



**THANE MUNICIPAL CORPORATION  
THANE**

**ELECTRICAL DEPARTMENT**

**BIDPAPERS FOR**

**NAME OF WORK:** Design, supply, erection, testing and commissioning of Solar Photovoltaic systems (136 kWp) at various locations in Thane Municipal Corporation area under solar city program.

**THANE MUNICIPAL CORPORATION, THANE  
ELECTRICAL DEPARTMENT**

|                          |   |
|--------------------------|---|
| <b>NAME OF WORK</b>      | <b>Design, supply, erection, testing and commissioning of Solar Photovoltaic systems (136 kWp) at various locations in Thane Municipal Corporation area under solar city program.</b> |
| <b>DOCUMENT FEE</b>      | <b>Rs . 5,1 5 1.00 + 258.00 (5% Vat) = 5409 (Rs. Five Thousand Four Hundred Nine Only )</b>   |
| <b>TO BE RECEIVED ON</b> | <b>Online Bid</b> On or before <b>16/12/2013</b><br>Up to <b>1 5 . 0 0 Hrs .</b> , at T.M .C . website<br><a href="http://www.thanemahapalika .com">www.thanemahapalika .com</a>      |
| <b>TO BE OPENED ON</b>   | On <b>16/12/2013</b> at <b>15.30 Hrs.</b> if possible,<br>in the office of the E Bid Cell. Thane Municipal Corporation, Almeda Road, Panchpakhadi, Thane.                             |

Contractor

Dy City Engineer (Elect)  
Thane Municipal Corporation, Thane

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**NAME OF WORK :** Design, supply, erection, testing and commissioning of Solar Photovoltaic systems (136 kWp) at various locations in Thane Municipal Corporation area under solar city program.

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# **Chapter - I**

## **Notice Inviting Bid**

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Thane Municipal Corporation, Thane

**ठाणे महानगरपालिका, ठाणे.**  
**विद्युत विभाग**

निविदा सूचना क्रमांक:- ठा.म.पा./विद्युत/नि.सू./२/२०१३-१४

ठाणे महानगरपालिकेच्या विद्युत विभागातर्फे विविध इमारतींवर एकूण १३६ कि. वॅ. क्षमतेची सोलार फोटो व्होलटाइक यंत्रणा बसविण्यासाठी (अंदाजखर्च रू. 2,83,20,000/- ) निविदा ई टेंडरिंग पध्दतीने दि. २२/११/२०१३ ते दि.१६/१२/२०१३ या कालावधीत मागविण्यात येत आहेत. निविदा पूर्व बैठक दि. ७/१२/२०१३ रोजी सकाळी ११.३० वा. घेण्यात येईल. सदरच्या निविदा ई टेंडरिंग पध्दतीने दि.१६/१२/२०१३ रोजी सांयकाळी १५.०० वाजेपर्यंत स्विकारण्यात येतील. सदर कामाच्या निविदा प्रपत्र ठाणे महानगरपालिकेच्या अधिकृत संकेतस्थळ [www.thanecity.gov.in](http://www.thanecity.gov.in) अथवा [www.tmc.abcprocure.com](http://www.tmc.abcprocure.com) येथे उपलब्ध आहे. ई टेंडरिंग बाबत अधिक माहितीसाठी ई निविदा कक्ष, नागरी सुविधा केंद्र, ठाणे महानगरपालिका, ठाणे येथे संपर्क साधावा.

सही/-

उप नगर अभियंता (विद्युत )  
ठाणे महानगरपालिका, ठाणे.

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Dy City Engineer (Elect)  
Thane Municipal Corporation, Thane

Thane Municipal Corporation  
(Elect Dept)  
Bid Notice No. TMC/Elec/TN/2/2013-14

Thane Municipal Corporation invites tenders in E - tender system for installation of 136 kWp solar PV system at various locations (Estimated cost Rs. 2,83,20,000/-) from 22.11.2013 to 16.12.2013 . Pre bid meeting shall be held on 7.12.2013 at 11.30 Hrs. The tenders in E - tender system shall be accepted on or before 16.12.2013 up to 15.00 hrs. Bid Notice and Bid documents are available on web site [www.thanecity.gov.in](http://www.thanecity.gov.in) and [www.tmc.abcprocure.com](http://www.tmc.abcprocure.com). Further information on E - tender system Bidder may contact E - tender Cell, Citizen Facilitation centre, Thane Municipal Corporation, Thane.

Dy City Engineer. ( Elect.)  
Thane Municipal Corporation

Contractor

Dy City Engineer (Elect)  
Thane Municipal Corporation, Thane

# **Chapter - II**

## **Detailed Bid Notice**

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Thane Municipal Corporation, Thane

## Chapter - II

### DETAILED BIDNOTICE

**NAME OF WORK:- Design, supply, erection, testing and commissioning of Solar Photovoltaic systems (136 kWp) at various locations in Thane Municipal Corporation area under solar city program.**

On Line Bids in B-1 form are invited by Thane Municipal Corporation for the following work from experienced and registered firms/ contractor/company. Blank Bids form are available at Web site [www.thanecity.gov.in](http://www.thanecity.gov.in) or [www.tmc.abcprocure.com](http://www.tmc.abcprocure.com) from **22.11.2013** to **16.12.2013**. The Pre-bid meeting shall be taken On **7.12.2013** at 11.30 Hrs. The Bids in E- tendering system shall be accepted on website [www.thanecity.gov.in](http://www.thanecity.gov.in) or [www.tmc.abcprocure.com](http://www.tmc.abcprocure.com) up to **16.12.2013 at 15.00 Hrs.** Bid shall be opened on **16.12.2013 at 15.30 hrs.** in the presence of Bidder or their authorized representative.

1. Name of work : **Design, supply, erection, testing and commissioning of Solar Photovoltaic systems (136 kWp) at various locations in Thane Municipal Corporation area under solar city program.**

2. Estimated Cost put to work : Rs . **2,83,20,000/-**
3. Cost of Each Bid Form : Rs . **5409/- (including VAT)**
4. Earnest Money : Rs . **2,84,000/-**

5. Qualification Criteria: Bidder should have following qualifying criteria.

- i. Bidders should have valid CST/State VAT registration certificate.
- ii. Bidder should be accredited by Ministry of New and Renewable Energy (MNRE), GOI as a valid channel partner for Solar Photovoltaic system.
- iii. Bidder should have successfully completed at least one single work of supply & installation of Solar PV System amounting to not less than 30% of estimated cost of this work during immediate last preceding three financial years with Govt. / semi Govt. organizations or local self Government. Bidders have to submit work completion certificate issued to this effect.
- iv. Bidder's average annual turn over during immediate last preceding three financial years should not be less than 75% of the estimated cost of work.

6. The pre Bid conference will be held on 7.12.2013. at 11.30 Hrs.



7. Validity Period : The offer of the contractor shall remain valid for 180 days from the date of opening of financial Bid.
8. Completion Period: Four months from date of issue of work order for capital work and five years all inclusive comprehensive maintenance after certified date of completion of capital work.
9. i ) The amount of Earnest Money is Rs. **2,84,000/-** and the amount of Bid form fee including e-tendering charges is Rs.**5409/-** .This amount for Bid form fee & earnest money shall be submitted as per E Tendering Procedure and online receipt for the same should be uploaded with the Bid document along with technical bid.

EMD & Cost of Blank Bid form shall be payable through one of the following modes only.

- 1. Net-Banking**
- 2. Debit Card**
- 3. Credit Card**
- 4. RTGS / NEFT \***

\* For paying the Document Fees / EMD through the option (4) **RTGS / NEFT**, please follow the below process:

i. Please mention the following details while making the **RTGS/NEFT** payment from bidder's Bank:

(a)Beneficiary account number - <TMCE+Bidder Code>

For example, in mention TMCEABC123 as the beneficiary account number.

(Bidder code shall be available through the E-Tendering portal)

(b)Beneficiary bank branch - **ICICI Bank, CMS**

(c)Beneficiary IFSC code - **ICIC0000104**

ii. One day after making the payment, please log in to our portal. While making payment for Document Fee / EMD, please select the RTGS/NEFT payment option at the document fee/ EMD payment screen. Upon doing so, you shall be able to view the funds remitted by you through NEFT/RTGS as available balance.

iii. Please proceed to make the payment. Upon doing so, the required amount to be paid through the Document fee/EMD, shall get appropriately deducted from the available balance and payment shall be confirmed real time.

iv. A receipt number would also get generated after successful payment.

Contractor

Dy City Engineer (Elect)  
Thane Municipal Corporation, Thane

- v. Kindly note that the payment is required to be made one day before you would like to make the document fee/EMD payment through our portal.
- vi. Bidder who do not deposit earnest money in one of the above acceptable forms shall be summarily rejected.
- vii. The amount of earnest money will be refunded to the unsuccessful Bidder after giving work order to successful tenderer. In case of the successful tenderer, it will be refunded on his paying the 3% of initial security deposit and completing the Biddocuments or it will be transferred towards a part of security deposit to be paid after awarding of the work. If successful Bidder does not pay the security deposit in the prescribed time limit and complete the agreement bond, his earnest money deposit will be forfeited to TMC. Thane, besides other suitable actions.

**Please get in touch with e-procurement support team in case any clarification is required.**

**Note:**

It will be solely upon the bidder's choice to select any of these payment options best suited to him. It is understood that the bidder is aware of the payment cycle and other technical requirements/ payment process under each of these modes. It is bidder's responsibility to see that the amount of EMD & cost of Blank Bid Form (BTC) are credited (in case of payment by NEFT/RTGS, the payment referred herein above may not mean final submission of EMD/BTC etc to TMC. The EMD/BTC etc shall be paid/ credited to TMC only when the bidder completes the Bid Document and other formalities online and submits the Tender), in the e-tender System well before the scheduled time and date, to be able to proceed with final submission of his Bid along with the EMD & BTC to TMC. TMC will not be responsible for any failure on part of the bidder in submission of the Bid and/or the EMD/BTC etc. before scheduled time and date, for any reason whatsoever, including, inter-alia, noncredit of said amounts of EMD/ cost of Blank Bid Form, and therefore no claims shall be entertained on these grounds.

Under this online payment system for e-Tendering the Tenders will not be submitted/ received by TMC unless the EMD & Cost of Blank Bids are received/ credited before scheduled time and date. Hence, bidder shall remit the said amount well in advance. It is clarified that the Tenders – both Technical and Financial – will not be considered for opening if EMD and BTC are not received/ credited before schedule time and date, for any reason whatsoever.

**ALERT:-** For the RTGS/NEFT payment option, considering that the payments are settled by RBI in batches, it is advisable that the bidder completes the leg of transfer of funds, from his bank account to his own User Account in the e-Tendering system, one day before his desired day of submitting his Bid to TMC.

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Dy City Engineer (Elect)  
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10. The tenders are invited on the departmental design only.
11. Submission of Bid document does not indicate that Bidder is qualified for awarding the work.
12. The tenderer, shall furnish detailed information regarding status of his firm (i.e. proprietary, partnership, private ltd. or public ltd. company etc . ) and also produce attested copies of the proof thereof. The Bidder should also specify the authorized person who will be transacting with TMC Thane (Power of Attorney holder).
13. Right is reserved to revise or amend the contract documents fully or part thereof prior to the, date notified or amended for the receipt of tender. Such deviations, amendments, if any, shall be communicated to the Bidder in the form of corrigendum or by a letter as may be considered suitable.
14. The work to be executed is within the TMC limits.
15. Right is reserved to reject any or all Bids without assigning any reason thereof or annul tendering process altogether without assigning any reason whatsoever for such decision.
16. Tenders once submitted shall not be taken back. if, Bidder wishes to withdraw his tender, in that case the earnest money deposited shall be forfeited
17. All the taxes and duties imposed by the Government from time to time shall

Contractor

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Thane Municipal Corporation, Thane

be borne by the contractor.

18. Bidder must bring all original documents at the time of opening of technical Bid on the day and time mentioned in the Bid document. These documents will have to be brought by the Tenderer/ authorized signatory or his authorized representative.
19. The Bid notice shall form a part of contract agreement

#### 1.1 Manner of submission of Bid and its accompaniments :

Bids shall be submitted their offer according to two Bid system. Bidder shall submit the scanned documents in technical Bid and shall produce original documents for verification at the date & time of opening of Tender. The Bids shall be submitted in two parts as below :

##### 1) Technical Bid (Documents) :

- a. Earnest money deposit of **Rs. 2,84,000/-** and document fee of **Rs 5409/-** along with the Bid should be paid online as mentioned in clause No 9 of chapter II.
- b. Copy of letter issued by Ministry of New and Renewable Energy (MNRE), GOI as a valid channel partner for Solar Photovoltaic system.
- c. Copy of valid CST/State VAT registration certificate.
- d. Work completion certificate issued by Govt. / semi Govt. organizations or local self Government for successful completion of at least one single work of supply and installation of Solar PV System amounting to not less than 30% of estimated cost of this work during immediate last preceding three financial years. Details of work carried out shall be mentioned in form No. III.
- e. Documentary evidences to prove that average annual turn over of Bidder during immediate last preceding three financial years is not be less than 75% of estimate cost of work.
- f. Details of works in hand with the value of the work unfinished on the last date of submission of Bid(In form number I).
- g. A list of machinery and tool & tackles immediately available with the Bidder for use on this work and list of machinery proposed to be utilized on this work but not immediately available and the manner in which it is proposed to be procured. (In Form No. II).
- h. Details of technical personnel on the rolls of the Bidder (in Form No. IV).
- i. General information of Bidder in Annexure I.

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- j. Commitment form from Bidder in Annexure II.
  - k. Declaration of the Bidder in Annexure III.
  - l. Data sheet for PV Modules in Annexure IV.
- (g) If Bidder is a proprietary firm, Bid booklet should be signed by proprietor of the firm or power of attorney holder of the firm, in which case original or attested copy of the power of attorney should be enclosed in technical Bid. If the tenderer, is a partnership firm, it shall be signed by all the partners of the firm or by a partner holding power of attorney for the firm for signing the tender, in which case original or certified copy of the power of attorney shall accompany the tender. A certified copy of the Partnership Deed and current address of the partners of the firm shall also accompany the tender.

If the Bidder is a Private Limited firm, the Power of Attorney holder of the firm shall sign the tender. Original or certified copy of the power of attorney along with the certified copy of the Articles of Memorandum of Private Limited firm shall accompany the tender.

**(2) Financial Bid (Tender):**

The Bidder should quote his original basic offer in percentage (in figures and words) at appropriate place Online. The Bidder should not quote his offer any where directly or indirectly. The Contractor shall quote for the work as per details given in the main Bid and also based on the detailed set of deviations issued/ additional stipulations made by the TMC Thane as informed to him by a letter from Dy. City Engineer (Elect.),TMC, Thane, after pre Bid conference . The Bidder shall submit their offer unconditionally. The conditional tenders are liable for rejection.

**1.2 Submission of Tender:**

Bid shall be submitted online before due date and time of submission.

**1.3 Opening of Tenders :**

On the date specified in the Bid notice following procedure will be adopted for opening of the tenders.

**Technical Bid :**

First of all, Technical Bid of all Bidder will be opened to verify its contents as per requirements . The documents shall be scrutinized with original documents of Bidder brought in person at the date and time of

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opening, as mentioned. If the various documents contained in this bid do not meet the requirements of the Thane Municipal Corporation Thane, a note will be recorded accordingly by the Bid opening authority and the said Bidder's Financial Bid may not be considered for further action and the same may be recorded.

**Financial Bid :**

This Bid shall be opened immediately after opening of Technical Bid, only if, the contents of Technical Bid are found to be acceptable to the TMC Thane, the tendered rates in schedule "B" or percentage above/ below the estimated rates shall then be read out.

**1.4 Acceptance of Tender:**

1.4.1 The successful Bidder will be required to produce to the satisfaction of the specified concerned authority when asked for, a valid and concurrent license issued in his favor under provision of the Contract labour. (Regulation and Abolition) Act 1970 before starting the work. On failure to do so, the acceptance of the Bid is liable to be withdrawn and Earnest money forfeited.

1.4.2 The Bidder whose Bid is accepted will have to give an undertaking in writing to the effect that he/they will pay the labours engaged on the work, the wages as per minimum Wages Act, 1948, applied to the zone in which the work lies or any other prevalent Act when asked for.

1.4.3 The Contractor shall comply with the provision of the Payment of Wages Act, 1963, Minimum Wages Act, 1948, Employees Liability Act, 1938, Workmen's Compensation Act, 1961, the Contract Labour (Regulation and Abolition) Act, 1979, and any modification thereof or any law relating there to, and rules made there under from time to time.

1.4.4 The Bidder whose Bid is accepted is required to note that the TMC Thane will release no foreign exchange.

1.4.5 The Contractor will have to sign the original copy of the Bid papers and the drawing according to which the work is to be carried out. The Bidder shall also have to give a declaration to the effect that he has fully studied the site,

Contractor

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plans , specifications , local conditions and availability of labour and materials and that he has quoted his rate with the considerations to all these factors. The Bidder shall be deemed to have studied site condition before quoting the Bid rates.

- 1.4.6 Contractor shall take out insurance policy for the awarded work along with the manpower employed for the work, with Government insurance fund for full work order amount and for complete contract period. The insurance shall be taken out only with Government insurance fund, room no. 264, 1st floor, Mhada Bhavan, Kalanagar, Bandra East , Mumbai - 5 1 . Insurance taken out with other insurance agencies shall not be considered. The insurance can also be taken out only with Government authorized " Oriental Insurance Co. Ltd. Divisional office (123100), third floor, Saraswati Vidyamandir, Near Marathi Garnth Sangrahalya , Subhash Path, Thane (W). Insurance taken out with other insurance agencies shall not be considered. If contractor fails to take out insurance of work as described above, then 1% (One percent) of the bill amount would be deducted from contractor's bill.

**1.5 SECURITY DEPOSIT :**

- 1.5.1 The successful Bidder within seven days of the intimation to this effect shall have to pay 3 % of accepted Bid cost including EMD as initial Security Deposit in favor of the Commissioner TMC Thane or in form of Bank Guarantee by Nationalized Banks as per format given and complete the contract documents failing which his earnest money will be forfeited to TMC, Thane. The balance of security Deposit will be recovered from the R.A. Bills at 2 % percent of the bill amount.

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Thane Municipal Corporation, Thane

1.5.2 All compensation or other sums payable by the Contractor under the terms of this contract or any other agreement or any account may be deducted from his security deposit or from any sums which may be due to him or may become due to him by TMC, Thane, on any account and in the event of the security being reduced by reason of any such above noted deductions the Contractor shall within 10 days of receipt of notice of demand from the Dy. City Engineer (Elect.) TMC Thane makes good the deficit.

**1.5.3 Condition for Payment of Performance Security Deposit if the offer is received lower than 15% below.**

In case, the Bidder offers the rates lower than 15% below the estimated cost put to tender. In that case, contractor should submit the rate analysis with explanation that how the work will be carried out in this below quoted offer and Bidder will have to pay additional security deposit along with the Initial security deposit, for performance of the work. The amount of additional Security deposit shall be amount exceeding 15 % below offer, in the form of Demand Draft or Interest bearing securities pledged in favour of the Thane Municipal Corporation, Thane OR in the form of Bank Guarantee on any Nationalized or Scheduled bank for full period of completion of work and it should be extendable up to expiry of valid extension if any as directed by Engineer-in-Charge, failing to which such Bid will be consider as withdrawn and the earnest money shall be forfeited. This additional security deposit shall be refundable after satisfactory completion of work.

1.5.4 There shall be no liability on the TMC, Thane, to pay any interest on the security deposited by or recovered from the Contractor.

1.5.5 Bidder shall obtain LBT registration (Local Body Tax) with Thane Municipal Corporation, Thane.

1.5.6 The Defect liability period for the work shall be five years from certified date of completion. Successful Bidder shall carryout all inclusive comprehensive maintenance during the period of five years from certified date of completion as per guidelines of MNRE. The rates quoted are inclusive of comprehensive maintenance for five years.

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Dy City Engineer (Elect)  
Thane Municipal Corporation, Thane



# **Chapter - III**

## **Declaration of the Contractor**

Contractor

Dy City Engineer (Elect)  
Thane Municipal Corporation, Thane

**Chapter - III****DECLARATION OF THE Bidder**

I/We, hereby declare that I/We have made myself/our self thoroughly conversant with all site conditions including sub -soil conditions, local conditions regarding all materials and Labour on which I/We have based my/our rates of this work. The specifications, rates and conditions, of this work have been carefully studied and understood by me/us before submitting this tender. I/We undertake to use only the best materials approved by the Dy City Engineer (Elect), Thane Municipal Corporation, Thane or his duly authorized assistant before starting the work and to abide by his decision.

Signature of Contractor(s).

Contractor

Dy City Engineer (Elect)  
Thane Municipal Corporation, Thane

# **Chapter - IV**

## **B-1 Form**

Contractor

Dy City Engineer (Elect)  
Thane Municipal Corporation, Thane

## Chapter - IV

### BIDFOR WORKS

1. I/We hereby Bid for the execution, for the Thane Municipal Corporation, Thane (here in before and hereinafter referred to as 'TMC, Thane) of the work specified in the under written memorandum within the time signed in such memorandum at\* .... Percent below/above the estimated rates entered in Schedule 'B' (memorandum showing items of work to be carried out) and in accordance in all respects with the specifications, designs, drawings and instructions in writing referred to in Rule 1 hereof and in clause 13 of the annexed conditions of the contract and agree that when materials for the work are provided by the Dy. City Engineer (Elect.) TMC, Thane such materials and the rate to be paid for them shall be as provided in Schedule 'A' hereto.

### MEMORANDUM

- (a) General Description :-
- (b) Estimated cost :- Rs .
- (c) Earnest Money :- Rs .
- (d) Security Deposit :-  
Initial
- i) Cash /DD  
Pay Order
- ii) To be deducted  
from current bills
- (e) Time allowed for the work from the date of written order to commence \_\_\_\_\_ Calendar months including monsoon.
- .

Contractor

Dy City Engineer (Elect)  
Thane Municipal Corporation, Thane

## CONDITIONS OF CONTRACT

### CLAUSE 1 : Security deposit

The person/persons whose tenders may accepted (hereinafter called the Contractor, which expression shall unless excluded by or repugnant to the context include his heirs, executor, administrators and assigns) shall (A) within 10 days (which may be extended by the Dy. City Engineer (Elect.) concerned upto 15 days' if the Dy. City Engineer (Elect.) thinks fit to do so) of the receipt by him of the notification of the acceptance of his Bid deposit with the Dy. City Engineer (Elect. ) in cash or approved securities endorsed to the Commissioner of sum sufficient which will make up the full security deposit specified in the Bid and (i) above and (B) Permit TMC, Thane at the time of making any payment to him for work done under the contract to deduct such as will amount to two percent. Of all money so payable such deductions to be held by TMC, Thane by way of security deposit until the full amount of the security deposit is made up. All compensation or other money payable, by the Contractor to TMC, Thane 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 TMC, Thane to the contractor under any other contract or transaction of any nature on any account 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 approved securities endorsed any sum or sums which may have been deducted from or raised by sale of his security deposit or any part thereof. The security deposit referred to when paid in cash may, at the cost of the depositor, be converted into interest bearing securities.

If the amount of securities deposit to be paid in 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 security deposit retained by the TMC, Thane shall be released after the expiry of period up to which the contractor has agreed to maintain the work in good order is over. In the event of the contractor failing or neglecting to complete

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rectification work within the period up to which the contractor has agreed to maintain the work in good order, then subject to provisions of clauses 17 and 20 hereof the amount of security deposit returned, by TMC, Thane shall be adjusted towards excess cost incurred by the TMC, Thane on rectification work.

## **CLAUSE 2**

The Contractor shall carry out the work in all respects according to the Plan and the specification in the schedule hereto under the supervision of appointed Engineering Staff. In case the schedule or specifications in the schedule are silent on any point the specification for such work as prescribed by the Dy. City Engineer (Elect.) shall be final and binding on the Contractor. In the event of the Contractor failing to complete his work by the date as per the period herein before specified in the detail work order the Contractor shall be liable to pay by way of liquidated damage/penalty at a rate of Rs. 1000/- per day. In case if the Contractor feels that the same cannot be completed within the above time limit, he should present his case to the Dy. City Engineer (Elect.) through Engineer-in-charge within 3 days of receipt of such dispute. In which case Dy. City Engineer (Elect.) decision will be final and binding.

## **CLAUSE 3: Action when whole of the security is forfeited**

In the case in which under any laws of this contract the contractor shall have rendered himself liable to pay compensation amounting to the whole of his security deposit (whether paid in one sum or deducted by installments) or in the case of abandonment of the work owing to serious illness or death of the contractor or any other cause, the Dy. City Engineer (Elect.) on behalf of the TMC, Thane shall have power to adopt any of the following courses as he may deem best suited to the interest of TMC, Thane.

- a) To rescind the contract (of which rescission notice in writing to the contractor under the signature of the Dy. City Engineer (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 the TMC, Thane.

Contractor

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- b) To carry out the work or any part of the work departmentally, debiting the contractor with the cost of the work expenditure incurred on tools and plants and charges on additional supervisory staff including the cost of work charged establishment employed for getting the unexecuted part of the work completed and crediting him with the value of the work done departmentally in all respect in the same manner and at the rates as if it has been carried out by the contractor under the terms of his contract. The certificate of the Dy. City Engineer (Elect.) as to the cost and other allied expense as incurred and as to the value of the work so done departmentally shall be final and conclusive against the contractor.
- c) To Order that the work of the contractor be measured up and to take such part as 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 a 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 his contract. The certificate of the Dy. City Engineer (Elect.) as to all cost of the work and other expenses incurred as aforesaid for, or in getting the unexecuted work done by the new contractor and as to the value of the work so done shall be final and conclusive against the contractor.

In case the contract shall be rescinded under clause (a) above the contractor shall not be entitled to recover or be paid any sum for any work therefore actually performed by him under this contract unless and until the Dy. City Engineer (Elect.) shall have certified in writing 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 work executed departmentally or through a new contractor and other allied expenses exceeding the value of such work credited to the contractors, the amount of excess

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values shall be deducted from any money due to the contractor by the TMC, Thane under the contract or otherwise howsoever or from his security deposit or the sale proceeds thereof, provided however that the contractor shall have no claim against TMC, Thane even if the certified value of the work done departmentally or through a new contractor exceeds the certified cost of such work and allied expenses provided always that whichever of the three Courses mentioned in clauses (a), (b) or (c) is adopted by the Dy. City Engineer (Elect.), the contractor shall have no claim to compensation for any loss Sustained by him by reason of his having purchased, or procured any material or entered into engagements or made any advances on account or with a view of the execution of the work or the performance of the contract. The certificates of the Dy. City Engineer (Elect.) as to all cost of the work and other expenses incurred as aforesaid for or in getting the unexecuted work done by the new contractor and as to the value of the work so done and shall be final and conclusive against the contractor.

**CLAUSE 4 : Action when the progress of any particular portion of the work is unsatisfactory**

If the progress of any particular portion of the work is unsatisfactory the Dy. City Engineer (Elect.) shall notwithstanding that the general progress of the work is satisfactory in accordance with clause (2) be entitled to take action under clause 3 (b) after giving the contractor 10 days notice in writing and the contractor will have no claim for compensation, for any loss sustained by him owing to such action.

**CLAUSE 5: Contractor liable to pay compensation if action not taken under clauses 3 & 4**

In any case in which any of the power conferred upon the Dy. City Engineer (Elect.) by clauses 3 and 4 hereof 'shall have become exercisable and the same shall not have been exercised, non-exercise thereof shall not constitute a waiver of any of conditions there of and such powers shall notwithstanding be exercised in the event of any future case of default by the contractor, for which, by any clause or clauses hereof he is declared liable and the liability of the contractor for past and future compensation shall remain unaffected.

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In the event of the Dy. City Engineer (Elect.) taking the action under sub clauses (a) or (c) of clause 3 he may if he so desires, take possession of all or any tools, plants materials and stores in or upon the works 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 Dy. City Engineer (Elect.) whose certificate thereof shall be final. In the alternative the Dy. City Engineer (Elect.) may after giving notice in writing to the contractor or his clerk of the work, foreman or other authorized gent, require him to remove such tools, plants, 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 requirement the Dy. City Engineer (Elect.) may remove them at the contractor 's expense or sell them by auction or private sale at risk and account of the contractor in all respect and the certificate of the Dy. City Engineer (Elect.) as to the expense of any such removal, and the amount of the proceeds, and expense of any such sale shall be final and conclusive against the contractor.

**CLAUSE 6 : Extension of time**

If the contractor shall desire an extension of time for completion of . the work on the round of his having been unavoidably hindered in its execution or on any other ground e shall apply in writing to the Dy. City Engineer (Elect.) before the expiration of the period stipulated in the Bid or before the expiration of 30 days from the date on which he was hindered as aforesaid, or on which the cause for asking for the extension occurred, whichever is earlier and the Dy. City Engineer (Elect.) if in his opinion there was reasonable grounds for granting an extension grant such extension if he thinks necessary or proper. The decision of the Dy. City Engineer (Elect.) in this matter shall be final.

**CLAUSE 7**

On completion of the work the Contractor shall be furnished with the certificate by the Dy. City Engineer (Elect.) (herein after called the "Engineer-in-Charge")of such completion but no such certificate shall be given nor shall the work be considered to

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be complete until the contractor shall have removed from the premises on which the work shall have been executed all scaffolding, Surplus material and rubbish and shall have been cleaned, the dirt from the wood work, doors, windows, walls, floor or other parts of the building in or upon which the work has been executed or of which he may have had possession for the purpose of executing the work, nor until the works shall have been measured by the Dy. City Engineer (Elect.) or where the measurements have been taken by his subordinates until they have received the approval of the Dy. City Engineer (Elect.) the said measurements being, binding, and conclusive against the contractor. If the contractor shall fail to comply with the requirements of this clause as to the removal of scaffolding surplus materials and rubbish and cleaning off dirt on or before the date fixed for the completion of the work, the Dy. City Engineer (Elect.) may at the expenses of 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 for with the pay 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.

**CLAUSE 8 : Payments on intermediate certificate to be regarded as advance**

No payment shall be made for any work estimated to cost less than Rs. 10000/- till after the whole of the said work shall have been completed and certificate of completion given. But in the case of the works estimated to cost more than Rs. 10000/- the contractor shall on submitting the monthly bill therefore, be entitled to receive payment proportionate to the part of the work then approved and passed by the Engineer-In-Charge, whose certificate of such approval and passing, of the sum of payable shall be final and conclusive against the contractor. All such intermediate payments shall be regarded as payments by way of advance against the final payments only and not as payments for work actually done and completed, and shall not preclude the Engineer-In-Charge from requiring any bad, unsound, imperfect or unskillful work to be removed and taken away and reconstructed or re-erected, nor shall any such payment be considered as an admission of the due performance of the contractor or any part thereof in any respect or the occurring of any claim, nor shall it conclude, determine, or affect in any other way the powers of the Engineer-In-Charge, as to the final

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settlement and adjustment of the account or otherwise, or in any other way vary or affect the contract. The final bill shall be submitted by the contractor within one month of the date fixed for the completion of the work, otherwise the Engineer-In-Charge, certificate of the measurements and of the total amounts payable for the work shall be final and binding on all parties.

**CLAUSE 9 : Payment at reduced rates on accounts of items of work not accepted as completed , to be at the discretion of the Engineer -In -Charge.**

The rates for several items on work estimated to cost more than Rs. 10000/- agreed to within, shall be valid only when the item concerned is accepted as having been completed fully in accordance with the sanctioned specifications. In case where the items of work are not accepted as so completed the Engineer-In-Charge may make payment on account of items at such reduced rates as he may consider reasonable in the preparation of final or on accounts bill.

**CLAUSE 10: Bills to be submitted monthly**

A bill shall be submitted by the contractor in each month on or before the date fixed by the Engineer-In-Charge for all work executed in the previous month and the Engineer-In-Charge shall take or cause to be taken requisite measurement for the purpose of having the same verified, and the claim so far as it is admissible, shall be adjusted, if possible, within 10 days from the presentation of the bill. If the contractor does not submit the bill within the time fixed as aforesaid, the Engineer-In-Charge may depute a subordinate to measure the said work in the presence of the contractor or his duly authorized agent whose counter signature to the measurement list shall be sufficient warrant, and the Engineer-In-Charge may prepare a bill from such list which shall be binding on the contractor in all respects.

**CLAUSE 11: Bills to be on printed forms**

The contractor shall submit all bills on the printed forms to be had on application at the office of the Engineer-In-Charge. The charges to be made in tile bills shall always be entered at the rates specified in the Bid 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.

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**CLAUSE 12: Stores supplied by TMC, Thane**

If the specifications or estimate of the work provided for the use of any special description of materials to be supplied from the TMC, Thane stores or if it is required that the contractor shall use certain stores to be provided by the Engineer-In-Charge (such materials and stores, and the prices to be charged therefore as hereinafter to mention being so far as practicable for the convenience of the contractor but not so as in anyway to control the meaning and effect of this contract-specified in the schedule or memorandum hereto annexed) the contractor shall be supplied with such materials and stores as he may be required from time to time to be used by him for the purpose of the contract only and the value of the full quantity of materials and stores supplied shall be set off or deducted from any "Sums then due or thereafter to become due to the contractor under the contract, or otherwise, or from the security deposits or the proceeds of the sale thereof. If the deposit is held in approved securities, the same or a sufficient portion thereof shall in that case be sold for the purpose. All material supplied to the contractor shall remain the absolute property of TMC, Thane and shall on no account be removed from the site of work, and shall at all times be open to inspection by the Engineer-In-Charge. Any such materials unused and in perfectly good condition at the time of completion or termination of the contract shall be returned to the TMC Thane store, if the Engineer-In-Charge so requires by notice in writing given under his hand but the contractor shall not be entitled to return any such material except with such consent of the Engineer-In-Charge and he shall have no claim for compensation on account of any such material supplied to him as aforesaid but remaining unused by him or for any wastage in or damage to any such materials.

**CLAUSE 12(A) : Stores supplied by TMC, Thane**

All stores of controlled materials such as cement, steel, etc. supplied to the contractor by TMC or procured by the contractor, should be kept by the contractor under lock and key and they will be accessible for inspection by the Dy. City Engineer (Elect.) or his authorized agent at all the times.

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**CLAUSE 13: works to be executed in accordance with specifications, drawings orders, etc.**

The contractor shall execute the whole and every part of the work in the most substantial and workman like manner, and both as regards material 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-In-Charge and lodged in his office and to which the contractor shall be entitled to have access for the purpose of inspections at such office, or in the site of the work during office hours. The contractor will be entitled to receive three sets of contract drawings and working drawings as well as one certified copy of the accepted Bid along with the work order free of cost whenever necessary.

**CLAUSE 14: Alterations in specifications & designs not to invalidate contracts**

The Engineer-In-Charge shall have power to make any alterations in or additions to the original specification drawings, designs and instructions that may appear 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-In- Charge 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 respect on which he agreed to do the main work, and at the same rates as per specified in the Bid 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 rates or at the rates mutually agreed upon between the Engineer-In-Charge and the contractor, whichever is lower.

If the additional or altered work, for which no rate is entered in the Schedule of Rates of schedule as adopted by TMC, ordered to be carried out before the rate is agreed upon,

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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-In-Charge of the rate which it is his intention to charge for such class of work and if the Engineer-In-Charge does not agree to this rate he shall be 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 the contractor shall commence work or incur any expenditure in regard thereto before the rates shall have been determined 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 by him prior to the date of the determination of the rates as aforesaid according to such rate or rates as shall be fixed by the Engineer-In-Charge In the event of a dispute, the decision of the Engineer-In-Charge of the TMC, Thane will be final.

The time limit for the completion of the work shall be extended in the proportion that the increase in its cost occasioned by alterations or additions bears to the cost of the original contract work, and a certificate of the Dy. City Engineer (Elect.) as to such proportion shall be conclusive.

**CLAUSE 15: No Claim to any payment or compensation for alteration in or restriction of work. 1)**

If at anytime after the execution of the contract documents, the Engineer-In-Charge shall for reasons whatsoever (other than default on the part of the contractor for which the TMC, Thane is entitled to rescind the contract) desires that the work or any part of the work specified in the Bid should be suspended for any period of that the whole or 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 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 decision of the Dy. City Engineer (Elect.) as to the stage at which

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the work 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 of compensation whatsoever by reason 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 work ordered as aforesaid continued for a continuous period exceeding 90 days, the contractor shall be at liberty to withdraw from the contractual obligations under the contract so far as it pertains to the unexecuted part of the work by giving 10 days prior notice in writing to the Dy. City Engineer (Elect.) within 30 days of the expiry of the said period of 90 days of such intention requiring the Dy. City Engineer (Elect.) to record the final measurement of the work already done and to pay the final bill. Upon giving such a notice the contractor shall be deemed to have been discharged from his obligations to complete the remaining unexecuted work under this contract. On receipt of such notice the Dy. City Engineer (Elect.) shall proceed to complete the measurement and make such payments as finally due to the contractor within the period of 90 days from 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 provision of this clause.

**3)** Where the Dy. City Engineer (Elect.) requires the contractor to suspend the work-for the period in excess of 30 days at any time or 60 days in aggregate, the contractor shall be entitled to apply to the Dy. City Engineer (Elect.) within 30 days of the resumption of the work after such suspension of payment of compensation to the extent of pecuniary loss suffered by him in respect of working machinery remaining idle on site or on account of his having had to period of suspension provided always that contractor shall not be entitled to any claim in respect of any such working machinery, salary or wages for the

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first (30) days whether consecutive or in the aggregate of any suspension whatsoever occasioned by unsatisfactory work or any other default on his part. The decision of the Engineer -In -Charge in this regard shall be final and conclusive against the contractor.

**4) In the event of :**

- i) Any total stoppage of work on notice from the Dy. City Engineer(Elect.) under sub clause (1) in that behalf.
- ii) Withdrawal by the contractor from the contractual obligations to complete the remaining unexecuted work under sub clause (2) on account of continued suspension of work for a period exceeding (90) days.
- iii) Curtailment in the quantity of item or items originally tendered on account of any alterations omissions or substitution as in the specifications, drawings, designs or instructions under clause 14 (i) where such curtailment exceeds 25% in quantity and the value of the quantity curtailed beyond 25% at the rates for items specified if the Bides more than Rs.5,000/-.

It shall be open to the contractor within (90) days from the service of (i) the notice of stoppage of work or (ii) the notice of withdrawal from the contractual obligations under the contract on account of the continued suspension of the work or (iii) notice under clause 14 (i) resulting in such curtailment to produce to the Dy. City Engineer (Elect) satisfactory documentary evidence that he had purchased or agreed to purchase material to use in the contracted work, before receipt by him of the notice of the stoppage, suspension or curtailment and require the TMC, Thane to take over on payment of such material at the rates determined by the Dy. City Engineer (Elect.) , provided however such rates shall in no case exceeds the rates at which the same where acquired by the contractor. The TMC, Thane shall thereafter take over the material so offered provided the quantities offered are not in excess of the requirements of the unexecuted work as specified in the accepted Bid

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and are of quality and specifications approved by the Dy. City Engineer (Elect.).

**CLAUSE 15(A) : No Claim to account of loss due to delay in supply of material by TMC, Thane.**

contractor shall not be entitled to claim any compensation from the TMC, Thane for the loss suffered by him on account of delay by TMC Thane in the supply of materials entered in schedule "A" where such delay is caused by

- i) Difficulties relating to the supply of railway wagons.
- ii) Force majeure.
- iii) Act of God.
- iv) Act of enemies of the state or any other reasonable cause beyond control of Government.

In case of such delay in the supply of material, the TMC, Thane shall grant such extension of time for the completion of the work as shall appear to the Dy. City Engineer (Elect.) to be reasonable in accordance with the circumstances of the case. The decision of the Dy. City Engineer (Elect.) as to the extension of time shall be accepted as final by the contractor.

**CLAUSE 16: Time limit for unforeseen claims**

Under no circumstances what so ever shall be contractor be entitled to any compensation from TMC, Thane on any account unless the contractor shall have submitted a claim in writing to the Engineer-In-Charge within one month of the case of such claim occurring.

**CLAUSE 17: Action & compensation payable in case of bad work**

If any time before the security deposit or any part thereof is refunded to the contractor it shall appear, to the Dy. City Engineer (Elect.) or his subordinate in charge of the work, that any work has been executed with unsound, imperfect or unskillful workmanship or with materials of inferior quality, or that any materials or articles, provided by him for the execution of the work are unsound or the quality inferior to that contracted for, or

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are otherwise not in accordance with the contract. It shall be lawful for the Dy. City Engineer (Elect.) to intimate this fact in writing, to the contractor and then notwithstanding the fact that the works, materials or articles, complained of may have been inadvertently 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 material or articles so specified and provide other proper and suitable 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-Charge in written intimation aforesaid the contractor shall be liable to pay compensation at the rate of 1% on the amount of the estimate for, everyday not exceeding 10 days during which the failure so continues and in the case of any such failure Dy. City Engineer (Elect.) 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 expenses in all respects, of the contractor. Should the Engineer-In-Charge, consider that any such inferior work or materials, as described above maybe accepted or made use of it shall be within his discretion to accept the same at such reduced rates as he may fix therefore.

**CLAUSE 18: Work to be open inspection. Contractor or responsible agent to be present**

All works under or course of execution or executed in pursuance of the contract shall at all times be open to the inspection and supervision of the Engineer-In-Charge and his subordinates, and contractor shall at all times during the usual hours and at all other times at which reasonable notice of the intention of the Dy. City Engineer (Elect.) or and his subordinate to visit the work 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

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force and effect as if they had been given to the contractor himself.

**CLAUSE 19: Notice to be given before the work is covered up**

The contractor shall give not less than five days notice in writing to the Engineer-In-Charge 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 may be measured and correct dimensions thereof taken before the same is covered up or placed beyond the reach of measurement, any work without the consent in writing of Engineer-In-Charge 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 expenses and in default thereof no payment or allowance shall be made for such work or for the materials with which the same was executed.

**CLAUSE 20: Contractor liable for the damage done and for imperfections.**

If during the period of five years from the date of completion as certified by the Engineer-In-Charge in pursuant of clause 7 of the contract or five years after commissioning the work whichever is earlier in the opinion of the Dy. City Engineer (Elect.), the said work is defective in any manner whatsoever the contractor shall forthwith and receipt of notice in that behalf from the Dy. City Engineer (Elect.) duly commence execution and completely carry out at his cost every respect all the work that may be necessary for rectifying and setting right the defects specified therein including dismantling and reconstruction of unsafe portions strictly in accordance with and in the manner prescribed and under the supervision of the Dy. City Engineer (Elect.) In the event of the contractor failing or neglecting to commence execution of the said electrification work within the period prescribed therefore in the said notice and/or to complete the same as aforesaid as required by the said notice, the Dy. City Engineer

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(Elect.) 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 TMC , the amount of such cost , -charges and expenses sustained or incurred by the TMC, Thane of which the certificates of the Dy. City Engineer (Elect.) shall be final and binding on the contractor. Such costs, charges and expenses shall be deemed to be arrears of land and revenue and in the event of contractor failing or neglecting to pay the same on demand as aforesaid without prejudice to any other right and remedies of the TMC, Thane the same maybe recovered from the Contractor as the arrears of land revenue . TMC shall not be entitled to deduct the same from any account which may then be payable or which may thereafter become payable by the TMC, Thane to the contractor either in respect of the said work or any other whatsoever or from the amount of security deposit retained by TMC, Thane.

**CLAUSE 21 : Contractor to supply plant, Ladder scaffolding etc. Contractor liable for damage arising from non profit provision of lights fencing etc**

The contractor shall supply at his own cost all material (except such special materials if any as may be required in accordance with the contract, by supplied from the \_\_\_\_\_ Stores ) plant , tools , appliances , implements , ladders , cordage, tackle, scaffolding and any temporary work required for the proper execution of the work, whether in the original, altered or substituted form, and whether included in the specification, 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-In-Charge as to any matter on which under these conditions he is entitled to be satisfied or which he is entitled to require together with carriage therefore, to and from the work. The contractor shall also supply without charge, the requisite number of persons with the means and

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materials necessary for the purpose of setting out work and counting, weighing and assisting in the measurement or examination at any time and from time to time of the works or the materials failing this the same may be provided by Engineer-In-Charge at the expense of the contractor under the contract or from his deducted from any money due to the contractor under the contract or from his security deposits or the proceeds of sale thereof, or a sufficient portion thereof. The contractor shall provide all necessary fencing and lights required to protect the public from the accident, and shall also be bound to bear the expense or defense of every suit action or other legal proceedings, that may be brought by any person for injury sustained owing to neglect of the above precautions and to pay and 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 in compromising any claim by any such person. List of machinery in contractor 's possession and which they propose to use on the works should be Submitted alone, with the tender.

**CLAUSE 21(A)**

The contractor shall provide suitable scaffolds and working platforms, gangway and stairways and shall comply with the following regulations in connection herewith.

- a ) Suitable scaffolds shall be provided for workmen for all work that cannot be safely done from a ladder or by other means.
  
- b ) A scaffold cannot be constructed, taken down or substantially altered except
  - i ) under the supervision of competent and responsible person and
  - ii) as far as possible by competent workers possessing adequate experience in this kind of work.
  
- c ) All scaffolds and appliances connected therewith and all ladders shall:
  - i ) be of sound material

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- ii) be of the adequate strength having regard to the loads and strains to which they will be subjected, and
  - iii) be maintained in proper condition.
- d ) Scaffolds shall be so-constructed that no part thereof can be displaced in consequence of normal use.
- e ) Scaffolds shall not be overloaded and so far as practicable the load shall be evenly distributed.
- f) Before installing lifting gear on scaffolds special precautions shall be taken to ensure the strength and stability of the scaffolds.
- g ) Scaffolds shall be periodically inspected by a competent person .
- h ) Before allowing a scaffold to be used by his workmen, the contractor shall , whether the scaffolds has been erected by his workmen or not, take steps to ensure that it complies fully with the regulations herein specified.
- i ) Working platforms, gangways and stairways shall
  - i ) be so constructed that no part thereof can sag unduly or unequally.
  - ii) to be constructed and maintained having regard to the prevailing conditions as to reduce as far as practicable risks of persons tripping or slipping, and
  - iii) be kept free from any unnecessary obstruction.
- j ) In the case of working platform and gangways working places and stairways at height exceeding 3 meters (to be specified)
- i ) every working platform and every working gangway shall be closely boarded unless other adequate measures are taken to ensure safety.

- ii) Every working platform and gangway shall have adequate width and iii) every working platform, gangway, working place and stairway shall suitably fenced.
- k ) Every opening in the floor of building or in working platform shall except for the time and to the extent required to allow the access of persons or the transport or shifting or materials, be provided with suitable means to prevent the fall of persons or materials.
- l) When persons are employed on roof where there is danger of falling from the height exceeding two meters (to be prescribed) suitable precaution shall be taken to prevent the fall of persons or materials.
- m ) Suitable precautions shall be taken to prevent persons being struck by articles, which might fall from scaffolds or other working places.
- n ) Safe means of access shall be provided to all working platforms and other working places.
- o ) The contractors) will have to make payments to the labours as per minimum wages Act.

**CLAUSE 21(B)**

The contractor shall comply the following, regulations as regards the Hoisting Appliances to be used by him:

- a ) Hoisting machine and tackle, including their attachments, anchorages and support shall :
  - i ) be of good mechanical construction, sound material and adequate strength and free from patent defect, and
  - ii) be kept in good repair and in good working order.
- b ) Every rope used in hoisting, and lowering materials or as means of suspension shall be of suitable quality ;and adequate strength and free from patent defect.

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- c ) Hoisting machines and tackle shall be examined and adequately tested after erection on the site and before use and re-examined in position at intervals to be prescribed by the TMC, Thane.
- d ) Every chain, ring, hook shackle, swivel and pulley block used in hoisting and lowering materials or as a means of suspension shall be periodically examined.
- e ) Every crane driver or hoisting appliance operator shall be properly qualified.
- 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 any operator.
- 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.
- h ) Every hoisting machine and all gears referred to, in the preceding regulation shall be plainly marked with the safe working load.
- i) In case of hoisting machine having available safe working loads, each safe working load and the conditions under which it is applicable shall be clearly indicated.
- j) No part of any hoisting machine or of any gear referred to in relation (g) above shall be loaded beyond the safe working load except for the purpose of testing.
- k ) Motors, gearing transmission, electric wiring and other dangerous parts of hoisting appliances shall be provided with efficient safeguards.



- l) Hoisting appliances shall be provided with such means as will reduce to minimum the risk of the accidental descent of the load.
  
- m ) Adequate precautions shall be taken to reduce to minimum the risk of any part of suspended load becoming accidentally displaced.

**CLAUSE 22: Measures for prevention of fire**

The contractor shall not set fire to any standing, jungle, trees, brush wood or grass without a written permit from the Dy. City Engineer (Elect.) When such permit is given, and also in all cases when destroying cut or dug up trees, brush wood, grass, etc. by fire the contractor shall take necessary measures to prevent such fire spreading to or otherwise damaging, surrounding property. The contractor shall make his own arrangement for drinking water for the labour employed for him.

**CLAUSE 23: Liability of Contractor for any damage done in or outside the work area.**

Compensation for all damages done intentionally or unintentionally by contractor's labours whether in or beyond the limits of TMC, Thane property including any damage caused by the spreading or fire mentioned in clause 22 shall be estimated by Engineer-In-Charge or such other officer as he may appoint and the estimates of the Engineer-In-Charge shall be final and the contractor shall be bound to pay the amount of the assessed compensation on demand, failing which, the same will be recovered from the contractor as damages in the manner prescribed in clause I or deducted by the Engineer-in-Charge from any sums that may be due or become due from TMC, Thane to contractor under this contract or otherwise.

The contractor shall bear the expenses of defending any action or other legal proceedings that may be brought by any persons for injury sustained by him owing to neglect of precautions to prevent the spread of fire and he shall also pay any damages and costs that may be awarded by the court in consequence.

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**CLAUSE 24 : Employment of female labour**

The employment of female labours on works in the neighborhood of soldier 's barracks should be avoided as far as possible.

**CLAUSE 25**

No work shall be done on Sunday without the sanction in writing of the Dy. City Engineer(Elect.)

**CLAUSE 25 : Work not to be sublet. Contract may be rescinded & security deposit forfeited for sub letting it without approval of for bribing a public officer or if contractor become insolvent**

The contract shall not be assigned or sublet without the written approval of the Dy. City Engineer (Elect.) And if the contractor shall assign or sublet his contract, or attempt to do so or become insolvent or commence any proceedings to get himself adjudicated and insolvent or make any composition with his creditors or attempt to do so, the Dy. City Engineer (Elect.) may, by notice in writing rescind the contract. Also if any bribe, gratuity, gift, loan prerequisite, 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 the TMC, Thane 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 contract the Engineer-In-Charge may be notice in writing rescind the contract. In the event of contract being rescinded, the security deposit of the contractor shall thereupon stand forfeited and be absolutely at the disposal of TMC, Thane, and 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.

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**CLAUSE 27 : Sum payable by way of compensation to be considered reasonable without reference to actual loss**

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 use of TMC , Thane without reference to the actual loss or damage sustained , and whether any damage has or has not been sustained.

**CLAUSE 28: Changes in the constitution of the firm to be notified.**

In the case of Bixby partners, any changes in the constitution of firm. shall be notified by the contractor to the Engineer-In-Charge for his information.

**CLAUSE 29: Direction & control of the Dy. City Engineer (Elect.)**

All works to be executed under the contract shall be executed under the direction and subject to the approval in all respects of the Dy. City Engineer (Elect.) of the TMC, Thane for the time being, who shall be entitled to direct at what points and in what manner they are to be commenced and from time to time carried on.

**CLAUSE 30**

1. Except where otherwise specified in contract, the decision of the Dy. City Engineer (Elect.) 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 designs, drawings and instructions herein before mentioned and as to the quality of workmanship or material used on the work, or as to any other question, claim, right matter, or thing, whatsoever, if any way arising out of, relating to the contract , designs , drawings , specifications estimates , orders or these conditions or otherwise concerning the works, or the execution, or failure to execute the same, whether arising, during the progress of the work, or after the completion or abandonment thereof.

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2. The contractor may, within thirty days of receipt of him by any order passed by the Dy. City Engineer (Elect.) of the TMC, Thane as aforesaid, appeal against it to the Municipal Commissioner concerned with the contract, work or project provided that-
- a) The accepted value of the contract exceeds Rs. 10 Lakhs (Rupees Ten Lakhs Only)
  - b) Amount of claim is not less than Rs. 1 Lakh (Rupees One Lakh)

**CLAUSE 31: Lump sums in estimates .**

When the estimates on which a Bidder made includes lump sum in respect of part of the work, the contractor shall be entitled to payment in respect of items of work involved or the part of the work in question at same rates as are payable under this contract for such items, or of the part of the work in question is not in opinion of the Engineer -In - Charge capable of measurement , the Dy. City Engineer (Elect.) may at his discretion pay the lump Sum amount entered in the estimate, and the certificate in writing of the Engineer-In-Charge shall be final and conclusive against the contractor with regard to any sum or sums payable to him under the provision of this clause.

**CLAUSE 32: Actions where no specifications**

In the case of any class of work for which there is no such specifications as is mentioned in rule 1. Such work shall be carried out in accordance with the TMC prescribed specifications, and in the event of there being, no TMC prescribed specification then in Such case then work shall be carried out in all respects in accordance with the instructions and requirements of the Engineer-In-Charge.

**CLAUSE 33: Definition of work.**

The expression ‘work’ or ‘works’ where used in these conditions shall unless there be something in the subject or context repugnant to Such construction be construed to mean the work or the works contracted, to be executed under or in virtue of the contract, Whether temporary or permanent and whether original, altered, substituted or additional.

**CLAUSE 34 : Contractor % whether applied to net or gross amount bill.**

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The percentage referred to in the Bid shall be deducted from/ added to the gross amount of the bill before deducting the value of any stock issued.

**CLAUSE 35: Quarry fees and royalties.**

All quarry fees, royalties, octroi/Local Body tax dues and ground rent for stacking materials, if any should be paid by the contractor.

**CLAUSE 36 : Compensation under Workman Compensation Act.**

The contractor shall be responsible for and shall pay any compensation to his workmen 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 and paid by TMC, Thane as principal under sub-section (i) of section- 12 of **the** said act, on behalf of the contractor, this shall be recoverable by the TMC, Thane 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.

**CLAUSE 37(A)**

The contractor shall be responsible for and shall pay the expenses of providing medical aid to any workmen who may suffer a bodily injury as a result of an accident. If such expenses are incurred by TMC, Thane the same shall be recoverable from the Contractor forthwith and deducted without prejudice to any other remedy of TMC, Thane from any amount due or that may become due to the contractor.

**CLAUSE 37(B)**

The contractor shall provide all necessary personal safety equipment and first-aid apparatus available for the use of the persons employed on site, and shall maintain the same in condition suitable for immediate use at any time and shall comply with the following regulations in connection therewith.

- a ) The worker shall be required to use the equipment so provided by the contractor and the contractor shall take adequate steps to insure proper use of the

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equipment by those concerned.

- b ) When work is carried on in proximity to any place where there is a risk of drowning, 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 .

**CLAUSE 37(C)**

The contractor shall duly comply with the provisions of “THE APPRENTICES ACT, 1961” (III of 1961), the rules made there under and the hereunder that may be issued from time to time under the said act and the said rules and on the failure or neglect to do o lie shall be subjected to all the liabilities and penalties provided by the said act and he said rules.

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**CLAUSE 38**

- 1) Quantities in respect of the several items shown in the Bid are approximate, and no revision in the tendered rate shall be permitted in respect of any of the items so long as, subject to any special provision contained in the -specifications, prescribing different percentage of permissible variations, the quantity of the item does not exceed the Bid quality beyond this limit, at the rate of the item specified in the tender, is not more than Rs. 5000/-
  
- 2) The contractor shall , if ordered in writing by the Dy. City Engineer (Elect.) so to do, also carry out any quantities in excess of the limit mentioned in sub-clause (1) hereof on the same conditions as and in accordance with the specifications in the Bid and on at the rates (i) derived from the rates entered in the current schedule of rates and in the absence of such rates, (ii) at the, rate prevailing in the market, the said rates being increased or decreased is the case may be by the percentage which the total tendered amount upon the schedule of rates applicable to the year in which the Bid were invited. For purpose of operation of this clause, this cost shall be taken to be **Rs.                      /- (In words Rs**

**Only).**

- 3) Claims arising, out of reduction in the tendered quantity; of any item beyond 25% will be governed by the provisions of clause 15 only when the amount f such reduction beyond 25% it the rate of item specified in the Bides more than Rs.5,000/- (The clause is not applicable to extra items)
  
- 4) The Clause is not applicable to extra items.
  
- 5) There is no change in the rate if the excess is more than 25% of the tendered quantity, but the value of the execs work at the tendered rates does not exceed Rs.5,000/-

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**CLAUSE 39 Employment famine labour,etc.**

The contractor shall employ any famine, convict or other labour of particular kind or class if ordered in writing to do so by the Engineer-In-Charge.

**CLAUSE 40 : Claim for Compensation for de-lay in starting the work.**

No compensation shall be allowed for any delay caused in the starting of the work, on account of any acquisition of land or in the case of the clearance works, on account of any delay in according sanction to estimates.

**CLAUSE 41: Claim for Compensation for de-lay in execution of work.**

No compensation shall be allowed for any delay in execution of work on account of water standing in borrow pits or compartments. The rates are inclusive of hard or cracked soil excavation in mud, subsoil water or water standing in borrow pits and no claim for extra rates shall be entertained, unless otherwise expressly specified.

**CLAUSE 42 : Entering upon commencing any portion of work.**

The contractor shall not enter upon or commence any portion of work except with the written authority and instruction of the Dy. City Engineer (Elect.) or of his subordinate in-charge of the work. Failing such authority the Contractor shall have no claim to ask for measurement of or payment of work.

**CLAUSE 43: Minimum age of persons employed , the employment donkeys and/or other animal and the payment of fair wages.**

- i) No contractor shall employ any person who is under the age of 18 years.
- ii) No contractor shall employ donkeys or other animals with bracing of string or thin rope. The bracing must be at least 3 inches wide and should be of tape (Nawar.)
- iii) No animal suffering from sores , lameness or emaciation or which is immature shall be employed on the work.
- iv) The Engineer-In-Charge or his agent is authorized to remove from the work any person or animal found which does not satisfy these conditions and no responsibility

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shall be accepted by the TMC, Thane for any delay caused in the completion of work by such removal.

- v) The contractor shall pay fair and reasonable wages to the work men employed by him in the contract undertaken by him in the event of any dispute arising between the contractor and his workmen on the ground, that the wages paid are not fair and reasonable the dispute shall be referred without delay to the Dy. City Engineer (Elect.) who shall decide the same. The decision of the Dy. City Engineer (Elect.) shall be conclusive and binding on the contractor, but such decision shall not in any way affect the condition in the contract regarding the payment to be made by TMC, Thane at the sanctioned Bid rates.
- vi) The contractor shall provide drinking water facility to the workers. Similar amenities shall be provided to the workers engaged on large works in urban areas.
- vii) Contractor is to take precaution against accidents which takes place on count of labour using loose garments while working near machinery.

**CLAUSE 44: Method of payment**

Payment to contractors shall be made by cheques drawn on any Bank within the TMC limits convenient to them, provided the amount exceeds Rs. 100/- Amounts not exceeding Rs. 100/- will be paid in cash .

**CLAUSE 45: Acceptance of conditions compulsory before tendering the work**

Any contractor who does not accept these conditions shall not be allowed to Bid for works.

**CLAUSE 46 : Employment of scarcity labour.**

If Government declares a state of scarcity or famine to exist in any village situated within 16 km. of the work in contractor shall employ upon such parts of the work, as are suitable for unskilled labour any person certified to him by the Dy. City Engineer (Elect.) or by any person to whom the Dy. City Engineer (Elect.) 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 minimum which Government have fixed in this behalf. Any disputes which may arise in connection with the implementation of this clause shall be decided by the Dy. City Engineer (Elect.) whose decision shall be final and binding on

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the contractor.

**CLAUSE 47**

The price quoted by the contractor 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 of goods the controlled price permissible under the provisions of Hoarding and Profiteering Ordinance, 1943, as amended from time to time. If the price quoted exceeds the controlled price of the price permissible under Hoarding and Profiteering Ordinance the contractor shall specifically mention this fact in his Bid along with reasons for quoting such higher price. The purchaser at his discretion will in such case exercise the right of revising the price at any stage so as to conform with the controlled price permissible under the hoarding and Profiteering Prevention Ordinance. This discretion will be exercised without prejudice to any other action that may be taken against the contractor

**CLAUSE 47 (A) : Maharashtra Act XLX of 1985, Clause regarding turnover tax, vide P.W.D . Circular No. AT-1086/CR-30 Bldg.2dt.10/6/ 1987.**

“The tendered rates shall be inclusive of all taxes, and shall also be inclusive of the tax payable in respect of works contract under the provision of the Maharashtra Sales Tax on transfer of property or goods involved in the execution of works Contract Act , 1985 (Maharashtra Act NO.XIX of 1985)”.

**CLAUSE 48**

The rates to be quoted by the contractor must be inclusive of Sales Tax. No extra payment on account of this will be made to the contractor.

**CLAUSE 49**

In case of materials that may remain surplus with the contractor from those issued for the work contracted for the date of ascertainment of the materials being surplus will be taken as date, of sale for the purpose of sales tax and the sales tax will be recovered

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on such sale .

**CLAUSE 50**

The contractor shall employ at least 80% of the total number of unskilled labour to be employed by him from out of the persons ordinarily residing in the district in which the site of the said work is located .Provided, however that if required unskilled labour not available, locally the contractor shall in the first instance employ such number of persons as is available and thereafter may with previous permission in writing of the Dy. City Engineer (Elect.) in charge of the said work, obtain the rest of the requirement of unskilled labour from outside the district.

**CLAUSE 51 : Wages to be paid to the skilled and unskilled labours engaged by the Contractor.**

The contractor shall pay the labours skilled and unskilled according to the wages prescribed by the Minimum Wages Act, 1948 applicable to the area in which the work of the contractor is in progress.

A contractor shall comply with the provisions of the Apprentice Act, 1961 and the rules and the orders issued there under from time to time. If he fails to do so his failure will be breach of the contract and the Dy. City Engineer (Elect.) may, in this discretion, 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.

The contractor shall pay the labours skilled and unskilled according to the wages prescribed by the Minimum Wages Act of 1948 applicable to the area in which the work of the contractor is in progress .

**CLAUSE 52**

All amount whatsoever the contractor is liable to pay to the TMC, Thane in connection with the execution of the work including the amount payable in respect of

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(i) materials and/or stores supplied/ issued here under by the TMC Thane to the contractor, (ii) higher charges in respect of heavy plant, machinery and equipment on hire by TMC, Thane to the contractor for execution by him of the work and/or on which advances have been given by the TMC, Thane to the contractor shall be deemed to be arrears of land revenue and the TMC, Thane to the contractor shall be deemed to be arrears of land revenue and the TMC, Thane, may without prejudice to any other right and remedies of the, TMC, Thane, recover the same from the contractor as arrears of land revenue.

**CLAUSE 53: Government Circular No.CAT-1284/(120)Bldg.2,Mantralaya,Bombay-32, dated 14/8/1985**

The contractor shall duly comply with all the provisions of the contract labour regulation and Abolition) Act, 1970 (37 of 1970) and the Maharashtra contract labour (Regulation & abolition) Rules 1971 as amended from time to time and all other relevant statutes and statutory provisions thereof concerning payments of wages particularly to workman employed by the contractor and workman 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 & Abolition) Rules 1971. If the contractor fails or neglects to pay wages at the said rates or makes short payment ad TMC, Thane 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 TMC, Thane to such workers shall be deemed to be arrears of land revenue and the TMC, Thane shall be entitled to recover the same as such from the contractor or deduct the same from the amount payable by the TMC, Thane to the contractor hereunder or from any other amount's payable to him by the TMC, Thane. (Inserted vide Govt. Public Works Department's Circular NO. CAT 1284\120) Building- dt 14.8.1985. Accompaniments to the G.R.P.W.D. No. BGD.1979\64188(358) Desk - 2 dt.4\2\1981.

**CLAUSE 54**

The contractor shall engage apprentices such as brick layer, carpenter, wiremen,

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plumber as well as black smith recommended by the State Apprenticeship Advisor, Director of Technical Education, Dhobi Talaw, Mumbai - 400 001, in the construction work (As per Government of Maharashtra , Education Departments circular No.TSA/5170/T/56689, dated 7/7/1972).

**CLAUSE 55**

(Govt. of Maharashtra P.W.D. Resolution NO.CAT- 1086/CR-243/ K/Bldg.2 dt. 1 1/8/1987.)

**CONDITIONS FOR MALARIA ERADICATION , ANTI -MALARIA AND OTHER HEALTH MEASURES**

- a) Anti malaria and other health measures shall be as directed by the Joint Director (Malaria and Fileria of health services, Pune).
- b) Contractor shall see that mosquitogenic conditions are not created so as to keep vector population to minimum level.
- c) Contractor shall carry out anti-malaria measures in the area as per guidelines prescribed under National Malaria Eradication program and as directed by the Joint Director (M&F) of Health Services, Pune.
- d) In case of default in carrying out prescribed anti -malaria measuring resulting in increase in malaria incidence Contractor shall be liable to pay to TMC, Thane the amount spent by TMC, Thane on anti-malaria measures to control the situation in addition to fine.
- e) Relations with Public Authorities: The contractor shall make sufficient arrangements for draining away the sewerage water as well as water coming from the bathing and washing places and shall dispose of this water in such a way as not to cause any nuisance. He shall also keep the premises clean by employing sufficient number of sweepers. The contractor shall comply with all rules regulations by laws and directions given from time to by any local or public authority in connection with this work shall pay fees or charges which are leviable on him without any extra cost to TMC, Thane. Accompaniment to Govt. Resolution PWD No .BDG. 1 0 9 1 /cr - 1 7 2 / bldg.2, Dated 10/1/1992.

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# **Chapter - V**

## **Additional General Condition and Specification Index**

**Chapter - V****ADDITIONAL GENERAL CONDITIONS AND SPECIFICATION INDEX**

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**1. GENERAL :**

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

**2. CONTRACTOR TO STUDY CONDITIONS :**

The Contractor shall be deemed to have carefully examined the work and site conditions' including labour, the general and the special conditions, specifications, schedules and drawings and shall be deemed to have visited the site of the work and to have fully informed himself regarding local conditions and carried out his own investigations to arrive at rates quoted in the tender. In this regard, he will be given necessary information to the best of knowledge of TMC, Thane but without any guarantee to it.

If he shall have any doubt as to the meaning of any portions of these general conditions or the special conditions, or the scope of the work or the specifications and drawings, or any other matter concerning the contract, he shall in good time, before submitting his tender, set forth the particulars thereof and submit them to the Dy. City Engineer (Elect.) in writing in order that such doubts may be clarified authoritatively before tendering. Once a Bides submitted, the matter will be decided according to the Bid conditions in the absence of such authentic pre clarification.

**3. DECLARATION OF THE CONTRACTOR :**

The Contractor should sign the declaration form of chapter III.

**4. INDEMNITY :**

The Contractor shall indemnify the TMC, Thane against all actions, suit claims and demands brought or made against him in respect of anything done or committed to be done by the Contractor in execution of or in connection with the work of his contract and against any loss or damage to the TMC, Thane in consequence of any action or suit being brought against the Contractor for anything done or committed to be done in the execution of the work of this contract.

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**5. DEFINITIONS :**

Unless excluded by or repugnant to the context.

- a) The expression "Government" as used in the Bid papers shall mean the Government of Maharashtra.
- b) The expression "Dy. City Engineer (Elect.)" as used any where in the Bid papers shall mean Dy. City Engineer (Elect.) of the Thane Municipal Corporation, Thane who is designated as such.
- c) The expression "Dy. City Engineer (Elect.)" or "Engineer-in-charge" as used in the Bid papers shall mean the Engineer in-charge of the work for time being.
- d) The expression "Contractor" used in the Bid papers shall mean the successful Bidder whose Bid has been accepted, and who has been authorized to proceed with the work .
- e) The expression "Contract" as used in the Bid papers shall mean the deed to contract together with its original accompaniment and those latter incorporated in it by mutual consent .
- f) The expression "Plant" as used in the Bid papers shall mean every temporary and necessary or considered necessary by the Engineer to execute, construct, complete and maintain the works and used in altered, modified, substituted and additional work ordered in the time and the manner herein provided and all temporary materials and special and other articles of appliances of every sort, kind and description whatsoever intended or used thereof.
- g) "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.
- h) "Engineer representative" shall mean an assistant of the Engineer notified in writing to the contractor by the Engineer.
- i) The "Site" shall mean the land and/or the places, or under, in or through which the work is to be executed under the

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contract including any other lands or places which may be designated by TMC, Thane or used for the purpose of contract .

- j) 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 work as required for performance of the contract.
- k) The "Contract Sum" shall mean the sum for which the Bides accepted.
- l) The "Accepting Authority" shall mean the officer competent to accept the tender.
- m) The "Day" shall mean the day of 24 hours from midnight irrespective of the number of hours worked in any day in that week.
- n) "Temporary works" shall mean all temporary works of every kind required in or about the execution, completion or maintenance of the works.
- o) "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.

**6. ERRORS, OMISSIONS AND DISCREPANCIES :**

- (a) In case of errors, omission and /or disagreement between written and scaled dimensions on the drawings or between drawings and specifications etc . the following order of preference shall apply.
  - i) Between actual and scaled dimensions or descriptions on drawings the latter shall be adopted.
  - ii) Between the written or shown description or dimensions in the drawing and corresponding one in the drawing and corresponding one in the specifications, the latter shall apply.

- iii) Between the quantities shown in schedule of the quantities and those arrived from the drawings, the latter shall be preferred.
  - iv) Between the written description of the item in the schedule of quantities and the detailed description in the specifications of the same items, the latter shall be adopted.
- (b) In case of discrepancy between percentages rates quoted in figures and words, the lowest of the two will be considered for acceptance of tender.
  - (c) In all cases of omissions and or doubts or discrepancies in the dimensions or description of any item or specification, a reference shall be made to the Dy. City Engineer (Elect.), TMC, Thane whose elucidation, elaboration or decision shall be considered as authentic. The Contractor shall be held responsible for any errors that may occur in the work through lack of such reference and precaution.
  - (d) The special provision in detailed specifications and wording of any item shall gain precedence over corresponding contradictory provision (if any) in the Standard Specifications of TMC, Thane . Department Handbook where reference to such specifications is given without reproducing the details in the contract.

## **7. WORKING METHODS AND PROGRESS SCHEDULE:**

### **7.1 PROGRAM OF WORK :**

The work is required to be completed within a period of **Four Months** (including the monsoon period) and five years all inclusive comprehensive maintenance after certified date of completion of capital work.

### **7.2 a ) METHODOLOGY OF CONSTRUCTION AND CONSTRUCTION EQUIPMENTS :**

Contractor shall furnish at least 15 days in advance his program of commencement of item of work, the details of actual methods that would be adopted by the Contractor for the execution of various items of work such as well sinking, cast-in situ, super structure for bridge work and earth work, W.B.M., black topping items, etc. for road works supported

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by necessary detailed drawing and sketches including those of the plant and machinery that would be used, theory locations, arrangements for conveying and handling materials etc. and obtain prior approval of Engineer-in-charge well in advance of starting of such item of work. The Engineer-in-charge reserves the right to suggest modifications or make complete changes in the method proposed by the Contractor, whether accepted previously or not at any stage of the work, to obtain the desired accuracy, quantity and progress of the work which shall be binding on the Contractor, and no claim on account of such change in method of execution will be entertained by TMC, Thane so long as specifications of the item remain unaltered. The sole responsibility for the safety and adequacy of the methods adopted by the Contractor, will however, rest on the Contractor, irrespective of any approval given by the Dy. City Engineer (Elect.)

In case of slippage from the approved work program at any stage, the Contractor shall furnish revised program to make up the slippage within the stipulated time schedule and obtain the approval of the Dy. City Engineer (Elect.) to the revised program.

**b) CONSTRUCTION , EQUIPMMNT :**

The Contractor shall be required to give a trial run of the equipments for establishing their capability to achieve the laid down specification and tolerance to the satisfaction of the Dy. City Engineer (Elect.) before commencement of the work. All equipment 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 the site without permission of Dy. City Engineer (Elect.)

**c) PROGRESS SCHEDULE :**

The Contractor shall furnish within the period of one month of the order to start the work, the program of work in CPM/PERT charts in quadruplicate indicating the date of actual start, the monthly progress expected to be achieved and the anticipated completion date of each major item of work to be

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done by him, also indicating dates of procurement and setting up of materials, plant and machinery. The schedule is to be such as is practicable of achievement towards the completion of whole work in the time limit, the particular items, if any, on the due dates specified in the contract and shall have the approval of the Engineer-in-charge. No revised schedule shall be operative without such acceptance in writing. The Engineer is further empowered to ask for more detailed schedule or schedules say; week by week for any item or items, in case of urgency of work as will be directed by him and the Contractor shall supply the same as and when asked for.

The Contractor shall furnish sufficient plant, equipment and labour as may be necessary to maintain the progress of the schedule. The working and shift hours restricted to one shift a day for operations to be done under the TMC, Thane supervision shall be such as may be approved by the Engineer-in-charge. They shall not be varied without the prior approval of the Dy. City Engineer (Elect.). Night work which requests supervision shall not be permitted except when specifically allowed by Dy. City Engineer (Elect.) each time, if requested by the Contractor. The Contractor shall provide necessary lighting arrangements etc. for night works as directed by Dy. City Engineer (Elect.) without extra cost.

Further, the Contractor shall submit the progress report of work in prescribed forms and charts etc. at periodical intervals, as may be specified by the Engineer-in-charge. Schedule shall be in the form of progress charts, form progress statement and/ or reports as may be approved by the Dy. City Engineer.

The Contractor shall maintain proforma, charts, details regarding machinery, equipment, labour, materials, personnel, etc. as may be specified by the Engineer and submit periodically returns thereof as may be specified by the Engineer-in-charge.

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**8. AGENT AND WORK ORDER BOOK :**

The Contractor shall himself manage the work or engage an authorized all time agent on the work capable of managing and guiding the work and understanding the specifications and contract conditions. A qualified and experienced, Engineer shall be provided by the Contractor as his agent for technical matter in case the Engineer-in-charge considers this is essential for the work and so directs Contractors. He will take orders as will be given by the Dy. City Engineer (Elect.) or his representative and shall be responsible for carrying them out. This agent shall not be changed without prior intimation to the Dy. City Engineer (Elect.) and his representative on the work site. The Contractor shall supply to the Engineer the details of all supervisory and other staff employed by the Contractor and notify changes when made, and satisfy the Dy. City Engineer (Elect.) regarding the quantity and sufficiency of the staff, thus employed. The Dy. City Engineer (Elect.) will have the unquestionable right to ask for changes in the quality and numbers of contractor 's supervisory staff and to order removal from work of any such staff. The Contractor shall comply with such orders and effect replacements to the satisfaction of the Dy. City Engineer (Elect.).

A work order book shall be maintained on site and it shall be the property of the TMC, Thane and the Contractors shall promptly sign orders given therein by the Dy. City Engineer (Elect.) or his representative and his superior officers, and comply with them. The compliance shall be reported by the Contractor to the Dy. City Engineer (Elect.) in good time so that it can be checked. The blank work order book with machine numbered pages will be provided by the TMC, Thane free of charge for this purpose. The Contractor will be allowed to copy out instructions therein from time to time.

**9. CO-ORDINATION :**

When several agencies for different sub-works of the project are to work simultaneously on the project site, there must be full coordination and co-operation between different contractors to ensure timely

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completion of the whole project smoothly. The scheduled dates for completion specified in each contract shall therefore, be strictly adhered to. Each Contractor may make his own independent arrangement for water, power, housing, etc. if they so desire, on the other hand the Contractors are liberty to mutual agreement in this behalf and make joint arrangements with the approval of the Engineer. No single Contractor shall take or cause to be taken any steps or action that may cause, disruption discontent, or disturbance of work, labour or arrangements, etc. of other Contractor in the project localities. Any action by any Contractor, which the Engineer in his unquestioned discretion may consider as infringement of the above code, would be considered as a breach of the Contract condition and shall be dealt with as such.

In case of any dispute, disagreement between the Contractors, the Dy. City Engineer (Elect.) decision regarding the coordination, co-operation and facilities to be provided by any of the Contractors shall be final and binding on the Contractor (s) of his/their obligations under the contract nor considered for the grant for any claim or compensation.

**10. ASSISTANCE IN PROCURING PRIORITEES, PERMITS ETC:**

The Dy. City Engineer (Elect.) on a written request by the Contractor, will, if in his opinion, the request is reasonable and in the interest of work and its progress, assist the Contractor in securing, the priorities for deliveries transport permits for controlled materials etc. where such are needed. The TMC, Thane will not, however be responsible for the non-availability of such facilities or delay on this behalf and no claims on account of such failures or delays shall be allowed by the TMC, Thane.

The Contractor shall have to make his own arrangement for machinery required for the work. However, such machinery conveniently available with the Department may be spared as the rules in force on recovery of necessary Security deposit and rent with agreement in the prescribed form. Such an Agreement shall be independent of this contract and the supply of machinery shall not form a ground for any claim or extension of time limit for this work.

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## **11. QUARRIES**

**11.1** No quarries are available with TMC, Thane. The Contractor(s) shall have to arrange the same himself/themselves.

**11.2** Quarrying permission will have to be directly obtained by the Contractor, from the Collector of the district concerned for which purpose the department will render necessary assistance. All quarry fees, royalty charges, octroi duties, ground rent for stacking materials, etc. if any to be paid, shall be paid directly by the Contractor as per rules in force. The Contractor will however be entitled to a refund of part of such charges as are admissible under rules as mentioned else where in this contract, after obtaining a certificate from the Engineer-in-charge that the material were required for use on TMC, Thane works.

## **12. TEMPORARY QUARTERS AND SITE OFFICE:**

**12.1** The Contractor shall at his own expense maintain sufficient experienced supervisory staff etc. required for the work and shall make Ms own arrangement, provide housing for them with all necessary arrangements, including fire preventing measures, etc. as directed by the Engineer-in-charge.

**12.2** The Contractor shall provide, finish, maintain and remove on completion of the work, a suitable office on the work site for the use of Dy. City Engineer (Elect.) representative. The covered area exclusive of veranda should not be less than 400 sq. ft. It may have bamboo matting walls and asbestos or corrugated iron roof, paved floor should be 18" above ground level. He should provide -a basket type latrine, urinals and keep them clean daily. This will be supposed to be included in his rate.

## **13. TREASURE-TROVIE :**

In the event of discovery by the Contractor or his employees, during the progress of the work of any treasure, fossils, minerals or any other articles of value or interest, the Contractor shall give immediate intimation thereof to the Engineer and forthwith hand over the Dy. City

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Engineer (Elect.) such treasure or things which shall be the property of TMC, Thane.

**14. EXPLOSIVES :**

The Contractor shall at his own expense construct and maintain proper magazines, if such are required for the storage of explosives for use in connection with the work and such magazine being situated, constructed and maintained in accordance with the Govt. rules as applicable in that behalf. The Contractor shall at his own expenses obtain such license or licenses as may be necessary for storing and using explosives. Notwithstanding that the location etc. or storage of explosives are approved by the Dy. City Engineer (Elect.), the Govt., shall not be incurring any responsibility what ever in connection with storage and use of explosives on the site or any accident or occurrence whatsoever in connection, therewith, all operations in or for which explosives are employed being at the risk of the Contractor and upon his sole responsibility and the Contractor hereby gives to TMC, Thane an absolute indemnity in respect thereof

**15. DAMAGE BY FLOODS OR ACCIDENTS :**

The Contractor shall take all precautions against damage by floods 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 construction. The Contractor shall be liable to make good at his cost any plant or materials belonging to the Govt. lost or damaged by floods or from any other cause, which is in his charge.

**16. POLICE PROTECTION :**

For the Special Protection of camp and of the Contractor 's work, the department will help the Contractor as far as possible to arrange for such protection with the concerned authorities, if so required by the Contractor in writing. The full cost of such protection shall be borne by the Contractor.

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**17. TRAFFIC REGULATION FOR ROAD WORKS :**

17.1 Unless separately provided for in the contract, the Contractor shall have to make all necessary arrangements for regulating traffic, day to night during the period of construction to the entire satisfaction of the Dy. City Engineer (Elect.). This includes the construction and maintenance to diversions if necessary. The Contractor shall have to provide necessary caution boards, barricades, flags, lights and watchmen, etc. so as to comply with the latest Motor Vehicles rules and regulations and for traffic safety and he shall be responsible for all claims from accidents which may arise due to his negligence whether in regulating the traffic or in stacking materials on the roads, or due to any other reasons.

17.2 The Contractor shall at all times carry out the work on the road in a manner creating least interference to the flow of traffic, while consistent with the satisfactory execution of the same. For all works involving improvement to the existing road, the Contractor shall, in accordance with the directives of the Engineer-in-charge, provide and maintain, during the execution of work a passage for traffic, either along or part of the existing carriageway under improvement or along a temporary diversion constructed close to the road.

**17.3 TRAFFIC REGULATION FOR BRIDGES AND C.D. WORKS :**

It is to be clearly understood that whatever work carried out by the Contractor for construction of diversion road including earthwork, W.B.M. bituminous surface dressing, R.C.C. pipe drains, etc. will be paid for only once if due to flow of traffic, due to floods or due to any other cause, this diversion road and/or the R.C.C. drain gets damaged it shall be repaired and maintained by the Contractor in good condition till completion of the whole work at his own expense.

Traffic safety and control shall be as per clause number 112.4 of

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M .O .S .T. Specifications for Roads and Bridges ( 2 nd Revision , 1990)

**18. SUPERVISION AND INSPECTION OF WORKS AND OUALITY**

**CONTROL :**

**18.1 SUPERVISION :**

The Contractor shall either himself supervise the execution of the works or shall appoint the competent agent approved by the Engineer-in-charge, to act on his behalf If in the opinion of the Engineer-in-charge, the Contractor has himself no sufficient knowledge and experience of receiving instructions or cannot give his full attention to the works, the Contractor shall at his own expenses employ as his accredited agent a qualified Engineer approved by the Engineer-in-charge.

Orders given to the Contractor 's agent shall be considered to have the force as if these had been given to the Contractor himself If the Contractor fails to appoint suitable agent as directed by the Engineer-in-charge, the Engineer-in-charge shall have full power to suspend the execution of the work until such date a suitable agent is appointed and the Contractor shall be responsible for the delay so caused to the works and the Contractor shall not be entitled for any compensation on this behalf

**18.2 INSPECTION :**

The Contractor shall inform the Engineer-in-charge in writing when any portion of the work is ready for inspection giving him sufficient notice to enable him to inspect the same without affecting the further progress of the work. The work shall not be considered to have been completed in accordance with the terms of the contract until the Engineer-in-charge shall have certified in writing to that effect. Approval of materials or workmanship or approval of part of the work during the progress of execution shall not bind the Engineer-in-charge or in any way affect him even to reject the work which is alleged to be completed and to

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suspend the issue of his certificate of completion until such alternation and modifications or reconstruction have been effected at the cost of the Contractor as shall enable him to certify that the work has been completed to his satisfaction.

The Contractor shall provide at his cost necessary ladders and such arrangements as to provide necessary facilities and assistance for proper inspection of all parts of the work at his own cost.

#### **19. SAMPLE AND TESTING OF MATERIALS :**

19.1 All materials to be used on work shall be got approved in advance from the Engineer-in-charge and shall pass the test and/or analysis required by him which will be:

- a ) As specified in the specification for the items concerned and/or
- b) I.S.I. Specification (whichever and wherever applicable) or
- C ) Such recognized specifications acceptable to Engineer-in-charge as equivalent there to or in absence of such authorized specification.
- d) Such requirement test and/or analysis as may be specified by the Engineer-in-charge in order of precedence given above.

19.2 The Contractor shall at his risk and cost make all arrangements and/or shall provide for all such facilities as the Engineer-in-charge may require collecting, preparing required number of samples for tests or for analysis at such time and to such place or places as may be directed by the Engineer and bear all charges and cost of testing. Such samples shall also be deposited with the Engineer-in-charge.

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- 19.3 The Contractor shall if & when and if required, submit at his cost the samples of material to be tested and analyzed and if, so directed, shall not make use of or incorporate in the work any material represented by the sample until the required tests or analysis have been made and the materials.
- 19.4 The Contractor shall not be eligible for any claim or compensation either arising out of any delay in the work or due to any corrective measures required to be taken on account of and as a result of testing of the materials.
- 19.5 The Contractor or his authorized representative will be allowed to remain present in the departmental laboratory while testing samples furnished by him. However, the results of all the tests carried out in the departmental laboratory in the presence or absence of the Contractor or his authorized representative will be binding on the Contractor.
- 19.6 The Contractor shall at his own cost set up laboratory to carry out the routine tests of materials which are to be used on the work. The tests will have to be carried out either in his field laboratory or in an approved laboratory. In case tests are carried out in field laboratory, at least 50% tests should be carried out in nearest quality control laboratory of the TMC, Thane.
- 19.7 In case of material procured by the Contractor, testing as required by the codes and specifications shall be arranged by him at his own cost. Testing shall be done in the presence of authorized representative of the Engineer-in-charge at the nearest approved laboratory, If additional testing other than as required by specification is ordered, the testing charges, shall be borne by the

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TMC, Thane, if the test results are satisfactory and by the Contractor if the same are not satisfactory.

**20. CHANGE OF CEMENT CONTENT ETC :**

The tendered rates for any item, involving the use of cement, shall apply to the quantity of cement specified for the mix for that item in the specifications. If for any reasons except those required for compensating the deficiencies, in the components, the cement content and the properties are altered by the Engineer (Engineer-in-charge) at any time or from time to time the tendered rates for that particular item and quantity or quantities, shall be duly enhanced or reduced only to account for the addition or reduction in cost of the cement content from the laid down in the specification at the rates specified in the Schedule 'A' of the contract plus 10 % to cover all other incidental charges whatever. Like-wise if any additives compound water proofing material, etc. are ordered by the Engineer to be added to the mortar or concrete, no extra rate shall be payable for this change which shall be carried out as per directions of the Engineer-in-charge, provided cost of such additives etc. is borne by Govt. or these are supplied free of cost to Contractor at site by the Govt.

**21. MISCELLANEOUS :**

- 21.1 Rate shall be inclusive of sales tax., General tax and other taxes, etc .
- 21.2 For providing electric wiring or water lines etc. recesses shall be provided if necessary through walls, slabs, beams, etc. and latter on refilled up with bricks or stone chipping, cement mortar without any extra cost.

- 21.3 In cases it becomes necessary for the due fulfillment of contract for the Contractor to occupy land outside TMC, Thane limits, the Contractor will have to make his own arrangements with the land owners

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and to pay such rents if any are payable as mutually agreed between them. The TMC, Thane will afford the Contractor all the reasonable assistance to enable him to obtain TMC, Thane land for such purpose on usual terms and conditions as per rules of TMC, Thane if such land is available.

- 21.4 The special provision in detailed specifications or wording of any item shall gain precedence over corresponding contradictory provision (if any) in the standard specifications or P.W.D. Hand Book where reference to such specifications is given without reproducing the details in contract.
- 21.5 Suitable separating Barricades and enclosures shall be provided to separate material brought by Contractor and material issued by TMC, Thane to Contractor under Schedule 'A'. Same applies for the material obtained from different sources of supply.
- 21.6 The stacking and storage of construction material at the site shall be in such a manner so as to prevent deterioration or intrusion of foreign matter and to ensure the preservation of their quality, properties and fitness for the work. Suitable precautions shall be taken by the Contractor to protect the material against atmospheric actions, fire and other hazards. The material likely to be carried away by wind shall be stored in suitable stores or with suitable barricades and where there is likely hood of subsidence of soil, such heavy materials shall be stored on approved platforms,
- 21.7 For road and bridge works the Contractor shall in addition to the specification cited here , comply with requirements of relevant I.R.C. Code practice.
- 21.8 The Contractor shall be responsible for making good the damages done to the existing property during construction by his men.

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21.9 If it is found necessary from safety point of view to test any part of the structure, the test shall be carried out by the Contractor with the help of the department at his own cost.

21.10 Defective work is liable to be rejected at any stage. The Contractor, on no account can refuse to rectify the defects merely on reasons that further work has been carried out. No extra payment shall be made for rectification.

21.11 In keep gap between words Schedule 'B' the work has been divided into sections but notwithstanding this, every part of it shall be deemed supplementary to and complementary to every other part.

21.12 General directions or detailed description of work, materials and item coverage of rates given in the specification are not necessarily repeated in the Bill of Quantities. Reference is, however, drawn to the appropriate section clause (s) of the General specifications in accordance with which the work is to be carried out.

21.13 In the absence of specific direction to the contrary, the rates and prices inserted in the items are to be considered as the full inclusive rates and prices for the finished work described there under and are to be cover all labour, materials, wastage, temporary work, plant overhead charges and profits as well as the general liabilities, obligations and risks arising out of the General conditions of contract .

21.14 The quantities set down against the item in the Schedule 'B' are only estimated quantities of each kind of work included in the contract and are not



to be taken as a guarantee that the quantities scheduled will be carried out or required or that they will not be exceeded.

21.15 All measurements will be made in accordance with the methods indicated in the specification and read in conjunction with the General Conditions of contract.

21.16 The details shown on drawings and all other informing pertaining to the work shall be treated as indicative and provisional only and are liable to variation as found necessary while preparing working drawing which will be supplied by the TMC, Thane during execution. The Contractor shall not, on account of such variation be entitled to any increase over the ones quoted in the Bid which are on quantity basis.

21.17 The recoveries if any due from Contractor will be affected as arrears of land revenue through the Collector of the District.

21.18 Clause 101 to 107 of Specifications of Road and Bridge work adhered herewith will be applicable to works as per Schedule 'B' unless specified otherwise in the detailed specifications of the relevant items.

21.19 All materials used in the construction shall conform to the requirement of Specification Clause under section 1000 "Materials for structures" of Specification of Road and Bridge Work, M.O.T. New Delhi, 1990 Edition.

21.20 Extraneous materials and steps to minimize dust nuisance during construction shall be as per clause 111 of M.O.S.T. specifications (second Edition 1990)

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**PROTECTION OF UNDERGROUND TELEPHONE CABLE AND AERIAL TELEPHONE WIRES AND POLES , TRANSMISSION TOWERS, ELECTRIC CABLES AND WATER SUPPLY LINE:**

During the execution of work it is likely that the Contractor may meet with telephone cable, electrical cables, water supply lines, etc. it will, therefore, be the responsibility of the Contractor to protect them carefully. All such cases should be brought to the notice of the Engineer-in-charge by the Contractor and also to the concerned department. Any damage whatsoever done to these cables and pipelines by the Contractor shall be made good by him at his cost.

**22. MEDICAL AND SANITARY ARRANGEMENTS TO BE PROVIDED FOR LABOUR EMPLOYED IN THE CONSTRUCTION BY THE CONTRACTOR :**

- a) The Contractor shall provide an adequate supply of potable water for the use of labours on works and in Camps.
- b) The Contractor shall construct trench or semi permanent latrines for the use of the labours. Separate latrines shall be provided for men and women.
- c) The Contractor shall build sufficient number of huts on a suitable plot of land for use of the labours according to the following specifications.
  1. Huts of bamboos and grass may be constructed.
  2. A good site not liable to submergence shall be selected on high ground remote from jungle but well provided with trees, shall be chosen wherever it is available. The neighborhood of tank , jungle ,grass or woods should be particularly avoided, camps should not be established close to large cuttings of earthwork.

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3. The lines of huts shall have open spaces of at least ten yards between rows . When a good natural site cannot be procured , particular attention should be given to the drainage.
  4. There should be no over crowding. Floor space at the rate of 30 sq .ft . per head shall be provided . Care should be taken to see that the huts are kept clean and in good order.
  5. The Contractor must find his own land and if he wants TMC, Thane land, he should apply for it and pay assessment for it, if made available by TMC, Thane.
  6. The Contractor shall make sufficient arrangements for draining away the surface and sewage water as well as water from the bathing and washing places and shall dispose off this waste water in such a way as not to cause any nuisance.
- d) The Contractor shall engage a Medical Officer with a traveling dispensary for a Camp containing 500 or more persons if there is no Government or other private dispensary situated within 8 km. from the Camp. In case of emergency the Contractor shall arrange at his cost for transport for quick medical help to his sick worker.
  - e) The Contractor shall provide the necessary staff for effecting a satisfactory drainage system and cleanliness of the camp to the satisfaction of the Engineer. At least one sweeper per 200 persons should be engaged.
  - f) The Assistant Director of Public Health shall be consulted before opening a labour camp and his instruction on matters such as water supply, sanitary conveniences, the camp site accommodation and food supply shall be followed by the Contractor.
  - g) The Contractor shall make arrangements for all anti malaria-measures to be provided for the labour employed on the work. The anti malaria measure shall be provided as directed by the Assistant Director of Public Health.

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**23. SAFETY CODE :**

Suitable scaffolds shall be provided for workmen for all works that can not safely be done from the ground or from solid construction except such short period work as can be done safely from ladders. When ladder is used an extra labour shall be engaged for holding the ladder and if the ladder is used for carrying materials as well, suitable footholds shall be provided on the ladder and the ladder shall be given an inclination not steeper than 1 to 4. (1 horizontal and 4 vertical).

Scaffolding or staging more than 3.25 M above the ground or floors, swing or suspended from an overhead support or erected with stationary supports, shall have a guard rail properly attached, bolted, braced and otherwise assured at least 1 meter high above the floor or platform of such scaffolding or staging and extending along the entire length of the outside and ends thereof with only such openings may be necessary for the delivery of materials. Such scaffoldings or staging shall be so fastened as to prevent it from swaying from the building or structure, working platform, gangways, and stairways shall be so constructed that they do not sag unduly or is more than 3.25m above ground level or floor level, it shall be closely boarded, have adequate width and suitably fenced as described in 2 above.

Every opening in floor of the building or in a working platform shall be provided with suitable protection to prevent fall of persons or materials by providing suitable fencing or railing with minimum height of 1 m.

Safe means of access shall be provided to all working platform and other working places. Every ladder shall be securely fixed. No portable single ladder shall be over 9m in length, width between side rails in a rung ladder shall in no case be less than 30 cm for ladders up to and including 3m in length. For longer ladders this width shall be increased at least 6 inches for each additional 30 cms of length. Uniform step spacing shall not exceed 30 cms.

Adequate precautions shall be taken to prevent danger from electrical equipments. No materials on any of the site shall be stacked or placed as to cause danger or inconvenience to any person or the public. The Contractor shall provide all necessary fencing and lights to protect public from accidents and shall be bound to bear expenses of defense of every suit, action or other proceedings at law that may be brought by any person for injury sustained owing to the neglect of the above precaution 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, to be paid to comprise any claim by any such person.

**EXCAVATION AND TRENCHING:**

All trenches, 1.5m or more in depth, shall at all times be supplied with at least one ladder for each 30 m in length or fraction thereof Ladder shall be extended from the bottom of trench to at least 1 m above surface of the ground, sides of a trench bracing, so as to avoid the danger of sides collapsing. Excavated materials shall not be placed within 1.3 M of edge of trench or half of depth of trench whichever is more. Cutting shall be done from top to bottom under no circumstances shall undermining or undercutting be done.

**DEMOLITION :**

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

- a) All roads and open areas adjacent to the work site shall either be closed or suitably protected.
- b) No electric cable or apparatus which is liable to be a source of danger or a cable or apparatus used by operator shall remain electrically charged.
- c) All practical steps shall be taken to prevent danger to person employed, from risk or fire or explosion or hooding. No floor, roof or other part of a building shall be so overloaded with debris of materials as to render it unsafe.

All necessary personal safety equipments as considered adequate by the Engineer-in-charge' shall be available for use of persons employed on the site and maintained in a condition suitable for immediate use and Contractor shall take adequate step to ensure proper use of equipment by those concerned.

- a) Workers employed on mixing asphalted materials cement and lime mortars concrete shall be provided with protective footwear and protective goggles.
- b) Those engaged in handling any materials which is injurious to eyes shall be provided with protective goggles.
- c) Those engaged in welding works shall be provided with welder 's protective eye shields.
- d) Stone breakers shall be provided with protection goggles and protective clothing and seated at sufficiently safe intervals.
- e) When workers are employed in sewers and manholes which are in use, the Contractor shall ensure that manhole covers are opened and manholes are ventilated at least for an hour before workers are allowed to get into them. Manholes opened shall be cordoned off with suitable railing and provided with warning signals or boards to prevent accident to public.
- f) The Contractor shall not employ, men below the age of 18 and women on the work of painting with products containing lead in any form wherever men above the age of 18 are employed on the work of lead painting the following precautions shall be taken:
  - i) No paint containing lead or lead product shall be used except in the form of paste or ready made paint.
  - ii) Suitable face masks shall be supplied for use by workers when

paint is applied in the form of spray or a surface having lead paint dry rubbed and scrapped.

- iii) Overalls shall be supplied by the Contractor to the workmen and adequate facilities shall be provided to enable working painters to wash during and on cessation of work.
- g) When work is done near any place where there is a risk of drowning all necessary equipment shall be provided and kept ready for use and all necessary steps taken for prompt rescue of any person in danger and adequate provision made for prompt first aid treatment of all injuries likely to be sustained during the course of the work.

Use of hoisting machines and shackles including the attachments, anchorage supports shall conform to the following

- a)
  - i) These shall be of good mechanical construction, round materials and adequate strength and free from potent defects and shall be kept in good repair and in good working order.
  - ii) Every rope used in hoisting or lowering materials or as a means of suspension shall be of durable quality and of adequate strength and free from potent defects.
- b) Every crane driver or hoisting appliance operator shall be properly qualified and no person under the age of 21 years shall be in charge of any hoisting machine including any scaffolding.
- c) In case of every hoisting machine and of every chain ring hook, shackle shovel and pulley block used hoisting or lowering or as a means of suspension safe working load shall be ascertained by adequate means. Every hoisting machines and all gear referred to above shall be plainly marked with safe working loads. In case of hoisting machine having a variable safe working load, each safe working load and the conditions under which it is applicable shall

be clearly indicated. No part of any machine or of any gear referred to above in the paragraph shall be loaded beyond safe working load except for the purpose of testing.

- d) In case of departmental machines safe working load shall be notified by Engineer-in-charge. As regards Contractor 's machines the Contractor shall notify safe working load of each machine to the Engineer -in –charge whenever, he brings it to site of work and get it to site of work and get it verified by the Engineer-in-charge.

Motors, gearing, transmission, electric wiring and other dangerous parts of the hoisting appliances shall be provided with such means as will reduce to the minimum risk of accidental descent of load. Adequate precaution shall be taken to reduce to the minimum the risk of any part of suspended load becoming accidentally displaced , when works are employed .

On electrical installations, which are already energized insulating materials wearing approved such as gloves, sleeves and coats as may be necessary shall be provided. Workers shall not wear any rings, watches and carry keys or other materials, which are good conductors of electricity.

All scaffolds, ladders and other safety devices mentioned or described herein shall be maintained in a safe condition and no place at the work spot. Persons responsible ensuring compliance with safety code shall be named therein by the Contractor.

- i) To ensure effective enforcement of the rules and regulations relating to safety precautions , arrangement made by the Contractor shall be open to inspection by the Engineer-in-charge or his representatives and the inspecting officers.

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- ii) Failure to comply with the provision hereunder shall make the Contractor liable to pay to the department as penalty an amount not exceeding Rs. 50/- for each default and decision of the Engineer-in-charge shall be final and binding.

Notwithstanding the above conditions 1 to 14 the Contractor is not exempted from the operation of any other Act or rules in force.

**24. PAYMENTS :**

**a) Running Bills:**

Two payments in the month will be granted by the Engineer-in-charge if the progress is satisfactory. Contractor should submit bills to the Engineer-in-charge in appropriate forms.

**b) Final Bill:**

The Contractor should submit final bill within one month after completion of the work and the same will be paid within 3 months if it is in order.

**c) Payment after completion of capital work :**

The job includes all inclusive comprehensive maintenance for a period of five years from certified date of completion. After successful completion of capital part of project, 85 % of quoted cost of each item of the price schedule shall be released.

**d) Payment for each year of comprehensive maintenance of 5 years.**

Payment of 3% of quoted cost of each item of the price schedule shall be released at the end of every year of comprehensive maintenance.

**25. HANDING OVER OF WORK:**

All the work and materials before finally taken over by the TMC, Thane, will be the entire liability of the Contractor for guarding, maintaining and making good any damages of any magnitude. Interim payments made for such work will not alter this position. The handing over

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by the Contractor and taking over by the Dy. City Engineer (Elect.) or his authorized representative will be always in writing of which copies will go to the Dy. City Engineer (Elect.) or his authorized representative and the Contractor, it is, however understood that before taking over such work TMC, Thane will not put it into regular use as distinct from causal or incidental one, except as specifically mentioned elsewhere in this contract, or as mutually agreed to.

- 26 Contractor shall have to establish service office in MMRDA region for prompt services such as routine and breakdown maintenance.

## **27 Penalty**

- 27.1 Bidder shall have to complete the work of " Design, supply, erection, testing and commissioning of Solar Photovoltaic systems (136 kWp) at various locations in Thane Municipal Corporation area under solar city program " and carry out all inclusive comprehensive maintenance for the period of five years from the certified date of completion.
- 27.2 The capital part of work shall be completed within a period of **Four months** from the date of issue of work order, failing which penalty at the rate of Rs. 5,000 per day shall be levied, provided that the total amount of penalty to be paid under provision of this clause shall not exceed 5 % of contract value of the work. Thereafter Thane Municipal Corporation reserves the right to get the work done through other agency at risk & cost of the Contractor.
- 27.3 During course of defect liability and comprehensive maintenance, if contractor fails in attending the defects in the systems within 48 hrs, a penalty of Rs. 2000.00 (Rs. two thousands) per day shall be charged to Contractor. This amount shall be recovered from the annual comprehensive maintenance bills or securities held with Thane Municipal Corporation.

Thane Municipal Corporation reserves the right to get the work done through other agency at risk & cost of the Contractor.

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# **Chapter - VI**

## **Technical Specification**

## Chapter - VI

### TECHNICAL SPECIFICATIONS

#### 6.1 Technical Specifications for SPV Power Plant:

##### 1. Solar PV Modules:

- i. The PV modules must qualify to the latest edition of any of the following IEC PV module qualification test or equivalent BIS standards for module design qualification and type approval: Crystalline Silicon Solar Cell Modules IEC 61215/ IS 14286.
- ii. PV modules must qualify to IEC 61730 Part I & II, for safety qualification testing and to be used in a highly corrosive atmosphere throughout their lifetime, they must qualify to IEC 61701.
- iii. PV modules used in solar power plants must be warranted for output peak wattage, which should not be less than 90% at the end of 10 years and 80% at the end of 25 years.
- iv. Full rated output of the SPV Array to be ensured after one year of operation. Number of modules and array capacity will depend on the rated output of individual modules.

##### Identification And Traceability

Each PV module must use a RF identification tag (RFID), which must contain the following information:

- (i) Name of the manufacturer of PV Module
- (ii) Name of the Manufacturer of Solar cells
- (iii) Month and year of the manufacture (separately for solar cells and module)
- (iv) Country of origin (separately for solar cells and module)
- (v) I-V curve for the module
- (vi) Peak Wattage,  $I_m$ ,  $V_m$  and FF for the module
- (vii) Unique Serial No and Model No of the module
- (viii) Date and year of obtaining IEC PV module qualification certificate
- (ix) Name of the test lab issuing IEC certificate
- (x) Other relevant information on traceability of solar cells and modules as per ISO 9000 series.

Until March 2013, the RFID can be inside or outside the module laminate, but must be able to withstand harsh environmental conditions. **It may be noted that from 1<sup>st</sup> April 2013 onwards; RFID shall be mandatory placed inside the module laminate.**

##### 2. Module Mounting Structure:

- i. Solar PV modules are to be installed & fixed with the module mounting structures with appropriate size stainless steel nuts & bolts.
- ii. The array structure shall be made of hot dip galvanized MS angles of size not less than 50mm X 50mm X 6 mm size. The minimum thickness of galvanization should be at least 80 microns. All nuts & bolts shall be made of very good quality of stainless steel. The minimum ground clearance of the lowest part of the module structure shall be 500 mm.

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- iii. The structure shall be designed for simple mechanical and electrical installation. It shall support SPV modules at a given orientation, absorb and transfer the mechanical loads to the ground properly. There shall be no requirement of welding or complex machinery at site.

### 3. Array Foundation:

The legs of the structures made with hot dip GI angles will be fixed and grouted in the RCC foundation columns made with 1:2:4 cement concrete. The minimum ground clearance from the lowest part of any module shall be 500 mm. While making foundation designs due consideration will be given to weight of module assembly, maximum wind speed of 200 Km per hour. The work includes necessary excavation, concrete-ing, back filling, shoring & shuttering etc.

No puncturing is allowed on terrace. Care should be taken while fixing structure at terrace of building. Contractor shall have to provide waterproofing materials at supports at terrace. If any leakage noticed due to foundation on terrace the contractor shall have to do waterproofing at that locations.

### 4. Junction Boxes (JBS):

- i. The junction boxes shall be dust and water proof and made of thermo-plastic. The terminals will be connected to copper lugs or bus-bar of proper sizes. The junction boxes will have suitable cable entry points fitted with cables glands. Suitable markings shall be provided on the lugs or bus-bar for easy identification and cable ferrules will be fitted at the cable termination points for identification. Each main junction box shall be fitted with appropriate rating blocking diode. The junction boxes shall be of reputed make.
- ii. The junction boxes shall have suitable arrangement for the followings:
  - a. Combine groups of modules into independent charging sub-arrays that will be wired into the controller.
  - b. Provide arrangement for disconnection for each of the groups.
  - c. Provide a test point for each sub-group for quick fault location.
  - d. To provide group array isolation.
  - e. The rating of the JBS shall be suitable with adequate safety factor to inter connect the Solar PV array.
  - f. Boxes shall be IP 65 (for Outdoor), IP 21 (for Indoor) as per IEC 62208.

### 3. Power Conditioning Unit (PCU)-

As SPV array produce direct current electricity, it is necessary to convert this direct current into alternating current and adjust the voltage levels before powering equipment designed for nominal mains AC supply. 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" OR simply PCU. In addition, the PCU shall also house MPPT (Maximum Power Point Tracker), an interface

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between Solar PV array & the Inverter, to maximize Solar PV array energy input into the System. PCU should conform IEC 61683, IEC 60068 as per specifications.

PCU refers to combination of charge controller, inverter and AC charger and shall be supplied as integrated unit or separate units.

### 3.1 PCU specifications of power plants

| <b>Power Conditioning Unit (Solar Charge Controller + Inverter)</b> |   |
|---|---|
| Switching device  | MOSFET/IGBT   |
| Type  | MPPT based PWM charger to charge 240 V battery bank   |
| Input voltage from PV array   | 48 V DC for 2 kW, 120 V Dc for 5 kW, 240V DC for 10kW & above<br>(The voltage variation shall be as per change in array output)   |
| Protections   | <ul style="list-style-type: none"> <li>➤ Short circuit protection</li> <li>➤ Input under voltage / Deep discharge of battery</li> <li>➤ Input surge voltage protection</li> <li>➤ Over current</li> <li>➤ Battery reverse polarity protection</li> <li>➤ Solar array reverse blocking diode (provided in array junction box)</li> <li>➤ DC rated fuse at input and AC rated fuse at output with suitable contactor/solid-state switches for safe start-up &amp; shutdown of system</li> <li>➤ Load surge current</li> <li>➤ Over temperature</li> <li>➤ Under / Over output voltage</li> <li>➤ Under / Over frequency</li> <li>➤ Automatic / manual isolation at input &amp; output</li> <li>➤ Suitable protection for solid-state switching devices</li> </ul> |
| Dielectric strength   | 1.1kV between input/output and ground with EMI protections removed  |
| Cooling   | Solar natural and Forced air cooling with temperature sensitive fan operation   |
| Ambient operation   | (max)<br>50° C  |
| Relative humidity   | 95% maximum   |
| Assembly & mounting   | As per normal industry practice   |
| Finish  | Epoxy powder coating  |
| Cable entry   | From rear 200mm above ground level  |
| Load test at factory  | Minimum 6 hours at full load  |
| Features  | <ul style="list-style-type: none"> <li>➤ Stand-alone and hybrid mode of operation.</li> <li>➤ High quality with high efficiency and reliability</li> <li>➤ Microprocessor based intelligent controller</li> <li>➤ Self monitoring capability.</li> <li>➤ Integral design with MPPT solar charge controller and inverter</li> </ul>  |

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|                    |   |
|--------------------|---|
|                    | <ul style="list-style-type: none"> <li>➤ Highly reliable &amp; efficient solid-state switching devices</li> <li>➤ Rated for continuous operation at full load</li> <li>➤ High over-load capability of 200% surge for 10 seconds</li> <li>➤ Inverter output power factor of 0.8 lag</li> <li>➤ Automatic re-start facility after over load triggered shutdown</li> </ul> |
| Efficiency         | <ul style="list-style-type: none"> <li>➤ 90% at rated load and normal operating conditions</li> <li>➤ 85% (min) at 25% load and nominal input voltage with UPF load</li> </ul>  |
| %THD               | Sine-wave output with 3% THD at full load UPF and nominal input voltage   |
| Output voltage     | 230V / 415 (+12.5-20%)V AC  |
| Output frequency   | 50Hz ± 0.5Hz  |
| %Regulation        | 5% against input voltage and load variation   |
| Indications        | As many as possible with relevance  |
| AC charger input   | 240 V AC, 50 Hz from AC mains grid  |
| Enclosure          | IP 30 (For indoor application)  |
| Weight / Dimension | The details of the inverter will be provided in the specification / user manual   |
| Battery type       | Tubular lead acid type  |

#### 4. Maximum Power Point Tracker (MPPT)

Maximum power point tracker shall be integrated into the PCU to maximize energy drawn from the Solar PV array. The MPPT should be microprocessor / microcontroller based to minimize power losses. The details of working mechanism of MPPT shall be mentioned. The efficiency of the Charge controller (MPPT based with data logger) shall not be more than 94% and shall be suitably designed to meet array capacity.

MPPT must conform IEC 62093, IEC 60068 as per specifications.

#### 5. Inverter

- a. Inverters shall be of very high quality having high efficiency and shall be completely compatible with the charge controller and distribution panel.
- b. Inverter should conform IEC 61683, IEC 60068 as per specifications.
- c. The inverter shall be designed for continuous, reliable power supply as per specifications. The inverter shall have high conversion efficiency from 25 percent load to the full rated load. The efficiency of the inverter shall be more than 90% at full load and more than 88% at partial load (50%-75%). The supplier shall specify the conversion efficiency in the offer. The inverter shall be designed for extreme temperatures.
- d. The Inverter shall have internal protection arrangement against any sustained fault in feeder.
- e. The dimension, weight, foundation details etc. of the inverter shall be clearly indicated in the detailed technical specification.
- f. Each solid-state electronic device shall have to be protected to ensure long life of the inverter as well as smooth functioning of the inverter.
- g. Supplier shall indicate tripping voltage & start up voltage for the inverters & this should be perfectly matched with the recommendation of battery manufacturers.

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- h. The PCU shall be mounted on a suitable reinforced concrete pad inside control room not susceptible to inundation by water. All cable entry to and from the PCU shall be fully sheathed to prevent access of rodents, termites or other insects into the PCU from bottom/top of the PCU in form of a detachable gland plate.
- i. For the Monitoring of Unit generated provision of Ah meters at input side shall be accomplished with Energy meter and voltmeters at suitable place and included in the technical specification clearly. Provision for the Equalizing Charging of battery periodically shall be made and state clearly in the technical details.
- j. The Bidder shall furnish details of proper operation, maintenance and trouble shooting details to TMC.
- k. The Bidder shall intimate TMC prior to dispatch of the inverter for inspection Shop tests on the inverter shall be conducted in the presence of the authorized representative of TMC in order to verify the capacity and proper working of all control and protection arrangement.
- l. The inverter will be highly efficient. The inverter should conform IEC 61683 / IEC 60068 and should be based on PWM technology and using IGBT. Inverters would display its own parameters and also the parameters of battery bank connected to the inverter.

● **Salient features of the Inverters for off grid application shall be as follows:**

| Sr. No. | Specification                           | 2 kW   | 12 kW   | 15 kW   |
|---------|---|--|---|---|
| 1       | Nominal AC output voltage and frequency | 220 V, 230 V, 240 V / 180 V – 280 V                | 415 V, 3Phase, 50 Hz                              | 415 V, 3 Phase, 50 Hz                             |
| 2       | Accuracy of AC voltage control          | +1%  | +1%   | +1%   |
| 3       | Output frequency                        | 50Hz   | 50 Hz   | 50 Hz   |
| 4       | Accuracy of frequency control           | + 0.1%   | + 0.1%  | + 0.1%  |
| 5       | Grid Frequency Synchronization range    | + 3 Hz   | + 3 Hz  | + 3 Hz  |
| 7       | Ambient temperature considered          | 40o C  | 40o C   | 40o C   |
| 8       | Humidity                                | 90%  | 95 % Non condensing                               | 95 % Non condensing                               |
| 9       | Protection of Enclosure                 | IP-20(Mini) for indoor.<br>IP-65(Min) for outdoor. | IP-20(Min) for indoor.<br>IP-65(Min) for outdoor. | IP-20(Min) for indoor.<br>IP-65(Min) for outdoor. |
| 10      | Grid Frequency Tolerance range (THD)    | + 3%   | + 3%  | +3%   |
| 11      | Grid Voltage tolerance                  | - 20% & + 15 %                                     | - 20% & + 15 %                                    | - 20% & + 15 %                                    |

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|    |                          |                             |                             |                             |
|----|--------------------------|-----------------------------|-----------------------------|-----------------------------|
| 12 | No-load losses           | Less than 1% of rated power | Less than 1% of rated power | Less than 1% of rated power |
| 13 | Inverter efficiency(min) | >90%                        | >90%                        | >90%                        |
| 14 | Battery                  | 48V/300AH                   | 120V/480AH                  | 120V/ 600AH                 |

### 6. Battery Bank-

- a) The batteries shall be solar photovoltaic batteries of flooded electrolyte, low maintenance, lead Acid and made of hard rubber container.
- b) Storage batteries should conform IEC 61427 / IS 1651 / IS 133369 as per specifications.
- c) The batteries shall use 2V cells and battery capacity is to be designed at C10 rate with end cell cut off voltage of 1.85 V per cell.
- d) Batteries shall be provided with micro porous vent plugs with floats.
- e) Charging instructions shall be provided along with the batteries
- f) Suitable carrying handle shall be provided.
- g) A suitable battery rack with interconnections & end connector shall be provided to suitably house the batteries in the bank. The features and dimensions of the battery rack shall be provided along with the bid document.
- h) The batteries shall be suitable for recharging by means of solar modules via incremental / open circuit regulators.
- i) Bidder shall mention the design cycle life of batteries at 80%, 10% and 20% depth of discharge at 27 deg. C.
- j) The batteries shall be designed for operating in ambient temperature of site in the state of Maharashtra.
- k) The self discharge of batteries shall be less than 3 % per month at 20 deg. C and less than 6% per month at 30 deg. C
- l) The charge efficiency shall be more than 90% up to 70% state of charge.
- m) The topping up frequency shall be 12 – 18 months.
- n) The batteries shall consist of individual cells, which can be carried separately with ease while transporting.
- o) Offered batteries shall comply to the following:
  - 10 % of DOD: 7200 cycles
  - 50 % of DOD: 3000 cycles
  - 80 % of DOD: 1200 cycles

The Battery Bank shall be designed to provide 3 days ("2 No Sun" days) autonomy. Bidder to provide battery sizing details along with their offer. The distance between two batteries may be kept 6 inches & vice versa.

There will be battery bank comprising of capacity 48V/300Ah , 120V / 400Ah and 120V /600Ah for 2KW,12KW & 15KW SPV Power Plant. The batteries should be of tubular plate lead acid & low type Maintenance and shall have long service life. The cells should confirm IEC 61427 /IS 1651 / IS 133369 and as per specification given below shall be provided.

|             |  |
|-------------|--|
| Container   | Polypropylene Co-polymer/hard rubbers with carrying handle.  |
| Cover       | Protective cover of polypropylenes against dirt & possible short circuit                               |
| Terminals   | Made of lead alloy suitable for bolted connection. The terminals should be greased with petroleum gel. |
| Electrolyte | Battery grade Sulphuric acid   |

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|                 |  |
|-----------------|--|
| Self Discharge  | Less than 3% per month at 30 degree C  |
| Life expectancy | 500 cycle duty at 27degree C at 80% depth of discharge 3000 cycle duty at 50% discharge      |
| Voltage         | 2 Volt   |
| Approval        | Batteries shall have to be approved by ERTL or CPRI or SEC or any MNRE approved test centers |
| Service Life    | Should perform satisfactory for a minimum period of 5 year under                             |

Each battery bank will contain suitable wooden rack, hydrometer, thermometer, cell tester and connecting leads etc.

#### 6.1 Battery Rack & Accessories

Battery interconnecting links shall be provided for interconnecting the cells in series and in parallel as needed. Connectors for inter cell connection (series / parallel) shall be maintenance free screws. Insulated terminal covers shall be provided.

#### 6.2 Battery protection panel

The battery protection panel shall be made of CRCA sheet having two incoming and two outgoing terminals. There shall be 2 Nos. HRC fuses of suitable rating with fuse holder/base etc as required. 2 poles MCB/ MCCB can also be used for isolation purpose in stead of fuses, if required.

#### 7. Junction Boxes

The junction boxes shall be dust, vermin and waterproof and made of FRP / Thermo Plastic. The terminals shall be connected to copper bus bar arrangement of proper sizes. The junction boxes shall have suitable cable entry points fitted with cable glands of appropriate sizes for both incoming and out going cables. Suitable markings shall be provided on the bus bar for easy identification and cable ferrules shall be fitted at the cable termination points for identification. Each main junction box shall be fitted with appropriate rating blocking diode.

The junction boxes shall be of reputed make and should be as per IP 65 (for outdoor), IP 21 (for indoor) & as per The junction boxes shall be dust, vermin and waterproof and made of FRP / Thermo Plastic. The terminals shall be connected to copper bus bar arrangement of proper sizes. The junction boxes shall have suitable cable entry points fitted with cable glands of appropriate sizes for both incoming and out going cables. Suitable markings shall be provided on the bus bar for easy identification and cable ferrules shall be fitted at the cable termination points for identification. Each main junction box shall be fitted with appropriate rating blocking diode. The junction boxes shall be of reputed make and should be as per IP 65 (for outdoor), IP 21 (for indoor) .

The junction boxes shall have suitable arrangement for the Following:

Combine groups of modules into independent charging sub-arrays that shall be wired

- (a) Combine groups of modules into independent charging sub-arrays that shall be wired to the controller
- (b) Provide arrangement for disconnection for each of the groups.
- (c) Provide a test point for each sub-group for quick fault location.
- (d) To provide group array isolation
- (e) To The rating of the JB's shall be suitable with adequate safety factor to inter connect the Solar PV array

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## 8. Charge Controller Unit:

- The Charge Controller shall be dual input type, where under normal condition the input is fed from a SPV panel and in the absence of SPV power or low SPV power conditions an external single phase AC source can be used for battery charging. A selector switch shall be provided for choosing between those modes. When the batteries are charged from external AC sources, the charging current should be set manually depending on the capacity of the source and the charging requirement of the batteries. The charge controller shall be preferably PWM type employing IGBT switching elements.
- Charge controller should conform IEC 62093 / IEC 60068 as per specification.
- The charging sequence from SPV array or external AC source shall be as follows:

### a) From SPV Array:

The battery shall be charged at the maximum rate depending on the solar radiation till the battery terminal voltage reaches 2.25 volts per cell. The battery charging should be automatically terminated when the rate of increase of battery voltage is steady (dv / dt sensing). The charger shall switch on the 'trickle charge' after this.

### b) From AC Source:

The battery shall be charged at the rate manually set depending on the battery condition or capacity of AC source. The maximum rate shall be internally preset. The battery charging should be automatically terminated when the rate of increase of battery voltage is steady (dv / dt sensing) or when the battery terminal voltage reaches 2.25 volts per cell.

Salient features of the Charge Controller shall be as follows:

**Switching elements:** IGBT

**Type of Charger:** PWM

**Input:**

From PV 2kWp/12kWp/15kWp, 48V/300Ah, 120V/480Ah, 120V/600Ah

**Output Voltage:** Suitable for charging 240V/1200Ah nominal battery bank from 2Kw/12Kw/15kW SPV array.

**Protections :** Short Circuit, Deep Discharge, Input Surge Voltage, Over Current (load), Battery Reverse Polarity, Solar array reverse polarity.

**Indication :** String 'ON', Main 'ON', Charging 'ON', 80% Charged, 100% Charged, Charger Overload, Battery On Trickle. Battery disconnected / Fault Battery Reverse Polarity, Low Solar Power, System Fault and Charger over Temperature and Input Over / Under Voltage (for AC).

**MIMIC Diagram :** To indicate power flow and operation of the charge controller/ battery charger; shall have provision for visual indications of existing power input/output through MIMIC diagram.

Bidder may design Power Conditioning Unit (PCU) which consists of a solar charge controller & inverter as per design mentioned above. Also it should have a Grid Charger.

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It provides the facility to charge the battery bank either through Solar or Grid set. The PCU continuously monitors the state of Battery Voltage, Solar Power output and the loads. Due to sustained usage of power, when the Battery Voltage falls below a preset level, the PCU will automatically transfer the load to the grid power and also charge the Batteries through the in-built Grid Charger. Once the batteries are charged to the preset level, the PCU cuts off the Grid power from the system and will restore to feeding the loads from the battery bank & continue to charge the battery bank from the available solar power.

The PCU always gives preference to the solar power and will use Grid power only when the solar power / battery charge is insufficient to meet the load requirement.

#### **Salient Features:**

- i. Priority of charging is from Solar Panels.
- ii. Over heating Protection.
- iii. Dual Display Showing PV & Inverter output
- iv. Short circuit & Over load Protection.
- v. Inbuilt Heavy Duly Solar Charge Controller.
- vi. No Load Shut Down for load = 5% not applicable for > 1 kVA systems)
- vii. Fully equipped with powerful Grid Charger.
- viii. User friendly client and Web based Software.

#### **8. AC Distribution Panel Board:**

- I. An ACDB shall be provided in between PCU and Load point.
- II. It shall have a MCB of suitable rating for connection to load point
- III. It shall have AC voltmeter and ammeter of suitable rating.
- IV. It shall have MCB's to supply power to control room loads such as exhaust fans, lighting loads and power plug sockets.

#### **9. Cables & Wirings:**

- i. All cables to be supplied should be as per IEC 60189 / IS 694 / IS 1554 or IS / IEC 69947 and should have proper current carrying capacity. The cable shall be PVC insulated PVC sheathed copper conductor.
- ii. All wiring in the control room shall be carried out with 2.4 sq. mm. PVC insulated copper conductor in surface/recessed steel conduct in control room & solar hut. All wiring shall be done with an appropriate size Cu conductor as earth wire. All wirings whether it is indoors or outdoors are to be casing capping system. As and when required flexible pipe may be used.
- iii. All cables and wires used shall be of copper conductors of suitable cross-section with crossed linked polythene or polyvinyl insulated with polyvinyl sheath. Stranded and flexible cable shall be used. Non-stranded cable shall not be acceptable expect otherwise mentioned and permitted.
- iv. Buried underground cables shall be armored. Unarmored buried underground cables shall be enclosed with suitable conduits. Unless, otherwise, specified, all other interconnecting cables shall be armored.

- v. Conductor size of cables and wires shall be selected based on efficient design criteria such that the overall electrical energy loss in any section of cable or wire is not more than 3% under the designed operating conditions. Conductor size of less than 2.5 sq. mm shall not be accepted.
- vi. Cable/wire connections shall be soldered, crimp-on type or split bolt type. Wire nut connections shall not be used.
- vii. All cables shall be adequately supported. Outside of the terminals/panels/enclosures shall be protected by conduits. Cables shall be provided with dry type compression glands wherever they enter junction boxes/panels/enclosures.
- viii. All cables shall be suited marked or coded for easy identification. Cables and wires shall conform to the relevant standards suppliers to specify the specification.
- ix. The wiring must be carried out in casing capping only.

#### **10. Solar Distillation Plant:**

Approved quality solar distillation Plant of 1000 mm X 1000 mm shall be installed on suitable GI structure. Supply of Solar Distillation Plant includes construction of suitable foundation for the distillation plant. At least two numbers of plastic pots and one funnel are to be supplied along with each of the two water Distillation plants. (For 12 kW and 15 kW)

#### **11. Danger plates:**

The Bidder shall provide at least 8 Danger Notice Plates of 200 mm X 150 mm made of mild steel sheet, minimum 2 mm thick and vitreous enameled white on both sides and with inscription in signal red color on front side as required. The inscription shall be in English and local language. Out of eight, four danger notice shall have to be provided at PV Yard & Four-danger notice at Control Room & Battery room.

#### **12. Lightning & Over Voltage Protection System: (Above 2 kW system)**

- a) The SPV power plant should be provided with Lightning and over voltage protection. Connected with proper earth pits. The main aim of over voltage protection is to reduce the over voltage to a tolerable level before it reaches the PV or other sub-system components. The source of over voltage can be lightning or other atmospheric disturbance.
- b) The lightning Conductors shall be made of 25 mm diameter 4000 mm long GI spike as per provisions of IS 2309-1969. Necessary concrete foundation for holding the lightning conductor in position to be made after giving due consideration to maximum wind speed and maintenance requirement at site in future. The lightning conductor shall be earthed through 20 mm X 3 mm thick GI flat earth pits/earth bus made with 25 mm X 5 mm GI flats.

#### **13. Earthing Systems:**

- i. The Earthing for array and distribution system & Power plant equipment shall be made with GI pipe, 4.5 m long 40 mm diameter including accessories and providing masonry enclosures with cast iron cover plate having locking arrangement, watering pipe using charcoal or coke and salt as required as per provisions of IS:3043. Necessary provision

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shall be made for bolted isolating joints of each Earthing pit for periodic checking of earth resistance.

- ii. Each array structure of the SPV yard shall be grounded properly. The array structures and the lightning conductors are to be connected to earth through 25 mm X 5mm GI strip.
- iii. The inverters and battery charger and all equipment inside the control room and battery room to be connected to earth through 25 mm X 5mm tinned copper strip including supplying of material and soldering. As earth bus is provided inside the control room with 25 mm X 5mm tinned copper strip.
- iv. In compliance to Rule 33 and 61 of Indian Electricity Rules, 1956 (as amended up to date), all non-current carrying metal parts shall be earthed with two separate and distinct earth continuity conductors to an efficient earth electrode.

**16. Tool kits:**

Necessary tools kit is to be provided along with the each Power Plant for any routine maintenance or immediate repair.

**17. Display Board:**

The Bidder shall provide the display board of size 3 ft x 3 ft which gives detailed circuit diagram of the system with its description.

**18. Comprehensive Maintenance Contract (CMC):**

The PV module (s), battery bank, Inverter and other sub - components will be warranted as per the given clause. The manufacturers can also provide additional information about the system and conditions of warranty as necessary.

**19. Scope of Operation & Maintenance of SPV Power Plant for a period of 5 years from date of commissioning**

- 1) Regular operation & maintenance of the SPV Power Plant for a period of 5 years after commissioning along with supply of consumable items as and when necessary and submission of daily performance data of the power plant shall come, under the operation & maintenance contract.
- 2) Installer should depute his Engineer for operation & maintain of the proposed systems and for giving training to the personnel deputed by respective locations.
- 3) The breakdown maintenance of the entire system including supply of necessary spare parts if any shall be for a period of 5 years from the date of commissioning of power plant. The operation and maintenance schedule of the SPV power plant during the 5 years contract period shall be as detailed below:
  - i. Five years operation and maintenance period shall begin on the date actual commissioning of the power plant. The requisite number of qualified and trained personnel is to be deputed on the Sites.
  - ii. The deputed personnel shall be qualified and well trained so that they can handle any type of operation hazard quickly and timely.

Contractor

Dy City Engineer (Elect)  
Thane Municipal Corporation, Thane

- iii. The deputed personnel should keep log sheet for the power plant as per format to be supplied by Engineer- in -charge after commissioning of the power plant.
- iv. The deputed personnel shall be in a position to check and test all the equipment regularly, so that preventive actions, if any, could be taken well in advance to save any equipment from damage. Any abnormal behavior of any equipment shall be brought to the notice of Engineer -in charge.
- 4) Normal and preventive maintenance of the power plant such as cleaning of module surface, topping up of batteries, tightening of all electrical connections, changing of tilt angle of module mounting structure, cleaning & greasing of battery terminals, etc. are also the duties of the deputed personnel.
- 5) Deputed personnel will operate the plant in accordance with the availability of solar energy stored in the battery bank. Under no circumstances the operator shall take such actions those are not damaging to the Power Plant and the battery bank. In case of non availability of solar power suitable notice board may be displayed. In the notice board in front of the control room to avoid local problems.
- 6) During operation and maintenance of period of one year of the power plant, if there is any loss or damage of any component of the power plant due to miss management/miss handling or due to any other reasons pertaining to the deputed personnel, what-so-ever, the supplier shall be responsible for immediate replacement/rectification. The damaged component may be repaired or replaced by new component. It is understood after examination the performance of the component or the system shall not degrade.

## 20. Summary for 5 kW, 10kW and 25 kW (Grid-Interactive) SPV Power Plant:

| Sr No. | Particular  | Specification                            |                      |                                |
|--------|---|--|----------------------|--------------------------------|
|        |   | 5 kW                                     | 10 kW                | 25 kW                          |
| 1      | SPV Module  |  |                      |                                |
|        | a) capacity   | 5000 W                                   | 10000 W              | 25000 W                        |
|        | b) Make   | Any MNRE approved OR IEC 61215 (revised) |                      |                                |
|        | c) Module   | 200/220/250/275Wp                        |                      |                                |
|        | d) No. of SPV Modules   | Depends on Module wattage                |                      |                                |
| 2      | Solar Charge Controller   | As per the requirement                   |                      |                                |
| 3      | Module Mounting Structure   | As per the available places at site      |                      |                                |
| 4      | Power Conditioning Unit (As per design specification given in Bid who includes charge controller, inverter & Grid charger. The output power should be of 3 phase) | 1 No.                                    | 1 No.                | 1 No.                          |
|        | Inverter  | 5 kVA                                    | 10 kVA               | 25 kVA                         |
| 5      | Cabling with casing capping As required at site   | As required at site                      |                      |                                |
| 6      | Transmission, Distribution & point wiring   | As required at site                      |                      |                                |
| 7      | Monitoring, Control & protection device   | 1 Set                                    | 1 Set                | 1 Set                          |
| 8      | Metering at generation side   | 1 No. (at AC side of Inverter)           | 1 No. (at AC side of | 1 No. (at AC side of Inverter) |

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|   |        |  |           |  |
|---|--------|--|-----------|--|
|   |        |  | Inverter) |  |
| 9 | Spares | Set of required fuses, screws, & terminals etc as required.<br>Set of required fuses, screws, & terminals etc as required. |           |  |

**Summary for 2 kW, 12 kW and 15kW SPV Power Plant (Off-Grid) SPV Power Plant:**

| Sr No. | Particular  | Specification  |                                |                                |
|--------|---|--|--------------------------------|--------------------------------|
|        |   | 2 kW   | 12 kW                          | 15 kW                          |
| 1      | SPV Module  |  |                                |                                |
|        | a) capacity   | 2000 W   | 12000 W                        | 15000 kW                       |
|        | b) Make   | Any MNRE approved OR IEC 61215 (revised)   |                                |                                |
|        | c) Module   | 100/180/200/220/250/275Wp  |                                |                                |
|        | d) No. of SPV Modules   | Depends on Module wattage  |                                |                                |
| 2      | Solar Charge Controller   | As per the requirement   |                                |                                |
| 3      | Module Mounting Structure   | As per the available places at site  |                                |                                |
| 4      | Power Conditioning Unit (As per design specification given in Bid who includes charge controller, inverter & Grid charger. The output power should be of 3 phase) | 1 No.  | 1 No.                          | 1 No.                          |
|        | Inverter  | 2 kVA  | 12 kVA                         | 15 kVA                         |
| 5      | Cabling with casing capping As required at site   | As required at site  |                                |                                |
| 6      | Transmission, Distribution & point wiring   | As required at site  |                                |                                |
|        |   |  |                                |                                |
|        |   |  |                                |                                |
| 7      | Monitoring, Control & protection device   | 1 Set  | 1 Set                          | 1 Set                          |
| 8      | Metering at generation side   | 1 No. (at AC side of Inverter)   | 1 No. (at AC side of Inverter) | 1 No. (at AC side of Inverter) |
| 9      | Spares  | Set of required fuses, screws, & terminals etc as required.<br>Set of required fuses, screws, & terminals etc as required. |                                |                                |

Contractor

Dy City Engineer (Elect)  
Thane Municipal Corporation, Thane



21. Data sheet shall be furnished by Bidder duly filled as follows and submit separately in (Annexure: IV)

| Sr No. | Description   | Detail |
|--------|---|--------|
| 1      | Mounting arrangement for Solar module   |        |
| 2      | Solar module frame material   |        |
| 3      | Module type   |        |
| 4      | Module dimensions   |        |
| 5      | No. of solar cells per module   |        |
| 6      | Solar cell manufacturer type  |        |
| 7      | Cable gland at module Junction Box  |        |
| 8      | Weather resistant HDPE junction Box (IP55)  |        |
| 9      | Make of Solar module :  |        |
| 10     | Country   |        |
| 11     | Max. Temperature rise of solar cells under severe working condition over max. Ambient temperature |        |
| 12     | Nominal voltage   |        |
| 13     | Operating voltage of solar module (nom)   |        |
| 14     | Peak power voltage (Vmp) at STC   |        |
| 15     | Peak Power current (Imp) at STC   |        |
| 16     | Open circuit voltage (Voc) at STC   |        |
| 17     | Short circuit current (Isc) at STC  |        |
| 18     | Weight of each module   |        |

## 22. Danger plates:-

The Bidder shall provide at least 8 Danger Notice Plates of 200mm X 150 mm made of mild steel sheet, minimum 2mm thick and vitreous enameled white on both sides and with inscription in signal red color on front side as required. The inscription shall be in English and local language. Out of eight, four danger notice shall have to be provided at PV Yard & Four-danger notice at Control Room & Battery room.

Contractor

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Thane Municipal Corporation, Thane

**SCHEDULE 'B'**

Memorandum showing items of work to be carried out.

| Item No. | Quantities estimate but may be more estimated quantities or less | Item of work                                   | Estimate Rate |          | Unit | Total Amount |
|----------|--|--|---------------|----------|------|--------------|
|          |  |  | In figure     | In words |      |              |
|          |  | <b>---- AS PER SEPARATE SHEET ATTACHED ---</b> |               |          |      |              |

Contractor

Dy City Engineer (Elect)  
Thane Municipal Corporation, Thane

## **DRAWINGS**

The contract drawings provided for tendering purpose with the Bid documents shall be used as a reference only. Contractor should visualize the nature of type of work contemplated and to ensure that the rates and prices quoted by him in the bill of quantities take due consideration of the complexities of the work involved during actual execution / construction as experienced Contractors in the field.

The tendered rates/prices for the work shall be deemed to include the cost of preparation, supply and delivery of all necessary drawings, prints, tracings and negatives that the Contractor is required to provide in accordance with the contract.

### **DOCUMENTATION :**

If so ordered by the Engineer-in-charge the Contractor will prepare drawings of the work at constructed and will supply original and three copies to the Engineer who will verify and certify these drawings. Final constructed drawings shall then be prepared by the Contractor and supplied in triplicate to the Engineer -in -charge for record and reference purpose at the Contractor cost.

Contractor

Dy City Engineer (Elect)  
Thane Municipal Corporation, Thane

# **Chapter - VII**

## **Agreement form and Proforma for Bank Guarantee Bond**

**Chapter - VII**

**A G R E E M E N T**

**(On Stamp Paper of appropriate amount)**

THIS AGREEMENT is made this \_\_\_\_\_ day of \_\_\_\_\_ 2013

**B E T W E E N**

THE MUNICIPAL CORPORATION OF THE CITY OF THANE, a body corporate under B.P.M.C. Act, 1949, represented by its Dy. City Engineer (Elect . )

Dy. City Engineer (Elect.), hereinafter called 'The Party of the First Part' & M/s. \_\_\_\_\_ (hereinafter called 'Contractor') of the 'Other Part'.

1. Whereas the Corporation, through Dy. City Engineer (Electrical) has invited Bid for the wok of
  
2. And whereas the Contractor has agreed to execute the works at \_\_\_\_\_ % below / At par / Above the estimated rates put to the Bid and which as been sanctioned by the Standing Committee vide resolution No . \_\_\_\_\_ dated \_\_\_\_\_ / Honorable Commissioner dated \_\_\_\_\_ for Rs. \_\_\_\_\_ (Rupees \_\_\_\_\_ )
  
3. NOW THEREFORE THE PARTIES HERETO COVENENT WITH EACH OTHER TO OBSERVE AND PERFORM THE FOLLOWING THAT IS TO SAY :
  - A) That in pursuance of this agreement the Dy. City Engineer (Elect) will issued work orders to the Contractor as per the rates agreed by the Contractor in the said Bid within \_\_\_\_\_ period and as per the requirement of the corporation.
  
  - B) The Contractor, in the same manner agrees to execute the work of  
Contractor  
Dy City Engineer (Elect)  
Thane Municipal Corporation, Thane

\_\_\_\_\_ According to the Bid documents of contract attached and made part of this agreement and complete all works and hand over to the Corporation on or before \_\_\_\_\_

- C) That the Contractor will handover the excess dismantled materials to the stores of the corporation as directed by the Engineer -In - Charge of the works. The Contractor shall arrange for all transportation of men and materials at his own risk and cost to the work site from T.M.C. / Contractors storing places.
- D) That the Contractor will provide guarantee for all the materials supplied by him and works executed by him against this contract for a period of \_\_\_\_\_ from the date of supply or execution of the works, whichever is later against any manufacturing defect or defective workmanship in which case the Contractor will replace the defective material or make good of the defects at his own cost and within the time limit as directed by the Dy. City Engineer (Elect.)
- E) That the Contractor shall provide all the labour and material and shall perform and carry out all the work as per drawing and specifications and as per schedule appended hereto showing times of work to be carried out and the rate agreed by the contractor. The rate quoted therein are including clearance of site (prior to commencement of the work and when it is required) in all respects and transporting of men and materials required for the execution of this work.
- F) The materials to be used for execution of work will be tested at the manufacturers remises by Engineer-In-Charge of T.M .C . as directed by Dy. City Engineer (Elect.) All such incidental charges for testing of materials will be borne by the contractor.
- G) The corporation through Dy. City Engineer (Elect.) agrees to make payment on account of this agreement of the work carried out at the Bid of actual work done as per detailed measurement.
- H) The Contractor will submit the bills against the work executed by him immediately after the said work is completed and duly certified by the Corporation Engineer-In-Charge of the above works, which will be paid by the corporation .

Contractor

Dy City Engineer (Elect)  
Thane Municipal Corporation, Thane

- I) The payment of bill for the execution of the work shall be subject to the recommendation of the Corporation Dy. City Engineer (Elect.) to the satisfactory completion of the work covered by the bill.
- J) The Contractor shall carry out the work in all respects according to the Plan and the specification in the schedule hereto under the supervision of appointed Engineering Staff. In case the schedule or specifications in the schedule are silent on any point, the specification for such work as prescribed by the Dy. City Engineer (Elect.) shall be final and binding on the Contractor. In the event of the Contractor failing to complete the work by the date as per the period hereinbefore specified in the detail work order the Contractor shall be liable to pay by way of liquidate damage / penalty at a rate of Rs. \_\_\_\_\_ per day. In case if the contractor feels that he cannot complete the work within specified time period, he should present his case to the Dy. City Engineer (Electrical) through Engineer-In-Charge within three days of work order, in which case Dy. City Engineer (Electrical) decision will be final and binding on the both the parties.
- K) In case the Contractor fails to maintain the speed and delays the work or fails to complete the work the Corporation shall withdraw the work and can entrust to another Contractor at the risk and cost of the Contractor.
- L) If, Contractor shall make default in the due performance of all or any of the conditions, the corporation shall be at liberty on the written advice of the Dy. City Engineer (Elect.) to give notice in written of such default to the Contractor specifying the same and if the Contractor continues with such default for the period of seven days, the corporation shall have power to terminate the contract through notice in writing but without prejudice to any right which may already accorded to the corporation under conditions of contract appended herewith.
- M) The terms and conditions as laid down in the Bid document shall be applicable to the extend that they are not inconsistent with this Agreement.
- N) That all the question relating to the making of specifications drawings and instructions hereinbefore mentioned provided or attached and to the quality of workmanship or materials used in the work and all disputes and differences which shall arise either during the progress of the work or after completion thereof concerning the work of execution, thereof or as to any other matter arising out of this agreement to the work to be executed or payment or refund to be made, in

Contractor

Dy City Engineer (Elect)  
Thane Municipal Corporation, Thane

pursuance thereof, shall be referred to the commissioner of the Corporation whose decision shall be final and binding on the parties to this agreement.

O) Any accident to worker, animal, public and property will be the entire responsibility of contractor and any claims arising out of the above will be entirely on the contractor account.

The Agreement is made on dated ..... for Thane Municipal Corporation work ..... for amount .....

IN WITNESS WHEREOF THE SAID M/s. and CORPORATION OF THE CITY OF THANE , HAVE HERETO SIGNED ON THE DATE RESPECTIVELY UNDER THEIR SIGNATURE.

**CONTRACTOR**

WITNESSESS :

- 1)
- 2)

**Dy. City Engineer (Elect.)  
THANE MUNICIPAL CORPORATION**

SIGNATURE OF THE MEMBER'S  
OF STANDING COMMITTEE

- 1)
- 2)

Contractor

Dy City Engineer (Elect)  
Thane Municipal Corporation, Thane



(On stamp paper worth Rs. 100/-)

**PROFORMA OF BANK GUARANTEE BOND**

In consideration of the Thane Municipal Corporation, Thane (herein after called "TMC Thane") having agreed to exempt \_\_\_\_\_  
 \_\_\_\_\_ (herein after referred to as "the Contractor")  
 from depositing with the TMC Thane in cash of the sum of  
 Rs. \_\_\_\_\_ (Rupees \_\_\_\_\_ only) being the  
 amount of security deposit payable by the Contractor or to the  
 TMC Thane under the terms and conditions of an agreement dated the  
 \_\_\_\_ day \_\_\_\_\_ of 200 \_\_\_\_ and made between the TMC Thane of the  
 one part and the Contractor of the other part (here in referred to as "the  
 said Agreement") for \_\_\_\_\_ as  
 security for the due observance and performance by the Contractor of  
 the terms and conditions of the said Agreement, on the contract furnishing to the  
 TMC Thane a guarantee in to the prescribed form of a  
 Nationalized Bank in India being in fact those present in the like sum of  
 Rs . \_\_\_\_\_ (Rupes \_\_\_\_\_  
 \_\_\_\_\_ only). We \_\_\_\_\_  
 BANK/LIMITED registered in India under \_\_\_\_\_ Act and having  
 one of our local Head Office at \_\_\_\_\_  
 do hereby :

- 1) Guarantee to the TMC Thane.
  - (a) Due performance and observance by the Contractor of the terms, covenants and conditions on the part of the Contractor contained in the said Agreement and
  - (b) Due and punctual payment by the Contractor to the TMC Thane of all sums of money , losses , damages , cost charges, penalties and expenses payable to the TMC Thane by the Contractor under or in respect to the said agreement.

Contractor

Dy City Engineer (Elect)  
 Thane Municipal Corporation, Thane

2) Undertake to pay the TMC Thane on demand and without demand and notwithstanding any dispute or disputes raised by the Contractor (s ) in any suit or proceeding filed in any Court of tribunal relating there to the said sum of Rs. \_\_\_\_\_ (Rupees \_\_\_\_\_ only) or such less sum may be demanded by the TMC Thane from us our liability hereunder being absolute and unequivocal and agree that.

3) (a) The guarantee herein contained shall remain in full force & effect during the subsistence of the said agreement and the same will continue to be enforceable till all the dues of the TMC Thane under or by virtue of the said agreement have been duly paid and its claims satisfied or discharged and till the TMC Thane certifies that the terms and conditions of the said agreement have been fully and properly carried out by the Contractor.

(b) We shall not be discharged or released from the liability under this guarantee by reasons of

- (i) Any change in the constitution of the bank of the Contractor, or
- (ii) Any arrangement entered in between the TMC Thane and the Contractor with or without our consent;
- (iii) Any forbearance or indulgence shown to the Contractor;
- (iv) Any variation in terms of covenants or conditions contained in the said agreement;
- (v) Any time given to the Contractor;
- (vi) Any other conditions or circumstances under which, in law, a surety would be discharged;

Contractor

Dy City Engineer (Elect)  
Thane Municipal Corporation, Thane

c) Our liability here under shall be joint and several with that of the Contractor as if we were the principal debtors in respect of the said sum of Rs. \_\_\_\_\_ (Rupees \_\_\_\_\_)

\_\_\_\_\_ only) and

d) We shall not revoke this guarantee during its currency except with the previous consent in writing of the TMC Thane. IN WITNESS WHERE OF THE common seal of \_\_\_\_\_ has been herein to affixed this \_\_\_\_\_ day of \_\_\_\_\_ 200 \_\_\_\_\_. The common seal of \_\_\_\_\_ was pursuant to the resolution of the Board of Directors of the Company dated the \_\_\_\_\_ day of \_\_\_\_\_ herein affixed in the presence of \_\_\_\_\_ who, in token there of, have here to set their respective hands in the presence of

(1)

(2)

Contractor

Dy City Engineer (Elect)  
Thane Municipal Corporation, Thane

# **Chapter - VIII**

## **Forms & Annexure**

Contractor

Dy City Engineer (Elect)  
Thane Municipal Corporation, Thane

**SECTION VIII****FORM I**

DETAILS OF WORKS IN HAND  
(To be submitted in Technical Bid)

| Sr.<br>No. | Name of<br>Customer | Description<br>of Work | Total<br>Contract<br>Value | Probable<br>Value of<br>unfinished<br>work at the<br>time of<br>submission<br>of tender | Date of<br>Completion | Remark |
|------------|---------------------|------------------------|----------------------------|---|-----------------------|--------|
|            |                     |                        |                            |   |                       |        |

Contractor

Dy City Engineer (Elect)  
Thane Municipal Corporation, Thane

**FORM II**

List of, Machinery and tools tackles.  
(To be submitted in Technical Bid)

| Sr.<br>No. | Machinery | Tools &<br>Tackles | Calibration<br>carried out | Remarks |
|------------|-----------|--------------------|----------------------------|---------|
|            |           |                    |                            |         |

Contractor

Dy City Engineer (Elect)  
Thane Municipal Corporation, Thane

**FORM III**

**DETAILS OF WORKS OF SIMILAR TYPE CARRIED OUT BY THE BIDDER  
(To be submitted in Technical Bid)**

| Sr. No. | Name and Location of installation | Description | Name & address of office by whom order was placed | Cost of contract | Operational experience |
|---------|-----------------------------------|-------------|---|------------------|------------------------|
|         |                                   |             |   |                  |                        |

**Note : Bidder shall have to produce documentary evidences for the above statement.**

Contractor

Dy City Engineer (Elect)  
Thane Municipal Corporation, Thane

**FORM IV**

DETAILS OF TECHNICAL PERSONNEL WITH THE BIDDER  
WHOM WILL BE DEPLOYED FOR THIS WORK  
(To be submitted in Technical Bid)

| Sr. No | Name of Person | Qualification | Whether working in Field or in Offices | Mode of Employment & Experience | Period for which the person is working with the Bidder | Remarks |
|--------|----------------|---------------|--|---------------------------------|--|---------|
|        |                |               |  |                                 |  |         |

Contractor

Dy City Engineer (Elect)  
Thane Municipal Corporation, Thane



Annexure I

**GENERAL INFORMATION OF BIDDER  
(To be typed separately & submitted in Technical Bid)**

To,  
The Dy City Engineer (Elect.)  
Thane Municipal Corporation, Thane

**Subject: Bid No.** TMC/Elec/TN/2/2013-14 **for** .....

- 1. **Name of Bidder** .....
- 2. **Status of Firm** Proprietorship Firm / Partnership Firm / Contractor .....
- 3. **Number of Years in Operation:** .....
- 4. **Registered Address** .....
- 5. **Operational Address** .....
- 6. **Telephone Number** .....
- 7. **E-mail Address & Web Site** .....
- 8. **Tele-fax Number** .....
- 9. **PAN [Number]** .....
- 10. **Service Tax Number** .....

(Signature of Tenderer)

Name: \_\_\_\_\_

Designation: \_\_\_\_\_

Date:

Place:

Seal:

Contractor

Dy City Engineer (Elect)  
Thane Municipal Corporation, Thane

**Annexure II****COMMITMENT FROM THE BIDDER**

(To be submitted in Technical Bid)

We here by confirm that the proposed 2 kW/5 kW/10 kW/12 kW/15 kW/25 kW SPV Power plant at respective locations, will provide the assured generation of 6/15/30/36/45/75 units per day respectively (during 300 sunny days in a year), at consumption side energy meter in control cabin/room as certified by joint meter reading of Contractor's representative and users representative.

However, for 5 years we hereby commit to pay an amount of Rs. 50/- (Rs Fifty only) per unit as compensation to Thane Municipal Corporation, Thane for the amount of units unable to supply against the guaranteed generation.

(Signature of Bidder)

Name: \_\_\_\_\_

Designation: \_\_\_\_\_

Place :

Date :

Seal:

Contractor

Dy City Engineer (Elect)  
Thane Municipal Corporation, Thane

**ANNEXURE- III****DECLARATION**

(To be submitted on Rs.100/- stamp paper duly Notarised)

I / We, hereby declare that I / We have made myself / ourselves thoroughly conversant with the sub - soil conditions, local conditions regarding all materials and Labour of which I / we have based my / our rates of this work. The specifications, conditions and lead of materials on this work have been carefully studied and understood by me / us before submitting this Tender. I / We undertake to use only the best materials defined / approved by the Ministry of New and Renewable Energy (MNRE) Gol.

The systems will be provided as per the specifications and guidelines issued by the Ministry of New and Renewable Energy & MEDA. We are bound to adhere to the guidelines issued by the Ministry of New and Renewable Energy / MEDA from time to time. We also hereby commit that if in future MNRE make any changes in the specifications of the systems the same will be incorporated in the present Bid projects. We hereby agree that the work will be executed within the cost of Bid mentioned in the financial bid and there will be no escalation in cost for any reason thereof. We also agree that if we fail to complete the work and leave the work in middle, Thane Municipal Corporation, Thane shall have right to recover the full amount from us. I / We shall accept any amendments made by TMC from time to time during total project completion period including 5 years Comprehensive maintenance contract (CMC).

I am / We are also commit that we shall complete the work within stipulated time period specified in the work order. We will not ask for any further time extension. I am / We are bound to work as per Bid and work Order issued by TMC for this work with 5 years Comprehensive Maintenance Contract. In case of failure of the same, we shall be responsible for any loss and for the action taken by competent Authority of TMC resulting to ban to work in the State of Maharashtra.

I / We shall comply with the provision of Contract Labour. (Regulation and Abolition) Act 1970, Minimum Wages Act. 1948, Payment of Wages Act. 1963, Workmen's Compensation Act. 1961, the Contract Labour (Regulation and Abolition) Act, 1979 and all other related Acts and any modification thereof or any law relating there to and rules made there under from time to time. TMC shall not be responsible in this regard.

I / We shall be wholly responsible for any accident or any unusual / unexpected circumstances held during the execution of work & also during the all inclusive comprehensive maintenance period of 5 years.

(Signature of Tenderer)

Name: \_\_\_\_\_

Designation: \_\_\_\_\_

Date:

Place:

Seal:

Contractor

Dy City Engineer (Elect)  
Thane Municipal Corporation, Thane

## Annexure: IV

## Data sheet for PV Modules:

| Sr No. | Description   | 2 kW | 5 kW | 10 kW | 12 kW | 15 kW | 25 kW |
|--------|---|------|------|-------|-------|-------|-------|
| 1      | Mounting arrangement for Solar module   |      |      |       |       |       |       |
| 2      | Solar module frame material   |      |      |       |       |       |       |
| 3      | Module type   |      |      |       |       |       |       |
| 4      | Module dimensions   |      |      |       |       |       |       |
| 5      | No. of solar cells per module   |      |      |       |       |       |       |
| 6      | Solar cell manufacturer type  |      |      |       |       |       |       |
| 7      | Cable gland at module Junction Box  |      |      |       |       |       |       |
| 8      | Weather resistant HDPE junction Box (IP55)  |      |      |       |       |       |       |
| 9      | Make of Solar module :  |      |      |       |       |       |       |
| 10     | Country   |      |      |       |       |       |       |
| 11     | Max. Temperature rise of solar cells under severe working condition over max. Ambient temperature |      |      |       |       |       |       |
| 12     | Nominal voltage   |      |      |       |       |       |       |
| 13     | Operating voltage of solar module (nom)   |      |      |       |       |       |       |
| 14     | Peak power voltage (Vmp) at STC   |      |      |       |       |       |       |
| 15     | Peak Power current (Imp) at STC   |      |      |       |       |       |       |
| 16     | Open circuit voltage (Voc) at STC   |      |      |       |       |       |       |
| 17     | Short circuit current (Isc) at STC  |      |      |       |       |       |       |
| 18     | Weight of each module   |      |      |       |       |       |       |

Contractor

Dy City Engineer (Elect)  
Thane Municipal Corporation, Thane

# **Chapter - IX**

## **Scope of Work**

## Chapter IX

### Scope of Work

1. On receipt of work order contractor will obtain approval of Dy City Engineer (Elect.) for the make of the material to be used for the work. The contractor will arrange for testing of the material to be utilized for the work. The testing shall be carried out in manufacturers premises and/or at appropriate testing laboratory or as per direction of Executive Engineer (Elect.) All the incidental charges toward the same shall be borne by the contractor. The contractor shall have testing facility, for testing of material at the site.
2. Even though the work order will be issued to the successful contractor, the entire work should not be carried out immediately. After receiving the letter from the corporation separate sanction will be taken from the sanctioning authority and intimation letter will be issued to the contractor to carry out the work.
3. The material used for the work shall be new & of best quality available and work should be carried out with best workmanship. Material used and works carried out shall conform to the relevant Electricity Act & rule of Bureau of Indian standard. Also the work should met the requirement of local power supply authority MSEDCL.
4. This is a MNRE funded project and the contractor will have to arrange testing and site inspection of MNRE/MEDA officials as required. All incidental charges shall be deemed to be included in quoted cost.
5. Contractor will have to arrange for the excavation of any part of land that is ordinary soil, marshy land, hard soil, rocky soil, kutchha pucca, Tar, Asphalted Road, concrete Roads within specified time and as per approved methods whenever required. Surplus sub soil shall be removed from the sites and dumped as directed. The unwinding and rewinding of cable from all drums will have to be done as per approved method by contractor. The work includes excavation, laying through pipe and road crossing, Nalas etc. and refilling of trenches.
6. The project nature is such that it attracts capital subsidy from MNRE. This subsidy shall be claimed from **MNRE** (or the other agencies) by **TMC** and necessary processing shall be done by the contractor.

Contractor

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7. No tools rollers and tackles ladders will be provided for laying, winding, unwinding of cable by the corporation. Tools such as crowbars, Ghamelas, Phawdas, Ladders etc. will have to be arranged by the contractor for laboures or carrying out work of excavation laying refilling of L.T. cables, erecting of fittings, junction box, Poles etc. loading and unloading of materials head loading of poles. The category wise tools/kits etc. will have to be arranged by contractor.
8. Normally required labour will have to report at the Corporation office before specified time to our Engineer-In-Charge through their supervisors or at places as per Engineer-In-Charge instruction.
9. Contractor will be solely responsible for the safety of their labours/ employee including payments of compassion in case of accidents/misshapes etc. and also safety of public during the course of work.
10. For each group of 8-10 labours, supervisor without any extra cost shall be provided by the Contractor.
11. Cable jointing materials, Bricks/tiles/pipes and vehicle for transport of materials from stores centers of TMC, Thane to various works sites will be arranged by the contractor. Loading of materials at above stores and unloading of materials at site will be done by the contractor. i.e. from stores center to site and vice-a-versa at their cost.
12. Labour engaged should be available for full time and should not leave place of work during working hours.
13. The work carried out should be to the entire satisfaction of the engineer in charge and payments will be made after issue of certificate to that effect by the concerned officer.
14. Contractor will be responsible for any damage cost to other installation during the course of work.
15. All the rules pertaining to the traffic for safety of public should be taken care by contractor which may include fencing and providing caution notice board and red lamps etc. wherever and whenever required.
16. The cable jointing of various size of L.T. cable with epoxy cable jointing kits will be

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done at different areas in odd hours also, in case of emergency. The jointing kits, soldering sticks and flux, exact quantity of kerosene and other materials essentially required also with the jointing materials will be supplied by the contractor. All other tools and Tackles required for jointers shall be arranged by the contractors minimum satisfactory performance of the joints.

17. L.T. cables jointing work will have to be carried out on live lines if required. The names of the experienced persons to be authorized for working in accordance with rule no.3 of Indian Electricity rules 1956 shall be submitted from time to time. Only authorized persons will be allow to do the work.
18. During the jointing work, sufficient precaution shall be taken in accordance with the Indian Electricity rules 1956 and in the event of any accidents, it will be the sole responsibility of the contractor for any consequent liabilities etc.
19. Items if minor nature not mentioned in Bid but required at work site so as to complete the scheme shall be supplied by the contractor free of cost. The cost towards such items deemed to be included in Bidders offer.
20. Area of operation of this contract is within the area of Thane Municipal Corporation.
21. The Contractor should provide appropriate tools and equipment's to the workmen and ensures that those are in proper working condition and the workmen use the appropriate tools and take precautions.  
 "PLEASE NOTE THAT ANY ACCIDENT TO THE WORKMEN / PUBLIC/ANIMALS/PROPERTY BOTH MOVABLE AND IMMOVABLE WILL BE THE ENTIRE AND SOLE RESPONSIBILITY OF THE CONTRACTOR AND ANY PROCEEDINGS ARRISING OUT OF THE SAME WILL BE AT THE CONTRACTORS RISK AND COST . THE CORPORATION OR ITS EMPLOYEES WILL NOT BE RESPONSIBLE FOR ANY SUCH INCIDENT."
22. Any dismantled material either New or Old should be transported to the required destination at contractor's cost & no other payments will be made to the contractor for the same. The contractor have to submit receipt of dismantled material handed Over to storekeeper (Elect.) along with the bills. The final bills will not be processed without the same.
23. Contractor should provide necessary manufacturer's test certificates for the materials being used for the works. If any tests are required to be witnessed by the concerned TMC's Engineers, contractor should provide facilities and bear all the cost for testing at manufacturer premises..

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24. The Contractor should monitor the electrical load on each phase & each circuit in the panel & also maintain load balance equally on all the phases. He should never allow any circuit to be overloaded.
25. The Contractor should keep the Electrical network safe & free from danger & avoid any chances for accidents.
26. The Thane Municipal Corporation reserves the rights to restrict the no. of works as per the capacity of the contractor as evaluated by T.M.C. site conditions and past experience about the contractor's performance.
27. The contractor should maintain field diary as per the format suggested by Executive Engineer (Elect.) & should make entries every day during the course of progress of work.
28. In case of any doubt regarding technical specifications terms, conditions etc. Bidder can seek clarifications from Executive Engineer (Electrical) on any working day before submission of tender.
29. All the taxes & duties, Local Body taxes of the Government in force or any change in it should be borne by the contractor.
30. The Defect liability period for the work shall be five years from certified date of completion. Successful Bidder shall carryout all inclusive comprehensive maintenance during period of five years from certified date of completion as per guidelines of MNRE.
31. Contractor shall have to establish service office in MMRDA region for prompt services such as routine and breakdown maintenance.
32. Contractor shall clean the Solar PV panels at least once in every fifteen days during the period of five years of all inclusive comprehensive maintenance. If required, to meet minimum energy deliverance parameter, the Contractor will have to clean the solar PV panels as site condition demands.

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# **Chapter - X**

## **LIST OF APPROVED**

## **MATERIAL**

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## **Chapter - X**

### **LIST OF APPROVED MAKE OF MATERIAL**

**As approved by MNRE/ MEDA or any relevant BIS/ IEC standard.**

Contractor

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# **Chapter - XI**

## **Schedule-B**

Contractor

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**Schedule B**

| <b>Name of work :</b> Design, supply, erection, testing and commissioning of Solar Photovoltaic systems (136 kWp) at various locations in Thane Municipal Corporation area under solar city program |  |                       |                          |                      |                    |
|---|--|-----------------------|--------------------------|----------------------|--------------------|
| <b>Sr. No.</b>  | <b>Location</b>  | <b>Capacity (kWp)</b> | <b>Installation type</b> | <b>Rate (Rs/kWp)</b> | <b>Amount (Rs)</b> |
| <b>Health Centers</b>   |  |                       |                          |                      |                    |
| 1   | Design, supply, erection, testing and commissioning of grid tied 5 kWp Solar Photovoltaic system at Manpada Arogya kendra as per specification.                      | 5                     | Grid Tied                | 190000               | 950000             |
| 2   | Design, supply, erection, testing and commissioning of grid tied 10 kWp Solar Photovoltaic system at Shivaji Nagar Arogya Kendra as per specification.               | 10                    | Grid Tied                | 190000               | 1900000            |
| 3   | Design, supply, erection, testing and commissioning of grid tied 5 kWp Solar Photovoltaic system at Anandibai Joshi Prasutigruh (Vartak Nagar) as per specification. | 5                     | Grid Tied                | 190000               | 950000             |
| 4   | Design, supply, erection, testing and commissioning of grid tied 10 kWp Solar Photovoltaic system at Anand Koliwada Hospital (Mumbra) as per specification.          | 10                    | Grid Tied                | 190000               | 1900000            |
| <b>Ward Committee Offices</b>   |  |                       |                          |                      |                    |
| 1   | Design, supply, erection, testing and commissioning of grid tied 25 kWp Solar Photovoltaic system at Majiwada Ward Office as per specification.                      | 25                    | Grid Tied                | 190000               | 4750000            |
| 2   | Design, supply, erection, testing and commissioning of grid tied 25 kWp Solar Photovoltaic system at Vartak Nagar ward office as per specification.                  | 25                    | Grid Tied                | 190000               | 4750000            |
| 3   | Design, supply, erection, testing and commissioning of grid tied 25 kWp Solar Photovoltaic system at Uthalsar Ward office as per specification                       | 25                    | Grid Tied                | 190000               | 4750000            |
| <b>Traffic Signals</b>  |  |                       |                          |                      |                    |
| 1   | Teen Hath Naka Signal  | 2                     | Solar Power Pack         | 270000               | 540000             |

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|                      |                                  |    |                  |        |          |
|----------------------|----------------------------------|----|------------------|--------|----------|
| 2                    | Cadbury Junction                 | 2  | Solar Power Pack | 270000 | 540000   |
| <b>Public Places</b> |                                  |    |                  |        |          |
| 1                    | SATIS Deck                       | 12 | Solar Power Pack | 270000 | 3240000  |
| 2                    | Dr Kashinath Ghanekar Auditorium | 15 | Solar Power Pack | 270000 | 4050000  |
| <b>GRAND TOTAL</b>   |                                  |    |                  |        | 28320000 |

Rupees Two Crore Eighty Three Lakh Twenty thousand Only

Note ; Cost is inclusive of all taxes, insurance, LBT, transportation, loading-unloading, installation & commissioning and all inclusive comprehensive maintenance of 5 years.

I / We agree to execute the above work at ..... % above/ below/ at par the above estimate cost

CONTRACTOR

Dy City Engineer (E)  
Thane Municipal Corporation, Thane

Contractor

Dy City Engineer (Elect)  
Thane Municipal Corporation, Thane