Bhopal Smart City Development Corporation Limited

"Development of Transportation Infrastructure and Smart Street on principles of Tactical Urbanism, along the stretch of Board office to Jyoti Talkies Square."
(Second Call)

REQUEST FOR PROPOSAL

2017

Prepared by

Approved by

Recommended by

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SECTION-1

NOTICE INVITING TENDER

Bhopal Smart City Development Corporation Limited

NOTICE INVITING e-TENDER (NIT)

BSCDCL invites online percentage rate /item rate tender as per schedule as under:

Tendering Document No.	:	MPBSCDCL/TENDER NO – 23/BSCDCL
Name of the Work	:	Development of Transportation Infrastructure and Smart Street on principles of Tactical Urbanism, along the stretch of Board office to Jyoti Talkies Square.
Brief Scope of Work	:	Place making like construction, development & maintenance of smart street, interchange bus terminal at board office, plaza, smart parking at mp nagar zone 1 opp. Db mall with underground electrification.(After Project implementation 3 year of maintenance has to be done by the bidder (contractor)) ,
Estimated Cost	:	Rs. 7,87,09,033/-(Seven crore eighty seven lakhs nine thousand thirty three only)
Period of Completion	:	9 Months including raining season
Earnest Money Deposit	:	Rs. 7.87 Lakh (Rs. Seven lakhs eighty seven Thousand Only)
Non-refundable cost of e- Tender Document	:	20,000/-(Rs. Fifty thousand only)
Purchase of Tender Start Date	:	28/04/2017 by 18.00 Hrs
Purchase of Tender End Date	:	29/05/2017 by 15.00 Hrs
Last date & time of submission of Online Tender(Bid Submission)	:	29/05/2017 by 17.30 Hrs
Period during which hard copy of the documents as per NIT shall be submitted.(With all technical credentials)	:	30/05/2017 by 15.00 Hrs
Date & Time of Opening of technical Tender	:	31/05/2017 by 11.00 Hrs
Date & Time of Opening of Financial Tender	:	Will be intimated later to successful Bidder
Validity of offer		90 days from the date of opening of price bid.
Pre-Tender Meeting & Venue		11/05/2017 at 12.00 Hrs. At BSCDCL, Bhopal Office

The tender document can be downloaded from www.mpeproc.gov.in **"Corrigendum, if any, would appear only on the** www.mpeproc.gov.in **web site and not to be published in any News Paper".**

The tenderer if required may submit queries in writing on E-mail Id. smartcitycell@bmconline.gov.in before **11.05.2017 up to 12.00 Noon**.

ELIGIBILITY CRITERIA FOR BIDDER:

1. Firm should have registered Civil contractor and having valid "A" class Electrical License from MP Electrical safety department with valid registration in MPMKVVCL in A3 class category.

2. The Average annual financial turnover for last 3 years(2013-14,2014-15,2015-16) shall be at least 30% of the estimated cost put to tender, Copies of balance sheets of last three financial years OR duly certified by a Chartered Accountant shall be submitted in support of the requisite financial Turnover.

3. The bidder shall have successfully completed similar works during the last seven years as mentioned below:

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

   OR

   Two similar works each costing not less than 50% of the estimated cost put to tender

   OR

   One similar work costing not less than 80% of the estimated cost.

   Similar work means construction, place making like development of area, building works, underground electrification beautification, and for electrical work providing underground ht cables / substation work(rmu,pss) / street lighting work value of at least three work each costing not less than 40% of the estimated cost, two similar works each costing not less than 50% of the estimated cost, one similar work costing not less than 80% of the estimated cost with electrical work costing in this tender. Should be primarily engaged in construction activities including Civil / Electrical works and registered/empaneled with appropriate govt. / GOI undertaking authorities.
   Should have in-house capability for specified jobs and satisfactorily completed
   (Phase/Part completion of the scope of work in a contract shall not be considered.

   The contractor / firm shall submit Client certificate(s) in support of work experience which should show the nature of work done, the value of work, date of start, date of completion as per agreement, actual date of completion and satisfactory completion of work.

4. Net worth should be positive in last three years.

5. Valid proof of Sales Tax, Service Tax, VAT Registration, EPF Registration Certificate & PAN Card, TAN No.

6. Applications from Joint venture and Consortium members are not allowed however they can be permitted to engage a approved agency to carryout electrical works after approval of BSCDCL as mentioned in SCC.

Annexure-I

MEMORANDUM

Sl. No.	Description	Cl. No. of NIT/ITT/Clauses of Contract (CC)	Values/Description to be Applicable for Relevant Clause (S)
1)	Name of Work		Development of Transportation, Infrastructure and Smart Street on principles of Tactical Urbanism, along the stretch of board office to Jyoti Talkies Square.
2)	Client/Owner		Bhopal Smart City Development Corporation Ltd.
3)	Type of Tender		Online percentage rate /Item rate
4)	Earnest Money Deposit		Rs. 7.87 Lakh (Rs. Seven lakhs eighty seven Thousand Only)
5)	Estimated Cost		Rs. 7,87,09,033/-(Seven crore eighty seven lakhs nine thousand thirty three only)
6)	Time allowed for Completion of Work		09 Months including raining season.
7)	Mobilization Advance		**10%** of contract value
8)	Interest Rate of Mobilization Advance		Simple Interest Rate of 10 % Percent only) (Per Annum)
9)	Schedule of rates applicable		Civil Works : UADD, PWD Electrical Works : UADD, PWD, NON SOR
10)	Validity of Tender		90 (Ninety) Days
11)	Performance Guarantee		5.00 % (Five Percent Only) of contract value within 30 days from the issue of Letter of Award
12)	Security Deposit/Retention Money		5.00% (Five Percent Only) of the gross value of each running bill.

13)	Time allowed for starting the work		The date of start of contract shall be reckoned from 10 days after the date of agreement.		
14)	Deviation limit beyond as per tender document except foundation.		Building work as per requirement.	Annual repair & maintenance of buildings As per requirement.	Road Work As per Requirement
			Note:-The Deviation Limit of Building Work shall also apply for combined works(Building).		
15)	Deviation limit beyond as per tender document shall apply for Foundation		Building work as per requirement.	Annual repair & maintenance of buildings As per requirement.	Road Work As per Requirement
			Note:-The Deviation Limit of Building Work shall also apply for combined works		
16)	Escalation		All rates as per Bill of Quantities (BOQ) quoted by contractor shall be firm and fixed for entire contract period as well as extended period for completion of the works. No escalation shall be applicable on this		
17)	Defects Liability Period		3 Years from the date of completion.		

The intending tenderer must read the terms and conditions of BSCDCL carefully. He should only submit his tender if he considers himself eligible and he is in possession of all the documents required. Information and Instructions for Tenderers posted on Website(s) shall form part of tender Document.

The Tender Document as uploaded can be viewed and downloaded free of cost by anyone including intending tenderer. But the tender can only be submitted after uploading the mandatory scanned documents such as:-

1. a) Proof of e-payment towards cost of tender document,
   b) Proof of online payment through e-portal www.mpeproc.gov.in/ Bank Guarantee of any Nationalized or Commercial Scheduled Bank against in favour CEO, BSCDCL of EMD & All other documents shall be as per Notice Inviting E tender.

List of Documents to be scanned and uploaded within the period of tender submission:

a. Proof of online payment / Bank Guarantee of any Nationalized or all Commercial Scheduled Bank against EMD in favor of CEO, BSCDCL.

b. Copy of documents related to qualifying requirement of bidders as per NIT clause.

c. Letter of Acceptance of tender condition unconditional as per format enclosed in Annexure-II.

d. Certificate of Financial Turnover duly certified by CA as indicated above.

e. Valid service tax registration, EPF registration, VAT registration, Sales Tax registration, PAN No, TAN No

e. Acknowledgement towards cost of tender fee submission

f. All pages of all the Corrigendum (if any) duly signed by the authorized person.

g. Affidavit as per "Appendix-O" of tender document.

h. Acceptance letter and Affidavit/Undertaking for Blacklisting/ Debar.

j. Should submit the list of tools plant and machinery.

If any condition or conditional rebate is offered by the tenderer, their tender shall summarily be rejected.

The tenderers are required to quote strictly as per terms and conditions, specifications, standards given in the tender documents and not to stipulate any deviations.

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

When it is desired by BSCDCL 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. On opening date, the tenderer can login and see the tender opening process. Contractor can upload documents in the form of JPG format and PDF format.

Contractor to upload scanned copies of all the documents including valid service tax registration/EPF registration/VAT registration/Sales Tax registration, PAN NO. As stipulated in the tender document.

If the contractor is found ineligible after opening of tenders, his tender shall become invalid and cost of tender document and processing fee shall not be refunded.

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 contractor the tender shall become invalid and cost of tender document and processing fee shall not be refunded.

Notwithstanding anything stated above, BSCDCL reserves the right to assess the capabilities and capacity of the tenderer to perform the contract, in the overall interest of BSCDCL. In case, tenderer's capabilities and capacities are not found satisfactory, BSCDCL reserves the right to reject the tender.

Instructions for financial bid submission-

In case of Percentage Rate Tender, Contractor must ensure to quote single percentage rate in attached financial bid format. Quote should be in percentage higher or below on the SOR Rates the same is to quoted in the form of decimal only. For example if contractor wants to quote 5 percent higher then he have to quote 1.05 and if he wants to

quote 5 [percent below he have to quote 0.95 in given column of financial bid sheet. In case of Item Rate Tender, price shall be entered against each item in the Bill of Quantities / Schedule of Quantities. The cost of item against which the contractor has failed to enter a rate or price shall be deemed to be covered by rates and prices of other items in Bill of Quantities / Schedule of Quantities and no payment shall be made for the quantities executed for items against which rate has not been quoted by the contractor. In addition to this, while selecting any of the cells a warning appears that if any cell is left blank the same shall be treated as “0”. Therefore, if any cell is left blank and no rate is quoted by the bidder , rate of such item shall be treated as “0” (ZERO).

i. Financial Bid format is uploaded in Excel Format in www.mpeproc.gov.in. At the time of financial bidding, bidder is requested to download the file, and update the same.

ii. For Non SOR items bidder can quote for individual item rates in respective financial bid sheet.

iii. Bidders are requested to check final figure in all the totals of all sheets. BSCDCL is not Responsible for errors in the financial bid document.

iv. Bidders are required to upload the updated financial bid in the prescribed excel format from the www.mpeproc.gov.in at the time of final financial bid submission.

SECTION-2

INSTRUCTIONS TO TENDERER

Instruction to Tenderer (ITT)

A. GENERAL INSTRUCTIONS:

2.1. General terms of Bidding-

2.1.1 No Bidder shall submit more than one BID for the Project.

2.1.2 The Feasibility Report / Preliminary Project Report of the Project has been assessed however the Bidders are expected to carry out their own surveys, investigations and other Preliminary examination of the Project before submitting their Bids. Nothing contained in the attached drawings/BOQ shall be binding on the BSCDCL nor confer any right on the Bidders, and the BSCDCL shall have no liability whatsoever in relation to or arising out of any or all contents of TENDER.

2.1.3 Notwithstanding anything to the contrary contained in this RFP, the Preliminary terms specified in the draft Agreement shall have overriding effect; provided, however, that any conditions or obligations imposed on the Bidder hereunder shall continue to have effect in addition to its obligations under the Agreement.

2.1.4 The BID shall be furnished in the format exactly as per Appendix-I i.e. Technical Bid as per Appendix IA and Financial Bid as per Appendix IB. BID amount shall be indicated clearly in both figures and words, in Indian Rupees in prescribed format of Financial Bid and it will be signed by the Bidder's authorized signatory. In the event of any difference between figures and words, the amount indicated in words shall be taken into account.

2.1.5 The Bidder shall deposit a BID Security (EMD) of Rs. 7.87 Lakhs in accordance with the provisions of this RFP. The Bidder has to provide the BID Security (EMD) through online payment or in the form of a Bank Guarantee acceptable to the BSCDCL, as per format at Appendix-II.

2.1.6 The validity period of the Bank Guarantee, shall not be less than 180 (one hundred and eighty) days from the BID Due Date, inclusive of a claim period of 60 (Sixty) days, and may be extended as may be mutually agreed between the BSCDCL and the Bidder.

2.1.7 The BID shall be summarily rejected if it is not accompanied by the BID Security. The BID Security shall be refundable no later than 150 (one hundred and fifty) days from the BIDDue Date except in the case of the Selected Bidder whose BID Security shall be retainedtill it has provided a Performance Security under the Agreement.

2.1.8 The Bidder should submit a Power of Attorney as per the format at Appendix-III, Authorizing the signatory of the BID to commit the Bidder.

2.1.9 Any condition or qualification or any other stipulation contained in the BID shall render the BID liable to rejection as a non-responsive BID.

2.1.10 The BID and all communications in relation to or concerning the Bidding Documents and the BID shall be in English language.

2.1.11 The documents including this RFP and all attached documents, provided by the BSCDCL are and shall remain or become the property of the BSCDCL and are Transmitted to the Bidders solely for the purpose of preparation and the submission of a BID in accordance herewith. Bidders are to treat all information as strictly confidential and shall not use it for any purpose other than for preparation and submission of their BID. The provisions of this Clause

2.1.12 shall also apply mutatis mutandis to BIDs and all other documents submitted by the Bidders, and the BSCDCL will not return to the Bidders any BID, document or any information provided along therewith.

2.1.13 This RFP is not transferable.

2.1.14 any award of Project pursuant to this RFP shall be subject to the terms of Bidding Documents and also fulfilling the criterion as mentioned in clause 2.1.17.

2.1.16 while bidding is open to persons from any country, the following provisions shall apply then the Eligibility of such Bidder shall be subject to approval of the BSCDCL from national security and public interest perspective. The decision of the BSCDCL in this behalf shall be final and conclusive and binding on the Bidder. The holding or acquisition of equity or control, as above, shall include direct or indirect holding/ acquisition, including by transfer, of the direct or indirect legal or beneficial ownership or control, by persons acting for themselves or in concert and in determining such holding or acquisition, the BSCDCL shall be guided by the principles, precedents and definitions contained in the Securities and Exchange Board of India (Substantial Acquisition of Shares and Takeovers) Regulations, 1997, or any substitute thereof, as inforce on the date of such acquisition. The Bidder shall promptly inform the BSCDCL of any change in the shareholding, as above, and failure to do so shall render the Bidder liable for disqualification from the Bidding Process.

2.1.17 Not withstanding anything to the contrary contained herein, in the event that the Bid Due Date falls within three months of the closing of the latest financial year of a Bidder, it shall ignore such financial year for the purposes of its Bid and furnish all its information and certification with reference to the 5 (five) years or 1 (one) year, as the case may be, preceding its latest financial year. For the avoidance of doubt, financial year shall, for the Purposes of a Bid hereunder, mean the accounting year followed by the Bidder in the course of its normal business.

2.1.18 Any entity which has been barred by GOI or Govt of Madhya Pradesh, MP DISCOM for the works of expressways, National highways, ISC and EI works, and the bar subsists as on the Bid Due Date, would not be eligible to submit the BID.

2.1.19 The BSCDCL reserves the right to reject an otherwise eligible bidder on the basis of the information provided under clause 2.1.19. The decision of the BSCDCL in this case shall be final.

2.2 Eligibility and qualification requirements of Bidder

2.2.1 For determining the eligibility of Bidder the following shall apply:

(a) The Bidder may be a single entity or Consortium, coming together to implement the Project. However, no Bidder applying individually or as a member of a Consortium, as the case may be, can be member of another Bidder. The term Bidder used herein would apply to both a single entity and a Consortium.

(b) Bidder may be a natural person, private entity, or any combination of them with a formal intent to enter into a Consortium agreement or under an existing agreement to form a Consortium. A Consortium shall be eligible for consideration subject to the conditions.

(c) An Bidder shall not have a conflict of interest (the "Conflict of Interest") that affects the Bidding Process. Any Bidder found to have a Conflict of Interest shall be disqualified and liable for forfeiture of the BID Security or Performance Security as the case may be. A Bidder shall be deemed to have a Conflict of Interest affecting the Bidding Process, if:

(d) A Bidder shall be liable for disqualification and forfeiture of BID Security, if any legal, financial or technical adviser of the BSCDCL in relation to the Project is engaged by the Bidder, its Member or any Associate thereof, as the case may be, in any manner formatters related to or incidental to such Project during the Bidding Process or subsequent to the (i) issue of the LOA or (ii) execution of the Agreement. In the even though such adviser is engaged by the selected Bidder or Contractor, as the case may be, after issue of the LOA or execution of the Agreement for matters related or incident alto the project, then notwithstanding anything to the contrary contained herein or in the13LOA or the Agreement and without Prejudice to any other right or remedy or the BSCDCL, including the forfeiture and appropriation of the BID Security or Performance Security, as the case may be, which the BSCDCL may have there under or otherwise, the LOA or the Agreement, as the case may be, shall be liable to be terminated without the BSCDCL being liable in any manner whatsoever to the Selected Bidder or Contractor for the same. For the avoidance or doubt, this disqualification shall not apply where such adviser was engaged by the Bidder, its Member or Associate in the past but its assignment expired or was terminated 6 (six) months prior to the date of issue of this RFP. Nor will this disqualification apply where such adviser is engaged after a period of 3 (three) years from the date of commercial operation of the Project.

Other Instructions-

1	On line percentage rate /item rate tenders on behalf of Owner/Client are invited for the work of Development of Transportation Infrastructure and Smart Street on principles of Tactical Urbanism, along the stretch of board office to Jyoti Talkies Square. for BSCDCL at Bhopal city. The pre-qualification / 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 pre-qualification of contractor should be valid on the original date of submission of tenders.
2	The work is estimated to cost Rs. 7,87,09,033/- Seven crores eighty seven lakhs nine thousand thirty three rupees only however, is given merely as a rough guide. The tender document as uploaded can be seen on website www.mpeproc.gov.in and can be downloaded free of cost.
3	**Mode of Submission:** **Earnest Money Deposit** Earnest Money Deposit of amount as mentioned in "NIT/ Memorandum (Annexure-I)" required to be submitted along with the tender shall be payable online through E-tendering portal www.mpeproc.gov.in through NEFT/RTGS. The EMD shall bevalid for minimum period of 150 (One Hundred Fifty) days from last day of submission of Tender. The EMD of all unsuccessful tenderers will be returned within thirty (30) days of the Award of the contract to successful tenderer through online portal.
4	Financial Bidding can be done through the excel sheet uploaded on www.mpeproc.gov.in, which contains four sheets: 1. UADD Building Works SOR 2.. MPPWD SOR 3. CIVIL NON SOR 4. ELECTRICAL UADD SOR 5 ELECTRICL PWD SOR 6 ELECTRICAL NON SOR * Rates for NON SOR items can be quoted in NON SOR sheet *BID to be quote 1 plus % above or below (for Example. If want to quote 5% above then write 1.05 and if want to quote 5% below then write 0.95) for SOR items. *Rates can be quoted in the yellow highlighted space of the excel sheet of Financial Bid
5	Interested Bidder who wish to participate in the tender has also to make following payments through online payment e-proc portal only. Cost of Tender Document –Rs. 20,000/- To be submit online only. E-Tender Processing Fee – As applicable for MPEPROC portal, Cost of Tender Document and, e-Tender Processing Fee online payment shall be payee online Copy of pre-qualification/enlistment letter and certificate of work experience (if required) and other documents as specified in the tender shall be scanned and uploaded to the e-Tendering website within the period of tender submission.

6	Online technical tender documents submitted by intending tenderers shall be opened only of those tenderers, whose Earnest Money Deposit, Cost of Tender Document and e-Tender Processing Fee and other.
7	Both the envelopes shall be placed in another envelope with due mention of Name of work, date & time of opening of tenders and to be submitted in the office of BSCDCL after last date & time of submission of tender. Online technical tender documents submitted by intending tenderers shall be opened only of those tenderers, whose Earnest Money Deposit, Cost of Tender Document and e-Tender Processing Fee and other documents placed in the envelope are found in order. The Price tender of those tenderers whose documents found to be in order shall be opened. The date of opening of price tender shall be informed to the tenderer.
8	The tender submitted shall become invalid if: The tenderer is found ineligible. The tenderer does not upload all the documents (including service tax registration/VAT registration/Sales Tax Registration) as stipulated in the tender document. If any discrepancy is noticed between the documents as uploaded at the time of submission of tender and hard copies as submitted physically in the office of tender opening authority.
7	Validity of Tender The tender for the works shall remain open for acceptance for a period of Ninety (90) days from the date of opening of financial tender. If any tenderer 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 the BSCDCL, then the BSCDCL shall, without prejudice to any other right or remedy, be at liberty to forfeit the said earnest money as aforesaid. Further the tenderers shall not be allowed to participate in the retendering process of work.
8	Acceptance of Tender BSCDCL reserves the right to reject any or all the tenders in part or full without assigning any reason whatsoever. BSCDCL does not bind itself to accept the lowest tender. The BSCDCL reserves the right to award the work to a single party or split the work amongst two or more parties as deemed necessary without assigning any reason thereof. The Contractor is bound to accept the part work as offered by BSCDCL after split up at the quoted/negotiated rates.
9	The tenders shall be strictly as per the conditions of contract. Tenders with any additional condition(s)/modifications shall be rejected.
10	The witnesses to the Tender/Contract Agreement shall be other than the tenderer/ tenderers competing for this work and must indicate full name, address, and status/occupation with dated signatures.

11	The acceptance of tender will rest with the BSCDCL who does not bind it self any or all the tenders received without assigning any reason thereof. Tenders in which, any of the prescribed conditions are not fulfilled or found incomplete in any respect are liable to be rejected.
12	On acceptance of tender, the name of the accredited representative(s) of the contractor who would be responsible for taking instructions from Engineer-in-Charge or its authorized representative shall be intimated by the contractor within 07 days of issue date of letter of Awards by BSCDCL.
13	The tenderer shall not be permitted to tender for works if his near relative is posted in the project office or concerned Zonal Office of the BSCDCL. The contractor shall also intimate the names of persons who are working with him in any capacity or are subsequently employed by him and who are near relatives to any of the officers in BSCDCL. Any breach of this condition by the tenderer would render him liable to the withdrawal of the work awarded to him and forfeiture of Earnest Money and Security Deposit. This may also debar the contractor from tendering for future works under BSCDCL. For the purpose of operation of this clause a near relative shall mean wife, husband, parents, grandparents, children, grandchildren, brothers, sisters, uncles, aunts, cousins and their corresponding in-laws.
14	The time of completion of the entire work, as contained in contract shall be as mentioned in "Memorandum - Annexure-I", which shall be reckoned from the 10th day after issue of the letter of Award by the BSCDCL.
15	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.
17	The tender award, execution and completion of work shall be governed by tender documents consisting of (but not limited to) Letter of Award/Letter of work order, Bill of Quantities, Special Conditions of Contract, General Conditions of Contract, Specifications, Drawings. The tenderers shall be deemed to have gone through the various conditions including sub-soil water conditions, topography of the land, drainage and accessibility etc. or any other condition which in the opinion of contractor will affect his price/rates before quoting their rates. No claim whatsoever against the foregoing shall be entertained.
18	The drawings with the tender documents are Tender Drawing and are indicative only.
19	ADDENDA/ CORRIGENDA Addenda/Corrigenda to the tender documents may be issued prior to the date of submission of the tender to clarify or effect modification in specification and/or contract terms included in various tender documents. The tenderer shall suitably take into consideration such Addenda/Corrigenda while submitting his tender. The tenderer shall return such Addenda/ Corrigenda duly signed and stamped as confirmation of its receipt & acceptance and submit along with the tender document. All addenda/ Corrigenda shall be signed and stamped on each page by the tenderer and shall become part of the tender and contract documents.

20	SITE VISIT AND COLLECTING LOCAL INFORMATION Before tendering, the tenderers are advised to visit the site, its surroundings to assess and satisfy themselves about the local conditions such as the working and other constraints at site, approach roads to the site, availability of water & power supply, application of taxes, duties and levies as applicable & any other relevant information required by them to execute complete scope of work. The tenderer may obtain all necessary information as to risks, weather conditions, contingencies & other circumstances (insurgencies etc.) which may influence or affect their tender prices. Tenderer shall be deemed to have considered site conditions whether he has inspected it or not and to have satisfied himself in all respect before quoting his rates and no claim or extra charges whatsoever in this regard shall be entertained / payable by the BSCDCL at a later date.
21	ACCESS BY ROAD Contractor, if necessary, shall build temporary access roads to the actual site of construction for the works at his own cost to make the site accessible. The Contractor shall maintain the same in motorable condition at all the times as directed by Engineer-in-Charge at his own cost. The contractor shall be required to permit the use of any roads so constructed by him for vehicles of BSCDCL or any other agencies/ contractors who may be engaged on the project site, free of cost. Non-availability of access roads or approach to site, for the use of the contractor shall in no case condone any delay in the execution of work nor be the cause for any claim for compensation.
22	HANDING OVER & CLEARING OF SITE The Contractor should note that area for construction may be made available in phases as per availability and in conjunction with pace of actual progress of work at site. The work may be required to be carried out in constrained situations. The work is to be carried out in such a way that the traffic, people movement, if any, is kept operative and nothing extra shall be payable to the contractor due to this phasing / sequencing of the work. The contractor is required to arrange the resources to complete the entire project within total stipulated time. Traffic diversion, if required, is to be done and maintained as per requirement of local traffic police or/and as per specification, by the contractor at his own cost and the contractor shall not be entitled for any extra payment, whatsoever, in this regard. The efforts will be made by the BSCDCL to handover the site to the Contractor free of encumbrances. However, in case of any delay in handing over of the site to the Contractor, the BSCDCL shall only consider suitable extension of time for the execution of the work. It should be clearly understood that the BSCDCL shall not consider any revision in contract price or any other compensation whatsoever viz. towards idleness of Contractor‟s labour, equipment etc. Old structures on the proposed site, if required, shall be demolished by the contractor properly at his own cost unless and otherwise mentioned elsewhere in the tender document.

23	The useful material obtained from demolition of structures & services shall be the property of the owner/BSCDCL and these materials shall be stacked in workmanship like at the place specified by the Engineer-in-charge. Necessary arrangement including its maintenance is to be made by the contractor for temporary diversion of flow of existing drain and road, as the case may be. The existing drain, road would be demolished, wherever required, with the progress of work under the scope of proposed project. The existing Road and Drain which are not in the alignment of the said project but are affected and/ or need to demolished during execution for smooth progress of the project, shall be rehabilitated to its original status and condition (including black topping) by the contractor at his own cost. The cost to be incurred by contractor in this regards shall be deemed to be included in the quoted rates of the bill of quantity items and contractor shall not be entitled for any extra payment whatsoever in this regard. The information about the public utilities (whether over ground or underground) like electrical/ telephone/ water supply lines, OFC Cables, open drain etc. is the responsibility of contractor to ascertain the utilities that are to be affected by the works through the site investigation. The contractor shall be responsible to obtain necessary approval from the respective authorities for shifting/ re-alignment of existing public utilities. BSCDCL shall only assist the contractor for liasioning in obtaining the approval from the concerned authorities. Any services affected by the works must be temporarily supported by the contractor who must also take all measures reasonably required by the various bodies to protect their services and property during the progress of works. It shall be deemed to be the part of the contract and no extra payment shall be made to the contractor for the same.
24	**SCOPE OF WORK** The scope of work covered in this tender shall be as per the Bill of Quantities, specifications, drawings, instructions, orders issued to the contractor from time to time during the pendency of work. The drawings for this work, which may be referred for tendering, provide general idea only about the work to be performed under the scope of this contract. These may not be the final drawings and may not indicate the full range of the work under the scope of this contract. The work will be executed according to the drawings to be released as "GOOD FOR CONSTRUCTION" from time to time by the Engineer- in-charge of BSCDCL and according to any additions/ modifications/ alterations/ deletions made from time to time, as required by any other drawings that would be issued to the contractor progressively during execution of work. It shall be the responsibility of the contractor to incorporate the changes that may be in this scope of work, envisaged at the time of tendering and as actually required to be executed. The quantities of various items as entered in the "BILL OF QUANTITIES" are indicative only and may vary depending upon the actual requirement. The contractor shall be bound to carry out and complete the stipulated work irrespective of the variation in individual items specified in the bill of quantities. The variation of quantities will be governed as per clause No. 6.0 of contract.

25	**APPROVAL OF TEMPORARY / ENABLING WORKS:** The setting and nature of all offices, huts, access road to the work areas and all other temporary works as may be required for the proper execution of the works shall be subject to the approval of the Engineer-in-charge. All the equipments, labour, material including cement, reinforcement and the structural steel required for the enabling/ temporary works associated with the entire Contract-shall have to be arranged by the Contractor only. Nothing extra shall be paid to the Contractor on this account.

26	**CLARIFICATION AFTER TENDER SUBMISSION** Tenderer‟s attention is drawn to the fact that during the period, the tenders are under consideration, the tenderers are advised to refrain from contacting by any means, the BSCDCL and/or his employees/ representatives on matters related to the tender under consideration and that if necessary, BSCDCL will obtain clarifications in writing or as may be necessary. The tender evaluation and process of award of works is done by duly authorized Tender Scrutiny Committee and this committee is authorized to discuss and get clarification from the tenderers.
27	**ORDER OF PRECEDENCE OF DOCUMENTS** In case of difference, contradiction, discrepancy, with regard to conditions of contract, Specifications, Drawings, Bill of quantities etc. forming part of the contract, the following shall prevail in order of precedence. Letter of Award, along with statement of agreed variations and its enclosures, if any. Description of Bill of Quantity / Schedule of Quantities. Special Condition of Contract. Technical specifications (General, Additional and Technical Specification) as given in Tender documents. General Conditions of Contract. Drawings CPWD/ MORTH specifications (as specified in Technical Specification of the Tender) update with correction slips issued up to last date of receipt of tenders. Relevant B.I.S. Codes

ACCEPTANCE OF TENDER CONDITIONS

From: (On the letter head of the company by the authorized officer having power of attorney)

BSCDCL Limited,

_____

_____

Sub: Name of the work & NIT No.:

Sir,

This has reference to above referred tender. I/We are pleased to submit our tender for the above work and I/We hereby unconditionally accept the tender conditions and tender documents in its entirety for the above work.

I/we are eligible to submit the tender for the subject tender and I/We are in possession of all the documents required.

I/We have viewed and read the terms and conditions of this GCC/SCC carefully. I/We have downloaded the following documents forming part of the tender document:

a) Notice Inviting e-Tender. (pg- to pg-)

b) Quoting Sheet for Tenderer (pg- to pg-)

c) Instructions to Tenderers & General Conditions of Contract (Vol-I/2013):(pg- to pg-)

d) Technical Specifications (Vol-II) (pg- to pg-)

e) Bill of Quantities (Vol-III) (pg- to pg-)

f) Tender Drawing (pg- to pg-)

Acceptance of Tender Conditions (Annexure II)

g) Corrigendum, if any (pg- to pg-)

I/we have uploaded the mandatory scanned documents such as cost of tender document, EMD, e-Tender Processing Fee and other documents as per Notice Inviting e-tender AND I/We agree to pay the cost of tender document, EMD, e-Tender Processing Fee (only receipt/proof of online payment) and other documents in physical form in the form and manner as described in NIT/ITT.

Should this tender be accepted, I/We agree to abide by and fulfill all terms and conditions referred to above and as contained in tender documents elsewhere and in default thereof, to forfeit and pay BSCDCL, or its successors or its authorized nominees such sums of money as are stipulated in the notice inviting tenders and tender documents.

If I/we fail to commence the work within 10 days of the date of issue of Letter of Award and/or I/we fail to sign the agreement as per Clause 82 of Clauses of Contract and/or I/we fail to submit performance guarantee as per Clause 02 of Clauses of Contract, I/we agree that BSCDCL shall, without prejudice to any other right or remedy, be at liberty to cancel the Letter of Award and to forfeit the said earnest money as specified above.

Yours faithfully,
(Signature of the tenderer with rubber stamp)

Dated _____

SECTION-3

GENERAL CONDITIONS OF CONTRACT (GCC)

CLAUSES OF CONTRACT(CC)

DEFINITIONS

The Contract means the documents forming the tender and acceptance thereof and the formal agreement executed between the competent authority on behalf of BSCDCL and the contractor, together with the documents referred to therein including these conditions, the specifications,

designs, drawings and instructions issued from time to time by the Engineer-in-Charge and all these documents taken together, shall be deemed to form one contract and shall be complementary to one another.

Bhopal Smart City Development Corporation Limited, hereinafter called 'BSCDCL' propose to get the works executed as mentioned in the Contract on behalf of Owner/ Client as Implementing agency/Executing Agency.

In the contract, the following expressions shall, unless the context otherwise requires, have the meanings, hereby respectively assigned to them:-

APPROVAL means approved in writing including subsequent written confirmation of previous verbal approval.

BILL OF QUANTITIES or SCHEDULE OF QUANTITIES means the priced and completed Bill of Quantities or Schedule of Quantities forming part of the tender.

CONTRACTOR shall mean the individual, firm**,** LLP or company, whether incorporated or not, undertaking the works and shall include the legal personal representative of such individual or the persons composing such firm or LLP or company, or the successors of such firm or company and the permitted assignees of such individual, firm or company.

CONTRACT VALUE means the sum for which the tender is accepted as per the letter of Award.

DRAWINGS mean the drawings referred to in the contract document including modifications if any and such other drawings as may from time to time be furnished and/ or approved by BSCDCL.

DATE OF COMMENCEMENT OF WORK: The date of start of contract shall be reckoned from 10 days after the date of issue of letter of Award.

ENGINEER-IN-CHARGE means the Engineer of BSCDCL who shall supervise and be in-charge of the work.

LANGUAGE: All documents and correspondence in respect of this contract shall be in English Language.

"LETTER OF AWARD" shall mean BSCDCL"s letter or notification conveying its acceptance of the tender subject to such conditions as may have been stated therein.

MONTH means English Calendar month „Day" means a Calendar day of 24 Hrs each.

BSCDCL shall means Bhopal Smart City Development Corporation Limited, a company registered under the Indian Company Act, with its registered office at Near Natraj Petrol Pump, Sector A, Berkheda, Bhopal, Madhya Pradesh 462023 or its Administrative officers or its engineer or other employees authorized to deal with any matter with which these persons are concerned on its behalf.

OWNER/ CLIENT means the Government, Organization, Ministry, Department, Society, Cooperative, JV Entities (whether incorporated or unincorporated or registered as the case may be) etc. who has awarded the work/ project to BSCDCL and/ or appointed BSCDCL as Implementing / Executing Agency/ Project Manager and/ or for whom BSCDCL is acting as an agent and on whose behalf BSCDCL is entering into the contract and getting the work executed.

SCHEDULE(s) referred to in these conditions shall mean the standard schedule of rates of the government mentioned in the Memorandum (Annexure-I) with the amendments thereto issued up to the date of receipt of the tender.

SITE means the lands and other places on, under, in or through the works are to be executed or carried out and any other lands or places provided by BSCDCL/client/owner or used for the purpose of the contract.

o) **TENDER** means the Contractor"s priced offer to BSCDCL for the execution And completion of the work and the remedying of any defects therein in accordance with the provisions of the Contract, as accepted by the Letter of Award or Award letter. The word TENDER is synonymous with Tender and the Word TENDER DOCUMENTS with "Tendering Documents" or "offer documents".

WRITING means any manuscript typed written or printed statement under or over signature and/or seal as the case may be.

Works or Work shall unless there be something either in the subject or context repugnant to such construction, be construed and taken to mean the works by or by virtue of the contract contracted to be executed whether temporary or permanent, and whether original, altered, substituted or additional.
The headings in the clauses/ conditions of tender documents are for convenience only and shall not be used for interpretation of the clause/ condition.
Words imparting the singular meaning only also include the plurals and vice versa where the context requires. Words importing persons or parties shall include firms and corporations and organizations having legal capacities.

Excepted Risk are risks due to riots (other than those on account of contractor"s employees), war (whether declared or not) invasion, act of foreign enemies, hostilities, civil war, rebellion revolution, insurrection, military or usurped power, any acts of Government, damages from aircraft, acts of God, such as earthquake, lightening and unprecedented floods, and other causes over which the contractor has no control and accepted as such by the BSCDCL or causes solely due to use or occupation by Government of the part of the works in respect of which a certificate of completion has been issued or a cause solely due to BSCDCL"s faulty design of works.

Market Rate shall be the rate as decided by the Engineer-in-Charge on the basis of the prevailing cost of materials and labour at the site where the work is to be executed plus the percentage mentioned elsewhere in the tender document to cover, all overheads and profits.

PERFORMANCE GUARANTEE:

"Within 30 (Thirty) days from the date of issue of letter of Award or within such extended time as may be granted by BSCDCL in writing, the contractor shall submit to BSCDCL an irrevocable performance bank guarantee in the form appended, from any Nationalized Bank or all Commercial schedule bank equivalent to 5% (five per cent only) of the contract value for the due and proper execution of the Contract. The Performance Guarantee shall be initially valid up to the stipulated date of completion plus 60 days beyond that. In case the time for completion of works gets extended, the contractor shall get the validity of Performance Guarantee extended to cover such extended time for completion of work.

BSCDCL reserve the right of forfeiture of the performance guarantee in the event of the contractor"s failure to fulfill any of the contractual obligations or in the event of termination of contract as per terms and conditions of contract.

Performance guarantee shall be returned after successful completion / testing / commissioning and handing over the project to the client up to the entire satisfaction of BSCDCL / Client.

In case the contractor fails to submit the performance guarantee of the requisite amount within the stipulated period or extended period, letter of Award automatically will stand withdrawn and EMD of the contractor shall be forfeited.

SECURITY DEPOSIT/ RETENTION MONEY

The Security deposit or the retention money shall be deducted from each running bill of the contractor @ 5% (five per cent only) of the gross value of the Running Account bill. Earnest money shall be adjusted first in the security deposit and further recovery of security deposit shall commence only when the upto date amount of security deposit exceed**s** the earnest money deductible under this clause. No Interest shall be paid on amount so deducted.
Security deposit will be released after completion of O&M period.

The release/refund of security deposit of the contractor shall be subject to the observance/compliance of the conditions as under and whichever is later:

a) Expiry of the defect liability period in conformity with provisions contained in claus (Defect liability clause). The expiry of defect liability period shall be extended from time to time depending upon extension of time granted by BSCDCL.

The contractor produces a clearance certificate from the labour office. As soon as the work is virtually completed, the contractor shall apply for the labour clearance certificate to the Labour Officer under intimation to the Engineer-in-Charge. The Engineer-in-Charge, on receipt of the said communication, shall write to the Labour Officer to intimate if any complaint is pending against the contractor in respect of the work. If no complaint is pending, on record till after 3 months after completion of the work and/or no communication is received from the Labour Officer to this effect till six months after the date of completion, it will be deemed to have received the clearance certificate.

3.4 BSCDCL reserves the right of part or full forfeiture of security deposit in addition to other claims in the event of contractor"s failure to fulfill any of the contractual obligations or in the event of termination of contract as per terms and conditions of contract.

MOBILIZATION ADVANCE

Mobilization advance up to maximum of amount as mentioned in the "Memorandum (Annexure-I)" shall be paid to the contractor, if requested by him, on submission of irrevocable Bank Guarantee valid for contract period of an amount 1.2 times of the mobilization advance to take care of advance and interest at prescribed rate from a nationalized bank or all Commercial scheduled bank in the enclosed Performa. The Mobilization advance shall be interest bearing @ as mentioned in the "Memorandum (Annexure-I)".

This advance shall be paid in three installments as follows:

First Installment of fifty percent of total mobilization advance shall be paid after the agreement is signed and upon submission of performance guarantee for full amount as specified.

2nd installment of twenty five percent of total mobilization advance will be paid after the setting up of site office and site laboratory, complete mobilization of plant and machinery, scaffolding & shuttering materials etc.

The Balance twenty five percent of total mobilization advance shall be paid on completion of 10% of work in terms of cost and after the contractor has fully mobilized the work at site.

The mobilization advance bear simple interest at the rate as mentioned in the Memorandum (Annexure-I) and shall be calculated from the date of payment to the date of recovery (365 days in a year) both days inclusive, on the outstanding amount of advance. Recovery of such mobilization advanced including interest shall be made by the deduction from the contractor's bills commencing after first ten percent of the gross value of the work is executed and paid, on pro-rata percentage basis to the gross value of the work billed beyond 10% in such a way that the entire advance is recovered either by the time eighty percent of the gross value of the contract is executed and paid, together with interest due on the entire outstanding amount up to the date of recovery of the installment or on expiry of eighty percent of contract period (i.e. time allowed for completion of work in terms of Memorandum-Annexure-I) whichever is earlier.

The bank guarantee submitted by contractor against mobilization advance shall initially be made for the full amount as mentioned in para 4.1 above and valid for the contract period, and be kept renewed from time to time to cover the balance amount and likely period of completion of recovery together with interest. However, the contractor can submit part bank guarantees against the mobilization advance in as many numbers as per proposed number of recovery installments equivalent to the amount of each installment.

Notwithstanding what is contained above, no mobilization advance whatsoever shall be payable, if payment of mobilization advance is not mentioned in the Memorandum (Annexure-I).

SECURED ADVANCE AGAINST NON-PERISHABLE MATERIALS

Interest free secured advance up-to a maximum of 75 % (seventy five percent) of the Market Value of the Materials or the 75 % (seventy five percent) cost of materials as derived from the tendered item rate of the contractor, whichever is less, required for incorporation in the permanent works and brought to site and duly certified by BSCDCL site Engineer shall be paid to the Contractor for all non-perishable items as per UADD/MPPWD/CPWD norms. The advance will be paid only on submission of Indemnity Bond in the

prescribed pro-forma. The advance shall be recovered in full from next Running Account bill and fresh advance shall be paid for the balance quantities of materials. The contractor shall construct suitable go-down at the site of work for safe storage of the materials against any possible damages due to sun, rain, dampness, fire, theft etc. at his own cost. He shall also employ necessary watch & ward establishment for the purpose at his costs and risks.

Such secured advance shall also be payable on other items of perishable nature, fragile and combustible with the approval of the Engineer-in-Charge provided the contractor provides a comprehensive insurance cover for the full cost of such materials. The decision of the Engineer-in-Charge shall be final and binding on the contractor in this matter. No secured advance shall however, be paid on high risk materials such as ordinary glass, sand, petrol, diesel etc.

DEVIATIONS / VARIATIONS EXTENT AND PRICING

The Engineer-in-Charge shall have power (i) to make any alterations in, omissions from, additions to or substitutions for, the original specifications, drawings, designs and instructions that may appear to him to be necessary during the progress of the work, (ii) to omit part of the works in case of non-availability of a portion of the site or for any other reasons and the contractor shall be bound to carry out the works in accordance with any instructions given to him in writing signed by the Engineer-in-Charge and such alterations, omissions, additions, or substitutions shall form part of the contract as if originally provided therein and any altered, additions or substituted works which the contractor may be directed to do in the manner specified above as part of the work, shall be carried out by the contractor on the same conditions in all respects including price on which he agreed to do the main work except as hereunder provided:

The time for the completion of the work shall, in the event of any deviations resulting in additional cost over the tendered value sum being ordered be extended, if requested by the contractor, as follows:

in the proportion which the additional cost of the altered, additional or substituted work bears to the original tendered value plus

25% of the time calculated in (i) above or such further additional time as may be considered reasonable by the Engineer-in-Charge.

If the extra items includes any work for which no rate is specified in the contract, then such work shall be carried out at the rates entered in the schedule of rates (as mentioned in Memorandum (Annexure-I)) for Civil/

Sanitary Works minus/plus the percentage which the tendered amount of scheduled items bears with the estimated amount of schedule items based on the Schedule of Rates (as mentioned in Memorandum (Annexure-I) for Civil/ Sanitary Works). The scheduled item means the items appearing in the Schedule of Rates (as mentioned in Memorandum (Annexure-I)for Civil/ Sanitary Works) which shall be applicable in this clause. This clause will apply mutates mutandis to electrical work except that Electrical Schedule of Rates as mentioned in Memorandum (Annexure-I) will be considered in place of Civil/ Sanitary works Schedule of rates as mentioned in Memorandum (Annexure-I).

However, In the case of extra item(s), (items that are completely new, and are in addition to the items contained in the contract, and not included in the schedule of rates (as mentioned in Memorandum (Annexure-I)), the contractor may within fifteen days of receipt of order or occurrence of the item(s) claim rates, supported by proper analysis, for the work and the engineer-in-charge

shall within one month of the receipt of the claims supported by analysis, after giving consideration to the analysis of the rates submitted by the contractor, determine the rates on the basis of the market rates and the contractor shall be paid in accordance with the rates so determined.

In the case of substituted items (items that are taken up with partial substitution or in lieu of items of work in the contract), the rate for the agreement item (to be substituted) and substituted item shall also be determined in the manner as mentioned in the following para:

If the market rate for the substituted item so determined is more than the market rate of agreement item (to be substituted), the rate payable to the contractor for the substituted item shall be the rate for the agreement item (to be substituted) so increased to the extent of the difference between the market rates of substituted item and the agreement item (to be substituted).

If the market rate for the substituted item so determined is less than the market rate of the agreement (to be substituted), the rate payable to the contractor for the substituted item shall be the rate for the agreement item (to be substituted) so decreased to the extent of the difference between the market rates of substituted item and the agreement item (to be substituted)

In the case of contract item(s), substituted item(s), contract cum substituted items, which exceed the limits laid down in Memorandum (Annexure-I), the contractor shall within fifteen days of receipt of order of occurrence of the excess, claim revision of the rates, supported by proper analysis for the work in excess of the above mentioned limits, provided that if the rates so claimed are in excess of the rates specified in the scheduled of quantities, the Engineer-in-Charge shall within one month of receipt of the claims supported by analysis, after giving consideration to the analysis of the rates submitted by the Contractor, determine the rates on the basis of the market rates and the contractor shall be paid in accordance with the rates so determined.

The provisions of the preceding paragraph shall also apply to the decrease in the rates of items for the work in excess of the limits laid down in Memorandum (Annexure-I), and the Engineer-in-charge shall after giving notice of the contractor within one month of occurrence of the excess and after taking into consideration any reply received from him within fifteen days of the receipt of the notice revise the rates for the work in question within one month of the expiry of the said period of fifteen days having regard to the market rates.

6.4 The contractor shall send to the Engineer-in-Charge once every three months, an up to date account giving complete details of all claims for additional payments to which the contractor may consider himself entitled and of all additional work ordered by the Engineer-in-Charge which he has executed during the preceding quarter failing which the contractor shall be deemed to have waived his right. However, the Engineer-in-charge may authorize consideration of such claims on merits.

For the purpose of operation of Memorandum (Annexure-I), the following works shall be treated as works relating to foundation unless and otherwise defined in the Contract:

For Buildings: All works up to 1.2 meters above ground level or up to floor 1 level whichever is lower.

For abutments, piers and well steining: All works upto 1.2m above the bed level.

(iii) For retaining walls, wing walls, compound walls, chimneys, over head reservoirs/tanks and other elevated structures: All works upto 1.2 metres above the ground level.

For reservoirs/tanks (other than overhead reservoirs/tanks). All works upto 1.2 metres above the ground level.

For basement: All works upto 1.2m above ground level or upto floor 1 level whichever is lower.

For Roads, all items of excavation and filling including treatment of sub base.

Any operation incidental to or necessarily has to be in contemplation of tenderer while filling, tender or necessary for proper execution of the item included in the Schedule of quantities or in the schedule of rates mentioned above, whether or not specifically indicated in the description of the item and the relevant specifications shall be deemed to be included in the rates quoted by the tenderer or the rate given in the said schedule or rates as the case may be Nothing extra shall be admissible for such operations.

Market Rates to be determined as per various sub-clauses under the clause 6.0 shall be on the basis of **Prevailing rates of Material (unless mentioned otherwise)**, **Relevant Labour authority rate for Labour**, **market rates of T&P** etc. **plus 15% towards Contractors' Profits and Overheads**.

The following factors may be considered in the justification of rates on which **Contractor's overhead & profit** shall not be applicable**:**

Buildings and Other Construction Worker Cess as applicable in the state of work place

EPF (Employer Contribution) component, as per EPF act on the portion of labour"s wages

VAT on works contract / WCT, as per composite scheme in the State of work place, if applicable Service Tax

ESCALATION

No claim on account of any escalation on whatsoever ground shall be entertained at any stage of works. All rates as per Bill of Quantities (BOQ) quoted by contractor shall be firm and fixed for entire contract period as well as extended period for completion of the works. No escalation shall be applicable on this contract.

COMPENSATION FOR DELAY

If the contractor fails to maintain the required progress in terms of clause or relevant clause of GCC & Special Conditions of Contract, to complete the work and clear the site on or before the contract or extended date of completion, he shall, without prejudice to any other right or remedy available under the law to the BSCDCL on account of such breach, pay as agreed compensation the amount calculated at the rates stipulated below as the Engineer in charge (whose decision in writing shall be final and binding) may decide on the amount of tendered value of the work for every completed day / week (as applicable) that the progress remains below that specified in Clause

or the relevant clause in GCC & Special Conditions of Contract or that the work remains incomplete.

This will also apply to items or group of items for which a separate period of completion has been specified

i) Compensation for delay of work @ 1.5% per month delay to be computed on per day basis

Provided always that the total amount of compensation for delay to be paid under this Condition shall not exceed 10% of the Tendered Value of work or of the Tendered Value of the item or group of items of work for which a separate period of completion is originally given. The amount of compensation may be adjusted or set-off against any sum payable to the Contractor under this or any other contract with BSCDCL.

In case, the contractor does not achieve a particular milestone mentioned elsewhere in the tender document, or the re-scheduled milestone(s) the amount shown against that milestone shall be withheld, to be adjusted against the compensation levied at the final grant of Extension of Time. With-holding of this amount or failure to achieve a milestone, shall be automatic without any notice to the Contractor. However, if the contractor catches up with the progress of work on the subsequent milestone(s), the withheld amount shall be released. In case the contractor fails to make up for the delay in subsequent milestone(s), amount mentioned against each milestone missed subsequently also shall be withheld. However, no interest, whatsoever, shall be payable on such withheld amount.

ACTION IN CASE WORK NOT DONE AS PER SPECIFICATIONS

All works under or in course of execution or executed in pursuance of the contract, shall at all times be open and accessible to the inspection and supervision of the Engineer-in-charge, his authorized subordinates in charge of the work and all the superior officers, officer of the Quality Assurance Unit of the BSCDCL or any organization engaged by the BSCDCL for Quality Assurance and the contractor shall, at all times, during the usual working hours and at all other times at which reasonable notice of the visit of such officers has been given to the contractor, either himself be present to receive orders and instructions or have a responsible agent duly accredited in writing, present for that purpose. Orders given to the Contractor's agent shall be considered to have the same force as if they had been given to the contractor himself.

If it shall appear to the Engineer-in-charge or his authorized subordinates in-charge of the work or to the officer of Quality Assurance or his subordinate officers or the officers of the organization engaged by the BSCDCL for Quality Assurance or his subordinate officers, that any work has been executed with unsound, imperfect, or unskillful workmanship, or with materials or articles provided by him for the execution of the work which are unsound or of a quality inferior to that contracted or otherwise not in accordance with the contract, the contractor shall, on demand in writing which shall be made within twelve months of the completion of the work from the Engineer-in-Charge specifying the work, materials or articles complained of notwithstanding that the same may have been passed, certified and paid for forthwith rectify, or remove and reconstruct the work so specified in whole or in part, as the case may require or as the case may be, remove the materials or articles so specified and provide other proper and suitable materials or articles at his own charge and cost. In the event of the failing to do so within a period specified by the Engineer-in-Charge in his demand aforesaid, then the contractor shall be liable to pay compensation at the same rate as under clause 8.0 of the contract (for non-completion of the work in time) for this default. In such case the Engineer-in-Charge may not accept the item of work at the rates applicable under the contract but may accept such items at reduced rates as the Engineer in charge may consider reasonable during the preparation of on account bills or final bill if the item is so acceptable without detriment to the safety and utility of the item and the structure or he may reject the work outright without any payment and/or get it and other connected and incidental

items rectified, or removed and re-executed at the risk and cost of the contractor. Decision of the Engineer-in-Charge to be conveyed in writing in respect of the same will be final and binding on the contractor.

ACTION IN CASE OF BAD WORK

If it shall appear to the Engineer-in-Charge or his authorized representative in charge of the work or to the Chief Technical Examiner or to any other inspecting agency of Government/ State Government/ Owner where the work is being executed, that any work has been executed with unsound, imperfect, or unskillful workmanship or with materials of any inferior description, or that any materials or articles provided by him for the execution of the work are unsound or of a quality inferior to that contracted for or otherwise not in accordance with the contract, the contractor shall on demand in writing which shall be made within twelve months of the completion of the work from the Engineer-in-Charge specifying the work, materials or articles complained of notwithstanding that the same may have been passed, Certified and paid for forthwith rectify, or remove and reconstruct the work so specified in whole or in part as the case may require or as the case may be, remove the materials or articles so specified and provide other proper and suitable materials or articles at his own proper charge and cost, and in the event of his failing to do so within a period to be specified by the Engineer-in-Charge in his demand aforesaid while the contractor failure to do so shall continue, the Engineer-in-Charge may rectify or remove and re-execute the work or remove and replace with others, the material or articles complained of as the case may be at the risk and expense in all respects of the contractor.

CANCELLATION/DETERMINATION OF CONTRACT IN FULL OR PART

Subject to other provisions contained in this clause the Engineer-in-Charge may, without prejudice to his any other rights or remedy against the contractor in respect of any delay, inferior workmanship, any claims for damages and / or any other provisions of this contract or otherwise, and whether the date of completion has or has not elapsed, by notice in writing absolutely determine the contract in any of the following cases:

If the contractor having been given by the Engineer-in-Charge a notice in writing to rectify, reconstruct or replace any defective work or that the work is being performed in an inefficient or otherwise improper or un-workmanlike manner shall omit to comply with the requirement of such notice for a period of seven days thereafter; or

If the contractor has, without reasonable cause, suspended the progress of the work or has failed to proceed with the work with due diligence so that in the opinion of the Engineer-in-Charge (which shall be final and binding) he will be unable to secure completion of the work by the date for completion and continues to do so after a notice in writing of seven days from the Engineer-in-Charge; or

If the contractor fails to complete the work within the stipulated date or items of work with individual date of completion, if any stipulated, on or before such date(s) of completion and does not complete them within the period specified in a notice given in writing in that behalf by the Engineer-in-Charge; or

If the contractor persistently neglects to carry out his obligations under the contract and / or commits default in complying with any of the terms and conditions of the contract and does not remedy it or take effective steps to remedy it within 7 days after a notice in writing is given to him in that behalf by the Engineer-in-Charge; or

If the contractor shall offer or give or agree to give to any person in BSCDCL service or to any other person on his behalf any gift or consideration of any kind as an inducement or reward for doing or forbearing to do or for having done or forborne to do any action relation to the obtaining or execution of this or any other contract for BSCDCL; or

If the contractor shall enter into a contract with BSCDCL in connection with which commission has been paid or agreed to be paid by him or to his knowledge, unless the particulars of any such commission and the terms of payment thereof have been previously disclosed in writing to the Engineer-in-Charge; or

If the contractor shall obtain a contract with BSCDCL as a result of wrong tendering or other non-bona-fide methods of competitive tendering or commits breach of Integrity Pact; or

If the contractor being an individual, or if a firm, any partner thereof shall at any time be adjudged insolvent or have a receiving order or order for administration of his estate made against him or shall take any proceedings for liquidation or composition (other than a voluntary liquidation for the purpose of amalgamation or reconstruction) under any Insolvency Act for the time being in force or make any conveyance or assignment of his effects or composition or arrangement for the benefit of his creditors or purport so to do, or if any application be made under any Insolvency Act for the time being in force for the sequestration of his estate or if a trust deed be executed by him for benefit of his creditors; or If the contractor being a company, shall pass a resolution or the Court shall make an order for the winding up of the company, or a receiver or manager on behalf of the debenture holders or otherwise shall be appointed or circumstances shall

arise which entitle the Court or debenture holders to appoint a receiver or manager; or If the contractor shall suffer an execution being levied on his goods and allow it to be continued for a period of 21 days, or. If the contractor assigns, transfers, sublets (engagement of labour on a piece-work basis or of the labour with materials not to be incorporated in the work, shall not be deemed to be subletting) or otherwise parts with or attempts to assign, transfer sublet or otherwise parts with the entire works or any portion thereof without and prior written approval of the Engineer-in-Charge.

When the contractor has made himself liable for action under any of the cases aforesaid, the Engineer-in-Charge may without prejudice to any other right or remedy which shall have accrued or shall accrue hereafter to BSCDCL, by a notice in writing to cancel the contract as whole or only such items of work in default from the Contract, the Engineer-in-charge shall have powers:

Take possession of site and any materials, constructional plant, implements, stores, etc. thereon; and/ or

Carry out the incomplete work by any means at the risk and cost of the contractor; and/ or

The Engineer-in-charge shall determine the amount, if any, is recoverable from the contractor for completion of the part work/part incomplete work of any item(s) taken out of his hands and execute at the risk and cost of the contractor, the liability of contractor on account of loss or damage suffered by BSCDCL because of action under this clause shall not exceed 10% of the tendered value of the work.

d) To determine or rescind the contract as aforesaid (of which termination or rescission notice in writing to the contractor under the hand of the Engineer-in-Charge shall be conclusive evidence). Upon such determination or rescission the full security deposit recoverable under the contract and performance guarantee shall be liable to be forfeited and un-used materials, construction plants, implements, temporary buildings, etc. shall be taken over and shall be absolutely at the disposal of the BSCDCL. If any portion of the Security Deposit has not been paid or received it would be called for and forfeited; and/ or

To employ labour paid by the BSCDCL and to supply materials to carry out the work or any part of the work debiting the contractor with the cost of the labour and the price of the materials of the amount of which cost and price certified by the Engineer-in-Charge shall be final and conclusive) against the contractor and crediting him with the value of the work done in all respects in the same manner and at the same rates as if it had been carried out by the contractor under the terms of his contract. The certificate of the Engineer-in- Charge as to the value of the work done shall be final and conclusive against the contractor provided always that action under the sub-clause shall only be taken after giving notice in writing to the contractor. If the expenses incurred by the BSCDCL are less than the amount payable to the contractor at his agreement rates, the difference shall not be paid to the contractor; and/ or

After giving notice to the contractor to measure up the work of the contractor and to take such whole, or the balance or part thereof as shall be un-executed or delayed with reference to the General Conditions of Contract clause no. 25.0 and/ or relevant clause of Special Conditions of Contract, out of his hands and to give it to another contractor to complete in which case any expenses which may be incurred in excess of the sum which would have been paid to the original contractor if the whole work had been executed by him (of the amount of which excess the certificate in writing of the Engineer-in-Charge shall be final and conclusive) shall be borne and paid by the original contractor and may be deducted from any money due to him by BSCDCL under his contract or on any other account whatsoever or from his security deposit or the proceeds of sales of unused materials, construction plants, implements temporary buildings etc. thereof or a sufficient part thereof as the case may be. If the expenses incurred by the BSCDCL are less than the amount payable to the contractor at his agreement rates, the difference shall not be paid to the contractor; and/or

By a notice in writing to withdraw from the contractor any items or items of work as the Engineer-in-charge may determine in his absolute discretion and get the same executed at the risk and cost of the contractor.

Any excess expenditure incurred or to be incurred by BSCDCL in completing the works or part of the works or the excess loss or damages suffered or may be suffered by BSCDCL as aforesaid after allowing such credit shall without prejudice to any other right or remedy available to BSCDCL in law be recovered from any moneys due to the contractor on any account, and if such moneys are not sufficient the contractor shall be called upon in writing and shall be liable to pay the same within 30 days.

If the contractor shall fail to pay the required sum within the aforesaid period of 30 days, the Engineer-in-Charge shall have the right to sell any or all of the contractors unused materials, constructional plant, implements, temporary buildings, etc. and apply the proceeds of sale thereof towards the satisfaction of any sums due from the contractor under the contract and if thereafter there be any balance outstanding from the contractor, it shall be recovered in accordance with the provisions of the contract and law.

Any sums in excess of the amounts due to BSCDCL and unsold materials, constructional plant etc. shall be returned to the contractor, provided always that if cost or anticipated cost of completion by BSCDCL of the works or part of the works is less than the amount which the contractor would have been paid had he completed the works or part of the works, such benefit shall not accrue to the contractor.

In the event of anyone or more of the above courses being adopted by the Engineer-in-Charge the contractor shall have no claim to compensation for any loss sustained by him by reasons of his having purchased or procured any materials or entered into any engagements or made any advances on account or with a view to the execution of the work or the performance of the contract. And in case action is taken under any of the provision aforesaid the contractor

shall not be entitled to recover or be paid any sum for any work thereof or actually performed under this contract unless and until the Engineer-in-Charge has certified in writing the performance of such work and the value payable in respect thereof and he shall only be entitled to be paid the value so certified.

Provided further that if any of the recoveries to be made, while taking action as above, are in excess of the security deposit forfeited, these shall be Limited to the amount by which the excess cost incurred by the BSCDCL exceeds the security deposit so forfeited.

CONTRACTOR LIABLE TO PAY COMPENSATION EVEN IF ACTION NOT TAKEN UNDER CLAUSE 11.0

In any case in which any of the powers conferred upon the Engineer-in-Charge by relevant clause thereof, shall have become exercisable and the same are not exercised, the non-exercise thereof shall not constitute a waiver of any of the conditions hereof and such powers shall notwithstanding be exercisable in the event of any future case of default by the contractor and the liability of the contractor for compensation shall remain unaffected. In the event of the Engineer-in-Charge putting in force all or any of the powers vested in him under any clause he may, if he so desires after giving a notice

in writing to the contractor, take possession of (or at the sole discretion of the Engineer-in-Charge which shall be final and binding on the contractor) use as on hire (the amount of the hire money being also in the final determination of the Engineer-in-Charge) all or any tools, plant, materials and stores, in or upon the works, or the site thereof belonging to the contractor, or procured by the contractor and intended to the used for the execution of the work/or any part thereof, paying or allowing for the same in account at the contract rates, or in the case of these not being applicable, at current market rates to be certified by the Engineer-in-Charge, whose certificate thereof shall be final and binding on the contractor and/or direct the contractor, clerk of the works, foreman or other authorized agent to remove such tools, plant, materials, or stores from the premises (within a time to be specified in such notice) in the event of the contractor failing to comply with any such requisition, the Engineer-in-Charge may remove them at the contractor"s expense or sell them by auction or private sale on account of the contractor and his risk in all respects and the certificate of the Engineer-in-Charge as to the expenses of any such removal and the amount of the proceeds and expenses of any such sale shall be final and conclusive against the contractor.

CARRYING OUT PART WORK AT RISK & COST OF CONTRACTOR

If contractor:

At any time makes default during currency of work or does not execute any part of the work with due diligence and continues to do so even after a notice in writing of 7 days in this respect from the Engineer-in-Charge;

or

Commits default in complying with any of the terms and conditions of the contract and does not remedy it or takes effective steps to remedy it within 7 days even after a notice in writing is given in that behalf by the Engineer-in-Charge;

or

Fails to complete the work(s) or items of work with individual dates of completion, on or before the date(s) so determined, and does not complete them within the period specified in the notice given in writing in that behalf by the Engineer-in-Charge.

The Engineer-in-Charge without invoking action under clause 11.0 of contract may, without prejudice to any other right or remedy against the contractor which have either accrued or accrue thereafter to BSCDCL, by a notice in writing to take the part work/part incomplete work of any item(s) out of his hands and shall have powers to:

Take possession of the site and any materials, constructional plant, implements, stores, etc., thereon; and/or

Carry out the part work / part incomplete work of any item(s) by any means at the risk and cost of the contractor.

The Engineer-in-Charge shall determine the amount, if any, is recoverable from the contractor for completion of the part work/ part incomplete work of any item(s) taken out of his hands and execute at the risk and cost of the contractor, the liability of contractor on account of loss or damage suffered by BSCDCL because of action under this clause shall not exceed 10% of the tendered value of the work.

In determining the amount, credit shall be given to the contractor with the value of work done in all respect in the same manner and at the same rate as if it had been carried out by the original contractor under the terms of his contract, the value of contractor's materials taken over and incorporated in the work and use of plant and machinery belonging to the contractor. The certificate of the Engineer-in-Charge as to the value of work done shall be final and conclusive against the contractor provided always that action under this clause shall only be taken after giving notice in writing to the contractor. Provided also that if the expenses incurred by the department are less than the amount payable to the contractor at his agreement rates, the difference shall not be payable to the contractor.

Any excess expenditure incurred or to be incurred by BSCDCL in completing the part work/ part incomplete work of any item(s) or the excess loss of damages suffered or may be suffered by BSCDCL as aforesaid after allowing such credit shall without prejudice to any other right or remedy available to BSCDCL in law or per as agreement be recovered from any money due to the contractor on any account, and if such money is insufficient, the contractor shall be called upon in writing and shall be liable to pay the same within 30 days.

If the contractor fails to pay the required sum within the aforesaid period of 30 days, the Engineer-in-Charge shall have the right to sell any or all of the contractors' unused materials, constructional plant, implements, temporary building at site etc. and adjust the proceeds of sale thereof towards the dues recoverable from the contractor under the contract and if thereafter there remains any balance outstanding, it shall be recovered in accordance with the provisions of the contract. In the event of above course being adopted by the Engineer-in-Charge, the contractor shall have no claim to compensation for any loss sustained by him by reason of his having purchased or procured any materials or entered into any engagements or made any advance on any account or with a view to the execution of the work or the performance of the contract.

SUSPENSION OF WORKS

The contractor shall, on receipt of the order in writing of the Engineer-in-charge, suspend the progress of the works or any part thereof for such time and in such manner as the Engineer-in-charge may consider necessary for any of the following reasons:

On account of any default on part of the contractor, or

For proper execution of the works or part thereof for reason other than the default of the contractor, or

For safety of the works or part thereof.

The contractor shall, during such suspension, properly protect and secure the works to the extent necessary and carry out the instructions given in that behalf by the Engineer-in-charge.

(b) If the suspension is ordered for reasons (ii) and (iii) in sub-para (a) above.

The contractor shall be entitled to an extension of the time equal to the period of every such suspension plus 25% for completion period. No adjustment in contract price will be allowed for reasons of such suspension.

ii) In the event of the Contractor treating the suspension as an abandonment of the Contract by BSCDCL, he shall have no claim to payment of any compensation on account of any profit or advantage which he may have derived from the execution of the work in full.

TERMINATION OF CONTRACT ON DEATH OF CONTRACTOR

Without prejudice to any of the right or remedies under this contract if the contractor dies, the Engineer in-charge shall have the option of terminating the contract without compensation to the contractor.

TIME ESSENCE OF CONTRACT & EXTENSION FOR DELAY

The time allowed for execution of the Works as specified in the Memorandum (Annexure-I) or the extended time in accordance with these conditions shall be the essence of the contract. The execution of the works shall commence from such time period as mentioned in MEMORANDUM (ANNEXURE – I) or the date on which the Engineer-in-Charge issues written orders to commence the work. If the Contractor commits default in commencing the execution of the work as aforesaid, the BSCDCL shall without prejudice to any other right or remedy available in law, be at liberty to forfeit the earnest money & performance guarantee absolutely.

16.2 Within 10 (Ten) days of Letter of Award, the Contractor shall submit a Time and Progress Chart (CPM/ PERT/ Quantified Bar Chart) and get it approved by the Engineer-in-Charge. The Chart shall be prepared in direct relation to the time stated in the contract documents for completion of items of the works. It shall indicate the forecast (mile-stones) of the dates of commencement and completion of various items, trades, sections of the work and may be amended as necessary by agreement between the Engineer-in-Charge and the Contractor within the limitations of time stipulated in the Contract documents and further to ensure good progress during the execution of the work, the contractor shall in all cases in which the time allowed for any work exceeds one month (save for special jobs for which a separate program has been agreed upon) complete 1/8th of the whole of work before 1/4th of the whole time allowed in the contract has elapsed, 3/8th of the work before one half of such time has elapsed and 3/4th of the work before 3/4th of such time has elapsed. The physical progress report including photographs shall be submitted by the contractor on the prescribed format & the intervals (not exceeding one month)as decided by the Engineer in Charge. The compensation for delay as per clause 8.0 shall be leviable at intermediate stages also, in case the required progress is not achieved to meet the above time deadlines of the completion period and/ or milestones of time and progress chart, provided always that the total amount of Compensation for delay to be paid under this condition shall not exceed 10% of the tendered value of work".

If the work(s) be delayed by:

1. force-majeure or
2. Abnormally bad weather, or
3. Serious loss or damage by fire, or
4. Civil commotion, local commotion of workmen, strike or lockout, affecting any or the trades employed on the work, or
5. Delay on the part of other contractors or tradesmen engaged by Engineer-in-Charge in executing work not forming part of the Contract, or
6. Non-availability of stores, which are responsibility of the BSCDCL or,

7. Non-availability or break down of tools and plant to be supplied or supplied by BSCDCL or,

8. Any other cause which, in the absolute discretion of the BSCDCL, is beyond the Contractor"s control, then upon the happening of any such event causing delay, the Contractor shall immediately give notice thereof in writing to the Engineer-in-Charge within 07 days but shall nevertheless use constantly his best endeavor to prevent or make good the delay and shall do all that may be reasonably required to the satisfaction of the Engineer-in-Charge to proceed with the works.

16.4 Request for extension of time, to be eligible for consideration, shall be made by the Contractor in writing within fourteen days of the happening of the event causing delay in the prescribed form. The Contractor may also, if practicable, indicate in such a request the period for which extension is desired. In any such case BSCDCL may give a fair and reasonable extension of time for completion of work. Such extension shall be communicated to the Contractor by the Engineer-in-Charge in writing within a reasonable time from the receipt of such request. Non application by the contractor for extension of time shall not be a bar for giving a fair and reasonable extension by the Engineer-in- Charge and the extension of time so given by the Engineer-in-Charge shall be binding on the contractor.

TIME SCHEDULE & PROGRESS

17.1 Time allowed for carrying out all the works as entered in the tender shall be as mentioned in the "Memorandum (Annexure-I)" which shall be reckoned from the 10th day from the date on which the letter of Award is issued to the Contractor. Time shall be the essence of the contract and contractor shall ensure the completion of the entire work within the stipulated time of completion.

The contractor shall also furnish within 10 days of date of issue of letter of Award a CPM network/ PERT chart/ Bar Chart for completion of work within stipulated time. This will be duly got approved from BSCDCL. This approved

Network/ PERT Chart shall form a part of the agreement. Achievement of milestones as well as total completion has to be within the time period allowed.

Contractor shall mobilize and employ sufficient resources for completion of all the works as indicated in the agreed BAR CHART/PERT Network. No additional payment will be made to the contractor for any multiple shift work or other incentive methods contemplated by him in his work schedule even though the time schedule is approved by the Engineer-in-Charge.

During the currency of the work the contractor is expected to adhere to the time schedule on mile stone and total completion and this adherence will be a part of Contractor"s performance under the contract. During the execution of the work contractor is expected to participate in the review and updating of the Network/BAR CHART undertaken by the BSCDCL. These reviews may be undertaken at the discretion of Engineer-in-charge either as a periodical appraisal measure or when the quantum of work order on the contractor is substantially changed through deviation orders or amendments. The review shall be held at site or any of the offices of BSCDCL/owner /consultant at the sole discretion of BSCDCL. The contractor will adhere to the revised schedule thereafter. The approval to the revised schedule resulting in a completion date beyond the stipulated date of completion shall not automatically amount to a grant of extension of time to the contractor.

Contractor shall submit (as directed by Engineer-in-Charge) progress reports on a computer based program (program and software to be approved by Engineer-in-Charge) highlighting status of various activities and physical completion of work. The contractor shall send completion report with as built

drawings to the office of Engineer-in-Charge, of BSCDCL in writing within a period of 30 days of completion of work.

The photographs of the project taken on last day of every month indicating progress of work (in soft copies) shall be attached along with the physical progress reports to be submitted to Engineer-in-charge.

TAXES AND DUTIES

18.1 Except as otherwise specifically provided in the contract, the contractor shall be liable and responsible for the payment, of all taxes, such as excise duty, custom duty, sales tax, Value Added Tax including the purchase tax, consignment tax, work contract tax, service tax, entry tax or any other similar tax in the state concerned, turnover tax, toll tax, octroi charges, royalty, labour cess, levy and other tax(es) or duty(ies) which may be specified by local/state/ central government from time to time on all material articles which may be used for this work. The rates quoted by him in the tender in bill of quantities shall be inclusive of all taxes, duties, levies etc.

The imposition of any new and/or increase in the aforesaid taxes, duties levies (including fresh imposition of any other Tax) is imposed by Statute, after the last stipulated date for the receipt of tender including extensions if any and the contractor thereupon necessarily and properly pays such taxes/levies/cess, the contractor shall be reimbursed the amount so paid, provided such payments, if any, is not, in the opinion of Engineering-in charge attributable to delay in execution of work within the control of contractor. The contractor shall, within a period of 30 days of the imposition of any such further tax or levy or cess, give a written notice thereof to the Engineering-in-charge that the same is given pursuant to this condition, together with all necessary information relating thereto. In

the event of nonpayment/default in payment of any of the above taxes, BSCDCL reserves the right to with-hold the dues/payments of contractor and make payment to local/state/Central Government authorities or to labourers as may be applicable.

The rate quoted by the contractor shall be deemed to be inclusive of all taxes as given in clause 19.1 Tax deductions at source shall be made as per laws prevalent in the State as applicable for the work.

The stamp duty and registration charges, if any, on the contract agreement levied by the Government or any other statutory body, shall be paid by the contractor as applicable in the state of work.

It will be incumbent upon the Contractor to obtain a registration certificate as a dealer under the Local Sales Tax Act / VAT and the Central Sales Tax Act and necessary evidence to this effect shall be furnished by the Contractor to BSCDCL.

The tenderer shall quote his rates inclusive of Service Tax, Turnover Tax / Sales Tax on Works Contract / VAT payable to State Govt. along-with other taxes, duties, levies etc. in conjunction with other terms and conditions. In case, the Turnover Tax/ Sales Tax on Works contract on execution of works is waived off by the State Govt. at later stage for this project, the equivalent amount from the date of waiver of such tax (as per prevailing rate as on the date of waiver of Turnover Tax/ Sales Tax on Works Contract/ VAT) shall be deducted from the amount payable to the contractor from subsequent RA bills.

In the event of decrease / relxation and / or waiver of any of the existing / prevailing tax(es), duties, levies, cess by Central / state Govt. Or any other statutory body(ies), after the last stipulated date for the receipt of tender including extension (if any), and the contractor thereupon has been paid or has raised claims of such tax(es), duties, levies, cess; such sums shall be

recovered / deducted (from claims raised but which has not been paid) effective from the date as reckoned in the relevant statutory order / law / ordnance etc. The contractor, shall, within a period of 30 days of any such waiver/relaxation/decrease in tax(es), duties, levies, cess, give a written notice thereof to Engineer-in-charge stating the statutory change with

Documentary proof thereto. Provided always that Engineer-in-charge shall have full powers to effect recovery/deduction on account of any such statutory change even if contractor has not intimated in the event when any such statutory action comes to his notice.

INCOME TAX DEDUCTION (TDS)

Income tax deductions shall be made from all payments made to the contractor including advances against work done, as per the rules and regulations in force, in accordance with the Income Tax act prevailing from time to time.

VALUE ADDED TAX (VAT) / SALES TAX

The contractor shall comply with all the provisions of VAT / SALES TAX Act applicable in the respective state. The contractor shall be registered with the applicable sales tax authority of the state / Union territory as applicable for the works. The contractor shall be responsible for submission of appropriate sales tax / VAT to the authority and BSCDCL shall all times be kept indemnified for non fulfilment of the sales tax / VAT obligations by the contractor including but not limited to registration, submission of tax & its returns at appropriate times and any other statutory obligation(s) in this regard as applicable. However, contractor is bound to submit the proof of deposit of Sales Tax / VAT to the BSCDCL failing which the Engineer-in-charge shall have, without prejudice to any other rights or remedy available under any of the clauses of contract, full powers to deduct / recover the sum(s) he deems fit from any amount due / payable or any security deposit available at his disposal.

SERVICE TAX

The tenderer shall quote his rates inclusive of Service Tax along with other taxes, duties, levies etc. The contractor must have registration No. with Service Tax Authorities and will provide copy of Registration to BSCDCL before release of any payment by the Corporation. The contractor will submit regular Invoice / Bill fulfilling all conditions of Service Tax Rules 1994 amended from time to time and shall produce proof of deposit of Service Tax to the Corporation as and when demanded failing which the Engineer-in-charge shall have without prejudice to any other rights or remedy available under any of the clauses of contract, full powers to deduct / recover the sum(s) he deems fit from any amount due / payable or any security deposit available at his disposal.

ROYALTY ON MATERIALS:

The contractor shall deposit royalty and obtain necessary permit for supply of bajri, stone, kankar, sand and other materials etc. from the local authorities and quoted rates shall be inclusive of royalty.

The contractor shall be deemed to have inspected the site, its surrounding and acquainted itself with the nature of the ground, accessibility of the site and full extent and nature of all operations necessary for the full and proper execution of the contract, space for storage of materials, constructional plant, temporary works, restrictions on the plying of heavy vehicles in area, supply and use of labour, materials, plant, equipment and laws, rules and regulations, if any, imposed by the local authorities.

The rates and prices to be tendered in the bill of quantities are for completed and finished items of works and complete in all respects. It will be deemed to include all constructional plant, labour, supervision, materials, transport, all temporary works, erection, maintenance, contractor"s profit and establishment/overheads, together with preparation of designs & drawings pertaining to casting yard, shop drawing, fabrication drawing (if required), staging form work, stacking yard, etc. all general risk, all taxes, royalty, duties, cess, octroi and other levies, insurance liabilities and obligations set out or implied in the tender documents and contract.

If any temporary/ permanent structure is encountered or safety of such structure in the vicinity is endangered due to execution of the project, the contractor has to protect the structures by any means as per direction of Engineer-in–Charge. If any damage is caused to any temporary or permanent structure(s) in the vicinity due to execution of the project, the contractor has to make good the same by any means as per direction of Engineer-in–Charge. The contractor should inspect the site of work from this point of view. The cost to be incurred in this regard shall be deemed to be included in his quoted rates of BOQ items and the contractor shall not be entitled for any extra payment in this regard.

INSURANCE OF WORKS ETC

Contractor is required to take contractor"s all risk policy or erection all risk policy (as the case may be) from an approved insurance company in the joint name with BSCDCL and bear all costs towards the same for the full period of execution of works including the defect liability period for the full amount of contract against all loss of damage from whatever cause arising other than **excepted risks** for which he is responsible under the terms of the contract and in such manner that the BSCDCL and the contractor are covered during the period of construction of works and/or also covered during the period of defect liability for loss or damage

The work and the temporary works to the full value of such works.

The materials, constructional plant, centering, shuttering and scaffolding materials and other things brought to the site for their full value.

Whenever required by BSCDCL, the contractor shall produce the policy or the policies of insurance and the receipts for payment of the current premium.

INSURANCE UNDER WORKMEN COMPENSATION ACT

Contractor is required to take insurance cover under the Workman Compensation Act, 1923 amended from time to time from an approved insurance company and pay premium charges thereof. Wherever required by BSCDCL the contractor shall produce the policy or the policies of Insurance and the receipt of payment of the current premiums.

THIRD PARTY INSURANCE

Contractor is required to take third party insurance cover for an amount of 5%(five percent) of contract value from an approved insurance company for insurance against any damage, injury or loss which may occur to any person or property including that of BSCDCL / owner / client, arising out of the execution of the works or temporary works. Wherever required by BSCDCL the contractor shall produce the policy or the policies of Insurance and the receipt of payment of the current premiums.

In case of failure of the contractor to obtain contractors all risk policy, insurance under workman compensation act and third party insurance as described above within one month from the date of commencement of work, running account payments of the contractor shall be withheld till such time the aforesaid insurance covers are obtained by the contractor.

If the Contractor could not effect a comprehensive insurance cover against risks which he may be required to effect under the terms of the contract, then he shall give his attention to get the best insurance cover available and even in case of effecting a wider insurance cover than the one which the subsidiary of the General Insurance Company could offer, such an insurance is ought to be done after the BSCDCL"s approval, by or through the subsidiary of the General Insurance Company.

(Refer clause 74.2) The contractor shall at all times indemnify BSCDCL and Owner against all claims, damages or compensation under the provision of Payment of wages act-1936, Minimum Wages Act-1948, Employer"s liability

Act-1938, the workmen"s compensation Act-1947, Industrial Disputes Act-1947 and Maternity Benefit Act-1961 or any modifications thereof or any other law in force or as consequence of any accident or injury to any workman or other persons in or about the works, whether in the employment of the contractor or not, against all costs, charges and expenses of any suit, action or proceedings arising out of such incident or injury and against all sum or sums which may with the consent of the contractor be paid to compromise or compound any such claim. Without limiting his obligations and liabilities as above provided, the contractor shall insure against all claims, damages or compensation payable under the Workmen"s Compensation Act 1923 or any modification thereof or any other law relating thereto.

PAYMENTS

All running payments shall be regarded as payments by way of advance against the final payment only and not as payments for work actually done and completed and/or accepted by BSCDCL and shall not preclude the recovery for bad, unsound and imperfect or unskilled work to be removed and taken away and reconstructed or re-erected or be considered as an admission of the due performance of the Contract, or any part thereof, in this respect, or the accruing of any claim, nor shall it conclude, determine or affect in any way the powers of the BSCDCL under these conditions or any of them as to the final settlement and adjustments of the accounts or otherwise, or in any other way vary/ affect the contract. The final bill shall be submitted by the contractor within three months of the completion of work, otherwise BSCDCL"s certificate of the measurement and of the total amount payable for the work accordingly shall be final and binding on contractor. Each Running Bills should be accompanied by two sets of at-least 20 (twenty) photographs as per direction of Engineer-in-charge taken from various points depicting status of work as on Report/ Bill date and Monthly Progress Report for the concerned month in the pro-forma to be given/ approved by Engineer-in-Charge. Intermittent progress Photographs as and when required shall also be provided by the Contractor at his own cost as per direction of Engineer-in-Charge. No payment of running account bill shall be released unless it is accompanied by photographs and Monthly Progress Report as above.

It is clearly agreed and understood by the Contractor that notwithstanding anything to the contrary that may be stated in the agreement between BSCDCL and the contractor; the contractor shall become entitled to payment only after BSCDCL has received the corresponding payment(s) from the client/ Owner for the work done by the contractor. Any delay in the release of payment by the client/ Owner to BSCDCL leading to a delay in the release the corresponding payment by BSCDCL to the contractor shall not entitle the Contractor to any compensation/ interest from BSCDCL.

All payments shall be released by way of e-transfer through RTGS/NEFT in India directly at their Bank account by BSCDCL.

MEASUREMENTS OF WORKS

Engineer-in-charge shall, except as otherwise provided, ascertain and determine by measurement, the value of work done in accordance with the contract.

Except where any general or detailed description of the work expressly shows to the contrary, measurement shall be taken in accordance with the Procedure set forth in the UADD/MPPWD/CPWD Specification. In the case of items which are not covered by specifications, mode of measurement as specified in the Technical Specifications of the contract and if for any item no such technical specification is available, then a relevant standard method of measurement issued by the Bureau of Indian Standard shall be followed.

Provided further that, In case of Cancellation/Determination of Contract in Full or in Part in accordance with clause 11.0 (and its sub-clauses), following methodology shall be adopted in respect of measurements in addition to what has been mentioned in foregoing:-

All measurements and levels shall be taken jointly by the Engineer-in-Charge or his authorized representative and by the contractor or his authorized

representative from time to time during the progress of the work and such measurements shall be signed and dated by the Engineer-in-Charge and the contractor or their representatives in token of their acceptance. If the contractor objects to any of the measurements recorded, a note shall be made to that effect with reason and signed by both the parties.

If for any reason the contractor or his authorized representative is not available and the work of recording measurements is suspended by the Engineer-in-Charge or his representative, the Engineer-in-Charge and BSCDCL shall not entertain any claim from contractor for any loss or damages on this account. If the contractor or his authorized representative does not remain present at the time of such measurements after the contractor or his authorized representative has been given a notice in writing three (3) days in advance or fails to countersign or to record objection within a week from the date of the measurement, then such measurements recorded in his absence by the Engineer-in-Charge or his representative shall be deemed to be accepted by the Contractor. The contractor shall, without extra charge, provide all assistance with every appliance, labour and other things necessary for measurements and recording levels.

COMPUTERISED MEASUREMENT BOOKS

Engineer-in-Charge shall, except as otherwise provided, ascertain and determine by measurement the value of work done in accordance with the contract. All measurements of all items having financial value shall be entered by the contractor and compiled in the shape of the Computerized Measurement Book as per the format of BSCDCL so that a complete record is obtained of all the items of works performed under the contract. All such measurements and levels recorded by the contractor or his authorized representative from time to time, during the progress of the work, shall be got checked by the contractor from the Engineer-in-Charge or his authorized representative as per interval or program fixed in consultation with Engineer-in-Charge or his authorized representative.

After the necessary corrections made by the Engineer-in-Charge, the measurement sheets shall be returned to the contractor for incorporating the corrections and for resubmission to the Engineer-in- Charge for the dated signatures by the Engineer-in-Charge and the contractor or their representatives in token of their acceptance.

Whenever bill is due for payment, the contractor would initially submit draft computerized measurement sheets and these measurements would be got checked/test checked from the Engineer-in-Charge and/or his authorized representative. The contractor will, thereafter, incorporate such changes as may be done during these checks/test checks in his draft computerized measurements, and submit to BSCDCL a computerized measurement book, duly bound, and with its pages machine numbered. The Engineer-in-Charge and/or his authorized representative would thereafter check this MB, and record the necessary certificates for their checks/test checks.
The final, fair, computerized measurement book given by the contractor, duly bound, with its pages numbered, should be 100% correct, and no cutting or over-writing in the measurements would thereafter be allowed. If at all any error is noticed, the contractor shall have to submit a fresh computerized MB with its pages duly numbered and bound, after getting the earlier MB cancelled by the BSCDCL. The contractor shall submit two spare copies of such computerized MB"s for the purpose of reference and record by the various officers of the BSCDCL.

The contractor shall also submit to the department separately his computerized Abstract of Cost and the bill based on these measurements, duly bound, and its pages numbered along with two spare copies of the "bill.

The contractor shall, without extra charge, provide all assistance with every appliance, labour and other things necessary for checking of measurements /levels by the Engineer-in-Charge or his representative.

The contractor shall give not less than seven days" notice to the Engineer-in-Charge or his authorized representative in charge of the work before covering up or otherwise placing beyond the reach of checking and/or test checking the measurement of any work in order that the same may be checked and/or test checked and correct dimensions thereof be taken before the same is covered up or placed beyond the reach of checking and/or test checking measurement and shall not cover up and place beyond reach of measurement any work without consent in writing of the Engineer-in-Charge or his authorized representative in charge of the work who shall within the aforesaid period of seven days inspect the work, and if any work shall be covered up or placed beyond the reach of checking and/or test checking measurements without such notice having been given or the Engineer-in-Charge"s consent being obtained in writing the same shall be uncovered at the Contractor"s expense, or in default thereof no payment or allowance shall be made for such work or the materials with which the same was executed.

Engineer-in-Charge or his authorized representative may cause either themselves or through another officer of the BSCDCL to check the measurements recorded by contractor and all provisions stipulated herein above or anywhere in the tender document shall be applicable to such checking of measurements or levels.

It is also a term of this contract that checking and/or test checking the measurements of any item of work in the measurement book and/or its payment in the interim, on account of final bill shall not be considered as conclusive evidence as to the sufficiency of any work or material to which it relates nor shall it relieve the contractor from liabilities from any over measurement or defects noticed till completion of the defects liability period.

WITHHOLDING AND LIEN IN RESPECT OF SUMS DUE FROM CONTRACTOR

Whenever any claim or claims for payment of a sum of money arises out of or under the contract or against the contractor, BSCDCL shall be entitled to withhold and also have a lien to retain such sum or sums in whole or in part from the security, if any, deposited by the contractor and for the purpose aforesaid, BSCDCL shall be entitled to withhold the security deposit, if any, furnished as the case may be and also have a lien over the same pending finalization or adjudication of any such claim. In the event of the security being insufficient to cover the claimed amount or amounts or if no security has been taken from the contractor, BSCDCL shall be entitled to withhold and have a lien to retain to the extent of such claimed amount or amounts referred to above, from any sum or sums found payable or which may at any time thereafter become payable to the contractor under the same contract or any other contract pending finalization of adjudication of any such claim.

It is an agreed term of the contract that the sum of money or moneys so withheld or retained under the lien referred to above by the Engineer-in-Charge or BSCDCL will be kept withheld or retained as such by the Engineer-in-Charge or BSCDCL till the claim arising out of or under the contract is determined by the competent court and that the contractor will have no claim for interest or damages whatsoever on any account in respect of such

withholding or retention under the lien referred to above and duly notified as such to the contractor. For the purpose of this clause, where the contractor is a partnership firm or a limited company, the Engineer-in-Charge or the BSCDCL shall be entitled to withhold and also have a lien to retain towards such claimed amount or amounts in whole or in part from any sum found payable to any partner/limited company, as the case may be whether in his individual capacity or otherwise. BSCDCL shall have the right to cause an audit and technical examination of the works and the final bills of the contractor including all supporting vouchers, abstract, etc, to be made after payment of the final bill and if as a result of such audit and technical examination any sum is found to have been overpaid in respect of any work done by the contractor under the contract or any work claimed to have been done by him under the contract and found not to have been executed, the contractor shall be liable to refund the amount of over-payment and it shall be lawful for BSCDCL to recover the same from him in the manner prescribed in sub-clause 27.1 of this clause or in any other manner legally permissible; and if it is found that the contractor was paid less than what was due to him under the contract in respect of any work executed by him under it, the amount of such under payment shall be duly paid by BSCDCL to the contractor, without any interest thereon whatsoever.

LIEN IN RESPECT OF CLAIMS IN OTHER CONTRACTS

Any sum of money due and payable to the contractor (including the security deposit returnable to him) under the contract may be withheld or retained by way of lien by the Engineer-in-Charge or by BSCDCL against any claim of the Engineer-in-Charge or BSCDCL in respect of payment of a sum of money arising out of or under any other contract made by the contractor with the Engineer-in-Charge or the BSCDCL. It is an agreed term of the contract that the sum of money so withheld or retained under this clause by the Engineer-in-Charge or the BSCDCL will be kept withheld or retained as such by the Engineer-in-Charge or the BSCDCL or till his claim arising out of the same contract or any other contract is either mutually settled or determined by the competent court, as the case may be, and that the contractor shall have no claim for interest or damages whatsoever on this account or on any other ground in respect of any sum of money withheld or retained under this clause and duly notified as such to the contractor.

WORK TO BE EXECUTED IN ACCORDANCE WITH SPECIFICATIONS, DRAWINGS, AND ORDERS ETC.

All items of work in the bill of quantities/ schedule of quantities shall be carried out as per the UADD/MPPWD/CPWD/ MORTH (as the case may be) specifications, drawings and instructions of the Engineer-in-Charge of BSCDCL and the rates shall include for supply of required materials including proper storage, consumables, skilled & unskilled labour, supervision and tools, tackles, plant & machinery complete as called for in the detailed specifications and conditions of the contract. Latest updated UADD/MPPWD/CPWD specification shall be followed for execution of work.

The contractor shall execute the whole and every part of the work in the most substantial and workman like manner both as regards materials and otherwise in every respect in strict accordance with the specifications.

The contractor shall also conform exactly, fully and faithfully to the design, drawings and instructions in writing in respect of the work assigned by the Engineer-in-Charge.

The contractor shall comply with the provisions of the contract and execute the works with care and diligence and maintain the works and provide all

labour and materials, tools and plants including for measurements and supervision of all works, structural plans and other things of temporary or permanent nature required for such execution and maintenance in so far as the necessity for providing these, is specified or is reasonably inferred from the contract. The contractor shall take full responsibility for adequacy, suitability and safety of all the works and methods of construction.

MATERIALS TO BE PROVIDED BY THE CONTRACTOR

The contractor shall, at his own expense, provide all materials, required including Cement & Steel for the works. The contractor shall at his own expense and without delay; supply to the Engineer-in-Charge samples of materials to be used on the work and shall get the same approved in advance. All such materials to be provided by the Contractor shall be in conformity with the specifications laid down or referred to in the contract.

The contractor shall, if requested by the Engineer-in-Charge furnish proof, to the satisfaction of the Engineer-in-Charge that the materials so comply.

The contractor shall at his risk and cost, submit the samples of materials to be tested or analyzed and bear all charges and cost of testing unless specifically provided for otherwise elsewhere in the contract or specifications. The Engineer-in-Charge or his authorized representative shall at all times have access to the works and to all workshops and places where work is being prepared or from where materials, manufactured articles or machinery are being obtained for the works and the contractor shall afford every facility and every assistance and cost in obtaining the right and visit to such access. The Engineer-in-Charge shall have full powers to require the removal from the premises of all materials which in his opinion are not in accordance with the specifications and in case of default, the Engineer-in-Charge shall be at liberty to employ at the expense of the contractor, other persons to remove the same without being answerable or accountable for any loss or damage that may happen or arise to such materials. The Engineer-in-Charge shall also have full power to require other proper materials to be substituted thereof and in case of default, the Engineer-in-Charge may cause the same to the supplies and all costs which may require such removal and substitution shall be borne by the contractor.

MATERIALS AND SAMPLES

The materials/products used on the works shall be one of the approved make/ brands out of list of manufacturers / brands /makes given in the tender documents. The contractor shall submit samples/ specimens out of approved makes of materials/ products to the Engineer-in-Charge for prior approval. In exceptional circumstances Engineer-in-Charge may allow alternate equivalent makes/brands of products/ materials at his sole discretion. The final choice of brand / make shall remain with the Engineer-in-Charge, whose decision in this matter shall be final and binding and nothing extra on this account shall be payable to the Contractor. In case single brand/ make are mentioned, other equivalent makes/ brands may be considered by the Engineer-in-Charge. In case of variance in UADD/MPPWD/CPWD/IS/BIS Specifications from approved products/makes specification, the specification of approved product/make shall prevail for which nothing shall be paid extra to the Contractor. In case no make or brand of any materials, articles, fittings and accessories etc. is specified, the same shall comply with the relevant Indian Standard Specifications and shall bear the ISI/BIS mark. The Engineer of BSCDCL and the owner shall have the discretion to check quality of materials and equipments to be incorporated in the work, at source of supply or site of work and even after incorporation in the work. They shall also have the discretion to check the workmanship of various items of work to be executed in this work. The contractor shall provide the necessary facilities and assistance for this purpose.

The above provisions shall not absolve the contractor from the quality of final product and in getting the material and workmanship quality checked and approved from the Engineer-in-Charge of BSCDCL.

The contractor shall well in advance, produce samples of all materials, articles, fittings, accessories etc. that he proposes to use and get them approved in writing by BSCDCL. The materials articles etc. as approved shall be *LABELLED* as such and shall be signed by BSCDCL and the Contractor"s representative.

The approved samples shall be kept in the custody of the Engineer-in- Charge of BSCDCL till completion of the work. Thereafter the samples except those destroyed during testing shall be returned to the contractor. No payment will be made to the contractor for the samples or samples destroyed in testing.

The brands of all materials, articles fittings etc. approved together with the names of the manufacturers and firms from which supplies have been arranged shall be recorded in the site order book.

The contractor shall set up and maintain at his cost, a field testing laboratory for all day to day tests at his own cost to the satisfaction of the Engineer-in-Charge. This field testing laboratory shall be provided with equipment and facilities to carry out all mandatory field tests as per MORTH/UADD/MPPWD/CPWD (as the case may be) specifications. The laboratory building shall be constructed and installed with the appropriate facilities, Temperature and humidity controls shall be available wherever necessary during testing of samples. All equipments shall be provided by the Contractor so as to be compatible with the testing requirements specified. The Contractor shall maintain all the equipments in good working condition for the duration of the contract. The Contractor shall provide approved qualified personnel to run the laboratory for the duration of the Contract. The number of staff and equipment available must at all times be sufficient to keep pace with the sampling and testing programme as required by the Engineer-in-charge. The Contractor shall fully service the site laboratory and shall supply everything necessary for its proper functioning, including all transport needed to move equipment and samples to and from sampling points on the site, etc. The Contractor shall re-calibrate all measuring devices whenever so required by the Engineer-in-charge and shall submit the results of such calibration without delay. All field test shall be carried out in the presence of BSCDCL"s representative. All costs towards samples, materials, collection, transport, manpower, testing etc. shall be borne by the Contractor and are deemed to be included in the rates quoted by him in the bill of quantities.

The contractor(s) shall display the calibration certificate of each equipment at the location of equipment & shall get recalibrated at least one week before its expiry date.

MATERIALS PROCURED WITH THE ASSISTANCE OF BSCDCL

If any material for the execution of this contract is procured with the assistance of BSCDCL either by issue from its stores or purchase made under orders or permits or licenses obtained by BSCDCL, the contractor shall hold

and use the said materials economically and solely for the purpose of this contract and shall not dispose them without the permission of Engineer-in-charge. The contractor, if required by the BSCDCL, shall return all such surplus or unserviceable materials that may be left with him after the completion of the contract or at its termination on whatsoever reason, on being paid or credited such price as the Engineer-in-charge shall determine having due regard to the conditions of materials. The price allowed to the contractor, however, shall not exceed the amount charged to him excluding the element of storage charges which shall be 10% of the cost charged to contractor. The decision of the Engineer-in-charge shall be final and conclusive.

Contractor(s) has / have to deploy security personnel for safeguarding of materials procured at site.

CONTRACTOR TO SUPPLY TOOLS & PLANTS

The contractor shall provide at his own cost all materials, machinery, tools & plants as require for completion of work. In addition to this, appliances, implements, other plants, ladders, cordage, tackle, scaffolding and temporary works required for the proper execution of the work, whether original, altered or substituted and whether included in the specifications or other documents forming part of the contract or referred to in these conditions or not, or which may be necessary for the purpose of satisfying or complying with the requirements of the Engineer-in-Charge as to any matter as to which under these conditions he is entitled to be satisfied, or which he is entitled to require together with carriage therefore to and from the work. The contractor shall also supply without charge the requisite number of persons with the means and materials, necessary for the purpose of setting out works, and counting, weighing and assisting the measurement or examination at any time and from time to time of the work or materials. Failing his so doing, the same may be provided by the Engineer-in-Charge at the expense of the contractor and the expenses may be deducted, from any money due to the contractor, under this contract or otherwise and/or from his security deposit or the proceeds of sale thereof, or of a sufficient portions thereof.

MOBILIZATION OF MEN, MATERIALS AND MACHINERY:

All expenses towards mobilization at site and de-mobilization including bringing in equipment, work force, materials, dismantling the equipment"s, clearing the site etc. shall be deemed to be included in prices quoted and no separate payment on account of such expenses shall be entertained.

It shall be entirely the Contractor"s responsibility to provide, operate and maintain all necessary construction equipment"s, scaffoldings and safety, gadget, lifting tackles, tools and appliances to perform the work in a workman like and efficient manner and complete all jobs as per the specifications and within the schedule time of completion of work. Further, contractor shall also be responsible for obtaining temporary electric and water connection for all purposes. The contractor shall also make standby arrangement for water & electricity to ensure un-interrupted supply.

It shall be the responsibility of the contractor to obtain the approval for any revision and/or modification desired by him from BSCDCL before implementation.

The procurement and supply in sequence and at the appropriate time of all materials and consumable shall be entirely the contractor"s responsibilities and his rates for execution of work shall be inclusive of supply of all these items.

It is mandatory for the contractor to provide safety equipment"s and gadgets to his all workers, supervisory and Technical staff engaged in the execution of the work while working. The minimum requirement (but not limited to) shall be gum boots, safety helmets, Rubber hand gloves, face masks, safety nets, safety belts, goggles etc. as per work requirements. Sufficient nos. of these equipment"s and gadgets shall also be provided to BSCDCL by the contractor at his own cost for use of BSCDCL Officials and/ or workforce while working/supervision of work at site. No staff/ worker shall be allowed to enter the site without these equipment"s/ gadgets.

The cost of the above equipment"s/ gadgets are deemed to be included in the rates quoted by the contractor for the items & works as per Bill of Quantities and contractor shall not be entitled for any extra payment in these regard. The above norm is to be strictly complied with at site. In case the contractor is found to be deficient in providing Safety Equipment"s/ Gadgets in the opinion of Engineer-in-charge, the Engineer-in-charge at his option can procure the same at the risk & cost of contractor and provide the same for the use of worksite and shall make the recoveries from the bills of the contractor for the same. The contractor shall abide by all rules & regulations pertaining to Health, Safety and Environment.

All designs, drawings, bill of quantities, etc., except Bar Bending Schedule, Shop & Fabrication drawings, for all works shall be supplied to the contractor for their scope of work all buildings services and development works by BSCDCL in phased manner as the works progress. However it shall be the duty and responsibility of the contractor to bring to the notice of the BSCDCL in writing as to any variation, discrepancy or any other changes required and to obtain revised drawings and designs and / or approval of the BSCDCL in writing for the same.

One copy of contract documents including drawings furnished to the contractor shall be kept at the site and the same shall at all reasonable times be available for inspection.

All materials, construction plants and equipments etc. once brought by the contractor within the project area, will not be allowed to be removed from the premises without the written permission of the Engineer-in-charge. Similarly all enabling works built by the contractor for the main construction undertaken by him, shall not be dismantled and removed without the written authority of the BSCDCL.

Contractor shall have to prepare the Bar Bending Schedule, shop and fabrication drawings free of cost, if required for any of the items of work.

Five copies of these drawings each including for revision will be submitted to BSCDCL for approval. Before executing the item, shop drawings and bar bending schedule should be approved by BSCDCL.

BSCDCL shall supply Work Force in the various categories to assist the contractor in execution of the works on recoverable basis as per provision mentioned elsewhere in the contract.

All contractors" plant, machinery and equipment shall be kept in perfect condition during currency of the contract.

QUALITY ASSURANCE PROGRAMME

To ensure that the services under the scope of this contract are in accordance with the specifications, the Contractor shall adopt Quality Assurance Programme to control such activities at the necessary points.

The contractor shall prepare and finalize such Quality AssurancebAward. Programme within 15 days from date of issue Letter of BSCDCL shall also carryout quality audit and quality surveillance of systems and procedures of Contractor"s quality control activities. A Quality Assurance Programme of Contractor shall generally cover the following:

His organization structure for the management and implementation of the proposed Quality Assurance Program.

Documentation control system.

c) The procedure for purpose of materials and source inspection.

System for site controls including process controls.
Control of non-conforming items and systems for corrective actions.
Inspection and test procedure for site activities.
System for indication and appraisal of inspection status.
System for maintenance of records.
System for handling, storage and delivery.

A quality plan detailing out quality practices and procedures, relevant standards and acceptance levels for all types of work under the scope of this contract.

All the quality reports shall be submitted by the Contractors in the formats appended hereto. Checklist enclosed here in this document shall be followed while carrying out Construction activities (items). If any item is not covered by the Checklist/ Formats appended hereto, the Format for the same may be developed and submitted to Engineer-in-Charge for approval and the same shall be adopted. These filled in formats shall be prepared in two copies and duly signed by representatives of contractor and BSCDCL. All the costs associate with Printing of Formats and testing of materials required as per technical specifications or by Engineer-in-charge shall be included in the Contractor"s quoted rates in the Schedule/ Bill of quantities.

CONTRACT COORDINATION PROCEDURES, COORDINATION MEETINGS AND PROGRESS REPORTING

The Contractor shall prepare and finalize in consultation with BSCDCL, a detailed contract coordination procedure within 15 days from the date of issue of Letter of Award for the purpose of execution of the Contract. The Contractor shall have to attend all the meetings at any place in India at his own cost with BSCDCL, Owners/ Clients or Consultants of BSCDCL/ Owner/ Client during the currency of the Contract, as and when required and fully cooperate with such personal and agencies involved during these discussions. The Contractor shall not deal in any way directly with the Clients/ Owners or Consultants of BSCDCL/Owner/ Clients and any dealing/correspondence if required at any time with Clients/ Owners/ Consultants shall be through BSCDCL only. During the execution of the work, Contractor shall submit at his own cost a detailed Monthly progress & programme report to the Engineer-in-charge of BSCDCL by 5th of every month. The format of monthly progress & programme report shall be as approved by Engineer-in-Charge of BSCDCL.

COMPLETION CERTIFICATE AND COMPLETION PLANS

Within ten days of the completion of the work, the contractor shall give notice of such completion to the Engineer-in-Charge and within thirty days

of the receipt of such notice, the Engineer-in-Charge shall inspect the work and if there is no defect in the work, shall furnish the contractor with a final certificate of completion, otherwise a provisional certificate of physical completion indicating defects (a) to be rectified by the contractor and/or

(b) for which payment will be made at reduced rates, shall be issued. But no final certificate of completion shall be issued, nor shall the work be considered to be complete until the contractor shall have removed from the premises on which the work shall be executed all scaffolding, surplus materials, rubbish and all huts and sanitary arrangements required for his/their work people on the site in connection with the execution of the works as shall have been erected or constructed by the contractor(s) and cleaned off the dirt from all wood work, doors, windows, walls, floor or other parts of the building, in, upon, or about which the work is to be executed or of which he may have had possession for the purpose of the execution; thereof, and not until the work shall have been measured by the Engineer-in-Charge. If the contractor shall fail to comply with the requirements of this Clause as to removal of scaffolding, surplus materials and rubbish and all huts and sanitary arrangements as aforesaid and cleaning off dirt on or before the date fixed for the completion of work, the Engineer-in-Charge may at the expense of the contractor remove such scaffolding, surplus materials and rubbish etc., and dispose of the same as he thinks fit and clean off such dirt as aforesaid, and the contractor shall have no claim in respect of scaffolding or surplus materials as aforesaid except for any sum actually realized by the sale thereof less actual cost incurred on removal of materials / debris / malba etc.

The contractor shall submit completion plan as required vide General Specifications for Electrical works as applicable within thirty days of the completion of the work. In case, the contractor fails to submit the completion plan as aforesaid, he shall be liable to pay a sum equivalent to 2.5% of the value of the work subject to a ceiling of Rs.5,00,000 (Rs. Five Lakhs only) as may be fixed by the Engineer-in-charge concerned and in this respect the decision of the Engineer-in-charge shall be final and binding on the contractor.

PROHIBITION OF UNAUTHORISED CONSTRUCTION & OCCUPATION

No unauthorized buildings, construction of structures should be put up by the contractor anywhere on the project site, neither any building built by him shall be occupied in un-authorized manner by him or his staff.

It shall be the responsibility of the contractor to see that the building under construction is not occupied by anybody in un-authorized manner during construction, and is handed over to the Engineer-in-Charge with vacant possession of complete building. If such building though completed is occupied illegally, then the Engineer-in-Charge shall have the option to refuse to accept the said building/buildings in that position. Any delay in acceptance on this account will be treated as the delay in completion and for such delay, a levy of compensation upto 5% of tendered value of work may be imposed by the Engineer-in-Charge whose decision shall be final both with regard to the justification and quantum and shall be binding on the contractor.

However, the Engineer-in-Charge, through a notice, may require the contractor to remove the illegal occupation any time on or before construction and delivery.

FORECLOSURE OF CONTRACT BY BSCDCL/OWNER

If at any time after the commencement of the work the BSCDCL shall for any reason whatsoever is required to abandon the work or is not require the whole work thereof as specified in the tender to be carried out, the Engineer-in-Charge shall give notice in writing of the fact to the contractor, who shall have no claim to any payment of compensation whatsoever on account of any profit or advantage which he might have derived from the execution of the work in full, but which he did not derive in consequence of the foreclosure of the whole or part of the works.

DEFECTS LIABILITY PERIOD

The contractor shall be responsible for the rectification of defects in the works for a period twelve months from the date of taking over of the works by the BSCDCL or clients whichever is later. Any defects discovered and brought to the notice of the contractor forthwith shall be attended to and rectified by him at his own cost and expense. In case the contractor fails to carry out these rectifications, the same may without prejudice to any other right or remedy available, be got rectified by BSCDCL at the cost and expense of the contractor

RESTRICTION ON SUBLETTING

The contractor shall not sublet or assign the whole or part of the works except where otherwise provided, by the contract. The provision of labour on piece work basis shall not be deemed to be a subletting under this clause.

The contractor may entrust specialist items of works like MEP services, HVAC, Lifts, Building Management System, Water Proofing, and Data &

Communication networking, interiors, landscaping etc. to the agencies specialized in the specific trade. The contractor shall give the names and details of such firm whom it is going to employ for approval of BSCDCL. These details shall include the expertise, financial status, technical manpower, equipment, resources and list of works executed and on hand of the specialist agency. Further, prior written approval is required from BSCDCL to deploy such agency / sub-contractor.

FORCE MAJEURE

Any delay in or failure to perform of either party, shall not constitute default so as to give rise to any claim for damages, to the extent such delay or failure to perform is caused by an act of God, or by fire, explosion, flood or other natural catastrophe, governmental legislation, orders or regulation etc. Failure of the client / owner to hand over the entire site and / or release funds for the project, to BSCDCL, shall also constitute force majeure. The time for performance of the obligation by the parties shall be deemed to be extended for a period equal to the duration of the force majeure event. Both parties shall make their best efforts to minimize the delay caused by the force majeure event. If the failure / delay of the client /owner in handing over the entire site and / or in releasing the funds continues even on the expiry of the stipulated date of completion, BSCDCL, may, at the request of the contractor, foreclose the

contract without any liability to either party. In the event of such foreclosure, the contractor shall not be entitled to any compensation whatsoever. If prior to such foreclosure the contractor has brought any materials to the site, the Engineer-in-Charge shall always have the option of taking over of all such materials at their purchase price or at the local current rates, whichever is lower.

NO COMPENSATION CLAUSE

The contractor shall have no claim whatsoever for compensation or idle charges against BSCDCL on any ground or for any reason, whatsoever.

DIRECTION FOR WORKS

All works under the contract shall be executed under the direction and subject to approval in all respect of the Engineer-in-Charge of BSCDCL who shall be entitled to direct at whatever point or points and in whatever manner works are to be commenced and executed.

The Engineer-in-Charge and his representative shall communicate or confirm their instructions to the contractor in respect of the execution of work during their site inspection in a „Works Site Order Book" maintained at the site office of Engineer-in-Charge. The contractor or his authorized representative shall confirm receipt of such instructions by signing against the relevant orders in the book.

WORK IN MONSOON AND RAIN

The execution of the work may entail working in the monsoon also. The contractor must maintain labour force as may be required for the job and plan and execute the construction and erection according to the prescribed schedule. No special/ extra rate will be considered for such work in monsoon. The contractors" rate shall be considered inclusive of cost of dewatering due to rains required if any and no extra rate shall be payable on this account. The stipulated period for completion of project includes the monsoon period, holidays & festivals.

WORK ON SUNDAYS, HOLIDAYS AND DURING NIGHT

For carrying out work on Sunday and Holidays or during night, the contractor will approach the Engineer-in-Charge or his representative at least two days in advance and obtain his permission. The Engineer-in- Charge at his discretion can refuse such permission. The contractor shall have no claim on this account whatsoever. If work demand, the contractor shall make arrangements to carry out the work on Sundays, Holidays and in two, three shifts with the approval of Engineer-in-Charge at no extra cost to BSCDCL.

WATER AND ELECTRICITY

The contractor shall make his own arrangement for Water & Electrical power for construction and other purposes at his own cost and pay requisite electricity and water charges. The contractor shall also make standby arrangement for water & electricity to ensure un-interrupted supply.

LAND FOR LABOUR HUTS/ SITE OFFICE AND STORAGE ACCOMMODATION

The contractor shall arrange the land for temporary office, storage accommodation and labour huts at his own cost and get the clearance of local authorities for setting up/construction of labour camp and same is deemed to be included in the rates quoted by the contractor for the works. The contractor shall ensure that the area of labour huts is kept clean and sanitary conditions are maintained as laid down by the local authorities controlling the area. The labour huts shall be so placed that it does not hinder the progress of work or access to the worksite. The vacant possession of the land used, for the purpose shall be given back by contractor after completion of the work.

The security deposit of the contractor shall be released only after contractor demolishes all structures including foundations and gives back clear vacant possession of this land In the event the contractor has to shift his labour campus at any time during execution of the work on the instructions of local authorities or as per the requirement of the work progress or as may be required by BSCDCL, he shall comply with such instructions at his cost and risk and no claim whatsoever shall be entertained on this account.

WATCH, WARD AND LIGHTING OF WORK PLACE

The contractor shall at his own cost take all precautions to ensure safety of life and property by providing necessary barriers, OBSTRUCTIONS, lights, watchmen etc. during the progress of work as directed by Engineer-in- charge.

BITUMEN WORK

The contractor shall collect the total quantity of tar or bitumen required for the work as per standard formula, before the process of painting started and shall hypothecate it to the Engineer-in-Charge. Although the materials are hypothecated to BSCDCL the Contractor undertakes the responsibility for their proper watch, safe custody and protection against all risks. The materials shall not be removed from site of work without the written consent of the Engineer-in-charge.

If any bitumen or tar remains unused on completion of the work on account of lesser use of materials in actual execution for reasons other than authorized changes of specifications and abandonment of portion of work, a corresponding deduction equivalent to the cost of unused materials as determined by the Engineer-in-Charge shall be made and the material return to the contractors.

SCHEDULE OF QUANTITIES / BILL OF QUANTITIES

The quantities shown against the various items of work are only approximate quantities which may vary as per the actual requirement at site. No item which is not covered in the bill of quantities shall be executed by the Contractor without the approval of the BSCDCL. In case any Extra/Substituted item is carried out without specific-approval, the same will not be paid.

WATER PROOF TREATMENT

53.1 The water proof treatment shall be of type and specifications as given in the schedule of quantities.

The water-proofing of basement, roofs, water retaining areas shall be and remain fully effective for a period of not less than 10(Ten) years to be reckoned from the date of expiring of the Defect Liability period, prescribed in the contract. At any time during the said guarantee period if BSCDCL finds any defects in the said treatment or any evidence of re-infestation, dampness, leakage in any part of buildings or structure and notifies the contractor of the same, the contractor shall be liable to rectify the defect or give re-treatment and shall commence the work or such rectification or re-treatment within seven days from the date of issue of such letter to him. If the contractor fails to commence such work within the stipulated period, the BSCDCL may get the same done by another agency at the Contractor"s cost and risk and the decision of the Engineer-in-Charge of BSCDCL for the cost payable by the contractor shall be final and binding upon him.

Re-treatment if required shall be attended to and carried out by the Contractor within seven days of the notice from Engineer-in-Charge of BSCDCL.

The BSCDCL reserves the right to get the quality of treatment checked in accordance with recognized test methods and in case it is found that the chemicals with the required concentration and rate of application have not been applied, or the water proofing treatment is not done as per specifications, the contractor will be required to do the re-treatment in accordance with the required concentration & specifications at no extra cost failing which no payment for such work will be made. The extent of work thus rejected shall be determined by BSCDCL.

Water proofing shall be got done through approved / specialized agencies only with prior approval of Engineer-in-Charge.

The contractor shall make such arrangement as may be necessary to safe guard the workers and residents of the building against any poisonous effect of the chemicals used during the execution of the work.

During the execution of work, if any damage shall occur to the treatment already done, either due to rain or any other circumstances, the same shall be rectified and made good to the entire satisfaction of Engineer-In-Charge by the contractor at his cost and risk.

The contractor shall make his own arrangement for all equipment"s required for the execution of the job. The contractor whose tender is accepted shall execute Guarantee Bond in the prescribed form as appended for guaranteeing the water proofing treatment.

INDIAN STANDARDS

Wherever any reference is made to any IS in any particular specifications, drawings or bill of quantities, it means the Indian Standards editions with up to date amendments issued till last date of receipt of tender documents.

CENTERING & SHUTTERING

Marine plywood or steel plates or any material mentioned elsewhere in the tender document or as approved by Engineer-in-Charge shall be used for formwork. The shuttering plates shall be cleaned and oiled before every repetition and shall be used only after obtaining approval of BSCDCL"s Engineers at site. The number of repetitions allowed for plywood and steel shuttering shall be at the discretion of Engineer-in-Charge of BSCDCL depending upon the condition of shuttering surface after each use and the decision of Engineer-in-Charge in this regard shall be final and binding on the contractor. No claim whatsoever on this account shall be admissible.

RECORDS OF CONSUMPTION OF CEMENT & STEEL

For the purpose of keeping a record of cement and steel received at site and consumed in works, the contractor shall maintain a properly bound register in the form approved by the BSCDCL, showing columns like quantity received and used in work and balance in hand etc. This register shall be signed daily by the contractor"s representative and BSCDCL"s representative.

The register of cement & steel shall be kept at site in the safe custody of BSCDCL"s Engineer during progress of the work. This provision will not, however, absolve the contractor from the quality of the final product.

In case cement or steel quantity consumed is lesser as compared to the theoretical requirement of the same as per MORTH/UADD/MPPWD/CPWD (as the case may be) specifications/ norms, the work will be devalued and/ or a penal rate (i.e. double the rate at which cement/ steel purchased last) recovery for lesser consumption of cement/ steel shall be made in the item rates of the work done subject to the condition that the tests results fall within the acceptable criteria as per MORTH/UADD/MPPWD/CPWD (as the case may be) specifications otherwise the work shall have to be dismantled and redone by the contractor at no extra cost. In case of cement, if actual consumption is less than 98% of the theoretical consumption, a recovery shall be effected from the contractors bills at the penal rate for the actual quantity which is lower than 98% of theoretical consumption.

TESTS AND INSPECTION

The contractor shall carry out the various mandatory tests as per specifications and the technical documents that will be furnished to him during the performance of the work. All the tests on materials, as recommended by UADD/MPPWD/CPWD, MORTH and relevant Indian Standard Codes or other standard specifications (including all amendments current at the last date of submission of tender documents) shall be got carried out by the contractor at the field testing laboratory or any other recognized institution/ laboratory, at the direction of the BSCDCL. All testing charges, expenses etc. shall be borne by the contractor. All the tests, either on the field

or outside laboratories concerning the execution of the work and supply of materials shall be got carried out by the contractor or BSCDCL at the cost of the Contractor.

WORKS TO BE OPEN TO INSPECTION

All works executed or under the course of execution in pursuance of this contract shall at all times be open to inspection and supervision of the BSCDCL. The work during its progress or after its completion may also be inspected, by Chief Technical Examiner of Government of India (CTE) and/ or an inspecting authority of State Government of State in which work is executed and/or by third party checks by owner/ clients. The compliance of observations/improvements as suggested by the inspecting officers of BSCDCL/CTE/ State authorities/ Owners shall be obligatory on the part of the Contractor at the cost of contractor.

BORROW AREAS

The contractor shall make his own arrangements for borrow pits and borrow disposal areas including their approaches and space for movement of man, machinery, other equipments as required for carrying out the works. The contractor shall be responsible for taking all safety measures, getting approval, making payment of royalties, charges etc. and nothing extra shall be paid to the contractor on this account and unit rates quoted by the contractor for various items of bill of quantities shall deemed to include the same.

60.0 CARE OF WORKS

From the commencement to the completion of works and handing over, the contractor shall take full responsibility for care thereof all the works and in case of any damage/loss to the works or to any part thereof or to any temporary works due to lack of precautions or due to negligence on part of Contractor, the same shall be made good by the Contractor.

CO-ORDINATION WITH OTHER AGENCIES

Work shall be carried out in such a manner that the work of other Agencies operating at the site is not hampered due to any action of the Contractor. Proper Co-ordination with other Agencies will be Contractor"s responsibility. In case of any dispute, the decision of BSCDCL shall be final and binding on the contractor. No claim whatsoever shall be admissible on this account.

SETTING OUT OF THE WORKS

The contractor shall be responsible for the true and proper setting out of the works and for the correctness of the position, levels, dimensions and alignment of all parts of the works. If at any time during the progress of works, shall any error appear or arise in the position, levels, dimensions or alignment of any part of the works, the contractor shall at his own expenses rectify such error to the satisfaction of Engineer-in-charge. The checking of any setting out or of any line or level by the engineers of BSCDCL shall not in any way relieve the contractor of his responsibility for the correctness.

NOTICE BEFORE COVERING UP THE WORK

The contractor shall give not less than seven day"s notice before covering up or otherwise placing beyond the reach of measurement any work, to the Engineer-in-charge in order that the same may be inspected and measured. If any work is covered up or placed beyond the reach of inspection/measurement without such notice or his consent being obtained the same shall be uncovered at the contractor expenses and he shall have to make it good at his own expenses.

SITE CLEARANCE

The contractor shall ensure that the working site is kept clean and free of obstructions for easy access to job site and also from safety point of view. Before handing over the work to the BSCDCL the contractor shall remove all temporary structures like the site offices, cement go-down, stores, labour hutments etc., scaffolding rubbish, debris etc. left over materials tools and plants, equipments etc., clean the site to the entire satisfaction of the Engineer-in-charge. If this is not done the same will be got done by BSCDCL at his risk and cost.

The contractor shall clean all floors, remove cement/ lime/ paint drops and deposits, clean joinery, glass panes etc., touching all painter"s works and carry out all other necessary items of works to make the premises clean and tidy before handing over the building, and the rates quoted by the contractor shall be deemed to have included the same.

SET-OFF OF CONTRACTOR'S LIABILITIES

BSCDCL shall have the right to deduct or set off the expenses incurred or likely to be incurred by it in rectifying the defects and/or any claim under this agreement against the Contractor from any or against any amount payable to the contractor under this agreement including security deposit and proceeds of performance guarantee.

POSSESSION PRIOR TO COMPLETION

BSCDCL shall have the right to take possession of or use any completed or partially completed work or part of the work. Such possession or use shall not be deemed to be any acceptance of any work not completed in accordance with the contract agreement. If such prior possession or use by BSCDCL delays the progress of work an equitable adjustment in the time of completion will be made and the contract agreement shall be deemed to be modified accordingly. The decision of BSCDCL in such case shall be final binding and conclusive.

When the whole of the works or the items or the groups of items of work have been completed the contractor will give a notice to that effect to the Engineer in writing. The Engineer shall within 7 days of the date of receipt of such notice inspect the works and give instructions in writing to the contractor specifying the balance items of work which are required to be done by the contractor and shall also notify the contractor of any defect in the works affecting completion.

The contractor shall during the course of execution prepare and keep updated a complete set of „as built" drawings to show each and every change from the contract drawings, changes recorded shall be countersigned by the Engineer-in-Charge and the contractor. Four copies of „as built" drawings shall be supplied to BSCDCL by the contractor within 30 days of the completion. All costs incurred in this respect shall be borne by the contractor.

EMPLOYMENT OF PERSONNEL

The contractor shall employ only Indian Nationals as his representatives, servants and workmen after verifying their antecedents and loyalty. He shall ensure that no personnel of doubtful antecedents and any other nationality in any way is associated with the works. In case BSCDCL observed misconduct negligence or incompetence etc. on the part of any representative, agent, servant and workmen or employees etc. of the contractor, the BSCDCL shall have full power and without giving any reason to the contractor, instruct the contractor to remove such engineer / staff / worker from site and provide suitable replacements. The decision of the Engineer-in-charge shall be final and binding on the contractor. The contractor shall not be allowed any compensation on this account.

TECHNICAL STAFF FOR WORK

The contractor shall employ at his cost the adequate number of technical staff during the execution of this work depending upon the requirement of work. For this purpose the numbers to be deployed, their qualification,experience as decided by BSCDCL shall be final and binding on contractor. The contractor shall not be entitled for any extra payment in this regard. The technical staff should be available at site, whenever required by BSCDCL to take instructions.

Within 15 days of Letter of Award, the contractor shall submit a site organizational chart and resume including details of experience of the Project-in-Charge and other staff proposed to be deputed by him and the technical team shall be deputed by them on the Project after getting approval from Engineer-in-Charge. If desired by the contractor at later date, the Project-in-Charge and other staff whose resume is approved by BSCDCL can be replaced with prior written approval of BSCDCL and replacement shall be with equivalent or superior candidate only. Decision of Engineer-in-Charge shall be final and binding on the contractor.

Even after approving the site organizational chart, the Engineer-in-Charge due to technical reasons and exigency of work can direct the contractor to depute such additional staff as in view of Engineer-in-Charge is necessary and having qualification and experience as approved by the Engineer-in-Charge. The removal of such additional staff from the site shall only be with the prior written approval of Engineer-in-Charge. The contractor shall not be paid anything extra whatsoever on account of deployment of additional staff and decision of the Engineer-in-Charge shall be final and binding on the contractor.

In case the contractor fails to employ the staff as aforesaid he shall be liable to pay a reasonable amount not exceeding a sum of Rs. 50,000 (Rupees Fifty Thousand only) for each month of default in the case of each person. The decision of the Engineer-in-charge as to number of Technical Staff to be adequate for the project and the period for which the desired strength of technical staff was not employed by the contractor and as to the reasonableness of the amount to be deducted on this account shall be final and binding on the contractor as to the amount and the contractor"s liability to pay the said amount.

VALUABLE ARTICLES FOUND AT SITE

All gold, silver and other minerals of any description and all precious stones, coins, treasure, relics, antiques and all other similar things which shall be found in, under or upon the site, shall be the property of the owner/ BSCDCL.

MATERIALS OBTAINED FROM DISMANTLEMENT TO BE OWNER'S PROPERTY

All materials like stone, boulders and other materials obtained during the work of dismantling, excavation etc. will be considered BSCDCL/owner property and such materials shall be disposed off to the best advantage of BSCDCL/owner according to the instructions in writing issued by the Engineer-in-charge.

FURNISHED OFFICE ACCOMMODATION & MOBILITY COMMUNICATION TO BE ARRANGED BY CONTRACTOR

On acceptance of tender, the contractor at his own cost will construct a suitably equipped office at site with basic facilities such as telephone(s), fax, internet, photocopier, computer(s) and printer(s) along with operator(s), regular electric & drinking water supply and staff carrying vehicles for the supervisory staff with driver, fuel and maintenance etc. as per the requirement of the project. The contractor shall maintain the aforesaid facilities

intact/operational during the tenancy of the contract or maximum up to 6 months beyond the stipulated contractual completion date if the work is delayed due to any reasons. Operation and maintenance cost of all such materials, equipments / services shall be borne by the contractor.

The contractor shall also make sufficient arrangement for photography/video-graphy so that photographs video can be taken of any specific activity at any point of time. The contractor shall also make arrangement of software like MS Project etc. for the purpose of preparing progress report etc.

The contractor shall make all arrangements for ground breaking ceremony/inaugural function etc. for the project as required and the cost towards it deemed to be included in his rates/offer. Any expenditure already incurred/to be incurred by BSCDCL, shall be recovered from the contractor.

PROVIDING PLANTATION OF TREES AT PROJECT SITE AND MAINTENANCE OF THE SAME UPTO DEFECT LIABLITY PERIOD

The contractor at his own cost shall plant Trees including Ornamental of height not less than 05 ft. of different varieties as per decision of Engineer in charge within 03 months from the date of start of the Project. The contractor shall maintain the same in healthy condition upto defect liability period. Numbers of trees/plants are given below:

S.No.	Value of the project as per agreement (Rs. In crores)	Number of Trees / Plant of various categories
1.	Upto Rs.10 crore	25
2.	Above Rs.10 crore to 30 crore	50

Note: In case of change in layout/fouling with facilities/structure, the same may be replanted & their survival growth shall be ensured by the Contractor.

LABOUR LAWS

LABOUR LAWS TO BE COMPLIED BY THE CONTRACTOR

The contractor shall obtain a valid license under the contract labour (Regulation & Abolition) Act 1970 and the contract labour Act (Regulation & Abolition) Central Rules 1971 and amended from time to time, and continue to have a valid license until the completion of the work including defect liability period. The contractor shall also adhere by the provision of the child labour (Prohibition and Regulation) Act. 1986 and as amended from time to time.

The contractor shall also comply with the provisions of the building and other Construction Workers (Regulation of Employment & Conditions of Service) Act, 1996 and the building and other Construction Workers Welfare Cess Act, 1996.

Any failure to fulfil above requirement shall attract the penal provisions of this contract arising out the resultant for non execution of the work before the commencement of work. No labour below the age of 18 years shall be employed on the work.

Payment of wages:

The contractor shall pay to labour employed by him either directly or through subcontractors, wages not less than fair wages as defined in the BSCDCL Contractor"s Labour Regulations or as per the provisions of the Contract Labour (Regulation and Abolition) Act, 1970 and the contract Labour (Regulation and Abolition) Central Rules, 1971, wherever applicable.

The contractor shall, notwithstanding the provisions of any contract to the contrary, cause to be paid fair wage to labour indirectly engaged on the work, including any labour engaged by his sub-contractors in connection with the said work, as if the labour had been immediately employed by him.

In respect of all labour directly or indirectly employed in the works for performance of the contractor"s part of this contract, the contractor shall comply with or cause to be complied with the BSCDCL contractor"s Labour Regulations in regard to payment of wages, wage period, deductions from wages recovery of wages not paid and deductions unauthorisedly made,

maintenance of wage books or wage slips, publication of scale of wages and other terms of employment, inspection and submission of periodical returns and all other matters of the like nature or as per the provisions of the Contract Labour (Regulation and Abolition) Act, 1970, and the Contract Labour (Regulation and Abolition) Central Rules, 1971, wherever applicable.

(a) The Engineer-in-Charge concerned shall have the right to deduct from the moneys due to the contractor any sum required or estimated to be required for making good the loss suffered by a worker or workers by reason of non-fulfilment of the conditions of the contract for the benefit of the workers, non-payment of wages or of deductions made from his or their wages which are not justified by their terms of the contract or non- observance of the Regulations.

(b) Under the provision of Minimum Wages (Central) Rules, 1950, the contractor is bound to allow to the labours directly or indirectly employed in the works one day rest for 6 days continuous work and pay wages at the same rate as for duty. In the event of default, the Engineer-in-Charge shall have the right to deduct the sum or sums not paid on account of wages for weekly holidays to any labours and pay the same to the persons entitled thereto from any money due to the contractor by the Engineer-in- Charge concerned

The contractor shall comply with the provisions of the Payment of Wages Act, 1936, Minimum Wages Act, 1948, Employees Liability Act, 1938, Workmen"s Compensation Act, 1923, Industrial Disputes Act, 1947, Maternity Benefits Act, 1961, and the Contractor"s Labour (Regulation and Abolition) Act 1970, or the modifications thereof or any other laws relating thereto and the rules made there under from time to time.

The contractor shall indemnify and keep indemnified BSCDCL against payments to be made under and for the observance of the laws aforesaid and the BSCDCL Contractor"s Labour Regulations without prejudice to his right to claim indemnity from his sub-contractors.

The laws aforesaid shall be deemed to be a part of this contract and any breach thereof shall be deemed to be a breach of this contract.

LABOUR SAFETY PROVISION

The contractor shall be fully responsible to observe the labour safety provisions:

The contractor shall at his own cost take all precautions to ensure safety of life and property by providing necessary barriers, lights, watchmen etc. during the progress of work as directed by Engineer-in- charge

In case of all labour directly or indirectly employed in work for the performance on the contractor"s part of this contract, the contractor shall

comply with all rules framed by Govt. from time to time for the protection of health and sanitary arrangements for workers.

OBSERVANCE OF LABOUR LAWS

The contractor shall be fully responsible for observance of all labour laws applicable including local laws and other laws applicable in this matter and shall indemnify and keep indemnified BSCDCL against effect or non observance of any such laws. The contractor shall be liable to make payment to all its employees, workers and sub-contractors and make compliance with labour laws. If BSCDCL or the client/ owner is held liable as "Principal Employer" to pay

contributions etc. under legislation of Government or Court decision in respect of the employees of the contractor, then the contractor would reimburse the amount of such payments, contribution etc. to BSCDCL and/ or same shall be deducted from the payments, security deposit etc. of the contractor.

The Contractor shall submit proof of having valid EPF registration certificate. He shall within 7 days of the close of every month, submit to BSCDCL a statement showing the recoveries of contributions in respect of each employee employed by or through him and shall furnish to BSCDCL such information as the BSCDCL is required to furnish under the provisions of para 36 B of the EPF scheme 1952 to the EPF authorities and other information required by EPFO authorities from time to time. He shall also submit a copy of challan every month in token of proof of having deposited the subscription and contribution of workers engaged on the project.

In case, the contractor is not complying the above provision BSCDCL shall withhold payment to the extent of 4.70% (Four point Seven Zero percent) of the value of the Running Account bill and shall release only after the submission of above mentioned details. If it is incumbent upon BSCDCL to deposit withhold amount with EPF authorities, the withhold amount shall be deposited by BSCDCL with EPF authorities. In such a case BSCDCL shall not refund this withheld amount to the contractor even after the production of EPF registration certificate.

MINIMUM WAGES ACT

The contractor shall comply with all the provisions of the minimum wages Act, 1948, contract labour Act (Regulation & Abolition) 1970, and rules framed there under and other labour laws/local laws affecting contract labour that may be brought into force from time to time.

LABOUR CESS

The rates of the contractor shall be inclusive of labour cess. BSCDCL shall make a recovery @ 1% on account of labour cess from each RA bill of the contractor and labour cess so recovered/deducted shall be deposited with the Labour Board of the concerned state. In case the Labour Board is not established in the state, recovery made by BSCDCL on account of labour cess shall be retained under suspense account and will be deposited with the Labour Board at later date as & when the Labour Board is constituted in the state.

Every contractor, sub-contractor, affiliates, their legal assigns or heirs as the case may, shall be responsible for registration of every Building worker who has completed eighteen years of age but has not completed sixty years of age and who has been engaged in any Building or Other Construction Work for not less than Ninety Days during the preceding twelve months; with the Board / Funds as applicable under various sections of "THE BUILDINGS AND OTHER CONSTRUCTION WORKERS (REGULATION OF EMPLOYMENT AND CONDITIONS OF SERVICE) ACT, 1996 and THE BUILDING AND OTHER CONSTRUCTIONWORKERS" WELFARE CESS ACT, 1996.

The contractor shall also be responsible for maintaining register of beneficiaries i.e. the workers in such form as may be prescribed by the

competent authority & the same shall be kept open at all reasonable times for inspection of relevant authority and officials of client / BSCDCL.

The contractor shall be further responsible for maintaining such register & records; giving such particulars of Building workers employed by him, the work performed by them, the number of hours of work which shall constitute a normal working day, the wages paid to them, the receipts given by them and, such other particulars in such form as may be prescribed by the authority or BSCDCL.

In the event of contractor failing to comply with the above clause(s) in part or in full, BSCDCL, without prejudice to any other rights or remedy available under law or any other clause(s) of contract, shall be at absolute liberty to forfeit any sum or sums that are payable or could become payable on account of execution of contract work and decision of Engineer-in-charge shall be final & binding in this regard on the contractor.

RECOVERY OF COMPENSATION PAID TO WORKMEN

In every case in which by virtue of the provisions sub-section (1) of Section 12, of the Workmen"s Compensation Act, 1923, BSCDCL is obliged to pay compensation to a workman employed by the contractor, in execution of the works, BSCDCL will recover from the contractor, the amount of the compensation so paid; and, without prejudice to the rights of the BSCDCL under sub-section (2) of Section 12, of the said Act, BSCDCL shall be at liberty to recover such amount or any part thereof by deducting it from the security deposit or from any sum due to the contractor whether under this contract or otherwise. BSCDCL shall not be bound to contest any claim made against it under sub-section (1) of Section 12, of the said Act, except on the written request of the contractor and upon his giving to BSCDCL full security for all costs for which BSCDCL might become liable in consequence of contesting such claim.

ENSURING PAYMENT AND AMENITIES TO WORKERS IF CONTRACTOR FAILS

In every case in which by virtue of the provisions of the Contract Labour (Regulation and Abolition) Act, 1970, and of the Contract Labour (Regulation and Abolition) Central Rules, 1971, BSCDCL is obliged to pay any amounts of wages to a workman employed by the contractor in execution of the works, or to incur any expenditure in providing welfare and health amenities required to be provided under the above said Act or under the BSCDCL Contractor"s Labour Regulations, or under the Rules framed by Government from time to time for the protection of health and sanitary arrangements for workers employed by BSCDCL"s Contractors, BSCDCL will recover from the contractor, the amount of wages so paid or the amount of expenditure so incurred; and without prejudice to any other right or remedy available under this contract, BSCDCL shall be at liberty to recover such amount or any part thereof by deducting it from the security deposit or from any sum due by BSCDCL to the contractor whether under this contract or otherwise BSCDCL shall not be bound to contest any claim made against it under sub-section (1) of Section 20, sub-section (4) of Section 21, of the said Act, except on the written request of the contractor and upon his giving to the BSCDCL full security for all costs for which BSCDCL might become liable in contesting such claim.

CHANGE IN FIRM'S CONSTITUTION TO BE INTIMATED

Where the contractor is a partnership firm, the prior approval in writing of the Engineer-in-Charge shall be obtained before any change is made in the constitution of the firm. Where the contractor is an individual or a

Hindu undivided family business concern such approval as aforesaid shall likewise be obtained before the contractor enters into any partnership agreement where under the partnership firm would have the right to carry out the works hereby undertaken by the contractor. If prior approval as aforesaid is not obtained, the contract shall be deemed to have been assigned in contravention of Clause 65.0 hereof and the same action may be taken, and the same consequences shall ensue as provided in the said Clause 65.0.

INDEMNITY AGAINST PATENT RIGHTS

The contractor shall fully indemnify the BSCDCL from and against all claims and proceedings for or on account of any infringement of any patent rights, design, trademark or name or other protected rights in respect of any construction plant, machine, work or material used for in connection with the works or temporary works.

LAW COVERING THE CONTRACT

This contract shall be governed by the Indian laws for the time being in force.

LAWS, BYE-LAWS RELATING TO THE WORK

The contractor shall strictly adhere by the provisions, for the time being in force, of law relating to works or any regulations and bylaws made by any local authority or any water & lighting agencies or any undertakings within the limits of the jurisdiction of which the work is proposed to be executed. The contractor shall be bound to give to the authorities concerned such notices and take all approvals as may be provided in the law, regulations or bylaws as aforesaid, and to pay all fees and taxes payable to such authorities in respect thereof.

CONTRACT AGREEMENT

The Contractor shall enter into a Contract Agreement with the BSCDCL within10 (TEN) days from the date of Letter of Award or within such extended time, as may be granted by the BSCDCL failing which no payment shall be released to the contractor. The cost of stamp papers, stamp duty, registration, if applicable on the contract, shall be borne by the Contractor. In case, the contractor does not sign the agreement as above or start the work within 10 (Ten) days of the issue of letter of Award, his earnest money is liable to be forfeited and Letter of award consequently will stand withdrawn.

MANNER OF EXECUTION OF AGREEMENT

The agreement as per prescribed Performa as enclosed shall be signed at the office of the BSCDCL within 10(TEN days) days from the date of issue of Letter of Award. The Contractor shall provide for signing of the Contract, appropriate Power of Attorney and the requisite documents/ materials. Unless and until a formal contract is prepared and executed, the Letter of Award read in conjunction with the Tendering Documents will constitute a binding contract.

The agreement will be signed in five originals and the Contractor shall be provided with one signed original and the other four originals will be retained by the BSCDCL

The Contractor shall provide free of cost to the BSCDCL all the Engineering data, drawings and descriptive materials submitted along with the tender, in at least three (3) copies to form an integral part of the Agreement within seven 7 days after issuing of Letter of Award.

Subsequent to signing of the Agreement, the Contractor at his own cost shall provide to the BSCDCL with at least five (5) true hard bound copies of Agreement within thirty (30) days of its signing.

JURISDICTION

The agreement shall be executed at BHOPAL on non-judicial stamp paper purchased in BHOPAL and the courts in BHOPAL alone will have jurisdiction to deal with matters arising there from, to the exclusion of all other courts.

SECTION-4

LABOUR SAFETY, HEALTH & SANITARY RULES AND REGULATIONS INCLUDING FORMS

LABOUR SAFETY PROVISIONS

Suitable scaffolds should be provided for workmen for all works that cannot safely be done from the ground, or from solid construction except such short period work as can be done safely from ladders. When a ladder is used an extra mazdoor shall be engaged for holding the ladder and if the ladder is used for carrying materials as well, suitable footholds and hand holds shall be provided on the ladder and the ladder shall be given an inclination not steeper than ¼ to 1 (1/4 horizontal and 1 vertical).

Scaffolding or staging more than 3.6m (12 feet) above the ground or floor, swung or suspended from an overhead support or erected with stationery support shall have a guard rail properly attached or bolted, braced and otherwise secured at least 90 cm. (3 feet) high above the floor or platform of such scaffolding or staging and extending along the entire length of the outside and ends thereof with only such opening as may be necessary for the delivery of materials. Such scaffolding or staging shall be so fastened as to prevent it from swaying from the building or structure.

Working platforms, gangways, and stairways should be so constructed that they should not sag unduly or unequally, and if the height of the platform or the gangway or the stairway is more that 3.6m (12 feet) above ground level or floor level, they should be closely boarded, should have adequate width & should be suitable fastened as described in (2.0) above.

Every opening in the floor of a building or in a working platform shall be provided with suitable means to prevent the fall of persons or materials by providing suitable fencing or railing whose minimum height shall be 90 cm (3 feet).

Safe means of access shall be provided to all working platforms and other working places. Every ladder shall be securely fixed. No portable single ladder shall be over 9m. (30 feet) in length while the width between side rails in rung ladder shall in no case be less than 29 cm. (11.5”) for ladder up to and including 3m (10 feet) in length. For longer ladders this width should be increased at least 1/4" for each additional 30 cm (1 ft.) of length. Uniform step spacing shall not exceed 30 cm (12"). Adequate precautions shall be taken to prevent danger from electrical equipment. No materials on any of the sites of the work shall be so stacked or placed as to cause danger or inconvenience to any person or the public. The contractor shall provide all necessary fencing and lights to protect the public from accident, and shall be bound to bear the expenses of defense of every suit, action or other proceeding at law that may be brought by any person for injury sustained owing to neglect of the above precautions and to pay any damages and cost which may be awarded in any such suit, action or proceedings to any such person or which may, with the consent of the Contractor, be paid to compensate any claim by any such person.

EXCAVATION AND TRENCHING

All trenches, 1.2mts.(four feet) or more in depth, shall at all times be supplied with at least one ladder for each 30m.(100 feet) in length or fraction thereof, ladder shall be extended from bottom of the trench to at least 90cm (3feet) above the surface of the ground. The side of the trenches, which are 1.5 m. (5feet) or more in depth shall be stepped back to give suitable slope or securely held by timber bracing, so as to avoid the danger or sides to collapsing. The excavated materials shall not be placed within 1.5m (5 feet) of the edges of the trench or half of the depth of the trench whichever is more.
Cutting shall be done from top to bottom. Under no circumstances undermining or undercutting shall be done.

Demolition - Before any demolition work is commenced and also during the progress of the work following precautions shall be observed:

All roads and open areas adjacent to the work site shall either be closed or suitably protected.

No electric cable or apparatus which is likely to be a source of danger or a cable or apparatus used by the operator shall remain electrically charged.

All practical steps shall be taken to prevent danger to persons employed from risk or fire or explosion or flooding. No floor, roof or other part of the building shall be overloaded with debris or materials as to render it unsafe.

All necessary personal safety equipments as considered adequate by the Engineer-in-charge should be kept available for the use of persons employed on the site and maintained in a condition suitable for immediate use, and the contractor should take adequate step to ensure proper use of equipment by those concerned. The following safety equipment shall be invariably provided.

Workers employed on mixing asphaltic materials, cement and lime mortars shall be provided with protective footwear and protective goggles.

Those engaged in white washing and mixing or stacking of cement bags or any materials which are injurious to the eye shall be provided with protective goggles.

Those engaged in welding works shall be provided with welders protective eye Shields.

Stone breakers shall be provided with protective goggles and protective clothing and seated at sufficiently safe interval.

When workers are employed for works in sewers and manholes, which are in active use, the Contractors shall ensure that the manhole covers are opened
and ventilated at-least for an hour before the workers are allowed to get into the manholes, and the manholes so opened shall be cordoned off with suitable railing and provided with warning signals or boards to prevent accident the public. In addition, the contractor shall ensure that the following safety measures are adhered to:
Entry for workers into the sewer line shall not be allowed except under supervision of the JE or any other higher officer.

At least 5 to 6 manholes upstream and downstream should be kept open for at least 2 to 3 hours before any man is allowed to enter into the manholes for working inside.

Before entry, presence of Toxic gases should be tested by inserting wet lead acetate paper which changes color in the presence of such gases and gives indication of their presence.
Presence of Oxygen should be verified by lowering a detector lamp into the manhole. In case, no Oxygen is found inside the sewer line, workers should be sent only with Oxygen kit.

Safety belt with rope should be provided to the workers. While working inside the manholes such rope should be handled by two men standing outside to enable him to be pulled out during emergency.

The area should be barricaded or cordoned off by suitable means to avoid mishaps of any kind. Proper warning signs should be displayed for the safety of the public whenever cleaning works are undertaken during night or day.
No smoking or open flames shall be allowed near the blocked manhole being cleaned.

The malba obtained on account of cleaning of blocked manholes and sewer lines should be immediately removed to avoid accidents on account of slippery nature of the malba.

Workers should not be allowed to work inside the manhole continuously. He should be given rest intermittently. The Engineer-In-charge may decide the time up to which a worker may be allowed to work continuously inside the manhole.

Gas masks with Oxygen Cylinder should be kept at site for use in emergency.

Air-blowers should be used for flow of fresh air through the manholes. Whenever called for, portable air-blowers are recommended for ventilating the manholes. The Motors for these shall be vapour proof and of totally enclosed type. Non sparking gas engines also could be used but they should be placed at-least 2 metres away from the opening and on the leeward side protected from wind so that they will not be a source of friction on any inflammable gas that might be present.

The workers engaged for cleaning the manholes / sewers should be properly trained before allowing to work in the manhole.

The workers shall be provided with Gumboots or non sparking shoes, bump helmets and gloves non sparking tools, safety lights and gas masks and portable air blowers (when necessary). They must be supplied with barrier cream for anointing the limbs before working inside the sewer lines.

Workmen descending a manhole shall try each ladder step or rung carefully before putting his full weight on it to guard against insecure fastening due to corrosion of the rung fixed to manhole well.

If a man has received a physical injury, he should be brought out of the sewer immediately and adequate medical aid should be provided to him.

The extent to which these precautions are to be taken depend on individual situation but the decision of the Engineer-In-charge regarding the steps to be taken in this regard in an individual case will be final.

The Contractor shall not employ men and women below the age of 18 years on the work of painting with products containing lead in any form wherever men above the age of 18 are employed on the work of lead painting the following precautions should be taken.

1. No paint containing lead or lead products shall be used except in the form of paste or readymade paint.
2. Suitable face masks should be supplied for use by the workers when paint is applied in the form of spray or a surface having lead paint is dry rubbed and scrapped.
3. Overalls shall be supplied by the Contractor to the workmen and adequate facilities shall be provided to enable the working painters to wash during the cessation of work.
4. White lead, sulphate or lead work products containing those pigments shall not be used in painting operation except in the form of paste or of paints ready for use.
   Measures shall be taken whenever required in order to prevent danger arising from the application of paint in the form of spray.

   Measures shall be taken, whenever practicable to prevent danger arising out of dust caused by dry rubbing down and scrapping.

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

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

Cases of lead poisoning and of suspected lead poisoning shall be notified and shall be subsequently verified by a medical man appointed by the competent authorities of BSCDCL.

The BSCDCL may require when necessary a medical examination of workers.

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

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

Use of hoisting machines and tackle including their attachment encourage and supports shall conform to the following standard of conditions.
These shall be of good mechanical construction, sound material and adequate strength and free from patent, defects and shall be kept in good working order.

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

Every crane driver or hoisting appliance operator shall be properly qualified and no person under the age of 21 years should be in-charge of any hoisting machine including any scaffolding, winch or giving signals to operator.
In case of every hoisting machine and of every chain ring hook, shackle swivel and pulley block used in hoisting or as means of suspension the safe
working load shall be ascertained by adequate means. Every hoisting machine and all gear referred to above shall be plainly marked with the safe working load. In case of a hoisting machine having a variable safe working load, each safe working load and the conditions under which it is applicable shall be clearly indicated. No part of any machine or any gear referred to above in this clause shall be loaded beyond the safe working load except for the purpose of testing.

In case of BSCDCL machines, the safe working load shall be notified by the Engineer-in-Charge. As regards Contractor"s machines the Contractor shall notify the safe working load of the machine to the Engineer-in-charge whenever he brings any machinery to site of work and get verified by the Engineer-in-Charge.

Motors gearing, transmission electric wiring and other dangerous parts of hoisting appliances should be provided with efficient safeguard. Hoisting appliances should be provided with such means as will reduce to the minimum the risk of accidental descent of the load. Adequate precautions should be taken to reduce the minimum the risk of any part of a suspended load becoming accidentally displaced. When workers are employed on electrical installations, which are already energized, insulating mats, wearing apparel, such as gloves sleeves and boots as may be necessary be provided. The worker should not wear any rings, watches and carry keys or other materials, which are good conductors of electricity.

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

These safety provisions should be brought to the notice of all concerned by display on a notice board at a prominent place of work spot. The person responsible for compliance of the safety codes shall be named therein by the contractor.

To ensure effective enforcement of the rules and regulations relating to safety precautions the arrangements made by the Contractor shall be open to inspection by BSCDCL Official or their representatives.

Notwithstanding the above Clauses from (i) to (xiv) there is nothing in these to exempt the contractor from the operations of any other Act or Rule in force in the Republic of India.

SECTION-5

FORMS AND FORMATS

Appendix - 'N'

FORM XXV

DETAILS OF THE BALANCE WORK IN HAND AS ON_____
(UPTO THE PRECEDING MONTH OF SUBMISSION OF BID) WITH BSCDCL

(To be submitted in Envelop-1)

S. No	Name of the Unit/Zone/SBG/RGB	Contract Value	Date of start as per LOI/ Contract	Date of completion as per LOI /Contract	Work done up to the preceding month of submission of bid	Balance value of work

Note: The bidder shall also include the value of all such works which are awarded to bidder but yet not started up to the preceding month of submission of bid.

Appendix - 'O'

FORM XXVI

AFFIDAVIT

(To be submitted by bidder on non-judicial stamp paper of Rs. 100/- (Rupees Hundred only) duly attached by Notary Public)

(To be submitted in Envelop-1)

Affidavit of Mr. .....S/o .....
R/o .....

I, the deponent above named do hereby solemnly affirm and declare as under:

That I am the Proprietor/Authorized signatory of M/s …….
Having its Head Office/Regd. Office at ……..

That the information/documents/Experience certificates submitted by M/s……. along with the tender for …… *(NAME OF WORK)*……
To BSCDCL Ltd. are genuine and true and nothing has been concealed.

I shall have no objection in case BSCDCL verifies them from issuing authority(ies). I shall also have no objection in providing the original copy of the document(s), in case BSCDCL demand so for verification.

I hereby confirm that in case, any document, information & / or certificate submitted by me found to be incorrect / false / fabricated, BSCDCL at its discretion may disqualify / reject / terminate the bid/contract and also forfeit the EMD / All dues.

I shall have no objection in case BSCDCL verifies any or all Bank Guarantee(s) under any of the clause(s) of Contract including those issued towards EMD and Performance Guarantee from the Zonal Branch /office issuing Bank and I/We shall have no right or claim on my submitted EMD before BSCDCL receives said verification.

That the Bank Guarantee issued against the EMD issued by (name and address of the Bank) is genuine and if found at any stage to be incorrect / false / fabricated, BSCDCL shall reject my bid, cancel pre-qualification and debar me from participating in any future tender for three years.

I, ..., the Proprietor / Authorised signatory of M/s..... do hereby confirm that the contents of the above Affidavit are true to my knowledge and nothing has been concealed there from..... and that no part of it is false.

Verified at ..... this..... day of .....

DEPONENT

ATTESTED BY (NOTARY PUBLIC)

APLICATION FOR EXTENSION OF TIME

(To be completed by the Contractor)

P A R T –I

Name of Contractor

Name of the work as given in the Agreement

Agreement No.

Estimated amount put to tender

Date of commencement work as per agreement

Period allowed for completion of work as per agreement

Date of completion stipulated as per agreement

Period for which extension of time has been give previously

Extension granted

First extension vide Engineer-in-charge letter No… ……date	Months	Days
2nd extension vide Engineer-in-charge letter No…… date	Months	Days
3rd extension vide Engineer-in-charge letter No……. date	Months	Days
4th extension vide engineer-in-charge letter No……. date	Months	Days

Total extension previously given

Reasons for which extension have been previously given (copies of the previous application should be attached)

Period for which extension is applied for:

Hindrances on account of which extension is applied for with dates on which hindrances occurred, and the period for which these are likely to last.

Serial No.

Nature of hindrance

Date of Occurrence

Period for which it is likely to last

Period for which extension required for this particular hindrance.

Over lapping period, if any, with reference to item

Net extension applied for

Remarks, if any

Total period for which extension is now applied for on account of hindrances mentioned above ……. Month/ days.

Extension of time required for extra work.

Details of extra work and on the amount involved:

Total value of extra work

Proportionate period of extension of time based on estimated amount put to tender on account of extra work.

Total extension of time required for 11 & 12

Submitted to the Engineer-in-Charges office.

SIGNATURE OF CONTRACTOR

DATE

APPLICATION FOR EXTENSION OF TIME

(PART – II)

Date of receipt of application from Contractor for the work in the Engineer-in-charge office.

Acknowledgement issued by Engineer-in-charge vide his letter No.dated

Engineer-in-charge remarks regarding hindrances mentioned by the Contractor.

Serial No.

Nature of hindrance

Date of occurrence of hindrance

Period for which hindrance, is likely to last

Extension of time period applied for by the contractor

Over lapping period, if any, giving reference to items which over lap

Net period for which extension is recommended.

Remarks as to why the hindrance occurred and justification for extension recommended.

Engineer-in-charge recommendations.

The present progress of the work should be stated and whether the work is likely to be completed by the date up to which extension has been applied for. If extension of time is not recommended, what compensation is proposed to be levied under the agreement.

SIGNATURTE OF ENGINEER-IN-CHARGE

PROFORMA FOR EXTENSION OF TIME

P A R T –III

To

NAME

ADDRESS OF THE CONTRACTOR

SUBJECT:

Dear Sir(s)

Reference your letter No _____ dated _____ , in connection with the grant of extension of time for completion of the work…..

The date of completion for the above mentioned work, is …… as stipulated in the agreement, dated ……

Extension of time for completion of the above mentioned work is granted upto_____, without prejudice to the right of the BSCDCL to recover compensation for delay in accordance with the provision made in Clause of the said agreement dated the ___/ ___ / ___. It is also clearly understood that the BSCDCL shall not consider any revision in contract price or any other compensation whatsoever due to grant of this extension.

Provided that notwithstanding the extension hereby granted, time is and shall still continue to be the essence of the said agreement.

Yours faithfully,

FOR Bhopal Smart City Development Corporation Ltd.

PROFORMA OF BANK GUARANTEE
IN LIEU OF E M D (TENDER BOND)

(Judicial Stamp paper of appropriate value as per stamp Act-of respective state)

Bhopal Smart City Development Corporation Ltd.
Near Natraj Petrol Pump, Sector A, Berkheda,
Bhopal, Madhya Pradesh 462023

In consideration of Bhopal Smart City Development Corporation Limited, having its Registered Office at , Near Natraj Petrol Pump Sector A, Berkheda (hereinafter called "BSCDCL" which expression shall unless repugnant to the subject or context include its successors and assigns) having issued Notice Inviting Tender No..... and M/s..... having its Registered Head Office at..... (hereinafter called the "TENDERER") is to participate in the said tender for..... Whereas BSCDCL, as a special case, has agreed to accept an irrevocable and unconditional Tender Bond Guarantee for an amount of Rs..... valid upto..... from the tenderer in lieu of Cash Deposit of Rs..... required to be made by the tenderer, as a condition precedent for participation in the said tender. We the .....(hereinafter called the "BANK") having its Registered, Office at..... and branch office at..... do hereby unconditionally and irrevocably undertake to pay immediately on demand in writing and without demur/protest any amount but not exceeding Rs ..... Any such demand made by BSCDCL shall be conclusive and binding on us irrespective of any dispute or differences that may be raised by the tenderer. Any change in the constitution of the tenderer or the Bank shall not discharge our liability under the guarantee.

We, the..... Bank, lastly undertake not to revoke this guarantee during its currency without the prior consent of BSCDCL in writing and this guarantee shall remain valid upto..... Unless a claim is made within three months from the date of expiry i.e. ..... (three months after the date of expiry), we shall be relieved of our liability under this guarantee thereafter.

FOR AND ON BEHALF OF BANK

PLACE :

DATED :

WITNESS.

1.

2

PROFORMA OF BANK GUARANTEE (PERFORMANCE)

(Judicial Stamp paper of appropriate value as per stamp Act-of respective state)
Bhopal Smart City Development Corporation Ltd.
Near Natraj Petrol Pump, Sector A, Berkheda,
Bhopal, Madhya Pradesh 462023

Whereas the Bhopal Smart City Development Corporation Limited, having its Registered Office at BSCDCL Near Natraj Petrol Pump Sector A, Berkheda, Bhopal (hereinafter called "BSCDCL" which expression shall include its successors and assigns) having awarded a work order/contract / supply order No. dated (hereinafter called the contract) to M/s. .... (hereinafter called the contractor / supplier) at a total price of Rs..... subject to the terms and conditions contained in the contract.

WHEREAS, the terms and conditions of the contract require the contractor to furnish a bank guarantee for Rs..... (Rupees.....) being ..... % of the total value of the contract for proper execution and due fulfillment of the terms and conditions contained in the contract.

We, the Bank, (hereinafter called the "Bank") do hereby unconditionally and irrevocably undertake to pay to BSCDCL immediately on demand in writing and without protest/or demur all moneys payable by the contractor/supplier to BSCDCL in connection with the execution/supply of and performance of the works/equipment, inclusive of any loss, damages, charges, expenses and costs caused to or suffered by or which would be caused to or suffered by BSCDCL by reason of any breach by the contractor/supplier of any of the terms and conditions contained in the contract as specified in the notice of demand made by BSCDCL to the bank. Any such demand made by BSCDCL on the bank shall be conclusive evidence of the amount due and payable by the bank under this guarantee. However, the Bank's liability under this guarantee, shall be limited to Rs..... in the aggregate and the bank hereby agrees to the following terms and conditions:-

(i) This guarantee shall be a continuing guarantee and irrevocable for all claims of BSCDCL as specified above and shall be valid during the period specified for the performance of the contract including the period of maintenance/warranty i.e. up to.....

(ii) We, the said bank further agree with BSCDCL that BSCDCL shall have the fullest liberty without our consent and without affecting in any manner our obligations and liabilities hereunder to vary any of the terms and conditions of the said contract or to extend time for performance of contract by the contractor from time to time or to postpone for any time or from time to time any of the powers exercisable by BSCDCL against the contractor/supplier under the contract and forbear or enforce any of the terms and conditions relating to the said contract and we shall not be relieved from our liability by reason of any such variations or extension being granted to the contractor or for any act or omission on the part of BSCDCL or any indulgence by BSCDCL forbearance, to the contractor or by any such matter or thing whatsoever, which under the law relating to the sureties would, but for this provision, have effect of so

relieving us.

This guarantee/undertaking shall be in addition to any other guarantee or security whatsoever BSCDCL may now or at any time have in relation to the performance of the works/equipment and the company shall have full re-course to or enforce this security in performance to any other security or guarantee which the BSCDCL may have or obtained and there shall be no forbearance on the part of the company in enforcing or requiring enforcement of any other security which shall have the effect of releasing the Bank from its full liability. It shall not be necessary for BSCDCL to proceed against the said contractor/supplier before proceeding against the Bank.

This guarantee/ undertaking shall not be determined or affected by the liquidation or winding up, dissolution or change of constitution or insolvency of the supplier/ contractor, but shall in all respects and for all purposes be binding and operative until payment of all moneys payable to BSCDCL in terms thereof are paid by the Bank.

The Bank hereby waives all rights at any time inconsistent with the terms of this Guarantee and the obligations of the bank in terms hereof, shall not be otherwise effected or suspended by reasons of any dispute or disputes having been raised by the supplier/contractor (whether or not pending before any Arbitrator, Tribunal or Court) or any denial of liability by the supplier/contractor stopping or preventing or purporting to stop or prevent any payment by the Bank to BSCDCL in terms hereof.

We, the said Bank, lastly undertake not to revoke this guarantee during its currency except with the previous consent of BSCDCL in writing. Unless a claim is made in writing within three months from the date of expiry of this guarantee i.e..... (three months after the date of expiry) we shall be relieved from all liabilities under this guarantee thereafter.

Signed this ..... day of ..... at…….

For and on behalf of Bank

WITNESS. 1._____

2._____

PROFORMA OF BANK GUARANTEE
(FOR MOBILIZATION ADVANCE)

(Judicial Stamp paper of appropriate value as per stamp Act-of respective state)

Bhopal Smart City Development Corporation Limited,
Near Natraj Petrol Pump, Sector A, Berkheda,
Bhopal, Madhya Pradesh 462023

1.0 In consideration of the Bhopal Smart City Development Corporation Limited, having its Registered Office at BSCDCL, Near Natraj Petrol Pump, Sector A, Berkheda,Bhopal (hereinafter called "BSCDCL" which expression shall unless repugnant to the subject or context include his successor and assigns) having agreed under the terms and conditions of Contract No..... dated..... made between..... BSCDCL in connection with..... (hereinafter called "the said contract") to make at the request of the Contractor a Mobilization Advance of Rs..... for utilizing it for the purpose of the Contract on his furnishing a guarantee acceptable to BSCDCL, we Ltd., (hereinafter referred to the "the said Bank") and having our registered office at..... do hereby guarantee the due recovery by BSCDCL of the said advance as provided according to the terms and conditions of the Contract. We..... do hereby undertake to pay the amount due and payable under this Guarantee without any demur, merely on a demand from BSCDCL stating that the amount claimed is due to BSCDCL under the said Agreement. Any such demand made on the..... shall be conclusive as regards the amount due and payable by the..... under this guarantee and..... agree that the liability of the ..... to pay BSCDCL the

amount so demanded shall be absolute and unconditional notwithstanding any dispute or disputes raised by the Contractor and notwithstanding any legal proceeding pending in any court or Tribunal relating thereto. However, our liability under this Guarantee shall be restricted to an amount not exceeding Rs.....

We ……. Bank further agree that BSCDCL shall be the sole judge of and as to whether the amount claimed has fallen due to BSCDCL under the said agreement or whether the said Contractor has not utilized the said advance or any part thereof for the purpose of the Contract and the extent of loss or damage caused to or suffered by BSCDCL on account of the said advance together with interest not being recovered in full and the decision of BSCDCL that the amount has fallen due from contractor or the said Contractor has not utilized the said advance or any part thereto for the purpose of the contract and as to the amount or amounts of loss or damage caused to or suffered by BSCDCL shall be final and binding on us.

We, the said Bank, further agree that the Guarantee herein contained shall remain in full force and effect till the said advance has been fully recovered and its claims satisfied or discharged and till BSCDCL certify that the said advance has been fully recovered from the said Contractor, and accordingly discharges this Guarantee subject, however, that BSCDCL shall have no claims under this Guarantee after the said advance has been fully recovered, unless a notice of the claims under this Guarantee has been served on the Bank before the expiry of the said Bank Guarantee in which case the same shall be enforceable against the Bank.

BSCDCL shall have the fullest liberty without affecting in any way the liability of the Bank under this Guarantee or indemnity from time to time to vary any of the terms and conditions of the said Contract or the advance or to extend time of performance by the said Contractor or to postpone for any time and from time to time of the powers exercisable by it against the said Contractor and either to enforce or forbear from enforcing any of terms and conditions governing to BSCDCL an the said Contract or the advance or securities available the said Bank shall not be released from its liability under these presents by any exercise by BSCDCL of the liberty with reference to the matters aforesaid or by reasons of time being given to the said Contractor or any other forbearance, act or omission on the part of or any indulgence by BSCDCL

BSCDCL to the said Contractor or of any other matter or thing whatsoever which under the law relating to sureties would but for this provision have the effect of so releasing the bank from its such liability.

5.0 It shall not be necessary for BSCDCL to proceed against the Contractor before proceeding against the Bank and the Guarantee herein contained shall be enforceable against the Bank notwithstanding any security which BSCDCL may have obtained or obtain from the Contractor or shall at the time when proceedings are taken against the Bank hereunder be outstanding or unrealized.

We, the said Bank, lastly undertake not to revoke this Guarantee during its currency except with the previous consent of BSCDCL in writing and agree that any change in the constitution of the said Contractor or the said Bank shall not discharge our liability hereunder.

Dated this .....day of.....

For and on behalf of Bank

(NAME AND DESIGNATION)

Dated:

PROFORMA OF BANK GUARANTEE

(IN LIEU OF SECURITY DEPOSIT)

(Judicial Stamp paper of appropriate value as per stamp Act-of respective state)

Bhopal Smart City Development Corporation Ltd.,
Near Natraj Petrol Pump, Sector A, Berkheda,Bhopal

In consideration of the Bhopal Smart City Development Corporation Ltd., having its Registered Office at Near Natraj Petrol Pump Sector A, Berkheda(hereinafter called "BSCDCL") which expression shall include its successors and assigns having awarded to M/s..... (hereinafter called "the Supplier/Contractor") which expression shall wherever the subject or context so permits includes its successors and assigns) a Contract in terms inter-alia of BSCDCL's letter NO..... dated..... and the Contract/Purchase Conditions of BSCD
CL and upon the condition of the Supplier/Contractor furnishing Security for the performance of the Supplier's obligations and /or discharge of the contractor's/supplier's liability under and/or in connection with the said supply contract upto a sum of Rs..... (Rupees..... only)

We,..... ((hereinafter called "The Bank") which expression shall include its successors and assigns) hereby undertake and guarantee payment to BSCDCL forthwith on the same day on demand in writing and without protest or demur of any and all moneys payable by the supplier/contractor to BSCDCL under, in respect or in connection with the said contract inclusive of all the losses, damages, costs, charges and expenses and other moneys payable in respect of the above as specified in any notice of demand made by BSCDCL to the Bank with reference to this guarantee upto
and aggregate limit of Rs…....(Rupees.....only) and the bank hereby agree with BSCDCL that:

This Guarantee shall be continuing guarantee and shall …… remain valid and irrevocable for all claims of BSCDCL and liabilities of Supplier/Contractor arising upto and until midnight of.....

This Guarantee shall be in addition to any other Guarantee or Security whatsoever that BSCDCL now or at any time have in relation to the Supplier's obligations/liabilities under and/or in connection with the said supply/contract, and BSCDCL shall have full authority to take recourse or to enforce this Security in preference to any other Guarantee or Security which BSCDCL may have or obtain and no forbearance on the part of BSCDCL in enforcing or requiring enforcement of any other Security shall have the effect of releasing the Bank from its liability hereunder.

BSCDCL shall be at liberty without reference to the Bank and without affecting the full liability of the Bank hereunder to take any other security in respect of the Supplier's/Contractor's obligations and/ or liabilities under or in connection with the said supply/contract or to grant time and / or indulgence to the supplier / contractor or to increase or otherwise vary the prices or the total contract value or to release or to forbear from enforcement of all or any of the conditions under the said supply / contract and / or the remedies of BSCDCL under any other security/securities now or hereafter held by BSCDCL and no such dealings, increase(s) or other indulgence(s) or arrangement(s) with the supplier / contractor or releasing or forbearance whatsoever shall have the effect of releasing the Bank from its full liability to BSCDCL hereunder or prejudicing rights of BSCDCL against the Bank. This Guarantee shall not be determined or affected by the liquidation or winding up, dissolution or change of constitution or insolvency of the supplier / contractor but shall in all respects and for all purposes be binding and operative until payment of all moneys payable to BSCDCL in terms thereof.

5. The Bank hereby waives all rights at any time inconsistent with the terms of this Guarantee and the obligations of the Bank in terms hereof shall not be otherwise affected or suspended by reason of any dispute or disputes having been raised by the supplier / contractor (whether or not pending before any Arbitrator, Tribunal or Court) or any denial or liability by the supplier/

contractor stopping/ preventing or purporting to stop or prevent any payment by the Bank to BSCDCL in terms thereof.

The amount stated in any notice of demand addressed by BSCDCL to the Guarantor as liable to be paid to BSCDCL by the supplier/contractor or as suffered or incurred by BSCDCL on account of any losses or damages, costs, charges and / and BSCDCL be conclusive of the or the expenses shall as between the Bank amount so liable to be paid to BSCDCL or suffered or incurred by BSCDCL as the case may be to BSCDCL in terms hereof subject to a maximum and payable by the Guarantor of Rs .....(Rupees ..... only),

Unless demand or claim under this Guarantee is made on the Guarantor in writing within three months form the date of expiry of the Guarantee i.e upto ..... the Guarantor shall be discharged from all liabilities under this Guarantee there under.

Notwithstanding anything contained herein before our liability under this guarantee is restricted to Rs . ..... (Rupees .....only). This guarantee will expire on..... Any claim under this Guarantee must be received by us within three months from the date of expiry i.e. ..... (date, three months after the expiry date) and if no such claim has been received by us by that date all your rights under this guarantee will cease.

For and on behalf of the Bank

Place Date

WITNESS:

1. 2.

PROFORMA OF BANK GUARANTEE

(FOR MOBILIZATION ADVANCE WITH INTEREST BEARING)

(Judicial Stamp per Stamp Act - paper of appropriate value as respective state)

Bhopal Smart City Development Corporation Limited,Bhopal, Pin- 462023

In consideration of the Bhopal Smart City Development Corporation Limited., having its Registered Office at Bhopal -462023 (hereinafter called "BSCDCL" which expression shall unless repugnant to the subject: or context Include his successor and assigns) having agreed under the terms and conditions of Contract No. dated made between (name of the contractor) and BSCDCL in connection with (name of work) (hereinafter called "the said contract") to make at the request of the Contractor a Mobilization Advance of Rs. _____ carrying interest @ … % p.a. for utilizing it for the purpose of the Contract on his furnishing a guarantee acceptable to BSCDCL, we the Bank (hereinafter referred to the "the said Bank") and having our registered office at do hereby guarantee the due recovery by BSCDCL of the said advance alongwith interest as provided according to the terms and conditions of the contract. We ...

do hereby undertake to pay the amount due and payable under this Guarantee without any demur, merely, on a demand from BSCDCL stating that the amount claimed is due to BSCDCL under the said Agreement. Any such demand made on the said bank shall be conclusive as regards the amount due and payable by the said contractor under this guarantee and agree that the liability of the said bank to pay BSCDCL the amount so demanded shall be absolute and unconditional notwithstanding any dispute or disputes raised by the Contractor and notwithstanding any legal proceeding pending in any court or Tribunal relating thereto. However, our liability under this Guarantee shall be restricted to an amount not exceeding Rs … inclusive of interest @ …….% p.a.

We the said bank further agree that BSCDCL shall be the sole judge of and as to whether the amount claimed has fallen due to BSCDCL under the said agreement or whether the said Contractor has not utilized the said advance or any part thereof for the purpose of the Contract and the extent of loss or damage caused to or suffered by BSCDCL on account of the said advance together with interest not being recovered in full and the decision of BSCDCL that the amount has fallen due from' contractor or the said Contractor has not utilized the said advance or any part thereto for the purpose of the contract and as to the amount or amounts of loss or damage caused to or suffered by BSCDCL shall be final and binding on us.

We, the said Bank, further agree that the Guarantee herein contained shall remain in full force and effect till the said advance has been fully recovered and its claims satisfied or discharged and till BSCDCL certify Contractor, and accordingly discharges this Guarantee subject, however, that BSCDCL shall have no claims under this Guarantee unless a notice of the claims under this Guarantee has been served on the Bank before the expiry of the said Bank Guarantee in which case the same shall be enforceable against the Bank.

BSCDCL shall have the fullest liberty without affecting in any way the liability of the Bank under this Guarantee or indemnity from time to time to vary any of the terms and conditions of the said Contract or the advance or to extend time of performance by the said Contractor or to postpone for any time and from time to time of the powers exercisable by it against the said Contractor and either to enforce or forbear from enforcing any of terms and conditions governing the said Contract or the advance or securities available to BSCDCL and the said Bank shall not be released from its liability under these presents by any exercise by BSCDCL of the liberty with reference to the matters aforesaid or by reasons of time being given to the said Contractor or any other forbearance, act or omission on the part of BSCDCL or any indulgence by BSCDCL to the said Contractor or of any other matter or thing whatsoever which under the law relating to sureties would but for this provision have the effect of so releasing the bank from its such liability. It shall not be necessary for BSCDCL to proceed against the Contractor before proceeding against the Bank and Guarantee herein contained shall be enforceable against the Bank notwithstanding any security which BSCDCL may have obtained or obtain from the Contractor or shall at the time when proceedings are taken against the Bank hereunder be outstanding or unrealized.

We, the said Bank, lastly undertake not to revoke this Guarantee during its currency except with the previous consent of BSCDCL in writing and agree that any change in the constitution of the said Contractor or the said Bank shall not discharge our liability hereunder.

Dated this…..…… day of…….....

Place:

Date:

Witness:

1.

FORM FOR GUARANTEE BOND
FOR ANTI-TERMITE TREATMENT

THIS AGREEMENT made this____ day of Two thousand _____ between M/s_____ (hereinafter called the guarantor of the one part and M/s Bhopal Smart City Development Corporation Limited, hereinafter called the BSCDCL hereinafter called the OWNER of the other part.

Whereas this agreement is supplementary to the contract hereinafter called the contract dated_____ made between the guarantor of the one part and National Buildings Construction Corporation Ltd., of the other part whereby the contractor inter-alia, understood to render the buildings and structures in the said contract recited, completed, termite proof. And whereas the guarantor agreed to give a guarantee to the effect that the said structure will remain termite proof for TEN YEARS to be so reckoned from the date after the maintenance period prescribed in the contract expires.

During this period of guarantee the guarantor shall make good all defects and for that matter shall replace at his risk and cost such wooden member as may be damaged by termite and in case of any other defect being found, he shall render the building termite proof at his cost to the satisfaction of the Engineer-in-charge and shall commence the works of such rectification within seven days from date of issuing notice from the Engineer-in-Charge calling upon him to rectify the defects falling which the work shall be got done by BSCDCL/ OWNER by some other contractor at the guarantor's cost and risk and in the later case the decision of the Engineer-in-charge as to the cost recoverable from the guarantor shall be final and binding.

That if the Guarantor fails to execute the Anti-Termite treatment or commits breaches hereunder then the Guarantor will indemnify BSCDCL against all losses damages, cost expenses or otherwise which may be incurred by him by reasons of any default on the part of the guarantor in performance and observance of this supplemental Agreement. As to the amount of loss and or damage and/or cost incurred by BSCDCL/ OWNER decision of the Engineer-in-charge will be final and binding on the parties.

In witness where of these presents have been executed by the Guarantor_____ and by_____ for and on behalf of BSCDCL on the day of month and year first above written.

Signed sealed and delivered by (Guarantor)

IN THE PRESENCE OF: 1.

2.

Signed for and on behalf of BSCDCL by/ in presence of:

1.
2.

GUARANTEE TO BE EXECUTED BY CONTRACTOR FOR REMOVAL OF DEFECTS AFTER COMPLETION IN RESPECT OF WATER PROOFING WORKS

The agreement made this …….. day of …….. Two thousand One and …….. between …… (hereinafter called Guarantor of the one part) and the BSCDCL (hereinafter called the Execution Agency of the other part).

WHEREAS this agreement is supplementary to a contract(hereinafter called the Contract), dated …… and made between the GUARANTOR OF THE ONE part and the BSCDCL of the other part, whereby the Contractor, inter-alia, undertook to render the buildings and structures in the said contract recited completely water and leak proof.

AND WHEREAS the Guarantor agreed to give a guarantee to the effect that the said structures will remain water and leak proof for ten years from the date of handing over o the structure of water proofing treatment.

NOW THE GUARANTOR hereby guarantees that water proofing treatment given by him will render the structures completely leak proof and the minimum life of such water proofing treatment shall be ten years to be reckoned from the date after the maintenance period prescribed in the contract.

Provided that the Guarantor will not be responsible for leakage caused by earthquake or structural defects or misuse of roof or alteration and for such purpose.

Misuse of roof shall mean any operation, which will damage proofing treatment, like chopping of fire wood and things of the same nature which might cause damage to the roof.

Alternation shall mean construction of an additional storey or a part of the roof or construction adjoining to existing roof whereby proofing treatment is removed in parts

The decision of the Engineer-in-Charge with regard to cause of leakage shall be final

During this period of guarantee, the Guarantor shall make good all defects and in case of any defect being found render the building water proof to the satisfaction of the Engineer-in-Charge at his cost and shall commence the work for such rectification within seven days from the date of issue of notice from the Engineer-in-Charge calling upon him to rectify the defects failing which the work shall be got done by the BSCDCL by some other Contractor at the guarantor"s cost and risk. The decision of Engineer-in-Charge as to the cost, payable by the Guarantor shall be final and binding.

That if the Guarantor fails to execute the water proofing or commits breach there-under, then the Guarantor will indemnify the principal and his successors against all laws damage, cost, expense or otherwise which may be incurred by him by reason of any default on the part of the GUARANTOR in performance and observance of this supplementary agreement. As to the amount of loss and / or damage and/ or cost incurred by the BSCDCL, the decision of the Engineer-in-Charge will final and binding on the parties.

IN WITNESS WHEREOF these presents have been executed by the Obligator,,,,….. and by ……. And for and on behalf of the BSCDCL on the day, month and year first above written.

Signed, sealed and delivered by Obligator in the presence of-

1.

2.

Signed for and on behalf of the BSCDCL by _____

In presence of:

1.

2.

PROFORMA OF
INDENTURE FOR SECURED ADVANCE OR CREDIT

THIS INDENTURE made this day of _____ Between _____
(hereinafter called the contractor) which expression shall where the Context as admits or implies be deemed to include his executor/administrators and assign of the one part and National Buildings Construction Corporation Ltd., having its Registered Office at BSCDCL, Bhopal (hereinafter called the Engineer) which expression shall where the context so admits or implies be deemed to include its successors and assign of the other part.

Whereas by an agreement dated (hereinafter called the said agreement). The Contractor has agreed to construct.....

And whereas the Contractor has applied to the Engineer that he may be or be given credited for materials brought by him to the site of the work subject to the said agreement for use in construction of the work.

NOW THIS INDENTURE WITNESSETH that in pursuance of the said agreement and in consideration of the sum of Rs._____ (Rupees _____ only) paid to the contractor by the Engineer. The receipt where the Contractor hereby acknowledges and of such advance or credited (if any) as may be made to him as aforesaid the Contractor hereby covenants and agrees with The Engineer and declares as follows:

That all sums given as advance or credit by The Engineer to the Contractor as aforesaid shall be employed by the Constructor in or toward the execution of the said works and for no other purpose whatsoever.

That the material for which the advance or credit is given are offered to and accepted by The Engineer as security and are absolutely the Contractor's own property and free from encumbrances of any kind the Contractor will not make any application for or receives further advance or credit on the security or material which are not absolutely his own property and free from encumbrances of any kind and the Contractor shall indemnify The Engineer against any claims to any material in respect of which advance or credit has been made to him as aforesaid.

That the said material and all other material on the security of which any further advance or advances or credit may be given as aforesaid (hereinafter called the said materials) shall be used by the Contractor s solely in the execution of the said works in accordance with the direction of the Engineer and in terms of said agreement.

That the Contractor shall make at his own cost all necessary and adequate arrangement for the proper safe custody and protection against all risks of the said material and that until used in the construction as aforesaid the material shall remain at the site of the said works in Contractor's custody and on his responsibility and shall at all times be open to inspection by The Engineer. In the events of the materials or any part thereof being stolen, destroyed or damaged or becoming deteriorated in greater degree than in due to reasonable use and wear thereof the Contractor will replace the same with other materials of like quality of repair and make good the same as required by The Engineer.

That said material shall not on any account be removed from the site of work expect with the written permission of The Engineer.

That the advance shall be repayable in full when or before Contractor receives payment from The Engineer of the price payable to him for the said work under the term and provisions of the said agreement. Provided that if any intermediate payments are made to the Contractor on account of work done then on the occasion of each payment The Engineer will be at liberty to make a recovery from the Contractor's bill from such payments by deducting there from the value of the said materials than actually used in the contraction and in respect of which recovery has not been made previously. The value of this purpose being determined in respect of each description of materials at the rates at which the amounts of the advance as made under these presents was calculated.

That if the Contractor shall at any time make at any default in the performance of observance in respect of any of the terms and provisions of the said agreement or of that provisions the total amount of the advance or advances that may still be owing to The Engineer, shall immediately on the happening of such default be repayable by the Contractor to The Engineer together with interest thereon at 12% p.a. from the date of respective dated to such advance or advances to the date of payment and with all costs. Damages and expenses incurred by The Engineer in or for recovery hereof or the Contractor hereby covenants and agrees with The Engineer to repay and pay the same respective to him accordingly.

That the Contractor hereby charges all the said materials with the repayment to The Engineer of all sums advances or credit as aforesaid and all costs. Charges, damages and expenses payable under these presents PROVIDED ALWAYS it is hereby agreed and declared that notwithstanding anything in the said agreement and without prejudice to the powers contained therein if and wherever the covenant for payment and repayment herein before contained shall be become enforceable and the money owing shall not be paid in accordance therewith. The Engineer may at any time thereafter adopt all or any of the following courses he may deem best:

Seize the utilize the said material or any part thereof in the completion of the said works in accordance with the provision in that behalf contained in the said agreement debating the Contractor with the actual cost of effecting such completion and the amount due in respect of advance or credit under these presents and crediting the Contractor with value of work done as if he has carried it out in accordance with the said agreement and the rates thereby provided if the balance is against the Contractor is to pay the same to the engineer on demand.

Remove and sell by public action the seized materials or any part thereof and out of the money arising from the sale repay the engineer under these presents and pay over the surplus (if any) to the Contractor.

Deduct all or any part of the moneys owing from any sums due to the contractor under said agreement.

Expect in the event of such default on the part of contractor as aforesaid, interest or the said advance shall not be payable.

That in the event of conflict between the provisions of these presents and the said agreements, the provision of these presents shall prevail and in the event of any dispute or difference arising over the construction or effect of these presents, the settlement of which has not been hereinbefore expressly provided for the same shall so far as is lawful be subject to jurisdiction of BHOPAL courts only.

IN WITNESS whereof the said the engineer and the contractor hereunto set their respective hands and seals the day year first above written.

Signed Sealed and delivered by

Contractor The Engineers

AGREEMENT FORM

This agreement made this day of (Month) (Year), between the **Bhopal Smart City Development Corporation Limited (BSCDCL),** a company incorporated under the Companies Act, 1956 having its Registered Office at BSCDCL, Bhopal 462023 (hereinafter referred to as the "BSCDCL" which expression shall include its administrators, successors, executors and assigns) of the one part and **M/s (NAME OF CONTRACTOR)** (hereinafter referred to as the „Contractor" which expression shall unless the context requires otherwise include its administrators, successors, executors and permitted assigns) of the other part.

WHEREAS, BSCDCL, has desirous of construction of **(NAME OF WORK)** (hereinafter referred to as the "PROJECT") on behalf of the **(NAME OF OWNER/MINISTRY)** (hereinafter referred to as "OWNER"), had invited tenders as per Tender documents vide NIT No. _____.

AND WHEREAS **(NAME OF CONTRACTOR)** had participated in the above referred tender vide their tender dated _____ and BSCDCL has accepted their aforesaid tender and award the contract for (NAME OF PROJECT) on the terms and conditions contained in its Letter of Intent No. _____ and the documents referred to therein, which have been unequivocally accepted by **(NAME OF CONTRACTOR)** vide their acceptance letter dated _____ resulting into a contract.

NOW THEREFORE THIS DEED WITNESSETH AS UNDER:

ARTICLE 1.0 – AWARD OF CONTRACT

SCOPE OF WORK

BSCDCL has awarded the contract to **(NAME OF CONTRACTOR)** for the work of **(NAME OF WORK)** on the terms and conditions in its letter of intent No.
_____ dated _____ and the documents referred to therein. The award has taken effect from **(DATE)** i.e. the date of issue of aforesaid letter of intent. The terms and expressions used in this agreement shall have the same meanings as are assigned to them in the "Contract Documents" referred to in the succeeding Article.

ARTICLE 2.0 – CONTRACT DOCUMENTS

The contract shall be performed strictly as per the terms and conditions stipulated herein and in the following documents attached herewith (hereinafter referred to as "Contract Documents"). BSCDCL Notice Inviting Tender vide No. _____ date _____and BSCDCL"s tender documents consisting of:

General Conditions of Contract (GCC) alongwith amendments/errata to GCC (if any) issued (Volume-I).

Special Conditions of Contract including Appendices & Annexures, Volume-II.

Bill of Quantities alongwith amendments/corrigendum of schedule items, if any (Volume-II)

_____

_____

(NAME OF CONTRACTOR) letter proposal dated _____ and their subsequent communication:
Letter of Acceptance of Tender Conditions dated _____

_____

_____

BSCDCL"s detailed Letter of Intent No. _____ dated _____ including Bill of Quantities. Agreed time schedule, Contractor"s Organization Chart and list of Plant and Equipment"s submitted by Contractor.

All the aforesaid contract documents referred to in Para 2.1 and 2.2 above shall form an integral part of this Agreement, in so far as the same or any part thereof column, to the tender documents and what has been specifically agreed to by BSCDCL in its Letter of Intent. Any matter inconsistent therewith, contrary or repugnant thereto or deviations taken by the Contractor in its "TENDER" but not agreed to specifically by BSCDCL in its Letter of Intent, shall be deemed to have been withdrawn by the Contractor without any cost implication to BSCDCL. For the sake of brevity, this Agreement along with its aforesaid contract documents and Letter of Intent shall be referred to as the "Contract".

ARTICLE 3.0 – CONDITIONS & CONVENANTS

The scope of Contract, Consideration, terms of payments, advance, security deposits, taxes wherever applicable, insurance, agreed time schedule, compensation for delay and all other terms and conditions contained in BSCDCL"s Letter of Intent No. _____ dated _____ are to be read in conjunction with other aforesaid contract documents. The contract shall be duly performed by the contractor strictly and faithfully in accordance with the terms of this contract.

The scope of work shall also include all such items which are not specifically mentioned in the Contract Documents but which are reasonably implied for the satisfactory completion of the entire scope of work envisaged under this contract unless otherwise specifically excluded from the scope of work in the Letter of Intent.

Contractor shall adhere to all requirements stipulated in the Contract documents.

Time is the essence of the Contract and it shall be strictly adhered to. The progress of work shall conform to agreed works schedule/contract documents and Letter of Intent.

This agreement constitutes full and complete understanding between the parties and terms of the presents. It shall supersede all prior correspondence to the extent of inconsistency or repugnancy to the terms and conditions contained in Agreement. Any modification of the Agreement shall be effected only by a written instrument signed by the authorized representative of both the parties.

The total contract price for the entire scope of this contract as detailed in Letter of Intent is Rs. _____ (Rupees _____ only), which shall be governed by the stipulations of the contract documents.

ARTICLE 4.0 – NO WAIVER OF RIGHTS

Neither the inspection by BSCDCL or the Engineer-in-Charge or Owner or any of their officials, employees or agents nor order by BSCDCL or the Engineer-in-Charge for payment of money or any payment for or acceptance of, the whole or any part of the work by BSCDCL or the Engineer-in-Charge nor any extension of time nor any possession taken by the Engineer-in-Charge shall operate as waiver of any provisions of the contract, or of any power herein reserved to BSCDCL, or any right to damage herein provided, nor shall any waiver of any breach in the contract be held to be a waiver or any other or subsequent breach.

ARTICLE 5.0 – GOVERNING LAW AND JURISDICTION

The Laws applicable to this contract shall be the laws in force in India and jurisdiction of BHOPAL Court (s) only.

Notice of Default

Notice of default given by either party to the other party under the Agreement shall be in writing and shall be deemed to have been duly and properly served upon the parties hereto, if delivered against acknowledgment due or by FAX or by registered mail duly addressed to the signatories at the address mentioned herein above.

IN WITNESS WHEREOF, the parties through their duly authorized representatives have executed these presents (execution whereof has been approved by the Competent Authorities of both the parties) on the day, month and year first above mentioned at BHOPAL.

For and on behalf of:	For and on behalf of:
(NAME OF CONTRACTOR)	(M/s Bhopal Smart City Development Corporation)
WITNESS:	WITNESS:
1.	1.

SECTION-6

SPECIAL CONDITION OF CONTRACT

SPECIAL CONDITIONS OF CONTRACT (SCC)

GENERAL-

1. The following special conditions shall be read in conjunction with General conditions of contract. If there are any provisions in these Special Conditions, which are at variance with the provisions of General Conditions of Contract, the provisions in the Special Conditions shall take precedence.

2. Where any portion of Special Conditions of Contract is repugnant to or at variance with any provision of the instructions to Tenderer and General Conditions of Contract and / or the other documents forming part of the contract then unless a different intention appears the provision of the Special Conditions of Contract shall be deemed to override the provisions of the general conditions of contract and / or the other documents forming part of the contract only to the extent such repugnant/various in the special conditions of contract as are not possible of being reconciled with the provisions in the special conditions of contract as are not possible of being reconciled with the provision with instructions to Tenderer or General Conditions of contract and / or the other documents from part of the contract.

3. Structural Drawings shall be prepared by bidder and the same shall got weighted by any reputed institute like MANIT or any other institute.

4. Working drawing shall be according to the drawing given in the Tender document.

5. Items mentioned in the BOQ may vary or any changes is needed then it should bring to the attention of BSCDCL.

6. Working drawings are given by BSCDCL in tender document; if any deviations found and correction required then it should be brought to BSCDCL for rectification.

7. The items which are missing or not defined in the given BOQ in this Tender Document, then the contractor has to submit the items for approval to BSCDCL.

8. The contractor has to submit sample of the items defined in BOQ the same to be approved by BSCDCL, before use.

9. Internal wiring work should be done as per UADD/MPPWD/CPWD/MPPWD specifications.

10. Quote should be in percentage higher or below on the SOR Rates the same is to quoted in the form of decimal only. For example if contractor wants to quote 5 percent higher then he have to quote 1.05 and if he wants to quote 5 [percent below he have to quote 0.95 in given column of financial bid sheet.

11. Applications from Joint venture and Consortium members are not allowed however they can be permitted to engage a approved agency to carryout electrical works after approval of BSCDCL as per below mentioned conditions.

a. The applicant in such case shall submit consent letter of the Associates along with their credentials for Electrical works.. However, the name(s) of the associates(s) once nominated and accepted by BSCDCL, cannot be changed afterwards without written approval of BSCDCL. Credentials of associates(s) for work experience duly supported with clients' completion certificate(s) starting reference to order, the value of completed work, date of start of work, date of completion of work, duly self-attested in respect of Electrical shall be submitted along with application itself for pre-qualification.

b. Similar Nature of the job for electrical work providing underground HT cables / Substation work(RMU,PSS) / street lighting work value of at least three works, each of Rs.108 lakhs or two works, each of Rs.135 lakhs or one work of Rs.216 lakhs in single contract and should possess valid electrical license and registered in MPMKVV Co. Ltd. Bhopal.

SECTION-7

TECHNICAL SPECIFICATIONS

Technical Specifications

1. The works in General shall be carried out as per latest UADD/MPPWD/CPWD Specifications, BHOPAL (updated with corrections slips issued upto last date of submission of tender) unless otherwise specified in the nomenclature of the individual item or in the particular specifications of concerned items of works.

2. For items not covered under UADD/MPPWD/CPWD specifications with correction slips or those specifications are not given in the technical specifications appended or not incorporated in the nomenclature of the individual item, the work shall be done as per latest relevant BIS Codes of Practice or as per approval of Engineer-in-charge of BSCDCL.

3. All the works shall be executed as per the approved drawings / designs. The patterns shown in the tender drawings can be modified as per the site requirements by the Engineer-in-charge and nothing extra whatsoever shall be payable over and above the quoted rates.

4. Material should be of the best approved quality obtainable and they shall comply to the respective Indian Standard Specifications.

5. Samples of all materials shall be got approved before placing order and the approved sample shall be deposited with the Client/Engineer In-Charge.

6. It shall be obligatory for the Contractor to furnish Certificate, if demanded by the Client/Engineer In- Charge from manufacturer or the material supplier that the work has been carried out by using their material and as per their recommendations.

7. All materials supplied by the Client/Engineer In-Charge any other specialized firms shall be properly stored and the contractor shall be responsible for its safe custody until they are required on the works and till the completion of work.

SITE CLEARANCE

Before the earth work is started, the area coming under cutting and filling shall be cleared of shrubs, rank vegetation, grass, brushwood, trees and saplings of girth up to 30cm measured at a height of one metre above ground level and rubbish removed up to a distance of 50 metres outside the periphery of the area under clearance. The roots of trees and saplings shall be removed to a depth of 60cm below ground level or 30 cm below formation level or 15 cm below sub grade level, whichever is lower, and the holes or hollows filled up with the earth, rammed and leveled.

The trees of girth above 30 cm measured at a height of one metre above ground shall be cut only after permission of the Engineer-in-Charge is obtained in writing. The roots of trees shall also be removed as specified in 2.4.1. payment for cutting such trees and removing the roots shall be made separately.

Existing structures and services such as old buildings, culverts, fencing, water supply pipe lines, sewers, power cables, communication cables, drainage pipes etc. within or adjacent to the area if required to be diverted/removed, shall be diverted/dismantled as per directions of the Engineer-in-Charge and payment for such diversion/dismantling works shall be made separately.

EXCAVATION FOR FOUNDATIONS

Notes:

1 The excavations shall conform to the lines & levels show n in the draw ings and as directed by the Engineer-in-Charge. The contractor shall not excavate outside the limits of excavation. Any excess depth/width, excavated beyond the specified levels/dimensions on the draw ing shall be made good at the cost of the contractor w ith the concrete as specified for the foundation.

2 Rate includes dressing the pits and excavated materials after dumping as directed by Engineer-in-Charge.

3 **CLASSIFICATION OF EXCAVATED MATERIALS**

a) ***Soil :*** This shall comprise top soil, turf, sand, clay, mud, peat, black cotton soil, shale, moorum, copra admixture of these and similar material w hich yields to the ordinary application of pick spade and/or shovel, rake or other ordinary digging equipment. Removal of gravel or any other nodular material having dimensions in any one direction not exceeding 300mm occuring in such soil shall be deemed to be covered under this category. Macadam surfaces such as water bound macadam and bitumen/tar bound, soling of roads, paths etc. in all depths/thicknesses shall be classified as soils.

b) ***Ordinary Rock :*** Laterites, shales and conglomerates, varieties of lime stone and sand stone etc., cement/lime concrete, stone masonry and brick w ork in cement/lime mortar below ground level, reinforced cement concrete and boulders having maximum dimension in any direction of more than 300mm., loose or embedded in soil, may or may not be requiring blasting are classified as ordinary rocks.

c) ***Hard Rock (Requiring Blasting) :*** This shall comprise Granites, Basalt and similar rocks for the excavation of which the use of mechanical plant and or blasting is required.

d) ***Excavation in Rocks, where blasting is prohibited :*** Hard rock requiring blasting but where blasting is prohibited for any reason and excavation has to be carried out by chiseling, wedging or any other agreed method.

4 BLASTING OPERATIONS

Blasting shall be carried out in a manner that completes the excavation to the lines and levels as indicated in the drawings with the least disturbance to adjacent material. It shall be done only with the written permission of the Engineer-in-Charge. All statutory law s, regulations, rules etc. pertaining to the acquisition, transport, storage, handling and use of explosives shall be strictly followed. The contractor may adopt any method or methods of blasting consistent with the safety and job requirements. Prior to starting any phase of the operation, the contractor shall provide information describing pertinent blasting procedures, dimensions and notes. The magazine for storage of explosives shall be limited to the designs and specifications of the explosive department concerned and located at the approved site. No unauthorized person shall be admitted in to the magazine, which when not in use, shall be kept security locked. No matches or inflammable material shall be allowed in the magazine. Materials, tools, plants, equipments and personnel, deputed on blasting operation, should be approved by Engineer-in-Charge.

5 Extra rates for excavation for under water or in foul condition w ill be payable only for excavation below sub soil water level.

6 Lift is to be calculated on the height of C.G. of lifted materials above C.G. of borrow pit. In measuring lifts no notice w ill be taken of lifts less than 0.5 M.

7 In measuring lead, distance less than 25 meters will be ignored and 25 meters or above

shall taken as 50 meters and part thereof.

8 Surface dressing comprises training the uneven surface of ground to uniform surface (either horizontal or slopping) by scraping off high patches and filling in low patches with the scraped soil. The Maximum depth of cutting or filling not exceeding 15cm.

9 Dry vegetation earth sand gravel, stone, deserts or brickwork, concrete, masonry etc. obtained from the excavation shall be property of Govt. of M.P. The rates of excavation include the separation of serviceable and unserviceable materials and depositing the serviceable ones in regular heaps.

10 Shoring in wells, foundations and trenches will not be payable without obtaining prior approval of concern Superintending Engineer.

11 **Rates:**

Rates of all items in this chapter are inclusive of the expenses of all labor, materials, T & P and all incidental and other charges required completing the item of work in full and also including hire & running expenses of all machineries required for the work, including stacking of excavated materials as directed w here ever required.

12 **Antiquities:**

Any ancient carvings, relics of antiquity, coins or other curiosities w hich may be discovered or excavated, are the property of the Government and are to be delivered to the Engineer-in-Charge.

MORTARS

NOTES :

1 **Cement:** Cement to be used in the works shall be any of the following types with the prior approval of the Engineer-in-charge :

a) Ordinary portland cement, 33 Grade conforming to IS : 269.
b) Ordinary portland cement, 43 Grade conforming to IS : 8112.
c) Ordinary portland cement, 53 Grade conforming to IS : 12269.
d) Sulphate resistant portland cement conforming to IS : 12330.

2 **Sand:** Sand to be used in the work, shall conform to IS: 1542-1960 for plaster and IS: 2166-1965 for masonry work.

3 **Cement Mortar:** Cement and sand shall be mixed in specified proportions given in the agreement/drawings. All mortars shall be mixed with a minimum quantity of water to produce desired workability consistent with maximum density of mortar. The mix shall be clean and free from injurious type of soil/acid/alkali/organic matter or deleterious substances.

4 **Water :** Water used for mixing and curring shall be clean and free from injurious amount of oils, acids, alkalis, salts, sugar, organic or other substances. Potable water is generally considered satisfactory for preparing mortars.

5 The mixing shall preferably be done in a mechanical mixer operated manually or by power. Hand mixing can be resorted to as long as uniform density of the mix and its strength are assured subject to prior approval of the Engineer-in-Charge. Hand mixing operation, if permitted, shall be carried out on a clean water tight platform where cement and sand shall be first mixed dry in the required proportion by being turned over and over, backwards and forwards several times till the mixture is of uniform colour. Thereafter, minimum quantity of water shall be added to bring the mortar to the consistency of stiff paste. The mortar shall be mixed for at least two minutes after addition of water.

Mortar shall be mixed only in such quantity as required for immediate use. The mix which has developed initial set, shall not be used. Intial set of mortar with O.P.C. shall normally be considered to have taken place in 30 minutes after mixing. If the mortar has stiffened during initial setting time because of evaporation of water, same can be

re-tempered by adding water as frequently as needed to restore requisite consistency but this retempering shall not be permitted after 30 minutes. Mortar, unused for more than 30 minutes, shall be rejected and removed from site.

PLAIN CEMENT CONCRETE

Notes:

1 **Cement:** Cement to be used in the works shall be any of the following types with the prior approval of the Engineer-in-charge :

a) Ordinary portland cement, 33 Grade conforming to IS : 269.
b) Ordinary portland cement, 43 Grade conforming to IS : 8112.
c) Ordinary portland cement, 53 Grade conforming to IS : 12269.
d) Sulphate resistant portland cement conforming to IS : 12330.

2 **Aggregates:** aggregate shall consist of clean, hard, strong, dense, non-porous and durable pieces of crushed stone. They shall not consist pieces of disintegrated stones, soft, flaky, elongated particles, salt, alkali, vegetable matter or other deleterious materils. All aggregate shall conform to IS: 383 and tests for conformity shall be carried out as per IS : 2386 parts I to VIII.

The maximum value of flakiness Index for aggregate shall not exceed 35 percent. The aggregate shall satisfy the following requirements of grading:

Grading Requirements of Aggregate

IS Sieve	Percentage by weight passing the sieve		
	40 mm	20 mm	12.5 mm
63 mm	100	-	-
40 mm	95-100	100	-
20 mm	30-70	95-100	100
12.5 mm	-	-	90-100
10 mm	10-35	25-55	40-85
4.75 mm	0-5	0-10	0-10

Sand/Fine Aggregates :

Sand to be used for lime or cement concrete should be dry and free from all deleterious materials, and shall conform to IS: 383-2007 & fine aggregates shall not contain dust, lumps, soft or flaky materials, mica or other deleterious materials. Fine aggregates having positive alkali-silica reaction shall not be used. All fine aggregate shall conform to IS : 383. The fineness modulus of fine aggregate shall neither be less than 2.0 nor greater than 3.5.

4 **Water :** Water used for mixing and curing shall be clean and free from injurious amounts of oils, acids, alkalis, salts, sugar, organic materials or other substances that may be deleterious to concrete. Potable water is generally considered satisfactory for mixing and curing of concrete.

5 **Concrete:** Concrete shall be mixed either in a concrete mixer or in a batching and mixing plant. Hand mixing is prohibited. Mixing shall be continued till materials are uniformly distributed and a uniform colour of the entire mass is obtained and each individual particle of the aggregate shows complete coating of mortar, containing its proportionate amount of cement. In no case, mixing shall be done for less than 2 minutes.

Concrete shall be transported and placed as near as practicable to its final position. Concrete shall not be freely dropped into place from a height exceeding 1.50 metres and it shall be compacted in its final position within 30 minutes of its discharge from the mixer. It shall be compacted thoroughly by vibration or other means during placing so as to produce a dense homogeneous void-free mass having the required surface finish. Bottom and side surfaces shall give a uniform texture, smooth surface and good appearance. Non uniform texture and rough surface of concrete shall be treated as defective work and it has to be remedied with 1:3 cement plaster but in no case, more than 5% of area be permitted to be made good with plastering, Concrete having rough, non uniform texture and honey combing in more than 5% area shall be rejected and the payment for the formwork shall also be not made.

6 Formwork shall include all temporary or permanent forms required for forming the concrete of the shape, dimensions and surface finish as shown on the drawings together with all props, staging, centering, scaffolding and temporary construction required for their support.

7 All materials shall conform to the specifications issued by the Indian Standards Institution. Materials and components used for formwork shall be examined for damage or excessive deterioration before use/reuse and shall be used only if found suitable after necessary repairs. In case of timber form work, the inspection shall not only cover physical damages but also signs of attacks by decay, rot or insect attack or the development of splits.

8 Form shall be constructed with metal or timber. The metal used for forms shall be of such thickness that the forms remain true to shape. All bolts should be counter sunk.

9 The contractor shall furnish the design and drawing of complete formwork (i.e. the forms as well as their supports) for approval of the Engineer-in-Charge before any erection is taken up. Not withstanding any approval or review of drawing and design by the Engineer-in-Charge, the contractor shall be entirely responsible for the adequacy and safety of form work.

10 The formwork shall be robust and strong and joints shall be leakproof. Staging must have cross bracings and diagonal bracings in both direction and the number of joints in the form work shall be kept to a minimum by using large size panels.

11 Rates in this chapter are for the finished work including the cost of all materials, labour, tools and plant required for design, construction and removal of formwork including properly supporting the members until the concrete is cured, set and hardened as required and also inclusive of lining with material approved by the Engineer-in-Charge so as to provide a smooth finish of uniform texture, appearance and to produce a finished concrete true to shape, line, levels and dimension as shown on the drawings. The material used shall leave no stain on the concrete and so fixed to its backing as not to impart any blemishes. The rate also includes coating of formwork with an approved release agent that will effectively prevent sticking and will not stain the concrete surface. Lubricating (machine oils) are prohibited for use as a coating.

12 The rate includes provision of gradient in formwork for terrace roof as per direction of Engineer-in-Charge and the gradient shall be provided necessarily so that water is drained out quickly and effectively.

13 Rates also include all leads and lifts of all materials etc. required for the work.

REINFORCED CEMENT CONCRETE

NOTES:

1 Cement: Cement to be used in the works shall be any of the following types with the prior approval of the Engineer-in-charge:

a) Ordinary portland cement, 33 Grade conforming to IS : 269.
b) Ordinary portland cement, 43 Grade conforming to IS : 8112.
c) Ordinary portland cement, 53 Grade conforming to IS : 12269.
d) Sulphate resistant portland cement, conforming to IS : 12330.

2 Steel: Steel to be used shall conform to IS: 1786. All steel shall be procured from original producers; no re-rolled steel shall be incorporated in the work. Only new steel shall be delivered to the site. Every bar shall be inspected before asssembling on the work and defective, brittle or burnt bar shall be discarded. Cracked ends of bars shall be discarded.

3 Aggregates: aggregate shall consist of clean, hard, strong, dense, non-porous and durable pieces of crushed stone. They shall not consist pieces of disintegrated stones, soft, flaky, elongated particles, salt, alkali, vegetable matter or other deleterious materials. All aggregate shall conform to IS: 383 and tests for conformity shall be carried out as per IS: 2386 parts I to VIII. The maximum value of flakiness Index for aggregate shall not exceed 35 percent. The aggregate shall satisfy the following requirements of grading:

Grading Requirements of Aggregate

IS Sieve	Percentage by weight passing the sieve		
	40 mm	20 mm	12.5 mm
63 mm	100	-	-
40 mm	95-100	100	-
20 mm	30-70	95-100	100
12.5 mm	-	-	90-100
10 mm	10-35	25-55	40-85
4.75 mm	0-5	0-10	0-10

4 Sand/Fine Aggregates: Fine aggregates shall not contain dust, lumps, soft or flaky materials, mica or other deleterious materials. Fine aggregates, having positive alkali-silica reaction, shall not be used.
All fine aggregates shall conform to IS : 383. The fineness modulus of fine aggregate shall neither be less than 2.0 nor greater than 3.5.

5 **Water:** Water used for mixing and curing shall be clean and free from injurious amount of oils, acids, alkalis, salts, sugar, organic materials or other substances that may be deleterious to concrete. Potable water is generally considered satisfactory for mixing and curing of concrete.

6 **Concrete:** Concrete shall be mixed either in a concrete mixer or in a batching and mixing plant. Hand mixing is prohibited. Mixing shall be continued till materials are uniformly distributed and a uniform colour of the entire mass is obtained and each individual particle of the aggregate shows complete coating of mortar, containing its proportionate amount of cement. In no case, mixing shall be done for less than 2 minutes.

Concrete shall be transported and placed as near as practicable to its final position. Concrete shall not be freely dropped into place from a height exceeding 1.50metres and it shall be compacted in its final position within 30 minutes of its discharge from the mixer. It shall be compacted thoroughly by vibration or other means during placing so as to produce a dense homogeneous void-free mass having the required surface finish. Bottom and side surfaces shall give a uniform texture, smooth surface and good appearance. Non uniform texture and rough surface of concrete shall be treated as defective work and it has to be remedied with 1:3 cement plaster.

7 Item for Ready mixed concrete has also been included in this chapter in view of changing technology.

BRICK WORK

THE GHOL BRICKS SHALL BE OF 1st GRADE QUALITY (ALLAHABAD BRICKS)

Notes :

1 This work shall consist of construction of structures with bricks jointed together by cement mortar in accordance with the details show n on the drawings or as approved by the Engineer in charge

2 Burnt clay bricks shall conform to the requirements of IS:1077. They shall be free from cracks and flaws and nodules of free lime. The brick shall have smooth rectangular faces with sharp corners and emit a clear ringing sound w hen struck.

3 Cement mortar for the work shall be as per details given in Chapter III of this SOR.

4 All bricks shall be thoroughly soaked in a tank filled w ith w ater for a minimum period of one hour prior to being laid. Soaked bricks shall be removed from the tank sufficiently in advance so that they are skin dry at the time of actual laying. Such soaked bricks shall be stacked on a clean place where they are not contaminated w ith dirt, earth, etc.

5 The thickness of joints shall not exceed 10mm. All joints on exposed faces shall be tooled to give concave finish.

6 The brick work shall be built in uniform layers, and for this purpose wooden straight edge with graduations indicating thickness of each course including joint shall be used. Corners and other advanced work shall be raked back. Brickw ork shall be done true to plumb or in specified batter. All courses shall be laid truly horizontal and vertical joints shall be truly vertical. Vertical joints in alternate courses shall come directly one over the other. During construction, no part of work shall rise more than one metre above the general construction level, to avoid unequal settlement and improper jointing. Where this is not possible in the opinion of the Engineer in charge, the works shall be raked back according to the bond (and not toothed) at an angle not steeper than 45 degrees with prior approval of the Engineer in charge. Toothing may also be permitted where future extension is contemplated.

7 Where fresh masonry is to join w ith masonry that is partially/entirely set, the exposed jointing surface of the set masonry shall be cleaned, roughened and wetted, so as to effect the best possible bond with the new work. All loose bricks and mortar or other material shall be removed. In the case of vertical or inclined joints, it shall be further ensured that proper bond between the old and new masonry is obtained by interlocking the bricks. Any portion of the brickwork that has been completed shall remain undisturbed until thoroughly set.

8 Green work shall be protected from rain by suitable covering and shall be kept constantly moist on all faces for a minimum period of seven days. Brick work carried out during the day shall be suitably marked indicating the date on which the work is done so as to keep a watch on the curing period. Watering may be done carefully so as not to disturb or wash out the green mortar.

During hot weather, all finished or partly completed w ork shall be covered or wetted in such a manner as w ill prevent rapid drying of the brickw ork.

During the period of curing of brick w ork, it shall be suitably protected from all damages. At the close of day's work or for other period of cessation, w atering and curing shall have to be maintained. Should the mortar perish i.e. become dry, w hite or powdery through neglect of curing, work shall be pulled dow n and rebuilt as directed by the Engineer in charge. If any stains, appear during w atering, the same shall be removed from the face.

The scaffolding shall be sound, strong and safe to w ithstand all loads likely to come upon it. Putlog holes are not allowed.

9 Bricks having crushing strength of more than 40kg/cm2. shall be used for load bearing walls.

10 Classification of Bricks and Masonry:-

In this schedule the following three classifications of bricks and masonry is given and shall have the minimum crushing strength w hen tested according to IS: 1077-1992

(a) Class 40 TM chimney brick/grog or ghol brick: - For this item either selected chimney burnt bricks or ghol bricks are used and superior workmanship than the following varieties is required. The crushing strength w hen thoroughly soaked in water shall not be less than 40kg/sq.cm.

(b) Class 25 TM chimney brick masonry: - The crushing strength w hen thoroughly soaked in water shall not be less than 25 kg/sq.cm.

(c) Class 25TM open bhatta or pajaw a burnt brick :- As is clear the only difference between (b) and (c) varies in the method of burning bricks. The crushing strength when thoroughly soaked in w ater shall not be less than 25 kg/sq.cm.

11 Periodical sampling and testing of bricks shall be carried out at contractors cost to classify the brick. The record of test results shall be kept w ith the Executive Engineer, or Authorised officer.

12 When reinforcement is used in 10cm thick brick masonry, minimum lap of reinforcement should be 15cm. In case of w all joints of the main w all, reinforcement should go 15cm to the main wall.

STONE WORK

Notes:

1 The work shall consist of construction of structures with stone jointed together by cement mortar in accordance w ith the details shown on the draw ings.

2 Stones shall be of the type specified. It shall be hard, sound, free from cracks, decay and weathering and shall be freshly quarried from an approved quarry. Stone w ith round surface shall not be used.

The stones, w hen immersed in w ater for 24 hours, shall not absorb water by more than 5 percent of their dry weight when tested in accordance w ith IS: 1124.

The length of stones shall not exceed three times its height nor shall they be less than twice its height plus one joint. No stone shall be less in width than the height and the w idth on the base shall not be greater than three-fourth of the thickness of the w all nor less than 150mm.

3 The type of masonry used for the structures shall be random rubble masonry (coursed or uncoursed) or Coursed rubble masonry (Second Sort) or ashler masonry.

4 The dressing of stone shall be as specified for individual type of masonry w ork and it shall also conform to the general requirements of IS:1597 and requirement for dressing of stone covered in IS : 1129.

The masonry w ork shall be laid to lines, levels, curves and shapes as shown in the plan. The height, in each course, shall be kept same and every stone shall be fine tooled on all beds, joints and face full and true. The exposed faces shall be gauged out, grooved, regulated and sunk or plain moulded as the case may be.

Stones shall be sufficiently w etted before laying to prevent absorption of water from mortar.

Stratified stones must be laid on their natural beds. All bed joints shall be normal to the pressure upon them.

Stones in the hearting shall be laid on their broadest face that gives a better opportunity to fill the spaces betw een stones. The practice of placing loose mortar on the course and pouring water on it to fill the gaps in stones is not acceptable. Mortar may be fluid mixed thoroughly and then poured in the joints. No dry or hollow space shall be left anywhere in the masonry and each stone shall have all the embedded faces completely covered with mortar.

Shaping and dressing shall be done before the stone is laid in the w ork. No dressing and hammering, w hich w ill loosen the masonry, w ill be allow ed after it is once placed. All necessary chases for joggles, dow els and clamps should be formed before hand. Sufficient transverse bonds shall be provided by the use of bond stone extending from the front to the back of the wall and in case of thick w all from outside to the interior and vice versa. In the latter case, bond stones shall overlap each other in their arrangement. In case, headers are not available, precast headers of M 15 concerete shall be used. Castin- situ headers are not permitted.

Stones shall break joint on the face for at least half the height of the course and the bond shall be carefully maintained throughout.

In band w ork at all angle junctions of w alls, the stones at each alternate course shall be carried into each of the respective walls so as to unite the w ork thoroughly.

The practice of building up thin faces tied w ith occasional through stones and filling up the middle w ith small stuff or even dry packing is not acceptable.

All quoins and the angles of the opening shall be made from selected stones, carefully squared and bedded and arranged to bond alternately long and short in both directions.

All vertical joints shall be truly vertical. Vertical joints shall be staggered as far as possible. Distance between the nearer vertical joints of upper layer and low er shall not be less than half the height of the course.

Only rectangular shaped bond stones or headers shall be used. Bond stones shall overlap each other by 150mm or more.

All connected masonry in a structure shall be carried up nearly at one uniform level throughout but w hen breaks are unavoidable, the masonry shall be raked in sufficiently long steps to facilitate jointing of old and new work. The stepping of raking shall not be more than 45 degrees with the horizontal.

6 Quoin stone i.e. stone specially selected and neatly dressed for forming an external angle in masonary w ork, shall not be less than 0.03 cubic metre in volume.

7 The plum stones are selected long stones embedded vertically in the interior of the masonary to form a bond betw een successive courses and shall be provided at about 900mm. intervals.

VITRIFIED TILE FLOORING

The tiles shall be of approved make and shall generally conform to IS 15622. They shall be flat, and true to shape and free from blisters crazing, chips, welts, crawling or other imperfections detracting from their appearance. The tiles shall be tested as per IS 13630.

The tiles shall be square or rectangular of nominal size. Confirming IS 15622. Thickness shall be specified by the manufacturer. It includes the profiles on the visible face and on the rear side. Manufacturer/supplier and party shall choose the work size of tiles in order to allow a nominal joint width upto 2mm for unrectified floor tiles and upto 1mm for rectified floor tiles. The joint in case of spacer lug tile shall be as per spacer. The tiles shall conform to IS 15622 with water absorption 3 to 6% (Group BII). The selection of tile should be as per engineer in-charge/ competent authority.

The top surface of the tiles shall be glazed. Glaze shall be either glossy or matt as specified. The underside of the tiles shall not have glaze on more than 5% of the area in order that the tile may adhere properly to the base. The edges of the tiles shall be preferably free from glaze. However, any glaze if unavoidable, shall be permissible on only upto 50 per cent of

the surface area of the edges.

Base concrete or the RCC slab on which the tiles are to be laid shall be cleaned, wetted and mopped. The bedding for the tile shall be with cement mortar 1:4 (1 cement : 4 coarse sand) or as specified. The average thickness of the bedding shall be 20 mm or as specified while the thickness under any portion of the tiles shall not be less than 10 mm.

The surface of the flooring during laying shall be frequently checked with a straight edge about 2 m long, so as to obtain a true surface with the required slope. In bath, toilet W.C. kitchen and balcony/verandah flooring, suitable tile drop or as shown in drawing will be given in addition to required slope to avoid spread of water. Further tile drop will also be provided near floor trap.

The joints shall be cleaned off the grey cement slurry with wire/coir brush or trowel to a depth of 2 mm to 3 mm and all dust and loose mortar removed. Joints shall then be flush pointed with white cement added with pigment if required to match the colour of tiles. Where spacer lug tiles are provided, the half the depth of joint shall be filled with polysulphide or as specified on top with under filling with cement grout without the lugs remaining exposed. The floor shall then be kept wet for 7 days. After curing, the surface shall be washed and finished clean. The finished floor shall not sound hollow when tapped with a wooden mallet.

Length and breadth shall be measured correct to a cm before laying skirting, dado or wall plaster and the area calculated in square metre correct to two places of decimal. Where coves are used at the junctions, the length and breadth shall be measured between the lower edges of the coves.

No deduction shall be made nor extra paid for voids not exceeding 0.20 square metre. Deductions for ends of dissimilar materials or other articles embedded shall not be made for areas not exceeding 0.10 square metre. Areas, where glazed tiles or different types of decorative tiles are used will be measured separately.

PRSTRESED CERAMIC TILES IN SKIRTING AND DADO

The tiles shall be of approved make and shall generally conform to IS 15622. The tiles shall be pressed ceramic covered by a glaze thoroughly matured and fitted to the body. The tiles shall be sound, true to shape, flat and free from flaws and other manufacturing defects affecting their utility.

The top surface of the tiles shall be glazed. The underside of the tiles shall not have glaze on more than 5% of the area in order that the tile may adhere properly to the base. The edges of the tiles shall be free from glaze, however, any glaze if unavoidable shall be permissible on only upto 50 per cent of the surface area of edges.

The glaze shall be free from welts, chips, craze, specks, crawlings or other imperfections detracting from the appearance when viewed from a distance of one metre. The glaze shall be either glossy or matt as specified. The glaze shall be white in colour except in the case of coloured tiles when colours shall be specified by the Engineer-in-Charge. There may be more than one colour on a tile.

WOOD WORK AND PVC WORK

Notes:

FRAMED WORK:

1. The timber used in the w ork shall conform to IS: 883.
2. Rates include cost of all materials i.e. timber spikes, nails, screws, glue etc. required for the work. Rates also include cost of all labour for making, hosting, erecting and fixing in possition.
3. Timber discribed as “Framed and Fixed” timber include:-

3.1 Joints in w ood w ork are not permitted. Unless otherw ise specified, all joints shall be simple tenon and mortice joints.

3.2 Lapping, halving, tabling, scarping, notching, birds mouth cutting, splayed or bevelled ends

3.3 Framing together w ith mortise and tenon tusk tenon or dovetailed joints

3.4 Framed joinery put together w ith white lead or glue in joints and pinned w ith hard wood or bamboo pins.
3.5 Boring for bolts
3.6 Hoisting erecting and fixing in position.
3.7 Small labours like splays, chambers, rounded angles and rounded nosing

SHUTTERS :

1. For all hard w ood shutters, timber shall conform to IS : 883.
2. For factory made panelled shutters approved hard w ood as per IS : 4021 duly kiln seasoned & ascu vacCum.ed pressure treated as per IS : 1141 & IS : 401 shall only be accepted.
3. Flush doors w ith solid block board core shall conform to IS:2201-1973.
4. The rate for glazed and partly glazed shutter include the cost of wooden fillets, plain or moulded and of the size and design depending on the type of shutter being glazed.
5. All fittings & fixtures like hinges, aldrops, tow er bolts, handles, nails, screws etc. shall be as per the relevant IS specifications.
6. Glass panes shall conform to IS : 1761-1960.

STEEL WORK

Notes:

1 Structural steel shall be of tested, standard quality conforming to IS: 226-69 & commercial quality shall conform to IS: 1977-69.
2 Steel w ork in single section are for w orks, like hold fasts & iron w ork for w ooden trusses, M.S. Square/round guard bars fixed in w ooden or steel w indows & ventilators frames etc.
3 Steel w ork riveted or bolted shall conform to IS: 1148-1968 and IS : 800-1962.
4 Welding of steel shall be electric arc welding as per IS : 816-1956 and shall be on the lines given in IS : 800-1962.
5 Rolling shutters should conform to IS : 6248-1971.
6 Rolled steel sections for fabrication of steel glazed doors, w indows & ventilators shall conform to IS : 7452-1974.
7 Glass panes should conform to IS : 1761-1960.
8 Screws shall conform to IS : 4218 (Part I to V I) 1967.
9 Steel doors, w indows & ventilators shall conform to IS : 1038-1975 and IS : 7452-1974.

10 The rates of steel doors, w indows & ventilators include cost of all materials, labour, T&P, hire & running charges of machineries & w astages etc. and also include cost of w elding, all fixtures, erecting and fixing the sections in position.

11 Rates of steel angle iron fencing include all forging, reducing to required size, shape & figure, drilling, tapping, punching, counter sinking for screws, nailing etc. and every description of workmanship that may be necessary to fabricate, finish, erect and fix in positions in perfect manner.

12 Cold rolled framed profiles of pressed steel made from commercial M.S. Sheets conforming IS-513 of 1973 and as per general specifications of IS : 4351 are to be filled with M-15 grade of concrete and rates of items w ith these sections are inclusive of the cost of concrete.

FINISHING WORK

Notes:

1 Plastering shall be done w here shown on the draw ing. Plastering shall be started from top and worked down. All putlog holes shall be properly filled in advance of the plastering w hile the scaffolding is being taken dow n. Wooden screeds 75mm w ide and of the thickness of the plaster shall be fixed vertically 2.5 to 4 metres apart, to act as gauges and guides in applying the plaster. The mortar shall be laid on the wall between the screeds using the plasterer's float and pressing the mortar so that the raked joints are properly filled. The plaster shall then be finished off with a wooden straight edge reaching across the screeds. The straight edge shall be w orked on the screeds w ith a small upw ard and sidew ays motion 50mm to 75mm at a time. Finally, the surface shall be finished off with a plasterer's wooden float. Metal floats shall not be used.

2 Pointing shall be carried out using mortar not leaner than 1:3 by volume of cement and sand or as shown on the drawing. The mortar shall be filled and pressed into the raked joints before giving the required finish.

3 Curing shall be commenced as soon as the mortar used for finishing has hardened sufficiently not to be damaged during curing. It shall be kept w et for a period of at least 7 days. During this period, it shall be suitably protected from all damages.

4 For a white w ashing, class C lime i.e. fat lime shall be used.

5 For colour w ash the colouring material shall be of approved make and as approved by Engineer-in-Charge.

6 Dry distemper shall conform to I.S. 427-1965.

7 Oil bound distemper shall conform to I.S. 428-1969.

8 Cement paint shall conform to I.S. 5410-1969.

9 Primer on w ooden surfaces is to be follow ed by putty of two parts of w hite chalk pow der, one part of enamel paint and added by turpentine oil proportionately to prepare a smooth surface by sand pappering.

10 Primer on metal steel surfaces shall be done w ith red oxide zinc chromite.

11 Synthetic enamel paint shall conform to I.S. 2932-1974, IS 2933-1975 and IS 133-1975.

12 Ready mixed paints shall conform to I.S. 3631-1966.

13 Clear synthetic varnish shall conform to IS 525-1968.

14 Copal varnish shall conform to I.S. 337-1975.

15 Waxing - A mixture of bee's wax and turpentine oil in proportion of 2 Bee's w ax : 1½ double boiled linseed oil : 1 turpentine : ½ varnish shall be used. The wax is melted and added to turpentine.

16 The other paints etc. should conform to the follow ing specifications:

a) Aluminium paint - IS 2339-1963
b) Black japan - IS 341-1968
c) Anti corrosive Bituminious - IS158-1969
d) Plastic emulsion paint - IS 5411-1974
e) French polish - IS 348-1986
f) Red oxide - IS 2074-1963
g) Turpentine - IS 533-1973
h) Double boiled linseed oil - IS 77-1977

17 Painting of frames and shutters of doors, w indows, ventilators, steel work, and corrugated sheets etc. will be measured by multiplying the length or width by the height of one face only and the area thus obtained being further multiplied by factors as per I.S. 1200 of mode of measurements for building w orks w ith further amendments if any.

18 In case of sponge/sand faced (Non plain or equivalent) plastered surface of wall, the area measured, is to be multiplied by the factor 1.50 for payments of white w ash, colour w ash and distempering for one or more coats of required finish.

19 The rates in this chapter are for all locations like walls, ceiling, sloping roofs and in all floors and heights and depths, and for all shades with cost of all mater ials, labour, scaffoldings, T & P, hire & running charges of machineries, ladders, cans, brushes and other appliances etc. required for the efficient execution of work.

SANITARY INSTALLATION

Notes :

1 Water closets and urinals shall conform to I.S. 771-1963.

2 Wash hand Basin shall conform to I.S. 771-1963.

3 Sinks shall conform to I.S. 771-1963.

4 The R.S. or C.I. cantilever brackets for wash hand basin & sink shall conform to IS 775-1962.

5 Socket and spigot spun Iron pipes shall conform to I.S. 1534-1947

6 The flushing of W.C. pan shall be done by "pull and let go" Flushing cistern of valve-less syphonic type conforming to I.S. 774 -1960.

7 C.I. pipes shall conform to I.S. 3114-1965. The overflow pipes shall be of G.I. 15mm. diameter w ith fittings.

8 The outlet flush pipe shall be of 32 diameter. They shall be one piece lead pipe or telescopic galvanised inside and outside.

9 Glazed stone w are pipe shall be of grade "A".

10 All joints shall be made w ith special care, particularly those between pipes of different mater ial. All joints shall be perfectly air and w ater tight. No joint shall be embedded in w all if, avoidable.

11 The rates include, unless otherw ise specified, cost of all material, labour, T&P, hire and running charges of machineries etc. with all leads and lifts required for the w ork. The rates also include labour for installation, making holes in walls, excavation, cutting of floors & making good the same to its original condition.

DRAINAGE

Notes :

1 All soil waste pipes and accessories shall be of grade 'A'.

2 In brick masonry manholes/chambers, the benching of inlets and outlet lines shall not cross each other for effective drainage.

3 All the drainage line shall be laid as per required gradient.

4 Soak pits shall be constructed at least 3.00m. apart from septic tank.

5 Cast Iron manhole covers and frames shall conform to I.S. 17276-1960.

6 Septic tanks shall be constructed conforming to I.S. 2470 (Part-I) 1963.

7 Centre to centre spacing of each manhole shall not exceed 6.00m.

8 Rates include excavating soil for pipes, chambers etc. and also include refilling with the excavated stuff. Rates also include w ork of reinforcement and formwork required for top slab to manholes and chambers.

9 The rates include cost of all materials, labours, scaffolding, water, T & P, hire and running charges of machineries etc. complete w ith all leads and lifts for all materials required for the work.

ALUMINUM WORK

All aluminium sections shall confirm to IS:733 and IS:1285, the sections shall be powder coated with minimum thickness of 50 microns.

FOR INTERIOR WORK

Gypsum borad false ceiling

Frame work for false ceiling shall be made of special sections, power pressed from M.S. sheets and galvanized with zinc coating of 120 gms/sqm (both side inclusive) as per IS : 277 and consisting of angle cleats of size 25 mm wide x 1.6 mm thick with flanges of 27 mm and 37mm, at 1200 mm centre to centre, one flange fixed to the ceiling with dash fastener 12.5 mm dia x 50mm long with 6mm dia bolts other flange of cleat fixed to the angle hangers of 25x10x0.50 mm of required length with nuts & bolts of required size and other end of angle hanger fixed with intermediate G.I. channels 45x15x0.9 mm running at the rate of 1200 mm centre to centre to which the ceiling section 0.5 mm thick bottom wedge of 80 mm with tapered flanges of 26 mm each having lips of 10.5 mm, at 450 mm centre to centre, shall be fixed in a direction perpendicular to G.I. intermediate channel with connecting clips made out of 2.64 mm dia x 230 mm long G.I. wire at every junction, including fixing perimeter channels 0.5 mm thick 27 mm high having flanges of 20 mm and 30 mm long, the perimeter of ceiling fixed to wall/partition with the help of rawl plugs at 450 mm centre, with 25mm long dry wall screws @ 230 mm interval.

Fixing of 12mm thk gypsum board to ceiling section and perimeter channel shall be with the help of dry wall screws of size 3.5 x 25 mm at 230 mm c/c, including jointing and finishing to a flush finish of tapered and square edges of the board with recommended jointing compound , jointing tapes , finishing with jointing compound in 3 layers covering up to 150 mm or both sides of joint and two coats of primer suitable for board. Including cutting openings for light fittings, grills, diffusers, cut outs in perfect machine cut edges leaving no gap visible after fixture is installed and shall be with frame of perimeter channels suitably fixed. (sections shall be of gypsum india make)

Timber

The timber shall be of the best of its kind available, properly seasoned and of mature growth. It shall be free from decay and insect attack, saps, warps, cracks, knots & knot holes and any other defects which may affect the looks or harm the strength of the member. All the timber shall be seasoned as per UADD/MPPWD/CPWD Specifications.

Plywood

i) Unless otherwise stated, only BWR / BWP grade plywood boards shall be used. Plywood shall comply with standards and specifications. Face veneers may be either commercial or decorative on both sides or one side commercial and the other decorative. Type of face veneer and grade of plywood boards shall be, as specified.

ii) CROSS GRAIN/ LONG GRAIN FLEXIPLY: - Shall have flexibility and high bending quality. It can be cold formed to curved surface requirements. Made of gurjan species, exclusively with phenolic resin and conditioned to undergo any sort of rigorous climatic changes such as alternate wetting and drying. Shall not require any external heat or water sprays which are the conventional for post forming.

ELASTICITY: - Cross grain 200N/mm²
DENSITY: - 0.75gm/cc
Bending Radius

6mm 10mm diameter

8mm	12mm diameter
12mm	30mm diameter

Decorative Timber Veneer Ply

3.5 - 4.0mm thick straight grained matching approved veneers shall be used. The veneer shall be resin bonded & suitable for the intended use The decorative veneer should have attractive appearance due to figure, colour, grain, luster etc. The decorative veneer surface shall be selected for figure, texture, color and grain characteristics. All the veneer shall be from one lot and shall be group matched so as to be similar in grain and characters. Architect‟s prior approval of the lots is to be obtained before the same is procured. The grains/flowers shall be strictly placed either horizontally or vertically or diagonally and matched as per instructions of the Owner. The decorative veneered surface shall be free from torn grain, dead knots, discoloration and sapwood. Where group match veneers are specified it shall refer to a certain number of decorative matched plywood panels, matching in figure, colour and grain as required to form a group to give an overall general effect, the quantity of each group unless mentioned in the schedule shall be restricted to at least one enclosed cabin space, as the case may be. The decorative veneered surfaces with figures shall not be allowed unless specified with schedule. For majority of veneers the contractor shall arrange for selection of finishing material from bulk stocks of the supplier. A joint visit shall be arranged by the contractor along with ARCHITECT ? employer for the selection process. This shall have no bearing on the cost to the employer.

Laminate Sheets

Laminate shall be of the brand, catalogue surface finish, colour as specified and approved by the Architect. All laminates shall be in finish as per design intent unless mentioned otherwise. Laminates shall comply with standards and specifications.

Gypsum board
Gypsum board as manufactured by India Gypsum Ltd. Or Saint Gobain and shall confirm to CBRI certification. Board shall be moisture resistant, light weight, strong, durable dimensionally stable, smooth surface finished such that ready to receive directly painting, wall papering etc.

All fittings and fixtures shall be as specified in Schedule of Items or on drawing by Architect. Approved makes only shall be used for respective items. Fittings shall be guaranteed by the manufacturer for its performance.

Adhesives and glue shall be as per IS for exterior quality and water repellent.

Fasteners :
All fixing anchor, bolts, screws, nuts, washers or other miscellaneous anchoring / fixing devices shall be of non magnetic stainless steel and approved by Architect and shall provide adequate strength.

LACQUERED GLASS:

6mm thick durable, humid resistance, poly urethane lacquer glass. The planilaque glass should be manufactured by industrial curtain coating process. It should meet quality standards as per BS EN 1036 1999 & confirms to persoz hardness test of at least 220 oscillations. The substrate of the glass should conform to standard BS EN 572 1995 parts 1 and 2: glass in building – basic soda lime glass products.

Consistency of colour, opacity and homogeneity throughout production campaigns and also to the ageing properties, mechanical resistance and resistance to humidity and to chemical agents of lacquer should remain stable when exposed to normal levels of ultra – violet light in interior applications.

Mock-ups

Before fabricating and installing interior Architectural work, mock-ups should be built for each form of construction and finish required to verify selections made under sample submitted and to demonstrate aesthetic effects and qualities of materials and execution. Build comply with the following requirements, using materials indicated for the completed work:

1. Mock-ups should be built in the location and size indicated or, if not indicated, as directed by Architect
2. Notify Architect seven days in advance of dates and times when mock-ups will be fabricated and installed.
3. Mock ups should demonstrate the proposed range of aesthetic effects and workmanship.
4. Approval of Architect for the mock-ups must be obtained before starting interior architectural work fabrication
5. Mock-ups should be maintained during construction in undisturbed conditions as a standard for judging the completed work.
6. Demolish and remove mock-ups when directed.
7. Approved mock-ups may become part of the completed work if undisturbed at time of substantial completion.

Finishing

i) All completed works shall be delivered fully finished in neat and clean condition without any stains, marks, defects, etc. and shall meet with the approval of the Architect. Unless otherwise stipulated all work shall include priming and protective treatments and finishing as required

ii) During the course of work regularly all debris swash excess material shall be cleared

and removed from site. On completion clean all places / spaces thoroughly.

iii) Wood work shall be protected from defacement, marring till final completion and hand it over to the Employer.

iv) Repair and replace all defective work prior to final inspection.

v) Prior to final inspection by the Architect / Employer the contractor to check to ensure proper operations, finish and surroundings.

vi) The approval of work do not relieve the contractor of his liability to maintain to defects liability period at contractors cost.

vii) Before fabric wall covering is started in any area, it shall be broom cleaned and excessive dust shall be removed. After wall covering operations begin in a given area, broom cleaning will not be allowed. Cleaning shall then be done only with commercial vacuum cleaning equipment.

viii) The Contractor shall be responsible for protecting all the mirrors & glasses fixed by him till handing over of mirrors & glasses forming part of this contract. The contractor shall replace at his own expense any

broken or damaged mirrors & glasses caused through lack of adequate protection or care in installation or handling. All installed materials shall be left in perfect condition to the satisfaction of Architect/ Owner.

ix) Upon completion of work, the contractor shall remove all adhesive from the floors, glass and other surfaces. Remove from the premises all rubbish and accumulated materials of whatever nature, not caused by others, and leave this part of the work in clean, orderly and acceptable conditions.

x) All paints / polish shall have VOC within limit as specified in Tender Documents as per Green Building requirements. Paints used in the works shall conform to the respective IS or equivalent, other international standard

DEFINITION OF ONE COAT

The painting shall be laid on evenly and smoothly by means of crossing and laying off, the latter in the direction of the grain of wood.
The crossing and laying off consists of covering the area with paint, brushing alternative in opposite directions, two or three times and then finally brushing lightly in a direction at right angle to the same. In this process no brush marks shall be left after the laying off is finished. The full process of crossing and laying off constitute one coat.
Each coat shall be applied in sufficient quantity to obtain complete coverage, shall be well brushed and evenly worked out over the entire surface and into all corners, angles and services allowed to thoroughly dry. Second coat shall be of suitable shade to match final colour, and shall be approved by the Owner , before final coat is started. Allow at least 48 house drying time between coats for interior and 7 days for exterior work and if in the judgement of the Owner ,more time is required it shall be allowed.
The contractor shall apply the final coat on all internal walls and other surfaces at the appropriate time in consultation with Owner so that the finished work is not damaged by other agencies.

POLYURETHENE MATTE/GLOSSY FINISH or POLYCOT FINISH

DIRECTION TO USE ON Proper surface preparation is a prerequisite for optimum results. The major operations involved in surface preparation are sanding, fitting & staining.

SANDING :

Sandpaper the wood surface with flint paper No. 100 and then the emery paper No. 220 along with the grains. Brush off loose dust along the grains.

FILLING :

Make PU primer putty using appropriate colour powder and apply the same by brushing. When the surface is completely dried, sand the same along the grains. Remove excess filters along the grains by a putty knife. Allow drying for 304 hrs. at room temperature. The hard dried surface is then sanded with flint paper No. 100 & then with No. 320 along the grains. Wipe off loose dust completely.

STAINING :

To match the filled surface with wood, staining has to be done. The surface can be stained to any desired shade like Walnut, Mahogany, Sesame, Rose wood, Raw sienna etc. make a fine paste of any of the above

powder with mineral turpentine. Apply with a cloth. Allow drying for 20 minutes . Wipe the surface with a dry cloth thoroughly to remove excess staining.

LACQUERING :

Mix both the resin & hardener as per the specifications. Mix the constituents and shake well for at least 5 minutes. Keep it for another 5 minutes. Filter the solutions through a muslin cloth 7 spray (Note : Both components are to be shaked well before usage so that all settled articles from homogeneous mixtures) Allow the coated surface to dry at room temperature for 3-6 hrs. Rub the first coat using an emery paper No. 320 wet with water. Wipe with cloth. Give the second coat by spray allow drying at room Temperature preferably in a dust free atmosphere.

Melamine Finish

Timber works shall be finished by the applications of two coats of an acid catalyzed clear lacquer (melamine) wherever it is indicated in the drawings. The Finish shall be a satin, semi –gloss finish & shall be carried out as follows. :-

The base shall be sand papered to desired finish & coated with a colour tinge to give it shade. This shade shall be sealed with a coat of spirit finish.

After the base, first coat of lacquer shall be applied evenly by a soft cloth or by spray to give an even coat to the veneer surface.

After the 1st coat has fully dried, the lacquered surface shall be rubbed down in the direction of the veneer grain with very fine glass paper and left completely smooth & clean before the second coat is applied.

When the 2nd coat of lacquer is fully dried, the surface shall be rubbed down in the direction of veneer grain very fine wire wool dipped in a petroleum – based wax to give lubrication.

Twenty four hour after completion of this process the lacquered veneer surface shall be finished by brushing with a soft cloth to an approved finish.

ROLLER BLINDS

FABRIC

The fabric shall be woven from a very fine glass fibre yarn coated with a specially formulated plastisol. The fabric shall be so waved to provide view of the other side of the blind with an openness factor of 3%. The fabric shall have a composition of 36% glass fibre 64% plastisol, weigh 400 gms per sq. mtr and shall be 0.45 mm thick. The fabric shall hang straight and flat without buckling or distortion and the edges shall remain straight and free of raveling. Fabric shall be flame retardant and fade resistant.

ROLLER TUBE

Roller tube shall be of extruded Aluminium alloy 32 mm O.D. with a minimum wall thickness of 1.0 mm duly anodised for long life.

CLUTCH

Clutch shall be of wrap spring design with high strength fiberglass reinforced polyester assembly and high carbon steel springs to transmit motion from driving to driven members of clutch mechanism. Clutch shall operate by directionally with the use of an endless beaded chain. Clutch mechanism shall be crash proof, prevent slippage and shall raise and lower smoothly to any desired height. Clutch shall never need adjustment.

IDLER

Idler shall be of high strength fiberglass reinforced polyster, consisting of an outside sleeve and center shaft. Sleeve shall provide bearing surface for roller tube and rotate freely on center shaft, providing smooth, quiet and long wearing operation.

INSTALLATION BRACKETS

Brackets shall be of tomized steel powder coated to give superior finish. Bracket shall accommodate overhead, side or face mounting with clutch assembly on either end of roller.

BOTTOM WEIGHT

Bottom of the blind shall be provided with Aluminum tube powder coated in a color matching to the fabric. The fabric shall be enclosed in the suitably created pocket along with the tube. The tube shall be closed from sides with end caps to give a neat look.

FINISH

Finishes shall be fully in accordance with the drawings and schedules. Where timber is in natural finish, pieces shall be matched for colour and grain before assembly. Where timber is stained the stain shall be matched throughout.

HARDWARE

Hinges, locks, latches, door handles, nails, etc., shall be as specified or as approved substitute equal or be better than the specified. For fixing drawer slides (runner slides), auto closing hinges etc. hole pattern as recommended by the manufacturer. Cup holes shall be punched very accurately mechanically only using a drill bit, drilling template. Drilling positions shall be to suit the kind of hardware used. Marking of drill holes shall be corresponding to hinge type.

LIST OF APPROVED MANUFACTURERS / NATURAL SOURCES OF MATERIALS TO BE USED IN THE INTERIOR WORKS SUBJECT TO THE APPROVAL OF SAMPLES BY THE CONSULTANT/ ENGINEER IN CHARGE.

CARPENTRY / WOOD WORKS:

S.NO.	Material Name.	Brand / Manufacturer.
1.	**Plywood – BWR (boiled water Resistant, Termite Resistant & Borer Resistant) – Confirming To IS : 303.**	Green ply, Kit ply, Century, Mayur ply.
2.	**Laminate – Confirming To IS: 2046-1995**	Greenlam / Merino / Royal Touche / Formica / Century /Archid/ Signature/Virgo
3.	**Glass**	Triveni / Modifloat / Asahifloat / Saint Gobain Make.
4	**Flush Door – Confirming To Is : 2202 (Part – 1) – 1991**	Egg Wood, Euro wood
5	**Beech Wood.**	As Approved By The Consultant.
6	**Veneer. (4mm And Paper Veneer) – oup Matched, Straight Grain.**	Truwood / Donear / Durian / Century / Archid
7	**Block Board.**	Truwud / Archid / Greenply/ Kit ply/ Century/ Mayur ply.
8	**G.I Support System For False Ceiling.**	Saint Gobain gypsum board.
9	**G.I Dry Wall Partition System.**	BMS

10	**Plaster Boards.**	Boral
11	**Soft Board.**	Jolly Board
12	**Screws.**	GKW ,Nettlefold.
13	**Adhesives.**	Movicol / Fevicol Sh / Araldite
14	**Paint.**	Asian / ICI / Berger/Nerolac/ Jotun
15	**Floor Spring.**	Doorset, Hardwyn, Ozone, Ebco
16	**Door Closures.**	Stearling Mech, Hardwyn, Godrej
17	**Textured Paint.**	Terraco / Spectrum
18	**Vinyl Flooring.**	Armstrong Or Approved Equivalent.
19	**Writing Board.**	White Mark Or Approved Equivalent.
20	**Ceiling Tiles.**	Armstrong
21	**HARD WARE FOR STORAGE CUPBOARDS AND DRAWS**	
a	**Draw and Cupboard handles**	Italica Model 9DS 74 304 Grade
b	Cup board Hinges	Magnum 3"x1/2"x3/4"x2mm thk
Jyothi brand 3"x1/2"x3/4"x2mm		
c	**Locks**	Door set,MP330
HardwynHMP 510,Godrej 5117		
d	**Magnets**	Bmw/avon Medium 2
22	**Draw Channels**	Hettiach/Ebco telescopic 18" for tables &12 for side tables
23	**Key boards**	Ebco Metal Powder coated KTSM 45
24	**HARD WARE FOR DOORS UPTO 7'-0"**	
A	**Glass Door Handles**	Doorset SH 12 P SS
Hardwyn HPH -141 H Shape 32x450		
b	**Floor Spring**	Doorset FS-120
Enox EFS 2090		
c	**Locks**	Door set,MP330
HardwynHMP 510,Godrej 5117		
B	**Solid Door Handles**	Doorset SL OR SS
Hardwyn HPH -105		
a	**Dead locks**	Godrej 5426,5427 Model
Link 501 Model Hardwyn 455		
b	**Hinges**	Door set SSBearing Hinge Series 102x76 x2.5x12, Ebco

NOTE: The contractor shall use only above mentioned material to be approved by the Consultant / Engineer in charge. All other materials shall confirm to the specifications laid down and the shall be of reputed company/brand. The tenderer shall take this into account while tendering rates / prices.

FOR ELECTRICAL WORK

General:

These special conditions shall be read in conjunction with the description of the item of work in the Bill(s) of Quantities, the particular Specifications, Local Statutory Regulations, Indian Standards Specifications/Codes and the drawings. All the above quoted documents, shall be considered

supplementary to each other. However, in the case of conflict amongst the various provisions the owner's and the consultants opinion will be final and shall be adopted.

The tenderer is advised to inspect the site to ascertain the nature of site, access thereto, local facilities for procurement of materials and working labour rates prevalent in the area, in fact all matters affecting his prices and execution of the work. The tenderer shall be deemed to have full knowledge of the site and drawings whether or not he actually inspects them.

Scope :

This specification is intended to cover the requirements of supply, installation, testing and commissioning of electrical wiring installation and other accessories required for its satisfactory operation. This covers the essential requirements or precautions regarding wiring installations for ensuring satisfactory and reliable service.

Standards :

The Electrical wiring installations and other accessories shall comply with latest IS : 732 - 1989 and National Electrical code - 1985.

Construction:

Wall mounted switch boards shall be installed such that the bottom is at a minimum height of 1.35 m above finished floor level wherever applicable, as indicated in the drawing.

Equipment which is on the front of a switch board shall be so arranged that inadvertent personnel contact with live parts is unlikely during the manipulation of switches, changing of fuses or similar operation.

In every case in which switches and fuses are fitted on the same pole, these fuses, shall be so arranged that the fuses are not live when their respective switches are in 'OFF' position.

No fuses other than fuses in instrument circuit shall be fixed on the back or behind a switch board panel or frame.

Capacity of circuit :

Lighting Circuits shall not have more than a total of ten points of fans, 5A socket outlets and light points and its total load shall not exceed 800 watts. Lights, fans, and 5A socket outlets can be wired on a single common circuit. If fan circuit is drawn separately, circuit shall not be used more than eight points and load shall not exceed more than 800 watts. In the circuit, the neutral and earth wires can be looped up to 10points. From distribution boards Neutral & Earth wires shall be run for every circuit.

The power circuits shall not have more than two outlets per circuit if load to be fed by each outlet is less than 1KW, and if load is more than 2KW, each outlet shall be connected to a separate circuit.

Switches :

All switches shall be placed in the live conductor of the circuit and no single pole switch or fuse shall be inserted in the earth or earthed neutral conductor of the circuits. Single pole switches (other than for multiple control) carrying not more than 15amperes may be of the piano flush type and the switch shall be 'ON' When the knob is down.

Lamp holders : Lamp holders for use on brackets and the like shall have not less than 1.3 cm nipple and all those for use with flexible pendant shall be provided with cord grips. All lamp holders shall be provided with shade carriers. Where centre contact Edison screw lamp holders are used, the outer or screw contact shall be connected to the 'middle wire' or the neutral or to the earthed conductor of the circuit.

Lamps :

All CFL/ LED lamps, unless otherwise specified shall be hung at a height of not less than 2.5 m above the finished floor level.

Ceiling rose :

a) A ceiling rose or any other similar attachment shall not be used on circuit, the voltage of which normally exceeds 250 volts.

A ceiling rose shall not embody fuse terminals as an integral part of it.

Every socket outlet shall be controlled by a switch. The switch controlling the socket shall be on the 'live' side of side line.5 Amps and 15 Amps socket-outlet shall normally be fixed at any convenient place 60 cm above the floor level or near such level as indicated in drawing. 15 Amps socket outlets in kitchen shall be fixed at convenient place 23cm above the working platform. In a room containing a fixed bath or shower, there shall be no socket outlet and there shall be no provision for connecting a portable appliance.

Recessed MS conduit wiring system:

a) **Making of chase** : The chase in the wall shall neatly be made and shall be of suitable dimension to permit the conduit to be fixed in the manner desired by the Engineer-in-charge. In the case of buildings under construction, chases shall be provided in the wall, ceiling, etc. at the time of their construction and shall be filled up neatly after erection of conduit and brought to the original finish of the wall.

b) **Fixing of conduit in chase** : The conduit shall be fixed by means of staples or by means of saddles not more than 600 mm apart. Fixing of standard bends or elbows shall be avoided as far as practicable and all curves maintained by bending the conduit pipe itself with a long radius which will permit easy drawing-in of conductors. All the threaded joints of rigid steel conduits shall be treated with approved preservative compound to ensure protection against rust.

c) **Inspection boxes** : To permit periodical inspection and to facilitate replacement of wires, suitable inspection boxes shall be provided at convenient locations. They shall be mounted in flush with the wall. The minimum size of inspection boxes shall be 75 x 75 mm. Suitable ventilating holes shall be provided in the inspection box covers.

d) **Types of accessories to be used** : All outlets, such as switches and sockets, may be either of flush mounting type or of surface mounting type.

The switches and other outlets shall be mounted on such boxes. The metal box shall be efficiently earthed with the earth continuity wire run along the conduit.

When crossing through expansion joints in buildings, the conduit sections across the joint may be through flexible copper bellows of the same size as PVC conduit. The Number of wires that can be drawn through a conduit shall be strictly as per IS 732 and as mentioned in Drawings.

MS Conduits:

MS conduit shall be black enameled and of thickness not less than 16SWG and of size minimum 19 mm dia. The Conduit shall conform to IS 9537/ Part II

Bunching of cables : Separate conduits shall be used for bunching of conductors of AC supply and DC supply for lighting and small power outlet circuits.

All outlets of conduit systems shall be properly drained and ventilated, but in such a manner so as to prevent the entry of insects etc. as far as possible.

Bends in conduit : Wherever necessary, bends or diversions may be achieved by bending the conduits or by employing normal bends, inspection bends, inspection boxes, elbows or similar fittings.

In case of plain conduit, heat may be used to soften the conduit for bending and forming joints. Positioning of conduit in close proximity to hot surfaces should be avoided.

Testing of wiring:

The following tests shall be carried out on all types of wiring on completion of the work & before energizing the installation :

i) Insulation resistance test,
ii) Electrical continuity test,
iii) Earth continuity test,
iv) Earth electrode resistance test,
v) Switch polarity test.

i) Insulation Resistance test :

The insulation resistance shall be measured by using 500 v megger between the following points.

Phase and neutral conductor with all fuses in position and all switches in closed condition and main switch in OFF position with lamps and other devices removed.

Between earth and whole system of conductors with all fuses in place, all switches closed and all lamps in position.

Between all conductors connected to one phase of the supply of the above tests shall not be less than 50 divided by the number of points on the circuit. Where a whole installation is being tested, a lower value than that given by the above formula is acceptable subject to a minimum of one mega ohm.

The insulation resistance in mega ohm as obtained by each of the above tests shall not be less than 50 divided by the number of points on the circuit. Where a whole installation is being tested, a lower value than that given by the above formula is acceptable subject to a minimum of one mega ohm.

(ii) Electrical continuity test :

Each and every circuit shall be tested for electrical continuity by using a multimeter.

(iii) Earth continuity test :

The earth continuity conductor including metal conduit shall be tested for electrical continuity and the resistance of the same along with the earthing lead measured from the connection with the earth electrode to any point in the earth continuity conductor in the complete installation shall not exceed one ohm.

iv) Earth electrode resistance test :

The earth electrode resistance shall be tested as specified in section

(v).Switch polarity test :

Test shall be made to verify that all switches in every circuit have been fitted in the same conductor throughout and such conductor shall be marked for connection to the phase conductor.

Distribution Boards :

All the distribution boards shall be with MCBs as described in the respective schedule.

The distribution boards shall be controlled by a switch fuse, miniature circuit beaker or an isolator as described in the respective schedule. Each outgoing circuit shall be provided either with MCB or a fuse on the phase. The neutral shall be connected to a common link and be capable of being disconnected individually for testing purposes.

The distribution boards shall be located as indicated in the respective electrical working drawings and as directed by Engineer - in - charge. The distribution boards shall be fixed on wall in the niche provided and marked with the details of circuits, source of supply, size of incoming wires Etc.,

All marking shall be clear and legible.

The total load of the consuming devices shall be evenly distributed between the number of ways of distribution board.

The consuming devices circuit shall be connected to distribution board in proper sequence, so as to avoid unnecessary crossing of wires.

Cables shall be connected to a terminal only by crimped lugs.

Cables shall be rigidly fixed in such a manner that a clearance of at least 2.5cm is maintained between conductors of opposite polarity or phase and between the conductors and any material other than insulating material.
The incoming and outgoing cables shall be neatly bunched.

MOUNTING HEIGHTS :

The Mounting heights of various fixtures shall be as specified in the Drawings.

POWER CONTROL CENTRES

1. **Scope** :
This specification is to cover the requirement of design, supply, installation, testing and commissioning of LT power control centres / main switch boards with all components, Instruments, fittings and accessories for efficient operation without any trouble.

2. **Standards** :
The PCC specified herein, unless otherwise stated shall conform to the relevant and latest revisions of Indian standards and Indian Electricity Rules.

3. **Design and construction** :
3.1 Design requirements : The power control centres shall be suitable for operation on 440volt, 3 phase,4wire 50HZ system to withstand a short circuit level of 50 KA RMS symmetrical.
The PCC shall be designed for operation in high ambient temperature upto 45 degrees centigrade and high humidity upto 95% and tropical atmospheric conditions. Means shall be provided to facilitate ease of inspection, Maintenance and Servicing.
3.2 Constructional requirements :
The power control centre shall be of
i) Metal clad, cubicle, indoor, free standing type suitable for Mounting on Built up Trenches with U Channels of adequate size.
ii) Made up of the requisite vertical sections, which when coupled together shall form continuous dead front switch board.
iii) Dust and damp protected, the degree of protection shall be better than IP - 54 as specified in IS-2147.
iv) Readily extendable on both sides by the addition of vertical sections after removal of the end covers.
v) Single front construction with the circuit beaker feeder and switch fuse feeders suitable for operation from the front of the panel.
The PCC shall have the feeder ratings as per the schematic diagrams enclosed with the schedule and constructed only of materials capable of withstanding the mechanical, electrical and thermal stresses as well as the effects of humidity, which are likely to be encountered in normal service.
3.3 Vertical Sections :Each vertical section shall comprise a front framed structure rolled folded sheet steel channel section of minimum 2 mm thickness rigidly bolted together. This structure shall house the components contributing the major weight of the equipment such as circuit breaker, switch fuse units, main horizontal busbars, vertical risers and other front mounted accessories. The structure shall be mounted on a rigid base frame of folded sheet steel of minimum of 2.5 mm thickness and 100mm height. The design shall ensure Structural stability during Transit and also during Operation after Commissioning Suitable cable chamber housing the cable end connections and power / control cable terminations shall be provided. The design shall ensure generous availability of space for ease of installation and maintenance of cabling and adequate safety for working in one vertical section without coming into accidental contact with live parts in the adjacent section. A cover plate at the top of the vertical section shall be provided with necessary ventilating arrangements. Any aperture for ventilation shall be covered with a perforated sheet having less than 1 mm diameter perforations to prevent entry of vermin.

3.4 Sheet Steel Cubicle :

3.4.1 The sheet steel cubicle shall be designed in fully segregated multitier formation. Each cubicle shall have hinged front access door with easy operating fasteners. All the doors and covers shall be heavily gasketed to make the compartment dust tight. Each cubicle shall have a covering at the bottom to make a dust and vermin proof construction. Door hinges shall be of concealed type.

The cubicle shall be of minimum 2 mm thick sheet steel. Sheet steel shrouds and partitions shall be of minimum 1.6 mm thickness. All sheet steel work forming the exterior of switch boards shall be smoothly finished, leveled and free from flaws. The corners shall be rounded. The minimum Thickness of Gland plates shall be 3mm.

3.4.2 The apparatus and circuits in the power control centers shall be so arranged as to facilitate their operation and maintenance at the same time to ensure the necessary degree of safety.

Apparatus forming part of the control centers shall have the following minimum clearance.

i) between phases - 25 mm,

ii) between phase and neutral - 25 mm,

iii) between phases and earth - 25 mm,

iv) Between neutral and earth - 19 mm,

When, for any reason, the above clearances are not available suitable insulation shall be provided. Clearance shall be maintained during normal service conditions. Creepage distances shall comply with those specified in relevant standards.

3.4.3 All insulating materials used in the construction of the equipment shall be non hygroscopic duly treated to withstand the effect of high humidity, high temperature and tropical ambient service conditions.

3.4.4 Functional units such as circuit beakers and fuse switches shall be arranged in multitier formation, except that not more than One air circuit braker housed in a single vertical section.

3.4.5 Metallic/insulated barriers shall be provided within vertical sections and between adjacent sections to ensure prevention of accidental contact with :

i) Main busbars and vertical risers during operation, inspection or maintenance of functional units and front connected accessories.

ii) Cable terminations of one functional unit, when working on those of adjacent unit/units.

3.4.6. All doors / covers providing access to live power equipment / circuits shall be provided with tool operated fastners to prevent unauthorized access.

3.4.7 Provisions shall be made for permanently earthing the frames and other metal parts of the switchgear by two independent connections.

3.5 Metal treatment and finish :

All steel works used in the construction of the switch boards shall have undergone a suitable rigorous metal treatment process so as to remove oxide scales and rust formation and to facilitate a durable coating of the paint on the metal surfaces and also to prevent the spreading of rust, in the event of the paint film being mechanically damaged.

Two coats of Anti Corrosive primer followed by a finishing coat of Epoxy spray power coating of the shade 631 of IS : 5 (i.e. Siemens grey) shall be given. The total thickness of paint shall not be less than 25 micron.

3.6 Bus Bars :

3.6.1 The busbars shall be housed in non-segregated sheet steel compartments in the cubicle at convenient locations with provision for access to the buses from the front of the panel. The busbar shall be suitably braced with DMC/SMC supports to provide a through fault withstand capacity of 50 KA RMS symmetrical for one second and a peak short circuit withstand capacity 150 KA minimum. The neutral as well as the earth bus shall be capable of withstanding the above fault level.

3.6.3 Large clearance and creeping distance shall be provided on the busbar system to minimize the possibility of a fault.

3.6.4 High tension bolts, nuts and spring washers shall be provided at all busbar joints.

3.6.5 The continuous rating of the busbar shall be 125% of the rated current. Maximum temperature of the bus and the connections shall not exceed 85 degrees centigrade. The busbars shall be of liberal design for the required current rating i.e. 0.8Amp/sq.mm.

The main phase busbars shall have continuous current rating throughout the length of each power control centre and the neutral busbars shall have continuous rating of at least 50% of phase busbars.
3.6.6 Connections from the main busbars to functional circuits shall be arranged and supported so as to withstand without any damage or deformation, the thermal and dynamic stresses due to short circuit currents.
All busbars and tapings shall be provided with color coded sleeves for phase identification.
All joints/tapping points of the buses shall be suitably shrouded to prevent accidental contact.

4. Circuit Breakers :

4.1 General :

4.1.1 Circuit breakers shall be of triple pole / four pole, air break, horizontal draw out /Fixed type, as given in the schedule of work and comply with the requirements of relevant IS with latest amendments and shall have the following :
i) A short circuit breaking capacity of not less than 50 KA RMS at 415 volts, 50 Hz AC. ii) A short circuit making capacity of 105 KA.
iii) A short time withstand capacity of 150 KA for one second.
iv) Electrical overload performance at 6 times the rated current, 100% of the rated voltage as recovery voltage at 0.5 power factor.
v) Dielectric test of 2.5 KV applied for one minute on main circuits.

4.1.2 The circuit breakers shall be fitted with detachable arc chutes on each pole designed to permit rapid dispersion, cooling and extinction of the arc. Interphase barriers shall be provided to prevent flash over between phases.
4.1.3 Arcing contacts shall be of hard wearing material copper tungsten or silver tungsten and shall be easily replaceable. Main contacts shall be of silver plated copper of high pressure type and generous cross section.

4.2 Operating Mechanism :

The operating mechanism shall be of robust design, with minimum number of linkages to ensure maximum reliability. Manually operated circuit breakers shall be provided with spring operated closing mechanism which are independent of speed of manual operation. Electrically shall be independent of the motor which shall be used slowly for charging the closing spring.
The operating mechanism shall be such that the breaker is at all times free to open immediately when the trip coil is energized.
Mechanical operation indicators shall be provided to show open and close positions of the breaker. Electrically operated breakers shall be additionally provided with mechanical indications to show charged and discharged conditions of the charging spring.
Means shall be provided for slow closing and opening of the breaker for maintenance purposes, and for manual changing and closing of electrically operated breakers during emergencies,

4.3 Protection :

Provisions shall be available for fitting a minimum of five trip devices - three over current, as shunt trip and an under voltage release or two over current and earth fault release, a shunt trip and one under voltage release. The breakers shall be of the shunt or series trip type as specified in the schedule.

4.4 Housing of Circuit

Breaker :
Circuit breakers shall be individually housed in sheet metal castle provided with hinged doors. The breaker along with its operating mechanism shall be mounted on a robust carriage moving on guide rollers with in the castle. Isolating contacts for both power and control circuits shall be of robust design and fully self aligning. The assembly shall be designed to allow smooth and easy movement of the breakers within its castle.
The breaker shall have three distinct positions within the castle as follows :
i) ` Service' position : With main and auxiliary contacts connected.
ii) `Test' position : with power contacts fully disconnected and control circuit contacts connected. iii) `Isolated' position : with both power and control circuit contacts fully disconnected.
It shall be possible to achieve any of the above positions with the castle doors closed. Mechanical position indicators shall be provided for the three positions of the breakers.
4.5
Interlocking :
4.5.1. The moving portion of the circuit breaker shall be interlocked so that
i) It shall not be possible either to isolate it from the connected position, or to plug it in from the Isolated position with the breaker closed.
ii) The circuit breaker can be closed only when it is in one of the three positions or when it is fully out of the castle.
iii) It shall not be possible to open the hinged door of the castle unless the breaker is drawn to the isolated position.
iv) Inadvertent with drawl of the circuit breaker too far beyond the supporters is prevented by the suitable stops.
4.5.2 Provisions shall be available for the padlocking of the circuit breaker access flame in any of the three positions.
4.5.3 Automatically operated safety shutters shall be provided to screen the fixed isolating contacts when the breaker is drawn out from the castle.
4.5.4 The moving portion of the circuit breaker shall be provided with a heavy duty, self aligning earth contact, which shall make before and break after the main isolating contacts during insertion into with drawl
from the service position of the breaker. Even in the isolated position positive earthing contact should exist.
4.5.5 Auxiliary switches directly operated by the breaker operating mechanism and having 4 `NO' and 4
`NC' contacts, shall be provided on each breaker. The auxiliary switch contacts shall have a minimum rated thermal current of 10 amps.

5. Switch Fuse Units :

5.1
General :
The switch fuse units shall be of the load break, heavy duty, cubicle type conforming to the requirements IS
and of AC 23
duty.
The switch fuse units shall be capable of withstanding the thermal and electromagnetic stresses caused by short circuits for the time of operation of the associated fuse links.

The switch fuse units shall be double break and have quick make break mechanism, designed to ensure positive operation.

All switch fuse contacts shall be silver plated at the current transfer surfaces.

The unit shall be provided with a front operating handle. The ON and OFF positions of the switch handle shall be clearly marked.

5.2 Interlocks and Safety :

Interlocks shall be provided so as to prevent opening of the unit door when the switch is in the ON position and also to prevent closing of the switch with the door not properly secured. It should however be possible for a competent person to operate the switch shall be suitable for locking with switch in the OFF position by means of a padlock.

The interior arrangement of the switch fuse unit shall be such that all 'Live' parts are shrouded.

5.3 HRC Fuses :

The switch fuse units shall be fitted with High rupturing capacity cartridge fuse links with ISI marking for a rupturing capacity of not less than 80 KA at 415 volts. The fuse links shall be mounted in a drawout carriage, thus ensuring positive isolation of contacts during fuse replacements.

6. Current Transformers.

Current transformers shall comply with the requirements of relevant latest amendment IS. They shall have ratios, outputs and accuracy as specified in the schedule.

7.0 **Indicating / Integrating Meters** :

All indicating instruments shall be of flush mounted industrial pattern conforming to the relevant latest amended IS. The instrument shall have non reflecting bazels, clearly, divided and indelibly marked scales, and shall be provided with zero adjusting devices in the front. Integrating instruments shall be of flush mounted switch board pattern complying with the requirements of relevant latest IS.

8. Relays :Circuit breakers shall be provided with integrally mounted relays as specified in the schedule.

The relay shall have a set of three phase characteristics, which shall be adjustable over a wide range, to provide discrimination between a multiplicity of devices. The relay shall be able to provide over current and earth fault protection. Also UV and Shunt trip Relays are to be provided.

9. Control switches/Selector switches : Control switches/Selector switches shall be of the heavy duty rotary type, with plates clearly marked to show the operating position. They shall be of semi-flush mounted type with only the front plate and the operating handle projected.

Circuit breakers control switches shall be of the spring return to neutral type.

10. Indicating lamps and push buttons :

Indicating lamps shall be of the LED type of low watt consumption, provided with series resistors where necessary and with translucent lamp covers. Bulbs and lenses shall be easily replaceable from the front.

Push buttons shall be of the momentary contact, push to actuate type fitted with self-reset contacts and provided with plates marked with its junctions.

11. Cable terminations :

Cable entries and terminals shall be provided in the switch board to suit the number, type and size of aluminum conductor power cables and copper conductor control cables as indicated in the schematic diagram.

Provision shall be made for top or bottom entry of cables as required. Generous size of cabling chambers shall be provided, with the position of cable glands and terminals such that cables can be easily and safely terminated.

Barriers or shrouds shall be provided to permit safe working at the terminals of one circuit without accidentally touching that of another live circuit.

Cable riser shall be adequately supported to withstand the effects of rated short circuit currents without damage and without causing secondary faults.

Cable sockets shall be of copper and of the crimping type/soldering as required.

12. Control wiring :All control wiring shall be carried out with 1100/650 V grade single core Copper cable conforming to relevant IS having stranded copper conductors of minimum 2.5 sq.mm. section for CT Wiring and 1.5sq.mm for Control/indicating Instruments.

Wiring shall be neatly bunched, adequately supported and properly routed to allow easy access and maintenance.

Wires shall be identified by numbered ferrules at each end. The ferrules shall be of the ring type of non-deteriorating material. They shall be firmly located on each wire so as to prevent free movement.

All control circuit fuses shall be mounted in front of the panel and shall be easily accessible.

13. Terminal blocks and lables :

Terminal block shall be of 500 volts grade of the stud type. Insulating barriers shall be provided between adjacent terminals.

Terminal block shall have minimum current rating of 10 amps and shall be shrouded. Provisions shall be made for lable inscriptions.

Lables shall be made of anodized aluminum, with white engraving on black background. They shall be properly secured with fasteners. Danger plate of size and descriptions as recommended in the relevant IS shall be provided on the PCC.

14. Tests :

i) The power control centre shall be completely assembled, wired, adjusted and tested for operation under simulated conditions to ensure correctness of wiring and interlocking and proper functioning of all components.

ii) Each power control centre and components shall be subjected to standard routine tests as per applicable clauses of relevant standards.

iii) All current carrying parts and wiring of power control centre shall be subjected to power frequency voltage withstand test.

15. Drawings : After the award of the contract the contractors shall submit three copies of the following drawings for approval of the Department.

i) Outline dimensional drawing of the PCC showing the general arrangement indicating the following :

a) Busbar clearances;

b) power and control cable entry points;
c) Configuration of busbars;
d) Details of support insulations and spacings;
e) Outgoing power cable termination arrangements.

ii) Single line diagram of power control centre showing Protection, Metering etc.

iii) Cubicle wiring diagram.

iv) List of Firements with Ratings & makes / Models

16. Installation Testing and commissioning :

The power control centre shall be installed over the cable trench/cable pit using suitable size of MS channel including grouting of the channel with necessary bolts and nuts. Proper earthing of PCC shall be done using two independent copper/GI strip of sizes as indicated in the schedule. The channel shall be painted with one coat of red oxide primer and two coats of anticorrosive enamel paint of proper shade as directed by the Engineer-i-charge.
The pre-commissioning tests as required shall be done and the PCC shall be commissioned.

LIST OF APPROVED MANUFACTURERS / NATURAL SOURCES OF MATERIALS TO BE USED IN

S.No.	Material Name.	Brand / Manufacturer / Recommended Make.
1.	Switches/Sockets	MDS (Mosaic) / MK India / Anchor Woods / Clipsal/crabtree
2.	Copper Conductor wires	Finolex / Qflex/ Lapp/ Anchor/KEI/Polycab
3.	PVC conduits & Accessories	Precision / Sudhakar/ Avon plast
4.	MS Conduits	Gupta / Bharat
5.	Metal clad Sockets	MDS /L&T- Hager / Merlingerin /BCH
6.	MCBs /MCB Distribution boards	MDS /L&T- Hager / Merlingerin(Compact)
7.	MCCBs/Switchgear	GE Power /Merlin Gerin(Compact) /BCH /L&T /MD
8.	Cable Glands	HMI /Comet
9.	Capacitor Bank	Epcos /Neptune
10.	Cable Lugs	Dowell's / 3D
11.	MV Panels (PCCs)	Manufacturers with CPRI Test Certificate.
12.	ELRs/CBCT	Prokdvs /Nagoba
13.	Measuring Instruments	Prokdvs /Enercon
14.	Selector Switches	Vaishno / Salzer / Kaycee
15.	Indication Lamps LED (protected type)	Schneider / Vaishno / Binay
16.	Resign cast CTs	AE / Kappa
17.	Telephone Wires	Lapp / Delton /National
18.	Light Fixtures	Philips / Tulip / GE/Wipro/ Crompton
19.	Ceiling Fans & Exhaust Fans	Usha / Polar / Khaithan / Bajaj

NOTE : The contractor shall use only above mentioned material or equivalent make to be approved by the Consultant. All other materials shall confirm to the specifications laid down. The tenderer shall take this into account while tendering rates / prices. The Consultant / Owner has got every right to select any of the above Makes for the Project. However the samples of every material including all fixing accessories shall be got approved by Owner / Consultant before Execution.

NON-SOR ITEMS

Acrylic signage:

The acrylic signage shall be made of minimum 3mm translucent acrylic sheet, digitally printed as directed by engineer in-charge. The Box of the signage shall be made of Powder coated GI sheet of minimum thickness 0.5mm. The internal frame shall be made of m.s. pipes (25mmx25mm) section welded and duly coated with red oxide. The signage box shall be internally lit by T5 (40watt)/ LED (of respective wattage) (of make Bajaj, Philips, Crompton greeves, Havells). The wires shall be of make finolex, anchor etc.

M.S. BENCHES

The m.s. benches shall have frame of 40mmx40mm m.s. tubular section (medium weight) duly coated with red oxide. The M.S. pipe shall be duly fixed on the floor with extended member grouted on concrete at each corner. The grouting length shall not be less than 300mm. The top and back of the bench shall be made of CNC cut 6mm sheet, powder coated of shade as directed by engineer in-charge.

SAND STONE SEATING

The sand stone (rainbow/ teak wood) seating shall be made by 100mm sand stone slabs jointed to each other by cement mortar, the joint shall be groove joint and shall not be visible. The sand stone shall be of Honed finish, duly coated with two coats of stone sealer of approved brand. The vertical supports of the seating shall be fixed on
200mm thk PCC
bed.

SOLID STONE SEATING

The solid stone seating shall be carved out of single stone piece. The sand stone shall be of shade 'rainbow, teak wood, chocolate brown or similar shade as approved by engineer in charge'. The contractor must insure that the carving is done in proper manner with out leaving any cracks. The finished stone shall be polished with stone sealer. The seat shall be placed on already prepared M15 concrete platform.

FERROCRETE SEATING

The seat shall be pre-cast with 6mm wire mesh as reinforcement structure. The wall thickness of the seat shall not be less than 30mm. The seat shall be placed and fixed to the ground PCC bed. The surface shall be duly painted with enamel paint of required shade. The seat shall be made out of single mould no joints shall be visible.

SOLID EXPOSED CONCRETE SEATING

The exposed concrete seating shall be caste in situ by cement concrete grade M20, The centering/ shuttering shall be made of 12mm ply in desired form. The concrete finish then shall be duly polished with sealer. The base for the concrete seat shall be prepared by 150mm thick PCC bed (M15).

FIBBRE MADE DUSTBINS

The dustbins of quality as approved by engineer in charge shall be single mould cast of size 0.60m x0.60m.x0.90m. fixed on M.S. frames with sewing mechanism.

TENSILE ROOF STRUCTURE

Complete tensile membrane system shall be of coated fabric 700 GSM, fabric shall be fitted with pre-tensioning. All the corner fitting in fabric contact shall be in S.S. 316 steel. Structure shall be epoxy colour coated in selected shade. Roofing shall be fixed with 10,12mm galvanized wire with SS 316 end fitting.

12MM FIXED TOUGHENED GLASS

12mm Fixed toughened glass (of make saint gobain or equivalent) shall be fixed with the help of SS fittings, channels of make (Dorma, enox or equivalent).

BACKLIT ACRYLIC LETTERS

Backlit letters shall be made of 3mm thick acrylic sheets, CNC cut fixed with SS studs.

CIVIL WORKS

LIST OF APPROVED MAKES FOR CIVIL WORKS

Note:- Final choice of brand / make shall remain with Engineer in charge whose decision in this matter shall be final. Contractor should provide the material approved by engineer in charge without any extra cost.

S. No.	MATERIALS	PROPOSED BRAND NAMES/MANUFACTURER'S NAMES
1	OPC,PPC,PSC	Ultratech, GujratAmbuja, Lafarge, Birla
2	White cement	Grasim Industries ltd , J.K. Cement, Birla white
3	Construction chemicals	Sika India pvt. Ltd., Fosroc Chemicals(India)Ltd., Pidilite Ind. Ltd ,Cico Tec. Ltd
4	Pigments	Tata chemicals, Sudershan Chemical Industries
5	Adhesive	Pidilite Ind. Ltd , Vam Organic
6	Reinforcement Steel bars	As per IS:1786
7	Glass Mosaic Tiles	Bizasa , Pilladio, Pixel glass Mosaic,Pearl
8	Ceramic Tile	Dakshini Murty, Bell , Johnson, Kajaria, orient, NITCO, Euro.
9	Tiles: Glazed tiles	Bell/ Somany / Johnson / Kajaria / Spartek / Orient / Nitco / Swastik Tile/ Ultra
10	Tiles: Vitrified Tiles	Bell/ Somany / H.R.Johnson / Kajaria / Spartek / Orient / Nitco /RAK / Swastik Tile/Ultra
11	Pavers & Kerb Stone	Rajesh tiles , Ultra tiles KK Manholes / Uni Stone Products (India) Pvt. Ltd/ Hindustan Tiles/ Raj tiles
12	Tiles Adesive/Grout	Bal Endura , Latecreat , Unitiles
13	Plastic or Acrylic Emulsion Paint, Synthetic enamel Paint, Oil Bound Distemper, Dry Distempers, Aluminium Paint, Primers (Cement wood , Metal	Asian , Nerolac , Jonson & Nicholson
14	Cement Based Paint (for Exterior)	Super Snowcem or Snowcem plus , Duro cem
15	Paint- Cement Paint	All types of paints i.e. cement based paints, Oil bound distemper, acrylic paints, plastic emulsion paints etc
16	Paint - Dry Distemper	
17	Paint - Oil Bound Distemper / Acrylic Washable Distemper	

18	Paints - Cement Based	shall be First quality of ICI, Berger, Asian, Dulux, Goodlas Nerolac and Johnson & Nicholsan make, For Cement based paint add Snowcem plus and Tatacem make
19	Paints - External Emulsion Paint	
20	Paints - Other Paints / Primer	
21	Paints - Plastic Emulsion Paint	
22	Paints - Resin Based Paints	
22	Paints - Synthetic Enamel Paints	

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S. No.	MATERIALS	PROPOSED BRAND NAMES/MANUFACTURER'S NAMES
23	Paint Epoxy paint	Nerolac / Shalimar / Cico / Fairmate / Sika / BASF / Berger / Asian / Pidilite
24	Paints - Texture paint	Berger / J & N / Spectrum / Unilite heritage /Asian / Shalimar / ICI .
25	Paver blocks (All Types)	
26	M.S. Pipe	Jindal / Prakash – Surya / BST/ Kalinga /TATA / TT Swastik

General Guide lines to Prepare Tensile Fabric Roof Membrane Structure

1) Scope of Works (for Tensile Fabricator):

i) The Fabric Roofing, Contractor shall be responsible for the design, engineering, patterning, Welding, Fabrication, supply and installation of the tensioned membrane structures completely as shown on the drawings including the followings:

- Design, engineering, and patterning of Architectural Membrane, cables and related perimeter attachment hardware.
- Supply of Architectural Membrane, cables, complete perimeter attachment system, and all normally associated components.
- Fabrication of Architectural Membrane.
- Delivery of all supplied components to the project site.
- Installation of all supplied items.

ii) For steelwork, the contractor shall be responsible for the:

- Steel roof shop drawing, fabrication and connection details.
- Steel shop drawings
- Steel fabrication
- Painting of the steel structure
- Steel installation

iii) The work shall consist of the supply of all labour, tools, plant and materials necessary to complete the design, supply and installation of the tensioned membrane. The work shall be executed in the best trade practice by a Specialized Tradesman, all strictly in accordance with a reputable manufacturer's written instructions.

2) Fabric Roofing:

As per detailed drawings, the canopy shall be an engineering tensile membrane structure designing,

fabricating and installation company having full time business of Tensile Membrane structure only.
The Architectural Membrane shall be Polyester Yarn PVC coated PVDF coated both side, suitable Make - **Ferrari / Mehler or equivalent having 15 years warranty.** The complete FEM Analysis should be done ONLY on high end software Membrane (N D N) version.2.25 or higher having following features (Based on NASA developed Algorithms). The software should take care of following operations like:

3 D model building: After modeling based on our actual site conditions, software Membrane version.2.25 or higher only, which takes care of following operations:

Shaping: The Shape Generation Environment performs form finding of the membrane system. It operates on either the membrane components alone, or on the full system, as directed by the user. It can be used to produce shapes with either defined stress fields or defined force densities. All element types — including cables, struts, and beams — can be actively and simultaneously used during the form-finding process.

Loading: This Environment is used to generate the data for externally applied loads such as wind, snow and live load.

Analysis: The Analysis Environment performs the large deflection FEM analysis based on the Stiffness Method. The internal solver is an optimized sparse matrix solver. It is not limited by bandwidth and uses minimum memory.

Post Processing: The Post Process Environment allows examining and graphically displaying analysis results, such as deflections, stresses, member forces and moments. It currently performs automatic steel and cable member sizing using British, Australian, or U.S. design codes. It generates output and calculation reports to several different levels of detail.

Patterning: The Pattern Environment allows patterns to be defined individually by the user or generated automatically based on an available fabric width. DXF files are generated yielding the cutting patterns as an "exploded assembly" complete with marking plans. Pattern edges are splinted and seam allowances (adds and subtracts) are automatically included.

3) Design:

The following items shall be the design responsibility of the contractor. All calculations and drawings shall be endorsed by the contractor/ for the project.

- Calculation of wind and other loads from information supplied on the Contract
- Drawings and considering local conditions;
- Computer analysis of fabric structure (non linear analysis)
- Provision of computations.
- Detailed design of structural steel to support tensioned membrane:
- Provision of reactions and geometry to check the design and capacity of the foundations and supporting superstructure.
- Design of steel tensioning cables

4) Design Criteria, Codes and Standards:

The membrane structure shall be designed to comply with all statutory requirements under the Building Ordinance and inter-related Regulations and Codes of Practice

i) Live Load: - 50 Kg/m2
ii) Wind Load: IS 875 Indian Wind Code: 50 meter/second.
iii) Wind pressure coefficient: - IS 875 (part 3).

5) Life Safety:

All fabric structures shall be designed so no life safety issue is created in the event of a loss of a part of the fabric.
i) The fabric structure shall not rely completely on the fabric for structural stability.
ii) The tensioned membrane shall conform to the current relevant standards and to the requirements of the statutory authorities. Relevant publications of particular importance are as follows:

* IS 875 (part 3) - : Indian Wind Code
* BS 8118: Structural Use of Aluminum
* AS 1441: Method of Test for Coated Fabrics
* AS 1530: Methods for Fire Tests on Building Materials, Components and Structures
* AS 2001: Methods of Test for Textiles
* IS: 800 Code of practice for general construction in steel.(Reaffirmed 2003)
* IS: 814 Covered Electrodes for Manual Metal Arc Welding of Carbon and Carbon Manganese Steel Specification
* IS: 816 Code of practice for use of metal arc welding for general construction in mild steel
* IS: 817 Training and testing of metal-arc Welders (Part 1 & 2)
* IS: 808 Dimensions for Hot Rolled Steel Beam, Column, Channel and Angle Sections
* IS: 961 Structural steel (High Tensile)
* IS: 1363 Black Hexagonal Bolts, Nuts and Lock Nuts and Black Hexagonal Screws
* IS: 1364 Precision and Semi-precision Hexagonal Bolts, Screws, Nuts and Lock Nuts
* IS: 1367 Technical supply conditions for threaded fasteners
* IS: 3757 Specification for High Strength Structural Bolts
* IS: 3139 Dimensions for screw threads for bolts and nuts (dia range M42 to M150) [covered in
* IS: 4218 Part 5] IS: 2016 Specification for Plain Washers
* IS: 3613 Acceptance tests for wire flux combination for submerged arc welding
* IS: 1852 Rolling and cutting tolerances for hot rolled steel products
* IS: 2074 Ready Mixed Paint, Air Drying, Red Oxide Zinc Chrome, Priming – Specification
* IS: 875 Code of Practice for Structural Safety of Building - Loading Standards
* IS: 1893 Recommendations for Earthquake Resistant Design of Structures
* IS: 4000 Code of practice for high strength bolts in steel structures
* IS: 4353 Submerged Arc Welding of Mild Steel and Low Alloy Steels – Recommendations
* IS: 823 Code of procedure for manual metal arc welding of mild steel
* IS: 1181 Qualifying Tests for Metal Arc Welders (engaged in welding structures other than pipes)
* IS: 1182 Recommended Practice for Radiographic examination of Fusion - Welded Butt Joints in Steel Plates
* IS: 2595 Code of Practice for Radiographic Testing
* IS: 3658 Code of Practice for Liquid Penetrations Flaw Detection
* IS: 5334 Code of Practice for Magnetic Particle Flaw Detection of Welds
* IS: 1477 Code of Practice for Painting of Ferrous Metals in Buildings and Allied Finishes
* IS: 801 Code of Practice for Use of Cold Formed light Gauge Steel Structural Members in General Building Construction
* IS: 806 Code of Practice for Use of Steel Tubes in General Building Construction
* IS: 7205 Safety code of Erection of Structural Steel work
* IS: 7215 Tolerances for Fabrication of Steel Structures
* IS: 1161 Steel Tubes for Structural Purposes – Specification
* IS: 811 Cold formed light gauge structural steel sections
* IS: 6610 Specification for Heavy Washers for Steel Structures
* IS: 12843 Tolerances for erection of steel structures
* IS: 1261 Code of practice for seam welding in mild steel
* IS: 3600 Method of Testing Fusion Welded Joints and Weld Metal in Steel: Part 2 Beam impact (charpy Vnotch) test IS 1024 Code of practice for use of welding in bridges and structures subject to dynamic loading
* IS: 1323 Code of practice for oxy-acetylene welding for structural work in mild steels
* IS: 1395 Low and medium alloy steel covered electrodes for manual metal arc welding
* IS: 2879 Mild steel for metal arc welding electrodes

6) Submissions

1. Samples of fabric proposed to use: The successful bidder will submit sample of fabric for the approval of Engineer in charge and will go ahead only with his approval of fabric.

2. Successful bidder will submit his plan and course of action in writing with proper milestone to finish the project in scheduled time and will ensure to stick to milestones set.

3. Shop Drawings: The Contractor shall submit the shop drawings of the structural steel work for review and shall obtain an approved copy before commencing fabrication. The drawings shall show in standard engineering drawing manner, clear and complete details of each assembly, component and connection in the work, together with information relative to their fabrication, surface treatment and erection. Drawings are defining the complete structure, connection details, interfaces, and general fabric seam arrangement shall be submitted by the subcontractor for review and approval by the project engineer/architect. Drawings shall confirm the general arrangement submitted with the tender. While preparing the drawings, the following shall be considered and included:-

i) Computer generated model indicating the shape and overall appearance of the Tensioned Membrane.
a) Ensure that Shop Drawings conform to the requirements of the Contract.
b) Prepare all drawings of consistent standard size.
c) Submit two (2) initial copies to the structural engineer for examination. If amendments are required, the engineer shall mark one (1) copy and return to the Contractor for amendments to the original Shop Drawings. [This process may be repeated until the engineer considers that the Shop Drawings are satisfactory].
d) Acceptance of the Shop Drawings shall imply only that the engineer's interpretations of the relevant requirements of the Contract are generally correct, but shall in no way relieve the Contractor of his obligations under the Contract to construct and complete the Works correctly and accurately.
e) The survey is to include a check that the Main Contractor's design and built foundations on which steel is to be placed by the steelwork sub contractor are at the correct levels to receive base plates and/or other fixings and verify the correctness for location and level of all anchor bolts set in the bases. Immediately notify the Architect of any inaccuracies.
ii) Specification sheets for the Membrane proposed to be used by the contractor, demonstrating compliance with the requirements herein
iii) Schedule indicating key milestone dates during the project.
iv) A compilation of all calculations and the basis therefore shall be submitted as substantiation for the sizes, loads, and dimensions shown on the drawings.
v) Maintenance manual: Submit two (2) copies of a maintenance manual for the fabric roof structure to the Client. The manual shall include a schedule for routine inspection, an inspection checklist, instructions for emergency repair and use of emergency repair materials, and warranty.
vi) Test reports, indicating that the Specified Architectural Membrane meets the criteria listed: Physical test data of the actual roll goods to be used in the project confirming conformance with specifications for the fabric.
vii) Installation scheme, phasing, erection methodology, equipment details etc need to be submitted to the structural engineer for their approval before starting any activity at site.

7) Engineering
Structural calculation for the tensile membrane project shall be prepared by, or under the direct supervision of the structural engineers on the record. Drawings shall define the completed structure, precise interface geometry determination, definition and co-ordination with the superstructure, reaction loads, connections, details, interfaces and seam layout together with foundation layout. All structural drawings and calculations shall be prepared under the supervision of, and endorsed by a fully qualified engineer - the Designer. The Designer must also possess competence and experience in the design and construction of tensioned fabric structures, acceptable to the lead consultant.

Structural calculation for the tensile structure shall include the following:

i) Large deflection numerical shape generation that will ensure a stable uniformly stressed three dimensionally curved shapes that is in static Equilibrium with the internal Pre - stress forces, and is suitable to resist all applied loads.
ii) Large deflection finite element method structural analysis of the membrane system under all applicable applied wind, dead and live load conditions.
iii) Large deflection non linear finite element method structural analysis of the fabric support frame system.
v) Accurate generation of the two-dimensional compensated fabric templates required to generate the three-dimensional equilibrium shape.
vi) Member size calculations of all major primary structural members.
vii) Connection design including bolts, weld, and secondary member sizing required for the fabric support.

8) Warranty:
i) All materials supplied and installed or erected shall be in accordance with this specification and shall be guaranteed against water leakage, faulty materials and workmanship for 5 years.
ii) The warranty shall be underwritten by the tensioned fabric structure manufacturer for the fabric used too.

9) Fabric Materials
i) The fabric membrane shall comprise high quality PVC coated fabric with PVDF top coat and back PVDF coat.
ii) The primary materials shall be obtained from one manufacturer.
iii) The entire membrane shall be fabricated from one type of fabric. The grade of fabric shall be that required by detailed finite element analysis calculation. The contractor shall submit the detail of selected membrane, and provide a specification data sheet and A4 size sample.
iv) The final color of the membrane should be white/off white.
v) Coating defects such as pinholes, cracks, lumps and broken yarns which reduce the weathering protection to the yarns shall be limited to less than 1% of the surface area of the fabric and shall not affect the complete protection of the Fabric.

11) Patterning:
i) Design: Membrane-form finding design analysis and patterning shall be by computer finite element analysis
conducted by the manufacturer's engineer experienced in the field of tensile membrane engineering.
ii) Seam Layout: Submit to the Architect for approvals a seam layout indicating the proposed location of all seems to be included in the complete membrane.

12) Fabrication of Fabric Panel:
i) General:
a) Fabrication shall only be by an approved specialist fabricator experienced in the work.
b) Fabric shop drawings shall include all information necessary for the fabrication of the fabric membrane.
They shall include size and shape of envelope, type and location of shop and field connections, size, type, and extent of all heat welded seams.
c) The fabric membrane shall be fabricated in a sizable, clean, properly equipped and systematically established factory shop condition specialized in the fabrication of tension membrane.
d) All membrane shall be patterned using finite analysis computer modeling. The membrane shall be cut using the latest CAD/CAM manufacturing technology with a tolerance of -1mm, +1mm.
e) The fabricator shall exercise necessary care to plan and assemble the sections such that the assembly has no shop patches. Splices, if any, shall be patterned into a symmetrical and repetitive geometric arrangement within the assembly, shown on the shop drawings and where feasible hidden by structural members. He shall exercise great care in marking, cutting, aligning, checking, welding seams and additions as well as general handling and soiling prevention procedures to produce a smooth uniform surface with even curved edges free from irregularities and interfaces lacking wrinkling, cuts, abrasions,

stains of marks, surface imperfections or welding aberrations. The fabric shall be cut along marked lines to an accuracy of +1mm.

ii) Fabric Joints:

a) Fabric joints shall be formed under pressure at the appropriate temperature and to a tolerance of +1mm, -1mm. adjacent panels shall be overlapped, the joints shall be formed using high frequency equipment.

b) The fabricator shall carefully plan his assembly to ensure that seams are always single laid and that a cut edge does not face uphill.

c) Joints shall be symmetrical as specified by the cutting pattern. No short pieces or selvage will be permitted.

d) All fabricated joints shall have a minimum of 90% of the total strength of the coated fabric in strip tensile testing. All structural joints shall be fused in accordance with industry standards and shall maintain the integrity of the coating.

iii) Rope Edges:

Rope edges shall be formed using PVC cord minimum diameter 12 mm. All add-on details to the fabric shall use the same fabric jointing procedures as for structural joints.

iv) Field splices:

The structure fabricated using field splices shall be limited to places where factory seaming is not possible and applied only where shown and Approved by the Architect. Where splices are not specified and the fabricator proposes the use of same, full description including details of location and design shall be provided to the Architect for approval.

13) Erection

ii) Method of Erection:

a) Erection shall only be executed by the fabricator's experienced installation supervisor. Such person shall have at least 4 years experience in tensile membrane structures installation. They shall attend all membrane erection actions at the site. Provide guidance where necessary and appropriate.

b) The erection procedure shall be examined with respect of practicality and compatibility with other work on the project. Where the sub-contractor proposes to use a different basis for the erection procedure, full details shall be submitted for approval.

iii) Preparation for Installation of Fabric:

a) A clear and level site shall be provided for undertaking erection and assembly procedures of the fabric element. The Contractor shall arrange for activities on the site to co-operatively fit in with the erection procedure of the fabric membrane.

b) Prior to commencement of erection, the contractor shall check all contact surfaces to be in contact with the fabric for smoothness, and remove causes for rips and/or scratching during the installation of the fabric panels.

c) The contractor shall provide ground sheets where the membrane is to be dragged across a surface. Prevention of chaffing of the surface is required at all times.

d) The contractor shall limit access to the area where the fabric is to be installed to only the personnel during the preparation and installation of the fabric structure for proper protection. The fabric shall be protected from damages upon installation.

iv) Installation of fabric:

a) The sub-contractor shall install the fabric structure in a sequence and with sufficient bracing to ensure stability of the structure.

b) No creasing or folding of the fabric around sharp corners will be permitted. The fabric shall not be abraded in any manner.

v) Pretension:

The fabric shall be stressed uniformly to avoid local over stresses. The Engineer - in- charge shall be informed of any condition, which is unexpected or causes concern.

vi) Damage occurring during the installation sequence may be temporarily repaired with field patches; however, permanent repairs shall be made with full panel replacement from seam to seam or seam to approved splice.

14) Final Inspection:
The specialist contractor shall give one full working day's notice to the Engineer-in-charge on completion of installation of tensioned membrane and shall execute immediately any adjustments, making good damage or defects.

15) Mode of Measurement:
i) Actual Surface Area (i.e. arch length * total Length) / Geometrical shape will be calculated for the measurement purpose.
ii) Structural Steelwork as per drawings submitted and erected. In case the weight is to be measured, sample size pipe will be weighed and multiplied as per drawing length. The wastage and loss in cutting is to be considered while actually calculating.

16) Set-Outs and Survey - Steelwork:
a) A survey of installed anchor bolt or steel stub positions and foundations shall be carried out by the Specialist Steelwork Sub-Contractor for checking accuracy a minimum of 21 days before the scheduled erection of the steelwork.

17) Handling and Storage and Protection:
a) Handle and store steelwork items carefully and in such manner as to avoid damage and to protect from the elements. Proprietary items shall be stored as recommended.
b) Make good damage to conform to the original specification or replace completely.
c) Protect all surfaces from damage from any cause whatsoever, and where necessary, cover with a protective membrane or a strippable temporary coating. Remove all temporary protective measures on completion.

18) Welding:
a) Provide an experienced and competent operative to supervise welding. Submit evidence that all welders are capable;
b) When directed by the Engineer-in-charge, keep a site record that identifies the welders responsible for major welds.
c) Plan the fabrication and erection of structural steelwork to avoid the need for the site welding. Site welding will not be permitted unless Approval is given by the Engineer-in-charge.
d) Where site welding is permitted follow the procedures described below:-
* Surfaces to be welded must be clean, free from paint, grease, contaminants dry and free from condensation. Where the steel is damp or the temperature is low then warming with a low temperature flame may be used. Thermal indicating crayons may be used to determine the plate temperature and the area preheated;
* Protection from the weather: provide adequate protection to shield the welding from the weather. Tent type structures made from fireproof and waterproof material may be used to shield the weldment from the wind and rain. Such temporary structures to be mounted on stable scaffolding supports and a stable platform to be provided for the welder Where welding to hollow sections is required ensure draughts are prevented from blowing through the section.
* Electrodes: bake on site at a temperature between 100/C and 150/C and where necessary store in heated quivers for use at the welders convenience;
* Power supply: may be from a transformer or generator to provide a three phase power supply of the required voltage. Locate the generator or transformer as close as possible to the welder to prevent a drop in voltage along the cables length. Ensure all the cables are as short as possible, routed away from the path of construction vehicles, and adequately protected.
* Earth run: adequately earth all electrical plant. Ensure the welding return from the weldment is adequate in cross section and correctly connected and earthed.
* Weld detail: ensure the welded joint is of the correct profile and fit up. As a general guide do not carry out welding where the gap is less than 1 mm or more than 3 mm unless a backing strip is provided. Where a backing strip is provided the weld gap is not to exceed the greater of 5 mm or the thickness of the material being welded. Adequately support all welded joints with props or restraints that ensure relative movement of the fusion faces is prevented;

* Work in confined spaces: provide adequate ventilation and formulate plans of evacuation and escape before the work commences.

19. TECHNICAL SPECIFICATION OF WELDING:

Wherever specified in to drawings or instructed by the Architect/project Manager welded laps shall be provided and paid for separately unless specifically included in the item or work. The welding of bars shall be done in accordance with IS: 816A, IS: 2751, IS: 9417 and as specified on the drawing and instruction. But welding between the ends of bars in line whereby the stress in transferred across the weld will not be permitted. No welding shall be done at the bend in a bar.

Following sizes of electrodes shall be used for lap with longitudinal beads:
Bar diameter (mm) - 6 10 20 32 40
Electrode size (mm)- 2 2.5 3.5 5 5

The thickness of weld shall be 0.2 diameter of the said smaller diameter bar unless otherwise specified in the drawings. The length of longitudinal bead to weld cold twisted deformed bars shall be 12 diameters of the bar of which not more than half the length shall be permitted for a continuous bead in any case.

The contractor shall employ only a qualified and tested welder specifically trained and experienced in welding of reinforcement bars to execute the welding of laps to the complete satisfaction of the Architect/Project Manager.

Before doing the welding of bars at side the contractor shall make minimum 3 joints and get them tested in a approved laboratory (including x-ray testing of welds if required) at his own cost. The contractor shall be permitted to do the welding only after the satisfactory test certificate from the laboratory is obtained. Whenever the welder changes, similar test shall be carried out again.

The following precaution must be taken for welded laps:
(a) If the cold twisted deformed bar to be lapped has an untwisted end at the lapping point, the same portion shall be cut off prior to welding up to a length of at least 10cms from such end.
(b) Bars shall be aligned and kept in proper axis in order to minimize crookedness in bar after welding.
(c)Slag produced in welding after alternative run should be chipped and removed by rush.(e) Electrode should not be lighted by touching the hot bar.

Base Plates and Anchor Bolts:

a) Base plates supported on concrete, whether shop attached or shipped loose, shall be furnished and set on shims or leveling plates. Grouting shall be by the Steelwork Sub Contractor.
b) Anchor bolt locations shall be furnished by the steelwork subcontractor and used by the Concrete Contractor to install the bolts to the required tolerances. The Concrete Contractor shall check concrete. Anchor bolts shall have nuts and washers and shall have threads protected during the concrete pour. Damaged threads shall be repaired or be cut to permit full tightening of nuts.
c) Where dissimilar metals are in contract or where like metals are fixed in just a position in a situation where exposed to the weather and corrosion due to crevice effect is likely, separate the mating or contacting surfaces by one of the following means:-

(1) By coating one (or both) of the contact surfaces with two (2) coats of Epozy primer
(2) By coating as above, two (2) coats Epoxy paint.
(3) By inserting continuous strips of non-hardening chromate or pressure sensitive PVC tapes.

Protective coating to all structural steelworks shall be according to General Specification. Submit paint manufacturer's data for approval before use.

Materials:-

a) Scope of Works :
This work shall consist of the fabrication and supply of all the structural cables and fittings for the support of the tensioned membrane structures as shown on the drawings.

b) Cables and Fittings :
All edge cables to be Galvanized Strand of 1 x 19 constructions (Grade 1570MPa standard) with galvanized end terminations. All tensioners, nuts and bolt shall be hot dipped galvanized and manufactured to the relevant standards. All membrane plates shall be proprietary design manufactured to IS standards. All membrane plates shall be hot dip galvanized and treated with a two-coat epoxy paint finishing system applied by an accredited painting contractor.

c) Joints in Cables:
No splicing or joining of wires strands or ropes shall be permitted. Wire rope shall be packaged in coils or reels at the discretion of the manufacturer, and handled throughout in such a manner as to avoid permanent deformation of wire, rope or strand.

d) Swaged Terminals:
All terminations shall be galvanized. The materials, thickness and swaging system employed shall be chosen by the specialist contractor to achieve a breaking strength of the terminal detail not lower than the specified minimum breaking strength of the cable.

e) Shackles, Rigging Screws and Turnbuckles:
All fitting shall be hot dipped galvanized. The strength of the shackles, rigging screws and turnbuckles etc shall exceed the minimum breaking load specified on the drawings. The shackles, rigging screws and turnbuckles etc shall meet the tensioning and tolerance requirements for the fitting.

Fabrication:-
a) Accuracy of Fabrication:
The overall cable length including terminations shall comply with the following tolerances at the prestress load:
Strand +/-1mm for lengths less than 2 meters.
+/-2mm for lengths greater than 2 meters but less than 5 meters.
+/-3mm for lengths over 5 meters

b) Cutting:
Cables shall only be cut using carborundum disc cutters or other approved mechanical devices. Under no circumstances will thermal cutting be approved.

iii) Tolerances:
Thickness shall be plus or minus 10%. Width shall be plus or minus 1.6 mm whole spacing (if required) shall be plus or minus 1% of theoretical.

20) Technical specifications for Fabric Cutting Plotting Machine:

The Prosail Mklll Plotter/ Cuttter or equivalent shall be used for tensile membrane structures to cut the panel in single stroke. The integrated drill punch function shall be employed for making the curves gentle and cut in smooth shapes. The cutting will be completely done on the machine and not manually.

Electrical Technical Specifications

1 TECHNICAL SPECIFICATION FOR MAINTENANCE FREE OUTDOOR 11 KV RING MAIN UNIT SWITCHGEAR

1.1 GENERAL:

1.1.1 All equipment and material shall be designed manufactured and tested in accordance with the latest applicable IEC standard.

1.1.2 Equipment and material conforming to any other standard, which ensures equal or better quality, may be accepted. In such case copies of English version of the standard adopted shall be submitted.

1.1.3 The electrical installation shall meet the requirement of Indian Electricity Rules-1956 as amended up to date; relevant IS code of practice and Indian Electricity Act-1910. In addition other rules and regulations applicable to the work shall be followed. In case any discrepancy the most stringent and restrictive one shall be binding.

1.1.4 The high-tension switchgear offered shall in general comply with the latest issues including amendments of the following standards but not restricted to them.

1.2 SCOPE

Design, Engineering, Manufacture, assembly, Stage testing, inspection and testing before supply and delivery at site, Erection, Installation, testing & Commissioning of Ring Main units outdoor type SF6 filled , with various combinations of load break isolators & breakers.

The RMUs should be provided with necessary take off terminal units for future automations and all these units should be shielded in a outdoor metal-body for making them suitable for outdoor use. The insulation/dielectric media inside the stainless steel welded tank should be SF6 gas. The RMUS should be of **extensible type on both sides** with provision of attaching/connecting with SNAP FIT arrangement W/o External Busbars additional load break switches and circuit breakers **in future whenever required.** Alternatively Extension shall be possible by adding trunking chambers and required accessories or by plug-in bushing type arrangement.

Configurations Required:-

a) 2-Way , 11KV Gas (SF6) Insulated RMU with One 630A load break switches and One SF6 Insulated VCB of suitable rating –3-way , 11KV
,Gas (SF6) Insulated RMU with 2Nos 630A load break switch and 1No. SF6
insulated VCB of suitable rating -

b) 4-way ,11KV Gas (SF6) Insulated RMU with 2Nos 630A Load break switches and 2Nos , SF6 Insulated VCB of suitable rating –

PLS NOTE : THE NOMINAL CURRENT RATING OF VCB SHALL BE ACCORDING TO LOAD OF THE FEEDER AND ACCORDINGLY SUITABLE RELAY SHALL BE PROVIDED .

1.2.1 This Specification provides for design, manufacture, inspection and testing before despatch, packing and delivery F.O.R.(Destination) of SF6 insulated RMUs with necessary take off terminal units for future automations, other accessories and auxiliaries equipments and mandatory spares, described herein and required for their satisfactory operation.

1.2.2 The objective of the RMUs is for extremely small construction width, compact, maintenance free, independent of climate, easy installation, operational reliability, Safe and easy to operate, minimum construction cost, minimum site work and minimum space requirement.

1.2.3 The RMUs shall conform in all respects to high standards Of Engineering design, workmanship and latest revisions of relevant standards at the time of offer.

1.2.4 The type of the 11 KV circuit breaker shall be VCB and insulating medium for load break isolators, Earth switch, 11 KV Buses and other associated equipments should be SF6 gas.

1.3 **GENERAL**

The Ring Main Unit shall be installed at 11 KV junction points to have continuous supply by isolating faulty sections. The RMU shall be extensible on both sides and consists of the following combinations of load break switches and Circuit breakers for a nominal voltage of 12 KV using SF6 gas as insulating and Vacuum as arc quenching medium.

The RMU and combination shall be tropicalised and outdoor metal enclosed type. The RMU metal parts shall be of high thickness, high tensile steel which must be grit/short blasted, thermally sprayed with Zinc alloy, phosphate or should follow the 7 tank pre-treatment process and be subsequently painted with polyurethane based powder paint. The overall paint layer thickness shall be not less than 80 microns.

Relevant IE rules for clearances, safety and operation inside the enclosure shall be applicable. The enclosure shall be IP 54 and type tested for weather proof at EREDA/CPRI.

All live parts except for the cable connections in the cable compartments shall be insulated with SF6 gas. The SF6 gas tank shall be made of TIG or MIG or Laser welded stainless steel, to have the best weld quality or It shall be metallised resin cast construction. The gas cubicle shall be metal enclosed with stainless steel of minimum 2 mm thickness and should be provided with a pressure relief arrangement away from operator.

Both the load break switches and the tee off circuit breaker shall be suitable for motorization in future.

The cable box of isolators and circuit breakers both should be of front /side/rear access type as per site requirement.

Any accidental over pressure inside the sealed chamber shall be limited by the opening of a pressure-limiting device in the top or rear-bottom part of the tank or enclosure. Gas will be release to the rear of the switchboard away from the operator and should be directed towards the bottom, into the trench to ensure safety of the operating personnel and the pedestrians / civilians. All the manual operations should be carried out on the front of the switchboard.

The Entire units or minimum three functions of RMU shall be enclosed in a single compact metal clad, outdoor enclosure suitable for all weather conditions. The switchgear/steel gas tank shall be filled with SF6 as per IEC/IS Standards relative pressure to ensure the insulation and breaking functions. The steel gas tank must be sealed for life and shall meet the “sealed pressure system” criteria in accordance

with the IEC 298 standard. The RMU must be a system for which no handling of gas is required throughout the 20 years of service life.

The RMU shall have a design such that in the event of an internal arc fault, the operator shall be safe. This should be in accordance with IEC 298 and relevant Test certificates shall be submitted with the Tender.

1.3.1 The RMU shall be tested for an internal arc rating of 20 kA for 1 Sec.
Suitable temperature rise test on the RMU shall be carried out & test reports shall be submitted with tender for technical bid evaluation.
Each switchboard shall be identified by an appropriately sized label, which clearly indicates the functional units and their electrical characteristics.

The switchgear and switchboard shall be designed so that the position of the different devices is visible to the operator on the front of the switchboard and operations are visible as well

The entire system shall be totally encapsulated. There shall be no access to exposed conductors. In accordance with the standards in effect, the switchboards shall be designed so as to prevent access to all live parts during operation without the use of tools.

The entire 11 KV RMU are insulated by inert gas (SF6) suitable for operating voltage up to 12 KV respectively. The 11 KV circuit breakers must be VCB breaker. It is necessary to fit an absorption material in the tank to absorb the moisture from the SF6 gas. The SF6 insulating medium shall be constantly monitored via a temperature compensating gas pressure indicator offering a indication at different temperature ranges, having distinctive RED and GREEN zones for safe operation.

All the RMUs must be routine tested for the following at factory in India:-

- Micro-ohm test for the assembly inside the tank.
- Circuit breaker analyzer test so as to ensure the simultaneous closing of all poles for VCB.
- SF6 gas leak test.
- Partial Discharge test on the complete gas tank so as to be assure of the proper insulation level and high product life.
- High voltage withstand.
- Secondary test to ensure the proper functioning of the live line indicators, fault passage indicators and relays.

1.3.2 Sulphur Hex fluoride Gas (SF6 GAS)

The SF6 gas shall comply with IEC 376,376A,and 376B and shall be suitable in all respects for use in 11 KV RMUs under the operating conditions. The SF6 shall
be tested for purity, dew point air hydrolysable fluorides and water content as per IEC

376,376A and 376B and test certificate shall be furnished to the owner indicating all the tests as per IEC 376 for each Lot of SF6 Gas

1.4 **STANDARDS**

Unless otherwise specified elsewhere in this Specification, the RMU, Switchboard (Switchgear), Load break isolators, Instrument Transformers and other associated accessories shall conform to the latest revisions and amendments there of to the following standards.

1. IEC 60 298/IEC 62 271-200/IS 12729:1988 - General requirement for Metal Enclosed Switchgear
2. IEC60129/IEC62271-102/IS 9921 - Alternating current disconnector's (Load break isolators) and earthing switch
3. IEC 62 271-100 & 200/IEC 60 056/IS 13118:1991 - Specification for alternating current circuit breaker
4. IEC 62 271-1/IEC 60694 - Panel design, SF6/Vacuum Circuit Breakers
5. IEC 60044-1/IEC 60185/IS 2705:1992 - Current Transformer
6. IEC 60265/IS 9920:1981- High voltage switches.

7. IEC 376 - Filling of SF6 gas in RMU.
8. IEC 60273/IS :2099 - Dimension of Indoor & Outdoor post insulators
   i. with voltage > 1000 Volts.
9. IEC 60529/IS 13947(Part-1) - Degree of protection provided by
   i. enclosures for low voltage switchgear and
   ii. control gear.
10. Indian Electricity Rules/IS Code

Equipment meeting with the requirements of any other authoritative standards, which ensures equal or better quality than the standard mentioned above shall also be acceptable. If the equipments, offered by the Bidder conform to other standards, salient points of difference between the standards adopted and the specific standards shall be clearly brought out in relevant schedule. In case of any difference between provisions of these standards and provisions of this specification, the provisions contained in this specification shall prevail. One copy of such standards with authentic English Translations shall be furnished along with the offer.(Hard copy)

1.5 **THE STANDARDS MENTIONED ABOVE ARE AVAILABLE FROM:**

IEC - (INTERNATIONAL ELECTRO-TECHNICAL COMMISSION, BUREAU CENTRAL DE LA COMMISSION, ELECTRO TECHNIQUE INTERNATIONAL, 1, RUE DE VEREMBE, GENEVA, SWITZERLAND.)
ISO - INTERNATIONAL STANDARD ORGANISATION

1.6 **SPECIFIC REQUIREMENTS IN RMU:-**

1.6.1 CLIMATE CONDITIONS

The climatic conditions under which the equipment should operate satisfactory are as under:

o Maximum ambient air temperature	:50 deg. C
o Minimum ambient air temperature	:10 deg.C
o Maximum daily average ambient air temperature	:40 C
o Maximum humidity	:100%
o Altitude above M.S.L. (maximum)	:1000 metres
o Average annual rainfall(mm)	:925
o Max. wind pressure(Kg/sq.m)	:200
o Seismic level(Horizontal accn.) Iso-ceraunic	:0.3 g
o level(Days per Year) Average thunder storm	:50
o days per annum	:50

1.7 **RMU OUTDOOR METAL CLAD ENCLOSURE.**

The RMU enclosure must be a metallic, it shall follows an industrialized process of manufacturing**.** The RMU and combination shall be tropicalised and outdoor metal enclosed type. The RMU metal parts shall be of high thickness, high tensile steel which must be grit/short blasted, thermally sprayed with Zinc alloy, phosphate or should follow the 7 tank pre-treatment process and be subsequently painted with polyurethane based powder paint. The overall paint layer thickness shall be not less than 80 microns.

The rating of enclosure shall be suitable for operation on three phase, three wire, 11KV, 50 cycles, A.C. System with short-time current rating of 20KA for 3 seconds with RMU Panels.

The enclosure should have two access doors one for the operation and relay monitoring and other for the cable access. Both the doors should have the locking facility to prevent the access to operating mechanism to avoid unauthorized operating of RMU and relay.

1.8 **TAKE OFF TERMINAL UNITS FOR AUTOMATION:**

The RMU should be provided with necessary take off terminal units for automations, located in the front recesses / LV cubical of the RMU. The connectivity to the FRTU for SCADA purpose shall be provided

1.9 **ISOLATORS (LOAD BREAK TYPE)**

The load break isolators for Incoming and Outgoing supply must be provided. These should be fully insulated by SF6 gas. The load break isolators shall consist of 630 Amp fault making/load breaking spring assisted ring switches, each with integral fault making earth switches. The switch shall be naturally interlocked to prevent the main and earth switch being switched 'ON' at the same time. The selection of the main and earth switch is made by a lever on the facia, which is allowed to move only if the main or earth switch is in the off position. The load break isolators should have the facility for future remote operation. Each load break switch shall be of the triple pole, simultaneously operated, non automatic type with quick break contacts and with integral earthing arrangement.

The isolating distance between the OFF and the ON position in the isolator should be sufficient to withstand dielectric test as per IS/IEC, so as to have enough isolating distance for ensuring safety during DC injection for Cable testing.

Amp fault making/load breaking spring assisted ring switches, each with integral fault making earth switches. The switch shall be naturally interlocked to prevent the main and earth switch being switched 'ON' at the same time. The selection of the main and earth switch is made by a lever on the facia, which is allowed to move only if the main or earth switch is in the off position. The load break isolators should have the facility for future remote operation. Each load break switch shall be of the triple pole, simultaneously operated, non automatic type with quick break contacts and with integral earthing arrangement.

The isolating distance between the OFF and the ON position in the isolator should be sufficient to withstand dielectric test as per IS/IEC, so as to have enough isolating distance for ensuring safety during DC injection for Cable testing.

1.10 **EARTHING OF ISOLATORS AND BREAKERS (EARTH SWITCH)**

Necessary arrangements are provided at Load break isolators Breaker for selecting Earth position. Mechanical interlocking systems shall prevent the RMU function from being operated from the 'ON' to 'Earth On' position without going through the 'OFF' position.

1.11 **DISTRIBUTION TRANSFORMER/FEEDER BREAKER (VACUUM)**

The VCB breaker for the controlling of DT/Feeder Breaker must be provided inside welded stainless steel SF6 gas tank with the outdoor metal clad enclosure.

The VCB circuit breaker must be a spring assisted three positions with integral fault making earth switch. The selection of the main/earth switch lever on the facia, which is allowed to move only if the main or earth switches is in the off position.

The manual operation of the circuit breaker shall not have an effect on the trip spring. This should only be discharged under a fault (electrical) trip; the following manual reset operation should recharge the trip spring and reset the circuit breaker mechanism in the main off position.

The circuit breaker shall be fitted with a mechanical flag, which shall operate in the event of a fault (electrical) trip occurring. The 'tripped' flag should be an unambiguous colour differing from any other flag or mimic.
Both the circuit breaker and ring switches are operated by the same unidirectional handle.

The protection on the circuit breaker shall comprise of the following components:-

- 3 class X protection CT's,
- a low burden trip coil and
- a self powered (No external DC or AC source required) IDMT protection relays (Numeric/Micro processor based) 3 x over current and earth fault element shall be Definite Time type relay . The protection system should be suitable for protecting transformers of rated power from 250 KVA on wards. The relay should be housed within a pilot cable box accessible

1.12 **BUSHINGS**

The units are fitted with the standardized bushings that comply with IEC standards. All the bushings are the same height from the ground and are protected by a cable cover.

1.13 **CABLE BOXES**

All the cable boxes shall be air insulated suitable for dry type cable terminations and should have front / rear/side access. The cable boxes at each of the two ring switches should be suitable for accepting HV cables of sizes 3c x 300/3c x
120 sq.mm and circuit breaker cable suitable up to 3c x 120 sq.mm. The cable boxes for an isolator in it's standard design should have sufficient space for connecting two cables per phase. Necessary Right angle Boot should be supplied to the cable terminations .***The type of the Right angle Boot should be cold applied insulating Boot.***

1.14 **CABLE TESTING FACILITY**

It shall be possible to test the cable after opening the cable boxes. The cable boxes should open only after operation of the earth switch. Thus ensuring the earthing of the cables prior to performing the cable testing with DC injection.

1.15 **VOLTAGE INDICATOR LAMPS AND PHASE COMPARATORS**

The RMU shall be equipped with a voltage indication to indicate whether or not there is voltage on the cable. There should be a facility to check the synchronization of phases with the use of external device. It shall be possible for the each of the function of the RMU to be equipped with a permanent voltage indication as per IEC 601958 to indicate whether or not there is voltage on the cables.

1.16 **EXTENSIBLE**

Each combination of RMU shall have the provision for extension by load break isolators / breakers in future, with suitable accessories and necessary Bus Bar. The equipment shall be well designed to provide any kind of extension / trunking chamber for connecting and housing extensible Busbars. Extensible isolators and circuit breakers shall be individually housed in separate SF6 gas enclosures. Multiple devices inside single gas tank / enclosure will not be acceptable. In case of extensible circuit breakers, the Breaker should be capable of necessary short circuit operations as per IEC at 20 KA, and the Breaker should have a rated current carrying capacity of 200 A.

1.17 **WIRING & TERMINALS:**

The wiring should be of high standard and should be able to withstand the tropical weather conditions. All the wiring and terminals (including take off terminals for future automation, DC, Control wiring), Spare terminals shall be provided by the contractor. The wiring cable must be standard single-core non-sheathed, Core marking (ferrules), stripped with non-notching tools and fitted with end sleeves, marked in accordance with the circuit diagram with printed adhesive marking strips.

The wiring should be of high standard and should be able to withstand the tropical weather conditions. All wiring shall be provided with single core multi-strand copper conductor wires with P.V.C insulation.

The wiring shall be carried out using multi-strand copper conductor super flexible PVC insulated wires of 650/1100V Grade for AC Power, DC Control and CT circuits. Suitable colored wires shall be used for phase identification and interlocking type ferrules shall be provided at both ends of the wires for wire identification. Terminal should be suitably protected to eliminate sulphating. Connections and terminal should be able to withstand vibrations. The terminal blocks should be stud type for controls and disconnecting link type terminals for CT leads with suitable spring washer and lock nuts.

Flexible wires shall be used for wiring of devices on moving parts such as swinging Panels (Switch Gear) or panel doors. Panel wiring shall be securely supported, neatly arranged readily accessible and connected to equipment terminals, terminal blocks and wiring gutters. The cables shall be uniformly bunched and tied by means of PVC belts and carried in a PVC carrying trough.

The position of PVC carrying trough and wires should not give any hindrance for fixing or removing relay casing, switches etc., Wire termination shall be made with solder less crimping type of tinned copper lugs. Core identification plastic ferrules marked to correspond with panel wiring diagram shall be fitted with both ends of each wire. Ferrules shall fit tightly on the wire when disconnected. The wire number shown on the wiring shall be in accordance with the IS.375.

All wires directly connected to trip circuits of breaker or devices shall be distinguished by addition of a red color unlettered ferrule.

Inter-connections to adjacent Panels (Switch Gear) shall be brought out to a separate set of Terminal blocks located near the slots or holes to be provided at the top portion of the panel. Arrangements shall be made for easy connections to adjacent Panels (Switch Gear) at site and wires for this purpose shall be provided and bunched inside the panel. The bus wire shall run at the top of the panel. Terminal block with isolating links should be provided for bus wire. At least 10% of total terminals shall be provided as spare for further connections. Wiring shall be done for all the contacts available in the relay and other equipment and brought out to the terminal blocks for spare contacts. Color code for wiring is preferable in the following colours.

?	Voltage supply	Red, Yellow, Blue for phase and Black for Neutral
?	CT circuits	similar to the above
?	DC circuits	Grey for both positive and negative
?	250V AC circuits	Black for both phase and neutral
?	Earthing	Green

The wiring shall be in accordance to the wiring diagram for proper functioning of the connected equipment. Terminal blocks shall not be less than 650V grade and shall be piece-molded type with insulation barriers.

The terminal shall hold the wires in the tight position by bolts and nuts with lock washers. The terminal blocks shall be arranged in vertical formation at an inclined angle with sufficient space between terminal blocks for easy wiring.

The terminals are to be marked with the terminal number in accordance with the circuit diagram and terminal diagram. The terminals should not have any function designation and are of the tension spring and plug-in type.

External box in RMU shall be provided for installing FRTU. The Aux supply will be taken through the PT provided for metering in RMU. The PT must have sufficient burden for meeting the aforesaid requirement also for battery charging.

1.18 **EARTHING**

The RMU outdoor metal clad, Switch Gear, Load break isolators, Vacuum circuit breakers shall be equipped with an earth bus securely fixed along the base of the RMU.

The size of the earth bus shall be made of IEC/IS standards with tinned copper flat for RMU and M.S.Flat for Distribution Transformer, earth spike and neutral earthing. Necessary terminal clamps and connectors shall be included in the scope of supply.

All metal parts of the switchgear which do not belong to main circuit and which can collect electric charges causing dangerous effect shall be connected to the earthing conductor made of copper having CS area of minimum 75 mm². Each end of conductor shall be terminated by M12/equivalent quality and type of terminal for connection to earth system installation. Earth conductor location shall not obstruct access to cable terminations.

The following items are to be connected to the main earth conductor by rigid or copper conductors having a minimum cross section of 75 mm² (a) earthing switches (b) Cable sheath or screen (c) capacitors used in voltage control devices, if any.

The metallic cases of the relays, instruments and other panel mounted Equipment's shall be connected to the earth bus by independent copper wires of size shall be made of IEC/IS standards. The colour code of earthing wire shall be green. Earthing wires shall be connected on the terminals with suitable clamp connectors and soldering shall not be permitted.

1.19 **ACCESSORIES & SPARES:**

The following spares and accessories shall be supplied along with the main equipments at free of costs. This shall not be included in the price schedule.

1. Charging lever for operating load break isolators & circuit breaker of each RMU.
2. The pressure gauges indications – 1 numbers

Provision shall be made for padlocking the load break switches/ Circuit breaker, and the earthing switches in either open or closed position with lock & master key.

1.20 **TESTING OF EQUIPMENT & ACCESSORIES:**

Provision for testing CTs,PTs, Relays, Breakers and Cables shall be made available. Procedure and schedule for Periodical & Annual testings of equipments, relays, etc. shall be provided by the supplier.

1.20.1 TYPE TEST

The Tenderers should, along with the tender documents, submit copies of all Type test certificate of their make in full shape as confirming to relevant ISS/IEC of latest issue obtained from a International/National Govt. Lab/Recognized laboratory.

The above type test certificates should accompany the drawings for the materials duly signed by the institution who has type test certificate. The details of type test certificate as per Schedule F.

1.20.2 ACCEPTANCE AND ROUTINE TESTS

All acceptance and routine tests as stipulated in the latest IEC- shall be carried out by the supplier in the presence of Board's representative. The supplier shall give at least 7 days advance intimation to the Board to enable them to depute their representative for witnessing the tests. The partial discharge shall be carried out as routine test on each and every completely assembled RMU gas tank and not on a sample basis. As this test checks and guarantees for the high insulation level and thus the complete life of switchgear.

1.20.3 ADDITIONAL TESTS

The Board reserves the right for carrying out any other tests of a reasonable nature at the works of the supplier/laboratory or at any other recognized laboratory/research institute in addition to the above mentioned type, acceptance and routine tests at the cost of the Board to satisfy that the material complies with the intent of this specification.

1.20.4 PRE-COMMISSIONING TESTS

All the pre-commissioning tests will be carried out in the presence of the Board testing engineer and necessary drawing manual and periodical test tools shall be arranged to be supplied.

During the above tests the contractor's representative should be present till the RMUs are put in to service.

1.21 **INSPECTION:**

The inspection may be carried out by the Board at any stage of manufacture. The supplier shall grant free access to Board's representative at a reasonable time when the work is in progress. Inspection and acceptance of any equipment under this specification by the Board shall not relieve the supplier of his obligation of furnishing equipment in accordance with the specification and shall not prevent subsequent rejection if the equipment is found to be defective.

The supplier shall keep the Board informed in advance, about the manufacturing programme so that arrangement can be made for inspection. The Board reserves the right to insist for witnessing the acceptance/routine testing of the bought out items. The Board has rights to inspect the supplier's premises for each and every consignment for type & routine test.

No material shall be dispatched from its point of manufacture unless the material has been satisfactorily inspected and tested / unless the same is waived by the Board in writing.

1.21.1 QUALITY ASSURANCE PLAN:

The bidder shall invariably furnish following information along with his offer / in case of event of order.

I. Statement giving list of important raw materials including but not limited to a) Contact material
   b) Insulation
   c) Sealing material
   d) Contactor, limit switches, etc. in control cabinet.

Name of sub-suppliers for the raw materials, list of standards according to which the raw materials are tested, list of test normally carried out on raw materials in presence of Bidder's representative, copies of test certificates.

II. Information and copies of test certificates as in (i) above in respect of bought out accessories.

III. List of areas in manufacturing process, where stage inspections are

IV. normally carried out for quality control and details of such tests and inspections.

V. Special features provided in the equipment to make it maintenance free.

VI. List of testing equipment available with the Bidder for final testing of RMUs and associated combinations vis-à-vis the type, special, acceptance and routine tests specified in the relevant standards. These limitations shall be very clearly brought out in the relevant schedule i.e. schedule of deviations from specified test requirements. The supplier shall, within 15days from the date of receipt of Purchase Order submit following information to the Board.

   a) List of raw materials as well bought out accessories and the names of sub-suppliers selected from those furnished along with offer.

   b) Necessary test certificates of the raw material and bought out accessories.
   c) Quality Assurance Plan (QAP) withhold points for Board's inspection. The quality assurance plan and hold points shall be discussed between the Board and supplier before the QAP is finalized.

The supplier shall submit the routine test certificates of bought out items and raw material, at the time of routine testing of the fully assembled breaker.

1.22 **TRAINING:**

The supplier shall give rigorous training to the engineers & staff for 2 days in attending trouble shooting and maintenance .

1.23 **SCADA CONNECTIVITY:**

Provision shall be made in all the RMUs with necessary take off terminal units for automations and connectivity with FRTU. Space for motorization wherever required for SCADA operation should be provided

1.24 **DOCUMENTATION and DRAWINGS**

All drawings shall conform to relevant International Standards Organization (ISO) Specification. All drawings shall be in ink and suitable for microfilming.

The tenderer shall submit along with his tender dimensional general arrangement drawings of the equipments, illustrative and descriptive literature in triplicate for various items in the RMUs which are all essentially required for future automation.

I. Schematic diagram of the RMU panel
II. Instruction manuals
III. Catalogues of spares recommended with drawing to indicate each items of spares
IV. List of spares and special tools recommended by the supplier.
V. Copies of Type Test Certificates as per latest IS/IEC.
VI. Drawings of equipments, relays, control wiring circuit, etc. VII.
Foundation drawings of RMU and D.T.Structure.
VIII. Dimensional drawings of each material used for item Vii.
IX. Actual single line diagram of RMU/RMUs with or without Extra combinations shall be made displayed on the front portion of the RMU so as to carry out the operations easily.

The following should be supplied to each consignee circle/town along with the initial supply of the equipments ordered.

a. Copies of printed and bound volumes of operation, maintenance and erection manuals in English along with the copies of approved drawings and type test reports etc.
b. Sets of the manuals as above shall be supplied to the Dy. Chief General Manager (UP). A soft copy of the all Technical and Drawing furnished in a CD.

1.25 **NAME PLATE:**

Each RMU and its associated equipments shall be provided with a nameplate legible and indelibly marked with at least the following information.

a. Name of manufacturer
b. Type, design and serial number
c. Rated voltage and current
d. Rated frequency
e. Rated symmetrical breaking capacity
f. Rated making capacity
g. Rated short time current and its duration
h. Purchase Order number and date
i. Month and Year of supply
j. Rated lighting impulse withstand voltage

k. Feeder name (Incoming and Outgoing), DTs Structure name, 11000Volts Dangers etc.

NOTE:

I) THE WORD RATED NEED NOT APPEAR ON THE NAME PLATE. RECOGNIZED ABBREVIATIONS MAY BE USED TO EXPRESS THE ABOVE PARTICULARS.

II) WHETHER THE CIRCUIT BREAKER IS FITTED WITH CLOSING/TRIPPING DEVICES NECESSITATING AN AUXILIARY SUPPLY SHALL BE STATED EITHER ON THE CIRCUIT BREAKER NAME PLATE OR ANY OTHER ACCEPTABLE POSITION.

1.26 **FAULT PASSAGE INDICATORS (FPI):**

These shall facilitate quick detection of faulty section of line. The fault indication may be on the basis of monitoring fault current flow through the device. The unit should be self-contained requiring no auxiliary power supply. The FPI shall be integral part of RMU. The FPI shall have ***LCD/LED display***, automatic reset facility.

The sensors to be bushing mounted. The number of FPI should be put in all the three phases of the outgoing branch of the RMUs

FPI should have suitable connectivity with the FRTUs for the SCADA purpose.

1.27 **TROPICALISATION:**

Due regard should be given to the climatic conditions under which the equipment is to work. Ambient temperature normally vary between 20 ?C and 32 ? C, although direct sun temperature may reach 50 ?C. The climate is humid and rapid variations occur, relative humidity between 60% and 90% being frequently recorded, but these values generally correspond to the lower ambient temperatures. The equipment should also be designed to prevent ingrees of vermin, accidental contact with live parts and to minimize the ingress of dust and dirt. The use of materials which may be liable to attack by termites and other insects should be avoided.

1.28 **Motorisation:**

All the functions within the RMU i.e Isolators/Breakers should be fitted with motor mechanism and closing coil making it suitable to make it on from remote.

Other Accessories (required with RMU) :-

a) Shunt Trip Coil (Coil voltage shall be indicated later on)
b) Battery & Battery Charger.
c) 4NO+4NC auxiliary contacts.

1.29 **Metering:**

Multifunction Energy meter shall be provided with, of accuracy class of 0.5 at incoming isolator of all RMUs. The Metering CTs and PTs of suitable rating shall be provided.

1.30 **TECHNICAL SPECIFICATION FOR RMU**

1.30.1 11KV Bus Bar

I.	Current Carrying Capacity	: *630 Amps.*
II.	*Short time rating current for 3 secs.*	*: 20 KA*
III.	*Insulation of bus bar*	*: SF6*
IV.	*Bus bar connections*	*: Anti-oxide grease*

2 TECHNICAL SPECIFICATIONS FOR 33 kV, 3 WAY RMU

2.1 **GENERAL:**

2.1.1 All equipment and material shall be designed manufactured and tested in accordance with the latest applicable IEC standard.

2.1.2 Equipment and material conforming to any other standard, which ensures equal or better quality, may be accepted. In such case copies of English version of the standard adopted shall be submitted.

2.1.3 The electrical installation shall meet the requirement of Indian Electricity Rules-1956 as amended up to date; relevant IS code of practice and Indian Electricity Act-1910. In addition other rules and regulations applicable to the work shall be followed. In case any discrepancy the most stringent and restrictive one shall be binding.

2.1.4 The high-tension switchgear offered shall in general comply with the latest issues including amendments of the following standards but not restricted to them.

2.2 **IEC IS Description**

60694: 12729 Common clauses for high-voltage switchgear and control standards

(for voltages exceeding 1000 V).

62271-200: A.C. Metal-enclosed switchgear and control gear

60129: Alternating current disconnectors (isolators) and earthing switches

60529: 13947 Classification of degrees of protection provided by enclosures

-IP 67 for tank with high voltage components

-IP 3X for the front covers of the mechanism

-IP 3X for the cable connection covers

-IP 54 for the outdoor enclosure (kiosk)

60265: High voltages switches Part 1

62271-100: 13118 High Voltage AC Circuit Breakers, General Requirement.

6005:Colour for ready mixed paints and enamels, Code of practice for phosphating of iron and steel,

60044-1: Current Transformers

60044-1 Voltage Transformers

60255: Electrical Relays

60 9135 High Voltage testing techniques.

427 13516 Method of Synthetic Testing of H.V.A.C Circuit Breaker.

IEC 62271-200 MV metal-enclosed switchgear,
(IEC 62271-102) AC disconnections and earthing switches,

2.3 **Design Criteria**

2.3.1 Service conditions

The 33 kV RMU shall be suitable for operations at a height up to 2000 meters above sea level. The RMU shall be capable of operating normally within the following temperature range:

- Maximum ambient temperature : + 50 ° C
- Minimum ambient temperature : - 15 ° C

Manufacturer shall declare whether RMU is able to operate in air temperature higher than + 45 °C and if current de-rating is necessary. The RMU shall be capable of being electrically commanded. And RMU shall be suitable for future motorization. The RMU shall be capable of being exposed to high relative humidity and polluted environments. The RMU shall be suitable for outdoor use.

2.3.2 4. System Parameters

Network	Three phases - Three wires
Rated Voltage	36 kV
Service Voltage	33 kV
System Frequency	50 Hz
Lightning Impulse withstand Voltage Phase to phase, phase to earth Across the isolating distance	 170 kV 195 kV
Power Frequency withstand voltage	70 kV rms - 1 mn
Rated Normal Current Line switches	 630 Amps
Rated Short time current withstand (1 sec)	25 kA
Internal Arc 1 sec	16 KA
Rated Short circuit making capacity of line switches & breaker	62.5KA
Number of operations at rated short circuit current on breaker	20 OC operations

Rated load interrupting current Line switch	 630 Amps
No load line / cable breaking current capacity No load transformer breaking capacity	25 A 25 A
Number of mechanical operations of line switch	1000 O/C
Number of electrical operations at full rated current	100 O/C at 630 amps
Number of electrical operations at full rated current for breaker	2000 O/C at 630 amps
Number of Mechanical operations at full rated current for breaker	2000 O/C

All of the switchgear shall be capable of withstanding these parameters without any damage being caused, in accordance with the standards mentioned in this specification

2.3.3 Configuration requirements

Breaker – breaker - Line Switch - Line switch (compact unit Non -Extensible)

2.3.4 General stipulations regarding the design and development of switchgear

2.3.5 Introduction

The RMU shall meet the criteria for compact, metal-enclosed outdoor switchgear in accordance with IEC 62271-200,IEC 60694:

- Switchgear classification: PM class
- Loss of service continuity class: LSC2A

It shall include, within the same metal enclosure, the number of MV functional units required for connection, power supply, i.e.:switch disconnectors, earthing switches.

2.3.6 Switchboards

The switchgear and busbar shall all be contained in a stainless steel enclosure filled with SF6 at 0.3 bar relative pressure to ensure the insulation and breaking functions. Sealed for life, the enclosure shall meet the "sealed pressure system" criterion in accordance with the IEC 62271-1 standard (§ 3.6.6.4 and 5.15.3) : "a volume for which no further gas processing is required during its entire expected life. In addition, manufacturer shall confirm that maximum leakage rate is lower than 0,1 % / year. It shall provide full insulation, making the

switchgear insensitive to the environment (temporary flooding, high humidity...), IP67 degrees of protection in accordance with recommendation IEC 60529 § 14.2.7. It shall provide full insulation, making the switchgear insensitive to the environment conditions such as pollution, humidity, dust, etc…

The active parts of the switchgear shall be maintenance-free and the switchboard shall be low-maintenance. The switchgear shall provide IP3X degree protection with the exception of the MV cable entrance and earthing plug where entrance is admissible. The tank shall be made of 3 mm ANSI 304 unpainted stainless steel. The colour shall be RAL 9002 for the enclosure. The switchboards shall be suitable for mounting on a trench, utilities space or base. Each switchboard shall be identified by an appropriately sized label which clearly indicates the functional units and their electrical characteristics. The switchgear shall be designed so that the positions of the different devices are visible in its front panel; in addition the cubicle must have voltage indicators that allow check if any income or outcome is energized.

In accordance with the standards in effect, the switchboards shall be designed so as to prevent access to all live parts during operation without the use of tools.

2.3.7 Dielectric medium

SF6 gas is the preferred dielectric medium for MV RMUs. Oil filled / Air insulated switchgear will not be considered. SF6 gas used for the filling of the RMU shall be in accordance with IEC 60376.

2.3.8 Earthing of metallic parts

There shall be continuity between the metallic parts of the switchboard and cables so that there is no electric field pattern in the surrounding air, thereby ensuring the safety of people. The substation frames shall be connected to the main earth busbar without dismantling any busbars.

2.3.9 Earthing of the main circuit

The cables shall be earthed by an earthing switch with short-circuit making capacity; the earthing switch can only be operated when the switch is open. in compliance with IEC standard 62271-102. The earthing switch shall be fitted with its own operating mechanism. The speed of the manual closing, driven by a fast-acting mechanism, is independent of the operator. Mechanical interlocking systems shall prevent access to the operating shaft to avoid all operator errors such as closing the earthing switch when the switch is closed and the earthing switch operating shaft shall have a padlocking facility.

2.3.10 "network" disconnectors:

They shall be maintenance-free, with breaking in low pressure SF6 gas.

The position indicator shall provide positive contact indication and reliability of indication in accordance with IEC 62271-102 standard. The switches shall be of the type E3 "increased operating frequency" in accordance with IEC 60265-1 § 3.104 standard. They shall have 3 positions with individual operating mechanism for network disconnector and earth switch , open-disconnected, closed and earthed, and will be constructed in such a way that natural interlocking prevents unauthorized operations. The switches shall be fully mounted and inspected in the manufacturer's factory. Manual opening and closing will be driven by a fast- acting mechanism, independent of operator action. Each load break switch shall be suitable for an electrical operation in future in a specially reserved location, without any modification of the operating mechanism and without de-energizing the switchboard. The load break switch and earthing switch operating mechanism shall have a mechanical endurance of at least 1000 mechanical operations. The switches shall be fully mounted and inspected in the factory. An operating mechanism can be used to manually close the switch and charge the mechanism.

2.4 **Circuit Breaker:**

The circuit breaker inside SF6 chamber shall be consist of Vacuum circuit breaker confirming to latest IEC standards. The CB shall be maintenance free. The breaker shall be capable of performing a full cycle O-3min-CO-3min CO. The CB shall be three position independent operation. The disconnector operation is only possible when circuit breaker is open. The CB shall be suitable for up gradation for electrical operation in future. The CB shall be equipped with a self powered protection relay for over current and earth fault. The circuit breaker mechanism shall have mechanical endurance of at least 2000 mechanical operation. It shall be fitted with a local system for manual tripping by an integrated push button.

2.5 **RMU bushings and Cable terminations**

2.5.1 Bushing

The bushing should be conveniently located for working with 2 runs of 3 core 400 Sq mm 33 kV cables specified and allow for the termination of these cables in accordance with the instructions supplied for the 630A M16 bolted connectors on line switches. The profiles of the cable connection bushings shall be in compliance with EN-50181 standards.

2.5.2 Cable clamps

A non ferro-magnetic cable clamp arrangement must be provided for all network cables terminated on the RMU.

2.5.3 Padlocking facilities

Live load break switches and earthing switches can be locked in the open or closed position by means of padlocks introduced in holes of 8 mm diameter.

2.5.4 Voltage indicator lamps and phase comparators

Each function shall be equipped with a voltage indicator box on the front of the device to indicate whether or not there is voltage in the cables. The capacitive dividers will supply low voltage power to the lamps. Three inlets can be used to check the synchronization of phases.

This device shall be in compliance with IEC 61 958 standard.

2.5.5 Safety of people

Any accidental over pressure inside the sealed chamber shall be limited by the opening of a pressure-limiting device in the top or rear-bottom part of the tank or enclosure. Gas will be release to the rear of the switchboard away from the operator and should be directed towards the bottom, into the trench to ensure safety of the operating personnel and the pedestrians / civilians. All the manual operations should be carried out on the front of the switchboard.

2.5.6 Front plate

The front plate shall have an IP 3X degree of protection. The front shall include a clear mimic diagram which indicates the different functions. The position indicators shall give a true reflection of the position of the main contacts. They shall be clearly visible to the operator. The lever operating direction shall be clearly indicated in the mimic diagram. The manufacturer's plate shall include the switchboard's main electrical characteristics.

2.5.7 Cable insulation testing

The Cable testing is possible without disconnecting the cables from the bushing. It shall be preferable to carry out the phase by phase testing. The maximum test voltage shall be less than 50 kV DC for 15 minutes.

2.5.8 Dimensions

The overall dimensions shall not be greater than the followings :

Width (mm) :1200

Height (mm) :2200

Depth (mm) :1000

2.5.9 Finishing

The device shall be fully designed for use in a hot, humid atmosphere and shall be low- maintenance. At least two lifting rings shall be installed on the top of the switchboards for handling.

2.6 **Type and routine tests**

According to this specification and IEC recommendations, the following type test certificates shall be supplied:

- Impulse withstand test,
- Temperature-rise test,
- Short-time withstand current test,
- Mechanical operation test,
- Checking of degree of protection,
- Switch, earthing switch making capacity.
- Switch, breaking capacity.
- Internal arc withstand
- Checking of partial discharge on complete unit

In addition, for switches, test reports on rated breaking and making capacity shall be supplied. For earthing switches, test reports on making capacity, short-time withstand current and peak short-circuit current shall be supplied.

The routine tests carried out by the manufacturer shall be backed by test reports signed by the factory's quality control department. They shall include the following:

- Conformity with drawings and diagrams,
- Measurement of closing and opening speeds,
- Checking of filling pressure,
- Checking of gas-tightness,
- Dielectric testing.
- Main circuit resistance measurement.
- Fuse combination mechanical checking.

2.7 **Quality**

When requested by the customer, the supplier shall provide proof that he applies a quality procedure in compliance with the standard, namely:

- Use of a quality manual approved and signed by a top management representative,

- Periodic updating of the manual so that it reflects the quality control procedures in effect,

- ISO 9001and ISO 14001 certification.

2.8 **ADDITIONAL REQUIRMENTS (GENERAL):**

2.8.1 The following shall be provided in the SCADA for monitoring:

a. Alarm points from protective relays (individual alarm points for each protection operation shall be provided) lockout relays, supervision relay & auxiliary relays.
b. Status point of switchgear equipments (CB,Isolator & Earth switchs), Selector switch (Local/remote, Busbar Protection-In/Out,Synchronisation-In/out etc.)
c. Analog Points:

Necessary number of transducers shall be provided in the switchyard control panel for Analog output to SCADA system (Voltage, Current, kW, kVAR for Lines; current kW, kVAR, kWH, kVARH and Voltage & frequency for main buses).

2.8.2 All i/o points shall be wired up to a separate terminal block and the same shall be labeled SCADA-TB.

The RMUs should be provided with necessary take off terminal units for future automations and all these units should be shielded in a outdoor metal-body for making them suitable for outdoor use. The insulation/dielectric media inside the stainless steel welded tank should be SF6 gas. The RMUS should be of **extensible type on both sides** with provision of attaching/connecting with SNAP FIT arrangement W/o External Busbars additional load break switches and circuit breakers **in future whenever required.** Alternatively Extension shall be possible by adding trunking chambers and required accessories or by plug-in bushing type arrangement.

All live parts except for the cable connections in the cable compartments shall be insulated with SF6 gas. The SF6 gas tank shall be made of TIG or MIG or Laser welded stainless steel, to have the best weld quality or It shall be metallised resin cast construction. The gas cubicle shall be metal enclosed with stainless steel of minimum 2 mm thickness and should be provided with a pressure relief arrangement away from operator.

External box in RMU shall be provided for installing FRTU. The Aux supply will be taken through the PT provided for metering in RMU. The PT must have sufficient burden for meeting the aforesaid requirement also for battery charging.

2.9 **Metering:**

Multifunction Energy meter shall be provided with, of accuracy class of 0.5 at incoming isolator of all RMUs. The Metering CTs and PTs of suitable rating shall be provided.

2.10 **TESTS**

Each type of H.V. Switchgear shall be completely assembled, wired, adjusted and tested at the factory as per the relevant standards and during manufacture and on completion.

2.11 **Routine Test**

The tests shall be carried out in accordance with relevant standards but not necessarily limited to the following:

a) Withstand voltage at Power Frequency for all current carrying parts including wiring
b) Measurement of resistance of the main circuit Non-Extensible / extensible RMU
c) Leakage test
d) Withstand power frequency voltage on auxiliary circuits
e) Operation of functional locks, interlocks, signaling devices and auxiliary devices
f) Suitability and correct operation of protections, control instruments and electrical connections of the circuit breaker operating mechanism (primary & secondary injection)
g) Verification of wiring
h) Visual Inspection Routine test shall be carried out on all equipment such as circuit breakers,current transformers, relays, etc. as per relevant standards.

2.12 **Acceptance Tests**

The acceptance tests shall include all the routine tests mentioned above and also demonstration of tripping through the relay by secondary injection tests.

. Type Test

The Type Test reports, for following tests conducted in an accredited lab shall be submitted. The type tests shall be in accordance with relevant IS 9920/IEC 265/IEC 420.

The type Tests shall include but not limited to the following-

a. Impulse test
b. Temperature rise test c.
Short Circuit test
d. Dielectric Tests
e. Operation and mechanical endurance

2.13 **TECHNICAL SPECIFICATION OF RMU INSTALLATION**

1. RMU shall be installed out door locations. The support structure shall be supplied and installed with the RMU.
2. RMU units shall be installed on platform at 50 Cm above ground level.
3. Earthing of RMU shall be made by utilising existing earth pit and risers to the extent possible. A total of 2 earth pits would be needed for the RMU and other equipment bodies. Earthing to be done as per general technical requirement.

3 Technical Specification 11kV Cable jointing Kit

3.1 Scope

3.1.1 As cable termination kit shall be suitable for termination of the cable on indoor switchgear or outdoor installation as per requirement. The type of cable will be XLPE insulated. The cable termination jointing kits shall be as per defined in I.S.I.-
13573.

3.1.2 Proper stress control, stress grading and non-tracking arrangement in the termination and joint shall be offered by means of proven methods, details of which shall be elaborated in the offer. Detailed sectional views of the assemblies shall be submitted alongwith the offer.

3.1.3 In case of heat shrinkable cable accessories, stress control tubing, shall have volume resistively of minimum 1,00,00,000 Ohms- meter for both termination and straight through joints. Also relative permittivity shall be minimum 15.

3.1.4 Tenderer shall furnish documentary evidence conforming adherence to these alongwith the offer. Further, impedance of stress control tubing shall not change over a range of temperature from O degree C to 125 Degree C.

3.1.5 The impedance also remains constant in spite of the difference in stress, which will exist within the sleeve due to hearting effect within the conductors and the temperature of the environment. Tenderer must submit graph-showing effect on the impedance value of stress control humbling due to temperature variations and thermal ageing, with his offer. In case of tapex cast resin type straight through joints, encapsulation of joints is done by specially developed resin system, which is compatible with the material used for bonding. The jointing kit shall be with aluminum crimping type ferrules, semi-conductor self bonding tape, the self amalgamating tape [or EPR or equivalent] stress grading pad etc.

3.1.6 The straight through joints should be absolutely impervious to the entry or water.
The manufacturer shall use the proven technologies and design to ensure a construction, which will prevent entry of water or any other liquid inside the straight
through joint and cable. Proven technologies such as resin injection, hydrophobic
sealants etc. shall be deployed in the critical areas.

3.1.7 In all type of kits offered, the external leakage insulation between high voltage conductor and ground as specified in I.E.E.E. –48 / 1975 amended up to time to time shall be of non-tracking erosion resistant and weather resistant flexible sleeve.

3.1.8 For 3-core cable, the gripping tubing [termination boot] for the cable where the trifurcation takes place shall be considered as a part of the kit.

3.1.9 The kit offered shall provide for total environmental sealing of the cable crutch and at the lug end.

3.1.10 Termination and jointing system shall be suitable for use with standard aluminum conductor fittings [cable lugs and ferrules] of compressed crimping type.

3.1.11 The termination of straight through jointing kit of heat shrinkable type kit, the joint shall heat shrinkable duel wall tubing, which shall be insulating from inside and semi conductor from outside. Tenderer shall specifically give compliance to this alongwith the offer.

3.1.12 For straight through joint the kit shall also include tubular Sleeve in line connectors for solder less crimping of cable connector. The connector shall be of aluminum alloy A 6 drop forged type or other equivalent or better material.

3.1.13 Material used for construction of a joint/termination shall perfectly match with the dielectric, chemical and physical characteristics of the associated cable. The material and design concepts shall incorporate a high degree of operating compatibility between the cable and the joints.

3.1.14 The kit offered shall be suitable for the following sizes of three core cables.

3.2 **CABLE – X L P E/PILC**

o 95 sq.mm.
o 120 sq.mm. o 150 sq.mm. o 185 sq.mm. o 240 sq.mm. o 300 sq.mm. o 400 sq.mm.

3.3 The tenderer shall quote unit rates for insulating tape, lugs, nuts and bolts of various sizes and special tools required for erection and commissioning, if any, in the offer. These prices shall be kept valid for at least of one year after placement of order/s. These rates shall not be considered for evaluation of the offer.

3.4 The tenderer shall indicate the required net dimensions of the indoor cable, joints for various cable sizes, in the form of Length X Breadth X Depth in m.m.

3.5 The tenderer shall specifically bring out the precautions to be observed in execution of the jointing / termination work to avoid any loss or damage to the cable, the kit, the personnel or the installation.

An instruction booklet shall be supplied with each kit. Detailed instructions with suitable illustrative drawings shall be included in the instruction booklet to enable proper jointing work.

3.6 The kit which requires lesser skill for the cable jointing which can be done in shorter time and guarantee a reliable and long operating life and reduced or no waiting time for erection shall be given preference.

3.7 **Type Test:**

3.7.1 The jointing kits offered, shall be fully type tested at CPRI as per the relevant standards. The tenderer shall furnish four sets of the type test reports alongwith the offer. Offers without type test reports will not be considered. For any change in the Design/type already type tested and the design/type offered against this specification, the purchaser reserve the right to demand repetition of type tests without any extra cost in presence of purchaser's representative.

3.7.2 Type tests shall be carried out as per the test sequence given in I.S.: 13573 or VDE-0278 at C.P.R.I. Laboratory as amended from time to time. The test report will have to be submitted for the test carried out.

3.8 **ACCEPTANCE & ROUTING TESTS:**

3.8.1 The supplier shall carry out all acceptance and routing tests as stipulated in the elevant standards in presence of purchaser's representative.

3.8.2 The purchaser reserves the right to insist for witnessing the acceptance/routing testing of the brought out items.

4 TECHNICAL SPECIFICATION FOR `ISI' MARKED XLPE INSULATED AND PVC SHEATH 33 KV XLPE CABLE

4.1 SCOPE:-

The specification covers the design, manufacture, testing and delivery at places anywhere in Central Zone Discom listed in Annexure-IV of General Terms and Conditions of Tender Specification of 'ISI' marked 33 KV grade, weather proof 33 KV XLPE Cable of size 3cx300 Sq.mm. The conductor shall be compacted circular aluminium stranded, provided with extruded semi-conducting screening layer, XLPE Insulation provided with screening Comprising of non metallic extruded Semi Conducting Compound & copper tape screening, extruded PVC sheath, suitable for 33 KV effectively earthed system conforming to IS:7098(Pt-2)1985 with latest amendment. The cable should be suitable for laying underground.

4.2 APPLICABLE STANDARD:-

All the cables shall conform to the requirements of following standards with latest amendments, if any

(i)	IS:7098(Part-2) 1985 with latest amendments.	Cross linked Polyethylene insulated Sheathed Cables for working voltage from 3.3 KV up to and including 33KV
(ii)	IS:8130-1984	Specification for conductors for Insulated electric cables.
(iii)	IS:5831-1984	Specification for PVC Insulation and sheath of electric cables.
(iv)	IS: 3975-1979	Specification for mild steel wires, strips and taps for armouring cables.
(v)	IS:10810-1984	Methods of test for cables.
(vi)	IS:4905-1968	Methods for random sampling.
(vii)	IS:10418-1982	Wooden drum for electric cables.

4.3 GENERAL TECHNICAL REQUIREMENT:-

4.3.1 CONDUCTOR:

The nominal cross section area of aluminium conductor used in XLPE cable shall be 300 Sq.mm and shall be of stranded wire construction and compacted circular wires complying to the requirement to IS:8130-1984, with latest amendments and shall be in accordance with clause-9 of IS: 7098(Part-2)1985.

4.3.2 CONDUCTOR SCREENING:-

Conductor screening shall be non-metallic and shall consists of extruded semi conducting compound and comply to the requirement of caluse-10 of IS:7098(Pt-2). The semi conducting compound shall be suitable for the operating temperature of the cable and compatible with the insulating material.

4.3.1 INSULATION:-

The conductor (with protective screen) shall be provided with cross linked polyethylene(XLPE) insulation applied by extrusion conforming to the requirements given in Table-1 of IS:7098(Pt-2)1985. The XLPE insulation shall be suitable for specified 33 KV System voltage. The manufacturing process shall ensure that insulation shall be free from voids. The insulation shall withstand mechanical and thermal stresses under steady state and transient operating conditions. The insulation shall be so applied that it fits closely on the conductor screening and it shall be possible to remove it without damaging the conductor. XLPE insulation shall be suitable for continuous conductor temperature of 90ºC under normal operation and 250ºC under short circuit condition.

The average thickness of insulation in respect of each Size of cable shall not be less than the nominal value(ti) specified in Table-2 of(IS:7098)Part-2/1985 IE 8.8 MM. The smallest of measured value of thickness of insulation shall not fall below the nominal value (ti) specified in Table-2 by more than 0.1 mm+ 0.1 ti.

4.3.4 INSULATION SCREENING:-

Cable shall be provided with the insulation screening complying to Clause-12 of IS:7098(Pt-2)1985. The insulation screening shall consist of two parts, namely metallic and non- metallic.

Non metallic part shall be applied directly over the insulation of each core and shall consists of either a semi-conducting tape or extruded semi conducting compound or a combination of the two or either material with semi conducting coating.

Metallic part shall consist of copper tape and shall be applied over the non-metallic part.

4.3.5 CORE IDENTIFICATION:-

Identification of cores shall be by using coloured strips of Red, Yellow and Blue Colours respectively and shall conform to Clause-13 of IS-7098(Part-2)1985 to identify phase conductors.

4.3.6 OUTER SHEATH:-

The outer sheath shall be applied by extrusion. It shall be applied over the non-magnetic metallic part of insulation screening. The outer sheath shall of PVC Compound type ST2 (conforming to the requirement of IS:5831-1984, with latest amendments) and shall be black in colour. The thickness of outer sheath shall be as specified in Table-5 of IS:7098(Pt-2)1985. Minimum thickness of PVC outer sheath shall not fall below the nominal value (ts) specified in Table-5 of IS:7098(Pt-2) by more than 0.2 mm+0.2ts.

4.3.7 IDENTIFICATION, PACKING & MARKING :-

4.3.7.1 Identification:-

Following marking shall be embossed over the sheath.

1. Cable size and Voltage Grade.
2. Word `MPMKVVCL' & Name of Manufacturer at every three meters.

The embossing shall be increasive, automatic in line throughout the length of the cable and shall be legible and indelible.

4.3.7.2 PACKING & MARKING:-

1. The cable shall be wound on a drum (refer-IS:10418-1982) of suitable size and packed. The packing shall be robust enough for rough handling that is occasioned during transportation by Rail/Road. The ends of the cable shall be sealed by means of non-hygroscopic sealing material.
2. The Cable should carry the following information stenciled on the drum:- i. Reference to Indian Standard IS:7098(Pt-2),
   ii. Manufacturer's name, brand name or trade mark, iii. Type of cable and voltage grade,
   iv. Number of cores,
   v. Nominal cross-sectional area of the conductor, vi. Cable Code,
   vii. Length of cable on the drum,
   viii. Number of lengths on drum(if more than one),
   ix. Direction of rotation of drum by means of an arrow,

x. Gross Mass,
xi. Country of Manufacturer,
xii. Year of manufacture,
xiii. Name of purchaser

4.3.7.3 'ISI' Certification Mark:-

The Cable (Drum) must bear `ISI' certification Mark. In this connection, a certified photo copy of valid `ISI' Marking License rights duly attested must be submitted along with the tender as documentary evidence. In absence of this, offer is liable for rejection.

4.3.7.4 Standard Length:-

The standard length of cable shall be 250/500 Mtrs. with ±5% tolerance. However to complete the supply of ordered quantity, last drum of non standard length may also be accepted.

4.4 **TESTS:-**

Following type tests, acceptance tests and routine tests are to be carried out in accordance with clause-18 of IS 7098(Part-2)1985, with its latest amendments as indicated below:-

4.4.1 **TYPE TESTS**:-

The following shall constitute type tests:-

Sl. No.	Tests	For requirement Ref. to	For Test method Ref. to Part No. of IS:10810
(A)	**TEST ON CONDUCTOR** (whichever applicable)		
(i)	Tensile Test	IS:8130-1984	2
(ii)	Wrapping Test	IS:8130-1984	3
(iii)	Conductor resistance Test	IS:8130-1984	5
(B)	TEST FOR THICKNESS OF INSULATION AND SHEATH	Clause 11&17 Table-2 & 5	6
(C)	PHYSICAL TEST FOR INSULATION:		
(i)	Tensile Strength and elongation at break	Table-1 of IS:7098(Pt-2)	7
(ii)	Ageing in Air Oven	---do---	11
(iii)	Hot set Test	---do---	30
(iv)	Shrinkage Test	---do---	12
(v)	Water absorption test (gravimetric)	---do---	33
(D)	PHYSICAL TEST FOR OUTER SHEATH		
(i)	Tensile Strength and elongation at break.	IS:5831-1984	7
(ii)	Ageing in Air oven	---do---	11
(iii)	Shrinkage Test	---do---	12
(iv)	Hot deformation	---do---	15
(E)	BLEEDING & BLOOMING TEST(FOR OTHER SHEATH)	---do---	19
(F)	PARTIAL DISCHARGE TEST	Clause 19.2 of IS:7098(Pt-2)	46
(G)	BENDING TEST	Clause 19.3 of IS:7098(Pt-2)	50
(H)	DIELECTRIC POWER FACTOR TEST:	clause 19.4 of IS:7098(Pt-2)	48
(i)	as a function of voltage		

Sl. No.	Tests	For requirement Ref. to	For Test method Ref. to Part No. of IS:10810
(ii)	as a function of temperature		
(I)	HEATING CYCLE TEST	Clause 19.5 of IS:7098(Pt-2)	49
(J)	IMPULSE WITHSTAND TEST	Clause 19.6 of IS:7098(Pt-2)	47
(K)	INSULATION RESISTANCE (VOLUME RESISTIVITY TEST)	Table-1 of IS:7098 (Part-2) Clause 19.7 of IS:7098(Pt-2)	43
(L)	HIGH VOLTAGE TEST	Clause 19.7 of IS:7098(Pt-2)	45
(M)	FLAMMABILITY TEST	Clause 19.8 of IS:7098(Pt-2)	53

4.4.1.1 The following test on the Aerial bunched cable shall be performed successively on the same test sample of completed cable, not less than 10 mtrs. in length between the test accessories as per clause 18.1.2 of IS:7098(Pt-2):-

a. Partial discharge test,
b. Bending test followed by partial discharge test, c. Dielectric Power factor as a function of voltage,
d. Dielectric Power factor as a function of temperature, e. Heating cycle test followed by dielectric power factor f. as a function of voltage and partial discharge tests, g. Impulse withstand test and
h. High voltage test.

The bidders are advised to submit certified photo copy of type test certificate for type tests indicated in para 4.1.1 and 4.1.2 of the quoted sizes of Cable tested from the Govt. National Test House, ERDA, CPRI or any other NABL accredited laboratory along with the tender. The above type test certificate should not be more than five years old from the due date of opening of tender.

4.4.2 Acceptance test:

The following shall constitute acceptance tests:- a. Tensile Test (for aluminium if applicable),
b. Wrapping Test(for aluminium if applicable), c. Conductor resistance test,
d. Test for thickness of insulation and sheath,
e. Tensile strength and elongation at break of insulation and sheath, f. Insulation resistance (volume resistivity) test,
g. High voltage test,
h. Hot set test for insulation and
i. Partial discharge test (on full drum length)

All the above acceptance tests will be carried out by Company's representative as per relevant ISS at the time of material inspection for the purpose of clearing the lot offered by the bidder. Acceptance test shall be carried out in each type and size of cable, on cable drum selected at random as per sampling plan given in relevant ISS.

4.4.3 Routine Test:

The following shall constitute routine test:-

a. Conductor Resistance test,
b. Partial discharge test (on full drum length)
c. High voltage test.

The above routine test shall be conducted by the bidders in accordance with relevant ISS and test certificate in proof of this shall be submitted to this office along with each inspection offer. In absence of routine test certificate the inspection offer shall be considered as fake and all complication arising out of this shall be to the supplier's account.

4.5 **Inspection:**

All the tests and inspection shall be made at the place of manufacturer unless otherwise specially agreed upon by the manufacturer and purchaser at the time of purchase. The manufacturer shall offer all reasonable facilities to the purchaser, without charges to satisfy him that the material is being furnished in accordance with the specification.

On receipt of Cables at our consignee Area Store, the purchaser has the right to have any or all Type/Acceptance test carried out by an independent NABL accredited lab like ERDA, CPRI etc. to ascertain the quality of supply. In case the material fails to pass the test as per specification, the entire lot shall be rejected and the testing charges along with the other charges which may likely to be incurred for arranging the testing through independent agency shall be recovered from the supplier. In addition to this, action as deemed fit, may be taken against the supplier.

SCHEDULE-III

GUARANTEED TECHNICAL PARTICULARS OF XLPE CABLES

1	Name of Manufacturers	
2	Standard applicable	
3	Whether material offered is having ISI mark. Give ISI marking no. & its validity period	

A. AERIAL BUNCHED CABLES

4	Rated Voltage	
5	No of cores	
i	Power cores (no.)	
ii	Bare messenger (no)	
6	Suitable for effectively earthed or unearthed system	
7	Permissible voltage and frequency variation for satisfactory operation.	
a.	voltage	
b.	Frequency	
8	Continuous current rating corresponding temp when laying in Air	
9	Short Circuit Current carrying capacity	
a.	Current in amps(rms)	
b.	duration of short circuit	
c.	Conductor temperature allowed for the short circuit duty (°C)	
10	**Conductor**	
a.	Material	
b.	Nominal cross sectional area	
c.	Flexibility class as per IS:8130:1984	
d.	Form of conductor	
e.	Whether stranded or solid core	
f.	Max. degree centigrade resistance of conductor	
g.	Weight (Kg/Km)	
11	**Conductor screening**	
A	Type	
B	Material	
C	Minimum thickness	
12	**Insulation**	
a.	Composition of insulation	
b.	Source of receipt (Supplier's Name)	
c.	Average Thickness of insulation (mm)	
d.	Tolerance of thickness of insulation	
e.	Diameter of core over insulation (mm)	
f.	Specific insulation resistance: at 90°C	
g.	Colour Scheme for identification of cable	
13	**Insulation screening**	
a.	Material	
b.	Minimum Thickness	
i.	Semiconducting Part(mm)	
ii.	Metallic part(copper tape)(mm)	
iii.	Size of copper tape (width x thickness)	

iv.	Whether overlapping provided	
v.	Diameter of cable over screening	
vi.	Whether insulation screen is removable without application of heat.	
14	**Sheath**	
a.	Material/Type of sheath	
b.	Source of receipt (supplier's name)	
c.	Extruded or wrapped	
d.	Calcualted diameter undr the sheath (mm)	
e.	Nominal thickness of sheath (mm)	
f.	Diameter of cable over sheath	
	Weight of sheath (Kg/Km)	
15	**Messenger wire**	
i.	Material	
ii.	Nominal cross sectional area	
iii.	Form of conductor	
iv.	Whether galvanised	
v.	Approximate breaking load	
16	Laying up	
17	Over all diameter of cable	
18	Loss tangent a normal frequency	
19	Dielectric constant at normal frequency	
20	Thermal stability	
21	Oxygen index	
22	D.C.resistance per core at 20°C (Ohm/Km)	
23	Reactance per core at 50 HZ (Ohm/Km)	
24	Capacitance per core at 50HZ micro fad/Km	
25	Insulation resistance (volume resistivity) at 27ºC	
26	High Voltage Test:	
A	for acceptance test	
i.	voltage	
ii.	Duration	
B	for routine test	
i	voltage	
ii	duration	
27	Recommended minimum bending radius	
28	Safe pulling force when pulled by pulling eye	
29	Net weight of Cable (Kg/Km)	
30	Cable drums:-	
a.	Net weight (Kg.)	
b.	Drum Weight(Kg.)	
c.	Cable Weight(Kg)	
d.	Maximum length per drum (Mtrs.)	
31	Whether the cable is type tested from NABL accredited Laboratory for all the tests as per IS:7098(Pt-II)/1985 (Indicate name of lab and report no.)	
32	Whether copy of type test certificates pertaining to all tests as indicated in para 4.1 of technical specification has been furnished with the offer	

B. GENERAL

Whether following documents have been submitted with the offer:-

i	Manufacturer's leaflets giving details dimensions and characteristic of cable	
ii	Whether curves and tables relating to current rating of cable furnished	
iii	Whether write up with sketches, manufacturer's recommendations for splitting, jointing and termination of cable furnished	

SIGNATURE OF TENDERER
NAME:
DESIGNATION:

5 TECHNICAL SPECIFICATION FOR ISI' MARKED XLPE INSULATED AND PVC SHEATH 11 KV XLPE CABLE

5.1 **SCOPE:-**

The specification covers the design, manufacture, testing and delivery at places anywhere in Central Zone Discom of 'ISI' marked 11 KV grade, weather proof 11 KV XLPE Cable of size 3cx185 Sq.mm. The conductor shall be compacted circular aluminium stranded, provided with extruded semi-conducting screening layer, XLPE Insulation provided with screening Comprising of non metallic extruded Semi Conducting Compound & copper tape screening, extruded PVC sheath, suitable for 11 KV effectively earthed system conforming to IS:7098(Pt-2)1985 with latest amendment.. The cable should be suitable for laying underground.

5.2 **APPLICABLE STANDARD:-**

All the cables shall conform to the requirements of following standards with latest amendments, if any

(i)	IS:7098(Part-2) 1985 with latest amendments.	Cross linked Polyethylene insulated Sheathed Cables for working voltage from 3.3 KV up to and including 33KV
(ii)	IS:8130-1984	Specification for conductors for Insulated electric cables.
(iii)	IS:5831-1984	Specification for PVC Insulation and sheath of electric cables.
(iv)	IS: 3975-1979	Specification for mild steel wires, strips and taps for armouring cables.
(v)	IS:10810-1984	Methods of test for cables.
(vi)	IS:4905-1968	Methods for random sampling.
(vii)	IS:10418-1982	Wooden drum for electric cables.

5.3 **GENERAL TECHNICAL REQUIREMENT:-**

5.3.1 CONDUCTOR

The nominal cross section area of aluminium conductor used in XLPE cable shall be 185 Sq.mm and shall be of stranded wire construction and compacted circular wires complying to the requirement to IS:8130-1984, with latest amendments and shall be in accordance with clause-9 of IS: 7098(Part-2)1985.

5.3.2 CONDUCTOR SCREENING:-

Conductor screening shall be non-metallic and shall consists of extruded semi conducting compound and comply to the requirement of caluse-10 of IS:7098(Pt-2). The semi conducting compound shall be suitable for the operating temperature of the cable and compatible with the insulating material.

5.3.3 INSULATION:-

The conductor (with protective screen) shall be provided with cross linked polyethylene(XLPE) insulation applied by extrusion conforming to the requirements given in Table-1 of IS:7098(Pt-2)1985. The XLPE insulation shall be suitable for specified 11 KV System voltage. The manufacturing process shall ensure that insulation shall be free from voids. The insulation shall withstand mechanical and thermal stresses under steady state and transient operating conditions. The insulation shall be so applied that it fits closely on the conductor screening and it shall be possible to remove it without damaging the conductor. XLPE insulation shall be suitable for continuous conductor temperature of 90ºC under normal operation and 250ºC under short circuit condition.

The average thickness of insulation in respect of each Size of cable shall not be less than the nominal value(ti) specified in Table-2 of(IS:7098)Part-2/1985 IE 5.5 MM. The smallest of measured value of thickness of insulation shall not fall below the nominal value (ti) specified in Table-2 by more than 0.1 mm+ 0.1 ti.

5.3.4 INSULATION SCREENING:-

Cable shall be provided with the insulation screening complying to Clause-12 of IS:7098(Pt-2)1985. The insulation screening shall consist of two parts, namely metallic and non- metallic.

Non metallic part shall be applied directly over the insulation of each core and shall consists of either a semi-conducting tape or extruded semi conducting compound or a combination of the two or either material with semi conducting coating.

Metallic part shall consist of copper tape and shall be applied over the non-metallic part.

5.3.5 CORE IDENTIFICATION:-

Identification of cores shall be by using coloured strips of Red, Yellow and Blue Colours respectively and shall conform to Clause-13 of IS-7098(Part-2)1985 to identify phase conductors.

5.3.6 OUTER SHEATH:-

The outer sheath shall be applied by extrusion. It shall be applied over the non-magnetic metallic part of insulation screening. The outer sheath shall of PVC Compound type ST2 (conforming to the requirement of IS:5831-1984, with latest amendments) and shall be black in colour. The thickness of outer sheath shall be as specified in Table-5 of IS:7098(Pt-2)1985. Minimum thickness of PVC outer sheath shall not fall below the nominal value (ts) specified in Table-5 of IS:7098(Pt-2) by more than 0.2 mm+0.2ts.

5.3.7 IDENTIFICATION, PACKING & MARKING :-

5.3.7.1 Identification:-

Following marking shall be embossed over the sheath.

1. Cable size and Voltage Grade.
2. Word `MPMKVVCL' & Name of Manufacturer at every three meters.

The embossing shall be increasive, automatic in line throughout the length of the cable and shall be legible and indelible.

5.3.7.2 PACKING & MARKING:-

1. The cable shall be wound on a drum (refer-IS:10418-1982) of suitable size and packed. The packing shall be robust enough for rough handling that is occasioned during transportation by Rail/Road. The ends of the cable shall be sealed by means of non- hygroscopic sealing material.

2. The Cable should carry the following information stenciled on the drum:- i. Reference to Indian Standard IS:7098(Pt-2),
   ii. Manufacturer's name, brand name or trade mark, iii. Type of cable and voltage grade,
   iv. Number of cores,
   v. Nominal cross-sectional area of the conductor, vi. Cable Code,
   vii. Length of cable on the drum,
   viii. Number of lengths on drum(if more than one),
   ix. Direction of rotation of drum by means of an arrow,

x. Gross Mass,
xi. Country of Manufacturer,
xii. Year of manufacture,
xiii. Name of purchaser

3. ISI' Certification Mark:- The Cable (Drum) must bear `ISI' certification Mark. In this connection, a certified photo copy of valid `ISI' Marking License rights duly attested must be submitted along with the tender as documentary evidence. In absence of this, offer is liable for rejection.

21.3.7.3 Standard Length:- The standard length of cable shall be 250/500 Mtrs. with ±5% tolerance. However to complete the supply of ordered quantity, last drum of non standard length may also be accepted.

5.4 **TESTS:-**

Following type tests, acceptance tests and routine tests are to be carried out in accordance with clause-18 of IS 7098(Part-2)1985, with its latest amendments as indicated below:-

5.4.1 **TYPE TESTS**:-

The following shall constitute type tests:-

Sl. No.	Tests	For requirement Ref. to	For Test method Ref. to Part No. of IS:10810
(A)	**TEST ON CONDUCTOR** (whichever applicable)		
(i)	Tensile Test	IS:8130-1984	2
(ii)	Wrapping Test	IS:8130-1984	3
(iii)	Conductor resistance Test	IS:8130-1984	5
(B)	**TEST FOR THICKNESS OF INSULATION AND SHEATH**	Clause 11&17 Table-2 & 5	6
(C)	**PHYSICAL TEST FOR INSULATION:**		
(i)	Tensile Strength and elongation at break	Table-1 of IS:7098(Pt-2)	7
(ii)	Ageing in Air Oven	---do---	11
(iii)	Hot set Test	---do---	30
(iv)	Shrinkage Test	---do---	12
(v)	Water absorption test (gravimetric)	---do---	33
(D)	**PHYSICAL TEST FOR OUTER SHEATH**		
(i)	Tensile Strength and elongation at break.	IS:5831-1984	7
(ii)	Ageing in Air oven	---do---	11
(iii)	Shrinkage Test	---do---	12
(iv)	Hot deformation	---do---	15
(E)	**BLEEDING & BLOOMING TEST(FOR OTHER SHEATH)**	---do---	19
(F)	**PARTIAL DISCHARGE TEST**	Clause 19.2 of IS:7098(Pt-2)	46
(G)	**BENDING TEST**	Clause 19.3 of IS:7098(Pt-2)	50
(H)	**DIELECTRIC POWER FACTOR TEST**:	clause 19.4 of IS:7098(Pt-2)	48
(i)	as a function of voltage		
(ii)	as a function of temperature		

Sl. No.	Tests	For requirement Ref. to	For Test method Ref. to Part No. of IS:10810
(I)	**HEATING CYCLE TEST**	Clause 19.5 of IS:7098(Pt-2)	49
(J)	**IMPULSE WITHSTAND TEST**	Clause 19.6 of IS:7098(Pt-2)	47
(K)	**INSULATION RESISTANCE (VOLUME RESISTIVITY TEST)**	Table-1 of IS:7098 (Part-2) Clause 19.7 of IS:7098(Pt-2)	43
(L)	**HIGH VOLTAGE TEST**	Clause 19.7 of IS:7098(Pt-2)	45
(M)	**FLAMMABILITY TEST**	Clause 19.8 of IS:7098(Pt-2)	53

The following test on the Aerial bunched cable shall be performed successively on the same test sample of completed cable, not less than 10 mtrs. in length between the test accessories as per clause 18.1.2 of IS:7098(Pt-2):-

a. Partial discharge test,
b. Bending test followed by partial discharge test, c. Dielectric Power factor as a function of voltage,
d. Dielectric Power factor as a function of temperature, e. Heating cycle test followed by dielectric power factor f. as a function of voltage and partial discharge tests, g. Impulse withstand test and
h. High voltage test.

The bidders are advised to submit certified photo copy of type test certificate for type tests indicated in para 4.1.1 and 4.1.2 of the quoted sizes of Cable tested from the Govt. National Test House, ERDA, CPRI or any other NABL accredited laboratory along with the tender. The above type test certificate should not be more than five years old from the due date of opening of tender.

5.4.2 Acceptance test:

The following shall constitute acceptance tests:-

a. Tensile Test (for aluminium if applicable),
b. Wrapping Test(for aluminium if applicable), c. Conductor resistance test,
d. Test for thickness of insulation and sheath,
e. Tensile strength and elongation at break of insulation and sheath, f. Insulation resistance (volume resistivity) test,
g. High voltage test,
h. Hot set test for insulation and
i. Partial discharge test (on full drum length)

All the above acceptance tests will be carried out by Company's representative as per relevant ISS at the time of material inspection for the purpose of clearing the lot offered by the bidder. Acceptance test shall be carried out in each type and size of cable, on cable drum selected at random as per sampling plan given in relevant ISS.

5.4.3 Routine Test:

The following shall constitute routine test:-

a. Conductor Resistance test,
b. Partial discharge test (on full drum length)
c. High voltage test.

The above routine test shall be conducted by the bidders in accordance with relevant ISS and test certificate in proof of this shall be submitted to this office along with each inspection offer. In absence of routine test certificate the inspection offer shall be considered as fake and all complication arising out of this shall be to the supplier's account.

5.5 **Inspection:**

All the tests and inspection shall be made at the place of manufacturer unless otherwise specially agreed upon by the manufacturer and purchaser at the time of purchase. The manufacturer shall offer all reasonable facilities to the purchaser, without charges to satisfy him that the material is being furnished in accordance with the specification.

On receipt of Cables at our consignee Area Store, the purchaser has the right to have any or all Type/Acceptance test carried out by an independent NABL accredited lab like ERDA, CPRI etc. to ascertain the quality of supply. In case the material fails to pass the test as per specification, the entire lot shall be rejected and the testing charges along with the other charges which may likely to be incurred for arranging the testing through independent agency shall be recovered from the supplier. In addition to this, action as deemed fit, may be taken against the supplier.

SCHEDULE-III

GUARANTEED TECHNICAL PARTICULARS OF XLPE CABLES

1	Name of Manufacturers	
2	Standard applicable	
3	Whether material offered is having ISI mark. Give ISI marking no. & its validity period	

A. AERIAL BUNCHED CABLES

4	Rated Voltage	
5	No of cores	
i	Power cores (no.)	
ii	Bare messenger (no)	
6	Suitable for effectively earthed or unearthed system	
7	Permissible voltage and frequency variation for satisfactory operation.	
a.	voltage	
b.	Frequency	
8	Continuous current rating corresponding temp when laying in Air	
9	Short Circuit Current carrying capacity	
a.	Current in amps(rms)	
b.	duration of short circuit	
c.	Conductor temperature allowed for the short circuit duty (°C)	
10	**Conductor**	
a.	Material	
b.	Nominal cross sectional area	
c.	Flexibility class as per IS:8130:1984	
d.	Form of conductor	
e.	Whether stranded or solid core	
f.	Max. degree centigrade resistance of conductor	
g.	Weight (Kg/Km)	
11	**Conductor screening**	
A	Type	
B	Material	
C	Minimum thickness	
12	**Insulation**	
a.	Composition of insulation	
b.	Source of receipt (Supplier's Name)	
c.	Average Thickness of insulation (mm)	
d.	Tolerance of thickness of insulation	
e.	Diameter of core over insulation (mm)	
f.	Specific insulation resistance: at 90°C	
g.	Colour Scheme for identification of cable	
13	**Insulation screening**	
a.	Material	
b.	Minimum Thickness	
i.	Semiconducting Part(mm)	
ii.	Metallic part(copper tape)(mm)	
iii.	Size of copper tape (width x thickness)	
iv.	Whether overlapping provided	
v.	Diameter of cable over screening	

vi.	Whether insulation screen is removable without application of heat.	
14	**Sheath**	
a.	Material/Type of sheath	
b.	Source of receipt (supplier's name)	
c.	Extruded or wrapped	
d.	Calcualted diameter undr the sheath (mm)	
e.	Nominal thickness of sheath (mm)	
f.	Diameter of cable over sheath	
	Weight of sheath (Kg/Km)	
15	**Messenger wire**	
i.	Material	
ii.	Nominal cross sectional area	
iii.	Form of conductor	
iv.	Whether galvanised	
v.	Approximate breaking load	
16	Laying up	
17	Over all diameter of cable	
18	Loss tangent a normal frequency	
19	Dielectric constant at normal frequency	
20	Thermal stability	
21	Oxygen index	
22	D.C. resistance per core at 20°C (Ohm/Km)	
23	Reactance per core at 50 HZ (Ohm/Km)	
24	Capacitance per core at 50HZ micro fad/Km	
25	Insulation resistance (volume resistivity) at 27ºC	
26	High Voltage Test:	
A	for acceptance test	
i.	Voltage	
ii.	Duration	
B	for routine test	
i	Voltage	
ii	Duration	
27	Recommended minimum bending radius	
28	Safe pulling force when pulled by pulling eye	
29	Net weight of Cable (Kg/Km)	
30	Cable drums:-	
a.	Net weight (Kg.)	
b.	Drum Weight(Kg.)	
c.	Cable Weight(Kg)	
d.	Maximum length per drum (Mtrs.)	
31	Whether the cable is type tested from NABL accredited Laboratory for all the tests as per IS:7098(Pt-II)/1985 (Indicate name of lab and report no.)	
32	Whether copy of type test certificates pertaining to all tests as indicated in para 4.1 of technical specification has been furnished with the offer	

B. GENERAL

Whether following documents have been submitted with the offer:-

i	Manufacturer's leaflets giving details dimensions and characteristic of cable	
ii	Whether curves and tables relating to current rating of cable furnished	
iii	Whether write up with sketches, manufacturer's recommendations for splitting, jointing and termination of cable furnished	

SIGNATURE OF TENDERER NAME:

SPECIAL CONDITIONS (Electrical)

1. The entire work shall be carried out confirming to relevant Indian standard code of practice and as directed by Engineer-in-Charge.
2. All material fitting's appliances etc. used in the installation shall confirm to relevant Indian standard specification wherever they exists. in cases where there is not Indian standard available the item shall confirmed to specification approved by Engineer-In- Charge.
3. All Electrical installation shall comply with required Indian electricity Act 1910 as amended and Indian electricity rules 1956 as amended upto date and as per rules and regulation of MP state electricity board and to the requirement of local bodies and electrical inspectorates/ Central electricity Authority.
4. The contractor executing the work will be fully responsible for arranging inspection of the above local authorities as and when required, preparation and submission of drawing as required, getting approval of the work and drawing etc. testing of the installation preparation and submission of test reports with signature of authorized license hold persons, on behalf of BSCDCL No payment of charges will be reimbursed to the contractor for this work. Necessary fees to MP electrical licensing board for getting charging permission shall be paid by contractor for. inspection/ Testing charges/ Supervision Charges/ System strengthening charges shall only be paid by BSCDCL to MP state electricity board.
5. The contractor shall make his own arrangement of water supply and electricity at site foe execution of work.
6. The contractor shall make his own arrangement of site office and store at site for execution of work.
7. The contractor shall finalize the latenderert of work physically at site as per approved drawing and get approved by MP electricity board taking actual measurement for quantities of items before BSCDCL.
8. The contractor should submit the excise gate pass for the equipment / materials supplies at site.
9. All the correspondence with other department like MP electricity board/ central electricity authority/ Mp licensing board etc. will be done by contractor only, though BSCDCL.
10. Payment of the running bill will be made only after rectification of defects if pointed out by any inspecting authority.
11. The contractor will be responsible to hand over the substation/ Lines to MPMKVVCL and submission of charge certificate to BSCDCL.
12. The date of charging of complete installation by MPMKVVCL and handing over of all installation to MPMKVVCL will be treated as date of completion of work.
13. The contractor will be responsible for talking shut down etc. if required, by their own Efforts.
14. The contractor should be responsible for any loss/ theft, if required by their own cost.
15. All the equipments/ accessories/ materials and complete installation shall be guaranteed for the period of two year's from date of charging by MP state electricity board.
16. The contractor shall have to furnish declaration on stamp paper worth Rs. 500/- as per Annexure for related work's.
17. 5% cost of transformer and 2% total value of work will be kept in miscellaneous deposit till the line is taken over by MPMKVVCL.
18. Transformers/ VCBs/ CTs/ PTs and associated item will be inspected/ tested as per IS at works by BSCDCL before dispatch.
    The above item will be accepted subject to the above specifying.
19. Guarantee against manufacturing defects for 24 months will be given in the name of MPMKVVCL directly by the manufacturer Arranged by the Tenderer.(not in case of fitting)
20. Guarantee/ warrantee offered by the manufacturer shall be given in the name MPMKVVCL be Arranged by the Tenderer.
21. If it found that the contractor has quoted abnormally high rates of the item/ items as compared to the rates as estimated by the BSCDCL, then payment of such items in running bill shall be limited to the rates as estimated by BSCDCL and shall be released at the time of settlement of final bill and also after the execution of necessary item for which contractor has quoted abnormally low rates as compared to the rated as estimated by BSCDCL.

Action and compensation payable in case of Bad work

22. If at any time before the security deposit is refunded to the contractor, it shall appear to the engineer-in-charge or his subordinate in charge of the work that any work has been executed with unsound, imperfect or un skillful workmanship or with material of inferior quality or that any materials or articles provided by him for the execution of the work are unsound or of a quality interior to that contracted four are otherwise not in accordance with the contract, it shall be lawful for the engineer-in-charge to intimate this fact in writing to the contractor and then notwithstanding the fact that the work, materials or articles complained of may have been inadvertently passed, certified and paid for the contractor shall be bound forthwith to rectify, or remove and reconstruct the work so specified in whole or inpart, as the case may require or if so required shall removed the materials or articles so specified and provide other proper and suitable materials or articles at his own proper charge and cost and in the event of his failing to do so within a period to be specified by the engineer-in-charge in written intimation as aforesaid, the contractor shall be liable to pay compensation at the rate of one percent on the amount of the estimate for every day not exceeding ten days, during which the failure so continues and in the case of any such failure the engineer-in-charge may rectify or removed and re-execute the work or removed and replace the materials as

described above may be accepted or maybe made use of at reduced rate then in such cases the engineer-in-charge shall submit detailed proposal for appropriate reduction (preferably supported by an analysis wherever possible) to and obtain this approval expeditiously and accept the same at such reduced rates as approved by the City Engineer.

23 Any sort of accident/fatal/Non fatal to workers or to any person. the entire full liability is on the part of contractor, BSCDCL has not the pay any compensation in this regard.

24 The Contractor should submit completion drawing on tracing cloth and five additional copies of the same showing the position of Metering DP Transformer, panel, earthig stations, cable routes etc. at the time of final bill otherwise deduction of 1/2 percent of total amount of completed contract work will be made from the bill. This condition corresponds to the completion plan of actual work done and the same shall have to be submitted by the contractor after completion of work and before submission of final bill.

25 Rights to increase or decrease work- The competent authority reserves the right to increase or decrease work.

26 The competent authority reserves the right to increase or decrease any item of the work during the currency of the contract and the contractor will be bound to comply with the order of the competent authority without any claim for compensation.

27 Execution of agreement- The Tenderer whose tender has been accepted hereunder referred to as the contractor shall produce an appropriate solvency certificate, if so required by the executive engineer and will execute the agreement in the prescribed form within a fortnight of the date of communication of the acceptance of his tender by competent authority failure to do so will result in the earnest money being forfeited to BSCDCL and tender being cancelled.

28 Conditions applicable for contract- All the condition of the tender notice will be binding on the contractors in addition to the conditions of the contract in the prescribed form-

Following documents annexed with this NIT shall form a part of the contract,

Document on (i) Stamp paper (ii) List of deleted clause

1 Action when the contractors becomes liable for levy Penalty.

a) To rescind the contract and in which case the security deposit of the contractor shall stand forfeited and be absolutely at the disposal of BSCDCL.

b) To empolly labour paid in the PWD/Irrigation/PHE department or by employing departmental machinery and to supply materials to carry out work or any part of work debiting the contractor with the cost of the labour or hire charge of departmental machinery and the price of the materials and crediting him with the value of the work done in all respects in the same manner and the same rate as if had been carred out by the contractor undr the terms of this contract or the cost of the labour certificate of the divisional officer as to the value of the work done shall be final and conclusive against the contractor. this does not qualify the contractor to any refund if the work is carried out at lower rates than the rates quoted by the contractor saving if any will go to the BSCDCL Bhopal.

c) To measure up the work the contractor and to take such part there of as shall be unexecuted out of his hand and to give it to another contractor to complete in such case any expenses which may by incurred in excess of the sum such would have been paid to the original contractor if the whole work had been executed by him shall be borne and paid by the original or any other contract with BSCDCL or otherwise or from his security deposit or the proceeds of sale thereof or a sufficient part thereof if the work is carried out at lowe rated the contractor shall not be entitled for any refund on the account saving, if any which shall go to the BSCDCL

<u>Alterations in specification and Designs</u>

1 The engineer-in-charge shall have power to make any alterations in omissions from additions to substitution for the original specification drawings designs and instructions that may appear to him to be necessary or advisable during the progress of the work and the contracted shall be bound to carry out work in accordance with any instructions which may be given to him in writing signed by the engineer-in-charge and such alternations omissions additions or substitutions shall not invalidate the contract and any above specified as part of the work shall be carried out by the contractor on the same condition in all respects on such he afreed to do the main work and at the same rates as are specified in the tender for the main work.

2 Extension of time in consequence of alterations- The time for the completion of the work shall be extended in the proportion that the altered additional or subsitiuted work bears to the original contract work and the certificate of the engineer-in-charge shall be conclusive as to such proportion.

3 Quantities shown in the tender are approximate and no claim shall be enertained for quantities or work executed being either more or less than those entered in the tender or estimate.

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

30 The submission of tender by tenders shall imply that he has read the Tender Notice , each and every word of this tender document, has understood its contents and scope of work within the meaning of technical and legal aspects has seen the site and has made self aware of the standard and procedure to be followed in this work.

31 The tender notice shall mean only an invitation extended to the contractor for making offer. it does not amount to an offer or proposal.

32 Issue of tender documents by Bhopal Smart City Development Corporation Ltd., to any tenders and subsequent participation of the latter by submitting his offer on due date shall not be an entitlement for this (Tender's) right of claim for approval by the BSCDCL even in the event of his being the lowest offers.

33 On contrary to the contents of the Para 2.086 instruction 4 in the M.P. works Department manual for negotiations on the basis of offers received in First call. An intimation for negotiations shall certainly mean for withdrawal of all conditions given by tenderers and reductions of their offered rates. In the event of increase of rates or addition of any condition by any

tenderer in negotiations, his original offer, without conditions, shall remain valid and open for considerations by BSCDCL for approval, in the event of such approved of original of original offer the tenders shall have no right to deny the acceptance of his original offer by BSCDCL. the tenderer withdrawing his offer shall forfeit his earnest money to BSCDCL.

34 All works shall be carried out in strict accordance to the norms, procedure and specifications issued and enforced by BIS in relevant Indian standard specifications and code of practices with up to date amendments and revisions. latest editions of National Building code and National Electric code, In additions the installation shall comply in all respects with the equipments of Indian. Electricity Act 1910 and Indian Electricity rule 1956 with up to date amendments and revisions and special requirement if any of the M.P. Madhya Kshetra Vidyut Company or chief electrical advisor to Government of Madhya Pradesh cum Chief Electrical Inspector and his subordinate office.

35 For certain items RATES ONLY have called for, in schedule of item, without mentioning their quantities. These items may, or not required for execution, In case, any or all these items are required to be executed under this contract, the same shall have to be executed for the quantities and on the rates to be decided as below:

(a) Rates for any item falling under this category shall be the average, of rates tendered by all tenders for respective individual item. In case, the derived average rate is more than the tendered rate of approved tenders the lesser/lower rate shall be approved and make applicable for payment under this contract.

(b) Quantities of all items falling under this category shall be as per requirement and up to any extent.

36. The successful tenders shall make his own arrangements for supply of water and electricity at his own expense, required for execution of work. The BSCDCL shall neither make any such arrangements nor shall make any payments in this regard.

37. The successful tenders has to construct at his own cost his site office and store at site on a suitable place and locations as permitted by BSCDCL shall not provide any place or room in the building under constructions for storage of equipments required for work. No amount shall be paid to the contractor in this regard.

38. Proper upkeep, maintenance, security and safety of stores and stocks of materials brought at site installed/laid at site shall be the responsibility of the contractor. The materials got damaged due to negligence for its up keeping at site or due to mishandling at the time of installation/laying. shall have to be replaced by the contractor at his own cost. On discovery of such damages the BSCDCL shall recover the amount paid through the running bills to the contractor which shall only be reimbursed after the replacement of the same. The BSCDCL shall also not be responsible for theft of materials from site and the contractor has to replace all such materials at his own cost, No compensations whatsoever shall be payable to the contractor on above grounds.

39 The successful tenderer shall note that during the execution of works there is likelihood of additions of such items or works which are not included in the schedule of items annexed with this tender document for which the tenderers has not tendered his rates, for such items analysis and proposed rates shall be prepared and submitted by contractor with all supporting documents which shall be scrutinized and decided by the tender accepting authority and shall be final and binding on the contractor. The quantum of such work will not more than 25% of contract amount shall depend upon the mutual agreement by the contractor and the BSCDCL.

40. The successful tenderer shall note that during the execution of works there is likelihood in change of latenderert, specifications and change in quantities of items entered in the schedule of item for which the successful tenderer has tendered his rates. The value of increase or decrease in the quantities of such items may be up to 30 percent of the rates sanctioned to him in his original offer. The contractor shall, on the grounds of execution of such quantity, not entitled to procurement of additional quantities of such items due to such changes. the successful tenderer has to procure the said additional quantity on the same rates as already entered by him in the tender without claiming any loss for compensation.

41 Time being the essence of the contract, the successful tenderer shall before commencement of the work prepare a detail work program for successful completion of contract with in the allowed time, which shall be approved by the City Engineer charge of the work.

42 Time schedule may under unavoidable circumstances be revised by the BSCDCL form time to time for any reasons whatsoever. it may be necessary to stop the work at certain places due to some unavoidable reasons and restart the work at a later date. Such contingencies shall not vitiate the contract and shall not be considered a ground for extra claim.

43 The successful tenderer shall not be entitled to any compensation for any loss suffered by him on account of delay in commencement of execution of work whatever the cause of delay may be including delay arising out of other materials or delay in supplying the materials to be supplied by BSCDCL or any other reasons whatever and the BSCDCL shall not be for liable any claim in this respected thereof.

44 The successful tenderer shall not. without the prior approval of the competent authority in writing sublet or assign to any other party, or parties, the whole or any portion of the work under contract. Even if such approval is granted the contractor shall not be relieved of any obligation of duty or responsibility which he undertakes under this contract.

45 All dues regarding taxed, including sales tax, service tax, octroi duties etc, levied by Government or Local Bodies or private individuals on the contractor, in connection with the after said work executed by the BSCDCL will be payable by the contractor, the BSCDCL will grant a certificate for the quantities actually used on the work, but will not entertain any claim on this account.

46 The successful tenderer shall finalize the latenderert of work, physically at site, and get it approved by MPMKVVC before placing orders for material. approval of above latenderert by MPMKVVC shall be general and shall not absolve the contractor with responsibility of its correctness.

47 The successful tenderer shall within 15 (fifteen) days from the date of issue of work order shall prepare and submit all relevant drawing and details for the work to be forwarded to the concerned office of MPMKVVC and to the office of Chief Electrical advisor to Government of Madhya Pradesh cum electrical inspector or its concerned subordinate office or any other competent office for approval. All required sanctions and approvals from the offices shall have to be obtained by the successful tenderer at his own cost and effort within the above stipulated period. the successful tenderer may however procure material at site within the context of clause 17 of these special conditions during this period.

48 Time allowed to carry out the work as entered in the tender notice shall be strictly observed by the contractor and shall rekoned form date issue of work order to commence the work.

49 Rates quoted in the schedule of items shall be firm not be subjected to any variation duo to increase in labour wages, cost of materials, etc. any other price variation whatsoever either due to cost escalation during the stipulated period of executions or during extended period of completion if any.

50 The decision of City Engineer for specific make of item to be supplied and installed at site from the list of approved make of materials shall be final and binding on the contractor. Before placing the orders for materials the successful tenderer shall get approval of the specific makes of every item by the City Engineer BSCDCL.

51 Rate quoted shall be applicable for works at all height unless otherwise specified in the schedule of quantities.

52 The successful tenderer shall afford all reasonable facilities and cooperation to the various other agencies and contractors working at the site simultaneously, so that the entire work can be preceded smoothly to the successful completion.

53 The successful tenderer shall submit the drawings to BSCDCL for this work duly approved by the office of the chief electrical advisor to the Government of Madhya Pradesh and its concerned subordinate office or concerned offices of MPMKVVC with in 15 days form the date of work order. The approval of theses drawing will be general and will not absolve the contractor of the responsibility of the correctness of these drawings. At least 5 sets/copies of the approved drawing shall be supplied to the City engineer BSCDCL for its distribution to various agencies at site. at no cost.

54 The successful tenderer shall submit manufacturer's test report and drawings of the equipments to be supplied, for approval of the City engineer before supplying the equipment. The successful tenderer shall also submit the purchase bills of major items as required and directed at no cost.

55 (A) The Successful tenderer shall have to arrange all free of cost facilities for the inspection, such as employ of material labour etc. and any fees payable to Government or any competent Authority at his own cost, the successful tenderer shall arrange to obtain all sanctions from the concerned office of MPMKVVC and from the office of the Chief Electrical advisor to Govt. fo M.P. or his concerned subordinate office at his own cost Any fee in respect of above work paid by the successful tenderer shall not be reimbursed or refunded by the BSCDCL and no claim for compensation shall be entertained in this regard.

(B) If required by the Engineer-in-Charge or concerned office of MPMKVVC of Chief electrical advisor to Government of M.P. cum Chief Electrical inspector. the contractor has to get any equipment or complete installation checked and tested by any Government/Semi Government/Private Authority such as CPRI, BHEL, Testing department of MPMKVVC etc. at his own cost He shall also provide free of cost all labour material transport equipments etc. for the purpose of above testing. The contractor shall not be entitled for any compensation on this on this ground.

56 The authority competent to accept the tenders reserves to itself the right to accept any or reject all the tenders without assigning any reason.

57 The authority competent to accept the tender reserves the right to itself to accept the tender for whole works. or for part of work. or to distribute the work between one or more contractors without assigning any reason thereof.

58 The contractor shall submit analysis of rates of any or all items for which he has tendered his rates in the schedule of item. if so desired by the Engineer-in-Charge at no cost.

59 The tender must be accompanied by a list of similar contracts executed by the tenderer since last 3 years.

60 Conditional Tenders are liable to be rejected.

61 Tenders not properly sealed shall be rejected.

62 The tender will be received only from the contractor/firms of repute. possessing proper valid electric license from the office of Chief Electrical advisor to Government of MP for executions of such work.

63 The successful tenderer shall make his own arrangement for transport of all materials. The BSCDCL is not bound to arrange for priority for getting wagon for transportation of any material.

64 Each of the tender documents is required to be signed by the person or persons submitting the tenders.

65 The contractor shall be responsible for removal of all defects and shall make rectification in the work at his own cost. if any, at the time of handing over the installation of MPMKVVC without any claim for compensation.

66 The successful tenderer shall submit the name, qualification, experience of his site staff with copies of their certificates to Engineer-in-Charge before start of work.

67 <u>It shall be the duty of the contractor.</u>

a. To arrange all clearances form Chief electrical advisor to Govt. of Mp. cum chief electrical inspector or from his subordinate office.

b. To coordinate and peruse the offices of MPMKVVC and office of the chief Electrical Advisor to Govt. of M.P. cum chief electrical inspector/Vidyut Anugyapan Mandal for periodical inspections during the currency of contract.

c. and to arrange final inspection of the work and get the complete installation handover to MPMKVVC and get it electrically charged in presence of MPMKVVCL representative.

d. All the dismantled material (including poles conductor,cables DP structure transrformers etc.) to be deposited in MPMKVVCL store as per MPMKVVCL return schedule and Receipt is to be produced before final payments.

No Extra payment shall be made to the contractor in above account.

68 The successful tenderer at his own cost and efforts shall arrange periodical inspection of work by various officers of MPMKVVCL (Superintending engineer, Divisional engineer, Rank Office) during course of execution of work and any instructions issued by the officers of MPMKVVC shall be executed by the bidder and communicated to BSCDCL in writing and prior permission shall be taken form BSCDCL before its compliance.

69 Blasting of any type shall in any case not be permitted for excavation work. the tenderer may therefore visit the site before filling up the tender. Only chiseling in hard rock shall be allowed.

70 The successful tenderer, during course of execution, desires to make drill holes of required dia. and depth through drill/rig machine for erection of poles shall be permitted to do so but no payment for excavation of such drilled hole shall be made. However in lieu of above amount not being paid for drill hole he shall be exempted to provide base plate at the bottom of pole as it is not required in said case.

71 Before entering the rates for individual items in the annexed schedule of items the tenderer must make himself fully sure of its correctness. the rates. Once entered in the schedule of items, shall be deemed to be final and any condition for deviation in above rates written separately at any place in the tender document shall not be offer volid and liable to be rejected by BSCDCL.

72 The complete installation shall be guaranteed for TWENTY-FOUR calendar months. The guarantee period shall be rekoned from the date of handing over the installation to MPMKVVCL The all transformers and cables shall be guaranteed for 24 calendar months from the date of handing over the installation to MPMKVVCL the contractor has to replace/repair the faulty of damaged material to the full satisfaction of MPMKVVCL authorities in the event of failure/damage of any item during the said guarantee period.

73 The tenderer has to ensure before filling up the rates regarding their availability and period of delivery, in the event of the materials of equipment of makes called for are available alternative make be approved under the conditions mentioned in Annexure. But it will not be a ground for claim of time extension or any other compensation whatsoever.

74 All the condition of the tender notice. Instructions in regard to submission of tender, schedule of items and rates accepted, these special conditions, general specifications and all other documents attached will be binding on the contractor and shall form part of the agreement to be executed by the contractor in addition to the conditions of the contract in the prescribed printed forms. In the event of any of theses special conditions being contradictory to the condition of similar effect inprinted form, condition mentioned in these special condition shall be deemed to be applicable for the contract agreement for all legal and technical matters. In the event of any of these special conditions is of the similar effect to that of any condition of printed form the former shall be read in conjunction with he for all legal and technical aspects within the scope of this contract.

List of Approved Make

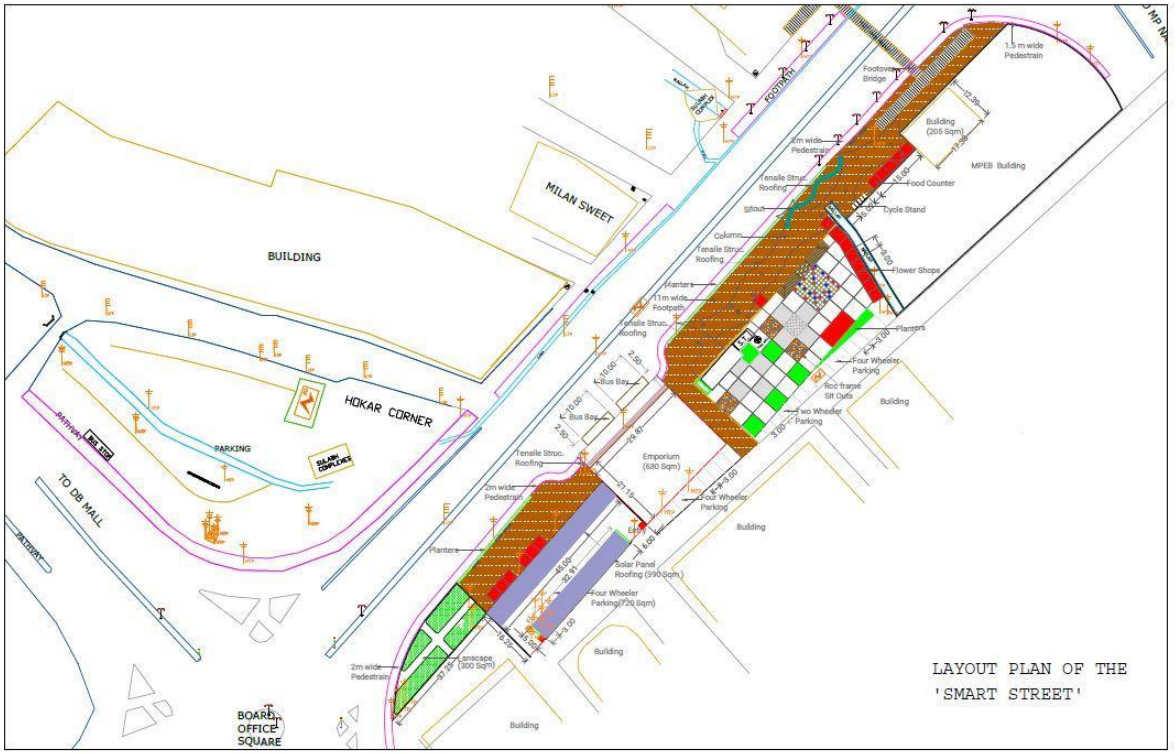
Electrical Material

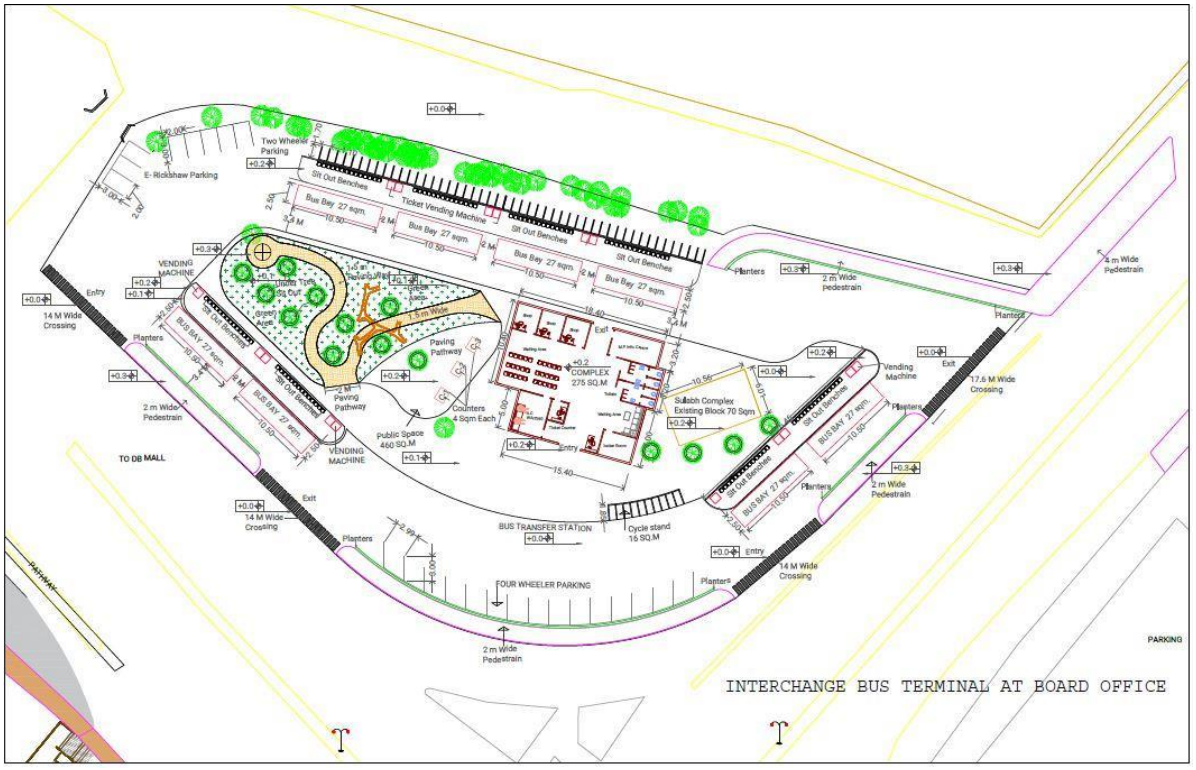
1.	**Cables HT (11KV& 33KV)**	-	Universal cables(Satna), RPG, Ravin Nicco, CCI(Banglore), Torrent/ Approved by MPMKVVCo Ltd and BSCDCL.
2.	**Cables LT**	-	Universal cables(Satna), Ravin, Nicco, CCI(Banglore), Torrent Approved by MPMKVVCo Ltd and BSCDCL.
3.	**RMU (11KV & 33KV)**	-	BHEL, ABB, Schneider, Siemens/ Approved by MPMKVVCo Ltd and BSCDCL.
4.	**HT Termination jointing kit**	-	Raychem, M-seal, Cabseal, Mahindra/ Approved by MPMKVVCo Ltd and BSCDCL.
5.	**PSS**	-	ABB, Schneider, Siemens, Kirloskar/ Approved by MPMKVVCo Ltd and BSCDCL.

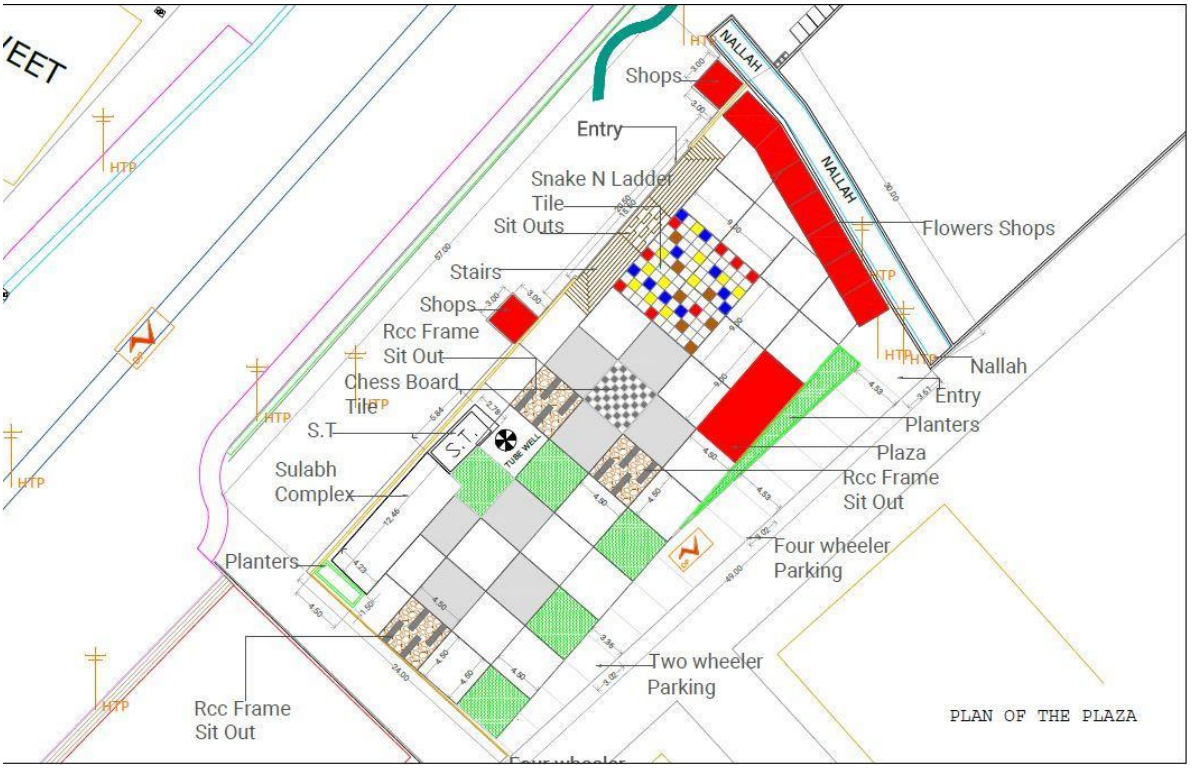
SECTION-8

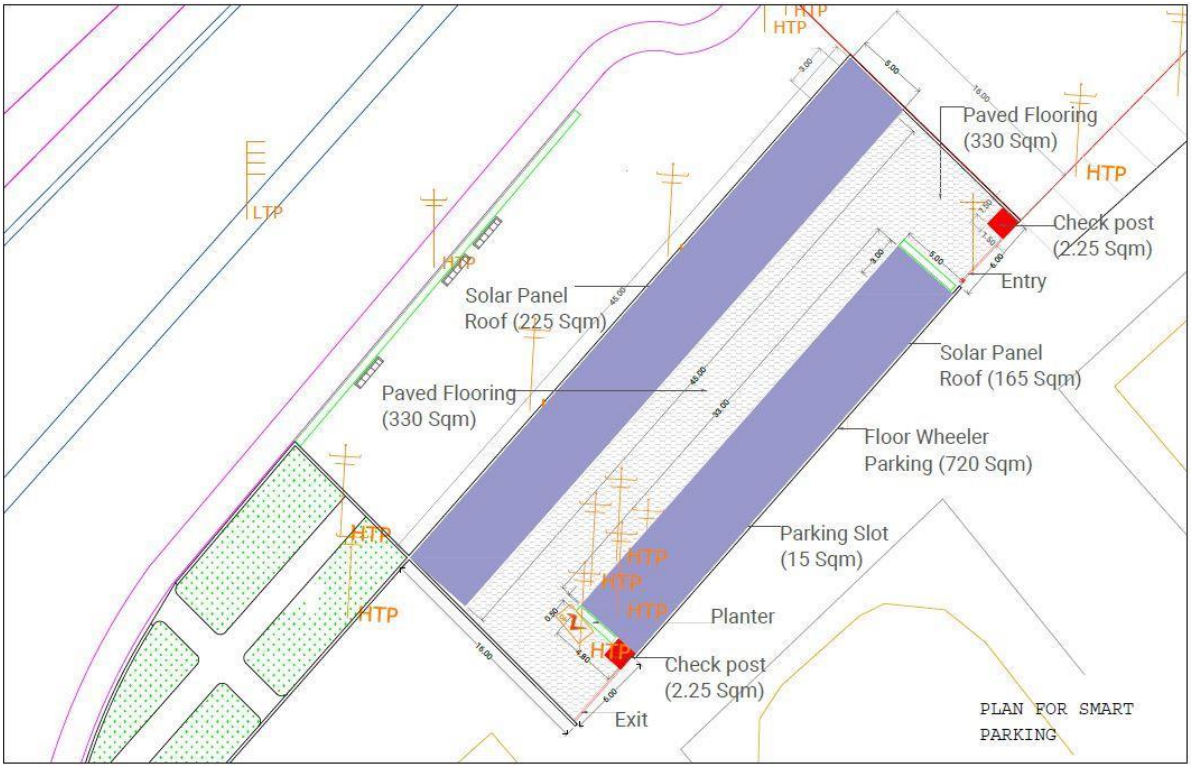
DRAWINGS

DRAWINGS AND LAYOUT PLAN






NALLAH
Shops
Entry
Snake N Ladder
Tile
Sit Outs
Flowers Shops
Stairs
Shops
Rcc Frame
Sit Out
Chess Board
Tile
S.T
Sulabh
Complex
Planters
Rcc Frame
Sit Out
Nallah
Entry
Planters
Plaza
Rcc Frame
Sit Out
Four wheeler
Parking
Two wheeler
Parking
PLAN OF THE PLAZA


Paved Flooring
(330 Sqm)
Check post
(2.25 Sqm)
Entry
Solar Panel
Roof (225 Sqm)
Solar Panel
Roof (165 Sqm)
Paved Flooring
(330 Sqm)
Floor Wheeler
Parking (720 Sqm)
Parking Slot
(15 Sqm)
Planter
Check post
(2.25 Sqm)
Exit
PLAN FOR SMART
PARKING

Smart street strech with plaza

*Conceptual views for broad understanding purposes only, actual drawing may differ

Bus interchange terminal

Bus stops with tensile structured roof

Car parking

Paved bus bays

** Conceptual views for broad understanding purposes only, actual drawing may differ*

Bus stop

Main building

Open / recreational area with siiting

** Conceptual views for broad understanding purposes only, actual drawing may differ*

concrete furniture along kiosks

retrofitting existing structure to G+1 with terrace to accomo-date public amenities

Landscaping

concrete street furniture

Entrance to public plaza

Information / food kiosks

Tensile roof along smart street

SECTION-9

BILL OF QUANTITY

CIVIL UADD SOR ITEMS

S.NO.	DISCRIPTION	REFERENCE		QUANTITY	UNIT	RATE	AMOUNT
		PAGE NO	ITEM NO.				
1	Surface dressing of the ground removing vegetaion and in-equalties not exceeding 15 cm deep and disposal of rubbish, lead upto 50 m and lift upto 1.5 m all kinds of soil.	19	2.28.1	13263	1 Sq.M	6.63	87933.69
	Earth work in excavation by mechanical means (Hydraulic excavator) / manual means over areas (exceeding 30cm in depth 1.5m in width as well as 10 sqm on plan) including disposal of excavated earth, lead upto 50m and lift upto 1.5 m, disposed earth to be levelled and neatly dressed.						
2	All kinds of Soil	15	2.6.1	1859.008	Cum	127	236094.016
3	Providing and laying in position cement concrete of specified grade excluding the cost of centering and shuttering - All work up to plinth level.						
4	CEMENT CONCRETE GRADE m-15 (NOMINAL MIX) WITH 20 MM MAXIMUM SIZE OF STONE AGGREGATE.	34	4.1.2	511.15	Cum	4154	2123317.1
5	Providing and laying in position specified grade of reinforced cement concrete (with 20mm nominal size graded stone aggregate) excluding the cost of centering, shuttering, finishing and reinforcement - All work up to plinth level : Cement concrete grade M-20	46	5.1.1	472.65	Cum	4728	2234689.2

	(Nominal mix) with 20 mm maximum size of stone aggregate.						
6	Reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding including cost of binding wire up to floor two level including all wastage etc. complete. Thermo Mechanically Treatedbars.(TMT)	49	5.20.6	56718	Kg.	60	3403080
7	Centering and shuttering including strutting, propping etc. and removal of form for : Foundations, footings, bases of columns, etc. for mass concrete.	209	20.1.1	1804.3	sqm	138	248993.4
8	Supplying and filling in plinth with hard muram/hard copra under floors including watering ramming cosolidating and dressing complete.						0
	Moorum / hard copra	19	2.27.3	5177.6	Cum	570	2951232
9	Brick work with well burnt chimney bricks in bulls patent trench kiln manufactured by ghol process, crushing strength not less than 40kg /sqcm and water absorption not more than 15% in foundation and plinth Cement Mortar 1:6 (1 cement : 6 sand).	58	6.1.2	600	Cum	4232	2539200
10	20mm cement plaster of mix: 1:6 (1 cement: 6 coarse sand)	156	13.6.3	995	sqm	95	94525
11	finishing walls with textured exterior paint of required shade: New work (two or more coats applied @3.28 ltr/10 sqm) over and includin g base coat of water proofing cement	161	13.45.1	1210.2	sqm	125	151275

	paint applied @ 2.20kg/10sqm.						
12	Providing and laying 80 mm thick factory made cement concrete interlocking paver block of M-30 grade made by block machine with strong vibratory compaction and of approved size and design/ shape laid in required colour and pattern over and including 50 mm thick compacted bed of course sand, filling the joints with course sand etc. all complete as per direction of Engineer -in-charge.	136	11.46.1	4581	sqm	568	2602008
13	Steel work in built up tubular trusses including cutting, hoisting fixing in position and applying a priming coat of approced steel preimer, welded and bolted including special shaped washers etc. complete. Hot finished seamless type tubes.						
14	a. 100mm dia @12.1kg/meter	115	10.16.1	29061.03	Kg	86	2499248.58
15	b. 40mm dia @3.61kg/meter	115	10.16.1				0
16	c. 80mm dia @8.47kg/meter	115	10.16.1				0
17	Painting with synthetic enamel paint of approved brand and manufacture to give an even shade: Two or more coats on new work.	163	13.61				0
18	a. 100mm dia	163	13.61	306.252	sqm	45	13781.34
19	b. 40mm dia	163	13.61				0
20	c. 80mm dia	163	13.61				0

21	Precasting and placing in position 125 mm dia bollard 600 mm high of required shape including providing M.S. pipe sleeve 50 mm dia 300 mm long in the bollard and M.S. plate welded at bottom and embedded 150mm in cement concrete grade M-10 (Nominal Mix with 20mm maximum size of stone aggregate) including necessary excavation of size 250X250X 450mm deep for the same in bitumen/ concrete pavement at specified spacing.	36	4.8	402	each	416	167232
22	Supplying and stacking good earth at site including royalty and carriage up to 1 km (earth measured in stacks will be reduced by 20% for payment).	204	19.2	102	cum	184	18768
23	Supply and stacking sludge at site including royalty and carriage up to 1 km (sludge measured in stacks will be reduced by 8% for payment).	204	19.3	63	cum	162	10206
24	Grassing with 'Doob' grass including watering and maintainance of the lawn for 30 days or more till the grass forms a thick lawn free from weeds and fit for mowing including supplying good earth if needed (the good earth shall be paid separately). In rows 5 cm apart in either direction.	204	19.10.3	300	100sqm	496	148800
25	a. Below concrete floor	128	11.3.1	1248	Cum	570	711360
26	Cement concrete flooring M-15 (nominal mix) finished with a floating coat of neat cement including cement slurry, but excluding the cost of nosing of steps etc.	128	11.3.1	1248	sqm	236	294528

	complete.: 40mm thick with 20mm maximum size of stone aggregate.						
27	40mm thick fine dressed stone flooring over 20 mm (average) thick base of cement mortar 1:5 (1 cement : 5 coarse sand) with joints finishing flush. (minimum size of kota stone 0.25 sqm.): white sand stone.	133	11.28.2	120	sqm	442	53040
28	Providing and fixing exterior grade deck-wood panels of weather proof, high pressure oil impregnated, of thickness minimum 25mm, fixed in tough & groove pattern, having self coating of PU/ melamine/ sealer, fixed on M.S. frame with screw and bolts, etc. complete in all respect as per direction of engineer in charge.	86	9.5.1.2	60	sqm	2019	121140
29	12 mm cement plaster of mix: 1:4 (1 cement : 4 fine sand)	156	13.1.1	1440	sqm	108	155520
31	Finishing wall with premium Acrylic smooth exterior paint with silicon additives of required shade- New work (two or more coats applied @1.43ltr/ 10 sqm. Over and including base coat of water proofing cement paint applied @ 2.20 kg/10sqm.)	161	13.47.1	1440	sqm	76	109440
32	Kota/ cuddapah stone slab 30 mm thick flooring over 20 mm (average) thick base laid over and jointed with grey cement slurry mixed with pigment to match the shade of the slab including rubbing and polishing complete with base of cement mortar (1 cement: 4 course sand) 1:4 9minimum size of Kota	133	11.26.1	1276	sqm	899	1147124

	stone 0.25 sqm.)						
33	Providing and laying polished vitrified floor tiles in different sizes (thickness to be specified by the manufacturer) with water absorption less than 0.08% and conforming to IS : 15622 of approved make in all colours and shades, laid on 20mm thick cement mortar 1:4 91 cement ; 4 coarse sand) including grouting the joints with white cement and matching pigments etc. complete Sie of tile 60x60cm x 10mm	135	11.39.2	97	sqm	1109	107573
34	Providing and fixing 1st quality ceramic glazed wall tiles conforming to IS : 15622 (6 to 7 mm thick) of approved make in all colours, shades except burgundy, bottle green, black of any size as approved by engineer in charge in skirting risers of steps and dados over 12mm thick bed of cement mortar 1:4 (1 cement : 4 coarse sand) including pointing the joints with white cement and matching pigment etc. complete	134	11.34	420	sqm	686	288120
35	Providing and fixing ISI marked flush door shutters conforming to IS : 2202 (Part 1) decorative type, core of block board construction with frame of 1st hard wood and well matched teak 3 ply veneering with vertical grains or cross bands and face veneers on both faces	90	9.20.1	56	sqm	2100	117600

	of shutters using following hinges. 35mm thick including ISI marked stainless steel butt hinges with necessary screws.						
36	Providing and fixing aluminum work for doors, windows, ventilators and partitions ……for fixed portion Anodised aluminum…….. Coating of grade AC15	190	17.1.1.1	100	Kg	347	34700
37	Providing and fixing glazing in aluminum door, windows, ventilators shutters and partition etc. with PVC / neoprene gasket etc. complete as per the architectural drawings and the directions of engineer in charge (Cost of the aluminum snp beading shall be paid in basic item): with float glass of 5.50mm thickness	191	17.3.2	24	sqm	859	20616
38	Providing and fixing Polyethelene- Aluminium-Polyethelene (PE-AL-PE) Composite pressure pipes conforming to IS-15450 UV. Stabilized with carbon black having thermal stability for hot & cold water supply, capable to withstand temperature upto 80˚ c including all special fitting of composite material (engineering plastic bend & brass inserts wherever required) e.g. elbows, tees, reducers, couplers & connectors etc. with trenching, refiling and testing of joints complete as per direction of the engineer in charge. External Wall - 3240 (40mm OD) pipe.	223	23.3.5	40	meter	469	18760

39	Providing and fixing Polyethelene- Aluminium-Polyethelene (PE-AL-PE) Composite pressure pipes conforming to IS-15450 UV. Stabilized with carbon black having thermal stability for hot & cold water supply, capable to withstand temperature upto 80˚ c including all special fitting of composite material (engineering plastic bend & brass inserts wherever required) e.g. elbows, tees, reducers, couplers & connectors etc. with clamps at 1.00 meter spacing. this includes testing of joints complete as per direction of the engineer in charge. Internal work- Exposed on wall. concealed work including cutting chases & making good the wall etc. - 2532 (32mm OD) pipe.	223	23.2.4	30	meter	427	12810
40	Providing and fixing Polyethelene- Aluminium-Polyethelene (PE-AL-PE) Composite pressure pipes conforming to IS-15450 UV. Stabilized with carbon black having thermal stability for hot & cold water supply, capable to withstand temperature upto 80˚ c including all special fitting of composite material (engineering plastic bend & brass inserts wherever required) e.g. elbows, tees, reducers, couplers & connectors etc. with clamps at 1.00 meter spacing. this includes testing of joints complete as per direction of the engineer in charge. Internal work- Exposed on wall. concealed work	223	23.2.3	48	meter	250	12000

	including cutting chases & making good the wall etc. - 1620 (20mm OD) pipe.						
41	Providing and fixing chlorinated Polyvinyl chloride (CPVC) pipes, having thermal stability for hot & cold water supply including all CPVC plain & brass threaded fittings, this includes jointing of pipes & fitting with one step CPVC solvent cement, trenching, refilling & testing of joints complete as per direction of Engineer in charge. 100mm nominal inner dia. pipes	225	23.9.9	100	meter	2435	243500
42	Providing and fixing chlorinated Polyvinyl chloride (CPVC) pipes, having thermal stability for hot & cold water supply including all CPVC plain & brass threaded fittings, this includes jointing of pipes & fitting with one step CPVC solvent cement, trenching, refilling & testing of joints complete as per direction of Engineer in charge. 150mm nominal inner dia. pipes	225	23.9.10	6	meter	4228	25368

43	Constructing brick masonry modular brick class designation 40 manhole in cement mortar 1:4 (1 cement: 4 sand) R.C.C. top slab with cement concrete grade M-20 (Nominal mix with 20mm maximum size of stone aggregate). 20 cm thick foundation concrete grade M-7.5 (Nominal mix with 40mm maximum size of stone aggregate) inside plastering 12mm thick with cement mortar 1:3 (1 cement : 3 sand) finished with floating coat of neat cement and making channels in cement concrete grade M-15 (Nominal mix with 20mm maximum size of stone aggregate) as per standard design. The size of manhole and manhole covers as: Manhole inside size 90x80 cm and deep 45cm deep including C.I. cover with frame (light duty) 455x610mm internal dimensions total weight of cover and frame to be not less than 38 kg (weight of cover 23 kg and weight of frame 15 kg).	224	23.4.1	8	each	7377	59016
44	Providing and fixing C.P. brass bib cock of approved quality conforming to IS:8931 - 15mm nominal bore.	229	23.29.1	24	each	360	8640
45	Providing and fixing C.P. brass long body bib cock of approved quality conforming to IS standards and weighing not less than 810 gms. - 15mm nominal bore.	229	23.31.1	22	each	363	7986

46	Providing and fixing water closet squatting pan (Indian type w.c. pan) with 100mm sand cast iron P or S trap, 10 litre low level white P.V.C. flushing cistern with manually controlled device (handle level) conforming to IS:7231, with all fittings and fixtures complete including cutting and making good the walls and floor wherever required: White vitreous china Orissa pattern W.C. pan of size 580x440mm with integral type foot rests.	245	25.1.1	10	each	2698	26980
47	Providing and fixing white vitreous china flat back or wall corner type lipped front urinal basin of 430x260x350mm and 340x410x265mm sizes respectively with automatic flushing cistern with standard flush pipe and c.p. brass spreaders with brass unions and G.I. clamps complete. including painting of fittings and brackets, cutting and making good the walls and floors wherever required: One urinal basin with 5 litre white P.V.C. automatic flushing cistern.	245	25.4.1	5	each	2246	11230
48	White vitreous china wash basin size 630x450mm with a pair of 15mm C.P. Brass pillar taps.	246	25.7.1	10	each	1564	15640
49	Providing and placing on at all floor levels high design HDPE (polyethylene) water storage tank ISI : 12701 marked with cover and suitable locking arrengement and making necessary holes for inlet, outlet and overflow pipes without fitting and the	229	23.28	3000	ltr	7	21000

	base support for the tank.						
50	Point wiring surface rigid P.V.C. conduit system with flush type accessories. Point wiring including metallic switch box, sheet, switches, sockets, lamp holders/ ceiling roses etc with 1.5 sq.mm. PVC insulated cable FR with copper multi strand conductor ISI marked in surface rigid P.V.C. conduit (MMS) ISI marked of suitable size and 1.5 sq.mm. PVC insulated copper earth continuity conductor of green colour inside conduit including painting etc. as required as per specification for: Light Point/ Fan Point- c) Long Point.	vol.4	1.1.1.c	128	each	894	114432
51	Circuit wiring - Wiring for circuit wiring with PVC insulated cable FR with copper multi strand conductor ISI marked in surface rigid P.V.C. conduit (MMS) of ISI marked suitable size including painting etc. as required as per specification. 4x2.5 sq.mm.	vol.4	1.1.6.b	520	meter	129	67080
52	Circuit wiring - Wiring for circuit wiring with PVC insulated cable FR with copper multi strand conductor ISI marked in surface rigid P.V.C. conduit (MMS) of ISI marked suitable size including painting etc. as required as per specification. 6x2.5 sq.mm.	vol.4	1.1.6.c	180	meter	148	26640

53	Modular switch boxes- Supplying & fixing of approved make modular type metal box with modular frame/ base plate and cover plate including fixing in concealed/ surface excluding switch, socket etc. as required for: 8 module	vol.4	2.9.4	14	each	202	2828
54	Modular switch boxes- Supplying & fixing of approved make modular type metal box with modular frame/ base plate and cover plate including fixing in concealed/ surface excluding switch, socket etc. as required for: 12 module	vol.4	2.9.5	14	each	255	3570
55	Power wiring in PVC casing caping system with modular accessories: point wiring including metallic switch box, sheet for 3 pin 16 amp. Socket outlet point with 4 sq.mm. PVC insulated cable FR with copper multi strand conductor ISI marked in surface rigid P.V.C. casing and capping ISI marked of suitable size including painting etc. with 16 amp. F.T. switch & socket / S.S. combined 16 Amp. of ISI marked and 4 sq.mm. PVC insulated copper earth continuity conductor of green colour inside capping as per specification for: on separate board: c. Long point	vol.4	3.3.3.c	32	each	1580	50560
56	Supplying of ISI marked and approved make of moulded case circuit breaker (MCCB) suitable for 3 phase, 3 pole, 50Hz, 415 Volts, AC supply with respective interrupting	vol.4	8.1.1.c	2	each	4939	9878

	capacity (KA) at 415 Volts cited against their range standard conforming to IS-8828: Current rating - 25 to 100 Amps & 70%-100% adjustable.						
57	Supplying, erection and testing of approved make electric ceiling fan of double ball bearing complete with standard down rod, canopy, hanging shackle, aluminium blades, without regulator, A.C. 230-250 volts including connections with all necessary material complete as required conforming to IS:374/1979 with upto date ammendments: ceiling fan (energy saver 50W)- 1200 mm sweep.	vol.4	9.32.1	18	each	1888	33984
58	Supply, erecting and testing of approved make exhaust fan heavy duty with mounting frame, blades AC 230-250 complete connections and including frame bolts/ anchor hole fastners etc. complete finished and as required. 450mm sweep 900 RPM	vol.4	9.36.3	2	each	4291	8582
		TOTAL-					23471628

CIVIL MPPWD SOR ITEMS

S.NO.	DISCRIPTION	REFERENCE		QUANTITY	UNIT	RATE	AMOUNT
S.NO.	PART- A - SOR BASED ITEMS	PAGE NO	ITEM NO.				
1	Providing and planting different variety of plants of approved quality and sizes as mentioned including making pits of required size at site, refilled with B.C. Soil mixture mannuring and pesticide etc. complete (to be paid separately) including watering and 90 days maintenance from the date of final bill as per direction of engineer in charge complete in all respect (B.C. Mixture paid separately). Foxtail Palm (1.80mtrs to 2.10mtrs height.)	MPPWD SOR	23.15.7	60	each	1784	107040
2	Supply, fixing & testing of approved make of H.D. asymmetrical beam flood light fitting suitable for tubular single lamp consisting of cast aluminum housing ALGLAS coated aluminum faceted reflector assly toughned glass cover, mounting bracket and aiming disc. separate control gear box required for HPSV/M.H. lamp (without lamp) including fixing & connection as required in position with all necessary material required. (SOR 26.50.2) 400 watt S.V. lamp/metal halide with control gear box.	MPPWD SOR	26.50.2	5	each	4690	23450
3	Supply, fixing & testing of approved make of H.D. asymmetrical beam flood light fitting suitable for tubular single lamp consisting of cast aluminum housing ALGLAS coated aluminum faceted reflector assly toughned glass cover, mounting bracket and aiming disc. separate control gear box required for HPSV/M.H. lamp (without lamp) including fixing & connection as required in position with all necessary material required. (SOR 26.50.2) 400 watt S.V. lamp/metal halide with	MPPWD SOR	26.50.2	8	each	4690	37520

	control gear box.						
4	Providing and fixing 10x10x7.50 cm Granite stone block hand cut and chisel dressed on top, for paving in floors, drains etc. laid over 20mm thick base mortar 1:4 (1cement:4 sand) with joints 10mm wide filled with same mortar mixed with matching pigment including ruled pointing etc. complete as per direction of engineer-in charge.	MPPWD SOR	11.31	800	sqm	1241	992800
5	Providing and fixing PUF insulated continueous sandwich panels for wall of total thickness not less than 50 mm and width 1.0m made out from continue line method on automatic plant. Panel shall have pre coated GI sheet on both side of Polyurethane foam confirming to IS 12436:1988. The precoated sheet shall be of minimum 240 mpa steel grade confirming to IS 14246:1995 and shall have zinc coating of minimum 120 gsm as per IS:277, 5-7 microns epoxy primer on both side of the sheet and polyester top coat 15-18 micron. The PPGI Sheet shall have plastic protective guard film of minimum 25 microns to avoid scratches during trasportation. The panels shall be vertically joined together by tongue and groove joints. The PU foam shall be self extinguishing, fire retardant type having minimum density of 40 kg/Cum. (±2 Kgs) including 0.25 mm thick craft paper edging on both edges. The panels shall be fixed to the steel frame structure with minimum 5mm thick craft paper edging on both edges. The panels shall be fixed to the steel frame structure with minimum 5mm thick	MPPWD SOR	24.13.1	45	sqm	2566	115470

	self tapping Gi screws of required length and nos. with minimum spacing of 300 mm c/c. PPGI sheet 0.5mm thick skin on both sides.						
6	Supply and installation of moisture/fire resistant lap siding 8 mm thick and width as per standard sizes made of cement fibre board with embossed decorative finish to give pleasing exterior finish fixed horizontally with staggered joints including minimum overlap of 32 mm on external cement fibre board conforming to IS 14862:2000 fixed with self drilling/tapping screws/fasteners of approved make	MPPWD SOR	24.8	45	sqm	702	31590
7	Providing and fixing 12 mm thick frameless toughened glass door shutter of approved brand and manufacture, including providing and fixing top bottom pivot spring type fixing arrangement and making necessary holes etc. for fixing required door fittings, all complete as per direction of Engineer-incharge (Door handle, lock and stopper etc.to be paid separately).	MPPWD SOR	21.18	12	sqm	4958	59496
8	Supply and installation of moisture/fire resistant lap siding 8 mm thick and width as per standard sizes made of cement fibre board with embossed decorative finish to give pleasing exterior finish fixed horizontally with staggered joints including minimum overlap of 32 mm on external cement fibre board conforming to IS 14862:2000 fixed with self drilling/tapping screws/fasteners of approved make	MPPWD SOR	24.8	90	sqm	702	63180
		TOTAL					1430546

CIVIL NON SOR ITEMS

S.NO.	DISCRIPTION	REFERENCE		QUANTITY	UNIT
		PAGE NO	ITEM NO.		
1	Supply & installation of signage made of poly carbonated sheets, UV reflective transparent, of thickness 3mm fixed on m.s. frame of pipe 25mmx25mm (medium weight) section of required size with LED light fitting within and all necessary wiring & electricals including providing and fixing of external switch for the same at the place within 2m. of the signage etc. complete in all respect as per direction of engineer in charge.	NON SOR		200	sqm
2	Supply and installation of three seater benches made on 40mmx40mm m.s. tubular sections (medium weight) and seat of 6mm cnc cut m.s. sheet, Duly painted with primer and enamel paint. Complete in all respect as per direction of engineer in charge.	NON SOR		2666	kgs
3	Supply & installation of complete tensil membrane system consisting high tensile fabric having tensile strength not less than 420/400 daN/5cm, tear strength not less than 55/50 daN, Solar reflectance – Rs. -75% with extreme working temperature ISO certified. etc. complete in all respect as per direction of engineer in charge.	NON SOR		212	sqm
4	40mm sand stone flooring of honed / brushed finish with 20mm mortar of 1:4 (1 cement: 4 coarse sand) including joint filling with matching pigment, complete in all respect as per direction of engineer in charge.	NON SOR		159	sqm
5	Supply and installation of three seater benches made on 40mm dia m.s. pipes (medium weight) and seat of 8mm cnc cut m.s. sheet, Duly painted with primer and enamel paint. Complete in all respect as per direction of engineer in charge.	NON SOR		8	NOS.

6	Supply & installation of complete tensil membrane system consisting high tensile fabric having tensile strength not less than 420/400 daN/5cm, tear strength not less than 55/50 daN, Solar reflectance – Rs. -75% with extreme working temperature ISO certified. etc. complete in all respect as per direction of engineer in charge.	NON SOR		100	sqm
7	40mm sand stone flooring of honed / brushed finish with 20mm mortar of 1:4 (1 cement: 4 coarse sand) including joint filling with matching pigment, complete in all respect as per direction of engineer in charge.	NON SOR		75	sqm
8	Supply and installation of three seater benches made on 40mm dia m.s. pipes (medium weight) and seat of 8mm cnc cut m.s. sheet, Duly painted with primer and enamel paint. Complete in all respect as per direction of engineer in charge.	NON SOR		12	NOS.
9	Supply & installation of complete tensil membrane system consisting high tensile fabric having tensile strength not less than 420/400 daN/5cm, tear strength not less than 55/50 daN, Solar reflectance – Rs. -75% with extreme working temperature ISO certified. etc. complete in all respect as per direction of engineer in charge.	NON SOR		212	sqm
10	40mm sand stone flooring of honed / brushed finish with 20mm mortar of 1:4 (1 cement: 4 coarse sand) including joint filling with matching pigment, complete in all respect as per direction of engineer in charge.	NON SOR		159	sqm
11	Supply and installation of three seater benches made on 40mm dia m.s. pipes (medium weight) and seat of 8mm cnc cut m.s. sheet, Duly painted with primer and enamel paint. Complete in all respect as per direction of engineer in charge.	NON SOR		8	NOS.
12	Supply & installation of complete tensil membrane system consisting high tensile fabric having tensile strength not less than 420/400 daN/5cm, tear strength not less	NON SOR		100	sqm

	than 55/50 daN, Solar reflectance – Rs. -75% with extreme working temperature ISO certified. etc. complete in all respect as per direction of engineer in charge.				
13	40mm sand stone flooring of honed / brushed finish with 20mm mortar of 1:4 (1 cement: 4 coarse sand) including joint filling with matching pigment, complete in all respect as per direction of engineer in charge.	NON SOR		75	sqm
14	40mm sand stone flooring of honed / brushed finish with 20mm mortar of 1:4 (1 cement: 4 coarse sand) including joint filling with matching pigment, complete in all respect as per direction of engineer in charge.	NONSOR		195	sqm
15	Supply & installation of seating with honed finish 50mm thick sand stone duly ploished with two coats of sealer of approved brand, with base as brick work and plastered & filling inbetween. The plasterd surface shall be painted with exterior grade textured paint etc. complete in all respect as per direction of engineer in charge.	NONSOR			
16	A 0.60M wide 3.0 m outer dia.	NONSOR		12	each
17	Supply & installation of LED bollard lights of height 0.60m of 9W, 20mA, 220-240 V/50-60 Hz integrated in driver box, with 96xled-HB, warm white, 3000K lumins, wide beam optic, body aluuminum, diffuser tube: polycarbonate gasket: silicon rubber, heat resistant, color grey, RAL 7043 etc. complete in all respect as per direction of engineer in charge.	NONSOR		30	each
18	Supply & installation of LED bollard lights of make philips, havels, Crompton greeves or equivalent, B29 of height 0.60m of 9W, 20mA, 220-240 V/50-60 Hz integrated in driver box, with 96xled-HB, warm white, 3000K lumins, wide beam optic, body aluuminum, diffuser tube: polycarbonate gasket: silicon rubber, heat resistant, color grey, RAL 7043 etc. complete in all	NONSOR		24	each

	respect as per direction of engineer in charge.				
19	Supply & installation of 9w LED light with two way through with 3000k lumins with aluminum body of size 200mm and width respectively of make Philips, havels, CG or equivalent with wall washer light including fitting, fixtures, wiring, control switch etc. complete in all respect as per direction of engineer in charge.	NON SOR		10	each
20	Providing and fixing of American Blue grass carpet of required size, including maintenance of the same upto 3 months complete in all respect as per direction of Engineer In Charge	NONSOR		90	sqm
21	Supply and installation of three seater benches made on m.s. pipes of required size and seat of 8mm cnc cut m.s. sheet, Duly painted with primer and enamel paint. Complete in all respect as per direction of engineer in charge.	NON SOR		12	each
22	Supply & installation of seating with honed finish 50mm thick sand stone (rainbow/ teak wood) duly ploished with two coats of sealer of approved brand, with base as brick work and plastered & filling inbetween. The plasterd surface shall be painted with exterior grade textured paint etc. complete in all respect as per direction of engineer in charge.	NON SOR		30	RM
23	Providing & fixing of solid stone blocks seating of honed finish sand stone (rainbow/ teak wood) carved as per design/ drawing out of solid stone block duly polished with two coats of sealer of approved brand, the outer envelope sized shall be measured. complete in all respect as per direction of engineer in charge.	NON SOR		2.88	Cum

24	Providing & fixing of ferrocrete seat of wall thickness minimum 30mm making envelope frame with seating height 0.40m and back height 0.40m duly painted with enamel paint etc. complete in all respect as per direction of engineer in charge.	NON SOR		36	RM
25	Providing & fixing of solid exposed concrete seating in decorative/ floating forms including reinforcement, centering/ formwork in ply.The concrete mix shall be 1:1.5:3, with sectional size of 0.40mx0.40m and length as per drawing, the top of the seat shall be of polished granite of thickness 18 mm fixed with 20 mm mortar including edge polishing of the same. The concrete surface shall be neatly grinded and duly coated with 2 coats of enamel paint etc, complete in all respect as per direction of engineer in charge.	NON SOR		40	RM
26	Providing & fixing of exposed concrete seating in decorative/ floating forms integrated to landscape including reinforcement, centering/ formwork in ply. The concrete mix shall be 1:1.5:3, with the thickness of the seats 150mm and length & form as per drawing, The concrete surface shall be neatly grinded and duly coated with 2 coats of enamel paint etc, complete in all respect as per direction of engineer in charge.	NON SOR		27	SQM
27	Providing & fixing of fibre made dustbins having three containers of sizes (0.6x0.6x0.9) each fixed on powder coated m.s. pipe frames with swing mechanism, complete in all respect as per direction of engineer in charge.	NON SOR		12	each
28	Design, making, supply and installation of sculptures carved out of solid block of sandstone of outer dimension 1.00mx1.00mx1.00m of rainbow/ teakwoodor any other color approved by engineer in charge. Duly polished with two coats of sealer etc. The design of	NON SOR		15	each

	sculpture shall be approved by the engineer-in-charge.				
29	Design, making, supply and installation of ensemble of 6 no. gun-metal/Architectural Bronzefigurines of varying sizes, with patina finish in desired degree of oxidization, with combined weight of the ensemble not less than 1200 kgs, fixed on concrete/ metal base, complete in all respect as per direction of engineer-in-charge. The design of sculpture shall be approved by the engineer-in-charge	NON SOR		1200	kgs
30	Design, supply and installation of S.S. sculpture of required dimension, fixed on concrete/ metal base, complete in all respect as per direction of engineer-in-charge. The design of sculpture shall be approved by the engineer-in-charge	NON SOR		300	kgs
31	Design, supply and installation of M.S. sculpture of required dimension duly finished with epoxy paint of approved shade, fixed on concrete/ metal base, complete in all respects as per direction of engineer charge. The design of sculpture shall be approved by the engineer-in-charge	NON SOR		300	kgs
32	Design, making, supply and installation of fibre glass mesh and epoxy resin figurine/sculptures, of weight not less than 30kgs, fixed on concrete/ metal base, complete in all respect as per direction of engineer-in-charge. The design of sculpture shall be approved by the engineer-in-charge.	NON SOR		100	kgs
33	Supply & installation of chequered chess patter in tiles made of granite black/ white silver polished on all visible surfaces with slab thickness minimum 25mm laid over 50mm cement slurry of mix 1:2:4,	NON SOR		25	sqm

	complete in all respect as per direction of engineer in charge.				
34	Design, making, supply and installation of upscaled replica of complete set of chess-pieces (32 figurines of varying sizes) of approved design cast in fibre mesh and epoxy resin with marble finish of approved grade and quality with largest piece having envelope size of 0.35m x 0.35m x 0.75m and total weight of all pieces not less than 320 kgs	NON SOR		320	kgs
35	Providing & fixing of back lit acrylic letters/ logo of desired size, fixed on vertical surfaces with the help of metal studs/ spacers, including providing & fixing of lighting fixtures (led strips) with all necessary wiring, fitting, control switches etc. of approved make, complete in all respect as per direction of engineer in charge.	NON SOR		12	sqm
36	Supply & installation of way finding signages made of S.S. plate of thickness 5mm cheet, including emgraving the desired letters, logo etc. ecomplete in all respect as per direction of engineer in charge	NON SOR		3	sqm
37	Supply & installation of sign board made of 40mm thick sand stone finish of honed finish, including emgraving the desired letters, logo etc. ecomplete in all respect as per direction of engineer in charge	NON SOR		12	sqm
38	Supply & installation of complete tensil membrane system consisting high tensile fabric having tensile strength not less than 420/400 daN/5cm, tear strength not less than 55/50 daN, Solar reflectance – Rs. -75% with extreme working temperature ISO certified. etc. complete in all respect as per direction of engineer in charge.	NON SOR		625	sqm

39	Providing and fixing of 12 mmthick designer MS tree gratingsfor protection of tree base, with CNC router cut perforations as per design, such that openings of each grating amounts to not more than 50% of surface area, and including powder coating on both sides with holdfasts for grouting, complete inall respects.	NON SOR		18	sqm
40	40mm sand stone flooring of honed / brushed finish with 20mm mortar of 1:4 (1 cement: 4 coarse sand) including joint filling with matching pigment, complete in all respect as per direction of engineer in charge.	NON SOR		50	sqm
41	Providing and fixing of 12mm toughened glass fixed with SS fitting including all hinges etc. complete in all respect as per direction of engineer in charge.	NON SOR		48	sqm
42	Supply & installation of complete tensil membrane system consisting high tensile fabric having tensile strength not less than 420/400 daN/5cm, tear strength not less than 55/50 daN, Solar reflectance – Rs. -75% with extreme working temperature ISO certified. etc. complete in all respect as per direction of engineer in charge.	NON SOR		72	sqm
43	40mm sand stone flooring of honed / brushed finish with 20mm mortar of 1:4 (1 cement: 4 coarse sand) including joint filling with matching pigment, complete in all respect as per direction of engineer in charge.	NON SOR		600	sqm
44	Providing and fixing of 30 mm thick calibrated Yellow Limestone floor tiles with machine cut edges and honed/brushed surface of approved quality laid over 20 mm 1:4:: cement:sand mortar base, fixed in required pattern of tile sizes 60x20, 60x40, 60x60 with joints filled with joint filler of approved color not exceeding 30 mm groove joint as per, complete in all respect as per the direction of Engineer-in-charge.	NON SOR		1000	sq,m

45	Supply & installation of complete tensil membrane system consisting high tensile fabric having tensile strength not less than 420/400 daN/5cm, tear strength not less than 55/50 daN, Solar reflectance – Rs. -75% with extreme working temperature ISO certified. etc. complete in all respect as per direction of engineer in charge.	NON SOR		54	sqm
46	40mm sand stone flooring of honed / brushed finish with 20mm mortar of 1:4 (1 cement: 4 coarse sand) including joint filling with matching pigment, complete in all respect as per direction of engineer in charge.	NON SOR		285	sqm
47	Supply & installation of seating with honed finish 100mm thick sand stone duly ploished with two coats of sealer of approved brand, with base as brick work and plastered & filling inbetween. The plasterd surface shall be painted with exterior grade textured paint etc. complete in all respect as per direction of engineer in charge.				
	a. 0.60m wide 3.0m outer dia	NONSOR		12	each
48	Supply and installation of three seater benches made on m.s. pipes of required size and seat of 6mm cnc cut m.s. sheet, Duly painted with primer and enamel paint. Complete in all respect as per direction of engineer in charge.	NON SOR		12	each
49	Supply & installation of seating with honed finish 100mm thick sand stone (rainbow/ teak wood) as vertical support, seat and back, duly polished with two coats of sealer of approved brand, complete in all respect as per direction of engineer in charge.	NON SOR		30	RM
50	Providing & fixing of solid stone blocks seating of honed/ natural finish sand stone (rainbow/ teak wood/ chocolate brown or similar shade as approved by engineer in charge) carved as per design/ drawing out of solid stone block duly polished with two coats of sealer of approved brand, the outer	NON SOR		2.88	Cum

	envelope sized shall be measured. complete in all respect as per direction of engineer in charge.				

TOTAL

	ELECTRICAL UADD SOR ITEMS						
	-	-					
S.NO.	**DISCRIPTION**	**REFERENCE**		**QUANTITY**	**UNIT**	**RATE**	**AMOUNT**
		PAGE NO	**ITEM NO.**				
1	Point wiring surface rigid P.V.C. conduit system with flush type accessories. Point wiring including metallic switch box, sheet, switches, sockets, lamp holders/ ceiling roses etc with 1.5 sq.mm. PVC insulated cable FR with copper multi strand conductor ISI marked in surface rigid P.V.C. conduit (MMS) ISI marked of suitable size and 1.5 sq.mm. PVC insulated copper earth continuity conductor of green colour inside conduit including painting etc. as required as per specification for: Light Point/ Fan Point- c) Long Point.	vol.4	1.1.1.c	70	each	894	62580
2	Circuit wiring - Wiring for circuit wiring with PVC insulated cable FR with copper multi strand conductor ISI marked in surface rigid P.V.C. conduit (MMS) of ISI marked suitable size including painting etc. as required as per specification. 4x2.5 sq.mm.	vol.4	1.1.6.b	450	meter	129	58050
3	Circuit wiring - Wiring for circuit wiring with PVC insulated cable FR with copper multi strand	vol.4	1.1.6.c	220	meter	148	32560

	conductor ISI marked in surface rigid P.V.C. conduit (MMS) of ISI marked suitable size including painting etc. as required as per specification. 6x2.5 sq.mm.						
4	Modular switch boxes- Supplying & fixing of approved make modular type metal box with modular frame/ base plate and cover plate including fixing in concealed/ surface excluding switch, socket etc. as required for: 8 module	vol.4	2.9.4	12	each	202	2424
5	Modular switch boxes- Supplying & fixing of approved make modular type metal box with modular frame/ base plate and cover plate including fixing in concealed/ surface excluding switch, socket etc. as required for: 12 module	vol.4	2.9.5	16	each	255	4080
6	Power wiring in PVC casing caping system with modular accessories: point wiring including metallic switch box, sheet for 3 pin 16 amp. Socket outlet point with 4 sq.mm. PVC insulated cable FR with copper multi strand conductor ISI marked in surface rigid P.V.C. casing and capping ISI marked of suitable size including painting etc. with 16 amp. F.T. switch & socket / S.S. combined 16 Amp. of ISI marked and 4 sq.mm. PVC insulated copper earth continuity conductor of green colour inside capping as per specification for: on separate board: c. Long point	vol.4	3.3.3.c	40	each	1580	63200
7	Supplying of ISI marked and approved make of moulded case circuit breaker (MCCB) suitable for 3 phase, 3 pole, 50Hz, 415 Volts, AC supply with respective interrupting	vol.4	8.1.1.c	12	each	4939	59268

	capacity (KA) at 415 Volts cited against their range standard conforming to IS-8828: Current rating - 25 to 100 Amps & 70%-100% adjustable.						
8	Supplying, erection and testing of approved make electric ceiling fan of double ball bearing complete with standard down rod, canopy, hanging shackle, aluminium blades, without regulator, A.C. 230-250 volts including connections with all necessary material complete as required conforming to IS:374/1979 with upto date ammendments: ceiling fan (energy saver 50W)- 1200 mm sweep.	vol.4	9.32.1	70	each	1888	132160
9	Supply, erecting and testing of approved make exhaust fan heavy duty with mounting frame, blades AC 230-250 complete connections and including frame bolts/ anchor hole fastners etc. complete finished and as required. 450mm sweep 900 RPM	vol.4	9.36.3	6	each	4291	25746
10	Supply of XLPE Insulated power cable (conforming IS- 7098) 1100 Volt grade/Heavy duty power cable conforming to IS 1554-1100 Volts grade , 2 core /3½ core/4 coreISI MARKED with Alu. Stranded /solid conductor	vol.4					0
11	ARMOURED 3½ CORE	vol.4					0
12	50 Sq.mm(XLPE) V4_14.1.6.3	vol.4		50	M	452.00	22600
13	70 Sq.mm(XLPE) V4_14.1.6.4	vol.4		100	M	597.00	59700
14	150 Sq.mm.(XLPE) V4_14.1.7.10	vol.4		100	M	1084.00	108400
15	300 Sq.mm.(XLPE) V4_14.1.6.10	vol.4		100	M	2097.00	209700
16	ARMOURED 4 CORE	vol.4					0
17	16 Sq.mm.(XLPE) V4_14.1.8.3	vol.4		50	M	229.00	11450

18	Supply of support for overhead line H-beam of I.S. standard including welding, drilling of required hole etc. complete as required. H-Beam 152x152mm , Std weight 37.1 kg per meter V4_13.2.6	vol.4		8	M	1977.00	15816
19	Erection of steel tubular or steel rail pole or H-Beam of length exceeding 10 meters but not exceeding 13 meters in cement concrete 1:3:6 (1 cement :3 coarse sand: 6 graded stone aggregate 40mm nominal size) foundation , base padding & muffing including excavation and refilling etc. as required.(4.55 bags of cement/cmt.) V4_13.14	vol.4		8	EA	2563.00	20504
20	Supplying and drawing All Aluminium Alloy conductor (AAAC) of approved make confirming to IS 398-1979 Pt. IV, including binding at existing insulator, jointing, jumpering, tearing off, connecting etc. as required including clearing of obstacles (if any) 0.075 sq.inch / 48 sq.mm Alloy Aluminium Conductor V4_13.5.4	vol.4		0	Km.	59138.00	0
21	Supplying of angle/channel flat iron fitting for overhead lines such as cross arms, clamps, brackets, welding and other necessary materials as per specifications. V4_13.58	vol.4		100	Kg.	54.00	5400
22	Supplying and erection of stay set complete (Galvanized) with 19mm.dia 1.8 meter long stay rod, ancher plate of size 300mm x 300mm x 6.4mm thimble stay clamps, bow tightener, 7/4.00 dia G.I. stay wire and strain insulator etc. in cement concrete 1:3:6 (1 Cement : 3 Coarse and : 6 granded stone aggregate 40mm nominal	vol.4		4.00	EA	2818.00	11272

	size) foundation including excavation and refilling etc. as required. V4_13.23						
23	Providing and fixing earthing arrangement with 38.1mm dia 2.5 meter long galvanized iron pipe electrode including packing of charcoal powder and salt as per specification watering pipe 19mm dia G.I. Connection etc. complete with refilling the pit as required, but excluding the excavation of earth pit. V4_11.35	vol.4		4	EA	1002.00	4008
24	Supplying and laying 25mm X 5mm G.I. strip at 0.5 meter below ground level as strip earth electrode including soldering etc. as required. V4_11.8	vol.4		40	M	65.00	2600
25	Supplying, installing, testing of earth Coil (coil of 115 turns of 50mm dia, and 2.5 Mtrs. Lead of 4 mm G.I wire.	vol.4		12	EA	219.00	2628
26	Supplying and fixing heavy duty cable gland for P.V.C. insulated armoured cable with brass washer, Rubber ring complete erected with cable and lead connection etc. as per specification complete.	vol.4					0
27	Gland Size 22mm suitable for cable 2,3, 3½, 4 x 10 Sq.mm or 2x 16 Sq.mm	vol.4		10	EA	44.00	440
28	Gland size 28mm for 3,4 x 16 Sq.mm	vol.4		10	EA	66.00	660
29	Gland size 32mm for 2,3, 3½, 4 x 25 Sq.mm OR 2,3, 3½ x 35 Sq.mm OR 2,3 x 50 Sq.mm.	vol.4		8	EA	76.00	608
30	Gland Size 45mm 3/3½ x 120 Sq.mm 3½ x 95 Sq.mm 3 x 150 Sq.mm.	vol.4		8	EA	149.00	1192

31	Gland Size 50 mm 3½ x 150 Sq.mm 3 x 185 Sq.mm	vol.4		8	EA	191.00	1528
32	Gland Size 57mm 3 x 225 Sq.mm 3 ½ x 185 Sq.mm	vol.4		8	EA	248.00	1984
33	Gland Size 70mm 3 x 240 Sq.mm 3½ x 300 Sq.mm	vol.4		8	EA	353.00	2824
34	Gland Size 82mm 3½ x 400 Sq.mm	vol.4		8	EA	501.00	4008
35	LUGS:- Supplying and fixing cramping type Alum. lugs as per I.S.S. Specification suitable for following size of cable with Alu. /Copper solid/stranded conductor evently cramped with high/pressure tool and connected to switch gear/Bus/M.C.C.B./ M.C.B. etc. as required complete.For Conductor Size-	vol.4					0
36	6mm to 16 Sq.mm	vol.4		128.00	EA	5.00	640
37	35 Sq.mm	vol.4		64.00	EA	9.00	576
38	50 Sq.mm	vol.4		32.00	EA	14.00	448
39	70 Sq.mm	vol.4		32.00	EA	22.00	704
40	150 Sq.mm.	vol.4		32.00	EA	44.00	1408
41	300 Sq.mm.	vol.4		32.00	EA	129.00	4128
42	Laying of underground cable armoured./ unarmoured as per specification in air with approved type of iron clamps complete. 2 / 3 / 4 Core cable upto 16 Sq.mm V4_14.12.1	vol.4		6	M	20.00	120
43	3 / 3½ / 4 Core cable 25 Sq.mm to 120 Sq.mm V4_14.12.2	vol.4		200	M	28.00	5600
44	3 / 3½ / 4 Core cable 150 Sq.mm and above V4_14.12.3	vol.4		200	M	36.00	7200
		TOTAL					**948214**

ELECTRICAL MPPWD SOR ITEMS

Sr No	Items/particulars	Unit	Qty	Rate	Amount
1	Suppling and laying G I pipe 150 mm dia B Class	meter	0.6	1425	855
2	Suppling and laying G I pipe 150 mm dia A Class	meter	0.6	1197	718.2
3	Suppling and laying G I pipe 100 mm dia B Class	meter	0.4	800	320
4	Suppling and laying G I pipe 100 mm dia A Class	meter	0.4	750	300
5	Providing and fixing for feeder pillers for telephone/electrical cablels as per design fixing over on concrete base (750x450x100) using nut and bolts. With all leads and lifts under the supervision of engineer in charge	nos	2	15000	30000
6	providing and laying of 3 core 2.5 sqmm flexible coper cable	km	0.2	50000	10000
7	Supplying and drawing All Aluminium Alloy conductor (AAAC) of approved make confirming to IS 398-1979 Pt. IV, including binding at existing insulator, jointing, jumpering, tearing off, connecting etc. as required including clearing of obstacles (if any)				
8	0.1 sq.inch / 100 sq.mm Alloy Aluminium Conductor (Dog)	Km.	0.1	77891	7789.1
9	Supplying and laying 50mm X 5mm G.I. strip at 0.5 meter below ground level as strip earth electrode including soldering etc. as required.	M	40	110	4400
10	Designing & casting with M-20 cement concrete foundation suitable for 12 mtrs. Octagonal/tubular poles considering the safe soil bearing capacity at site as 10 T/sqm at 2 mtrs. Depth including excavation, foundation nut bolts in an approved manner.	EA	4	14000	56000
11	supply and installation of disk insulators polymer type 11 kv	EA	12	458	5496
12	supply and installation of pin insulators polymer type 33 kv	EA	12	1374	16488
13	supply and installation of AB switch polymer type 11 kv	EA	2	6500	13000
14	supply and installation of AB switch polymer type 33 kv	EA	2	28000	56000

ELECTRICAL NON SOR ITEMS

Sr No	Items/particulars	Unit	Qty

1	Providing laying and testing of 11 KV Under-Ground XLPE Cable : (insulation level shall be in Delta format) 3x120 Sqmm	Km	0.5
2	Providing laying and testing of 11 KV Under-Ground XLPE Cable : (insulation level shall be in Delta format) 3x240 Sqmm	Km	0.5
3	Providing laying and testing of 11 KV Under-Ground XLPE Cable : (insulation level shall be in Delta format) 3x300 Sqmm	Km	0.5
4	Providing laying and testing of 33 KV under ground XLPE Cable (insulation level shall be in Delta format) 3x240Sqmm	Km	0.6
5	Providing laying and testing of 33 KV under ground XLPE Cable (insulation level shall be in Delta format) 3x300Sqmm	Km	0.6
6	Providing laying and testing of 33 KV under ground XLPE Cable (insulation level shall be in Delta format) 3x400 Sqmm	Km	0.6
7	Supply and erecting 11 KV heat shrinkable cable END jointing kit (A) Indoor Type Indoor heat shrinkable cable jointing kit with lugs for 11 kV grade XLPE cable for 3 core 120 sq mm	Set	4
8	Indoor heat shrinkable cable jointing kit with lugs for 11 kV grade XLPE cable for 3 core 240 sq mm	Set	2
9	Indoor heat shrinkable cable jointing kit with lugs for 11 kV grade XLPE cable for 3 core 300 sq mm Set 4310	Set	2
10	Outdoor heat shrinkable cable jointing kit with lugs for 11 kV grade XLPE cable for 3 core 120 sq mm	Set	4
11	Outdoor heat shrinkable cable jointing kit with lugs for 11 kV grade XLPE cable for 3 core 240 sq mm	Set	2
12	Outdoor heat shrinkable cable jointing kit with lugs for 11 kV grade XLPE cable for 3 core 300 sq mm	Set	2
13	Supply and erecting 11 KV heat shrinkable cable STRAIGHT THROUGH jointing kit i) 3x120 Sqmm	Set	1
14	ii)3x240 Sqmm	Set	1
15	iii) 3x300 Sqmm	Set	1
16	Supply and erecting 33 KV heat shrinkable cable END jointing kit (a) Indoor type i) 3x240 Sqmm	Set	2
17	ii)3x300 Sqmm	Set	2
18	iii) 3x400 Sqmm	Set	2
19	Outdoor type i) 3x240 Sqmm	Set	3
20	ii)3x300 Sqmm	Set	2
21	iii) 3x400 Sqmm	Set	2
22	Supply and erecting 33 KV heat shrinkable cable STRAIGHT THROUGH jointing kit		
23	(i) Straight through heat shrinkable cable jointing kit with lugs for 33 kV grade XLPE cable for 3 core 240 sq mm	Set	1
24	(ii) Straight through heat shrinkable cable jointing kit with lugs for 33 kV grade XLPE cable for 3 core 300 sq mm	Set	1
25	(iii) Straight through heat shrinkable cable jointing kit with lugs for 33 kV grade XLPE cable for 3 core 400Sqmm	Set	1

26	Suppling installation testing and commissioning of SCADA competable Ring Main Unit(RMU) 11 KV		
27	11 KV Ring main unit(RMU) SF-6 type 1 ckt breaker 3isolator	Each	1
28	11 KV Ring main unit(RMU) SF-6 type 2 ckt breaker 3isolator	Each	1
29	Suppling installation testing and commissioning of SCADA competable Ring Main Unit(RMU) 33 KV 33 KV Ring main unit(RMU) with 3isolator	Each	1
30	33 KV Ring main unit(RMU) with 4isolator	Each	2
31	Suppling installation testing and commissioning of FEEDER PILLERS (a) Out door type cubical feeder pillar (i) 1 no.-125 amp,16 kA b.c at 415 volts TP MCCB with copper neutral link 1 set-200 amp,rating TPN aluminium busbar,8 no 32 amp,10 kA b.c. TP MCB complete	Each	2
32	(ii)1 no.-160 amp,16 kA b.c at 415 volts TP MCCB with copper neutral link 1 set-250 amp,rating TPN aluminium busbar,8 no 63 amp,10 kA b.c. TP MCB complete	Each	1
33	(iii) 1 no.-125 amp,16 kA b.c at 415 volts TP MCCB with copper neutral link 1 set-200 amp,rating TPN aluminium busbar,24 no 32 amp,500 V Porcelain/DMC/bakelite rewirable type fuse carrier and base complete	Each	1
34	Suppling installation testing and commissioning of SCADA competable surface transformer PSS 11/0.4 kv, 500 KVA complete in all respect with civil work	each	1