NOTICE INVITING TENDER THROUGH e TENDER MODE.

PUDUCHERRY SMART CITY DEVELOPMENT LIMITED
(GOVERNMENT OF PUDUCHERRY UNDERTAKING)

NAME OF WORK: DEVELOPMENT OF MINI SPORTS STADIUM AT ANNATHIDAL, PUDUCHERRY.

Sub work : INTERNAL AND EXTERNAL ELECTRIFICATION WORKS.

FORM – 6

Certified that this NIT contains 123 items serially numbered from 1 to 123.

This NIT contains pages 99 (Ninety nine) Pages and approved for an amount of **Rs1,51,25,471/-** (Rupees one crore fifty one lakhs twenty five thousand four hundred and seventy oneonly)

CHIEF EXECUTIVE OFFICER
PUDUCHERRY SMART CITY DEVELOPMENT LIMITED,
PUDUCHERRY.

NOTICE INVITING TENDER

Tender for the work of	**:**	DEVELOPMENT OF MINISPORTS STADIUM AT ANNATHIDAL, PUDUCHERRY . **Sub work :** **INTERNAL AND EXTERNAL ELECTRIFICATION WORKS**
Approximate cost put to Tender	**:**	**1,51,25,471.00**
Earnest Money Deposit **(to be returned after receiving PG)**	**:**	**EXEMPTED.BID SECURITY DECLARTION CERTIFICATE TO BE SUBMITTED BY THE BIDDER.**
Date of Tender	**:**	**10/11/2021**
This tender contains	**:**	**(99)pages**
Time allowed for the work	**:**	**6(SIX) months including monsoon period**

CHIEF EXECUTIVE OFFICER
PUDUCHERRY SMART CITY DEVELOPMENT LIMITED,
PUDUCHERRY.

NOTICE INVITING TENDER for e-Tendering

1. Item rate tenders/Percentage rate tenders are invited by The Chief Executive Officer,PSCDL,PUDUCHERRY from approved and eligible contractors of C.P.W.D /PWD/ELECTRICITY Department Government of Puducherry andtheregistered electrical contractors of other states., for the work of: **"MINISPORTS STADIUM AT ANNATHIDAL, PUDUCHERRY-INTERNAL AND EXTERNAL ELECTRIFICATION WORKS UNDER SMART CITY MISSION"** through e-Tender mode.

The enlistment of the contractors should be valid on the last date of submission of tenders.In case the last date of submission of tender is extended, the enlistment of contractor should be validonthe original date of submission of tenders.

The work is estimated to cost **Rs 1,51,25,471/-** This estimate, however, is given merely as a rough guide.

Tender can be downloaded from e-Tender website **https://pudutenders.gov.in** by the eligible Electrical Contractors / Firms who are having valid contract license issued by the Liscensingauthorites of any of the States/Union territories in Union of India."

Conditions for all contractors .

Three similar completed works costing not less than 40% of the estimated cost put to tender.

(OR)

Two similar completed works costing not less than 60% of the estimated cost put to tender.

(OR)

One similar completed work costing not less than 80% of the estimated cost put to tender.

The value of executed works shall be brought to current costing level by enhancing the actual value of work at simple rate of 7% per annum; calculated from the date of completion to last date of submission of tenders.

1. Similar works means External and Internal Electrification,and allied works in State Govt Organization or central Govt Departments and or Public Sector Undertakings.

2. **Turnover**: Average Annual Financial Turnover on construction works during the last five years, ending 31stMarch of the previous financial year, should be at least 30% of the estimated cost

To become eligible for issue of tender, the tenderers shall have to furnish an affidavit as under:

I/We undertake and confirm that eligible similar work(s) has/have not been got executed through another contractor on back to back basis. Further that, if such a violation comes to the notice of Department, then I/we shall be debarred for tendering in PSCDL in future forever. Also, if such a violation comes to the notice ,before date of start of work, the Engineer-in-Charge shall be free to forfeit the entire amount of Earnest Money Deposit/Performance Guarantee. (Scanned copy to be uploaded at the time of submission of tender)

ALL CONTRACTORS , to upload the work experience certificate(s) and the affidavit as per the provisions of clause 1.2.1.The work experice certificate from the authority who has issued the work order shall be submitted/uploaded.

2. Agreement shall be drawn with the successful tenderers on prescribed PSCDL Form No. **PSCDL 7/8** which is available. Tenderer shall quote his rates as per various terms and conditions of the said form which will form part of the agreement.

3. The time allowed for carrying out the work will be **6(SIX) months** (including monsoon period) from the date of start as defined in schedule 'F' or from the first date of handing over of the site, whichever is later, in accordance with the phasing, if any, indicated in the tender documents.

4. (i)The site for the work shall be made available in parts as per execution of work.(The building is under construction)

5. The tender document consisting of specifications, the schedule of quantities of various types of items to be executed and the set of terms and conditions of the contract to be complied with and other necessary documents except Standard General Conditions of Contract Form can be seen on website **https://pondysmartcity.in** at free of cost.

6. After submission of the tender the contractor can re-submit revised tender any number of times but before last time and date of submission of tender as notified.

7. While submitting the revised tender, contractor can revise the rate of one or more item(s) any number of times (he need not re-enter rate of all the items) but before last time and date of submission of tender as notified.

8. When tenders are invited in three stage system and if it is desired to submit revised financial tender then it shall be mandatory to submit revised financial tender. If not submitted then the tender submitted earlier shall become invalid.

9. Tenders shall be accompanied with bid security declaration certificate and the format is enclosed in annexure.

10. Interested contractors who wish to participate in the tender has also to make following payments within the period of tender submission:

E-tender processing fee - **Rs 1500/-**using payment e-gateway,through internet banking or **RGTS/NEFT** facility drawn in favour of the **CHIEF EXECUTIVE OFFICER,PSCDL, Puducherry.**

Copy of license and certificate of work experience and other documents as specified in the press notice shall be scanned and uploaded to the e-Tendering website within the period of tender submission. However, certified copy of all the scanned and uploaded documents as specified in press notice shall have to be submitted by the lowest tenderer only.

Online tender documents submitted by intending tenderers shall be opened only of those tenderers, who has deposited e-Tender Processing Fee and BID SECURITY DECLARATION CERTIFICATE and other documents scanned and uploaded are found in order.

The tender submitted shall be opened at**.**

10. The tender submitted shall become invalid and e-tender processing fee shall not be refunded if:

(i) The tenderer is found ineligible.

(ii) The tenderer does not upload all the documents (including GST registration) as stipulated in the tender document including the undertaking bid security declaration certificate.

(iii) If any discrepancy is noticed between the documents as uploaded at the time of submission of tender and hard copies as submitted physically by the lowest tenderer in the office of tender opening authority.

11. The contractor whose tender is accepted will be required to furnish performance guarantee of 3% (three Percent) of the tender amount within the period specified in Schedule F. This guarantee shall be in the form of Banker's cheque of any scheduled bank/Demand Draft of any scheduled bank/ Pay order of any Scheduled Bank or Government Securities or Fixed Deposit Receipts or Guarantee Bonds of any Scheduled Bank or the State Bank of India in accordance with the prescribed form. The bid security declaration certificate shall be returned after receiving the aforesaid performance guarantee.

(a) This period can be further extended at the written request of the contractor by the Engineer-in-charge for a maximum period ranging from 1 to 15 days with late fee @ 0.1% per day, of performance guarantee amount.

In case the contractor fails to deposit the said performance guarantee and additional performance guarantee, if any, within the period as indicated in Schedule 'F', including the extended period if any, the Earnest Money deposited by the contractor shall be forfeited automatically shall entitle cancellation of award.

12. The description of the work is as follows: **"**MINI SPORTS STADIUM AT ANNATHIDAL,-INTERNAL AND EXTERNAL ELECTRIFICATION WORKS IN PUDUCHERRY,UNDER SMART CITY MISSION**".**

Intending Tenderers are advised to inspect and examine the site and its surroundings and satisfy themselves before submitting their tenders . A tenderer shall be deemed to have full knowledge of the site whether he inspects it or not and no extra charge consequent on any misunderstanding or otherwise shall be allowed. The tenderers shall be responsible for arranging and maintaining at his own cost all materials, tools & plants, water, electricity access, facilities for workers and all other services required for executing the work unless otherwise specifically provided for in the contract documents. Submission of a tender by a tenderer implies that he has read this notice and all other contract documents and has made himself aware of the scope and specifications of the work to be done and of conditions and rates at which stores, tools and plant, etc. will be issued to him by the Government and local conditions and other factors having a bearing on the execution of the work.

13. The competent authority of PSCDL does not bind himself to accept the lowest or any other tender and reserves to himself the authority to reject any or all the tenders received without the assignment of any reason. All tenders in which any of the prescribed condition is not fulfilled or any condition including that of conditional rebate is put forth by the tenderers shall be summarily rejected.

14. Canvassing whether directly or indirectly, in connection with tenderers is strictly prohibited and the tenders submitted by the contractors who resort to canvassing will be liable for rejection.

15. The competent authority of PSCDL reserves to himself the right of accepting the whole or any part of the tender and the tenderers shall be bound to perform the same at the rate quoted.

16. The contractor shall not be permitted to tender for works in the PSCDL responsible for award and execution of contracts, in which his near relative is posted a CEO,JT.CEO,Chief financial officer or as an officer in any capacity between the grades of Chief technical officer and deputy manager (both inclusive). He shall also intimate the names of person Who are working with him in any capacity or are subsequently employed by him and who are near relatives to any gazetted officer in the PSCDL, Union Territory of Puducherry. Any breach of this condition by the contractor would render him liable to be removed from the approved list of contractors of this PSCDL.

17. No Engineer of Gazetted Rank or other Gazetted Officer employed in Engineering or Administrative duties in an Engineering PSCDL of the Government of India is allowed to work as a contractor for a period of one year after his retirement from Government service, without the prior permission of the Government of India in writing. This contract is liable to be cancelled if either the contractor or any of his employees is found any time to be such a person who had not obtained the permission of the Government of India as aforesaid before submission of the tender or engagement in the contractor's service.

18. The tender for the works shall remain open for acceptance for a period of **Ninety(90)**days from the date of opening of technical bid in case bids are invited on 2 bid/envelop system/). If any tenderers withdraws his tender before the said period or issue of letter of acceptance, whichever is earlier, or makes any modifications in the terms and conditions of the tender which are not acceptable to PSCDL, then PSCDLshall not allow the bidder to participate in the future bidding and shall be blacklisted.

19. This notice inviting Tender shall form a part of the contract document. The successful tenderers/contractor, on acceptance of his tender by the Accepting Authority shall within 15 days from the stipulated date of start of the work, sign the contract consisting of:-

(a) The Notice Inviting Tender, all the documents including additional conditions, specifications and drawings, if any, forming part of the tender as uploaded at the time of invitation of tender and the rates quoted online at the time of submission of tender and acceptance thereof together with any correspondence leading thereto.

(b) Standard PSCDL Form 7/8 as applicable.

20. The Chief Executive Officer, PSCDL, Puducherry may reserves the right to change thetender submission and opening date and time without assigning any reason by notifying thesame inthewebsite.If the opening day of tender happens to be a Public Holiday the same will be opened onnextworking day.

CHIEF EXECUTIVE OFFICER,
PUDUCHERRY SMART CITY DEVELOPMENT LIMITED,
PUDUCHERRY.

PUDUCHERRY SMART CITY DEVELOPMENT LIMITED

STATE : PUDUCHERRY

REGION : PUDUCHERRY WING: ELECTRICAL

~~Percentage Rate Tender~~/Item Rate Tender & Contract for Works

(A) Tender for the work of: Development of Mini Sports Stadium at Annathidal, sub work: Internal and external electrification works in Puducherry UNDER SMART CITY MISSION.

(B) To be submitted/uploaded by **10.00 hours on 29/10/2021 to 16.00 hours on 10/11/2021.**

(C) To be opened in presence of tenderers who may be present at**11.00 hours on 11 /11/2021**in the office of the Chief executive officer, PSCDL, Puducherry.

Issued to.....*

Signature of officer issuing the documents ..... *

Designation :

Date of Issue:

* Not Applicable fore-tendering

TENDER

I/We have read and examined the notice inviting tender, schedule, A, B, C, D, E & F Specifications applicable, Drawings & Designs, General Rules and Directions, Conditions of Contract, clauses of contract, Special conditions, Schedule of Rate & other documents and Rules referred to in the conditions of contract and all other contents in the tender document for the work.

I/We hereby tender for the execution of the work specified for the Chief Executive officer,PSCDL,PUDUCHERRY within the time specified in Schedule 'F' viz., schedule of quantities and in accordance in all respect with the specifications, designs, drawing and instructions in writing referred to in Rule-1 of General Rules and Directions and in Clause 11 of the Conditions of contract and with such materials as are provided for, by, and in respect of accordance with, such conditions so far as applicable.

We agree to keep the tender open for **Ninety (90)** days from the date of opening of technical bid in case tenders are invited on 2 bid/envelope system and not to make any modification in its terms and conditions.

We agree to submit bid security declaration certificate in lieu of EMD as per the standard format and upload the scanned copy of the same.

If I/We, fail to furnish the prescribed performance guarantee within prescribed period, I/We agree that the said CEO,PSCDL or his successors, in office shall without prejudice to any other right or remedy, be at liberty to forfeit the said earnest money absolutely. Further, if I/We fail to commence work as specified, I/ We agree that CEO,PSCDL,PUDUCHERRYor the successors in office shall without prejudice to any other right or remedy available in law, be at liberty to forfeit the said performance guarantee absolutely. The said Performance Guarantee shall be a guarantee to execute all the works referred to in the tender documents upon the terms and conditions contained or referred to those in excess of that limit at the rates to be determined in accordance with the provision contained in Clause 12.2 and 12.3 of the tender form.

Further, I/We agree that in case of forfeiture of Performance Guarantee as aforesaid, I/We shall be debarred for participation in the re-tendering process of the work.

I/We undertake and confirm that eligible similar work(s) has/have not been got executed through another contractor on back to back basis. Further that, if such a violation comes to the notice of PSCDL, then I/We shall be debarred for tendering in PSCDL in future forever. Also, if such a violation comes to the notice of PSCDL before date of start of work, the Engineer-in-Charge shall be free to forfeit the entire amount of Earnest Money Deposit/Performance Guarantee.

I/We hereby declare that I/We shall treat the tender documents drawings and other records connected with the work as secret/confidential documents and shall not communicate information/derived therefrom to any person other than a person to whom I/We am/are authorized to communicate the same or use the information in any manner prejudicial to the safety of the State.

Dated. :

Witness :

Address :
Occupation :

Signature of Contractor
Postal address:

ACCEPTANCE

The above tender (as modified by you as provided in the letters mentioned hereunder) is accepted by me for and on behalf of the Puducherry Smart City Develpoment Limited for a sum of Rs……..……..…….....

(Rupees.....

.....

.....)

The letters referred to below shall form part of this contract agreement:-

(a)

(b)

(c) (c)

For & on behalf of the PSCDL

Signatures .....

Designation

.....

Dated:

PUDUCHERRY SMART CITY DEVELOPMENT LIMITED
PUDUCHERRY

GENERAL RULES & DIRECTIONS

1. All work proposed for execution by contract will be notified in a form of invitation to tender pasted in public places and signed by the officer inviting tender or by publication in News papers or posted on website as the case may be. This form will state the work to be carried out, as well as the date for submitting and opening tenders and the time allowed for carrying out the work, also the bid security declaration certificate to be submitted with the tender, and the amount of the security deposit and Performance guarantee to be deposited by the successful tenderer and the percentage, if any, to be deducted from bills. Copies of the specifications, designs and drawings and any other documents required in connection with the work signed for the purpose of identification by the officer inviting tender shall also be open for inspection by the contractor at the office of officer inviting tender during office hours.

2. In the event of the tender being submitted by a firm, it must be signed separately by each partner thereof or in the event of the absence of any partner, it must be signed on his behalf by a person holding a power-of attorney authorizing him to do so, such power of attorney to be produced with the tender, and it must disclose that the firm is duly registered under the Indian Partnership Act, 1952.

3. Receipts for payment made on account of work, when executed by a firm, must also be signed by all the partners, except where contractors are described in their tender as a firm, in which case the receipts must be signed in the name of the firm by one of the partners, or by some other person having due authority to give effectual receipts for the firm.

APPLICABLE FOR ITEM RATE TENDER ONLY (PSCDL - 8)

4. Any person who submits a tender shall fill up the usual printed form, stating at what rate he is willing to undertake each item of the work. Tenders, which propose any alteration in the work specified in the said form of invitation to tender, or in the time allowed for carrying out the work, or which contain any other conditions of any sort, including conditional rebates, will be summarily rejected. No single tender shall include more than one work, but contractors who wish to tender for two or more works shall submit separate tender for each. Tender shall have the name and number of the works to which they refer, written on the envelopes. The rate(s) must be quoted in decimal coinage. Amounts must be quoted in full rupees by ignoring fifty paisa and considering more than fifty paisa as rupee one. In case the lowest tendered amount (worked out on the basis of quoted rate of Individual items) of two or more contractors is same, then such lowest contractors may be asked to submit sealed revised offer quoting rate of each item of the schedule of quantity for all sub sections/sub heads as the case may be, but the

revised quoted rate of each item of schedule of quantity for all sub sections/sub heads should not be higher than their respective original rate quoted already at the time of submission of tender. The lowest tender shall be decided on the basis of revised offer.

If the revised tendered amount (worked out on the basis of quoted rate of individual items) of If the revised tendered amount (worked out on the basis of quoted rate of individual items) of two or more contractors received in revised offer is again found to be equal, then the lowest tender, among such contractors, shall be decided by draw of lots in the presence of CEO,JT.CEO, CTOs, and General Managerand the lowest contractors those who have quoted equal amount of their tenders.

In case all the lowest contractors those who have same tendered amount (as a result of their quoted rate of individual items), refuse to submit revised offers, then tenders are to be recalled after forfeiting 50% of EMD of each lowest contractors.

Contractor, whose earnest money is forfeited because of non-submission of revised offer, or quoting higher revised rate(s) of any item(s) than their respective original rate quoted already at the time of submission of his tender shall not be allowed to participate in the retendering process of the work.

APPLICABLE FOR PERCENTAGE RATE TENDER ONLY (PSCDL - 7)

In case of Percentage Rate Tenders, contractor shall fill up the usual printed form, stating at what percentage below/above (in figures as well as in words) the total estimated cost given in Schedule of Quantities at Schedule-A, he will be willing to execute the work. The tender submitted shall be treated as invalid if-

1. The contractor does not quote percentage above/below on the total amount of tender or any section/sub head of the tender.

2. The percentage above/below is not quoted in figures & words both on the total amount of tender or any section/sub head of the tender.

3. The percentage quoted above/below is different in figures & words on the total amount of tender or any section/sub head of the tender.

Tenders, which propose any alteration in the work specified in the said form of invitation to tender, or in the time allowed for carrying out the work, or which contain any other conditions of any sort including conditional rebates, will be summarily rejected. No single tender shall include more than one work, but contractors who wish to tender for two or more works shall submit separate tender for each. Tender shall have the name and number of the works to which they refer, written on the envelopes.

In case the lowest tendered amount (estimated cost + amount worked on the basis of percentage above/below) of two or more contractors is same, such lowest contractors will

be asked to submit sealed revised offer in the form of letter mentioning percentage above/ below on estimated cost of tender including all sub sections/sub heads as the case may be, but the revised percentage quoted above/below on tendered cost or on each sub section/ sub head should not be higher than the percentage quoted at the time of submission of tender. The lowest tender shall be decided on the basis of revised offers.

In case any of such contractor refuses to submit revised offer, then it shall be treated as withdrawal of his tender before acceptance and 50% of earnest money shall be forfeited.

If the revised tendered amount of two more contractors received in revised offer is again found to be equal , the lowest tender, among such contractors, shall be decided by draw of lots in the presence ofCEO,JT.CEO, CTOs, and General Manager and the lowest contractors those have quoted equal amount of their tenders. In case all the lowest contractors those have quoted same tendered amount, refuse to submit revised offers, then tenders are to be recalled after forfeiting 50% of EMD of each contractor. Contractor(s), whose earnest money is forfeited because of non-submission of revised offer, shall not be allowed to participate in the re-tendering process of the work.

5. The officer inviting tender or his duly authorized assistant, will open tenders in the presence of any intending contractors who may be present at the time, and will enter the amounts of the several tenders in a comparative statement in a suitable form. In the event of a tender being accepted, a receipt for the earnest money shall thereupon be given to the contractor who shall thereupon for the purpose of identification sign copies of the specifications and other documents mentioned in Rule-1. In the event of a tender being rejected, the earnest money shall thereupon be returned to the contractor remitting the same, without any interest.

6. The officer inviting tenders shall have the right of rejecting all or any of the tenders and will not be bound to accept the lowest or any other tender.

7. The receipt of an accountant or clerk for any money paid by the contractor will not be considered as any acknowledgement or payment to the officer inviting tender and the contractor shall be responsible for seeing that he procures a receipt signed by the officer inviting tender or a duly authorized Cashier.

8. The memorandum of work tendered for and the schedule of materials to be supplied by the PSCDL and their issue-rates, shall be filled and completed in the office of the officer inviting tender before the tender form is issued. If a form is issued to an intending tenderer without having been so filled in and incomplete, he shall request the officer to have this done before he completes and delivers his tender.

9. The tenderers shall sign a declaration under the officials Secret Act 1923, for maintaining secrecy of the tender documents drawings or other records connected with the work given to them. The unsuccessful tenderers shall return all the drawings given to them.

9A. Use of correcting fluid, anywhere in tender document is not permitted. Such tender is liable for rejection.

APPLICABLE FOR ITEM RATE TENDER ONLY (PSCDL-8)

10. In the case of Item Rate Tenders, only rates quoted shall be considered. Any tender containing percentage below/above the rates quoted is liable to be rejected. Rates quoted by the contractor in item rate tender in figures and words shall be accurately filled in so that there is no discrepancy in the rates written in figures and words. However, if a discrepancy is found, the rates which correspond with the amount worked out by the contractor shall unless otherwise proved be taken as correct. If the amount of an item is not worked out by the contractor or it does not correspond with the rates written either in figures or in words, then the rates quoted by the contractor in words shall be taken as correct. Where the rates quoted by the contractor in figures and in words tally, but the amount is not worked out correctly, the rates quoted by the contractor will unless otherwise proved be taken as correct and not the amount. In event no rate has been quoted for any item(s), leaving space both in figure(s), word(s), and amount blank, it will be presumed that the contractor has included the cost of this/these item(s) in other items and rate for such item(s) will be considered as zero and work will be required to be executed accordingly.

APPLICABLE FOR PERCENTAGE RATE TENDER ONLY (PSCDL - 7)

10A. In case of Percentage Rate Tenders only percentage quoted shall be considered. Any tender containing item rates is liable to be rejected. Percentage quoted by the contractor in percentage rate tender shall be accurately filled in figures and words, so that there is no discrepancy.

11. In the case of any tender where unit rate of any item/items appear unrealistic, such tender will be considered as unbalanced and in case the tenderer is unable to provide satisfactory explanation, such a tender is liable to be disqualified and rejected.

APPLICABLE FOR ITEM RATE TENDER ONLY (PSCDL-8)

12. All rates shall be quoted on the tender form. The amount for each item should be worked out and requisite totals given. Special care should be taken to write the rates in f igures as well as in words and the amount in figures only, in such a way that interpolation is not possible. The total amount should be written both in figures and in words. In case of figures, the word ‘Rs.’ should be written before the figure of rupees and word ‘P’ after the

decimal figures, e.g. ‘Rs. 2.15 P’ and in case of words, the word, ‘Rupees’ should precede and the word ‘Paise’ should be written at the end. Unless the rate is in whole rupees and followed by the word ‘only’ it should invariably be upto two decimal places. While quoting the rate in schedule of quantities, the word ‘only’ should be written closely following the amount and it should not be written in the next line.

APPLICABLE FOR PERCENTAGE RATE TENDER ONLY (PSCDL - 7)

12A. In Percentage Rate Tender, the tenderer shall quote percentage below/above (in figures as well as in words) at which he will be willing to execute the work. He shall also work out the total amount of his offer and the same should be written in figures as well as in words in such a way that no interpolation is possible. In case of figures, the word ‘Rs.’ should be written before the figure of rupees and word ‘P’ after the decimal figures, e.g. ‘Rs. 2.15P and in case of words, the word ‘Rupees’ should precede and the word ‘Paisa’ should be written at the end.

13. **(i)**The contractor whose tender is accepted will be required to furnish performance guarantee of 3% (Three Percent) of the tender amount within the period specified in Schedule F. This guarantee shall be in the form of Deposit at Call receipt of any scheduled bank/Banker's cheque of any scheduled bank/Demand Draft of any scheduled bank/ Pay order of any Scheduled Bank of any scheduled bank (in case guarantee amount is less than Rs. 1,00,000/-) or Government Securities or Fixed Deposit Receipts or Guarantee Bonds of any Scheduled Bank or the State Bank of India in accordance with the prescribed form. The bid security declaration certificate submittedalongwith tender shall be returned after receiving the aforesaid performance guarantee.

(a) This period can be further extended at the written request of the contractor by the Engineer-in-charge for a maximum period ranging from 1 to 15 days with late fee @ 0.1% per day, of performance guarantee amount.

In case the contractor fails to deposit the said performance guarantee and additional performance guarantee, if any, within the period as indicated in Schedule 'F', including the extended period if any, the Earnest Money deposited by the contractor shall be forfeited automatically without any notice to the contractor.

(ii) The contractor whose tender is accepted will also be required to furnish by way of Security Deposit for the fulfillment of his contract, an amount equal to 2.5% of the tendered value of the work. The Security deposit will be collected by deductions from the running bills as well as final bill of the contractor at the rates mentioned above. The Security amount will also be accepted in cash or in the shape of Government Securities.

Fixed Deposit Receipt of a Scheduled Bank or State Bank of India will also be accepted for this purpose provided confirmatory advice is enclosed.

14. On acceptance of the tender, the name of the accredited representative(s) of the contractor who would be responsible for taking instructions from the Engineer-in-Charge shall be communicated in writing to the Engineer-in-Charge.

15. This work is covered under Puducherry Goods and Service Tax Act, 2017 and Central Goods and Service Tax Act 2017, hence the contractors are requested to quote the rates including the effect of GST. Additional/Separate claim for GST will not be entertained on any account after the award of work. The payment is also liable for TDS as per provision of GST Act and Rules.

16. The contractor shall give a list of both gazetted and non-gazettedPscdl. employees related to him.

17. The tender for the work shall not be witnessed by a contractor or contractors who himself/ themselves has/have tendered or who may and has/have tendered for the same work. Failure to observe this condition would render, tenders of the contractors tendering, as well as witnessing the tender, liable to summary rejection.

18. The tender for composite work includes in addition to building work, all other works such as sanitary and water supply installations drainage installation, electrical work horticulture work, roads and paths etc. The tenderer must associate himself with agencies of tender for sanitary and water supply drainage, electrical and horticulture works, if any, in the composite tender.

19. The contractor shall submit list of works which are in hand (progress) in the following form:-

Name of Work	Name &particulars of Divn, Where work is being executed	Value of work	Position of works in progress	Remarks
(1)	(2)	(3)	(4)	(5)

20. The contractor shall comply with the provisions of the Apprentices Act 1961, and the rules and orders issued thereunder from time to time. If he fails to do so, his failure will be a breach of the contract and the CEO/JT.CEO/CTO/GENERAL MANAGER may in his discretion, without prejudice to any other right or remedy available in law, cancel the

contract. The contractor shall also be liable for any pecuniary liability arising on account of any violation by him of the provisions of the said Act.

21. The issues for which contractors seeking arbitration, shall be referred to the **Dispute Redressel Committee (DRC)** which was constituted vide circular No. 604/PW/CE/W/EE(P)/AE(P)1/56/2013-14 dt:16.05.2013 at the first instance and then, the proposal shall be settled to the contractor within the time frame as concluded by the Committee, otherwise the same shall be referred to appointment of arbitrator as per the provisions under General Conditions of Contract.

22. The contractor/firm must obtain necessary prior permit from **Pondicherry Ground Water Authority**, for the water requirement of the of the proposed construction/road works which will be meet out either from tube well or transportation through tanker lorries before commencement of the construction work.

23. Inviting guidelines prescribed by the Central Vigilance Commission **"No post tender negotiation"** shall be conducted with the tenderers. The tenderers are expected to quote their rates with permissible limit of variation.

24. The contractor must inspect the site and ascertain the availability of the building materials required for the work and take every details before tendering.

25. The contractor must study the plans appended with the tender and quote the rate accordingly.

26. The debris should be removed from the site on day basis without affect the public in general.

For any clarification the contractors shall contact the
THE CHIEF TECHNICAL OFFICER (ELECTRICAL) PSCDL, PUDUCHERRY.

PROFORMA SCHEDULES

SCHEDULE 'A' - SCHEDULE OF QUANTITIES

REF:ANNEXURE

(from page no 85 to 99)

SCHEDULE 'B'

Schedule of materials to be issued to the contractor.

Sl. No.	Description of Item	Quantity	Rates in figures & words at which the materials will be charged to the contractor	Place of issue
(1)	(2)	(3)	(4)	(5)
-------**all the men and materials shall be arranged by the contractor only**----------				

SCHEDULE 'C'

Tools and plants to be hired to the contractor.

Sl. No.	Description	Hire charges per day	Place of Issue
(1)	(2)	(3)	(4)
-NIL-			

ALL THE TOOLS AND PLANTS FOR THE WORK SHALL BE ARRANGED BY THE CONTRACTOR.

SCHEDULE 'D'

Extra schedule for specific requirements / documents for the work, if any.

SCHEDULE 'E'

Reference to General Conditions of contract: General Conditions of Contract forPSCDL Works .

Name of work : **MINI SPORTS STADIUM AT ANNA THIDAL, PUDUCHERRY-INTERNAL AND EXTERNAL ELECTRIFICATION WORKS UNDER SMART CITY MISSION**

Estimated Cost of Work : Rs 1.51,25,471/-

(i) Earnest Money : Nil. Bid security declaration certificate to be furnished by the bidder.

(ii)(a)Performance Guarantee : 3% of tendered value.

(iii) Security Deposit : 2.0% of tendered value from the successful bidder through direct debit/NEFT/RTGS mode only through online or in the fprm of banker's cheque of any scheduled bank/term deposit receipt/pay order of any scheduled bank or government securities or fixed deposit receipts from any scheduled bank or Nationalised bank in favour of the Chief executive officer,PSCDL,Puducherry.

Schedule "F"
GENERAL RULES & DIRECTIONS

Officer inviting tender	The Chief Executive Officer, PSCDL, Puducherry.
Maximum percentage for quantity of items of work to be executed beyond which rates are to be determined in accordance with Clauses 12.2 & 12.3	See below
Definitions:	
2(v) Engineer-in-Charge	The chief technical officer(Electrical), PSCDL, Puducherry.
2(viii) Accepting Authority	The Chief Executive officer, PSCDL, Puducherry.
2(x) Percentage on cost of materials and Labour to cover all overheads and profits.	15%
2(xi) Standard Schedule of Rates	**As per PSR2018-19 (Revised) notified by PWD ,Government of Puducherry for electrical works, Non-PSR approved rates, Rates quoted in previous tenders and Electricity Dept. Cost data have been adopted in this estimate.**
2(xii) Organisation	Puducherry smart city development limited,Puducherry.
9(ii) Standard PSCDL contract Form	PSCDL Form 7/8as available in the website http://pondicherrysmartcity.in (upto last date of receipt of tender)

Clause 1	**(i)**	Time allowed for submission of Performance Guarantee from the date of issue of letter of acceptance	15 days
	(ii)	Maximum allowable extension with late fee @ 0.1% per day of performance Guarantee amount beyond the period provided in (i) above....	15 days
Clause 2		Authority for fixing compensation under clause 2	THECHIEF EXECUTIVE OFFICER,PSCDL, Puducherry.

Clause 2A	Incentive for early completion of work	Deleted
Clause 5	Number of days from the date of issue of letter of acceptance for reckoning date of start	25 Days

Mile stone(s) as per table given below:

Sl. No.	Description of Milestone (Physical)	Time allowed in days (from date of start)	Amount to be with-held in case of nonachievement of milestone
1.			
2.			
3.			
4.			

Time allowed for execution of work **6(six) months** (including monsoon period)

(Or)

Sl. No.	Financial Progress	Time allowed in days (from date of start)	Amount to be withheld in case of non-achievement of milestone
1.	1/8th (of the whole work)	1/4th (of the whole work)	In the event of not achieving the necessary progress as assessed from the running payments, **1%** of the tendered value of work will be withheld automatically for failure of each milestone .without any notice to the contractor.
2.	3/8th (of the whole work)	½ (of the whole work)	
3.	3/4th (of the whole work)	3/4th (of the whole work)	
4.	Full	Full	

Authority to decide:

(i) Extension of time : The Chief Executive Officer,PSCDL,Puducherry.
(ii) Rescheduling of mile stone : The Chief Executive Officer,PSCDL, Puducherry.
(iii) Shifting of date of start in case of delay in handing over of site : ,The Chief Executive Officer ,PSCDL, Puducherry.

Clause 6 (or) 6A	Measurement of work done (or) Computerised Measurement Book	**~~6 (or)~~ 6A**
Clause 7	Gross work to be done together with net payment /adjustment of advances for material collected, if any since the last such payment for being eligible to interim payment	**25.21 Lakhs**

Clause 10A

List of testing equipment to be provided by the contractor at site lab:

NIL

Clause 10B(ii) : Mobilisation Advance ~~Applicable~~ / Not applicable

Clause 10C : Applicable / ~~Not applicable~~
Component of labour expressed as percent of value of work 15% approximately

Clause 10CA **:** Applicable / ~~Not applicable~~

S.N.	Materials covered Under this clause	Materialsfor which All India Wholesale Price Index to be followed	Base Price and its corresponding period of all the materials covered under Clause10 CA*
1.	ELECTRICAL GOODS AS INDICATED IN BOQ		As per PSR (ELECT) 2018-19 (Revised) applicable to Puducherry region.
2.			
3.			
4.			

* Base price and its corresponding period of all the materials covered under Clause10 CA is to be mentioned at the time of approval of NIT. In case of recall of tenders, the base price may be modified by adopting latest base price and its corresponding period.

Clause 11	Specifications to be followed for execution of work	C.P.W.D. specifications 2009,PSR2018-2019,PED and IS specifications and manuals (with correction slips and subsequent publications)
Clause 12	Type of work	Original work

Clause 12.2 & 12.3	Deviation Limit beyond which clauses 12.2 & 12.3 shall apply for building work	Not applicable.
12.5 (i)	Deviation Limit beyond which clauses 12.2 & 12.3 shall apply for foundation work (except items mentioned in earth work subhead in PSR and related items)	Not applicable
(ii)	Deviation Limit for items mentioned in earth work subhead of PSR and related items	Not applicable.
Clause 16	Competent Authority for deciding reduced rates	The CEO ,PSCDL, Puducherry.

Clause 25

Constitution of Dispute Redressal Committee (DRC)

1. Chairman : Chief Executive Officer, PSCDL
2. Member : Joint Chief Executive Officer, PSCDL
3. Member : Chief Technical Officer(Electrical), PSCDL
4. Member : General Manager (Project)
5. Member : General Manager (Planning & Procurement)

Clause 36(i)
Requirement of Technical Representative(s) and recovery Rate

Sl. No.	Minimum Qualification of Technical Representative	Discipline	Designation (Principal Technical/ Technical Representative)	Minimum Experience	Number	Rate at which recovery shall be made from the contractor in the event of not fulfilling provision of Clause 36(i)	
						Figures	Words

1	Graduate Engineer	Electrical	Principal Technical Representative	5years		Rs 25,000/per monthly	Rupees twenty five thousand only
	Graduate Engineer or Diploma Engineer		Site Engineer	2 Years Or 5 years	1	Rs15,000/- per month	(Rupees Fifteen thousand only)

Assistant Engineers retired from Government services who are holding Diploma will be treated at par with Graduate Engineers.

Diploma holder with minimum 10 year relevant experience with a reputed construction company can be treated at par with Graduate Engineers for the purpose of such deployment subject to the condition that such diploma holders should not exceed 50% of requirement of degree engineers.

Clause 42 (i) (a)	Schedule / statement for determining theoretical quantityof cement & bitumen on the basis of Puducherry	Puducherry Schedule of Rates 2018-19 (Revised) printed by P.W.D.Puducherry.
(ii)	Variations permissible on theoretical quantities	
(a)	For works with estimated cost put to tender more than Rs.5 lakh	2% plus/minus
(b)	Bitumen: All works	2.5% plus & only & NIL on minus side
(c)	Steel Reinforcement and structural steel; sections for each diameter,section and category	2% plus/minus
(d)	All other materials	Nil

RECOVERY RATES FOR QUANTITIES BEYOND PERMISSIBLE VARIATION

Sl.No.	**Description of items**	**Rates in figures and words at which recovery shall be made from the contractor**	
		Excess beyond permissible variation	**Less use beyond permissible variation**
1.	Electrical goods as per BOQ	Does not arise	
2.			
3.			
4.			
5.			

GENERAL CONDITIONS

(1) The work shall in general be carried out in accordance with CPWD specifications for works 2009 with correction slips and issued from time to time.

(2) However if the said specifications differ from those given in the description of any particular item in the schedule of quantities and specifications stipulated herein, the latter shall prevail.

(3) If the detailed description of any particular item in the schedule of quantities and specifications finally accepted by the PSCDL differs from the particular specifications given hereunder, the former shall prevail to the extent applicable.

(4) If the particular specification given hereunder differs from I.S. code provisions, in any respect, the former shall prevail.

(5) Wherever any reference to any Indian standard specification occurs in the documents relating to this contract the same should be inclusive of all amendments issued thereto or revision thereof if any, upto the date of receipt of tenders.

(6) Conditions involving any financial implications other than those covered in the schedule of quantities will not be entertained and such tenders are also liable to be rejected.

(7) When working near existing structures, care shall be taken to avoid any damage to such structures, any such damage caused intentionally or unintentionally shall be restored to original and or acceptable condition and to the satisfaction of the Engineer-in-charge.

(8) The contractor shall given to the Municipality, Police and other authorities all notices etc., that may be required to be given as per law and obtain all requisite licenses for temporary obstructions, enclosures and pay all fees, taxes and charges which may be leviable on account of the operations during the execution of the contract. No extra claim of the contractor will be entertained by the PSCDL on this account.

(9) Other agencies doing works related to this project may also simultaneously execute the works and the contractor shall co-ordinate and co-operate with them as found to be necessary at no extra cost.

CONDITIONS FOR ISSUE OF MATERIALS.

NOT APPLICABLE

(ALL THE MATERIALS SHALL BE ARRANGED BY THE CONTRACTOR ONLY

INCONVENIENCE TO PUBLIC

1. The contractor shall not deposit materials on any site, which will seriously inconvenience the public. The Engineer-in-charge may require the contractor to remove any materials, which are considered by him to be a danger or inconvenience to the public or cause them to be removed at the contractor's cost.

2. Any damage to work resulting from rains or from any other cause until the work is taken over by the PSCDL after completion will be made good by the contractor at his own cost.

3. The contractor shall deposit royalty and obtain necessary permit for supply of sand, HBG metal, red earth, etc. from local authorities.

4. The contractor will be permitted to set up labour camp only before a week from the commencement of work and not exceeding fifteen days after the completion of the work.

5. The contractor shall conform to the provision of any government acts which relate to works and to the regulations and bye-laws of any local authorities. The contractors shall give all notices required by the said acts or laws etc., pay all fees payable to such authorities and allow for these contingencies in his tendered rates including costs of restoration etc., and all other fees payable to the local authorities.

6. The debris should be removed from the site on day to day basis without affecting the public in general.

7. The contractor shall not employ women and men below the age of 18 on the work of painting with products lead, in any form wherever men above the age of 18 are employed on the work of lead painting, the following principles must be observed for such use:

   a) Measure shall be taken wherever practicable against danger arising from dust caused by dry rubbing down and scraping.

   b) Adequate facilities shall be provided to enable working painters to wash during and on cessation of work.

   c) Overalls shall be worn by working painters during whole of the working period.

   d) Suitable arrangements shall be made to prevent clothing put off during working hours being soiled by painting materials.

   e) Cases of lead poisoning and suspected lead poisoning shall be subsequently verified by a medical team appointed by the competent authority.

   f) The PSCDL may require when necessary medical examination of workers.

   g) Instructions with regard to the special hygienic precautions to be taken in the painting trade shall be distributed to working painter.

ADDITIONAL CONDITIONS

1. The rate for all items of works shall unless clearly specified otherwise include cost of all labour, materials and others inputs involved in the execution of item.

2 (a) For the purpose of recording measurements and preparing running account bill the abbreviated nomenclature enclosed with the standard form shall be adopted .The abbreviated nomenclature shall be taken to cover all the materials and operations as per the complete nomenclature of the relevant items in the agreement and other relevant specifications.

(b) In case of extra and substituted items of work for which abbreviated nomenclature is not provided in the agreements, the full nomenclature of items shall be reproduced in the measurement books and bill forms for running account bills.

3. (a) Tendered rates are inclusive of all taxes and levies payable under the respective status. However pursuant to the constitution (46th Amendment) Act 1982, if any further tax or levy is imposed by the statute after the date of receipt of tenders and the contractor thereupon necessarily and properly pays such taxes/levies, the contractors shall be reimbursed the amount so paid provided such payment, if, any, is not, in the opinion of the Engineer-in-Charge (whose decision shall be final and binding) attributable to delay in execution of work within the control of the contractor.

(b) The contractor shall keep necessary books of accounts and other documents for the purpose of this condition as may be necessary and shall allow inspection of the same by a duly authorized representative of Public Works PSCDL and further shall furnish such other information/document as the Engineer-in-Charge may require.

(c) The contractor shall within a period of 30 days of imposition of any further tax or levy pursuant to the Constitution (46th Amendment) Act, 1982 give a written notice thereof to the Engineer-in-Charge pursuant to this condition, together with all necessary information relating therein.

4. While execution of the work, the contractor shall organise his work in such a way that the normal functioning of the premises is not disturbed.

5. Any damage done to the existing structure while dismantling execution of the work shall be made good by the contractor at claim shall be made good by the contractor at his own cost and no extra claim shall be entertained on this account.

6. The contractor must see the site before participating the tender and his viability for executing the work.

7. ~~The item of Anti-termite treatment shall be executed through a specialized firm.~~

8. Rates should be quoted for the items specified in the NIT and shall not be compared with the analysis of rates.

9. Rates for all items should be quoted based on the availability of constructionmaterials in accordance to BIS/CPWD/PED/PWD specifications.

10. The Contractors themselves have to identify the place of disposal of un-serviceable materials like debris, waste mud, etc arises in the site. No extra lead and lift shall be considered for such disposal.

11. The Contractor must do their own arrangements at their own cost for signage/barricading etc. for the safety of Public during construction in the construction site of building/road/drain/canal/bridge/culverts etc. No separate claim will be admitted in this regard.

12. The contractor should not discontinue / suspend / slow down the work on the grounds of non payment of work bills, as the contractor in terms of Clause-7 of agreement is eligible for interest for the belated payment. If the contractor fails to continue the work in letter and spirit of agreement and other accepted terms and conditions on the grounds of non payment of work bills, the action against the contract shall be initiated as per the relevant clause of the agreement..

13. During the course of contract period, deduction of "CESS" to provide social security and various welfare benefits through the Puducherry Buildings and other construction workers Welfare Board under Section 18 of the Building and Other Construction Workers Cess collection (RECS) Act, 1996, shall be made at the rate of 1% (One Percent) of the gross amount of each bill or as per the advice of the Government of Puducherry.

14. Necessarytestcertificatesshouldbeproducedfromtheapprovedlaboratoryforthequality ofmaterials.

15. Defective materials will be rejected and the same have to be reparably by the contractor athisowncost.

16. Original purchase vouchers should be produced at the time of receipt of materials and atthe time of verification by the Engineer-in-Charge. The name of contractor, name of work andagreementnumbershouldbeclearlynotedintheoriginalvouchers.

17. Thetestspecimensshallbe providedatfreeofcost bythecontractor

ADDITIONAL CONDITIONS II

ADOPTION OF PSR ABBREVIATED NOMENCLATURE

The Puducherry Schedule of Rates Abbreviated Nomenclature for buildings and road works shall be adopted in recording of measurements and preparation of running account bills, etc., wherever applicable as per CPSCDL Works Manual 2014.

PARTICULAR SPECIFICATIONS

1. The work executed shall be measured as per metric dimensions given in the schedule of quantities. The FPS units wherever indicated in the drawings are for guidance only.

2. Unless otherwise specified, all the rates quoted by the contractor shall be for items of work at all levels and heights of the building.

3. The work shall be executed as per the C.P.W.D. specifications 2009 (with correction slips and subsequent publications). In case of discrepancies between the specifications of a particular item as indicated in the C.P.W.D. specifications mentioned above and as indicated in the nomenclature of the item the latter shall prevail.

4. All manufactured materials used in the work shall have ISI/BIS mark. In case of materials for which no manufacturer has been licensed to manufacture the materials with ISI marking, the materials shall conform to the provisions of C.P.W.D. /PED/PWDspecifications or the ISI code (in the absence of C.P.W.D. specifications or other specifation mentioned above for any particular material). In the case of all materials, tests shall be conducted to ensure that they conform to the specifications of codes mentioned above.

Form of bid security declaration certificate

FormatforBid declaration certificate forEarnestMoneyDeposit(If applicable)

(TobeprintedonNon-judicialstamppaperofappropriatevalue) Bid-SecurityDeclaration

To

THE CHIEF EXECUTIVE OFFICER
PUDUCHERRY SMART CITY DEVELOPMENT LIMITED,
UDUCHERRY

Reference: (1)Tender No:._____.
(2)OurBidNo._____dt.

1/We, ... irrevocablydeclare asunder:

I/Weunderstandthat, as perClause ..... ofTender/bidconditions,bidsmustbesupported byaBidSecurityDeclarationinlieuofEarnestMoneyDeposit.

I/We hereby accept that I/We may be disqualified from bidding for any contract with you fora period of **Three years** from the date of disqualification as may be notified by you (withoutprejudicetoPSCDL'srightstoclaimdamagesoranyotherlegalrecourse)if,

1) Iam/Weareinabreachofanyoftheobligationsunderthebidconditions,
2) I/We have withdrawn or unilaterally modified/amended/revised, my/our Bid duringthebidvalidityperiodspecifiedintheformof Bidorextendedperiod,ifany.
3) On acceptance of our bid by PSCDL, I/we fail to deposit the prescribed SecurityDeposit or fails to execute the agreement or fails to commence the execution of theworkinaccordancewiththetermsandconditionsandwithinthespecifiedtime.

Signature:

Name&designationoftheauthorizedpersonsigningtheBid-SecuringDeclarationForm:

Dulyauthorizedtosignthebidforandonbehalfof:
_____(completenameofBidder)

Datedon_____dayof_____month,_____year.

(Note: In case of a consortium, the Bid Security Declaration must be in the name of allpartnersof the consortiumthatsubmitsthebid).

FORM OF PERFORMANCE SECURITY (Guarantee)

BANK GUARANTEE BOND

In consideration of the President of India (hereinafter called "The Government") having offered to accept the terms and conditions of the proposed agreement between ..... and …….....

.....…… (hereinafter called "the said Contractor(s)") for the work…… (hereinafter called "the said agreement") having agreed to production of an irrevocable Bank Guarantee for Rs. …….
(Rupees……

…… only) as a security/guarantee from the contractor(s) for compliance of his obligations in accordance with the terms and conditions in the said agreement.

1. We, ... (hereinafter referred to as "the Bank") hereby undertake to pay to the Government an amount not exceeding Rs. …….. (Rupees… ..... Only) on demand by the Government.

2. We, …….(indicate the name of the Bank) do hereby undertake to pay the amounts due and payable under this guarantee without any demure, merely on a demand from the Government stating that the amount claimed as required to meet the recoveries due or likely to be due from the said contractor(s). Any such demand made on the bank shall be conclusive as regards the amount due and payable by the bank under this Guarantee. However, our liability under this guarantee shall be restricted to an amount not exceeding Rs……

   (Rupees ..... only)

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

4. We, ……. (indicate the name of the Bank) further agree that the guarantee herein contained shall remain in full force and effect during the period that would be taken for the performance of the said agreement and that it shall continue to be enforceable till all the dues of the Government under or by virtue of the said agreement have been fully paid and its claims

satisfied or discharged or till Engineer-in- Charge on behalf of the Government certified that the terms and conditions of the said agreement have been fully and properly carried out by the said Contractor(s) and accordingly discharges this guarantee.

5. We,.....(indicate the name of the Bank) further agree with the Government that the Government shall have the fullest liberty without our consent and without affecting in any manner our obligation hereunder to vary any of the terms and conditions of the said agreement or to extend time of performance by the said Contractor(s) from time to time or to postpone for any time or from time to time any of the powers exercisable by the Government against the said contractor(s) and to forbear or enforce any of the terms and conditions relating to the said agreement and we shall not be relieved from our liability by reason of any such variation, or extension being granted to the said Contractor(s) or for any forbearance, act of omission on the part of the Government or any indulgence by the Government to the said Contractor(s) or by any such matter or thing whatsoever which under the law relating to sureties would, but for this provision, have effect of so relieving us.

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

7. We,.....(indicate the name of the Bank) lastly undertake not to revoke this guarantee except with the previous consent of the Government in writing.

8. This guarantee shall be valid up to ……unless extended on demand by the Government.

Notwithstanding anything mentioned above, our liability against this guarantee is restricted to Rs. …… (Rupees ……..) and unless a claim in writing is lodged with us within six months of the date of expiry or the extended date of expiry of this guarantee all our liabilities under this guarantee shall stand discharged.

Dated the ……..day of ……for.....(indicate the name of the Bank)

SPECIFICATIONS FOR INTERNAL & EXTERNAL ELECTRICAL WORKS

LIST OF INDIAN STANDARDS

I : ELECTRO-TECHNICAL VOCABULARY

(1)	Fundamental definition	IS 1885 (Part-I) : 1961
(2)	Secondary cells and batteries (Superceding 1986IS1147 : 1957)	IS 1885 (Part-VIII) :
(3)	Electrical power system protection	IS 1885 (Part-X) : 1993
(4)	Electrical Measurement	IS 1885 (Part-XI) : 1966
(5)	Switchgear and control gear (First revision)	IS 1885 (Part-XVII) : 1979
(6)	Overhead transmission and distribution of 1971electrical energy	IS 1885 (Part-XXX) :
(7)	Cables, conductor and accessories for Electrical 1993supply (SupersedingIS 1591 : 1960)	IS 1885 (Part-XXXII) :
(8)	Transformers(First revision)	IS1885(Part-XXXVIII):1993

II : GRAPHICAL SYMBOLS USED IN ELECTRO TECHNOLOGY

(1)	Guide for preparation of diagrams, charts & 1976tablesfor electro technology. Definitions and Classification [Superceding IS 2032 (Part-I) : 1962]	IS 8270 (Part-I) :
(2)	Item designation	IS 8270 (Part-II) : 1976
(3)	General requirements for diagrams	IS 8270 (Part-III) : 1977
(4)	Circuit diagrams	IS 8270 (Part-IV) : 1977
(5)	Interconnection diagrams and table	IS 8270 (Part-V) : 1976

III : CONDUCTOR AND POWER CABLES

(1)	PVC insulated cable for working voltages 1990andincluding 1100 volts(Second revision) [Superceding IS 3035 (Part I) : 1965]	IS 694 :
(2)	(i)PVC insulated (Heavy duty) working Dielectric cables for voltage upto & i/c. 19881100volts (Second revision)	IS 1554 (Part-I) :
	(ii)For working voltage from 3.3 KV upto 1988andincluding 11 KV	IS: 1554 (Part II) :
(3)	(i)Recommended currentratings for cables: 1967Paperinsulated lead sheathed cables.	IS 3961 (Part I) :

	(ii)PVC insulated and PVC sheathed heavy duty cables	IS 3961 (Part II) :1967
(4)	Application guide for non-linear resistor type Surge 5).arrester for alternating current system (First revision)	IS 15086 (Part-
(5)	Recommended short circuit ratings of high voltage PVC 1970cable	IS 5819 :
(6)	Conductors for insulated electric cables and flexible cords	IS 8130 : 1984
(7)	Busbar trunking system (Air insulated & sandwitch 1993,insulatedtype)	IS 8623 Part I & II : IEC 60439 Part I & II

IV : ELECTRICAL INSTALLATION CODE OF PRACTICES

(1)	Installation and maintenance of transformers	IS 10028 (Part - II & III)
(2)	Insulation oil in service, maintenance and 2000supervision code of practice for	IS 1866 :
(3)	Earthing	IS3043 : 1987
(4)	Guide for short circuit calculations	IS 13234
(5)	Electrical wiring installation (system voltage not Exceeding650 volts)	IS 732 : 1989
(6)	Paper insulated power cables (Upto and including 198333KV (first revision)	IS 1255 :

V : SWITCH GEARAND CONTROLGEAR

(1)	Degree of protection provided by the (enclosure for I)low voltage switchgear and control gear)	IS 13947 (Part-
(2)	HRC cartridge fuse links upto 650 volts.	IS 9224 (Part-II)
(3)	(i)Circuit breaker AC requirements & tests for voltages Not exceeding1000Voltsa.cor1200voltsd.c.	IS 13947 (Part -II)
	(ii) Generalanddefinition.Section2-Voltages ve 1000 volt a.c.	IS13118:1991abo
(iii)	Type tests & Routine test for voltage above 0Volt a.c.	IS13118:1991100
(4)	Heavy duty air break switches and composite units air break switches & fuses for voltages not Exceeding 1000 volts.	IS 4064of
(5)	General requirements for switchgear, control I)gear for voltage not exceeding 1000 volts.	IS 13947 (Part-

(6)	(i)Factory built assemblies of switch gear and control 1993gear for voltages upto& including 1000 VAC or 1200V DC.	IS 8623 :
	(ii) Particular requirements for bus bar trunking system 1993(Bus ways)	IS 8623 (Part II) :
(7)	High Voltage alternating current circuit breakers	IS13118:1991 IEC60056
(8)	High Voltage Switches–Part I: Switches for Rated Voltages Above IKv and less than52Kv	IS9920 : 2002
(9)	A.C. Metal Enclosed Switchgear and Control 1997gear for Rated Voltages Above I KV and up To and Including 52 KV	IS 3427 :
(10)	Electrical Measuring Instruments and their Accessories	IS 1248

VI : TRANSFORMERS AND REACTORS

(1)	Dry type power transformer	IS11171:1985
(2)	Power Transformer	
	(i) General	IS2026 (Part-I) : 1977
	(ii) Temperature rise	IS 2026 (Part-II) : 1977
	(iii) Insulation level and di-electric tests	IS 2026 (Part-III) : 1981
(3)	Distribution transformers	IS1180:1989
(4)	Gas operated relays	IS 3637 : 1966
(5)	Power transformers fittings and accessories	IS 3639 : 1966
(6)	Guide for loading of oil immersed transformers	IS 6600 : 1972
(7)	(i)Current transformers Part I to III	IS 2705 : 1992
	(ii)Voltage transformers Part I to III	IS 3156: 1992
(8)	Outdoor type three-phase distribution transformers	IS 2099 : 1986

VII : CHEMECALS

(1)	Colours for ready mixed paints and enamels	IS 5 : 1994 (Third revision)
(2)	Ready mixed paint brushing zinc chrome revision)priming	IS 104 : 1979 (IInd
(3)	Enamel, synthetic exterior (a) under coating (b)finishing	IS 2932 : 2003 (Ist revision)

VIII : INSULATING LIQUIDS

(1)	Specific resistance (resistivity) or electrical 1971insulating liquids, methods for tests for	IS 6103 :
(2)	Electric strength of insulating oils, methods for 1992determination of	IS 6792 :
(3)	New insulation oils for transformers and switchgears 1993(2nd revision)	IS 335 :
(4)	Insulating Mats	IS 15625 : 2006

IX: SAFETYEQUIPMENTS

(1)	CO_2basedFireExtinguisher	IS 2878 : 1976
(2)	Chemical based Fire Extinguishers	IS 2171 : 1976
(3)	HCFC Blend-A Extinguishing System	IS 15505 : 2004

Insulating Mats

GENERAL& TECHNICAL

1 POINTWIRING:-

DEFINITION:-

A point(other than socket outlet point)shall include all work necessary in complete wiring to the following outlets from the controlling switch or MCB.

i. Ceiling rose or connector (in the case of points for ceiling/exhaust fan points, pre wired light fittings and call bells).
ii. Ceilin grose(in the case of pendants except stiff pendants)
iii. Back plate(in the case of stiff pendants).

SCOPE:-

Following shall be deemed to included in point wiring.

i. Conduit/casing and capping/channels as the case may be, accessories for the same and wiring cables between the switch box and the point outlet, loop protective earthling of each fan / light fixture.

1.3 MATERIAL:-

i The system of wiring shall consist of ISI marked single core, PVC insulated, FRLS,1100 volt grade, stranded, flexible copper conductor wires as per IS : 694 amended upto date.

ii The Conduit and accessories shall be of mild steel of ISI marked (IS:9537)ERW black, stove enameled, screwed type. The wall thickness of conduits shall be 16SWG for 20, 25 and 32

mm dia conduits and 14 SWG for 40 and 50 mm dia conduits. OR, ISI marked(IS:IS:9537-III,3419&2509)heavy duty Rigid PVC. The wall thickness shall be 2 mm.(As mentioned in the respective BOQ)

CONDUCTOR SIZE:-

Wiring shall be carried out with following sizes of wires–

a. Light/fan/call bell/exhaust fan point -1.5sqmm.
b. 5amp plug points -1.5sqmm.
c. Light circuit -1.5sqmm.
d. Power point -4.0sqmm.

Size of Earth wires shall be as per following table-

Size of point/circuit/sub-main wires	Earthwire
2x1.5sqmm.-	1x1.5 sqmm.
2x2.5sqmm.-	1x2.5 sqmm.
2x4sqmm.-	1x4 sqmm.
2x6sqmm.-	1x6 sqmm.
2x10sqmm.-	1x10 sqmm.
2x16sqmm.-	1x16 sqmm.
4x6sqmm.-	2x6sqmm.
4x10sqmm.-	2x10sqmm.
4x16sqmm.-	2x16sqmm.

2. MEASUREMENT:-

POINT WIRING:-

i. Unless and otherwise specified, there shall be no linear measurement for point wiring for light points, fan points, exhaust fan points and call bell points.

These shall be measured on unit basis by counting.

ii. No separate measurement will be made for interconnections between points in the same distribution circuit and for the circuit protective(loop earthling)conductors between metallic switch boxes.

POINT WIRING FOR SOCKET OUTLET POINTS:-

i. The light plug(5A/6A) point and power (15A/16A) point wiring shall be measured on linear basis, from the respective tapping point of live cable, namely switch box, another socket outlet point, or the sub distribution board as the case may be, up to the socket outlet.

ii. The metal /PVC box with cover switch/MCB socket outlet and other accessories shall be measured and paid as as eparate item.

GROUP CONTROL POINTS WIRING:-

i. In the case of points with more than one point controlled by the same switch, such point shall be measured in parts i.e.(a) from the switch to the first point outlet as one point (Primary point), and (b) for the subsequent points each shall be treated as separate point(additional/secondary).

ii. No recovery shall be made for non-provision of more than ones witch in such cases.

TWIN CONTROL LIGHT POINT WIRING:-

i. A light point controlled by two numbers of two way switches shall be

measured as two point.

ii. No recovery shall be made for non-provision of more than one ceiling rose

/connector in such cases.

MULTIPLE CONTROLLED CALLBELL POINTS WIRING:-

i. In the case of call bell points with a single call bell outlet, controlled from more than one place, the point shall be measured in parts i.e.

(a) from the call bell outlet to one of the nearest ceiling roses meant for connection to bell push, treated as one point and

(b) from that ceiling rose to the next one and so on, shall be treated as separate point(s).

ii. No recovery shall be made for non-provision of more than one ceiling rose or connector for connection to call bell in such cases.

3. CIRCUIT AND SUBMAIN WIRING:-

CIRCUIT WIRING:-

Circuit wiring shall mean the wiring from the distribution board up to the first tapping point inside the switch board.

SUBMAIN WIRING:-

Sub main wiring shall mean the wiring from one main/distribution switchboard toanotherand from Distribution Board to Power Outlet /AC Outlet.

4. MEASUREMENT OF SUBMAIN/CIRCUIT WIRING:-

i. Sub main wiring shall be measured on linear basis along the run of the wiring. The measurement shall include all length from end to end of conduit or casing and cap in gas the case may be, exclusive of interconnections inside the switch board etc. The increase on account of diversion or slackness shall not be included in the measurement.

ii. The length of circuit wiring shall be measured from the distribution board to the nearest switch box from which the point wiring starts. Looping of switch box also will be counted towards circuit wiring, measured along the length of conduit / channel

5. SYSTEM OF DISTRIBUTION AND WIRINGS:-

i. Main distribution board shall be controlled by the circuit breaker. Each outgoing circuit shall be controlled by a circuit breaker on the phase or live conductor.

ii. The branch distribution board shall be controlled by a circuit breaker. Each out going circuit shall be provided with a MCB of specified rating on the phase or live conductor.

iii. The load of the circuits shall be divided, as far as possible, evenly between the number of ways of the distribution boards, leaving at least one spare circuit for future extension.

iv. The neutral conductors (incoming and outgoing) shall be connected to a common link (multi way connector) in the distribution board and be capable of being disconnected individually for testing purposes.

v. Wiring shall be separate for essential loads (ie those fed through stand by supply) and non-essential loads throughout.

6. BALANCING OF CIRCUITS:-

The balancing of circuits in three wire or poly phase installations shall be arranged up to the satisfaction of the Engineer-in-charge.

7. WIRING SYSTEM:-

a) The wiring shall be done only by the "Looping system". Phase or live conductors shall be looped at the switch boxes. For point wiring neutral / earth wire looping for the first point shall be done in the switch box, and neutral / earth looping of subsequent point will be made from point outlet.

b) Lights, fans and call bells shall be wired in the 'lighting' circuits. 15A/16A socket outlets and other power outlets shall be wired in the 'Power' circuits. 5A/6A socket outlets shall also be wired in the "Lighting" circuit unless mentioned otherwise.

c) The wiring throughout the installation shall be such that there is no break in the neutral wire except in the form of a linked switch gear.

d) Surface wiring shall run, as far as possible, along the walls and ceiling so as to be easily accessible for inspection.

e) In all types of wiring, due consideration shall be given for neatness, good appearance and safety.

f) Colour coding:

Phase : Red / Yellow / Blue (three phase wiring)

Live : Red (single phase wiring)

Neutral : Black

Earth :Green

8. PASSING THROUGH WALLS OR FLOORS:-

When wiring cables are to pass through a wall, these shall be taken through a protection (steel/PVC) pipe or porcelain tube of suitable size such that they pass through in a straight line

i. Without twist or cross in them on either end of such holes. The end soft metallic pipe shall be neatly bushed with porcelain , PVC or other approved material.

ii. Where a wall pipe passes outside a building so as to be exposed to weather, the outer end shall be bell mouthed and turned downwards and properly bushed on theopen end.

iii. All floor openings for carrying any wiring shall be suitably sealed after installation.

9. JOINTS IN WIRING:-

i. No bare conductor in phase and/or neutral or twisted joints in phase, neutral, and/or protective conductors in wiring shall be permitted.

ii. There shall be no joints in the through-runs of cables. If the length of final circuit or sub main is more than the length of a standard coil, thus necessitating a through joint, such joints shall be made by means of approved mechanical connectors in suitable junction boxes.

iii. Termination of multi stranded conductors shall be done using suitable crimping type thimbles.

10. CONFORMITY TOI.E.ACT,I.E. RULES AND STANDARDS:-

i. All electrical works shall be carried out in accordance with the provisions of the Indian Electricity Act,1910 and Indian Electricity Rules1956 amended upto date.

ii. The work shall also conform to relevant Indian Standard codes of practice for the type of work involved.

iii. In all electrical installation works, relevant safety codes of practice shall be followed.

iv. The complete wiring installation shall confirm to IS:732 amended upto date.

11. GENERAL REQUIREMENTS OF COMPONENTS:-

QUALITY OF MATERIALS:-

All materials and equipment supplied by the contractor shall be new. They shall be ofsuch design, size and material as to satisfactorily function under the rated conditions of operation and to with stand the environmental conditions at site.

RATING OF COMPONENTS:-

i. All components in a wiring installation shall be of appropriate ratings of voltage, current and frequency, as required at the respective sections of the electrical installation in which they are used.

ii. All conductors, switches and accessories shall be of such size as to be capable of carrying the maximum current which will normally flow through them, without their respective ratings being exceeded.

CONFORMITY OF STANDARDS:-

All components shall conform to relevant Indian Standard specification, wherever existing. Materials with ISI certification mark shall be preferred. However for conduits, wiring cables, piano/tumbler switches and socket outlets, ISI marked materials shall only be permitted.

INTERCHANGEABILITY:-

Similar parts of all switches, lamp holders, distribution fuse boards, switch gears, ceiling groses, brackets, pendants, fan sand all other fittings of the same type shall be interchangeable each installation. SWITCHES & RECEPTACLES (Piano Type)

1. CONTROL SWITCHES FOR POINTS:-

i. The switch box or regulator box shall be hot dipped galvanized, factory fabricated. The wall thickness shall not be less than1.2mm (18gauge) for boxes upto a size of 20 cm x 30 cm, and above this size 1.6 mm (16 gauge) thick boxes shall be used. The metallic boxes shall be duly painted with anticorrosive paint before erection.

ii. Where a large number of control switches and/or fan regulators are required to be installed at one place, these shall be installed in more than one outlet box adjacent to each other for ease of maintenance.

iii. An earth terminal with stud & 2 metal washers shall be provided in each box for termination of protective conductors and for connection to socket outlet/metallic body of fan regulator etc.

iv. Clear depth of the box shall not be less than 50 mm, and this shall be increased suitably to accommodate mounting of fan regulators in flush pattern.

v. The fan regulators can also be mounted on the switch box covers, if so directed by the Engineer-in-charge.

vi. Control switches (single pole switches) carrying not more than 16 A shall be of piano type, as specified, and the switch shall be "ON" when then ob is down.

vii. Only MCB's shall be used for controlling industrial type socket outlets.Control switch shall be placed only in the live conductor of the circuit. No single pole switch or fuse shall be inserted in the protective (earth) conductor, or earthed neutral conductor of the circuit. All switches, regulators, outlets & other accessories shall be white colour with matching white cover plate. In no case ivory or off whites witches shall be accepted.

viii. All switches shall be as per IS3854 amended upto date.

2. SOCKET OUTLETS:-

i. Socket outlet shall be of the same type, white piano type as their control switches. These shall be rated either for 5A/6A or 15A/16A. Combined 5A/15A or 6A/16A six pin socket outlet shall be provided in `power' circuits.

ii. In an earthed system of supply, socket outlets and plugs shall only be of 3 pin type, the third pin shall be connected to earth through protective (loop earthing) conductor. 2pinor 5 pin sockets shall not be permitted to be used.

iii. Every socket outlets shall be controlled by a switch or MCB, as specified. The control switch/MCB shall be connected on the `live' side of the line.

iv. Outlet boxes for socket outlets (both15A/16A and 5A/6A) points shall be of size 175mmx 100mm. Unless and otherwise specified, the control switches for the 5A/6A and 15A/16A socket outlets shall be kept along with the socket outlets. All sockets shall be as per IS 1293amended upto date.

3. SWITCH BOX COVERS:-

Phenoliclaminated sheets of approved white shade (same as switches and sockets)shall be used for switch box covers. These shall be of white 3 mm thick synthetic phenolic resin bonded laminated sheet as base material and conforming to grade P-I ofIS:2036-1974, Secured to the box with counter sunk C.P. Brass Screws. The corners of cover plates shall be at right angle.

SWITCHES & BOXES (Modular Type)

i. The switchbox or regulator box shall be made of metal on all sides, except on the
ii. front. The boxes shall be used of the same make and model as of modular switches. In no case the locally manufactured switch boxes will be accepted. The size of box shall be governed by the number of switches/outlets/regulators on the respective board. The boxes shall be with zinc plating and yellow passivation to complies with the rust test asper IS 3854. The boxes should have slotted holes for level adjustments. The boxes shall be fitted with riveted brass earth terminals for earth connections.
iii. Clear depth of the box shall not in a range of 50 mm to 65 mm depending upon the size of board and manufacturer.
iv. Control switch shall be placed only in the live conductor of the circuit. No single poleswitch or fuse shall be inserted in the protective (earth) conductor, or earthed neutral conductor

of the circuit. The switches shall be provided with silver contacts. The neutral should make first and breaks last.

v. Socket outlet shall be rated either for 5A/6A or 15A/16A. 5/6 Amp sockets shall be of 5 pin type with shutters. Combined 5A/15A or 6A/16A six pin shuttered socket outlet shall be provided in `power' circuits. The earth pin shall be connected to earth through protective (loop earthing) conductor. All sockets shall be provided with safety shutters to allow easy entry of two pin plugs without the need to force the earth terminal by un safe means. All sockets shall confirm to IS: 1293.

vi. Every socket outlet shall be controlled by a switch, as specified. The control switch shall be connected on the `live' side ofthe line.

vii. The switches and sockets shall be manufactured using engineering plastic to make it fire retardant and highly resistant to impact.

viii. The fan speed regulators shall be of electronic and stepped type

ix. TheRJ-45datasocketshallbesuitableforcat5/cat6datacables.

x. Gold plated contacts shall be provided in all communication jacks to enhance data and voice transmission.

SWITCHGEAR AND CONTROLGEAR

1. GENERAL ASPECTS:-

i. All items of switchgear and distribution boards (DB's) shall be metal clad type.

ii. The types, rating and/or categories of switch gear and protective gear shall be as specified in the tender schedule of work.

iii. RCCB's and RCBO's where specified, shall conform to the requirements of current rating, fault rating, single phase or three phase configuration and sensitivity laid down in the tender documents.

iv. While each outgoing way of distribution board (D.B.) shall be of miniature circuit breaker (MCB) as specified, and of suitable rating on the phase conductor, the corresponding earthed neutral conductor shall be connected to a common neutral terminal block and shall be capable of being disconnected individually for testing purpose.

v. Independent earth terminal block. Every distribution board (single phase as well as three phase) shall have an earth terminal block identical to, but independent from neutral terminal block, to enable termination of protective (loop earthing) conductors (incoming as well as out goings) individually by screwed connection and without twisting.

vi. Earthing terminal (1 for single phase and 2 for three phase) shall be provided onthe metal cladding of switches and D.B.'s for body earthing. These shall be suitably marked.

vii. Knock out holes, with or without endplates as per standard design of manufacturers, shall be provided in the metal cladding of switches and D.B.' s for termination of conduits/cables.

viii. Each distribution board shall be provided with a circuit list giving details of each circuit which it controls and the current rating of the circuit, and the size of the fuse element.

2. MCB TYPE DISTRIBUTION BOARDS (MCBDB):-

i. MCB DB' s may be of single phase, three phase (horizontal type) suitable forfeeding single phase loads or 3 phase (vertical type) suitable for feeding single phase as well as three phase loads, each phase isolation type three phase DB in which each phase can be isolated by a separate circuit breaker or RCCB, as specified. These shall be complete with accessories, but without MCB's, which shall be specified as a separate item in the tender documents.

ii. The current ratings and the number of ways shall be as specified. Blanking plates shall be provided to close unused ways. These shall be indicated as a separate item in the Schedule of work.

iii. MCB DB's shall be of surface/flush mounting pattern according to the requirement oftheir location, and shall be suitable to accommodate MCB's and MCB type isolators and RCCB(ELCB) at incoming in single pole or multi pole configuration, as required.

iv. MCB DB's shall be double door type, dust and vermin proof conforming to IP 42, and shall be fabricated out of CRCA sheet steel, 1.6 mm thick, with stove enameled paint finish.

v. In case of Concealed/Recessed D.B.'s, cutting of brick work, providing suitable lintel, making good the wall including plastering etc. with necessary civil work including all Civil material shall be included in contractor's scope for proper completion of work.

vi. MCB DB's shall have removal type end plates with knock-outs at the bottom and top, and shall have hinged covers with locking arrangement.

vii. Only the knobs of the MCB's shall protrude out of the front covers through openings neatly machine made for the purpose.

viii. The bus bars used shall be solid electrolytic copper of appropriate sections.

ix. Din bar(s) shall be provided for mounting the MCB's.

x. The complete board shall be factory fabricated and shall be duly pre-wired in the works, ready for installation at site.

xi. The board shall be fully pre wired with single core PVC insulated copper conductors/insulated solid copper links, and terminated on to extended type terminal connectors, suitable for connections to the sizes of the respective conductors.

xii. All incoming and outgoing wiring to the pre wired MCB DB's shall be terminated only in the extended terminal connectors to be provided within the DB. The terminalconnectors shall therefore be so provided as to facilitate easy cable connections and subsequent maintenance.

3. MCCB TYPE DISTRIBUTION BOARDS (MCCBDB):-

i. All MCCB DB' s shall be of three phase suitable for feeding single phase loads or 3phase loads through SP/TP MCB's, IP 42 enclosure, sheet steel, double door with tinned copper bus bar, neutral bar, earth bar, knock outs etc. The DB's shall be original factory fabricated of approved make.

ii. The current ratings of Incomer MCCB shall be upto 250 amp and the number of ways shall be as specified. Blanking plates shall be provided to close un used ways.

iii. MCCB DB shall be of surface/flush mounting pattern according to the requirement of their location, and shall be suitable to accommodate Four pole MCCB at incomer andSP/TP MCB's at outgoings, as required.

iii. MCCB DB's shall be dust and vermin proof conforming to IP42, and shall be fabricated out of CRCA sheet steel,1.6mm thick, with stove enameled paint finish.

v. In case of Concealed/ Recessed D.B.'s, cutting of brickwork, providing suitable lintel, making good the wall including plastering etc. with necessary civil work includingallCivilmaterialshallbeincludedincontractor'sscopeforpropercompletionofwork.

vi. MCCB DB's shall have removal type end plates with knock-outs at the bottom and top, and shall have hinged covers with locking arrangement.

viii. Thebusbarsusedshallbesolidelectrolyticcopperofappropriatesections.

ix. Din bar(s) shall be provided for mounting the MCB's.

xiii. WORKMANSHIP:-

i. Good workmanship is an essential requirement to be complied with. The entire work of manufacture/ fabrication, assembly and installation shall conform to sound engineering practice.

ii. The work shall be carried out under the direct supervision of a first class licensed foreman, or of a person holding a certificate of competency issued by the state Government for the type of work involved, employed by the contractor, who shall rectify then and there the defects pointed out by the Engineer-in-charge during the progress of work.

4. COMMISSIONING ON COMPLETION:-

Before the work man leaves the work finally, he must make sure that the installation is in commission, after due testing.

5. COMPLETION PLAN AND COMPLETION CERTIFICATE:-

i. For all works completion certificate after completion of work shall be submitted to the Engineer-in-charge.

ii. Completion plan drawn to a suitable scale in tracing cloth with ink indicating the following, along with three blueprint copies of the same shall also be submitted.

a) Generally out of the building.

b) Locations of main switchboard and distribution boards ,indicating the circuit numbers controlled by them.

c) Position of all points and their controls.

d) Types of fittings, viz. fluorescent, pendants, brackets, bulkhead, fans and exhaust fans etc.

e) Name of work, job number, accepted tender reference, actual date of completion, names of Division/Sub-Division and name of the firm who executed the work with their signature.

6. ADDITION TO AN INSTALLATION:-

An addition, temporary or permanent, shall not be made to the authorized load of an existing installation until it has been definitely ascertained that the current carrying capacity and the condition of the existing accessories, conductors, switches etc affected, including those of the supply Authorities, are adequate for the increased.

EARTHING

1. SCOPE:-

This chapter covers the essential requirements of earthing system components and their installation. For details not covered in these specifications. IS code of Practice on Earthing (IS:3043-1987) shall be referred to.

2. INSTALLATION:-

1. ELECTRODES:-

i. Plate electrode shall be buried in ground with its faces vertical, and its top not less than 3 m below the ground level. The installation shall be carried out as per standard drawing.

ii. When more than one electrode is to be installed, a separation of not less than 2 m shall be maintained between two adjacent electrodes.

iii. a) The strip or conductor electrode shall be buried in trench not less than 0.5 m deep.

b) If condition necessitate the use of more than one strip or conductor electrode, they shall be laid as widely distributed as possible, in a single straight trench where feasible, or preferably in a number of trenches radiating from one point.

iv. Normally an earth electrode shall not be located closer than 1.5 m from any building. Care shall be taken to see that the excavation for earth electrode does not affect the foundation of the building; in such cases, electrodes may be located further away from the building, with the prior approval of the Engineer-in-Charge.

3. WATERING ARRANGEMENT :-

i. In the case of plate earth electrodes, a watering pipe 20mm dia. medium class pipes hall be provided and attached to the electrodes. A funnel with mesh shall be provided on the top of this pipe for watering the earth.

ii. Thewateringfunnelattachmentshallbehousedinamasonryenclosureofsizenotl essthan 30cm*30cm*30cm.

iii. A cost iron/MSframewithMScover,6mmthick, and having locking arrangement Shall be suitably embedded in the masonry enclosure.

4. EARTHING CONDUCTOR (Main earthing lead):-

i. The earthing conductor shall be securely terminated on to the plate with two bolts, nuts, check nuts and washers.

ii. A double C-clamp arrangement shall be provided for terminating tape type earthing conductor with GI watering pipe coupled to the pipe earth electrode. Galvanized "C" shaped strips, bolts, washers, nut sand check nuts of adequate size shall be used for the purpose.

iii. The earthing conductor from the electrode up to the building shall be protected from mechanical injury by a medium class 15 mm dia GI pipe in the case of wire, and by 40mmdia, medium class GI pipe in the case of strip. The protection pipe in ground shall be buried at least 30cm deep (to be increased 60 cm in case of road crossing and pavements). The portion within the building shall be recessed in walls and floors to adequate depth in due coordination with the building work.

iv. The earthing conductor shall be securely connected at the other end to the earth stud/ earth bar provided on the switchboard by:

v. Solderedorpreferablycrimpedlug,bolt,nutandwasherinthecaseofwire,and,

vi. Bolt, nut and washer incase of strip conductor.

vii. EarthingTerminal/neutralpoint/earthbusincaseofequipments/substations.

5. PROTECTIVE (Loop earthing/earth continuity)CONDUCTOR:-

i. Earth terminal of every switchboard in the distribution system shall be bonded to the earth bar/terminal of the upstream switchboard by protective conductor(s).

ii. Two protective conductors shall be provided for a switchboard carrying a 3 phase switch gear there on.

iii. All the mountings of industrial type switchboards shall be bonded to the earth stud/earth bar using a protective conductor looping from one to another. Loop earthing of individual un its will not be however necessary in the case of cubical type switch boards.

iv. The earth connector in every distribution board (DB) shall be securely connected totheearthstud/earthbarofthecorrespondingswitchboardbyaprotectiveconductor.

v. All metallic switch boxes and regulator boxes in a circuit shall be connected to the earth connector in the DB by protective conductor (also called circuit protective or loop earthing conductor), looping from one box to another up tot he DB.

VI. The earth pin of socket outlets as well as metallic body of fan regulators shall be connected to the earth stud in switch boxes by protective conductor. Where the switchboxes are non-metallic type, these shall be looped at the socket earth terminals, switchoratanindependentscrewedconnectorinsidetheswitchbox.Twistedearthconnectionssha ll not be accepted in any case.

VII. Double earthing strips in rising mains, bus trunking etc. shall be securely connectedtotheearthbar/earthstudatthesendingendswitchboard.Inthecaseofoverheadbus bar systems, protective conductors shall be provided in addition to feeder cable armouring connection.

6. EARTH RESISTANCE:-

i. The earth resistance at each electrode shall be measured. No earth electrode shall Have a greater ohm resistance than 5 ohms as measured by an approved earth testing apparatus. In rocky soil the resistance may be up to 8ohms.

ii. Where the above stated earth resistance is not achieved, necessary improvement shall be made by additional provisions, such as additional electrode(s), different type of electrode, or artificial chemical treatment of soil etc., as may be directed by the Engineer-in-charge.

7. MARKING:-

i. Earth bars/ terminals at all switch boards shall be marked permanently either as"E".

ii. Main earthing terminal shall be marked "SAFETYEARTH-DONOTDISCONNECT

CABLES

LOW VOLTAGE (L.V.) CABLES

1. Wires:

i. The design manufacture, testing and supply of single core FRLS PVC insulated 1.1 KV grade stranded twisted wires under this specifications shall comply with latest edition of following standards.

- IS:3961Current rating for cables.
- IS:5831HRPVC/PVC insulation and sheath of electric cables.
- IS:694 HRPVC/PVC insulated cables for working voltage upto and including 1100volts.
- IEC:754(i) FRLSPVC/HFFR insulated cable.

ii. Copper/ Aluminium stranded twisted conductor HRPVC / FRLS PVC / PVC insulated wires shall be used in conduit as per item of work. Aluminium for power cables and copper for control cables shall be used.

iii. The wires shall be colour coded RYB, for phases, Black for neutral and Green for earth. Progressive automatic in line indelible, legible and sequential marking of the length of cable in meters at every one meter shall be provided on the outer sheath of cable.

2. Cables

i. The design, manufacture, testing and supply of the cable under this specification shall comply with latest edition of following standards:

- IS : 8130 Conductors for insulated electric cables and flexible cords.IS:5831HRPVC/PVC insulation and sheath of electric cables.
- IS:3975 Mild steel wires, strips and tapes for armouring cables.
  IS: 3961Current rating of cables.
- IS:694 HRPVC/ PVC insulated (heavy duty) electric cables for working voltage upto and including1100 volts.
- IS: 424-1475 (F-3)

ii. Power cable-flammability test.

- IS : 7098(I) Specification for cross linked polyethylene insulated XLPE/PVC sheathed cable for working voltage upto 1.1 KV.
- IS : 1554 Specification for PVC insulated (heavy duty)electric cables for working voltages up to and including1100 volts.
- IS : 10810 Testing method of
  cable.
- IS: 6121 Cable glands.
- ASTM-D:2863 Standard method for measuring the minimum oxygen concentration to
- Support candle-like combustion of plastics (Oxygen Index).
- ASTM-D:2843 Standard test method for measuring the density of smoke from the burning or decomposition.
- IEEE:383 Standard for type of test Class-IE, Electric cables, field splicers and connections for power generation station.
- ASTME: 662IEC :
- 754 (A)Standard test method for specific optical density of smoke generated by solid materials.

- IS : 10418Cable drums.

3. Technical Requirements

a) The cables shall be suitable for laying in racks, ducts, trenches conduits and under-groundburiedinstallationwithuncontrolledbackfillandchancesoffloodingbywater.

b) They shall be designed to withstand all mechanical, electrical and thermal stresses under steady state and transient operating condition.

c) The aluminium/copper wires used for manufacturing the cables shall be true circular/sector in shape before stranding and shall be of uniformly good quality, free from defects. The conductor used in manufacture of the cable shall be of H2 grade.

d) The cable should withstand 1 – 50KAfor 1 sec with insulation armour insulated at one end. Bidder shall furnish calculation in support of capability to withstand the earth fault currents. The current carrying capacity of armour and screen (as applicable) shall not be less than the earth fault current values and duration. Copper screen of each core shall be suitable for carrying full fault/earth current.

e) The fillers and inner sheath shall be of non-hygroscopic fire retardant materials and shall be suitable for the operating Temperature of the cable.

Filler and inner sheath shall not stick to insulation and outer sheath. f) Progressive automatic in line indelible, legible and sequential marking of the length of the cable in meters at every one meters shall be provided on the outer sheath of all cables and atevery5 meter 'FRLS' marking incase of 'FRLS 'cables.

g) Strip/Wire armouring following method (b) mentioned in IS:3975 shall only be acceptable. For single core cable aluminium wire armouring shall be used.

h) Allow able tolerance on the over all diameter of the cables shall be+2mm.

i) The normal current rating of all PVC insulatedcablesshallbeasperIS:3961.

j) A distinct inner sheath shall be provided by pressure extrusion process for all multicore armoured and unarmoured cables as per IS:5831.

k) Outer sheath shall be provided by extrusion process as perIS:5031.

l) The breaking load of armour joint shall not be less than 95% of that armour wire. Zinc rich paint shall be applied on armoured joint surface.

m) In plant repairs to the cables shall not be accepted.

n) All the cables shall be supplied in non-returnabled rums as per IS:10418.

FRLS Cables

i) The inner and outer sheath of cables shall have an oxygen index of not less

Than 29 as per ASTMD:2863.

ii) The maximum acid gas generation by weight as per IEC:754(i) shall not be more

Than20% for outer sheath material of all cables. Bidder shall also guarantee the maximum the or ethical acid gas generation with20% by weigh to outer sheath.

iii) The cables inner and outer sheath shall meet the requirement of light transmission of 40% (minimum and shall be tested as per ASTMD:2843). In case the test for light transmission is conducted as per ASTME:662. The bidder shall furnish smoke density values as per this standard and shall core late the anticipated light transmission when tested as per ASTMD:2843.

iv) The cable shall pass the fire resistance test as per SS:42,41,475(I) and flammability test as per IEEE:383.

v) Smoke/light density rated shall be 40% (minimum) and 65%(maximum).

5. Inspection All cables shall be inspected at manufacture place and on receipt of the same at site checked for any damage during transit.
6. Joint in Cables The contractor shall take care that the cables received at site are distributed to various locations in such a manner as to ensure maximum utilization and avoidance of cable jointing. Cable shall be rechecked before cutting in lengths, where the joints are unavoidable, the location of such joints shall be got approved from the Owner/Consultant. The joints shall be done by qualified jointer strictly in accordance with manufacturer's instruction/drawings.
7. Joint Boxes For Cables

The cable joint boxes shall be of appropriate size suitable for type of cable of particular voltage rating.

8. Jointing of Cables

- All cable joints shall be made in suitable, approved cable joints boxes, on the jointing of cables in the joint box and the filling in of compound shall be done in accordance with manufacturer's instructions and in an approved manner. All straight through joints shall be done in epoxy mould boxes with epoxy resins. Straight through joints shall not be permitted unless the length of run is in excess of cable drum.
- End terminationsofcablesmorethan1.1 KV grade shall be done with epoxy mould boxed and epoxy resin. Cable glands shall be1.1KVgrade double compression type and made to tin

plated heavy duty brass casting and machine finished. Glands shall be of robust construction capable of clamping cable and cable armour, firmly without injury of cable.

- All was her sand hardwares shall be made of brass tinned. Rubber components used in the glands shall be made of neoprene of tested quality.
- Cable lugs shall be tinned copper/aluminium solder less crimping type conforming to IS:8309 suitable for aluminium or copper conductor.
- Crimping of terminals shall be done by using Corrosion inhibitory compound, with crimping tool.
- The contractor shall liaise fully with all other contractors to achieve an efficient and properly coordinated installation where equipment has to be re-positioned due to lack of site liaison, no extra cost shall be incurred by the client.

9. Testing of Cables

- Cables shall be tested at factory as per requirement of IS:1554 Part-I. The tests shall in corporate outline tests, type tests and acceptance tests. Prior to dispatch of cables. All the testes will be witnessed by Employer / Consultant in accordance with testing procedure approved by Consultant at no extra cost to Employer. Besides that the following tests shall be carried out:

a) Insulation test between phases and phase to earth for each length of cable before and after jointing.

On completion of cable laying work, the following test shall be conducted in the presence of Architect/Owner.

b) Insulation resistance test(Sectional and overall)1000/5000Vdepending upon the voltage grade of cable.

c) Continuity test.

10. Laying of Cable

- The cable drum shall be placed on jacks before unwinding the cable. Great care shall be exercised in laying cables to avoid forming kinks. At all changes indirections in horizontal & vertical places, the cable shall be bent with a radius of bend not less than12–15times diameter and 8times only at places of space constraints.

- The cable of 1.1KV grade shall be laid not less than 750mm below ground levelin a375mm wide trench (throughout), where more than one cable is to be laid in the same

trench, the width of the trench shall be increased such that the inter axial spacing between the cables

- except where otherwise specified shall at least be 150mm minimum or as per site requirements or as approved by the Engineer-in charge. Where single core cables are used in multiphase systems, the cables shall be installed in trefoil where possible.
- In case the cables are laid in vertical formation due to unavoidable circumstance the depth per tier shall be increased by 200mm(minimum).Cable shall be laid in reasonably straight line, where a change in direction takes place a suitable curvature shall be i.e. either20times the diameter of the cable or the radius of the bend shall not be less than twice the diameter of the cable drum or whichever less. Minimum 3meter long loop shall be provided at both sides of every straight through joint & 3metersat each end of cable or as directed at site.
- Greater care shall be exercised in handling the cable in order to avoid forming 'Kinks'. the cable drum shall in-verbally conveyed on wheels and the cable unrolled in right direction as indicated on the drum by the manufacturer. The cable shall be pulled over rollers in the trench steadily and uniformly without jerks and strains.
- Cables laid in trenches in single tier formation, 10 cms. in total sand cushioning be provided below and above the cable before a protective cover is laid. For every additional vertical tier. The 30cm of sand cushion be provided over the initial tier. The cable shall be protected by 2nd class bricks of size not less than 230x115x75mm, stone tiles/RCC curved channel be placed on top of the sand breadth wise for the full length of the cable and where more than one cable is to be laid in the same trench the brick shall cover all cables and project at least 8cms. Over the outer sides of the end cables.
- Filling of trenches shall be done after the sand cushioning and laying of tiles or brick s are carried out to the satisfaction of the Engineer-in-charge(Refer drawing). Back fill for trenches shall be filled in layer not exceeding 150mm. Each layer shall be properly
- Rammed & consolidate before laying the next layer.
- RCC pipe shall be provided for all road crossing. The size of the pipe shall be accordingtothecableandaminimum100mmdia. Pipe shall be provided. The pipe shall be laid in ground with special arrangement and shall be cement jointed and concreting shall be made as per relevant IS with latest amendment. Nothing extra shall be paid on this account. Location of cables laid directly underground shall be indicated by cable

marker at an interval of 30 meters &with change of direction. Aluminium strip cable tag of20mmwide with engraved tag no. shall be provided at both ends of cable.

- Where the cables are to be laid in ducts (masonry trenches) inside the building, they will have to be laid on MS rack/ on MS cable trays grouted in walls trenches. Cables sizing through floors shall be protected from mechanical damage by a steel channel to aheightofonemeterabovethefloorwherecablepassthroughwalltheyshallbesleevedwith PVC/steel conduit.
- Where the cables are laid in open (in building) along walls, ceiling or above false ceiling, cable rack (ladder type) or cable tray shall be provided. The size of the cable tray or rack shall depend on the number of cables to pass over that rack. Cable tray/rack shall be properly supported through wall/ ceiling according to the site conditions. Cable lay on tray & riser shall be neatly dressed &clamped at an interval of 1000 mm & 750mmfor horizontal & vertical cable run respectively either side at each bend of cable. All power cables shall be clamped individually & control cables shall be clamped in groups of three or four cables. Clamps for multi core cables shall be fabricated of 25x3 GI flats. Single core power cable shall be laid in trefoil formation & clamped with trefoil clamps made of PVC/fiber glass. Cable openings in wall/floor shall be sealed by the contractor suitably by Hessian tape& bitumen compound or by any other proven to preventing rests of water. After the cables are laid, shall be tested as per IS and the result submitted to Architects/Engineer and in case the results found unsatisfactory, all there pairing/replacing of cables will be done by the contractor free of charge.
- Cable shall be installed so that separation shown in the table below is observed.

HVCable	HV Cable - 50mm
ELV&LV230V/433V	ELV& LVcable230V/433V -50mm
HVcables	ELV &LVcables230 V/433V-300mm
LVcables433V	Telephone/Instrumentcable -350mm
Allcables	Allwet/hotpipe work -600mm

L.T.PANEL

1. CONSTRUCTION FEATURES

a) Panels shall be indoor, metal clad, modular construction, fix type (except circuit breaker cubicles) air insulated and floor mounted type.

b) Unless otherwise mentioned, panels shall be of single front construction and shall be of dead front type.

c) All panels shall be extensible on both sides.

d) All panels shall be dust proof and vermin proof.

e) The panels shall have horizontal Bus bar Chamber at top of the panel even for top cable entry.

f) All panels shall have provision for cable entry from top or from bottom or both as required. The same shall be confirmed to the Vendor during detailed engineering approval of shop drawing of panel manufacturer.

g) All panels including capacitor panels shall be fully compartmentalized with metal insulating partitions between individual compartments.

h) The Horizontal bus bar chamber shall be separate & totally enclosed.

i) Minimum thickness of CRCA MS sheet member shall be 1.6 mm for non load bearing members and 2.0 mm for load bearing members.

j) All panels shall comprise a continuous line up of dead front, free standing vertical sections. The installation of circuit breakers shall be limited to the bottom two tiers only. In two tiers formation two nos. Of up to1000 Amp. breakers can be provided.

k) All doors and cut outs shall be provided with neoprene gaskets.

l) The back doors of the panels shall be double door leaf type where the panels havemore than 400mm width.

m) All doors shall be supported by strong concealed type hinges.

n) All relays, meters, and switches etc. Shall be flush mounted type.

o) All incoming terminals shall be provided with shrouds. Supports / shrouds shall betransparentandshallbemadeofSMC/DMCmaterial.HoweverBakeliteHylammaterialisnotacceptableandshallnotbeused anywhere in panels.

p) The complete structure shall be rigid, self supporting free from vibration, twists and bend setc.

q) The panel circuit breaker feeders shall be in single front draw out execution. The incoming & bus coupler circuit breaker feeders shall be in single tier formation while the outgoing circuit breaker feeders may be in double tier formation, unless otherwise specified.

r) A suitable barrier shall be provided between the circuit breaker and the associated control.

s) The number of modules shall be so decided that the cable alleys are not overcrowded. However the number of module in any panel shall not exceed six. The minimum size of module shall be 300mm and 225mm for starter and switch fuse /MCCBs feeders respectively. The minimum clear width of cable alley shall be300mm.

t) In cable alley, outgoing terminal s shall be identified with feeder number.

u) The panel shall be provided with three phase buses and neutral bus bars of aluminium sections throughout the length of the panel and shall bead equately supported and braced to withstand the stresses due to the short circuit. Maximum temperature rise of bus bars and bus bar connection while carrying rated current shall not exceed 40 C over an ambient temperature of 50 C. Bus bar sizing calculation shall be submitted for approval before start of fabrication..

2 BUS AND BUSTAPS

a) The main buses and connection shall be of high grade of aluminium bus bars conductivity aluminium 1 aluminium alloy (Grade EC-91 E), sized for specified current ratings with max, temp. limited to85deg.C(35deg.above50deg. Ambient temp.).

b) Vertical bus bars shall be designed depending upon the actual feeder requirement. Bimetallic connector shall be provided for connection between dissimilar metals.

c) Bus bars and connections shall be fully insulated for working voltage with adequate phase 1 ground clearances. Insulating sleeves for Bus bars and shrouds for joint shall be provided. Minimum clearance of 25 mm is required between phases and between phase & earth.

d) Shrouds for bus bars joints / tapping points shall be of fiber glass only. Bus insulators shall be flame retardant, track resistant type with high creep age surface and of non-hy gyroscopic material such as epoxy /SMC / DMC.

Bus bars shall be supported and braced to withstand the stresses due to max. short circuit current and also to take care of any thermal expansion..

e) The bus bar size shall be of similar size as of bus duct.

3 CHANGE OVERS WITCHES

a) Changeover switches shall be 3 pole, heavy duty, group operated load break fault make type with AC 23A duty.

b) The switches shall be capable of successfully with standing the thermal stress foronesec. Caused by the short circuit corresponding to the fault level specified.

c) The switches shall be able to withstand mechanical stresses caused by the peak short circuit currents corresponding fault level specified.

d) The switches shall be provided with operating handle compartment door and shall be so interlocked that on the hinged compartment door and shall be so interlocked that:

e) The door can be opened only when the switch is in OFF position.

f) It shall not be possible to close the switch when the door is open.

g) The switch shall be provided with pad-locking arrangement for 250A and above rating.

h) The switch shall be provided with defeat interlock facilities.

4 FUSES

a) All fuses shall be HRC cartridge link type.

b) The fuses shall be provided with visible indication when they have operated.

c) Rating of the fuses shall be so chosen so as to have co-ordination with switch. Fuses shall preferably mounted directly on plug in type fuse bases & sufficient number of insulated fuse pullers shall be supplied.

d) Fuses and links functionally associated with the same circuit shall be mounted side by side. Earthing and neutral links in main supply circuits shall be of silver plated copper & of bolted pattern.

5 CONTACTORS

a) Contactors shall be of double break, single throw and electromagnetic and non gravity type.

b) Contactors shall be suitable for interrupted duty and shall be rated for class AC-3duty.

c) Main contacts of contactors shall be silver faced.

d) Operating coils of contactors shall be suitable for operation on 220/240V AC, 1phase, 50 Hz supply.

e) e) Contactors shall be provided with at least two pairs of 'NO' and' N C auxiliary contacts.

f) Contactors shall not drop out at voltages down to 70% of coil rated voltages and min. pick up voltage shall be 85%.

6 OVERLOAD RELAYS

a) Overload protection for each motor feeder (wherever required) shall be provided by thermal overload relay on each of the three phases.

b) The relay shall be duly compensated against fluctuations on ambient temp. and frequency and shall have single phasing preventer feature.

c) Relay shall be hand reset type from the front of the cubicle door.

Overload relay for fan applications shall be of heavy duty type with provision of by passing the same during starting of the fan.

7 CAPACITORS

a) The capacitor shall be of mixed dielectric type rated for 440Volts. Capacitors shall be provided with discharge resistors. The value of discharge resistors should be such that the residual voltage be less than 50V in one minute.

b) Capacitors shall be suitable for prolonged operation at an rms. voltage betweenterminalsnotexceeding1.10timestheratedvoltage, excluding transients.

c) Capacitors shall be suitable for continuous operation at an rms. line current not exceeding 1.30 times the current which occurs at rated sinusoidal voltage and rated frequency excluding transients.

d) The maximum continuous reactive output of a capacitor (including any due to flow of harmonic currents) shall not exceed 30%over rated reactive output of a capacitor.

e) Loss in the capacitors shall be kept also was possible.(Max.0.5W/KVAR).

f) Wherever capacitor consists of several elements inside the units, each element shall be provided with individual fuses, so that the unit need not be discharged or

g) Additional name plate of CTs lPTs shall be provided (if required) at such a place that it shall be possible to find out details of CTslPTs after mounting in the panel.

8 VOLTAGE TRANSFORMERS

a) Voltage transformers shall be cast-resin, fixed type and shall have an accuracy class of 1.0.

b) Low voltage fuses, sized to prevent overload, shall be installed in all ungrounded secondary leads. Fuses shall be suitably located to permit easy replacement while the board is energized.

9 RELAYS

Relays wherever provided shall be of draw-out design with built-intesting facilities. Small auxiliary relays may be in non-draw out execution-.

10 CONTROL AND SELECTOR SWITCHES

a) Control and selector switches shall be of rotary type having enclosed contacts, which are accessible by the removal of cover.

b) Control and selector switches shall be of flush mounted type and on front of panels..

c) Selector switches shall be of stay –put maintained contact type.

d) Control switches shall be provided with escutcheon plate clearly marked to show the position.

11 INDICATING METERS AND INSTRUMENTS

Indicating instrument (96x96mm) shall be digital meter, switch board type and accuracy class of.!(1 % full scale± 1 count).

12 INDICATING LAMPS

a) Indicating lamps shall be of LED type, low watt consumption and provided withappropriatevalueofresistors.TheLEDsshallalsohaveanin-builtsurgesuppressor.

b) Bulbs and lenses shall be interchangeable and easily replaceable from thefrontofthepanel.

13 PUSH BUTTONS

a) All push buttons shall be of the push to actuate the contact type.

b) All push buttons shall be oil tight and shall be provided with adequate no. of contacts.

14 POWER ANDCONTROL CABLE TERMINATION

a) Suitable supporting arrangement shall be provided for all power and control cables entering the panel.

b) Removable undrilled gland plate of 3 mm thick of MS for multi core cables and 4mmthick of Aluminium for single core cables sufficient in size to accommodate all compression type, heavy duty brass glands shall be provided.

c) Adequate termination arrangement shall be provided for all power cables which shall be aluminium / copper conductor, PVC insulated, sheathed, armoured PVC sleeved overall, heavy duty cables, 1.1 KV grade. Power cables termination shall be by means of crimping type lugs on conductor cables.

d) The terminal blocks shall be bolted lug type for cables. These shall be protected type and rated for 1100 Volts service. The minimum current rating of terminal block shall be 16 Amp. The construction shall be such that after the connection of cable by means of lugs, necessary clearance and creep age distance are available.

e) Whereverthereismorethanoneequipmentconnectedonthesamefeeder,separateterminals shall be provided.

15 INTERNAL WIRING

a) All internal wring shall be carried out with stranded copper conductors, PVCinsulated,1100/650 V grade.

b) Min. size of conductor 2.5 sq. mm for AC control wiring and 4.0 sq. mm. for DCcontrolwiring.Currenttransformersecondarywiringshallbewith2.5sq.mmconductor.

C) All wiring shall be run on the sides of the panels and shall be neatly bunched and shall not affect access to equipment mounted in the panels.

d) Wiring shall be terminated on terminal blocks using crimping type lugs and without joints or tees on their runs.

e) Power wiring shall be done either by phase identifying colored wires or suitably colored PVC sleeves shall be provided at each end of wire.

The following wiring codes shall be used.

Instrument Transformer: Red, yellow or blue depending upon phase with which wire is associated.

A-C phase wire: WhiteA-C
Neutral wire: Black Earth
connection: Green

f) PVC identification ferrules, yellow colour with black engraved letter shall be provided at each end of all control wires marked to correspond with equipment designation & termination numbers.

g) Ferrules provided shall be oil tight and numbered from left or right.

16 TERMINAL BLOCKS

a. Terminalblocksforcontrolwiringshallbe650Vgrade10sq.mmsize.
b. Terminal blocks shall be grouped depending on circuit voltage.
c. Different voltage groups of terminals blocks shall be segregated.
d. Terminals blocks shall be numbered for identification and provision shall be provided for terminal labels.
e. Terminalblocksrequiringduplicationshallbeprovidedwithsolidbondinglinks.
f. Terminal blocks for current transformer secondary lead wires shall be provided with shorting, disconnecting earthing facilities.
g. Terminal blocks and control wiring shall be so arranged that only one conductor of external wiring required to be terminated in at each terminal.

17 GROUND BUS

a) A ground bus, rated to carry maximum fault current, shall extend to full length of the panel.

b) The ground bus shall be provided with two-bolt drilling with GJ. bolts and nuts at each end to receive up to75X 10 mm G.I. flat. .

18 SPACE HEATERS

Each cubicle shall be provided with the most at controlled space heaters.

19 AC/DCPOWERSUPPLY

a) The panels shall be suitable to receive following power supplies.

ACSupply: Single Feeder
DCSupply : Double Feeder

b) Isolating switch fuse units shall be provided at each switchgear for the incoming supplies, 4-pole, single throw for AC. c) Bus-wires of adequate capacity shall be provided to distribute the incoming supplies to different cubicles. Isolating switch-fuse units shall be provided at each cubicle for AC supplies.

d) AC load shall be so distributed as to present a balance loading on three phase supply system.

20 NAME PLATES

a) Nameplatesofanodizedaluminiumshallbefurnishedatcubicleandateachinstrument, device mounted on and inside the cubicle.

b) Caution notice on suitable metal plate shall be affixed at the back of each vertical panel.

c) Name plates for feeders shall be provided on front and back of the panel.

21 . TROPICAL PROTECTION

a) All equipment, accessories and wiring shall have fungus protection, involving special treatment of insulation and metal against fungus, insects and corrosion.

b) Screens of corrosion resistant material shall be furnished on all ventilating louvers to prevent the entrance of insects.

22 . PAINTING

a) All surfaces shall be sand blasted, pickled and grounded as required to produce a smooth, clean surface free of scale, grease and rust.

b) After clearing, the surfaces shall be given a phosphate coating followed by 2 coats of high quality primer and stoved after each coat.

c) The panels shall be finished with two coats of Siemens Grey (Shade RAL 7032)powder coated / Polyester enameled.

23 . TESTS & INSPECTION

After completion of all work at the manufacturer's works the switchboards shall be inspected and tested in presence of Purchaser's representative. However, stage inspection may be carried out from time to time to check progress of work and workmanship. The following tests shall be carried out:

i) All routine tests specified in relevant Indian/British Standards shall be carried outonall circuit breakers.

ii) Testforprotectiverelayoperationbyprimaryorsecondaryinjectionmethod.

iii) Operation of all meters.

iv) Secondary wiring continuity test

v) Insulation test with 1000 Volts megger, before and after voltage test.vi) HV test on secondary wiring and components on which such test is permissible (2 KV for one minute)

vii) Simulating external circuits for remote operation of breaker, remote indicating lights and other remote operations, if any.

viii) Measurement of power required for closing/trip coil of the breaker.

ix) Pickup and drop out voltages for shunt trip and closing coils.

x) CT Polarity test.

Vendor shall provide all facilities such as power supply, testing instruments and apparatus required for carrying out the tests. Required copies of test certificates for all the tests carried out along with copies of type test certificates and certificates from Sub-Vendor for the components procured from the mare to be submitted be for dispatch of switch boards.

27. DRAWINGS AND INFORMATION

The Vendor shall furnish following drawings/documents in accordance with enclosed requirements:

i) General Arrangement drawing of the Switchboard, showing front view, plan, foundation plan, floor cutouts/trenches for external cables and elevations, transport sections and weights.

ii) Sectional drawings of the circuit breaker panels, showing general constructional features, mounting details of various devices, bus bars, current transformers, cable boxes, terminal boxes for control cables etc.

iii) Schematic and control wiring diagram for circuit breaker and protection including indicating devices, metering instruments, alarms, space heaters etc. Vendor drawings to be based on Purchaser's Control Wiring Diagram, if furnished.

iv) Terminal plans showing terminal numbers, ferrules markings, device terminal numbers, function etc.

v) Relay wiring diagrams.

vi) Equipment List.

Vendor shall furnish required number of copies of above drawings for Purchaser's review, fabrication of switch boards shall start only after Purchaser's clearance for the same. After final review, required number of copies and reproducible shall be furnished as final certified drawings.

The information furnished shall include the following:

i) Technical literature giving complete in formation of the equipment.

ii) Erection, Operation and Maintenance Manual complete with all relevant information, drawings and literature for auxiliary equipment and accessories, characteristics curves for relays etc.

iii) A comprehensive spare parts catalogue.

28. TOOLS

One complete set of all special or non-standard tools required for installation, operation and maintenance of the switch board shall be provided. The manufacturer shall provide a list of such tools individually priced with his quotation.

29. DEVIATIONS

Deviation from specification must be stated in writing at the quotation stage. In absence of such a statement, it will be assumed that the requirements of the specifications are met without deviation

No. 258 /PW/CE/EE(D)/AE(C)/F.No.290/2018-19
GOVERNMENT OF PUDUCHERRY
COMPUTER DESIGN CENTRE,
PUBLIC WORKS DEPARTMENT, PUDUCHERRY
Puducherry, the 14/08/2019

CIRCULAR

Sub: PW-CDC- Communication of updated approved makes / materials for use in construction and maintenance works of Chief Engineer, Chennai Zone, CPWD – Reg

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A copy of circular for updated list of approved makes / materials for use in construction and maintenance of works published by Office of the Chief Engineer, Chennai Zone, CPWD vide No.32/04/2018/CE(SZ)I/1694-99; dt: 09/08/2019 is also applicable to PWD, U.T. of Puducherry, since we are adopting the DSR 2018. Now this above circular is uploaded in the PWD website http://pwd.py.gov.in .

Hence it is requested that the above list of approved materials shall enclose in the NITs with effect from 15/08/2019 onwards.

//By order of Chief Engineer //

(K. VEERASELVAM)
Executive Engineer (Designs)

To

1) The Director, Directorate of Economics & Statistics, Puducherry
2) The Director, Local Administration Department, Puducherry
3) The Superintending Engineer, Electricity Department, Puducherry
4) The Superintending Engineer, Circle-I, PWD, Puducherry
5) The Superintending Engineer, Circle-II, PWD, Puducherry
6) The Superintending Engineer, Circle-III, PWD, Karaikal
7) The Chief Town Planner, Town & Country Planning Department, Puducherry
8) The Under Secretary (Works), Govt. of Puducherry, Chief Sect., Puducherry
9) The Project Manager, IGMC&RI, Kathirkamam, Puducherry
10) The Joint Project Director (Tech), T'sunami, Puducherry
11) The Superintending Engineer, LAD/ Slum Clearance Board, Puducherry
12) The Senior Accounts Officer, Central Office, PWD, Puducherry
13) The Executive Engineer, SBDI / SBDII / BRS / BRN / BRC / Irrigation / NH/ PHD / Planning, PWD, Puducherry
14) The Executive Engineer, B&R/I&PH, PWD, Karaikal
15) The Executive Engineer, PWD, Mahe, Yanam
16) The Executive Engineer, LAD / Pondicherry Municipality / Oulgaret Municipality
17) The Executive Engineer, Pondicherry Housing Board / PIPDIC, Puducherry
18) The Executive Engineer, MTPG&RIHS/MGPGI, /PORT/ PADCO / RIVER, Puducherry
19) The Executive Engineer, PAJANCOA, Karaikal
20) The Executive Engineer, Pondicherry Engineering College, Puducherry
21) The Assistant Engineer, Electrical Sub Division, PWD, Puducherry
22) The Registrar, Pondicherry University, Kalapet, Puducherry
23) The Chairman, BAI/ Local Contractors Association, Puducherry

Copy to:

1) The P.S. to the Chief Engineer, PWD, Puducherry
2) The P. S. to the Secretary (Works), Govt. of Puducherry, Chief Secretariat

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भारत सरकार /GOVERNMENT OF INDIA
मुख्य अभियंता (दक्षिण अंचल) I का कार्यालय
OFFFICE OF THE CHIEF ENGINEER (SZ)I
केंद्रीय लोक निर्माण विभाग /CENTRAL PUBLIC WORKS DEPARTMENT
जी स्कंद , 3री मन्ज़िल, राजाजी भवन/G WING, III FLOOR, RAJAJI BHAVAN,
बेसण्ट नगर चेन्नै -90/BESANT NAGAR, CHENNAI-90.
044-24464965 फ़ेक्स /Fax : 044-24919871/24910922
E MAIL- cpwdsz1@nic.in

सत्यमेव जयते

CPWD

No:- 32/04/2018/CE(SZ)I/ 1694-99

09.08.2019

To

1) The Executive Engineer,
   CID, C2D, C3D, C4D, CPWD
2) The Executive Engineer, CED, CPWD.
3) The Executive Engineer (P),
   O/o CE, Chennai

EE (P)
Pl. do the needful immediately.
13.8.2019.

Sir,

Sub:- List of updated approved makes of materials for use in construction & maintenance works of CE, Chennai Zone – reg

AE(C)
13/8/19

The updated list of approved makes / materials is attached for use in the construction and maintenance works of Chennai Zone, CPWD as required in NITs issued with effect from 15.08.2019. The list is suggestive and based on presentations made by interested manufacturers before CPWD Engineers and Architects at Chennai. However NIT approving authorities other than the Chief Engineer are advised to inform the changes adopted by them in the attached list to the undersigned along with reason for the changes so that the list is updated at zonal level as well.

This issues with the approval CE, Chennai, CPWD, Chennai and has applicability over his jurisdiction only.

JE(PSR)/ T.S. [illegible] for n/a pl
13/8

approved
09/08/19

डी.सी.गोयल / D.C. GOEL
मुख्य अभियंता (द.अं.)-I / Chief Engineer (SZ)-I,
के.लो.नि.वि., राजाजी भवन / C.P.W.D., Rajaji Bhawan,
बेसण्ट नगर, चेन्नई - 600 090 / Besant Nagar, Chennai - 600 090.

N.Candassamy
AE (MIS), O/o CE, Chennai,
CPWD, Chennai-90

List of Approved materials for Chennai Zone, CPWD, Chennai

NOTE: Not withstanding to the approval given in the list, the field staff are requested to observe the following conditions

1 Equivalent material and finishes of any other specialized make may be used on written request of the contractor, in case of unavoidable circumstances and also if it is established that minimum three alternative brands specified above are not available in the market, after written approval of the alternate brand by the NIT approving authority. This substitution shall be subject to cost adjustment in case the substituting brand is available at cheaper rates in market than those mentioned herein above. There shall be no cost adjustment if the subtituting brand is costlier in market than those mentioned herein.

2 In addition, above brands wherever applicable, should have valid and active BIS certificate on the date of supply for the work.

3 Material should conform to MII policy of Government of India as on the date of supply for the work.

4 Other brands not included in the above list but having BIS certificate on the date of supply for the work shall only be allowed against note (1) above.

5 In Case of non availability of BIS codes for any of the materials incorporated above, the Engineer-in -Charge shall send the materials for testing as per the relevent ASTM or EN codes and satisfy himself before using the same in work.

Sl. No	DSR Item No.	Material Code as per DSR	Material Description	Material	
				Brand	Make
SUB HEAD No.2					
EARTH WORK					
1	2.34.1	7022	Chloropyriphos	DURSBANTCT	DE-NOCIL Ltd.
				Premise Agenda	Bayer Ltd
SUB HEAD No.3					
MORTAR					
1	3.1 & other cement involved items	367	Ordinary Portland Cement (43 grade)	ACC	ACC cements Ltd
				Ultra Tech	Ultra Tech Cement Ltd.
				Coromandal	India Cements Ltd.
				Birla	Birla Corportion Ltd.
				Chettinadu	Chettinadu Cements Corportion Ltd.
				Bharathi	Bharathi Cement Corportion Ltd.
				Dalmia	Dalmia Cement Bharat Ltd.
SUB HEAD No.4					
CONCRETE WORK					
1	4.12	1213	Water Proof material	MAPEI	MAPEI Construction Products India P Ltd.
				Impermo	Snowcem Paints
				Duraseal	Apurva India Pvt. Ltd.
				ACCO Proof	ACC Cement Ltd.
				Dr. Fixit	Pidilite Industries
SUB HEAD No.5					
REINFORCED CONCRETE WORK					
1	5.22.6 & 5.22A.6	1005	TMT bars Fe-500D	SAIL	Steel Authoirty of India Ltd.
				TISCO	TATA STEEL Ltd
				VIZAG	Rastriya Ispat Nigam Ltd.
				JSW	JSW Steel Ltd
				Shyam Steel	Shyam Steel Industries ltd.
2	5.33.1 & 5.33.2	7318	Plasticiser & Super Plasticiser	Contrament, Power flow	MC Bauchemie (India) Pvt. Ltd
				Sunanda Chemicals	Sunanda Chemicals Ltd.
				Plastiment, Sikament	Sika Inida Pvt Ltd.,
				Conplast SP430	FOSROC India
				Chryso-HP / Delta / Optima	Chryso India Pvt. Ltd.,
3	5.28	339	Expansion Joint Bitumen board	Dura board HD100	Supreme Industries
				DURAFILL	Supreme Industries

ASSISTANT ENGINEER (MIS) O/o CE, CHENNAI CPWD,CHENNAI

Sl. No	DSR Item No.	Material Code as per DSR	Material Description	Material	
				Brand	Make
4			Post tensioning System	CRUX	Crux Processing systems Pvt Ltd.,
				VSL	VSL India Pvt Ltd.
				Ultracon	Ultracon Structural Systems Pvt Ltd
				BBR	BBR (India) Pvt . Ltd
5			PT Strands	DP wires	D.P Wires Ltd.
				TATA wiron	TATA Steel Ltd.,
				Usha Martin	Usha Martin Ltd
6			Adhesive	Dunlop	India Tyre & Rubber Co (India) Ltd.
				Vamorganic	Vamorganic Ltd.,
				Sika	Sika India Pvt. Ltd
				Fevicol	Pidilite Industries
				Proofex of adhesive	FOSROC India
7			Grout	Ardex	Ardex Endura Adhesive India Pvt. Ltd
				LATA POXY	MYK LATICRETE India Pvt. Ltd
				Fugabella, Porcelana	Kerakoll India Pvt. Ltd
				Dr. Fixit	Pidilite Industries
				Weber	Saint-Gobin India Pvt. Ltd

SUB HEAD No.6
BRICK WORK

1	6.38	8655	AAC Blocks	Xtralite	UITRATECH Cement Ltd
				Areocon	HIL
				Siporex	SIPOREX
				Nucon	Green way building materials India Pvt. Ltd
				Renacon	Renaatus Procon Pvt. Ltd.

SUB HEAD No.9
WOOD & PVC WORK

1	9.20&9.21	0714 to 0719	Wooden Flush door shutters	Jayna ply	Jain Wood Industries
				Raavella door	Raavella Industrials (P) Ltd
				Kailash	Kailash Hi tech Timber Industries India Pvt. Ltd
				Shakthi	Shree Shakthi Modern Flush doors
				Greenlam	Greenlam Industries
				Mayur	Mayur Plywood
				MP Ply wood products	MP Wood products
2	9.7 & 9.37	2480 to 2488	Water Proof Plywood, Commercial ply, Fire	Jayna ply	Jain Wood Industries
				Green Ply	Green ply Industires Ltd.
3			Laminate	Green Lam	Green lam Industries Ltd.
				Centuary	Centuray laminates
				Merino	Merino laminates
				Royal touche	Royal touche laminates
				Kitmica	Kitply Industries Ltd.
				Formica	Formica Laminates (India) Pvt Ltd.
				Decolam	Decolam India Pvt Ltd.
4	9.35 -9.39	2484 to 2488	Prelaminted particle board Exterior Grade	Novapan	GVK Novapan Industries Pvt Ltd.,
				Merino	Marino laminates
				Kitlam	Kit Ply Industires Ltd.
				Ecoboard	Ecoboard Industries Ltd.
				Associate	Associate Décor Limited
				Archid ply	Archid ply industries Ltd.
				TESA	Balaji Action Buildwell
				Centuary	Centuary MDF

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Sl. No	DSR Item No.	Material Code as per DSR	Material Description	Material	
				Brand	Make
5			High Density (HDF) Prelaminated board	Pergo	Red Floor India
				Armstrong	Armstrong world Industries
6	6.40,6.41, 9.105	8656,8717, 7366	Gypsum board	Gyproc Saint Gobain	Saint Gobain Gyprock India Ltd.,
				Lafarge	Lafarge Gypsum India Pvt. Ltd
				USG Boral Board	USG Board India (P) Ltd.
				Armstrong	Armstrong wold Industries
7			Glass door hardware	Dorma	Dorma India Pvt Ltd
				Kich	Kich Architectural Products Ltd.
				Classic	Classic hardware
				Hafele	Hafele India Pvt. Ltd
				Ozone	Ozone Hardware.
				Geze	Geze GMBH
				Define	Define Overseas Pvt. Ltd.
8	9.83	2456 & 7396	Hydraulic door closers/ Floor springs	Godrej	Godrej locking solution & systems
				Hardwyn	Hardwyn hardware
				Dorma	Dorma India Pvt Ltd.
				Everite	Everite agencies
9	9.76	8744 & 0413	Locks & Latches	Dorset	Dorset Industries Pvt Ltd
				Godrej	Godrej locking solutions & systems
				Harrison	Harrison locks
				Plaza	Bharat lock House
				Yale	ASSA ABLOY India (P) Ltd.
10			Metalic / Steel Fire Door	Shakthi Hormann	Shakthi Hormann Pvt Ltd,
				Promot	Promot fire & Insulation (P) Ltd.
				Godrej	Godrej Security solutions
11			Fire Smoke Seal	Hilti	Hilti India Pvt Ltd.
				Raven	Raven Global
12			Fire rated hardware	Dorma	Dorma India Pvt. Ltd
				Ingersolrand	Ingersolrand (India) Ltd,
				Geze	Geze GMbH
13			Non Metalic Fire door	NAVAIR	NAVAIR International Pvt Ltd
				Promot	Promot fire & Insulation (P) Ltd.
				Godrej	Godrej Security solutions
14	9.14, 9.15	8647, 8666	Stainless steel screws	Kundan	Kundan Industries Ltd.
				Pooja	Pooja Steel Corportion
				Atul	Atul fasteners Ltd.
15			Butt Hinges openable window shutters	Hafela	Hafele India Pvt. Ltd
				Alu Alpha	Alu Alpha India
16	9.27, 9.57	594-597	Mild Steel Butt Hinges / Piano hinges	Jolly	Jolly Engineering works
				Garg	D.P Garg & Company
				Amit	Lovely metal industries Pvt Ltd.
				Jyoti	Jypti Architectural Pvt Ltd.
17	9.70	8215-8221	Stainless steel Butt hinges	Prayag	Prayag Polymers (P) Ltd
18			Concealed tower bolt	Dorma	Dorma India Pvt Ltd
				Ingersolrand	Ingersolrand (India) Ltd,
				Alu Alpha	Alu Alpha India

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Sl. No	DSR Item No.	Material Code as per DSR	Material Description	Material	
				Brand	Make
19	9.119,9.120, 9.143-9.147	8710, 8711	PVC & UPVC doors, frames and windows	Fenesta	Fenasta DCM Shriman
				QUTE	Qute extrusion Pvt. Ltd
				LG	LG Housys India
				Kommerling	Profine India Window technology Pvt Ltd.
				Duroplast	Duroplast extrusion Pvt Ltd
				Polyline	Polyline extrusion Pvt Ltd
				Aparna Venstar	Aparna Induatries ltd.
				AMD	AMD overseas Impex (India) Pvt. LTD.
				Simta Astrix	Simta clear coats pvt.Ltd
				Rajshri	Rajshri Productions Pvt. Ltd.
				NCL VEKA	NCL VEKA Ltd.
20			Mumty / Toilet door	Shirke	B.G Shirke Construction Technology Pvt Ltd.
21	9.147A	8759	Stainless friction hinges	Hetich	Hetich India Pvt .Ltd.
				Haffle	Haffle India Pvt .Ltd.
				Securistyle	Securistyle India Pvt .Ltd.
				Earl Bihari	Earl Bihari India Pvt .Ltd.
				ROTO	ROTO Frank Asia
22	9.9,21.3	2407	Float Glass	Saint Gobain,	Saint Gobain India Pvt .Ltd. ,
				Asahi	Asahi India glass .Ltd.
				Pilkinton	Pilkinton India Pvt .Ltd.
				Modiguard	Gujarat Guardian Ltd.
23			Reflective glass	Saint Gobain,	Saint Gobain India Pvt .Ltd. ,
				Asahi	Asahi India glass .Ltd.
				Pilkinton	Pilkinton India
				Glaverbel	Glaverbel India
24			Tempered reflective/clear glass	Saint Gobain,	Saint Gobain India Pvt .Ltd.
				FUSO	FUSO Glass India Pvt .Ltd.
				Gurind	Gurind India
				Impact safety	Impact safety glass workes Pvt Ltd
25	9.138.1	8741	Fire rated glass	Contra flam/ Pyroswiss of Sanit Gobain	Saint Gobain India Pvt Ltd.
				Pyran of Schott	Schott glass India Pvt .Ltd.
				Pilkinton	Pilkinton India
26	9.1.1 & 9.2	7388	Dash fasteners	Hilti	Hilti India Pvt .Ltd.
				Fischer	Fischer India
				Anchor	Anchor Ltd
				Kundan	Kundan Industires Ltd.

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Sl. No	DSR Item No.	Material Code as per DSR	Material Description	Material	
				Brand	Make
SUB HEAD No.10 STEEL WORK					
1	10.1	1007	Structural Steel	SAIL	SAIL
				TISCO	TATA STEEL
				VIZAG	RINL
				JSW	JSW
2	10.15	4009	M.S.Pipe, Tubes	SAIL	SAIL
				TISCO	TATA STEEL
				METPRO	MKK Matel Section Pvt. Ltd.
3	10.28	4001	Stainless steel	Salem	SAIL
				Jindal	JSW
				SAIL	SAIL
				KINGSTON	KINGSTON Brass
4	10.28	4002	Stainless steel Bolts, washers, nuts	Kundan	Kundan Industires Ltd
				Pooja	Pooja Steel Corrporation
				Atul	Atul fasterners Ltd
				Hilti	Hilti India Pvt. Ltd
5		4002	Stainless steel pressure plate screws	Kundan	Kundan Industires Ltd
				Pooja	Pooja steel corporation
				Atul	Atul fasterners Ltd
6			Welding rods	Advani	Advani oerlikon Ltd.
				ESAB	ESAB India Pvt. Ltd
7			Metal Deck Sheet	TATA	TATA STEEL
				SAIL	SAIL
8			Shear Stud/ Connector	KOCO	KOSTER & Co.
9			Clamp, Rebar, Chemical fastener	Hilti	Hilti India Pvt. Ltd
				Fischer	Fischer India
				Wurth	Wuerth India Pvt. Ltd
				Hilti	Hilti India Pvt. Ltd
10			Anchor fasteners	Fischer	Fischer India
				Halfen	Halfen GmbH
SUB HEAD No.11					
FLOORING					
1	11.41	8621	Vitrified tiles	Asian	Asian Granite India Ltd
				NITCO	NITCO Ltd
				RAK	RAK Ceramic India Pvt Ltd.
				Restile	Restile Ceramic Ltd.
				Kajaria	Kajaria Ceramic Ltd
				Somany	Somany Ceramic Ltd
				Jhonson	Prism Jhonson Ltd
				Orient Bell	Orient Bell Ltd
				Varmora Granito	Varmora Granito Granite Pvt. Ltd
				Oasis	Oasis Vitrified Pvt. Ltd.
				Naveen	Murudeshwar Ceramics Ltd.,
2	11.39	7800	Glazed Ceramic tiles (Also wall tiles)	Asian	Asian Granite India Ltd
				NITCO	NITCO Ltd
				RAK	RAK Ceramic India Pvt Ltd.
				Kajaria	Kajaria Ceramic Ltd
				Somany	Somany Ceramic Ltd
				Jhonson	Prism Jhonson Ltd
				Orient Bell	Orient Bell Ltd
				Varmora Granito	Varmora Granito Granite Pvt. Ltd
				Oasis	Oasis Vitrified Pvt. Ltd.
				Naveen	Murudeshwar Ceramics Ltd.,

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Sl. No	DSR Item No.	Material Code as per DSR	Material Description	Material	
				Brand	Make
3			Synthetic Sports flooring	Armstrong	Armstrong flooring
				LG	LG Hausys India
				Wondorfloor	RMG Polyvinyl India Ltd.
4			Linoleum sports flooring	Armstrong	Armstrong flooring India Pvt Ltd.
				Forbo	Forbo flooring India Pvt. Ltd.
				Gerflor	Gerflor flooring
5			False floor	Hewetson	Hewetson India
				Unifloor	Unifloor India Ltd
				Unitile	Unitile office systems Pvt. Ltd
				Kebao	Inner Space (Distributors)
6			Engineered wood floor	Armstrong	Armstrong flooring
				Werner	Durafloor werner GmbH
				Pergo	Redfloor India
7	21.4	7396	Floor spring (For non DSR items)	Dorma	Dorma India Pvt Ltd
				Ingersolrand	Ingersolrand India Pvt Ltd
				GEZE	GEZE GmbH
8	11.2	7070	Cement concrete parking tiles	NITCO	NITCO Ltd
				Poddar	Poddar Udyog
				Eurocon	Eurocon tiles India
				Dazzle	Dazzle Designer tiles Pvt Ltd
				Ultra	Ultra tile private Ltd.
9			Synthetic Carpet tiles	TOLI	TOLI corporation
				Hollitex	Hollitex carper tiles
				Standard Carpets	Standard Carpets
10			Vitrified paving tiles	PAVIT	PAVIT ceramics Pvt Ltd.
11			Glass mosaic tiles	Italia	Tile Italia mosaics Pvt Ltd.
				Palladio	Palladio Mosaics
				Bisazza	Bisazza Italy
12			White Cement	ACC	ACC Cements Ltd
				Birla	Birla Corportion Ltd.
				JK White	JK Cement ltd.

SUB HEAD No.12
ROOFING

1			Roof Tiles (for Temperature reduction)	PAVIT (Eco Tile)	PAVIT Ceramics Pvt Ltd.
2			Thermal Insulation treatment	Elastospray	BASF
3			Acoustic Insulation	Twingerinsul	U.P.Twiga fiber glass Ltd
				Lloyd Insulation	Lloyd Insulation (India) Ltd
				Saint Gobain Gyproc	Saint Gobain Gyproc India
				Himalyan Acoustics	Himalyan Acoustics
				Knauf	Knauf Gypsum India Pvt. Ltd.
				Anutone	Anutone Acoustics Ltd.

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Sl. No	DSR Item No.	Material Code as per DSR	Material Description	Material	
				Brand	Make
4			UPVC Pipes and fittings (Rain water pipes)	Supreme	Superme Industries Ltd.
				Prince	Prince pipes and fittings Ltd.
				Finolex	Finoles Industries Ltd.
				Prepoly	Premier PVC Industry
				Ajay	Ajay Industrial Corporation
				Sharon	Sharon Extrusions
				Vectus	Vectus
				Prayag	Prayag Polimers (P) Ltd.
5	NSR		Sandwich PUF panelled roofing sheets	Lloyd Insulation	Lloyd Insulation (India) Ltd
				JINDAL MECTEC/ JINDAL	Mectec Pvt. Ltd
6			Polycorbanate Sheet	Danpalon	Danapal Light architecture
				Alcox	Hindeggan Alcox Ltd.
				Polygal	Polygal India Pvt Ltd.
7			False ceilings	Aerolite	Andhra Polimers Pvt. Ltd.
				Anutone	Anutone Accoustics Ltd.
				Armstrong	Armstrong World Industries
				Ramco	Ramco Industries Ltd.
				Knauf	Knauf Gypsum India Pvt. Ltd.
				Himalyan Acoustics	Himalyan Acoustics
				Saint Gobain Gyproc	Saint Gobain Gyproc India
8			False Ceiling Members (Perimeter, Ceiling section, intermediates, angles etc.,)	Armstrong	Armstrong World Industries
				Gypframe steel	British Gypsum
				Knauf	Knauf Gypsum India Pvt. Ltd.
				Saint Gobain	Saint Gobain Gyproc

SUB HEAD No.13 & 14
FINISHING

1	13.61	830	Synthetic enamel Paint	Premium gloss enamel	Asian paint Ltd
				Dulex	ICI dulex Ltd
				Nerolac	Nerolac Paints Ltd
				Berger	Berger Paints
				Nippon	Nippon Paint India Ltd.
2	13.50	823	Pink primer	Wood primer	Asian paint
				Dulex	ICI dulex
				Nerolac	Nerolac Kansia Nerolac Paints Ltd.,
				Berger	Berger Paints
				Nippon	Nippon
3	13.50.3	4202	Red Oxide Zinc Chromate primer	High performance yellow metal primer	Asian paint
				Dulex	ICI dulex
				Nerolac	Nerolac
				Berger	Berger Paints
				Nippon	Nippon
4	14.45	816	Oil Bound Distemper	Tractor Aqalock	Asian paint
				Dulex	ICI dulex
				Nerolac	Nerolac
				Berger	Berger Paints
				Nippon	Nippon

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Sl. No	DSR Item No.	Material Code as per DSR	Material Description	Material	
				Brand	Make
5	13.60	835	Acrylic emulsion	Tractor emulsion	Asian paint
				Dulex	ICI dulex
				Nerolac	Nerolac
				Berger	Berger Paints
				Nippon	Nippon
6	13.44.1	851	Water Proof Cement paint	Asian exterial wall primer	Asian paint
				Berger	Berger Paints
				Surfa	Surfacoats (India) Pvt. Ltd.
				Cem Colour	Snowcem Paints
7	13.46	8505	Acrylic smooth exterior paint	ACE	Asian paint
				Dulex	ICI dulex
				Nerolac	Nerolac
				Berger	Berger
				Nippon	Nippon
8	13.46	8506	Premium Acrylic smooth exterior paint with silicon additives	ULTIMA	Asian paint
				Dulex	ICI dulex
				Nerolac	Nerolac
				Berger	Berger
				Nippon	Nippon
9	13.42		Cement based wall putty	J.K.wall putty	J.K. Cement Ltd.
				Birla wall case	Birla Cements Ltd.,
				Asian paints	Asian paints Ltd
				Altek	NCL Alltek & seccold Ltd.
10			Acrylic texured plaster	Apex Duracast	Asian paints
				Spectrum paints	Spectrum paints Ltd.
				Heritage	Heritage Rajkamal Group
11			Ready mix cement plaster	Wall plast	Wall plast products Pvt Ltd.
				Readi Plast	Ultratech cements Ltd.
				Ramco super plaster melamine	Ramco cements Ltd.
				Gyproc Plasters	Saint Gobain Gyproc India
				Ultra tech	Ultra tech Cement Ltd.
				Knauf	Knauf Gypsum India Pvt. Ltd.
				Ferrous Crete	Ferrous Crete (India) Pvt. Ltd.
12	14.70	7241	Melamine Polish	Asian paints	Asian paints
				Polycure	Polycure malaysia
13	13.58	7240	Fire retardant paint	Jotun	Jotun paints
				Hilti	Hilti India
				Akzonobel	Dulex Akzonobel Paints
14	14.57	828	Anticorrosive bitumastic paint	Berger	Berger paints India Ltd.
				Shalimar	Shalimar paints India Ltd.
				IS 158 bituminous black	Asian Paints

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Sl. No	DSR Item No.	Material Code as per DSR	Material Description	Material	
				Brand	Make
15	13.43.1	820	Cement Primer	Asian paints	Asian paints
				JK Primaxx	JK Cement Ltd.
				Berger	Berger paints India Ltd.
15	13.52	7239	Epoxy paint	Asian epoxy	Asian paints
				Berger	Berger paints India Ltd.
				Shalimar	Shalimar paints
16			Epoxy coating	BASF	BASF India Ltd.
				Fosroc	Fosroc India
				Laticrete	MYK Laticrete India
17			Sililcon coating	Dow corning	Dow corning India
				BASF	BASF India Ltd.
				GE	GE Silicones
				Wacker	Wacker silicones.

SUB HEAD No.16
ROAD WORK

1	16.68	8689	Interlocking Concrete Paver Blocks	Dazzle	Dazzle designer tiles (P) Ltd.
				Ultra	Ultra tiles Pvt Ltd.,
				Shree	Shree Bharat Paver blocks
				Hindustan tiles	Hindustan tiles, Ranchi Pune
				Vyara tiles	VYARA TILES Pvt Ltd., / Surat
				Basant Betons	Basant Betons
2			Solar studs/ Median markers	3M	3M Science
				Avery Dennison	Avery Dennison India Pvt Ltd.
				Nikkalite	Nippon carbide Industires (USA)
3			Polycorbonate Convex mirrors, Rubberised road hump	Unique safety solutions	Unique safety solutions

SUB HEAD No.17
SANITARY INSTALLATIONS

1		7112, 7113, 7114	Mirror	Modi Guard	Gujarat Guardian Ltd.
				Saint Gobain	Saint Gobain Glass India Ltd.,
				AIS mirror	Asahi India glass Ltd,
				Atul	Atul glass Industries Ltd.,
2	14.80, 17.1.1, 17.1.2, 17.2.2, 17.3.1,	1954, 1955, 1947, 3229	Vitreous Commodes/ Washbasin	Hindware	HSIL Ltd,
				Roca	ROCA Bath room products
				Parryware	ROCA Bath Pvt. Ltd.,
				Kohler	Kohler world wide
				Somany	Somany Ceramic Ltd,
				Golf Ceramics (Prayag)	Golf Ceramics limited
				CERA	CERA Sanitaryware Ltd.,
				NEYCER	NEYCER India Ltd.,

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Sl. No	DSR Item No.	Material Code as per DSR	Material Description	Material	
				Brand	Make
3	17.1 - 17.4	7358-7361	Flushing Cistern	Parryware	ROCA Bath Pvt. Ltd.,
				Shakti	Shakti Enterprises
				Hindware	HSIL Ltd,
4	NSR		SWR PVC Pipes & fittings	Supreme	Superme Industires Ltd.
				Astral	Astral polytechnik Ltd.
				Finolex	Finolex Industries Ltd.,
				Ajay	Ajay Industries Ltd.
				Vectus	Vectus Industries Ltd.,
				Prince	Prince Pipes and fittings
				Prayag	Prayag polymers Pvt Ltd.,
5	17.10.1.1, 17.10.1.4	7095, 7098, 7101, 7102, 7013	Stainless Steel Kitchen sink	Jhonson	Prision Jhonson Ltd.,
				Diamond	Pheonix Appliances Pvt. Ltd.
				Jindal	Centuary polytech
				Kingston	Kingston brass India
				Nirali	Jyoti (India) matel Industries Pvt Ltd.
				Hindware	HSIL Ltd
				Silver shine	Blue stone sanitary Industries Pvt. Ltd.
				Prayag	Prayag Polimers (P) Ltd.
				Navkar	Shri Navkar Metals Ltd.
				Futura	Futura Kitchen Sinks India Pvt. Ltd.
6	17.35.1-17.35.2	1617-1686	Centrifugally Caste (Spun) Iron Soil Pipes	Neco	Jayaswal Neco Ltd
				RPMF	Raj Pattern Makers and Founders Pvt. Ltd.

SUB HEAD No.18
WATER SUPPLY

1	18.1	8300-8305	PE-AL-PE Composite pipes	Kitec	Kitec Industries (India) Pvt. Ltd.
2	18.10.1	1545	G I Pipes	TATA	TATA Steel Ltd.,
				Zenith	Zenith Birla (India) Ltd.
				Jindal	Jindal Pipes Ltd.,
3	18.10.1	1545	G I Pipe fittings	Zoloto	Zoloto Industries
				Unik	Unik malleables
				HB	HB Industries
				IC	Sgree samarth Engineers
4	18.31.1.2	1940, 1941, 3311	Water supply Valves	Zoloto	Zoloto Industries
				leader	leader valves Ltd.,
				ARCO	Arco valves Pvt. Ltd.,
				Nanda	Nanda Miller company

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Sl. No	DSR Item No.	Material Code as per DSR	Material Description	Material	
				Brand	Make
5	18.7.1	8636	CPVC pipes and fittings	Supreme	Supreme Industries Ltd.
				Finolex	Finolex Industries Ltd.
				Astral	Astral Polytechnik Ltd.,
				Prince	Prince Pipes and finttings Ltd,.
				Ajay	Ajay Industrial corporation
				Prayag	Prayag polymers Pvt Ltd.,
				Vectus	Vectus Industries Ltd.,
				Truflo	HIS Ltd.
				Birla Aerocon	HIL Ltd.
				Anil	Anil Thermoplastics Pvt. Ltd.
6	18.48	1649	PVC / HDPE water storage tanks	Sintex	Sintex plastic technology Ltd,.
				Vectus	Vectus Industries Ltd.
				Supreme	Supreme Industries Ltd.
7	18.22.1	7257 to 7259, 7501, 1878, 1879	Watersupply fixtures like bibcock, Shower panels	Jaquar	Jaquar Group
				Parryware	Roca bath room products Pvt. Ltd,
				Metro	Metro sanitations Pvt. Ltd.,
				Waterman	Kewal brothers
				Seiko	Seiko Sanitations
				Prayag	Prayag polymers Pvt Ltd.,
				Kingston	Kingston brass India
				Johnson	Prism Jhonson Ltd
				Shakti	Shakti Enterprises
8	18.59.1	7415	Air release valve	Kirloskar	Kirloskar brothers Ltd.,
				RBM	AFS Ltd.,
				Kartar	Kartar valves private Ltd.,
9	18.71.1	7712	Centrifugally (Spun) Cast Iron	Lanco	Electrosteel castings Ltd.
				Jindal	Jindal saw Ltd.
				Kesoram	Kesoram Industries Ltd.
				Electrosteel	Electrosteel castings Ltd.
10	18.70.1	7712	Spun cast iron fittings	Neco	Jayaswal Neco Ltd.
				Kartar	Kartar Valves Private Ltd.
				Electrosteel	Electrosteel castings Ltd.
				Kapilansh Centrifugal	Kapilansh Dhatu Udyog(P)Ltd.
				SKF brand	SINGHALIRON FOUNDARY Pvt. Ltd.,
11	18.71.1	7712	CI double flange sluice valve	Kirloskar	Kirloskar brothers Ltd.,
				RBM	AFS Ltd.,
				Kartar	Kartar valves private Ltd.,
				IVS	Indian valves private Ltd.,
				Zoloto	Zolota Industries
				Leader	Leader valves Ltd.
12			CI double flanged non return valve	Kirloskar	Kirloskar Brothers Ltd.,
13	18.17.1	1927	Gun metal Valves	Zolto	Zolota Industries
				Leader	Leader valves Ltd.
				Sant	Sant valves Pvt Ltd,
				Audco	L&T Valves
14	18.54.1, 18.74.1	7400, 7862	PTMT/PVC water supply sanitary fittings, bibcocks, pillar cock, Angle valve, Stop Valve	PEARL	Precision Products
				Prayag	Prayag Polymers (P) Ltd
				Supreme	Supreme Industries

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Sl. No	DSR Item No.	Material Code as per DSR	Material Description	Material	
				Brand	Make
SUB HEAD No.19 DRAINAGE					
1	19.6.6	1700, 1701, 1702, 1705	RCC Pipes	Indian Hume Pipe	Indian Hume Pipe Ltd.,
				Madurai spun pipe	Madurai spun pipe company
				Jain & Co	Jain spun pipes Co.,
2	19.7.1.1	1354	CI Manhole cover	Neco	Jayaswal Neco Ltd.,
				BIC	Bengal iron corporation
3	19.11.1.1	7135	SFRC Cover and grating	KK	KK Manhole and gratings Co Pvt Ltd.,
				Advent	Advent concrete vision
				Nu-TEC	Nu-Tech concrete products (P) Ltd,.
4	19.16	7354	Plastic Encapsulated Foot Rest	KK India	KK Manhole and gratings Co Pvt Ltd.,
				KGM	KGM Exports .
				Accurate Buildcon	Accurate Buildcon company.
5			Spun cast iron covers & gratings	Neco	Jayaswal Neco Ltd
				Jagannath	Sri Jagannath Iron Foundry Pvt. Ltd.
				Kapilansh Centrifugal	Kapilansh Dhatu Udyog(P)Ltd.
				SKF brand	SINGHALIRON FOUNDARY Pvt. Ltd.,
SUB HEAD No.21 ALUMINIUM WORK					
1	21.1.1	7306	Aluminium doors/windows sections	Hindalco	Hindalco Industries Ltd.,
				jindal	jindal Aluminium Ltd.,
				Bhoruka	Bhoruka Aluminium Ltd.,
				Indal	Indian Aluminium Ltd.,
2	21.1.1	8663-8664	Aluminium systems/ Anodised aluminium fittings for doors/windows	Define	Define Overseas Pvt. Ltd.
				Schueco	Schueco India Pvt. Ltd.,
				Bhoruka	Bhoruka Aluminium Ltd.,
				Kawneer	Kawneer India
				Hardima	Hardima sales corporation
				Everite	Everite Agencies
				Sigma	Sigma Corporation
3	9.147A	8757	Friction stay hinges	Earl Bihari	Earl Bihari Pvt. Ltd.
4	9.119, 9.141, 9.147A	2611, 7390	EPDM Gaskets	Anand	Anand NVH products (P) Ltd.,
				Roop	Roop Polymers Ltd.,
				Bohra	Bohra rubber Pvt Ltd.,
				Hanu	Hanu Industries
				Amee Rubber	Amee Rubber Industries Pvt Ltd.
5		2610	Silicon Gaskets	Sree Gaurav	Sree Gaurav Rubber products
6			Masking Tapes	3M	3M
				Sun	Sun
				Wonder polymer	Wonder Tape Industries
				Roop	Roop Polymers Ltd.,

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Sl. No	DSR Item No.	Material Code as per DSR	Material Description	Material	
				Brand	Make
SUB HEAD No.22					
WATER PROOFING WORK					
1	22.5	1213	Water proofing compound	Fosroc	Fosroc India
				Sika	Sika India
				Dr. Fixit	Pidilite Industires
				CICO	CICO Technologies Ltd.,
				Impermo	Snowcem paints
				Accoproof	ACC cements Ltd.,
				Ardex Endura	Ardex Endura (India) Ltd
				Alchemica	Alchemica Ltd.
2	22.17 to 22.20	8200 to 8205	Membarane Water proofing system	BASF	BASF India Ltd.,
				STP Ltd	STP Ltd
				Texsa	Texsa India Ltd
				WR Grace	WR Grace Co India Pvt Ltd,
				Dr. Fixit	Pidilite Industires
				Alchemica	Alchemica Ltd.
				Hydro tech	Hydro tech Ltd
3			Chemical water proofing system	BASF	BASF India Ltd.,
				MC-Bauchemie	MS-Bauchemie India Ltd.,
				Sika	Sika India
				Sunanda speciality coating	Sunanda speciality coating Pvt Ltd.
				Perma construction Aid	Perma construction Aid Pvt Ltd,
				Fosroc	Fosroc India
				Dr. Fixit	Pidilite Industires
4	22.4.1	7427, 7428	Water stops	Hydrotite	Sika India
				BASF	BASF India Ltd.,
				Dr. Fixit	Pidilite Industires
				Hydroswell	Sika India
SUB HEAD No.25					
ALUMINIUM COMPOSITE PANELS					
1	25.3	2634	Aluminium composite panels	Alucobond	3A Composites India Pvt.Ltd.
				Eurobond	M/S Euro panel products Pvt. Ltd.
				Aludecor	M/S Aludecor Lamination Pvt. Ltd.

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Sl. No	DSR Item No.	Material Code as per DSR	Material Description	Material	
				Brand	Make
MISELLANEOUS ITEMS					
1			PVC Perforated Pipes	Rex Polyextrusion	Rex Polyextrusion Ltd,
				Akash Enterprises	Akash Enterprises
				Zenplas Pipes	Zenplas Pipes Pvt. Ltd.,
				Supreme	Supreme Industries
2			Play Equipements	Koochie Play	Koochie Play Systems Pvt. Ltd,
				Playworld Systems	Playworld Systems India
3	25.3	2605	Structural Sealant	Dow corning	Dow corning India
				Wacker	Wacker Silicones.
				GE	GE Silicones
				Fosroc	Fosroc India
				BASF	BASF India Ltd.,
4			Poly-sulphide sealant	Dr. Fixit	Pidilite Industries Ltd,
				Chemetall-Raj	BASF India Ltd.,
				Fosroc	Fosroc India
				Techseal	Choksey Chemical Pvt. Ltd,
				Tuff seal	Bondit construction Chemical
5			Bitumen Impregnated Board	Shalitex	STP Limited
6			Polyethylene backer rod	Supreme	Supreme Industries
7	13.52.1, 16.59	7239	Epoxy	Fosroc	Fosroc India
				Shalibons	STP Limited
				CICO Poxy	CICO Technologies Ltd.,
				Ardex	Ardex Endura (India) Pvt. Ltd,.
8	21.8.1, 25.2	8646, 2607, 2608	Weather Silicon make and grade	Dow corning	Dow corning India
				Momentive (GE)	GE Silicones
9			Structural Silicon	Dow corning	Dow corning India
				Momentive (GE)	GE Silicones
10	NSR		GRC Jali	Terrafirma	Terrafirma GRC Industries
				Ecovision	Ecovision Industries Pvt. Ltd.,
				Mahesh GRC	Mahesh Prefab Pvt Ltd.,
11	NSR		Air transfer grills	Cool grills	Cool grills, Pune
				Systemair India	Systemair India Pvt. Ltd.,

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LIST OF APPROVED ELECTRICAL MATERIALS

NOTE: Not withstanding to the approval given in the list, the field staff are requested to observe the following conditions

1 Equivalent material and finishes of any other specialized make may be used on written request of the contractor, in case of unavoidable circumstances and also if it is established that minimum three alternative brands specified above are not available in the market, after written approval of the alternate brand by the NIT approving authority. This substitution shall be subject to cost adjustment in case the substituting brand is available at cheaper rates in market than those mentioned herein above. There shall be no cost adjustment if the subtituting brand is costlier in market than those mentioned herein.

2 In addition, above brands wherever applicable, should have valid and active BIS certificate on the date of supply for the work.

3 Material should conform to MII policy of Government of India as on the date of supply for the work.

4 Other brands not included in the above list but having BIS certificate on the date of supply for the work shall only be allowed against note (1) above.

5 In Case of non availability of BIS codes for any of the materials incorporated above, the Engineer-in - Charge shall send the materials for testing as per the relevent ASTM or EN codes and satisfy himself before using the same in work.

Internal Electrical Installations		
S. NO	Name of the Product	Manufactured by
1	PVC insulated copper conductor FRLS copper ISI Marked	Anchor/Finolex/Havells/RR Kabel/ Asmon /Mescab /L&T /KEI / Power flex
2	MCB DB's, MCB's & enclosures, RCCB	Legrand/Siemens/Schneider/ABB/GE./ Hager L&T/Panasonic by Anchor/ Asmon/
3	XLPE UG Aluminium/Copper LT Cable	CCI/Gloster/Havell/Universal/Finolex /Torrent/ KEI
4	Cable glands	Jainsons / Comet / Dowells / Prabath
5	Cable Lugs	Jainsons / Comet / Dowells / Prabath
6	DWC Pipe	Gemini / Rex /Duraline
7	PVC Conduit (ISI Marked)	Avonplast/AKG/Precision/Modi/Anchor/Vasavi (Emjay/ Javeri)
8	GI Pipe	Jindal / TATA/Zenith Birla
9	Telephone / Cat 6 Cable	Legrand / Delton / AMP / Havells
10	Modular Switches & Sockets, Fan Regulator,RJ-45 Data Socket	Legrand-Myrius/ Crabtree-Athena/MK-LogicPlus/HoneywellBenzPlus/ Anchor(RomaPlus)/Schneider (Livia)/Savic
11	1200mm ceiling Fan five star rated	Crompton/Orient/Havells/Bajaj/Surya/Almonard
12	Exhaust Fan	Crompton/Orient/Havells/Almonard/Bajaj
13	All LED Fittings	Crompton/Bajaj/Halonix/Philips/Surya/Jaquar/Wipro/Havells/Corvi/Syska/ Panasonic / Eveready / LightingTechnologies/ Litaski/Polycab
14	Electrical LT Panel Boards	CPRI approved for relevant bus bar rating
15	For Changeover Switches , SDFU	L&T / ABB / Schneider/C&S/ Legrand
16	Moulded Case Circuit Breaker/Motor protection circuit breaker Electric	Siemens/ ABB / L & T/C & S /Schneider/ Legrand / GE / Hager
17	Phenolic laminated sheet	3 mm thick with ISI mark
18	Ammeter / Voltmeter / Combined / Meters	AE / Mecon / Schneider / L&T / HPL/ C&S
19	Analogue Panel meters	AE/Mecon /Schneider/L&T / HPL /C&S
20	TV Coxial Cable	Havell's / Finolex/Anchor/DELTON/RR KABEL

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21	Cable trays	RMCON / Profab / Indiana / MBM
22	Fire Extinguisher (with ISI mark)	CeaseFire/Safex/Minimax/Agni/Usha Fire Safety
23	MS Conduits	AKG/BEC/Gupta/RMCON/Javeri
24	Connector/Terminal block	Wago/Elemac/Phoenix
25	CAT5/6 Cables	Amp/Legrand/Molex/Digilink/Belkin/Belden/KEI
26	PVC Batten / Angle Holder	Anchor / Salzer / Havells
27	Rising main, End Feed Unit,Tap Off Box	C&S/Legrand/Schneider/Siemens/L&T
28	Wall Bracket – fancy wall bracket decorative wall bracket	Havells/Wipro/Philips
29	ACB 415 V, 400 A-2000 A	Havells/ ABB/ Siemens/ L&T/ Schneider/ Legrand/ Anchor/ Hager / GE / Crompton
30	Automatic transfer switch (4P,100A, Std. Automatic)	Havells/ ABB/ Siemens/ L&T/ Schneider/ Legrand/ Anchor/ Hager
	Note: Modular Switch/Bell Push /Socket/Fan regulator shall be of same make For items where preferred makes are not specified the decision of the Engineer – in- charge will be final and binding.	

Providing Fire Alarm System

All the components of the entire FA system shall be preferably from a single manufacturer only.

S. NO	Name of the Product	Manufactured by
1	Addressable Multi sensor smoke Detectors/Heat detector	NOTIFIER/BOSCH/ SYSTEM SENSOR BY HONEY WELL/ SIEMENS/ GE-SECURITY (EDWARD)/RAVEL
2	Addressable Manual pull box	
3	Networkable Intelligent Analog Addressable Main Fire Alarm Control Panel with Battery Backup	
4	Addressable Control Module, isolator module, monitor module	
5	Hooters, Strobe , speaker, telephone jack, telephone receiver	
6	Digital Amplifier/Emergency voice evacuation system	
7	Response Indicator	Agni/ Edward/Ravel/Bosch/Notifier/Siemens

All component serial no. 1 to 6 shall be UL listed without fail. If any product above is not having UL listing, the same shall not be used.

WET RISER SYSTEMS

S. NO	Name of the Product	Manufactured by
1	PUMPS	KIRLOSKAR/Grundfoss/MATHER& PLATT
2	MS/GI PIPES WITH ISI mark	JINDAL/TATA/Zenith Birla
3	BUTTERFLY VALVE	AUDCO/ INTER VALVE/ NORMEX/Honeywell
4	NRV (Ball Valve)/Y Strainer	NORMEX/Audco/Intervalve/Honeywell
5	First aid hose reel with ISI mark	PADMINI/Minimax/Newage/Omex
6	First aid hose reel, ISI mark with hose reel drum	NEW AGE/ SAFEX/EVERSAFE/ OMOX
7	CANVAS HOSE ISI marked	NEW AGE/ ARIHANT/ WINCO
8	DOUBLE/SINGLE HYDRANT VALVE/branch pipe all with ISI mark	NEW AGE/ EVERSAFE/ WINCO/ ARIHANT/Kartar/Padmini
9	SLUICE VALVE with ISI mark	KALPANA/UPADHYAYA/ KIRLOSKAR
All item 1 to 6 except 5 shall be UL listed and UL marked. Any other accessories not specified shall be UL listed and UL marked only.		

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Approved makes for Solar Water Heater		
S. NO	Name of the Product	Manufactured by
1	uPVC pipe	Ashirwad/Finolex/Surya/Jindal/Apollo
2	GI Pipe	Tata/Zenith Birla/Jindal
3	Steel Sheet	Tate/Sail/Jindal
4	Solar Water Heater	Bosch/Havells/KCP solar/Honeywell/ Racold/ Emmvee/ Kotak Urja/ Jain Inigation/ Siemens/ Sudarshan
5	Mineral wool	Rockwool/Twiga
6	Nitrile Rubber	Kflex /Armaflex/Aeroflex

Technical Specifications for split type Air Conditioners

1 Air Conditioners shall be procured and installed through Dealers authorized by OEM
2 Unarmoured cables shall be for connections between outdoor and indoor units shall be one of these makes given in IEI package only.
3 Compressors provided shall have minimum five year warranty
4 Air conditioning units shall have rating as per BOQ
5 Condensers shall have copper coils
6 Refrigerant used shall be R410a

7	Approved makes	Air Conditioner-Carrier/LG/Samsung/Voltas/Daikin/Hitachi/Blue Star/O-General.

LIST OF APPROVED MAKES FOR SUB-STATION WORKS		
S. NO	DESCRIPTION OF ITEM	APPROVED MAKE
1	Tranformer	Crompton Greaves / Kirloskar / ABB / AREVA / Prolec GE / ALSTHOM / SIEMENS / BHEL / Wilson / Schneider
2	H. T. Cables	CCI / UNISTAR / Gloster / Finolex / Havells / KEI
3	H. T. Cables Jointing Kits	Rayhem / 3M / CCI-Xicon / Denson / M-Seal
4	Selector Switches for LT panels	Kaycee / BCH / L & T Salzer / Siemens / Schneider Electric
5	Contractors for APFC panels	Siemens / ABB / L&T / GE / C&S / Schneider Electric / Legrand
6	Electronic Load Manager	HPL / AE / Schnieder / Mecon / L&T / Conzerv
7	Indicating Lamps (LED type)	Siemens / Teknic / L&T / BCH / C&S / ABB / Schneider / JAI BALAJI / VAISHNO
8	Push Buttons	Siemens / Teknic / L&T / BCH / C&S / ABB / Schneider / JAI BALAJI / VAISHNO
9	M.V. Power Capacitors	L&T Heavy Duty Box Type / Siemens Epcos V (AC) 3PH, 50HZ / Neptune Model LLM / Schneider Varplus Energy (MDXL) 440V Range - Box Type
10	APFC Relay	Siemens / EPCOS / L&T / GE / ABB / Schneider / NEPTUNE
11	Current Transformers for LT panels	Kappa / AE / BCH / L&T / ABB / Siemens / GE / MECO / Schneider / IMP / PERFECT ELECTRICALS.
12	Relays	SEGC / Crompton / Siemens / GE / ABB / Schneider / L&T
13	Fire extinguishers	Minimax / Safex / Ceasefire / Agni / Usha Fire Safety
14	Sub Station Fire accessories	ISI marked (Wherever available) (Note: Where no ISI mark is available, the decision of the Engineer - in - charge shall be binding and final on the contractor)
15	First Aid Box	As approved by the State Fire Services Department
16	MS channel iron / GI pipes	SAIL / Jindal / Tata / Zenith
17	LV Glands & Lugs	Jainsons / Comet / dowells
18	Sandwich type bus trunking	Legrand / L&T / Schneider / C&S.

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19	HT Panel	ABB / Siemens / Schneider / System Control / Kirloskar
20	Electric insulation mat with ISI mark	Dozz / Padmini / Raychem / Jyoti Rubber Udyog

ASSISTANT ENGINEER
Management Information Services
O/o Chief Engineer, Chennai, CPWD
CHENNAI-90

ASSISTANT ENGINEER (MIS) O/o CE, CHENNAI, CPWD, CHENNAI

NAME OF PROJECT : ANNA THIDAL SPORTS GROUND @ PUDUCHERRY						
INTETRNAL AND EXTERNAL ELECTRIFICATION WORKS ABSTRACT OF ESTIMATE						
Code No.	**Sl. No.**	**Description of items**	**Unit**	**Qty**	**Rate**	**Amount**
1.10.3	1	Wiring or light point / fan point / exhaust fan point / call bell point with 1.5 sq.mm FRLS PVC insulated copper conductor single core cable in surface / recessed medium class pvc conduit , with modular switch, modular plate, suitable GI box and earthing the point with 1.5 sq.mm FRLS PVC insulated copper conductor single core cable etc. as required - GROUP C	per point	1013		
1.11	2	Wiring for twin control light point with 1.5 sq.mm FRLS PVC insulated copper conductor single core cable in surface / recessed medium class PVC conduit , 2 way modular switch , modular plate , suitable GI box and earthing the point with 1.5 sq.mm FRLS PVC insulated copper conductor single core cable etc. as required	Per point	15		
1.55.3	3	Wiring for group controlled (looped) light point / fan point / exhaust fan point / call bell point (without independent switch etc.) with 1.5 sq.mm FRLS PVC insulated copper conductor single core cable in surface / recessed PVC conduit , and earthing the point 1.5 sq.mm FRLS PVC insulated copper conductor single core cable etc. as required - Group C	Per point	111		
1.12	4	Wiring for light /power plug with 2x4 sq.mm FRLS PVC insulated copper conductor single core cable in surface / recessed medium class PVC conduit along with 1 No.4 sq.mm FRLS PVC insulated copper conductor single core cable for loop earthing as required	metre	900		
1.14.2	5	Wiring for circuit / sub main wiring along with earth wire with the following sizes of FRLS PVC insulated copper conductor , single core cable in surface / recessed medium class PVC conduit as required - 2 X 2.5 sq.mm + 1 x 2.5 sq.mm earth	metre	3643		
1.14.3	6	Wiring for circuit / sub main wiring along with earth wire with the following sizes of FRLS PVC insulated copper conductor , single core cable in surface / recessed medium class PVC conduit as required - 2 X 4 sq.mm + 1 x 4 sq.mm earth wire	metre	4040		
1.17.30	7	Supplying and drawing following sizes of FRLS PVC insulated copper conductor single core cable in the existing surface / recessed steel / PVC conduit as required -3 x 6 sq.mm	metre	9462		
1.4.11	8	Wiring for circuit / sub main wiring along with earth wire with the following sizes of FRLS PVC insulated copper conductor , single core cable in surface / recessed medium class PVC conduit as required - 4 X 16 sq.mm + 2 x 6 sq.mm earth wire	metre	252		

		PVC CONDUITS AND ACCESSORIES				
1.21.1	9	Supplying and fixing of following sizes of medium class PVC conduit along with accessories in surface / recess including cutting the wall and making good the same in case of recessed conduit as required - 20mm	Mtrs.	372		
1.21.2	10	Supplying and fixing of following sizes of medium class PVC conduit along with accessories in surface / recess including cutting the wall and making good the same in case of recessed conduit as required - 25mm	Mtrs.	16512		
1.21.3	11	Supplying and fixing of following sizes of medium class PVC conduit along with accessories in surface / recess including cutting the wall and making good the same in case of recessed conduit as required - 32mm	Mtrs.	60		
1.33	12	Supplying and fixing 3 pin , 5 A ceiling rose on the existing junction box / wooden block including connection etc as required	per no	307		
1.27.1	13	Supplying and fixing following size / modules , GI box along with modular base & cover plate for modular switches in recess etc. as required - 1 or 2 module (75mm x 75mm)	per no	6		
1.27.2	14	Supplying and fixing following size / modules , GI box along with modular base & cover plate for modular switches in recess etc. as required - 3 module (100mm x 75mm)	per no	18		
1.27.3	15	Supplying and fixing following size / modules , GI box along with modular base & cover plate for modular switches in recess etc. as required - 4 module (125 mm x 75 mm)	per no	2		
1.27.4	16	Supplying and fixing following size / modules , GI box along with modular base & cover plate for modular switches in recess etc. as required - 6 module (200 mm x 75 mm)	per no	2		
1.27.5	17	Supplying and fixing following size / modules , GI box along with modular base & cover plate for modular switches in recess etc. as required - 8 module (125 mm x 125 mm)	per no	2		
1.24.1	18	Supplying and fixing following modular switch / socket on the existing modular plate & switch box including connections but excluding modular plate etc. as required - 5/6 A switch	per no	12		
1.24.3	19	Supplying and fixing following modular switch / socket on the existing modular plate & switch box including connections but excluding modular plate etc. as required - 15/16 A switch	per no	6		
1.24.4	20	Supplying and fixing following modular switch / socket on the existing modular plate & switch box including connections but excluding modular plate etc. as required - 3 pin 5/6 A socket outlet	per no	12		
1.24.5	21	Supplying and fixing following modular switch / socket on the existing modular plate & switch box including connections but excluding modular plate etc. as required - 6 pin 15/16 A socket outlet	per no	6		
1.31	22	Supplying and fixing suitable size GI box with modular plate and cover in front on surface or in recess , including providing and fixing 3 pin 5/6 A modular socket outlet and 5/6 A modular switch , connections etc , as required	per no	478		
1.32	23	Supplying and fixing suitable size GI box with modular plate and cover in front on surface or in recess , including providing and fixing 6 pin 5/6 & 15/16 A modular socket outlet and 15/6 A modular switch ,	per no	220		

		connections etc , as required.				
1.56	24	Supplying and fixing suitable size GI box with modular plate and cover in front on surface or in recess, including providing and fixing 2 nos. 3 pin 5/6 A modular socket outlets and 2 nos. 5/6 A modular switches , connection etc. as required.	per no	5		
1.57	25	Supplying & fixing suitable size GI box with modular plate and cover in front on surface or in recess including providing and fixing 25 A modular socket outlet and 25 A modular SP MCB, "C" curve including connections, painting etc .as required.	per point	19		
		TELEPHONE				
NPSR App. Rate	26	Supplying and fixing RJ 11 modular type Telephone outlet and modular plate in cadmium / GI plated MS box including making connections etc as required. Make: MK / Creabtree	Nos.	5		
		DATA NETWORKING				
NPSR App. Rate	27	Supplying and fixing Data socket outlet modular type and modular plate in cadmium / GI plated MS box including making connections etc as required. Make: MK / Crabtree	Nos.	8		
		CABLE				
9.1.33	28	Supplying and making end termination with brass compression gland and aluminium lugs for following size of PVC insulated and PVC sheathed / XLPE aluminium conductor cable of 1.1 kV grade as required - 4 X16 sq.mm (28 mm)	Set.	18		
9.1.34	29	Supplying and making end termination with brass compression gland and aluminium lugs for following size of PVC insulated and PVC sheathed / XLPE aluminium conductor cable of 1.1 kV grade as required - 4 X25 sq.mm (28 mm)	per set	2		
9.1.36	30	Supplying and making end termination with brass compression gland and aluminium lugs for following size of PVC insulated and PVC sheathed / XLPE aluminium conductor cable of 1.1 kV grade as required - 4 X50 sq.mm (35 mm)	per set	22		
9.1.24	31	Supplying and making end termination with brass compression gland and aluminium lugs for following size of PVC insulated and PVC sheathed / XLPE aluminium conductor cable of 1.1 kV grade as required - 31/2 X95 sq.mm (45 mm)	per set	12		
9.1.29	32	Supplying and making end termination with brass compression gland and aluminium lugs for following size of PVC insulated and PVC sheathed / XLPE aluminium conductor cable of 1.1 kV grade as required - 31/2 X240 sq.mm (62 mm)	per set	2		
9.1.30	33	Supplying and making end termination with brass compression gland and aluminium lugs for following size of PVC insulated and PVC sheathed / XLPE aluminium conductor cable of 1.1 kV grade as required - 31/2 X300 sq.mm (70 mm)	per set	8		
9.1.31	34	Supplying and making end termination with brass compression gland and aluminium lugs for following size of PVC insulated and PVC sheathed / XLPE aluminium conductor cable of 1.1 kV grade as required - 31/2 X400 sq.mm (82 mm)	per set	4		
7.1.1	35	Laying of one number PVC insulated and PVC sheathed / XLPE power cable of 1.1 kV grade of following size direct in ground including excavation , sand cushioning, protective covering and refilling the trench etc. as	metre	900		

		required - Upto 35 sq.mm				
7.1.2	36	Laying of one number PVC insulated and PVC sheathed / XLPE power cable of 1.1 kV grade of following size direct in ground including excavation , sand cushioning, protective covering and refilling the trench etc. as required - above 35 sq.mm and upto 95 sq.mm	metre	893		
7.2.4	37	Laying of one number additional PVC insulated and PVC sheathed / XLPE power cable of 1.1 kV grade of following size direct in ground in the same trench in one tier horizontal formation including excavation , sand cushioning , protective covering and refilling the trench etc. as required - above 185 sq.mm and upto 400 sq.mm	metre	527		
7.5.4	38	Laying of one number PVC insulated and PVC sheathed / XLPE power cable of 1.1 kV grade of following size in the existing RCC / HUME / METAL pipe as required - above 185 sq.mm and upto 400 sq.mm	metre	21		
7.7.1	39	Laying and fixing of one number PVC insulated and PVC sheathed / XLPE power cable of 1.1 kV grade of following size on wall surface as required - upto 35 sq.mm (clamped with 1mm thick saddle)	metre	60		
7.7.2	40	Laying and fixing of one number PVC insulated and PVC sheathed / XLPE power cable of 1.1 kV grade of following size on wall surface as required - above 35 sq.mm and upto 95 sq.mm (clamped with 25 x3mm MS flat clamp)	metre	102		
7.7.4	41	Laying and fixing of one number PVC insulated and PVC sheathed / XLPE power cable of 1.1 kV grade of following size on wall surface as required - above 185 sq.mm and upto 400 sq.mm (clamped with 40 x3mm MS flat clamp)	metre	42		
		CABLE TRAY AND TRENCH				
4.6.2	42	Supplying and installing following size of perforated Hot dipped Galvanised iron cable tray (galvanization thickness not less than 50 microns) with perforation not more than 17.5% , in convenient sections , joined with connectors , suspended from the ceiling with G.I. suspenders including G.I .bolts & nuts , etc .as required - 150 mm width x 50 mm depth x 1.6mm thickness	metre	96		
4.6.4	43	Supplying and installing following size of perforated Hot dipped Galvanised iron cable tray (galvanization thickness not less than 50 microns) with perforation not more than 17.5% , in convenient sections , joined with connectors , suspended from the ceiling with G.I. suspenders including G.I. bolts & nuts , etc .as required - 300 mm width x 50 mm depth x	metre	180		
4.7.2	44	Supplying and installing following size of perforated Hot dipped galvanized iron cable tray "bends" (galvanization not less than 50 microns) with perforation not more than 17.5% , in convenient sections , joined with connectors , suspended from the ceiling with G.I. suspenders including G.I. bolts & nuts , etc. as required - 150 mm width x 50 mm depth x 1.6 mm thickness	per no	4		
4.7.4	45	Supplying and installing following size of perforated Hot dipped galvanized iron cable tray "bends" (galvanization not less than 50 microns) with perforation not more than 17.5% , in convenient sections , joined with connectors , suspended from the ceiling with G.I. suspenders including G.I. bolts & nuts , etc. as required - 300 mm width x 50 mm depth x 1.6 mm thickness	per no	2		

14.4	46	Excavation for cable trenches in soft soil , depth upto 1.2 m including dressing of sides lift upto 1.5m , including getting out the excavated soil , refilling with sand and good soil after laying of cable / pipe etc. in layers of 20cm , ramming, watering and disposal of surplus excavated soil as directed , within a lead of 50 meters	cum	624		
1024A (PSR 20-21)	47	Supply of GI pipe 100 mm dia	metre	21		
		EARTHING				
5.5	47	Supplying and installing following size of perforated Hot dipped galvanized iron cable tray "Tee" (galvanization not less than 50 microns) with perforation not more than 17.5% , in convenient sections , joined with connectors , suspended from the ceiling	Set.	2		
5.15	49	Providing and fixing 25mm x 5mm GI. Strip on surface or in recess for connections etc. as required	metre	1066		
5.14	50	Providing and fixing 25 mm x 5 mm copper strip on surface or in recess for connections etc as required	metre	96		
		TELEPHONE				
1.18.2	51	Supplying and drawing following pair 0.5 mm dia FRLS PVC insulated annealed copper conductor , unarmored telephone cable in the existing surface / recessed steel / PVC conduit as required - two pair	metre	594		
		DATA NETWORKING				
1.53.1	52	Supplying and drawing of UTP 4 pair CAT 6 LAN cable in the existing surface / recessed Steel / PVC Conduit as required - 1 run of cable.	metre	618		
		CCTV				
1.53.1	53	Supplying and drawing of UTP 4 pair CAT 6 LAN cable in the existing surface / recessed Steel / PVC Conduit as required - 1 run of cable.	metre	3720		
		CABLE				
NPSR	54	Supply of 4 x 16sqmm PVC sheathed armoured aluminium U.G cable - 1.1 KV grade. Make: Finolex/ Poly cab	Mtrs.	750		
NPSR	55	Supply of 4 x 25sqmm PVC sheathed armoured aluminium U.G cable - 1.1 KV grade. Make: Finolex/ Poly cab	Mtrs.	210		
NPSR	56	Supply of 4C x 50 sq mm PVC sheathed armoured aluminium U.G cable- 1.1 KV grade. Make: Finolex /Poly cab	Mtrs.	887		
NPSR	57	Supply of 3 1/2 x 95sqmm PVC sheathed armoured aluminium U.G cable- 1.1 KV grade. Make: Finolex /Poly cab	Mtrs.	108		
NPSR	58	Supply of 3 1/2 x 240sqmm PVC sheathed armoured aluminium U.G cable- 1.1 KV grade. Make: Finolex/ Poly cab	Mtrs.	36		

NPSR	59	Supply of 3 1/2 x 300sqmm PVC sheathed armoured aluminium U.G cable- 1.1 KV grade. Make: Finolex /Poly cab	Mtrs.	473		
NPSR	60	Supply of 3 1/2 x 400sqmm PVC sheathed armoured aluminium U.G cable- 1.1 KV grade. Make: Finolex/ Poly cab	Mtrs.	60		
PART - E		**PANEL**				
		Supply of outdoor type (IP 65) LT Pillar boxes fabricated with 14G CRCA sheet steel and powder coated, aluminium bus bars, provision for incoming and outgoing cable terminations, the incoming and outgoing switchgears are as per the followings. The items including necessary control wiring, safety features, lock & key / sealing arrangements and providing necessary, support structure/frames with painting as required for erection. All complete with necessary fixing accessories etc. All complete as required by PED standards & specifications.				
EDP. approved rate	61	6 way 600 Amps SS Pillar Box	Each	2		
EDP. approved rate	62	6 way 400/600 Amps Distribution Pillar Box	Each	4		
		Installation, testing and commissioning of outdoor type (IP 65) LT Pillar boxes fabricated with 14G CRCA sheet steel and powder coated, aluminium bus bars, provision for incoming and outgoing cable terminations, the incoming and outgoing switchgears are as per the followings. The items including necessary control wiring, safety features, lock & key / sealing arrangements, civil works and providing necessary, support structure/frames with painting as required for erection. All complete with necessary fixing accessories etc. All complete as required by PED standards & specifications.				
NPSR	63	6 way 600 Amps SS Pillar Box	Each	2		
NPSR	64	6 way 400/600 Amps Distribution Pillar Box	Each	4		
		Supply, installation, testing and commissioning of 415V metering panel board fabricated with 14G CRCA sheet steel, powder coated with Siemens gray (RAL7032 IS-5) after seven tank process, complete with aluminium bus bars (the clearance shall not less than 25 mm for phase-phase and 19mm for phase-neutral/earth), 3.15mm sheet steel or 40x40x6mm MS angle for load bearing members, lifting hooks, MS base frame of 75mm height incomers and outgoing switchgear as below. The item including cost of supply and fixing of 3-phase energy meters, necessary sealing arrangements, 25x3mm GI earthing throughout the bottom length, 6 sq.mm FRLS copper wire inter connections for compartment earthing, complete copper control wiring with crimping type ferrules, copper lugs, proper engravation sheet to be fixed on each outgoing etc. Also the cost inclusive of minor civil works and providing necessary, support structure/frames with painting as required for erection. All complete as per specifications, drawing and/or as required by CEA/PED. The contractor shall submit general arrangement & control wiring drawings and get approval from site Engineer/Consultant before commence the fabrication works. Note: panels costing should be as per sold & with respect to PED standards				

NPSR	65	**Metering Panel-1**				
		Incomer :				
		160A TPN FSU : 1 no.				
		Outgoings :				
		24 Sets each comprising of:				
		a) 32A DP Fuse cut outs with neutral link.				
		b) Single phase Energy meter as per PED requirement.				
		c) 32A DP MCB (C - curve 10KA)				
		1 Sets each comprising of:				
		a) 63A TPN Fuse cut outs with neutral link.				
		b) Three phase Energy meter as per PED requirement.				
		c) 63A FP MCB (C - curve 10KA)	Nos	1.00		
NPSR	66	**Metering Panel-2**				
		Incomer :				
		125A TPN FSU : 1 no.				
		Outgoings :				
		12 Sets each comprising of:				
		a) 32A DP Fuse cut outs with neutral link.				
		b) Single phase Energy meter as per PED requirement.				
		c) 32A DP MCB (C - curve 10KA)	Nos	1.00		
NPSR	67	**Metering Panel-3**				
		Incomer :				
		160A TPN FSU : 1 no.				
		Outgoings :				
		18 Sets each comprising of:				
		a) 32A DP Fuse cut outs with neutral link.				
		b) Single phase Energy meter as per PED requirement.				
		c) 32A DP MCB (C - curve 10KA)				
		3 Sets each comprising of:				
		a) 63A TPN Fuse cut outs with neutral link.				
		b) Three phase Energy meter as per PED requirement.				
		c) 63A FP MCB (C - curve 10KA)	Nos	1.00		
NPSR	68	**Metering Panel-4**				
		Incomer :				
		160A TPN FSU : 1 no.				
		Outgoings :				
		26 Sets each comprising of:				
		a) 32A DP Fuse cut outs with neutral link.				
		b) Single phase Energy meter as per PED requirement.				
		c) 32A DP MCB (C - curve 10KA)				

		1 Sets each comprising of:				
		a) 63A TPN Fuse cut outs with neutral link.				
		b) Three phase Energy meter as per PED requirement.				
		c) 63A FP MCB (C - curve 10KA)	Nos	1.00		
NPSR	69	**Metering Panel-5**				
		Incomer :				
		125A TPN FSU : 1 no.				
		Outgoings :				
		16 Sets each comprising of:				
		a) 32A DP Fuse cut outs with neutral link.				
		b) Single phase Energy meter as per PED requirement.				
		c) 32A DP MCB (C - curve 10KA)	Nos	1.00		
NPSR	70	**Metering Panel-6**				
		Incomer :				
		125A TPN FSU : 1 no.				
		Outgoings :				
		16 Sets each comprising of:				
		a) 32A DP Fuse cut outs with neutral link.				
		b) Single phase Energy meter as per PED requirement.				
		c) 32A DP MCB (C - curve 10KA)	Nos	1.00		
NPSR	71	**Metering Panel-7**				
		Incomer :				
		160A TPN FSU : 1 no.				
		Outgoings :				
		32 Sets each comprising of:				
		a) 32A DP Fuse cut outs with neutral link.				
		b) Single phase Energy meter as per PED requirement.				
		c) 32A DP MCB (C - curve 10KA)	Nos	1.00		
NPSR	72	**Metering Panel - 8**				
		Incomer :				
		125A TPN FSU : 1 no.				
		Outgoings :				
		24 Sets each comprising of:				
		a) 32A DP Fuse cut outs with neutral link.				
		b) Single phase Energy meter as per PED requirement.				
		c) 32A DP MCB (C - curve 10KA)				
		1 Sets each comprising of:				
		a) 63A TPN Fuse cut outs with neutral link.				
		b) Three phase Energy meter as per PED requirement.				

		c) 63A FP MCB (C - curve 10KA)	Nos	1.00		
NPSR	73	**Metering Panel- 9**				
		Incomer :				
		160A TPN FSU : 1 no.				
		Outgoings :				
		32 Sets each comprising of:				
		a) 32A DP Fuse cut outs with neutral link.				
		b) Single phase Energy meter as per PED requirement.				
		c) 32A DP MCB (C - curve 10KA)				
		1 Sets each comprising of:				
		a) 63A TPN Fuse cut outs with neutral link.				
		b) Three phase Energy meter as per PED requirement.				
		c) 63A FP MCB (C - curve 10KA)	Nos	1.00		
NON PSR	74	**UTILITY PANEL**				
	i)	100A, TPN, 25KA, MCCB with thermal magnetic releases and rotary handle mechanism & spreader - 1 No.				
		100A 4P 25KA on load Auto Transfer Switch with ON delay Timer, Auxiliary relay/contactor, single phase preventer, control MCB's, ON/OFF push buttons, MFn meter, phase indications etc. - 1 No.				
		Phase indication lamps(R,Y,B) - 1 set.				
		ON/OFF/TRIP Indication lamps - 1 set.				
		CT ratio 100/5A,CL:1.0 tape insulated bar primary type with suitable sorting links. - 3Nos. - 1 Set.				
		Metering: Multifunction meters cl:1.0 measured with following parameters: V,A,F,PF,KW,KWH & Phase sequence. - 1 Set				
		Bus bar:				
	i)	100A, TPN, 25KA, for 1 sec Aluminium bus bars				
	ii)	Phase: current density not more than 0.8A/sq.mm				
	iii)	Neutral: half of the phase current (0.5 x phase)				
	iv)	Earth: 25x3mm copper flat				
		Outgoing:				
	i)	63A, FP, 10KA, MCB 'C' Curve - 04 Nos.				
	ii)	32A, FP, 10KA, MCB 'C' Curve - 04 Nos.				
	iii)	25A, FP, 10KA, MCB 'C' Curve - 02 Nos.	Set	1		
NON PSR	75	**COMMON AREA PANEL - 1**				
	i)	100A, TPN, 25KA, MCCB with thermal magnetic releases and rotary handle mechanism & spreader - 1 No.				
		100A 4P 25KA on load Auto Transfer Switch with ON delay Timer, Auxiliary relay/contactor, single phase preventer, control MCB's, ON/OFF push buttons, MFn meter, phase indications etc. - 1 No.				
		Phase indication lamps(R, Y, B) - 1 set.				
		ON/OFF/TRIP Indication lamps - 1 set.				

		CT ratio 100/5A, CL: 1.0 tape insulated bar primary type with suitable sorting links. - 3Nos. - 1 Set.				
		Metering: Multifunction meters cl: 1.0 measured with following parameters: V,A,F,PF,KW,KWH & Phase sequence. - 1 Set				
		Bus bar:				
	i)	100A, TPN, 25KA, for 1 sec Aluminium bus bars				
	ii)	Phase: current density not more than 0.8A/sq.mm				
	iii)	Neutral: half of the phase current (0.5 x phase)				
	iv)	Earth: 25x3mm copper flat				
		Outgoing:				
	i)	63A, FP, 10KA, MCB 'C' Curve - 06 Nos.				
	ii)	32A, DP, 10KA, MCB 'C' Curve - 07 Nos.				
	iii)	25A, FP, 10KA, MCB 'C' Curve - 02 Nos.	Set	1		
NON PSR	76	**COMMON AREA PANEL - 2**				
	i)	100A, TPN, 25KA, MCCB with thermal magnetic releases and rotary handle mechanism & spreader - 1 No.				
		100A 4P 25KA on load Auto Transfer Switch with ON delay Timer, Auxiliary relay/contactor, single phase preventer, control MCB's, ON/OFF push buttons, MF n meter, phase indications etc. - 1 No.				
		Phase indication lamps(R, Y, B) - 1 set.				
		ON/OFF/TRIP Indication lamps - 1 set.				
		CT ratio 100/5A,CL:1.0 tape insulated bar primary type with suitable sorting links. - 3Nos. - 1 Set.				
		Metering: Multifunction meters cl: 1.0 measured with following parameters: V, A, F, PF, KW, KWH & Phase sequence. - 1Set				
		Bus bar:				
	i)	100A, TPN, 25KA, for 1 sec Aluminium bus bars				
	ii)	Phase: current density not more than 0.8A/sq.mm				
	iii)	Neutral: half of the phase current (0.5 x phase)				
	iv)	Earth: 25x3mm copper flat				
		Outgoing:				
	i)	63A, FP, 10KA, MCB 'C' Curve - 06 Nos.				
	ii)	32A, DP, 10KA, MCB 'C' Curve - 04 Nos.				
	iii)	25A, FP, 10KA, MCB 'C' Curve - 02 Nos.	Set	1		
NON PSR	77	**ADMIN PANEL**				
	i)	100A, TPN, 25KA, MCCB with thermal magnetic releases and rotary handle mechanism & spreader - 1 No.				
		100A 4P 10KA on load Auto Transfer Switch with ON delay Timer, Auxiliary relay/contactor, single phase preventer, control MCB's, ON/OFF push buttons, MFn meter, phase indications etc. - 1 No.				
		Phase indication lamps(R,Y,B) - 1 set.				
		ON/OFF/TRIP Indication lamps - 1 set.				

		CT ratio 100/5A, CL: 1.0 tape insulated bar primary type with suitable sorting links. - 3Nos. - 1 Set.				
		Metering: Multifunction meters cl: 1.0 measured with following parameters: V, A, F, PF, KW, KWH & Phase sequence. - 1Set				
		Bus bar:				
	i)	100A, TPN, 25KA, for 1 sec Aluminium bus bars				
	ii)	Phase: current density not more than 0.8A/sq.mm				
	iii)	Neutral: half of the phase current (0.5 x phase)				
	iv)	Earth: 25x3mm copper flat				
		Outgoing:				
	i)	40A, FP, 10KA, MCB 'C' Curve - 02 Nos.				
	i)	32A, FP, 10KA, MCB 'C' Curve - 02 Nos.	Set	1		
		TELEPHONE				
NPSR	78	Supplying and drawing of 10 Pair, FR PVC insulated annealed copper conductor, unarmored telephone cable in the existing surface/ recessed steel/ PVC conduit as required.	metre	20		
NPSR	79	Supply and fixing of 10-pair telephone Krone type junction box enclosed in MS box with hinged cover with lock & key arrangements, all complete as per specifications, drawings and / or as directed by the Engineer.	Nos	1		
		EARTHING				
EDP. approved rate	80	Supply of Potential Earth Electrodes Model STANDARD PS53C 48mm dia, wall thickness 3.25mm, terminal size :32 x 10 mm, terminal hole dia 12 mm, hot dip galvanized 80 to 100 microns, 3 meter long, pipe inner space filled with high conductive material, including 2 bags (25kg per bag) of Earth Life Compound , as IS 3043. Base Metal: IS marked branded mild steel pipes.	Nos	22		
		SAFETY AND SAFTY INSPECTIONS:				
	81	Supply and providing the following safety items as per the requirements of statutory authorities:				
EDP. approved rate	i)	Supplying of fire bucket painted red & approved (set of 4 buckets)	Set	1		
EDP. approved rate	ii)	Supplying and fixing danger plate 11KV written in two languages	No.	2		
EDP. approved rate	iii)	Supply of hand gloves suitable for 11 KV	No.	2		
EDP. approved rate	iv)	Supplying of non skid rubber mat 12mm thick and 900mm width.	No.	2		
EDP. approved rate	v)	Supplying and fixing of shock treatment chart	No.	1		
EDP. approved rate	vi)	Supplying and fixing danger plate 440 volts written in two languages	No.	9		

EDP. approved rate	vii)	Supply and fixing carbon di oxide fire extinguisher type 4.5Kg capacity	No.	9		
EDP. approved rate	82	Obtaining CEA Approval for energisation (safety certificate) of the installations after preparation & submission of drawings, documents relevant for the same.	Job	1		
		DISTRIBUTION BOARD				
2.4.3	83	Supplying and fixing following way , horizontal type three pole and neutral , sheet steel , MCB distribution board , 415 V, on surface / recess , complete with tinned copper bus bar , neutral bus bar , earth bar , din bar, Interconnections , powder painted including earthing etc. as required (but without MCB / RCCB / Isolator) 8way (4+24) , double door	Each	3		
2.4.2	84	Supplying and fixing following way , horizontal type three pole and neutral , sheet steel , MCB distribution board , 415 V, on surface / recess , complete with tinned copper bus bar , neutral bus bar , earth bar , din bar, Interconnections , powder painted including earthing etc. as required (but without MCB / RCCB / Isolator) 6way (4+18) , double door	Each	2		
2.4.1	85	Supplying and fixing following way , horizontal type three pole and neutral , sheet steel , MCB distribution board , 415 V, on surface / recess , complete with tinned copper bus bar , neutral bus bar , earth bar , din bar, Interconnections , powder painted including earthing etc. as required (but without MCB / RCCB / Isolator) 4way (4+12) , double door	Each	3		
2.3.3	86	Supplying and fixing following way, single pole and neutral , sheet steel , MCB distribution board , 240 V, on surface / recess, complete with tinned copper bus bar , neutral bus bar , earth bar , din bar , interconnections , powder painted including earthing etc. as required (But without MCB / RCCB / Isolator) - 12 way , double door	Each	8		
2.3.2	87	Supplying and fixing following way , single pole and neutral , sheet steel , MCB distribution board , 240 V, on surface / recess, complete with tinned copper bus bar , neutral bus bar , earth bar , din bar , interconnections , powder painted including earthing etc. as required (But without MCB / RCCB / Isolator) - 8 way ,double door	Each	200		
2.24.3	88	Supplying and fixing Cable End Box (loose wire box) (IP 43) suitable for following triple pole and neutral , sheet steel , MCB distribution board , 415 V, on surface / recess, complete with testing and commissioning etc. as required. For 8 way , double door TPN MCBDB	Each	3		
2.24.2	89	Supplying and fixing Cable End Box (loose wire box) (IP 43) suitable for following triple pole and neutral , sheet steel , MCB distribution board , 415 V, on surface / recess, complete with testing and commissioning etc. as required. For 6 way , double door TPN MCB DB	Each	2		
2.16	90	Supplying and fixing DP sheet steel enclosure on surface / recess along with 25 / 32 A 240 V "C" curve DP MCB complete with connections, testing and commissioning etc. as required.	Each	2		
		Supplying and fixing 5 A to 32 A rating , 240/415 V, 10 kA, "C" curve , miniature circuit breaker suitable for				

2.10.1	91	inductive load of following poles in the existing MCB DB complete with connections , testing and commissioning etc. as required. - Single Pole	Each	1353		
2.10.4	92	Supplying and fixing 5 A to 32 A rating , 240/415 V, 10 kA, "C" curve , miniature circuit breaker suitable for inductive load of following poles in the existing MCB DB complete with connections , testing and Commissioning etc .as required. - Triple Pole	Each	3		
2.14.1	93	Supplying and fixing following rating, double pole , (single phase and neutral), 240V , residual current circuit breaker (RCCB), having a sensitivity current 30 m A in the existing MCB DB complete with connections , testing and commissioning etc as required - 25 A	Nos.	208		
2.14.2	94	Supplying and fixing following rating, double pole , (single phase and neutral), 240V , residual current circuit breaker (RCCB), having a sensitivity current 30 mA in the existing MCB DB complete with connections , testing and commissioning etc as required - 40 A	Nos.	15		
2.14.3	95	Supplying and fixing following rating, double pole , (single phase and neutral), 240V , residual current circuit breaker (RCCB), having a sensitivity current 30 m A in the existing MCB DB complete with connections , testing and commissioning etc as required - 63 A	Nos.	9		
2.12.1	96	Supplying and fixing following rating , four pole ,415 V , isolator in the existing MCB DB complete with connections , testing and commissioning etc. as required - 40 A	Nos.	11		
2.12.2	97	Supplying and fixing following rating , four pole ,415 V , isolator in the existing MCB DB complete with connections , testing and commissioning etc. as required - 63 A	Nos.	3		
2.11	98	Supplying and fixing single pole blanking plate in the existing MCB DB complete etc. as required	Nos.	12		
		LIGHT FIXTURES / FAN				
1.35	99	Installation, testing and commissioning of wall bracket / ceiling fittings of all sizes and shapes containing upto two GLS / CFL /LED lamps per fitting. Complete with all accessories including connections etc as required.	Nos.	333		
NPSR App. Rates	100	Supply of ceiling fan Sweep 1200mm Fusion - 50 Energy saving fan five star. Make: Hevells.	Nos.	249		
1408	101	Stepped type Modular Fan regulator (2 module)	Nos.	249		
3141-O	102	3mm thick mica plate for fan hook box (L.M.R)	Nos.	249		
3140-O	103	Concealed type ceiling fan metal hook. (L.M.R)	Nos.	249		
1.44	104	Installation testing and commissioning of ceiling fan/wall mounting fan and wiring the down rod of standard length .(upto 30cm) with 14/.86mm Plastic insulated twisted Copper wire including earthing as	Nos.	249		
3129-O	105	Supply of 300mm 1400 rpm heavy duty exhaust fan Make:Almonard/Orient/Usha	Nos.	21		

1.50.1	106	Installation of exhaust fan in the existing opening , including making good the damage , connection , testing ,commissioning etc. as required - Upto 450 mm sweep	Nos.	21		
		LIGHT FIXTURES				
NON PSR	107	fixing Step type socket Fan Regulator on the existing switch box/cover including connections etc. as required.	Nos.	249		
NON PSR	108	Supplying of 230V, 1 x 20W LED ceiling mounted type light fitting with suitable 20W LED lamp andnecessary fixing accessories as required. Make: Philips/Bajaj	Nos.	18		
NON PSR	109	Supplying of 230V, 1 x 24W LED ceiling mounted type light fitting with suitable 24W LED lamp andnecessary fixing accessories as required. Make: Philips/Bajaj	Nos.	70		
NON PSR	110	Supplying of 230V, 1 x 18W LED wall mounted light fitting with suitable 18W LED lamp and necessary fixing accessories as required. Make: Philips/Bajaj	Nos.	235		
EDP approved rate	111	Supplying and fixing of LED 4000K 2 x 2 Square Type Recessed Fitting. (Philips / Havells)	Nos.	6		
EDP approved rate	112	Supply and Fixing of 20W LED tube light fitting Make: Philips / Bajaj / Benio	Nos.	582		
NON PSR	113	Supplying of 1 x 10 LED 2' Washbasin light fittings with suitable 10W LED lamp and necessary fixing accessories as required. Make: Philips/Bajaj	Nos.	10		
NON PSR	114	Supplying and fixing of 230V, 1 x 34W LED ceiling mounted type light fitting with suitable 34W LED lamp and necessary fixing accessories as required. Make: Philips/Bajaj	Nos.	6		
		DATA NETWORKING				
NPSR App.Rate	115	Supply, installation, testing and commissioning of 16 port Data switches with rack, the rate shall be inclusive of all required civil works. (Make: Netgear / Digilink)	Nos.	1		
		CAMERA				
NON PSR	116	Supplying and fixing of wall or ceiling mounted type Fixed Dome or Bullet type Camera 2.0 Megapixel high-performance CMOS, Analog HD output, up to 1080P resolution True Day/Night, DNR, Smart IR Up to 30m IR distance, IP66 weatherproof with all necessary BNC connectors and fixing accessories as required.	Nos.	30		
NON PSR	117	Supply, fixing and termination of high quality rack mounted type patch panel with one number of 24 port POE network switch, fixing frames, links and interconnections, necessary accessories etc., all complete as per specifications, drawings and / or as directed by the Engineer.	Nos.	2		
		Supply of wall Mounted network rack - 9U door of glass, completely covered and have security lockers, proper				

NON PSR	118	ventilated with one fan one cable manager, power distribution units of 6nos (5A) sockets with surge protection, mounting accessories and 5A top Ventilation switch.	Nos.	2		
NPSR App.Rate	119	Installation of wall Mounted network rack - 9U door of glass, complete covered and have security locks, proper ventilated with one fan one cable manager, power distribution units of 6nos(5A) sockets with surge protection, mounting accessories and 5A top Ventilation switch.	Nos.	2		
NON PSR	120	Supplying and installing of 64 Channel Network Video Recorder with Max 320Mbps incoming bandwidth Smart H.265+/H.265/ Smart H.264+/H.264/ MJPEG Up to 12MP resolution preview and playback Support 8 SATA HDDs up to 10TB Each, 4 USB (2 USB3.0, 2USB2.0) 2 HDMI / 2VGA simultaneous video output Support Multi-brand network cameras Support RAID 0/1/5/10 Mobile Software: iCMOB, gCMOB CMS Software: KVMS Pro. The items including supply of 6TB hard disk, connectors, pins and providing complete configuration etc.	Nos.	1		
NON PSR	121	Supplying and installing of Power Supply Unit along with necessary Battery backup, suitable for 1nos. 64 channel network video recorder system.	Nos.	1		
NON PSR	122	Supplying and installing of 43" LED colour monitor.	Nos.	3		
		INVERTER SYSTEM				
NON PSR	123	Supply and erection of 1 Phase, 230 V, 2 k VA 1P -n 1P out /INVERTER with suitable BCB (battery circuit breaker), filters, 6 nos. 12V 28Ah SMF battery bank, with 30minutes backup. The items including necessary safety features, protections/relays, necessary battery racks, cables/wires and fixing accessories etc.	Nos.	1		

This NIT contains 123 items and approved for an amount of Rs. 1,51,25,471/- (Rupees
One crore Fifty one lakhs Twenty five thousand Four hundred and Seventy one only)

CHIEF EXECUTIVE OFFICER/PSCDL