j) `Provisional sum' or `Provisional lump sum' shall mean lump sum included by MMRC in tender documents and shall represent the estimated value of work for which details are not available at the time of issue of tender.
- k) The 'site' shall mean the lands and/or other places, on under, in or through which the work is to be executed under the contract including any other lands or places which may be allotted by MMRC or used for the purpose of contract.
- l) The `Work' shall mean the works to be executed in accordance with the Contract or part(s) thereof as the case may be and shall include all extra or additional, altered or substituted works as required for performance of the Contract.
- m) The "Contract sum" shall mean the sum for which the tender is accepted.
- n) The "Accepting Authority" shall mean the Competent Authority to accept the tender.
- o) The "Day" shall mean a day of 24 hours from midnight to midnight irrespective of the number of hours worked in any day in that week.
- p) "Temporary works" shall mean all temporary works of every kind required in or about the execution, completion, or maintenance of the works.
- q) "Urgent works" shall mean any measure which, in the opinion of the Engineer-in-charge, become necessary during the progress of the works to obviate any risk or accident or failure or which become necessary for security of the work or the persons working, thereon. Where the context so requires, words importing the singular only also include the plural and vice-versa. Heading and marginal notes, if any, to the general conditions shall not be deemed to form part thereof or be taken into consideration in the interpretation or construction thereof of the contract.

3. **PROGRAMME OF WORK:**

The work is required to be completed within a period of two (2) calendar month from the date of work order to commence the work.

4. **WORK EQUIPMENTS:**

The Contractor shall be required to provide appropriate and adequate equipments for achieving the laid down specifications and tolerance to the satisfaction of the Engineer. All equipments provided shall be of proven efficiency and shall be operated and maintained at all times in a manner acceptable to the Engineer and no equipment or personnel will be removed from site without permission of the Engineer.

5. **DAMAGE BY ACCIDENTS:**

The Contractor shall take all precautions against damage by theft/floods/fire or like or from accident etc. No compensation will be allowed to the Contractor on this account or for correcting and repairing any such damage to the work during execution of work. The Contractor shall be liable to make good at his cost any plant or materials belonging to the MMRC lost or damaged by floods or from any other cause which is in his charge.

6. **PROPERTY**

All materials on the Site, Plant, Equipment, Temporary Works and Works are deemed to be the property of the Employer, if the Contract is terminated because of a Contractor's default. The contractor shall be liable for property damage of MMRC during the work, if any. Any drilling like procedure should be done with prior permission from the concerned authority only.

7. **RELEASE FROM PERFORMANCE**

If the Contract is frustrated by the outbreak of war or by any other event entirely outside the control of either the Employer or the Contractor the Engineer shall certify that the Contract has been frustrated. The Contractor shall make the Site safe and stop work as quickly as possible after receiving this certificate and shall be paid for all work carried out before receiving it and for any work carried out afterwards to which commitment was made.

8. **COMPLIANCE WITH LABOUR REGULATIONS:**

During continuance of the contract, the Contractor and his sub-Contractors shall abide at all times by all existing labour enactments and rules made there under, regulations, notifications and bye laws 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. Salient features of some of the major labour laws that are applicable are given below. 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 or reimburse, such amounts as may be necessary to cause or observe, or for non-observance of the provisions stipulated in the notifications/bye laws/Acts/Rules/regulations including amendments, if any, on the part of the Contractor, the Engineer/Employer shall have the right to deduct any money due to the Contractor including his amount of performance security. The Employer/Engineer 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. 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.



### **SALIENT FEATURES OF SOME MAJOR LABOUR LAWS APPLICABLE .**

- a) Workmen Compensation Act 1923: - The Act provides for compensation in case of injury by accident arising out of and during the course of employment.
- b) 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 the rate of 15 days' wages for every completed year of service. The Act is applicable to all establishments employing 10 or more employees.
- c) Employees P.F. and Miscellaneous Provision Act 1952: The Act Provides for monthly contributions by the employer plus workers @ 10% or 8.33%. The benefits payable under the Act are:
  - (i) Pension or family pension on retirement or death, as the case may be.
  - (ii) Deposit linked insurance on the death in harness of the worker.
  - (iii) Payment of P.F. accumulation on retirement/death etc.
- d) Maternity Benefit Act 1951: - The Act provides for leave and some other benefits to women employees in case of confinement or miscarriage etc.
- e) 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 Certificate 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 contract labour.
- f) Minimum Wages Act 1948: - The Employer is supposed to pay not less than the Minimum Wages fixed by appropriate Government as per provisions of the Act if the employment is a scheduled employment. Construction of Buildings, Roads, and Runways are scheduled employments.
- g) 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.
- h) 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.
- i) Industrial Disputes Act 1947: - The Act lays down the machinery and 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.
- j) 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.

- k) 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.
- l) 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 Labor is prohibited in Building and Construction Industry.
- m) 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, traveling expenses from home up to the establishment and back, etc.
- n) 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 employs 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.
- o) 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.

## 11. PROTECTION OF ENVIRONMENT:

The Contractor shall 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.

During continuance of the contract, the Contractor and his sub-Contractors shall abide at all times by all existing enactments on environmental protection and rules made there under, regulations, notifications and bye-laws of the State or Central Government, or local authorities and any other law, bye-law, regulations that may be passed or notification that may be issued in this respect in future by the State or Central Government or the local authority.

**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 the Environment (Protection) Act 1986, and exceeding such quantity as may be specified by notification by the Central Government.

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## **CHAPTER – VI** **SPECIAL CONDITIONS OF CONTRACT**

### **1. SCOPE OF WORK**

- 1.1. The scope of work for the bidder include detailed survey of site for Design, Design, Supply, installation, testing and commissioning of 16 kWp Grid Export (On-Grid) Roof Top Mounted Solar PV Plant at MMRC, NaMTTRI Building, BKC, Bandra(E), Mumbai.
- 1.2. The NaMTTRI Building is having G+5 floors &having open terrace area available for installing the system is approximately 176 m<sup>2</sup>.
- 1.3. Existing roof top space of NaMTTRI Building of Mumbai Metro Rail Corporation Ltd. Shall be used to install Solar PV array.
- 1.4. The superstructure along with RCC/PCC civil work, complimenting existing structure of building must be provided for installing Solar PV array.
- 1.5. PV array shall be installed utilizing maximum space to minimize effects of shadows due to adjacent PV panel rows. The gross weight of the panel assembly should be such that it will not affect the load bearing capacity building structure.
- 1.6. Adequate spacing shall be provided between two panel frames and rows of panels to facilitate personnel protection, ease of installation, replacement, cleaning of panels and electrical maintenance.
- 1.7. The bidder must identify the required space available for the inverter and DC/AC distribution boxes.
- 1.8. The Supplier will supply and install required size of Water Tank, pump, pipe etc. For cleaning the PV modules.
- 1.9. The supplier shall specify installation details of the PV Panel assembly with appropriate diagrams and drawings fulfilling all the technical specifications.
- 1.10. The bidder shall carry out all the activities for MMRC, required to obtain relevant subsidies from government.

### **2. PROJECT COST**

- 2.1. The Project cost shall include all the costs related to above Scope of Work. Bidder shall quote above/below with respect to estimated rate such that the total Bid Price covers all the obligations mentioned in the Bidding Documents in respect of Design, Engineering, Manufacture, Supply, Storage, Civil work, Erection, Testing & Commissioning of the solar PV project. The Bidder has to take all permits, approvals and licenses, Insurance etc. provide training and such other items and services required to complete the scope of work mentioned above.
- 2.2. The cost quoted shall be inclusive of all duties and taxes, insurance etc. The prices quoted by the firm shall be complete in all respect and no price variation /adjustment shall be payable

### **3. INSURANCE**

- 3.1. The Bidder shall be responsible and take an Insurance Policy for transit-cum-storage-cum-erection for all the materials to cover all risks and liabilities for supply of materials on site basis, storage of materials at site, erection, testing and commissioning.
- 3.2. The Bidder shall also take insurance for Third Party Liability covering loss of human life, engineers and workmen and also covering the risks of damage to the third party/material/equipment/properties during execution of the Contract. Before commencement of the work, the Bidder will ensure that all its employees and representatives are covered by suitable insurance against any damage, loss, injury or death arising out of the execution of the work or in carrying out the Contract. Liquidation, Death, Bankruptcy etc., shall be the responsibility of bidder.

### 3.3. WARRANTEES AND GUARANTEES

3.3.1 The Bidder shall warrant that the goods supplied under this contract are new, unused, of the most recent or latest technology and incorporate all recent improvements in design and materials.

The bidder shall ensure warrantee covering the rectification of any and all defects in the design of equipment, materials and workmanship including spare parts for a period of minimum 2 years from the date of commissioning or more as considered suitable.

The successful bidder has to transfer all the Guarantees /Warrantees of the different components to the Owner of the project. The responsibility of operation of Warrantee and Guarantee clauses and Claims/ Settlement of issues arising out of said clauses shall be responsibility of the Successful bidder and MMRC will not be responsible in any way for any claims whatsoever on account of the above.

## 4. TYPE AND QUALITY OF MATERIALS AND WORKMANSHIP

4.1. The design, engineering, manufacture, supply, installation, testing and performance of the equipment shall be in accordance with latest appropriate IEC/Indian Standards as detailed in the chapter VII (Technical specifications) of the bid document. Where appropriate Indian Standards and Codes are not available, other suitable standards and codes as approved by the MNRE shall be used.

4.2 The specifications of the components should meet the technical specifications mentioned in chapter VII.

4.3 Any supplies which have not been specifically mentioned in this Contract but which are necessary for the design, engineering, manufacture, supply & performance or completeness of the project shall be provided by the Bidder without any extra cost and within the time schedule.

## 5. OPERATION & MAINTENANCE (O&M)

The bidder shall be responsible for operation and maintenance of the Roof top Solar PV system during DLP (**Defect Liability Period**) of 2 years after the date of the commissioning of the project during which MMRC will monitor the project for effective performance in line with conditions specified elsewhere in the bid document. During this period, the bidder shall be responsible for supply of all spare parts as required from time to time for scheduled and preventive maintenance, major overhauling of the plant, replacement of defective modules, inverters, PCU's etc and maintaining log sheets for operation detail, deployment of staff for continuous operations and qualified engineer for supervision of O&M work, complaint logging & its attending.

## 6. METERING AND GRID CONNECTIVITY

Metering and grid connectivity of the roof top solar PV system under this scheme would be the responsibility of the Bidder in accordance with the prevailing guidelines of the MERC/ Concerned utility. MMRC could facilitate connectivity; however, the entire responsibility lies with bidder only.

## 7. PLANT PERFORMANCE EVALUATION

The successful bidder shall be required to meet minimum guaranteed generation with Performance Ratio (PR) at the time of commissioning and related Capacity Utilization Factor (CUF) as per the GHI levels of the location. PR should be shown minimum of 75% at the time of inspection for initial commissioning/ Minimum CUF of 15% should be maintained for a period of 2 years. The bidder should send the periodic plant output details to MMRC for ensuring the

CUF. The PR will be measured at Inverter output level during peak radiation conditions.

## **8. PROGRESS REPORT**

The bidder shall submit the progress report fortnightly (15 days) to MMRC in Prescribed Performa. MMRC will have the right to depute his/their representatives to ascertain the progress of contract at the premises of works of the bidder.

## **9. PROJECT INSPECTION**

The project progress will be monitored by MMRC and the projects will be inspected for quality at any time during commissioning or after the completion of the project either by officer(s) from MMRC or any authorized agency/ experts.

MMRC may depute a technical person(s) for inspection, Third party verification, monitoring of system installed to oversee, the implementation as per required standards and also to visit the manufacturers' facilities to check the quality of products as well as to visit the system integrators to assess their technical capabilities as and when required.

## **10. APPLICABLE LAW**

The Contract shall be interpreted in accordance with the laws of the Union of India.

## **11. FORCE MAJEURE**

- 11.1. Notwithstanding the provisions of clauses contained in this tender document; the MMRC shall not forfeit (a) Security deposit for delay and (b) termination of contract; if Contractor is unable to fulfill his obligation under this contract due to force majeure conditions.
- 11.2. For purpose of this clause, "Force Majeure" means an event beyond the control of the Contractor and not involving the Contractor's fault or negligence and not foreseeable, either in its sovereign or contractual capacity. Such events may include but are not restricted to Acts of God, wars or revolutions, fires, floods, epidemics, quarantine restrictions and freight embargoes etc. Whether a "Force majeure" situation exists or not, shall be decided by MMRC and its decision shall be final and binding on the Contractor and all other concerned.
- 11.3. In the event that the Contractor is not able to perform his obligations under this contract on account of force majeure, he will be relieved of his obligations during the force majeure period. In the event that such force majeure extends beyond six months, MMRC has the right to terminate the contract in which case, the security deposit shall be refunded to him.
- 11.4. All necessary precautions, preventive structural safety measures, and proper supporting arrangements to the structural members, methodology shall be designed and got it approved from MMRC and provided before the repair and restoration of the members or part of the structure. All required permissions /NOC /completion certificate from the concerned departments such as MCGM/ Police and other Departments for concerned work of this contract has to be obtained by the Contractor at his own cost.
- 11.5. The Contractor shall discuss and finalize the phase-wise programme of works in consultation with the Assistant General Manager/Sr. Deputy General Manager, MMRC before starting the work.

## **12. PAYMENT TERMS**

- a) First running bill of 75% of total amount will be paid after completion of 90% of the work.

(90% shall imply the complete Design, supply, installation, testing and commissioning of the works/BOQ activities)

- b) Second running bill of 25% of total amount will be paid after completion of 100% of work and Testing & Commissioning.
  - c) The Contractor shall have to submit the Bank Guarantee in lieu of 5% of bill amount which would serve as a performance guarantee up to 2 years during DLP period, after completion of the work.
  - d) No mobilization advance.
  - e) L.D. Clause: @ 1% of the contract value per day per week of delay subject to maximum of 10% of contract value.
- 13.** The Contractor shall be required to take sufficient nos. of coloured photographs or video shooting at their own cost with Digital Camera having date printing arrangement along the length or as directed by the Engineer in charge before commencing the work and equal Nos. after completion of work and during progress of the work at the same locations. Contractors shall submit the photos in colour prints and CD of the same to the Engineer-in-charge for proper record as directed. Failure to comply the above MMRC will take necessary action in this regard.
- 14.** Tenderer shall note that during work they shall take proper safety measures such as (i) Flags, (ii) work in progress board (painted in radium paint) (iii) Red lamp (if the work is in progress during night) and other measure such as posting the person near work and barricading at work place as it may be necessary, in order to avoid any possible accident.
- 15.** The percentage above / below the estimated rates shall be inclusive of all operations, taxes, duties etc. levied by State / Central Government, Local Bodies etc. for the fulfilment of the contract. Advances of any sort shall not be considered.
- 16.** The Contractor shall maintain all the records of machineries and labours deployed on the works.
- 17.** The work proposed to be executed under this tender happens to be one of the works within the overall development in the area and hence, time is the essence of the contract.
- 18.** Simultaneous, to this work there may be other works in progress in the area. It will be incumbent on the tenderer to provide all the facilities and co-operation to the other Contractors to smoothly carry on their work. This implies that the other agencies will have a right to access to their works through the area on which the present agency is entrusted with the work.
- 19.** Specifications of MERC, shall apply for execution of the work in the order of precedence.
- 20.** The quantities considered for Schedule-A are tentative and may increase or decrease to any extent as per site requirement. The provision of clause 38 under conditions of contract for variation for increase in rates shall be valid.
- 21.** The Contractor shall carry out all testing work in the presence of the representative of the Engineer-in-charge. In addition, he shall provide facilities, at his own cost for any independent testing to be carried out by the Engineer-in-charge and arrangement for visit at manufacturer's factory / workshop from where materials for works are being purchased.
- 22.** If necessary, the Engineer-In-Charge should get the material tested from ERDA, CPRI or from any State /Central Government approved laboratory for confirmation of its parameters as per relevant BIS and the cost shall be borne by Contractor.
- 23.** The contractor shall get the all required statutory approvals at his own cost.



**24. SUBSIDIES**

- a. The successful bidder has to coordinate with MEDA/MNRE/Relevant Govt. Organisation in order to obtain all the relevant subsidies for MMRC at his own cost.
  - b. The Bidder will not liable to avail the subsidy.
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## Chapter – VII

### TECHNICAL SPECIFICATIONS

#### **1.0. DEFINITION**

- 1.1. A Grid Tied Solar Rooftop Photo Voltaic (SPV) power plant consists of SPV array, Module Mounting Structure, Power Conditioning Unit (PCU) consisting of Maximum Power Point Tracker (MPPT), Inverter, and Controls & Protections, interconnect cables and switches. PV Array is mounted on a suitable structure. Grid tied SPV system is without battery and should be designed with necessary features to supplement the grid power during day time. Components and parts used in the SPV power plants including the PV modules, metallic structures, cables, junction box, switches, PCUs etc., should conform to the BIS or IEC or international specifications, as specified herein or otherwise wherever such specifications are available and applicable.

Solar PV system shall consist of following equipment/components.

- (a) *Solar PV modules consisting of required number of crystalline PV modules.*
- (b) *DC Distribution Panel Board (DCDB's).*
- (c) *AC Distribution Panel Boards (ACDB's).*
- (d) *Grid interactive Power Conditioning Unit/Inverter with Remote Monitoring System.*
- (e) *Mounting structures and associated civil works pertaining to site conditions.*
- (f) *Junction Boxes.*
- (g) *Earthing and lightening protections.*
- (h) *IR/UV protected FRLS/FRLSOH (for underground) Cables, pipes and accessories.*
- (i) *Metering, Protection & Grid Islanding arrangements as required by Distribution Licensee.*

#### **2. SOLAR PHOTOVOLTAIC MODULES**

##### **2.1. The PV modules used should be made in India.**

- 2.2 The PV modules used must qualify to the latest edition of IEC PV module qualification test or equivalent BIS standards Crystalline Silicon Solar Cell Modules IEC 61215/IS14286. In addition, the modules must conform to IEC 61730 Part-1- requirements for construction & Part 2 – requirements for testing, for safety qualification or equivalent IS.

- a) For the PV modules to be used in a highly corrosive atmosphere throughout their lifetime, they must qualify to IEC 61701/IS 61701
- b) The total solar PV array capacity should not be less than allocated capacity (kWp) and should comprise of solar crystalline modules of minimum 295 Wp and above wattage. Module capacity less than minimum 295 watts shall not be accepted.
- c) Protective devices against surges at the PV module shall be provided. Low voltage drop bypass diodes shall be provided.
- d) PV modules must be tested and approved by one of the IEC authorized test centers.
- e) The module frame shall be made of corrosion resistant materials, preferably having anodized aluminum.

- f) The bidder shall carefully design & accommodate requisite numbers of the modules to achieve the rated power in his bid. MMRC/owners shall allow only minor changes at the time of execution.
- g) Other general requirement for the PV modules and subsystems shall be the Following:
  - i. The rated output power of any supplied module shall have tolerance of +/- 3%.
  - ii. The peak-power point voltage and the peak-power point current of any supplied module and/or any module string (series connected modules) shall not vary by more than 2 (two) per cent from the respective arithmetic means for all modules and/or for all module strings, as the case may be.
  - iii. The module shall be provided with a junction box with either provision of external screw terminal connection or sealed type and with arrangement for provision of by-pass diode. The box shall have hinged, weather proof lid with captive screws and cable gland entry points or may be of sealed type and IP-65 rated.
  - iv. I-V (Current – Voltage) curves at STC (standard test conditions) should be provided by bidder.

2.3. Modules deployed must use a RF (Radio frequency) identification tag. The following information must be mentioned in the RFID used on each module (This can be inside or outside the laminate, but must be able to withstand harsh environmental conditions).

- a) Name of the manufacturer of the PV module
- b) Name of the manufacturer of Solar Cells.
- c) Month & year of the manufacture (separate for solar cells and modules)
- d) Country of origin (separately for solar cells and module)
- e) I-V curve for the module Wattage,  $I_{max}$ ,  $V_{max}$  and FF (Fill Factor) for the module
- f) Unique Serial No and Model No of the module
- g) Date and year of obtaining IEC PV module qualification certificate.
- h) Name of the test lab issuing IEC certificate.
- i) Other relevant information on traceability of solar cells and module as per ISO 9001 and ISO 14001.

#### 2.4. Warranties

##### a) Material Warranty

1. Material Warranty is defined as: "The manufacturer should warrant the Solar Module(s) to be free from the defects and/or failures specified below for a period not less than five (05) years from the date of sale to the original customer ("Customer)".
2. Defects and/or failures due to manufacturing,
3. Defects and/or failures due to quality of materials,
4. Non conformity to specifications due to faulty manufacturing and/or inspection processes. If the solar Module(s) fails to conform to this warranty, the manufacturer will repair or replace the solar module(s), at the Owners sole option.
5. The PV module must have 10 years free replacement guarantee against material defect or craftsmanship.

#### 2.5 Array Structure

- a) Hot dip galvanized MS mounting structures (with 1000 gm/m<sup>2</sup>zinc mass coating) may be used for mounting the modules/ panels/arrays. Each structure should have angle of inclination as per the site conditions to take maximum irradiation. However, to

accommodate more capacity the angle inclination may be reduced until the plant meets the specified performance ratio requirements.

- b) The Mounting structure shall be so designed to withstand the speed for the wind zone of the location where a PV system is proposed to be installed. It may be ensured that the design has been certified by a recognized Lab/ Institution in this regard and submit wind loading calculation sheet to MMRC. Suitable fastening arrangement such as grouting and calming should be provided to secure the installation against the specific wind speed.
- c) The mounting structure steel shall be as per latest IS 2062: 1992 and galvanization of the mounting structure shall be in compliance of latest IS 4759.
- d) Structural material shall be corrosion resistant and electrolytically compatible with the materials used in the module frame, its fasteners, nuts and bolts. Necessary protection towards rusting need to be provided either by coating or iodization.
- e) The fasteners used should be made up of stainless steel. The structures shall be designed to allow easy replacement of any module. The array structure shall be so designed that it will occupy minimum space without sacrificing the output from the SPV panels. Installation of solar structure should not damage the roof in any way. If any concrete or foundation is required, it should be pre-cast type.
- f) Regarding civil structures, the bidder need to take care of the load bearing capacity of the roof and need arrange suitable structures based on the quality of roof. The bidder must ensure that, civil structure design should gel with the existing aesthetics of the MMRC building.
- g) The total load of the structure (when installed with PV modules) on the terrace should be less than 60 kg/m<sup>2</sup>.
- h) The Associated Civil Structure, consists of following items with detail technical specifications:

Descriptions	Size (mm)	Material
Leg	ISMC (75X756)	HDGI
Rafter	80X40X40X15X2X2000	Pre GI
Purline P1	65X40X40X15X2X3000	Pre GI
Purline P2	65X40X40X15X2X2770	Pre GI
Joint	100X120X2	Pre GI
Kicker K1	40X25X25X2X700	Pre GI
Base Plate	200X200X8	HDGI
Kicker Plate	150X70X4	HDGI
Fasteners	NA	Stainless Steel

- i) The actual quantities required may vary pertaining to site conditions. So, the bidder may visit the site and quote accordingly

### 3. **JUNCTION BOXES (JBs)**

- a) The junction boxes are to be provided in the PV array for termination of connecting cables. The Junction Boxes (JBs) shall be made of GRP/FRP/Powder Coated Aluminum /cast aluminum alloy with full dust, water & vermin proof arrangement. All wires/cables must be terminated through cable lugs. The JB's shall be such that input & output termination can be made through suitable cable glands.

- b) Copper bus bars/terminal blocks housed in the junction box with suitable termination threads Conforming to IP65 standard and IEC 62208 Hinged door with EPDM rubber gasket to prevent water entry with single compression cable glands, provision of earthing. It should be placed at 5 feet height or above for ease of accessibility.
- c) Each Junction Box shall have High quality Suitable capacity Metal Oxide Varistors (MOVs) / surge arrestors, suitable Reverse Blocking Diodes. The Junction Boxes shall have suitable arrangement monitoring and disconnection for each of the groups.
- d) Suitable markings shall be provided on the bus bar for easy identification and the cable ferrules must be fitted at the cable termination points for identification.

**4. DC DISTRIBUTION PANEL BOARD (DCDB)**

- a) DC Distribution panel to receive the DC output from the array field.
- b) DCDB shall have sheet from enclosure of dust & vermin proof conform to IP 65 protection. The bus bars are made of copper of desired size. Suitable capacity MCBs/MCCB shall be provided for controlling the DC power output to the PCU along with necessary surge arrestors.

**5. AC DISTRIBUTION PANEL BOARD**

- c) AC Distribution Panel Board (ACDB) shall control the AC power from PCU/ inverter, and should have necessary surge arrestors. Interconnection from ACDB to mains at LT Bus bar while in grid tied mode.
- d) All switches and the circuit breakers, connectors should conform to IEC 60947, part I, II and III/ IS60947 part I, II and III.
- e) The changeover switches, cabling work should be undertaken by the bidder as part of the project.
- f) All the Panel's shall be metal clad, totally enclosed, rigid, floor mounted, air - insulated, cubical type suitable for operation on three phase / single phase, 415 or 230 volts, 50 Hz
- g) The panels shall be designed for minimum expected ambient temperature of 45 degree Celsius, 80 percent humidity and dusty weather.
- h) All indoor panels will have protection of IP54 or better. All outdoor panels will have protection of IP65 or better.
- i) Should conform to Indian Electricity Act and rules (till last amendment).
- j) All the 415 Volt AC or 230 volts devices / equipment like bus support insulators, circuit breakers, VTs etc., mounted inside the switchgear shall be suitable for continuous operation and satisfactory performance under the following supply conditions

<b>Variation in supply voltage</b>	<b>+/- 10 %</b>
<b>Variation in supply frequency</b>	<b>+/- 3 Hz</b>

**6. PCU/ARRAY SIZE RATIO:**

- a) The combined wattage of all inverters should not be less than rated capacity of power plant under STC (Standard test conditions).
- b) Maximum power point tracker shall be integrated in the PCU/inverter to maximize energy drawn from the array.

## 7. PCU / INVERTER:

As SPV array produce direct current electricity, it is necessary to convert this direct current into alternating current and adjust the voltage levels to match the grid voltage. Conversion shall be achieved using an electronic Inverter and the associated control and protection devices. All these components of the system are termed the “Power Conditioning Unit (PCU)”. In addition, the PCU shall also house MPPT (Maximum Power Point Tracker), an interface between Solar PV array & the Inverter, to the power conditioning unit/inverter should also be DG set interactive. If necessary inverter output should be compatible with the grid frequency. Typical technical features of the inverter shall be as follows:

➤ Switching devices	: IGBT/MOSFET
➤ Control Signal Processor)	: Microprocessor / DSP (Digital
➤ Nominal AC output voltage and frequency	: 415V, 3 Phase, 50 Hz
➤ Output frequency	: 50 Hz
➤ Grid Frequency Synchronization range	: + 3 Hz or more
➤ Ambient temperature considered	: -20° C to 50° C
➤ Humidity	: 95 % Non-condensing
➤ Protection of Enclosure	: IP-20(Minimum) for indoor. IP-65(Minimum) for outdoor.
➤ Grid Frequency Tolerance range	: + 3 Hz or more
➤ Grid Voltage tolerance	: - 20% & + 15 %
➤ No-load losses	: Less than 1% of rated power
➤ Inverter efficiency(minimum)	: >93%
➤ Inverter efficiency (minimum)	: > 90%.
➤ THD	: < 3%
➤ PF	: > 0.9

- a) Three phase PCU/ inverter shall be used with each power plant system.
- b) PCU/inverter shall be capable of complete automatic operation including wake-up, synchronization & shutdown.
- c) The output of power factor of PCU inverter is suitable for all voltage ranges or sink of reactive power; inverter should have internal protection arrangement against any sustainable fault in feeder line and against the lightning on feeder.
- d) Built-in meter and data logger to monitor plant performance through external computer shall be provided.
- e) The power conditioning units / inverters should comply with applicable IEC/ equivalent BIS standard for efficiency measurements and environmental tests as per standard codes IEC 61683/IS 61683 and IEC 60068- 2(1,2,14,30) /Equivalent BIS Std.
- f) The charge controller/ MPPT units environmental testing should qualify IEC 60068-2(1, 2, 14, 30)/Equivalent BIS std. The junction boxes/ enclosures should be IP 65(for outdoor)/ IP 54 (indoor) and as per IEC 529 specifications.
- g) The PCU/ inverters should be tested from the MNRE approved test centres / NABL /BIS /IEC accredited testing- calibration laboratories. In case of imported power conditioning units, these should be approved by international test houses.

## 8. INTEGRATION OF PV POWER WITH GRID:

The output power from SPV would be fed to the inverters which converts DC produced by SPV array to AC and feeds it into the main electricity grid after synchronization. In case of grid failure, or low or high voltage, solar PV system shall be out of synchronization and shall be disconnected from the grid with 4 pole isolation of inverter output with respect to the grid power connection need to be provided.

## 9. DATA ACQUISITION SYSTEM / PLANT MONITORING

### A. Data Acquisition System

- i. Data Acquisition System shall be provided for each of the solar PV plant.
- ii. Data Logging Provision for plant control and monitoring, time and date stamped system data logs for analysis with the high quality, suitable PC. Metering and Instrumentation for display of systems parameters and status indication to be provided.
- iii. Solar Irradiance: An Integrating Pyranometer (Class II or better, along with calibration certificate) provided, with the sensor mounted in the plane of the array readout integrated with data logging system.
- iv. Temperature: Temperature probes for recording the Solar panel temperature and ambient temperature to be provided complete with readouts integrated with the data logging system
- v. The following parameters are accessible via the operating interface display in real time separately for solar power plant:
  - a. AC Voltage.
  - b. AC Output current.
  - c. Output Power
  - d. Power factor.
  - e. DC Input Voltage.
  - f. DC Input Current.
  - g. Time Active.
  - h. Time disabled.
  - i. Time Idle.
  - j. Power produced
  - k. Protective function limits (Viz - AC Over voltage, AC Under voltage, Over frequency, Under frequency, ground fault, PV starting voltage, PV stopping voltage, over current, short circuit etc.
- vi. All major parameters available on the digital bus and logging facility for energy auditing through the internal microprocessor and read on the digital front panel at any time) and logging facility (the current values, previous values for up to a month and the average values) should be made available for energy auditing through the internal microprocessor and should be read on the digital front panel.
- vii. PV array energy production: Digital Energy Meters to log the actual value of AC/ DC voltage, Current & Energy generated by the PV system provided. Energy meter along with CT / PT should be of 0.5 accuracy class.
- viii. Computerized DC String/Array monitoring and AC output monitoring shall be provided as part of the inverter and/or string/array combiner box or separately.
- ix. String and array DC Voltage, Current and Power, Inverter AC output voltage and



- current (All 3 phases and lines), AC power (Active, Reactive and Apparent), Power Factor and AC energy (All 3 phases and cumulative) and frequency shall be monitored.
- x. The time interval between two sets of data shall not be more than 15 minutes.  
(A min. of 4 samples of data shall be recorded per hour)
  - xi. Data Acquisition System shall have real time clock, internal reliable battery backup (2 hours) and data storage capacity to record data round the clock for a period of min. 1 year.
  - xii. Computerized AC energy monitoring shall be in addition to the digital AC energy meter.
  - xiii. The data shall be recorded in a common work sheet chronologically date wise. The data file shall be MS Excel compatible. The data shall be represented in both tabular and graphical form.
  - xiv. All instantaneous data shall be shown on the computer screen one PC with latest configuration for this purpose shall be provided at location in the same premises specified by MMRC.
  - xv. Software shall be provided for USB download and analysis of DC and AC parametric data for individual plant.
  - xvi. Provision for Internet monitoring and download of data shall be also incorporated.
  - xvii. Remote Server and Software for centralized Internet monitoring system shall be also provided for download and analysis of cumulative data of all the plants and the data of the solar radiation and environment monitoring system in the central location.

**B. Solar Radiation and Environment Monitoring System.**

- i. Computerized solar radiation and environment monitoring system shall be installed on one of the buildings along with the solar PV power plant.
- ii. The system shall consist of various sensors, signal conditioning, data acquisition, LCD display and remote monitoring.
- iii. Global and diffuse beam solar radiation in the plane of array (POA) shall be monitored on continuous basis. Global Horizontal Irradiation at the collector panel is required to be measured.
- iv. Solar PV module back surface temperature shall be also monitored on continuous basis.
- v. Simultaneous monitoring of DC and AC electrical voltage, current, power, energy and other data of the plant for correlation with solar and environment data shall be provided.
- vi. Solar radiation and environment monitoring system shall have real time clock, internal reliable battery backup and data storage capacity to record data round the clock for a period of min. 1 year.
- vii. The data shall be recorded in a common work sheet chronologically date wise. The data file should be MS Excel compatible. The data shall be represented in both tabular and graphical form.
- viii. All instantaneous data shall be shown on the computer screen.
- ix. Historical data shall be available for USB download and analysis.

**10. METERING**

- a) The bidirectional Electronic Energy meter (0.2S class) shall be installed for the measurement of import / Export of energy.
- b) The energy meter capable of recording both import and export of electricity, for recording the net import and net export of electricity.
- c) The bidder must take approval/NOC from the Concerned utility for the connectivity,

technical feasibility, and synchronization of SPV plant with distribution network and submit the same to MMRC before commissioning of SPV plant.

- d) The Net Metering arrangements of the system must comply with MERC Net metering Regulations.
- e) The meter shall adhere to the Standards as specified in CEA (Installation and Operation of meters) Regulations 2006, and subsequent amendments thereof.

#### 11. **POWER CONSUMPTION**

Regarding the generated power consumption, priority need to be given for internal consumption first and thereafter any excess power can be exported to grid.

#### 12. **PROTECTIONS**

The system should be provided with all necessary protections like earthing, Lightning, and grid islanding as follows:

#### 13. **LIGHTENING PROTECTION**

- a) The SPV power plants shall be provided with lightning & overvoltage protection. The main aim in this protection shall be to reduce the over voltage to a tolerable value before it reaches the PV or other sub system components. The source of over voltage can be lightning, atmosphere disturbances etc. The entire space occupying the SPV array shall be suitably protected against Lightning by deploying required number of Lightning Arrestors. Lightning protection should be provided as per IEC 62305 standard. The protection against induced high-voltages shall be provided by the use of metal oxide arrestors (MOVs) and suitable earthing such that induced transients find an alternate route to earth.

#### 14. **SURGE PROTECTION**

- a) Internal surge protection shall consist of three MOV type surge-arrestors connected from +ve and -ve terminals to earth (via Y arrangement)

#### 15. **EARTHING PROTECTION**

- a) Each array structure of the PV yard should be grounded/ earthed properly as per IS: 3043-1987. In addition the lightning arrester/masts should also be earthed inside the array field. Earth Resistance shall be tested in presence of the representative of MMRC as and when required after earthing by calibrated earth tester. PCU, ACDB and DCDB should also be earthed properly.
- b) Earth resistance shall not be more than 5 ohms. It shall be ensured that all the earthing points are bonded together to make them at the same potential.

#### 16. **GRID ISLANDING:**

- a) In the event of a power failure on the electric grid, it is required that any independent power-producing inverters attached to the grid turn off in a short period of time. This prevents the DC-to-AC inverters from continuing to feed power into small sections of

the grid, known as “islands.”

- b) Powered islands present a risk to workers who may expect the area to be unpowered, and they may also damage grid-tied equipment. The Rooftop PV system shall be equipped with islanding protection. In addition to disconnection from the grid (due to islanding protection) disconnection due to under and over voltage conditions shall also be provided.
- c) A manual disconnect 4pole isolation switch beside automatic disconnection to grid would have to be provided at utility end to isolate the grid connection by the utility personnel to carry out any maintenance. This switch shall be locked by the utility personnel.

**17. CABLES :-** Cables of appropriate size to be used in the system shall have the following characteristics:

- i. Shall meet IEC 60227/IS 694, IEC 60502/IS1554 standards
- ii. Temp. Range:- 10°C to +80°C.
- iii. Voltage rating:-1100V.
- iv. Excellent resistance to heat, cold, water, oil, abrasion, UV radiation
- v. Flexible and Armoured.
- vi. Sizes of cables between array interconnections, array to junction boxes, junction boxes to Inverter etc. shall be so selected to keep the voltage drop (power loss) of the entire solar system to the minimum. The cables (as per IS) should be insulated with a special grade PVC FRLS compound formulated for outdoor use. FRLSZH cables shall be used in all underground areas.
- vii. Cable Routing/ Marking: All cable/wires are to be routed in a GI cable tray and suitably tagged and marked with proper manner by good quality ferule or by other means so that the cable easily identified.
- viii. The Cable should be so selected that it should be compatible up to the life of the solar PV panels i.e. 25years.
- ix. The ratings given are approximate. Bidder to indicate size and length as per system design requirement. All the cables required for the plant provided by the bidder. Any change in cabling sizes if desired by the bidder/approved after citing appropriate reasons. All cable schedules/layout drawings approved prior to installation.
- x. Multi Strand, Annealed high conductivity copper conductor with XLPE insulation. Overall PVC/XLPE insulation for UV protection Armored cable for underground laying. All cable trays including covers to be provided. All cables conform to latest edition of IEC/ equivalent BIS Standards as specified below.  
PVC/XLPE insulated cables for working Voltage up to and including 1100 V ,UV resistant for outdoor installation IS /IEC 69947.
- xi. The size of each type of DC cable selected shall be based on minimum voltage drop however; the maximum drop shall be limited to 2 %.
- xii. The size of each type of AC cable selected shall be based on minimum voltage drop however; the maximum drop shall be limited to 2 %.

**18. CONNECTIVITY**

The maximum capacity for interconnection with the grid at a specific voltage level shall be as specified in the Distribution Code/Supply Code and amended from time to time. Following criteria have been suggested for selection of voltage level in the distribution

system for ready reference of the solar suppliers.

Plant Capacity	Connecting voltage
16kWp	415V – three phase

MMRC has voltage level of 415 V for LT

**19. TOOLS & TACKLES AND SPARES:**

- a) After completion of installation & commissioning of the power plant, necessary tools & tackles shall be maintained by the bidder for maintenance purpose during DLP period.
- b) A list of requisite spares in case of PCU/inverter comprising of a set of control logic cards, IGBT driver cards etc. Junction Boxes. Fuses, MOVs / arrestors, MCCBs etc along with spare set of PV modules be indicated, which shall be maintained. A minimum set of spares shall be maintained in the plant itself for the entire period of warranty and DLP period.

**20. DANGER BOARDS AND SIGNAGES:**

- a) Danger boards should be provided as and where necessary as per IE Act. /IE Rules as amended up to date. Three signage's shall be provided one each at battery –cum-control room, solar array area and main entry in to the area. Text of the signage's may be finalized in consultation with MMRC.

**21. FIRE EXTINGUISHERS:**

- a) The firefighting system for the proposed power plant for fire protection shall be consisting of
  - i. Portable fire extinguishers in the control room for fire caused by electrical short circuits.
  - ii. Sand buckets in the control room
- b) The installation of Fire Extinguishers should confirm to TAC regulations and BIS standards. The fire extinguishers shall be provided in the control room housing PCUs as well as on the Roof or site where the PV arrays have been installed.

**22. DRAWINGS & MANUALS:**

- c) **Three sets** of Engineering, electrical drawings and Installation and O&M manuals are to be supplied. Bidders shall provide complete technical data sheets for each equipment giving details of the specifications along with make/makes in their bid along with basic design of the power plant and power evacuation, synchronization along with protection equipment.
- d) Approved ISI and reputed makes for equipment be used.
- e) For complete electro-mechanical works, bidders shall supply complete design, details and drawings for approval to MMRC before progressing with the installation work.

**23. PLANNING AND DESIGNING:**

- a) The bidder should carry out Shadow Analysis at the site and accordingly design strings & arrays layout considering optimal usage of space, material and labour. The bidder should submit the array layout drawings along with Shadow Analysis Report to MMRC/Owner for approval.
- b) MMRC reserves the right to modify the landscaping design, Layout and specification of sub-systems and components at any stage as per local site conditions/requirements.
- c) The bidder shall submit preliminary drawing for approval & based on any modification or recommendation, if any. The bidder shall submit three sets and soft copy in CD of final drawing for formal approval to proceed with construction work.

**24. DRAWINGS TO BE FURNISHED BY BIDDER AFTER AWARD OF CONTRACT :**

The Contractor shall furnish the following drawings after Award/Intent and obtain approval:-

- a) General arrangement and dimensioned layout.
- b) Schematic drawing showing the requirement of SPV panel, Power conditioning. Unit(s)/ inverter, Junction Boxes, AC and DC Distribution Boards, meters etc.
- c) Structural drawing along with foundation details for the structure.
- d) Itemized bill of material for complete SPV plant covering all the components and associated accessories.
- e) Layout of solar Power Array.
- f) Shadow analysis of the area.
- g) Guaranteed Technical Particular (GTP) of Solar PV modules, inverters, Remote monitoring system, DC cables, AC cables, Junction Box.

**25. SOLAR PV SYSTEM ON THE ROOFTOP FOR MEETING THE ANNUAL ENERGY REQUIREMENT**

The Solar PV system on the rooftop of the selected buildings will be installed for meeting the maximum energy requirements depending upon the area of rooftop available and the remaining energy requirement of the office buildings will be met by drawing power from grid.

**26. SAFETY MEASURES:**

The bidder shall take entire responsibility for electrical safety of the installation(s) including connectivity with the grid and follow all the safety rules & regulations applicable as per Electricity Act, 2003 and CEA guidelines etc.

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**CHAPTER – VIII**  
**CONTRACT AGREEMENT**

**MUMBAI METRO RAIL CORPORATION LIMITED**

THESE ARTICLES OF AGREEMENT made at Mumbai this \_\_\_\_\_ day of \_\_\_\_\_ Two Thousand Sixteen between the MUMBAI METRO RAIL CORPORATION LIMITED (MMRC) a company incorporated under companies act , 1956 on 13.04.2008 presently a 50:50 joint venture company of GoI and GoM within the meaning of section 617 of the companies Act 1956 having its office in MMRC, NAMTTRI Building Plot R-13,E Block of BKC, Bandra (East), Mumbai-400 051 hereinafter called “The Company” (which expression shall unless the context does not admit, include its successor or successors and assign or signs) of the one part and M/S \_\_\_\_\_ represented by Shri \_\_\_\_\_ having their office at \_\_\_\_\_, hereinafter called collectively “The Contractor” (which expression shall unless the context does not admit, include their respective heirs, administrators, executors and surviving partner or partners) of the other part.

WHEREAS the Company invited by its public advertisement No. \_\_\_\_\_ dated \_\_\_\_\_ published in the News Paper \_\_\_\_\_ dated \_\_\_\_\_ public tenders for the execution of works referred to therein and more particularly described in the tender documents constituted in the e-Tender Notice, Instructions to the Bidders, General Conditions of Contract, Additional General Conditions, Special Conditions Of Contract, Technical Specifications, Schedule of Quantities of work and other allied documents.

AND WHEREAS the Contractor submitted his tender dated \_\_\_\_\_ for a sum of Rs. \_\_\_\_\_.

AND WHEREAS in exercise of its schedule of power the said tender of the Contractor being accepted subject to the following terms and conditions.

AND WHEREAS the parties hereto are desirous of recording the Agreement so concluded between them which they do hereinafter.

**NOW THIS AGREEMENT WITNESSETH AS FOLLOWS:**

1. In this Agreement, words and expressions shall have the same meanings as are respectively assigned to them in the Conditions of Contract herein after referred to.
2. The following documents shall be deemed to form and read and construed as a part of this Agreement, and the priority of the documents shall be as follows:
  - (a) the Letter of Acceptance;
  - (b) Work order
  - (c) Common set of clarifications/deviations & addendum, if any
  - (d) Special conditions of contract
  - (e) Conditions of Contract
  - (f) Additional General Conditions
  - (g) General conditions Of Contract
  - (h) Percentage rate Tender & contract for works
  - (i) Technical specifications
  - (j) Tender Drawings
  - (k) Schedule of Bill of Quantities as per schedule-A

- 3. In consideration of the payments to be made by the Employer to the Contractor as hereinafter mentioned, the Contractor hereby covenants with the Employer to execute and complete the Works and remedy and defects therein conformity in all respects with the provisions of the Contract.
- 4. The Employer hereby covenants to pay the Contractor in consideration of the execution and completion of the Works and the remedying of defects therein the Contract Price or such other sum as may become payable under the provisions of the Contract at the times and in the manner prescribed by the Contract.

IN WITNESSTH whereof the parties hereto have caused this Agreement to be executed the day and year first before written:

SIGNED AND DELIVERED FOR AND ON  
BEHALF OF  
**MUMBAI METRO RAIL CORPORATION LIMITED**  
BY pursuant to Schedule of Powers

In the presence of :  
(1)  
(2)



Signature:  
Designation:

SIGNED AND DELIVERED FOR AND ON  
BEHALF OF THE CONTRACTOR BY  
Shri \_\_\_\_\_  
By the Partner pursuant to Authority of their  
Deed of Partnership

In the presence of :  
(1)  
(2)



Signature:  
Designation:



**CHAPTER – IX**  
**DECLARATION BY CONTRACTOR**

I / We hereby declare that I have made myself thoroughly conversant with the local or prevailing site conditions regarding availability of all construction materials and labour on which I/we have based my rates for this tender. The specifications and lead on this work have been carefully studied and understood by me/ us before submitting the tender. I/we undertake to use only the best materials and method proposed to employ duly approved by the Sr. Deputy General Manager, MMRC, Mumbai or to abide by his decision.

Signature of Contractor

Assistant General Manager/Elect.  
MMRCL, Mumbai



**CHAPTER – X****FORM B-1****Percentage Rate Tender and Contract for Works  
General Rules and Directions for the Guidance of Contractor**

1. All works proposed to be executed by Contractor shall be notified in a form of e-tender digitally signed by Engineer.

This form will state the work to be carried out as well as the date for submitting and opening tenders, and the time allowed for carrying out the work, also the amount of earnest money to be deposited with the tender, and the amount of the security deposit to be deposited by the successful tenderer and the percentage, if any, to be deducted from bills. It will also state whether a refund of quarry fees, royalties, octroi dues and ground rents will be granted. Copies of the specifications, designs and drawings and estimated rates, scheduled rates and any other documents required in connection with the work shall be signed by the Engineer for the purpose of identification shall also be open for inspection by contractors at the office of the Engineer during office hours.

Where the works are proposed to be executed according to the specifications recommended by a contractor and approved by a competent authority on behalf of the MMRCL such specifications with designs and drawings shall form part of the accepted tender.

2. In the event of the tender being submitted by a firm, it must be digitally signed by a person holding a power of attorney authorizing him to do so.
  - i) The contractor shall along with the Tender pay the earnest money by electronic transfer. The said amount of earnest money shall not carry any interest.
  - ii) In the event of his Tender being accepted subject to the provisions of sub-clause (iii) below the said amount of earnest money may be appropriated towards the amount of Security Deposit payable by him under condition of General Conditions of Contract.
  - iii) If, after submitting the tender, the contractor withdraws his offer, or modifies the same, or if after the acceptance of his tender the contractor fails or neglects to furnish the balance of Security Deposit, within 10 days from the date of letter of intent without prejudice to any other rights and powers of the MMRCL, hereunder or in law, MMRCL shall be entitled to forfeit the full amount of the earnest money deposited by him. Please see Clause 1 of conditions of contract.
  - iv) In the event of his tender not being accepted, the amount of earnest money deposited by the contractor shall unless it is prior thereto forfeited under the provisions of sub-clause (iii) above, to be refunded to him on his passing receipt thereof.
3. Receipts for payments made on account of any work, when executed by a firm shall also be signed by all the partners except where the contractors are described in their tender as a firm in which case the receipt shall be signed in the name of the firm by one of the partners, or by some other person having authority to give effectual receipts for the firm.

4. Any person who submits a tender shall quote his offer in the prescribed space in e-envelope C only. Tenders which propose any alteration in the works specified in the said form of invitation to “tender” or in the time allowed for carrying out the work or which contain any other conditions, will be liable to rejection.
5. The Executive Director/Elect. or his duly authorized Assistant shall open e-tenders in the presence of contractors who have submitted tenders or their authorized representatives who may be present at the time and he will enter the amounts of the several tenders in a comparative statement in a suitable form. In the event of a tender being accepted the contractor shall, for the purpose of identification, sign copies of the specifications and other documents mentioned in Rule 1. In the event of tender being rejected, the Engineer shall authorize the Accounts Office concerned to refund the amount of the earnest money deposited to the contractor taking the tender, on his giving a receipt for the return of the money.
6. The officer competent to dispose of the tenders shall have the right of rejecting all or any of the tenders.
7. No receipt for any payment alleged to have been made by a contractor in regard to any matter relating to this tender or the contract shall be valid and binding on MMRCL unless it is signed by the Engineer.
8. The memorandum of work to be tendered for and the Schedule of materials to be supplied by the MMRCL and their rates shall be filled in and completed by the office of Engineer before the tender form is issued. If a form issued to an intending tenderer has not been so filled in and completed, he shall request the said office to have this done before he completes and delivers his tender.
9. All work shall be measured out by the standard measure and according to the rules and customs of the MMRCL and their rates shall be subject to any local customs.
10. Under no circumstances shall any contractor be entitled to claim enhanced rates for any items in this contract.
11. All corrections and additions or pasted slips should be initialed.
12. The measurements of work will be taken according to the usual method in use in the MMRCL and no proposals to adopt alternative methods will be accepted. The Engineer’s decision as to what is “The usual method in use in the MMRCL” will be final.
13. The tendering contractor shall furnish a declaration along with the tender showing all works for which he has already entered into contract, and the value of the work that remains to be executed in each case on the date of submitting the tender.
14. Every tenderer shall submit along with the tender information regarding the Income-tax clearance of ward or the district in which he is assessed for income-tax, the reference to the number of the assessment and the assessment year.

15. In view of the difficult position regarding the availability of foreign exchange no foreign exchange would be released by the MMRCL for the purchase of plant and machinery required for the execution of the work contracted for.
16. The contractor will have to construct shed if required for storing controlled and valuable materials viz. timber paint, cement etc. at work site at his own cost after taking suitable approvals
17. The contractor shall also give a list of machinery in their possession and which they propose to use on the work.
18. Contractor should produce original license / attested copy of license duly attested by a Gazetted Officer, having registered with the Assistant Commissioner of Labour as required as per Contract Labour (Regulation and Abolition) Act, 1970 and Maharashtra Contract Labour (Regulation and Abolition) Rules, 1970.
19. Contractor should produce a year-wise list of works carried out during the last 03 (Three) Financial years.
20. The contractor shall produce true copies of registration certificate of appropriate class including its validity.

## TENDER FOR WORKS

I / We agree that this offer shall remain open for minimum period of 90 (Ninety days) from that fixed for receiving the same and hereafter until it is withdrawn by me / us by notice in writing duly addressed to the Authority opening the tenders and sent by registered Post A.D. or otherwise delivered at the office of such authority. I have deposited the earnest money by way of electronic transfer.

The amount of earnest money shall not bear interest and shall be liable to be forfeited to the MMRCL should I / We fail to abide by the stipulation to keep the offer open for the period mentioned above or (ii) sign and complete the contract documents as required by the Engineer and furnish the Security Deposit as specified in item (d) of the memorandum contained in paragraph 1 above within the time limit laid down in clause (i) of the Conditions of Contract. The amount of earnest money may be adjusted towards the Security Deposit or refunded to me / us if so desired by me / us in writing, unless the same or any part thereof has been forfeited as aforesaid.

Should any occasion for forfeit of bid security for this work arise due to failure on my / our part to (i) abide by the stipulation to keep the offer open for the period mentioned above or (ii) sign and complete the contract documents and furnish the security deposit as specified in item (d) of the memorandum contained in paragraphs above within the time limit laid down in clause (I) of the Conditions of Contract, the amount payable by me / us may at the option of the Engineer be recovered out of the amount deposited in lump sum for securing exemption in so far as the same may be extended in terms of the deficiency out of any other moneys which are due or payable to me / us the MMRCL, under any other contract or transaction of any nature whatsoever or otherwise.

*	<p>I / We hereby tender for the execution, for the Managing Director, MMRCL (hereinbefore and hereinafter referred to as 'MMRCL') of the work specified in the underwritten memorandum within the time specified in such memorandum at * ( <b>Offer to be filled in e-Envelop 'C' i.e. Financial Bid</b>) below / above the estimated rates entered in Schedule 'A' (Memorandum showing item of work to be carried out) and in accordance in all respects with the specification designs, drawings and instructions in writing.</p>
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<b><u>MEMORANDUM</u></b>									
a) Description Of Work	“Design, supply, installation, testing and commissioning of 16 kVA/16kWp Grid Export (On-Grid) Roof Top Mounted Solar PV plant”.								
b) Estimated Cost	Rs 19,00,000/-								
c) The amount of earnest money to be deposited shall be in accordance with the provisions of paras 206 & 207 of the MPW Manual. (EMD) :	Rs. 19,000./-								
d) This deposit shall be in accordance with paras 213 & 214 of the MPW Manual and as per stated in Clause 1.6. Additional Security Deposit as per Clause 1.6.2	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 60%;">Security Deposit</td> <td style="text-align: right;">Rs. 95,000/-</td> </tr> <tr> <td>(i) Demand Draft of any Nationalised Bank while accepting of tender. (not less than the amount of earnest money)</td> <td style="text-align: right;">Rs. 47,500 /-</td> </tr> <tr> <td>(ii) To be deducted from The Second Running Account Bill.</td> <td style="text-align: right;">Rs. 47,500 /-</td> </tr> <tr> <td style="text-align: right;"><b>TOTAL :</b></td> <td style="text-align: right;">----- Rs. 95,000 /- =====</td> </tr> </table>	Security Deposit	Rs. 95,000/-	(i) Demand Draft of any Nationalised Bank while accepting of tender. (not less than the amount of earnest money)	Rs. 47,500 /-	(ii) To be deducted from The Second Running Account Bill.	Rs. 47,500 /-	<b>TOTAL :</b>	----- Rs. 95,000 /- =====
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(ii) To be deducted from The Second Running Account Bill.	Rs. 47,500 /-								
<b>TOTAL :</b>	----- Rs. 95,000 /- =====								
e) This percentage where no security deposit is taken will vary from 5% to 10% according to the requirements of the case where	Percentage, if any, to be deducted 10(ten) percent from bills so as to make up the total amount required as security deposit by the time half the works as measured by the costs, is done.								

	security deposit is taken. See Note to clause 1 of Conditions Of Contract	
	f) Give schedule where necessary showing dates by which the various items are to be completed	Time allowed for the work from date: <b>2 (Two)</b> (Months of written order to commence). I/We hereby agree to abide by and fulfil all the terms, and provisions of the condition of contract annexed hereto so far as practicable, and in default thereof to forfeit and pay to MMRC the sums of money mentioned in the said conditions.
	g) Amount to be specified in words and figures	Receipt No. _____ dated _____ from the MMRC Finance and Accounts Division in respect of the sum of _____ is herewith forwarded representing the earnest money
	h) If no cash security deposit is to be taken	The full value of which is to be absolutely forfeited to MMRC should I/we not deposit the full amount of security deposit specified in above memorandum in accordance with the clause I (A) of the said conditions otherwise the said sum of Rs. 19,000/- shall be refunded
	i) Liquidated Damage	1.00 % of the Contract Amount Per Week per day of delay subject to a Maximum of 10% of the actual project cost.
	j) Time allowed for completion:	2 Months.
	k) Validity period for Tenders	120 days from the date of opening of the priced bid of the tender.
	l) Defect Liability Period	2 Years from the date of commissioning of the system.
	m) Period of Honouring Bills:	A) Running Bill: Ten working days from the date of completion with all the supporting documents.



	1. Final Bill: 30 working days from the date of completion with all the supporting documents.
n) Signature of Contractor before submission of tender	Contractor  Address  Dated the                      day of                      2016.
o) Signature of witness of Contractor's signature	(Witness)  (Address)  (Occupation)
p) Signature of the Officer by whom accepted.	The above tender is hereby accepted by me for and on behalf of the Managing Director, of MMRC.
<p>Should this tender be accepted, I/We hereby agree to abide by our tender / offer and fulfil the terms and provisions of the said set of Conditions of Contract annexed hereto so far as they may be applicable or in default thereof to forfeit and pay to the MMRC the amount mentioned in the said conditions.</p> <p>I / We have deposited a sum of Rs.                      /- as Earnest Money Deposit.</p> <p style="text-align: right;">Sr. Deputy General Manager MMRC, Mumbai</p>	



**CHAPTER: XI**  
**CONDITIONS OF CONTRACT**

Security Deposit	<p><b>CLAUSE 1 :</b> The person/ persons whose tender may be accepted (hereinafter called “the contractor” which expression shall unless excluded by or repugnant to the context include its heirs, executors, administrators, and assigns) shall (A) within 10 days (which may be extended by the Engineer concerned up to 15 days if he thinks fit to do so) of the receipt by him of the notifications of the acceptance of his tender, deposit with the Engineer (if deposited for more than 12 months) of sum sufficient which will make up the full security deposit specified in the tender or (B) (Permit MMRCL at the time of making any payment to him for work done under the contract to deduct such sum as will amount to five percent of all moneys so payable such deductions to be held by the MMRCL by way of security deposit) provided always that in the event of the contractor depositing a lump sum by way of security deposit as contemplated at (A) above, then and in such case, if the sum so deposited shall not amount to five percent of the total estimated cost of the work, it shall be lawful for MMRCL at the time of making any payment to the contractor for work done under the contract to make up the full amount of two and a half percent by deducting a sufficient sum from every such payment as last aforesaid until the full amount of the security deposit is made up. All compensation or other sums of money payable by the contractor to the MMRCL under the terms of his contract may be deducted from or paid by the sale of sufficient part of his security deposit or from the interest arising there from, or from any sums which may be due or may become due by MMRCL to the contractor under any other contract or transaction of any nature on any account securities endorsed as aforesaid, any sum or sums which whatsoever and in the event of his security deposit being reduced by reason of any such deduction or sale as aforesaid, the contractor shall, within ten days thereafter, make good in cash or Government may have been deducted from, or raised by sale of his security deposit or any part thereof. The security referred to when paid in cash may at the cost of the depositor, be converted into interest bearing securities provided that the depositor has expressly desired this in writing.</p>
	<p>If the amount of the security deposit to be paid in a lump sum within the period specified at (A) above is not paid, the tender / contract already accepted shall be considered as cancelled and legal steps taken against the contractor for recovery of the amounts. The amount of the security deposit lodged by a contractor shall be refunded along with the payment of the final bill, if the date up to which the contractor has agreed to maintain the work in good order is over. If such date is not over, only 50% amount of security deposit shall be refunded along with the payment of the final bill. The amount of security deposit retained by the MMRCL shall be released after expiry of defect liability period (DLP). In the</p>

	<p>event of the contractor failing or neglecting to complete rectification work within the period up to which the contractor has agreed to maintain the work in good order then subject to provision of Clause 17 and 20 hereof the amount of Security Deposit retained by MMRCL shall be adjusted towards the excess cost incurred by the MMRCL on rectification work.</p>
<p>Compensation for delay</p>	<p><b>CLAUSE 2:</b> At the rate of 1% of the contract value per day per week of the delay occurring from the period of completion as per ITB 1.1 subject to maximum of 10% of contract value shall be deducted. The delay shall be counted after the date of signing the contract agreement.</p>
<p>Action when whole of security deposit is forfeited.</p>	<p><b>CLAUSE 3:</b> In any case in which under any clause of this contract the contractor shall have rendered himself to pay compensation amounting to whole of his security deposit (whether paid in one sum or deducted by installments) or in case of abandonment of the work owing to serious illness or death of the contractor or any other cause the Executive Director/Elect.on behalf of the Managing Director of MMRCL, shall have power to adopt any of the following courses as he may deem best suited to the interest of the MMRCL.</p>

a)	The rescind the contract (for which decision notice in writing to the contractor under the hand of Executive Director/Elect shall be conclusive evidence) and in that case the security Deposit of the contractor shall stand forfeited and be absolutely at the disposal of MMRCL.
b)	To carry out the work or any part of the work departmentally debiting the contractors with cost of the work, expenditure incurred on tools and plant and charges on additional supervisory staff including the cost of the work charges establishment employed for getting the unexecuted part of the work completed and crediting him with the value of the work done departmentally in all respects in the same manner and at the rates as if it had been carried out by the contractor under the terms of this contract. The certificate of the Engineer as to the cost and other allied expenses so incurred and to the value of the work so done departmentally shall be final and conclusive as against the contractor.
c)	To order that the work of the contractor be measured up to date such part thereof as shall be unexecuted out of his hands and to give it to another contractor to complete in which case all expenses incurred on advertisement for fixing new contracting agency, additional supervisory staff including the cost of work charged establishment and cost of the work executed by the new contract agency will be debited to the contractor and the value of the work done or executed through the new contractor shall be credited to the contractor in all respects and in the same manner and at the same rates as if it had been carried out by the contractor under the terms of this contract. The certificate of the Engineer as to all the cost of the work and other expenses incurred as aforesaid for or in getting the unexecuted work done by the new contractor and as per the value of the work so done be final and conclusive against the contractor.
d)	In case the contract shall be rescinded under Clause (a) above the contractor shall be entitled to recover or be paid any sum for any work therefore actually performed by him under this contract unless and until the Engineer shall have certified in writing the performance of such work and the amount payable to him in respect thereof and he shall only be entitled to be paid the amount so certified, in the event of either of the course referred to in Clause (b) or (c) being adopted and the cost of the work executed departmentally. Or through a new contractor and other allied expenses exceeding the value of such work credited to the contractor, the amount of excess shall be deducted from any money due to the contractor by MMRCL under the contract or otherwise however for, from his Security Deposit or the sale proceed thereof provided however the contractor shall have no claim against MMRCL even if certified cost of such work and allied expenses, whichever of three courses mentioned in Clauses (1), (b) or (c) is adopted by the Engineer the contractor shall have no claim to compensation for any loss sustained by him by reasons of his having purchased procured any

	materials or entered into any engagements or made any advances on account of or with a view to the execution of the work of the performance of the contract.
Action when the progress of any particular portion or the work is unsatisfactory	<b>CLAUSE 4:</b> The Engineer shall notwithstanding that the general progress of the work, be entitled to take action under Clause 3 (b) after giving the contractor 5 days' notice in writing. The contractor will have no claim for compensation, for any loss sustained by him owing to such action.
Contractor remains liable to pay compensation if action is not taken under Clause 3 & 4  Power to take possession of required removal of or sale of contractor's plant.	<b>CLAUSE 5:</b> In any case in which any of the powers conferred upon the Executive Director/Elect. by Clause 3 and 4 hereof shall have become exercisable and the same shall not constitute a waiver of any of the conditions hereof and such powers shall notwithstanding be exercisable in the event any future case of default by the contractor for which under any clause or clauses hereof he is declared liable to pay compensation amount to the whole of his security deposit and the liability of the contractor for past and future compensation shall remain unaffected. In the event of the Executive Director/Elect. Taking action under  sub-clause (a) or (c) of Clause 3, he may, if he so desires, take possession of all or any tools, land, materials and stores in or upon the work or the site thereof or belonging to the contractor, or procured by him and intended to be used for the execution of the work or any part thereof paying or allowing for the same in account at the contract rates or in the case of contract rates not being applicable at current market rates, to be certified by the Engineer may, after giving notice in writing to the contractor or his clerk of the work, or foreman or other authorized agent require him to remove such tools, plant, materials or stores from the premises within a time to be specified in such notice and in the event of the contractor failing to comply with any such requisition the Engineer may remove them at the contractor's expense or sell them by auction or private sale on account of the contractor and at his risk in all respects, and the certificate of the Engineer as to the expense of any such removal and the amount of the proceeds and expense of any such be final and conclusive against the contractor.
Extension of time	<b>CLAUSE 6:</b> If the contractor shall desire an extension of the time for completion of work on the ground of his having been unavoidably hindered in its execution or on any other ground, he shall apply in writing to the Engineer before the expiration of the period stipulated in the tender or before the expiration of 30 days from the date of which he was hindered as aforesaid or on which the cause for asking for extension occurred, whichever is earlier and the Engineer, may if in his opinion there was reasonable grounds for granting an extension, grant such extension as he thinks necessary or proper. The decision of the Engineer in this matter be final.

Final Certificate	<p><b>CLAUSE 7:</b> On completion of the work the contractor shall be furnished with a certificate by the Executive Director/Elect.(hereinafter called the Engineer) of such completion but no such certificate shall be given nor shall the work be considered to be complete until the contractor shall have removed from the premises on which the work shall have been executed all scaffolding, surplus materials and rubbish, and shall have cleaned off the dirt from all wood work, doors, windows, walls, floor or other parts of any building in or upon which the work has been executed or of which he may hand possession for the purpose of executing the work nor until the works shall have been measured by the Engineer or where the measurement have been take by his subordinates until they have received the approval of the Engineer, the said measurements being binding and conclusive against the contractor. If the contractor fails to comply with the requirements of this clause as to the removal of scaffolding, surplus materials and rubbish and cleaning of dirt on or before the date fixed for the completion of the work the Engineer may at the expense of the contractor remove such scaffolding, surplus materials and rubbish and dispose of the same as he thinks fit and clean off such dirt as aforesaid and the contractor shall forthwith pay the amount of all expenses so incurred, but shall have no claim in respect of any such scaffolding or surplus materials as aforesaid except for any sum actually realized by the sale thereof.</p>
Payments on intermediate certificates to be regarded as advances	<p><b>CLAUSE 8:</b> Deleted.</p>
Payment at reduced rates on account of items of work not accepted as completed to be at the discretion of Engineer	<p><b>CLAUSE 9:</b> Deleted</p>
Bill to be submitted monthly	<p><b>CLAUSE 10:</b> Deleted</p>
Bill to be on printed forms	<p><b>CLAUSE 11:</b> The contractor shall submit all bills on the printed forms to be had on an application at the office of the Engineer. The charges to be made in the bills shall always be entered at the rates specified in the tender or in the case of any extra work ordered in pursuance of these conditions, and not mentioned or provided for in the tender, at the rates hereinafter provided for such work.</p>

Store supplied by MMRCL	<b>CLAUSE 12: Deleted</b>
Works to be executed in accordance with specifications drawings, orders etc.	<b>CLAUSE 13:</b> The contractor shall execute the whole and every part of the work of the most substantial and workman like manner and both as regards materials and in every other respect in strict accordance with specifications. The contractor shall also confirm exactly fully and faithfully to the designs, drawings and instructions in writing relating to the work signed by the Engineer and lodged in this office to which the contractor shall be entitled to have access for the purposes of inspection such office or on the site of work during office hours. The contractor will be entitled to receive three sets of contract drawings as well as one certified copy of the accepted tender along with the work order free of cost.
Alternative in specification and designs not to invalidate contracts.  Rates for works not entered in estimate, for schedule of rates of the district.	<b>CLAUSE 14 :</b> The Engineer shall have power to make any alteration in or additions to the original specifications, drawings, designs and instructions that may appear to him to be necessary or advisable during the progress of the work, and the contractor shall be bound to carry out the work in accordance with any instructions in this connection which may be given to him in writing signed by the Engineer and such alteration shall not invalidate the contract and any additional 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, and at the same rates as are specified in the tender for the main work. And if the additional and altered work includes any class of work for which no rate is specified in this contract then such class of work shall be carried out at the rates entered in the PWD Schedule of Rates of the Division or at the rates mutually agreed upon between the Engineer and the contractor, whichever are lower, if the additional or altered work for which no rate is entered in Schedule of Rates of Division, is ordered to be carried out before the rates are agreed upon then the contractor shall, within seven days of the date of receipt by him of the order to carry out the work, inform the Engineer of the rate which it is his intention to charge for such class of work, and if the Engineer does not agree to this rate he shall by notice in writing be at liberty to cancel his order to carry out such class of work, and arrange to carry it out in such manner as he may consider advisable, provided always that if the contractor shall commence work or incur expenditure in regard thereto before the rates shall have been mentioned as lastly herein before mentioned, then in such case he shall only be entitled to be paid in respect of the work carried out or expenditure incurred by him prior to the date of the determination of the rate as aforesaid according to such rate of rates as shall be fixed by the Engineer. In the event of a dispute, the decision of the Engineer of the MMRCL will be final.
	Where, however, the work is to be executed according to the designs, drawings and specifications recommended by the contractor and accepted by the



	competent authority the alterations above referred to shall be within the scope of such designs, drawings and specifications appended to the tender.
Extensions of time in consequence of additions or alterations	The time limit for the completion of the work shall be extended in the proportion that the increase in its cost occasioned by alterations of additions bears to the cost of the original contract work, and the certificate of the Engineer as to which proportion shall be conclusive.
No claim to any payment or compensation for alteration in or restriction of work	<b>CLAUSE 15 :</b> (1) If at any time after the execution of the contract documents, the Engineer shall for any reason whatsoever (other than default on the part of the contractor for which the MMRCL is entitled to rescind the contract) desire that the whole or any part of the work specified in the tender should be suspended for any period or that the whole part of the work should not be carried out at all he shall give to the contractor a notice in writing of such desire and upon the receipt of such notice the contractor shall forthwith suspend or stop the work wholly or in part as required, after having due regard to the appropriate stage at which the work should be stopped or suspended so as not to cause any damage or injury to the work already done or endanger the safety thereof provided that the Engineer as to the stage at which the work or any part of it could be or could have been safely stopped or suspended shall be final and conclusive against the contractor. The contractor shall have no claim to any payment or compensation whatsoever by reasons of or in pursuance of any notice as aforesaid, on account of any suspension, stoppage or curtailment except to the extent specified hereinafter.
	(2) Where the total suspension of the work ordered as aforesaid continued for a continuous period exceeding 60 days the contractor shall be at liberty to withdraw from the contractual obligation under the contract so far as it pertains to the un-executed part of the work by giving a 10 days prior notice in writing to the Engineer, within 30 days of the expiry of the said period of 60 days of such intention and requiring the Engineer to record the final measurements of the work already done and to pay the final bill. Upon giving such notice the contractor shall be deemed to have been discharged from his obligation to complete the remaining un-executed work under this contract. On receipt of such notice the Engineer shall proceed to complete the measurements and make such payment as may be finally due to the contractor within a period of 60 days from the receipt of such notice in respect of the work already done by the contractor. Such payment shall not in any manner prejudice the right of the contractor to any further compensation under the remaining provisions of this clause.
	(3) Where the Engineer requires the contractor to suspend the work for a period in excess of 30 days at any time or 45 days in the aggregate, the contractor shall be entitled to apply to the Engineer within 30 days of the resumption of work

	<p>such suspension of payment of compensation to the extent of pecuniary loss suffered by him in respect of working machinery rendered idle on the site or on account of his having had to pay the salary or wages of labour engaged by him during the said period of suspension, provided always that the contractor shall not be entitled to any claim in this respect.</p>
<p>No claim to compensation on account of loss due to delay of materials by MMRCL</p>	<p><b>CLAUSE 15-A :</b> The contractor shall not be entitled to claim any compensation from MMRCL for the loss suffered by him on account of delay by MMRCL in the supply of materials, entered in Schedule-A where such delay is caused by –</p> <ul style="list-style-type: none"> <li>i) Difficulties relating to the supply of railway wagons.</li> <li>ii) Force Majeure</li> <li>iii) Act of God</li> <li>iv) Act of enemies of the State or any other reasonable cause beyond the control of MMRCL.</li> </ul> <p>In the case of such delay in the supply of materials MMRCL shall grant such extension of time for the completion of the works as shall appear to the Executive Director/Elect. to be reasonable in accordance with the circumstance of the case. The decision of the Executive Director/Elect. as to the extension of time shall be accepted as final by the contractor.</p>
	<p><b>CLAUSE 16 :</b> Under no circumstance whatever shall the contractor be entitled to any compensation from MMRCL on any account unless the contractor shall have submitted a claim in writing to the Engineer within one month of the cause of such claim occurring.</p>
<p>Actions &amp; compensation payable in case of bad work</p>	<p><b>CLAUSE 17 :</b> If at any time before the security deposit is refunded to the contractor it shall appear to the Engineer or his subordinate in charge of the work, that any work has been executed with unsound, imperfect or unskillful workmanship of with materials of inferior quality, or that any material or articles provided by him for the execution of the work are unsound, or of a quality inferior to that contracted for, or are otherwise not in accordance with the contract it shall be lawful for the Engineer to intimate this fact in writing to the contractor and then notwithstanding the fact, the work, materials or articles complained of may have been in advertently passed, certified and paid for the contractor shall be bound forthwith to rectify or remove and reconstruct the work so specified in whole or in part, as the case may require or if so required, shall remove the materials or articles at his own charge and cost and in the event of his failing to do so within a period to be specified by the Engineer in the written intimation aforesaid, the contractor shall be liable to pay compensation at the rate of one percent on the amount of the estimate for every day not exceeding 10 days, during which the failure so continue and in the case of any such failure the Engineer may rectify or remove and re-execute the work or remove and replace the materials or articles complained of as the case may be at the risk and expense in all respects of the contractor. Should the Engineer consider that any such</p>

	inferior work or materials as described above may be accepted or made use of it shall be within his discretion to accept the same at such reduced rates as he may fix therefore.
Works to be open to inspection  Contractor or responsible agent to be present	<b>CLAUSE 18 :</b> All works under or in course of execution or executed in pursuance of the contract shall at all times be open to the inspection and supervision of the Engineer and his subordinates, and the contractor shall at all times during the usual working hours, and at all other times at which reasonable notice of the intention of the Engineer or his subordinate to visit the works shall have been given to the contractor, either himself be present to receive orders and instructions, or have a responsible agent duly accredited in writing present for that purpose. Orders given to the contractor's duly authorized agent shall be considered to have the same force and effect as if they had been given to the contractor himself.
Notice to be given before work is covered up	<b>CLAUSE 19 :</b> The contractor shall give not less than five days notice in writing to the Engineer or his subordinate in charge of the work before covering up or otherwise placing beyond the reach of measurement any work in order that the same is so covered up or placed beyond the reach of measurement any work without the consent in writing of Engineer or his subordinate in charge of the work, and if any work shall be covered up or placed beyond the reach of measurement without such notice having been given or consent obtained the same shall be uncovered at the contractor's expense, and in default thereof no payment or allowance shall be made for such work or for the materials with which the same was executed.
Contractor liable for damage done, and imperfection	<b>CLAUSE 20:</b> If during the period of <b>Twenty Four (24) calendar months</b> from the date of completion as certified by the Engineer pursuant to Clause 7 of the Conditions of Contract in the opinion of the Engineer, the said work is defective in any manner whatsoever, the Contractor shall forthwith on receipt of notice in that behalf from the Engineer duly commence execution and completely carry out at his cost in every respect all the work that may be necessary for rectifying and setting right the defect specified therein including dismantling and reconstruction of unsafe portions strictly in accordance with and in the manner prescribed and under the supervision of the Engineer in the event of the Contractor failing or neglecting to commence execution of the said rectification work within the period prescribed thereof in the said notice and / or to complete the same as aforesaid as required by the said notice. The Employer to get the same executed and carried out departmentally or by any other agency at the risk on account and at the cost of the Contractor. The Contractor shall forthwith on demand pay to the Employer amount of such costs, charges and expenses sustained or incurred by the Employer of which the certificate of the Engineer shall be final and binding on the Contractor. Such costs, charges and expenses shall be deemed to be arrears of land revenue and in the event of the Contractor

	<p>failing or neglecting to pay the same on demand as aforesaid without prejudice to any other rights and remedies of the Employer; the same may be recovered from the Contractor as arrears of land revenue. The Employer shall also be entitled to deduct the same from any amount which may then be payable or which may thereafter become payable by the Employer to the Contractor either in respect of the said work or any other work whatsoever or from the amount of security deposit retained by the Employer.</p>
<p>Contractor to supply plant ladders, scaffolding etc.</p> <p>And is liable for damages arising from non-provisions of lights, fencing etc.</p>	<p><b>CLAUSE 21 :</b> The contractor shall supply at his own cost all materials (except such special materials, if any, as may, in accordance with the contract, be supplied from the MMRCL stores), plant, tools, appliances, implements, ladders, cordage, tackle scaffolding, temporary works requisite or proper for execution of the work, whether the original, altered or substituted form, and whether included in specifications, or other documents forming part of the contract or referred to in these conditions or not and which may be necessary for the purpose of satisfying or complying with the requirements of the Engineer as to pay matter as to which under these conditions he is entitled to be satisfied, or which he is entitled to require together with carriage therefore and from the work. The contractor shall also supply without charge the requisite number of persons with the means and materials necessary for the purpose of setting out works, and counting, weighing and assisting in the measurement or examination at any time and from time to time of the work or the materials. Failing this the same may be provided by the Engineer at the expense of the contractor and the expenses may be deducted from any money due to the contractor under the contract or from his security deposit or the proceeds of sale thereof, or of a sufficient portion thereof. The contractor shall provide all necessary fencing and lights required to protect the public from accident, and shall also be bound to bear the expenses of defense of every suit, action or other proceedings, 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 or proceedings to any such person or which may with the consent of the contractor be paid for compromising any claim by any such person.</p>
<p>And is liable for damages arising from on provisions of lights fencing etc.</p>	<p><b>CLAUSE 21-A :</b> The contractor shall provide suitable scaffold and working platforms gangways and stairways and shall comply with the following regulations in connection herewith –</p> <ol style="list-style-type: none"> <li>a) Suitable scaffolds shall be provided for workmen for all works that cannot be safely done from a ladder or by other means.</li> <li>b) A scaffold shall not be constructed, taken down, or substantially altered except - <ol style="list-style-type: none"> <li>i) under the supervision of a competent and responsible person; and</li> <li>ii) as far as possible by competent worker possessing adequate experience in this kind of work.</li> </ol> </li> </ol>

	<p>c) All scaffolds and appliances connected therein and all ladders shall -</p> <ul style="list-style-type: none"> <li>i) be of sound material;</li> <li>ii) be of adequate strength having regard to the loads and strains to which they will be subjected, and</li> <li>iii) be maintained in proper condition.</li> </ul> <p>d) Scaffolds shall be so constructed that no part thereof can be displaced in consequence of normal use.</p> <p>e) Scaffold shall not be over-loaded and so far as practicable the load shall be evenly distributed.</p> <p>f) Before installing lifting gear on scaffolds special precaution shall be taken to ensure the strength and stability of the scaffolds.</p> <p>g) Scaffolds shall be periodically inspected by a competent person.</p> <p>h) Before allowing a scaffold to be used by his workman the contractor shall check up whether the scaffold has been erected by his workmen or not, take steps to ensure that it complies fully with the regulations herein specified.</p> <p>i) Working platforms, gangways and stairways shall -</p> <ul style="list-style-type: none"> <li>i) be so constructed that no part thereof can sag unduly or unequally;</li> <li>ii) be so constructed and maintained, having regard to the prevailing conditions as to reduce as far as practicable risks of persons tripping or slipping; and</li> <li>iii) be kept free from any unnecessary obstruction.</li> </ul> <p>j) In the case of working platforms, gangways, working places and stairways at a height exceeding 5.0 m.</p> <ul style="list-style-type: none"> <li>i) Every working platform and every gangway shall be closely boarded unless other adequate measures are taken to ensure safety.</li> <li>ii) every working platform and gangway shall have adequate width, and</li> <li>iii) every working platform, gangway, working place and stairway shall be suitably fenced.</li> </ul> <p>k) Every opening in the floor of a building or in a working platform shall except for the time and to the extent required to allow the excess of persons or the transport or shifting of material; be provided with suitable means to prevent the fall of persons or materials.</p> <p>l) When persons are employed on a roof where there is a danger of falling from a height exceeding suitable precaution shall be taken to prevent the fall of persons or materials.</p> <p>m) Suitable precautions shall be taken to prevent persons being struck by article which might fall from scaffolds or other working places.</p> <p>n) Safe means of access shall be provided to all working platforms and other working places.</p> <p>o) The contractor shall have to make payment to the labourers as per minimum wages act.</p>

	<p><b>CLAUSE 21-B:</b> The contractor shall comply with the following regulation as regards the hoisting appliances to be used by him.</p> <p>a) Hoisting machines and tackle, including their attachments, anchorage's and supports shall:</p> <p style="padding-left: 40px;">i) be of good mechanical construction, sound material and adequate strength and free from patent defect; and</p> <p style="padding-left: 40px;">ii) be kept in good repair and in good working order.</p> <p>b) Every rope used in hoisting or lowering materials or as a means of suspension shall be of suitable quality and adequate strength and free from patent defect.</p> <p>c) Hoisting machines and tackle shall be examined and adequately tested after erection on the site and before use and be re-examined in position at intervals to be prescribed by MMRCL.</p> <p>d) Every chain, ring, hook, shackle, swivel and pulley block used in hoisting or lowering materials or as a means of suspension shall be periodically examined.</p> <p>e) Every crane driver or hoisting appliance operator shall be properly qualified.</p> <p>f) No person who is below the age of 21 years shall be in control of any hoisting machine, including any scaffold which or give signals to the operator.</p> <p>g) In the case of every hoisting machine and of every chain, ring hook shackle, swivel and pulley block used in hoisting or lowering or as a means of suspension the safe working load shall be ascertained by adequate means.</p> <p>h) Every hoisting machine and all gear referred to in the proceeding regulation shall be plainly marked with the safe working load.</p> <p>i) In the case of a hoisting machine having a variable safe working load each safe working load and the conditions under which it is applicable shall be clearly indicated.</p> <p>j) No part of any hoisting machine or of any gear referred to in regulation 7 above shall be loaded beyond the safe working load except for the purpose of testing.</p> <p>k) Motors, gearing transmissions, electric wiring and other dangerous parts of hoisting appliances shall be provided with efficient safeguards</p> <p>l) Hoisting appliances shall be provided with such means as will reduce to a minimum the risk of the accidental descent of the load.</p> <p>m) Adequate precautions shall be taken to reduce to a minimum risk of any part of a suspended load becoming accidentally displaced.</p>
	<p><b>CLAUSE 21-C:</b> The contractor / contractors will have to make payments to the laborers as per Minimum Wages Act, (1950).</p>
Measures for prevention of fire	<p><b>CLAUSE 22:</b> The contractor shall not set fire to any standing jungle, trees, brushwood or grass without a written permit from the Engineer.</p> <p>When such permit is given and also in all cases when destroying out or dig up trees, brushwood, grass etc., by fire, the contractor shall take unnecessary</p>

	measures to prevent such fire spreading to or otherwise damaging surrounding property.
	The contractor shall make his own arrangements for drinking water for the labour employed by him.
Liability of contractor for any damage done in or outside work area	<b>CLAUSE 23:</b> Compensation for all damages done intentionally or unintentionally by contractor's labour whether in or beyond the limits of MMRCL property including any damage caused by the spreading of the fire mentioned in clause 22 shall be estimated by the Engineer or such other officer as he may appoint and the estimates of the Engineer subject to the decision of the Executive Director/Elect.on appeal shall be final and the contractor shall be bound to pay the amount of the assessed compensation on demands failing which the same will be recovered from the contractors as damages in the manner prescribed in Clause 1 or deducted by the Engineer from any sums that may be due or become due from MMRCL to the contractor under this contract or otherwise.
	The contractor shall bear the expenses of defending any action or other legal proceedings that may be binding by any person for injury sustained by him owing to neglect of precautions to prevent the spread of fire and he shall pay any damages and cost that may be awarded by the court in consequence.
Employment of female labour	<b>CLAUSE 24:</b> Deleted
	<b>CLAUSE 25:</b> No work shall be done on a Sunday without the sanction in writing of the Engineer.
Work not to be sublet unless it is permitted contract may be rescinded and security deposit forfeited for subletting it without approval or for bringing a public officer if contractors become insolvent	<b>CLAUSE 26:</b> The contractor shall not assign or sublet without the written approval of the Engineer. And if the contractor shall assign or sublet his contract or attempt so to do or become insolvent or commence any proceedings to get himself adjudicated an insolvent or make any composition with his creditors, or attempt to do or if bribed, grateful, gift, loan perquisite, reward or advantage, pecuniary or otherwise shall either directly or indirectly be given, promised or offered by the contractor or any of his servants or agents to any public officer or person in the employment of MMRCL in any way relating to his office or employment or if any such officer or person shall become in any way directly or indirectly interested in the contract, the Engineer may there upon by notice in writing rescind the contract, and the security deposit of the contractor shall thereupon stand forfeited and be absolutely at the disposal of MMRCL and the same consequences shall ensure as if the contract had been rescinded under Clause 3 hereof and in addition the contractor shall not be entitled to recover or be paid for any work therefore actually performed under the contract.

Sum payable by way of compensation to be considered as reasonable compensation without reference to actual loss.	<b>CLAUSE 27 :</b> All sums payable by a contractor by way of compensation under any of these conditions shall be considered as reasonable compensation to be applied to the use of MMRCL without reference to the actual loss or damage sustained, and whether any damage has or has not be sustained.
Changes in the constitution of firm to be notified	<b>CLAUSE 28:</b> In the case of tender by partners any change in the constitution of a firm shall be forthwith notified by the contractor to the Engineer for his information.
Work to be under direction of the Engineer	<b>CLAUSE 29:</b> All works to be executed under the contract shall be executed under the direction and subject to the approval in all respects of the Engineer of the MMRCL for the time being, who shall be entitled to direct at what point or points and in what manner they are to be commenced, and from time to time carried on.
	<b>CLAUSE 30(1):</b> Except where otherwise specified in the contract and subject to the powers delegated to him by MMRCL then in force the decision of the Assistant General Manager / Sr. DGM (Electrical) for the time being shall be final, conclusive and binding on all parties to the contract upon all questions relating to the meaning of the specifications, designs, drawings, and instructions, hereinbefore mentioned and as to the quality of workmanship or materials used on the work or as to any other question, claim, right, matter or things, whatsoever if any, way arising out of or relating to the contracts designs drawings, specifications, estimates, instructions, orders or other conditions or otherwise concerning the works or the execution of failure to execute the same, whether arising, during the progress of the work or after completion of abandonment thereof.
	<b>CLAUSE 30(2): Deleted</b>
	<b>CLAUSE 30 (3) :</b> Deleted
Stores of European or American manufacturer to be obtained from MMRCL	<b>CLAUSE 31:</b> Deleted
Lump sum estimates	<b>CLAUSE 32:</b> Deleted



Action where no specification	<b>CLAUSE 33:</b> In the case of any class of work for which there is no such specification as mentioned in Rule 1, such work shall be carried out in accordance with the MMRCL specifications and in the event of there being no MMRCL's specification, then in such case the work shall be carried out in all respects in accordance with the instructions and requirements of the Engineer.
Definition of work	<b>CLAUSE 34:</b> The expression "work" where used in these conditions, shall unless there be something in the subject or context repugnant to such construction, be constructed to mean the work or works contracted to be executed under on in virtue of the contract, whether temporary or permanent and whether original, altered, substituted or additional.
Contractor's percentage whether applied to net or gross amounts of bills	<b>CLAUSE 35:</b> The percentage referred to in the tender shall be deducted from or added to the gross amount of the bill before deducting the value of any stock issue.
Refund or quarry fees and royalties	<b>CLAUSE 36:</b> All quarry fees, royalties and ground rent for stacking materials, if any should be paid by the contractor.
Compensation under the workmen's compensation Act	<b>CLAUSE 37:</b> The contractor shall be responsible for and shall pay any compensation to his workman payable under the workmen's compensation Act, 1923 (VIII) of 1923 (hereinafter called the said Act) for injuries caused to the workmen. If such compensation is payable, paid by MMRCL as principal under sub-section (1) of Section 12 of the said Act on behalf of the Contractor, it shall be recoverable by MMRCL from the contractor under Sub-section (2) of the said section. Such compensation shall be recovered in the manner laid down in Clause 1 above.
	<b>CLAUSE 37-A:</b> The contractor shall provide all necessary personal safety equipment and first aid apparatus available for the use of the persons employed on the site, shall maintain the same condition suitable for immediate use at any time and shall comply with the following regulations in connection therewith.
	a) The workers shall be required to use the equipment so provided by the contractor and the contractor shall take adequate steps to ensure proper use of the equipment by those concerned.
	b) When work is carried on in proximity to any place where there is a risk of drawing all necessary equipment shall be provided and kept ready for use and all necessary steps shall be taken for the prompt rescue of any person in danger.
	c) Adequate provision shall be made for prompt first-aid treatment of all injuries likely to be sustained during the course of the work.

Claim for quantities entered in the tender or estimates	<p><b>CLAUSE 38:</b> (1) Quantities in respect of the several items shown in the tender are appropriate and respect of any of the items so long as, subject to any special provision contained in the specifications prescribing a different percentage of permissible variation, the quantity varies by more than 50%, no variation in rate shall be entertained.</p> <p><b>CLAUSE 39:</b> The contractor shall employ any famine, convict or other labour of a particular kind of class if ordered in writing to do so by Engineer.</p> <p><b>CLAUSE 40:</b> No compensation shall be allowed for any delay caused in the starting of the work on account of acquisition of land or in the case of clearance works, on account of any delay in according sanction to estimates.</p>
Employment of famine etc. labour	<b>CLAUSE 41:</b> Deleted
Claim for compensation for delay in the starting the work	<b>CLAUSE 42:</b> The contractor shall not enter upon or commence any portion of work except with the written authority and instructions of the Engineer or of his sub-ordinate in charge of the work, failing which the contractor shall have no claim to ask for measurements or payment for work.
Claim for compensation for delay in the execution of work	<p><b>CLAUSE 43:</b> (i) No Contractor shall employ any person who is under the age of 14 years.</p> <p>(ii) No contractor shall employ donkeys or other animals with breaching of string or thin rope. The breaching must be at least three inches wide and should be of tape (Newar).</p> <p>(iii) No animal suffering from sores, lameness or emaciation or which is immature shall be employed on the work.</p> <p>(iv) The Engineer or his Agent is authorized to remove from the work any person or animal found working which does not satisfy these conditions and no responsibility shall be accepted by MMRCL for any delay caused in the completion of the work due to such removal.</p>
Entering upon or commencing any portion of work	(v) The contractor shall pay fair and reasonable wages to the workmen employed by him in the contract undertaken by him.

<p>Minimum age of persons employed; the employment of donkeys And or other animals and the payment of fair wages</p>	<p>In the event of any dispute arising between the contractor and his workmen on the grounds that the wages paid are not fair and reasonable the dispute shall be referred to workmen on the grounds that the wages paid are not fair and reasonable the dispute shall be referred without delay to the Engineer, who shall decide the same. The decisions of the Engineer shall be conclusive and binding on the contractor, but such decision shall not in any way affect the conditions in the contract regarding the payment to be made by MMRCL at the sanctioned rates.</p>
	<p>(vi) Contractor shall provide drinking water facilities to the workers. Similar amenities shall be provided to the workers engaged on large work in urban areas.</p>
	<p><b>CLAUSE 44:</b> Payment to contractor shall be made by cheque drawn on any bank with division convenient to them provided the amount exceeds Rs. 10/-. Amount not exceeding Rs. 10/- will be paid in cash.</p>
	<p><b>CLAUSE 45:</b> Any contractor who does not accept these conditions shall not be allowed to tender for work.</p>
<p>Method of payment</p>	<p><b>CLAUSE 46:</b> If Government declares a state of scarcity of famine to exist in any village situated within 10 miles of the work, the contractor shall employ upon such parts of the work, as are suitable for unskilled labour, any person certified to him by the Engineer or be any person to whom the Engineer may have delegated this duty in writing to be in need of relief and shall be bound to pay to such persons, wages not below the minimum which Government may have fixed in this behalf. Any disputes which may arise in connection with the implementation of this clause shall be decided by the Engineer whose decision shall be final and binding on the contractor.</p>
<p>Acceptance of condition before tendering for works</p>	<p><b>CLAUSE 47:</b> The price quoted by the contractors shall not in any case exceed the control price, if any, fixed by Government or reasonable price which it is permissible for him to charge a private purchaser for the same class and description, the controlled price of the price permissible under Hoarding and Profiteering Ordinance 1943 as amended from time to time. If the price quoted exceeds the controlled price or the price permissible under Hoarding and Profiteering Prevention Ordinance, the contractor will specifically mention this fact in this tender along with the reasons for quoting such higher prices. The purchaser at his discretion will in such case exercise the right of revising the price at any stage so as to conform to the controlled price or the price permissible under the Hoarding and Profiteering Prevention Ordinance. The discretion will be exercised without prejudice to any other action that may be taken against the contractor.</p>

Employment of Scarcity of Labour	<b>CLAUSE 48 : Deleted</b>
	<b>CLAUSE 49:</b> In case of materials that may remain surplus with the contractor's from those issued for the work contracted for the date as containment of the materials being surplus will be taken as the date of sale for the purpose of sales tax and the sales tax will be recovered on such sale.
	<b>CLAUSE 50:</b> Deleted
	<b>CLAUSE 51:</b> "All amounts, whatsoever, which the contractor is liable to pay to the MMRCL in connection with the execution of the work including the amount payable in respect of (i) materials and or stones supplied/issued hereunder by the MMRCL to the contractor (ii) hire charges in respect of heavy plant, machinery and equipment given or hired by the MMRCL to the contractor shall be deemed to be arrears of land revenue and the MMRCL may without prejudice to any other rights and remedies of the MMRCL, recover the same from the contractor as arrears of land revenue".
	<b>CLAUSE 52:</b> "A contractor shall comply with the provision of the Apprentice Act, 1961 and the rules and orders issued there-under from time to time if he fails to do so, his failures will be breach of the contract and the Engineer may in his direction cancel the contract. The contractor shall also be liable for any pecuniary liability arising on account of any violation by him of the provision of the Act".

**CLAUSE 53:** The contractor shall duly comply with all the provisions of the Central Government (Regulation and Abolition Act, 1970 (37 of 1970) and the Maharashtra Contract Labour (Regulation and Abolition) Rules, 1971 as amended from time to time and all other relevant statutes and statutory provisions concerning payment of wages particularly to workmen employed by the contractor and working on the site of the work.

In particular the contractor shall pay wages to each worker employed by him on the site of the work at the rates prescribed under the Maharashtra Contract Labour (Regulation and Abolition) Rules, 1971. If the contractor fails or neglects to pay wages at the rates or makes short payment and the MMRCL makes such payment of wages in full or part thereof less paid by the contractor as the case may be, the amount so paid by the MMRCL to such workers shall be deemed to arrears of land revenue and the MMRCL shall be entitled to recover the same as such from the contractor or deduct the same from the amount payable by the MMRCL to the contractor hereunder or from any other amounts payable to him by the MMRCL.



**Chapter – XII**  
**Price variation clause**

**No Price variation shall be paid under this contract**





**Chapter-XIII**  
**Schedule A**

Schedule Of Rates

Sr. No.	Ref	Item Description	Unit	Qty	Rate(Rs.)	Total Amount(Rs)
<b>Module, Inverter &amp; ACDB</b>						
1	Non-DSR Item	Multicrystalline PV Module 295 wp/panel RenewSys Vikram solar, Jinco or equivalent tier one	Each	55	14160	778800
2	Non-DSR Item	Solar inverter- 17 kVA, 3-phase, Dual MPPT (maximum power point tracker) (with data manager) SMA, Fronius or equivalent	Each	1	440000	440000
3	PWD ELE DSR 5-4-25	Supplying & erecting triple pole and neutral distribution board (TPNDB) with door surface/ flush mounted suitable for 3 Pole MCCB as Incommer & outgoing SP MCB (12 Poles) or TP MCB of 4 ways (12 Poles) on iron frame. (Vertical Busbar type) as per specification no. SW-SWR/MCDB1	Each	1	6239	6239
4	PWD ELE DSR 5-1-7	Supplying and erecting Triple pole metal/ iron clad switch and fuse 415/500V 63A on angle iron frame as per specification No. SW-SWR/MTP	Each	1	2785	2785
<b>Cables</b>						
5	Non-DSR Item	1 Core 4 Sqmm CU FLEX DC Solar Cable 1.6kV Gr	meter	200	85	17000
6	PWD ELE DSR 7-1-16	Supplying, erecting & terminating PVC armoured cable 4 core 16 sq mm aluminium conductor with continuous 5.48 sq mm (12 SWG) G.I. earth wire complete erected with glands & lugs, on wall/ trusses/pole or laid in provided trench/ pipe as per specification no. CB-LT/AL	meter	80	198	15840
7	PWD ELE DSR 1-3-8	Supplying & erecting mains with 2x4 sq.mm F.R.L.S copper PVC insulated wire laid in provided conduit/trunking/inside pole/Bus bars or any other places. as per specification No: WGMA/BW	meter	75	78	5850
<b>Connector and protection System</b>						
8	Non-DSR Item	MC4 Connectors (for 4 Sq.mm) +ve, -ve	sets	10	500	5000
9	PWD ELE DSR 9-1-5	Supply, Installation, Testing and commissioning of UL Certified / CPRI Tested Maintenance Free Earthing comprising of Electrode of 17.2 mm diameter Low Carbon Steel with 250 micron Molecular Copper Bonded Earthing Rod of Length 3m along with 25 kg Carbon Based environment friendly back fill Ground Enhancing compound required to fill up the excavated earth with required quantity as per specification no EA-MOBI	Each	2	15126	30252

10	PWD ELE DSR 9- 2-3	Supplying and erecting G.I. strip of required size used for earthing on wall and/or any other purpose with necessary GI clamps fixed on wall painted with bituminous paint in an approved manner with joint required. as per specification No (EA-EP).	kg	120	166	19920
11	PWD ELE DSR 9- 3-3	Supplying & erecting conventional spike type air termination suitable to carry lightning stroke made up of heavy gauge 40 mm dia copper pipe of standard length with 5 Nos. copper spikes fixed on copper ball as air terminals duly threaded in copper pipe erected on provided foundation in an approved manner	Each	1	4195	4195
<b>METERING</b>						
12	Non- DSR Item	.2S Energy Meter For Net Metering	Each	1	10000	10000
<b>Remote Monitoring System (Web or mobile monitoring)</b>						
12	Non- DSR Item	Radiation and temperature sensor and data monitor	Nos	1	120000	120000
13	Non- DSR Item	Router	Nos	1	3000	3000
14	Non- DSR Item	CAT "6" Cable	Mtr	15	40	600
15	Non- DSR Item	Communication Cable	Mtr	16	35	560
<b>Miscellaneous</b>						
16	PWD ELE DSR 7- 11-1	Providing & erecting Hot deeped Galvanised Ladder type Cable tray manufactured from 16 swg (1.6 mm thick) GI sheet of 150 mm width & 100 mm height comprising all required standard accessories.	meter	25	746	18650
17	PWD ELE DSR 1- 6-21	Supplying & erecting mains with 4x10 sq.mm and earth wire 6 sq.mm FRLS PVC copper wire, in rigid PVC conduit 32mm dia, as per specification No: WG-MA/PC, para no. 1.4.1	meter	35	521	18235
18	PWD ELE DSR 7- 7-2	Supplying & erecting Siemens type brass cable glands for 3 to 4 core 6 sq mm /2 to 4 core 10 sq mm for PVC armoured cable as per specification No. CB-GL	Each	3	41	123
19	PWD ELE DSR 7- 10-1	Supplying & erecting crimping type aluminium lugs for cable upto 16 sq mm complete as per specification No. CB-CL/AL	Each	4	6	24

20	NON-DSR Item	Associated Civil Structure Items required for mounting of Solar PV Array (Refer Chapter VII, S.No. 2.5)	Set	1	25/Wp	4,00,000
Total Estimated Cost =Rs.19,00,000/-						

**Cost of work: Rs. 19,00,000 (Rupees Nineteen Lakhs Only) Inclusive of All Taxes.**