

NAME OF WORK: - CONSTRUCTING SHOPS CUM GODOWN & WAREHOUSE OF
A.P.M.C. UNJHA SUB MARKET YARD BRAHMANVADA. AT RS NO 613 OF
BRAHMANVADA, TA. UNJHA, DISTRICT: MEHSANA.

I N D E X

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J	List of approved Electrical Products	
	[i] Amount put to tender Rs.	0
	[ii] Tender Fee Rs.	0
	[iii] Earnest Money Deposit Rs.	0
	[iv] Security Deposit Rs.	0
	[v] Performance Bond Rs.	0

:: M E M O R A N D U M ::

1]	Name of work	::	
2]	Estimated Cost	::	Rs.
3]	Earnest Money	::	Rs.
]	Validity Period of tender offers	::	(120*or 90*) days from the stipulated date of the tender but no modification shall be allowed after handing over tender to the Postal Authorities OR 120 days from the last date of On-line submission of tender (Only in case of works Estimate above Rs. 10.00 Lacs)
5]	Security Deposit	::	(5%)
	[i] In the form of Small Saving or Narmada Bonds.	::	(2.50%) Rs.
	[ii] To be deducted from the bills	::	(2.50%) Rs.
	[iii] Performance Bond of Schedule Bank)	::	(5.00%) Rs.

		Total	10% Rs.
			:: (10.00%)

*Strike out whichever is not applicable.

* Vide R&B D.G.R.No. TNC-1088-1-B/1(13)/C Dt. 4.5.93 & Revised vide G.R. No. TNC-1088-1-B/18/(13)/C dated 31.8.94

Deposit furnished in the form of interest-bearing documents as per item No. 5 [i] can further be extended for renewal if so desired and communicated by the contractor in writing before one month from the expire date. Similarly, Cash deposit deducted as per Item No. 5[ii] can also be converted into Interest Bearing fixed term securities of Schedule and Nationalized Banks, if so desired and communicated by the contractor in writing.

Should this tender be accepted, I/We hereby agree to abide by and fulfil the terms and provisions of the conditions of the contract annexed here to so far as applicable and in default thereof to forfeit and pay to Government in Office the sums and money mentioned in the said conditions.

(Receipt No..... date.....from the Government Treasury or Sub-Try. at.....in respect of sum

Rs.....is forwarded herewith representing the Earnest Money Deposit + [a] the full of value of which is to be absolutely for fitted to Govt. should I/We not deposit the full amount of Security Deposit specified in the above Memorandum in accordance with Clause-1- of the said condition, otherwise the said sum of above Rs..... shall be refunded.

Date::

* Digital Signature of the contractor

Place ::

** Signature of the contractor

*** Witness (at the time of execution of tender documents)

Name and address

Occupation.

* Digital Signature of Contractor before submission of On-line tender.

** Signature of the contractor at the time of execution of contract documents.

*** Signature of Witness to Contractor's signature at the time of execution of contract documents.

The above tender is hereby Accepted by me on behalf of the Governor of Gujarat

Date _____ the Day _____ of _____ 2018

Note: The normal rate of Security Deposit is 5% for works up to Rs.30.00 lacs and further 5% as Performance Bond for works above Rs. 30.00 lacs. Out of 5% Security Deposit 50% is payable at the time of acceptance of tender and the balance by deduction from progress bills.

Instructions to Tenderers

1. Tenders, sealed and marked. on the outside for
"will be received by undersigned

Up to the

in the form of "Tender for Electrical Works hereto annexed

2. The tenderers shall state precisely in his tender the type and description of the materials, plant and stores he proposes to use for the work. If he proposes to use materials, plant or stores of other than Indian manufacture lip Must clearly state this in his tender, together with the name, manufacturer and of the country of origin of the same.
3. The officer with whom cash deposits are to be made, or to whom securities are to be endorsed ill accordance with clause 3 of General Conditions of Contract for Electrical Works. is the- Ex. Engr.
4. The work must be carried Out in accordance with the General Conditions of Contract for Electrical Works. and the general specification for electrical works in Government building.
5. Plans may be seen, in the office of the APMC Unjha
Department_____
6. The Governor of Gujarat does not undertake. to accept the lowest or any tender.

Date

ORIGINAL

Form of Tender for Electrical Works

Department

1. I/We do hereby tender to execute the whole of the work

Described in the accompanying tender for the several sums, and in the case of measured works, at the several rates, set forth in the tender hereto attached and signed by me/us and should this tender be accepted. I/We further undertake to complete the work within the time stated below reckoned for the date of acceptance of tender namely.

2. I/We do agree and bind myself/ourselves to abide by and fulfil the general conditions of contract and the Special Conditions of Contract annexed to the Specification or in default thereof to pay to the purchaser, as reasonable compensation for such breach of such conditions, the sums of money mentioned in the said condition.

3. I/We further agree to make good at My/our own expense all defect in the installation which appear within twelve months from the date bringing the installation into beneficial use when such defects are due to defective workmanship or material executed or supplied by me/us.

4. I/We hereby declare that my/our near relative are not working in this Division or in its sub-division as an Ex. Engineer, Deputy Executive Engineer, Assistant Engineer, Additional Assistant Engineer, Overseer, Divisional Accountant, Store Keeper. Manager of Tithe/Wishram Guha and in the circle as Superintending Engineer in addition for Panchayat Works not working nor having posting as Chairman of P.W. Committee or as incumbent in Jill Panchayat at today.

Signature(s)

Dated at

The Date of 2022

The above tender is hereby accepted by me for and on behalf of the Governor of Gujarat.

Dated at

The day of 2022

Duplicate

Form of Tender for Electrical Works
APMC UNJHA

1. I/We do hereby tender to execute the whole of the work

Described in the accompanying tender for the several sums, and in the case of measured works, at the several rates, set forth in the tender hereto attached and signed by me/us and should this tender be accepted. I/We further undertake to complete the work within the time stated below reckoned for the date of acceptance of tender, namely.

2. I/We do agree and bind myself/ourselves to abide by and fulfill the general conditions of contract and the Special Conditions of Contract annexed to the Specification or in default thereof to pay to the purchaser, as reasonable compensation for such breach of such conditions, the sums of money mentioned in the said condition.

3. I/We further agree to make good at My/our own expense all defect in the installation which appear within twelve months from the date bringing the installation into beneficial use when such defects are due to defective workmanship be executed or supplied by me/us.

4. I/We hereby declare that my/our near relative are not working (in this Division or in its sub-division as an Ex. Engineer, Deputy Executive Engineer, Assistant Engineer, Additional Assistant Engineer, Overseer, Divisional Accountant, Store Keeper, Manager of Atithi/Vishram Gruha and in the circle as Superintending Engineer in addition for Panchayat Works not working nor having posting as Chairman of RW. Committee or as incumbent in Jilla Panchayat at today.

Signature(s)

Dated at

The Date of 2022

The above tender is hereby accepted by me for and on behalf of the Governor of Gujarat.

Dated at

The day of 2022

Chairman
APMC UNJHA

GENERAL CONDITIONS

1. The work of the Electrical Installation shall be carried out as per I.S_ Specifications I. S. 732-Code Part 1, 11 & III -1982-82 of practice of Electrical wiring and fitting in building.
For Hospital I.S. 7732 of 1985
For Educational Installation I.S. 108941 - 1984
For Aluminium Conductor I.S. 398- 1984 Part III
2. The fitting should be fixed with mild steel hooks to be supplied and erected and duly grouted in the cement concrete by the contractor wherever possible the decision of the Ex. Engr. in respect of the feasibility of providing such hooks in the cement concrete, shall be final and binding on the contractors.
3. The work shall have to be completed within the prescribed time limit unless the extension in the time limit at tile instance and the request of the contractor is granted by the authorities in which case, the application for the extension in time limit have to be made by the contractors by registered post before the date of expiry of the schedule time limit under the agreement.
4. The amount of Rs. 1 -00 for each empty wooden box of ceiling fan and 0-50 paisa for each empty wooden box of Table fan issued to the contractors for the work as per Schedule B of the work shall be recovered from the Contractors.
5. Materials required for the work shall be supplied to the contractor as per rates mentioned in the Schedule 'A' attached herewith and the cost of materials will be recovered from their bills.
6. The tender documents required shall have to be filled in either in ink or by ball pen.
(G.R.B. & C. Dept. No.TNC-1 175-1113-853/198 V, Dtd. 8-6, 79).
7. In addition to the above the tender will also be liable to be rejected outright if -
 - (i) Any of the pages of the tender is/are removed or replaced.
 - (ii) In the case of "Item rate?" tender, the rates not entered in ink. in figures and words and the total of each item arid grand total are not struck by the tenderer or in ink in the last column of schedule 'B' under his signature.
 - (iii) All Corrections additions or pasted slips are not initialled by the tenderer. (iv) Any erasure is made by him in the tender AND
 - (v) The tenderer in the case of a firm, each partner or the person holding the power of attorney thereof does not sign or the signature is/are not attested by witness on page 8 of the tender in the space provided for purpose
8. A certificate of registration as approved contractor should be attached with the tender.
9. In respect of tenders from the co-operative society a solvency certificate of an amount equal to 20% of the amount of the work put to tender will have to be produced along with the tender or-a certificate, regarding the borrowing capacity of the society issued by the legal Assistant, Directorate of Cottage Industries will have to be produced along with the tender.
10. The several documents forming the contract are the essential parts of the contract and requirement occurring in one is as binding as though occurring in all, they are intended to be mutually explanatory and complementary and to describe and provide for a complete work.
11. In the event of any discrepancy the several documents forming the contract or in any one document the. following order of precedence should apply
 - (a). Dimension and quantities:
 - (i) Drawing
 - (ii) Schedule' B' of the tender form
 - (iii) SpecificationOn drawing figures, dimensions unless obvious in contract will be followed in preference to sealed dimension.
 - (b) Description: -
 - (i) Schedule 'B' of the tender form
 - (ii) Drawings
 - (iii) SpecificationsIn case of defective description or an ambiguity, the Ex. Engineer in charge should issue further instructions directing in what manner the work is to be carried out is being understood that the last modern practice is to be followed. The contractor should forthwith comply with such instruction.
12. The contractor should take no advantage of any apparent error, omission in drawings or a specifications and the Ex-Engineer in charge should be permitted to make fulfil the intent of the plans and specifications.
13. Controlled materials (Essentially certificate)
 - (i) As regards "Controlled materials, the R. & B Dept, will help to arrange for the permits as far as possible and hold the contractor in securing the same. All incidental charges in procuring these materials shall be borne by th I e permit as far as possible by the contractor himself. Though the R. & B. Dept. will help to arrange for, tile permit as far as possible and help the contractor in obtaining the materials, it shall not accept any responsibility for any delay or loss on account of delay caused to the contractor while obtaining the same.
 - (ii) The contractor shall submit the monthly returns in the prescribed forms as to the receipts and actual use of tile controlled materials during the month to the Ex. Engr. of Every calendar month.
 - (iii) The contractor shall submit the Ex. Engineer or his representatives to inspect the stock of the controlled

- materials by him at any time whenever the Ex. Engineer or his representatives so desire.
14. The tender for the work shall remain open for a period (90/120*) days from the stipulated date of receiving of the tenders for this work and that the tenderer shall not be allowed to withdraw or modify the offer on his own after handing over the tender to postal authorities for dispatch. If any tenderer withdraws or makes any modifications or additions in the terms and conditions of his tender not acceptable to the Government (Public Works Department) then the Government shall without prejudice to any right remedy. be at liberty to forfeit in full they said earnest money absolutely.
 15. The contractor shall employ only such labours who shall produce a valid certificate of having been vaccinated against small pox within in period of last three years.
 16. The contractor shall provide drinking water facilities to the workers, labourers to comply with the provisions, the engineer in charge shall give notice for such facility to the workers, Labourers within a period of ten days from the date of the notice in writing the Engineer in charge shall there upon make the arrangement for the drinking water at the cost of the contractor.
 17. The contractor shall provide the amenity of shade and shelter to the workers, labourers and their children on Govt. work as soon as the work starts. If the contractor fails to provide shade and shelter than the Govt. Shall provide the same at the cost of the contractor.
Govt Resolution PWD No. TNC-2172 (i) 76-C Dt. 4-7-1973.
 18. Wires of I.S.I. mark will be allowed to be used on the work.
 19. The rates should be written both in words and figures inclusive of all taxes and duties.
 20. The percentage additions in total amount tendered of any items is not allowed however if over all reduction in _____

*Strike out whichever is not applicable

and figures. If no reduction is to be made the gap should be filled in by the word 'NIL'.

Note: As per Govt. Resol. No. CDN/1269/PAC/51-C. dt. 15/4/1978

21. Safeguards:
 - (a) That the percentages and the tender amount by each contractor shall actually be shown to the other contractors who may be present at the time of opening the tenders.
 - (b) That a tender with any erasures and/or over writing in percentage (both in word and in figures) shall be rejected outright.
 - (c) Those insertions and or correction in the percentage quoted (both in words and in figures) resulting into increase in the value of the work shall be liable to be rejected outright unless it is authenticated by the officer opening the tender at the time of opening tender as well as the contractors they may be present at the time of opening tender and
 - (d) That any other correction or insertions shall be authenticated by the officer opening the tender and the intending bidders who may be present.
22. Wherever secured advance has been granted the contractor should provide necessary sign board indicating the fact of hypothecation of the materials to the Govt. and exhibited the same publicly prominently. (Govt. in P.W.D. Reso. No. PWD-2675-IB-905-66-C. dtd. 30-11-77).
23. The contractor should give a written undertaking while applying for the grant of secured advance in case of the agreement indenture bond already prescribed to the effect that he has not taken or caused to be taken nor shall be taken or caused to be taken any advance on the same materials on which secured advance is applied for from any other person/firm, corporation, limited company or any financing institution like Bank etc. by hypothecating or pledging the materials (Govt. in RW.D., Resolution No. PWD-2675 B/905/66-C, dtd. 30-11-77).
24. Secured advance will be paid after producing equivalent amount of Bank Guarantee of Schedule Bank (R&BD G.R.No. P.W.M.-1090/U-0-13(5)-C, dated 4-10-1997)
25. Any error in quantity or amount in Schedule 'B' showing items of works to be carried out shall be adjusted in accordance with the following rules:
 - (a) In the event of a discrepancy between description in words and figures quoted by a tenderer in the rates column, the description in words shall prevail.
 - (b) In the event of an error occurring in the amount column of the Schedule 'B' showing item of works, as a result of wrong multiplication of the unit rate and quantity the unit rate shall be regarded as firm and multiplication shall be amended on the basis of the rate.
 - (c) All errors in total in the amount column, and in carrying forward totals shall be corrected.
 - (d) Any rounding off of amounts against items of in totals shall be ignored. The tendered sum so altered shall for the purpose of tender be substituted for the sum original tendered and considered for acceptance.
26. Battens shall be teakwood for acceptable quality and shall be varnished before fixing in position.
27. Wooden-cup board should be polished on both the sides.
28. Whenever Government materials are issued, the contractor shall be responsible for the safe custody and proper use

- of the materials.
29. Loose electric fitting connection should be done at the time of handing over possession of building to the concerned civil or administrative department and accordingly after taking over possession of these connection concerned Civil/ Administrative department is responsible for fittings.
 30. (i) Late tenders (i.e. tender received after the specified time of opening) Delayed tender (i.e. tenders received before the time of opening but after the due date & time of receipt of tenders) and post tender offers shall not be opened and considered at all.
 31. (ii) The tenders received (by registered post after the time of date specified in the tender notice) shall not be received by the concerned office from the postman, for which date and time may be recorded on the cover of the tender as to when tender was refused by the Divisional Accountant or the Divisional Head or any other person in charge.

Signature of contractor/s

Chairman APMC Ujnha

NOTICE INVITING TENDERS

1. Tenders are invited on behalf of Governor of state of the Gujarat for work as per page number one of this booklet. The work is estimated to cost of Rs. This estimate however, is given as a rough guide.
2. The works are required to be completed within months as per the terms of the contract conditions.
3. The contractor whose names are borne of the approved list of contractors of Gujarat State R & B Electrical Deptt in....._class will be permitted to tender. Not more than one tender shall be submitted by a contractor or by a firm of contractors. No two or more concerns in which an individual is interested as a proprietor and / or a partner shall tender for the execution of the same works. If they do so, all such tenders shall be liable to be rejected.
4. Bid document can be downloaded and submitted in Electronic Format on online website www.nwr.procure.com / www. from / /2022 up to / /2022 Hrs.
5. Tender documents consisting of conditions, specifications, schedule(s) of quantities of the various classes of work to be done, the conditions of contract etc. will be shown on above website.
6. Copies of other drawings and documents pertaining to tender and signed for the purpose of identification by the Accepting Officer or his accredited representative will be open for inspection by tenderers at the following offices during working hours between the dates mentioned in clause 4 above.
7. Tenderers are advised to visit the site sufficiently in advance of the date fixed for submission of the tender. A tenderer shall be deemed to have full knowledge of all the relevant documents samples, site etc.; whether he inspects them or not.
8. Submission of a tender by a tenderer implies that he has read this notice and all other contract documents and has made himself aware of the scope and specification of the work to be done and of conditions and rates at which stores, tools and plant etc. will be issued to him by Government and local conditions and other factors bearing on the execution of the works.
9. The bidder should quote his bid premium or rebate at the end of Schedule B. If he do not wish to quote premium or rebate, he should indicate "at par" in the blank space preceding "% above/below" in Schedule B. Thereafter he should work out and indicate the offered bid amount both in words and figures in Schedule B.
10. All rates shall be quoted on the tender form.
11. The tender for the works shall not be witnessed by a contractor or contractors who himself / themselves has / have tendered or who may and has / have tendered for the same works. Failure to observe this condition shall render the tender of the contractor tendering, as well as of those witnessing the tender, liable to rejection.
12. The electronically offered bids will be opened at 12.00 hours on / /2019 in the presence of bidders who may choose to remain present in the office of the Bid opening Authority specified in bid documents.
13. "Demand Draft for tender fee. & F.D.R. for E.M.D. shall be submitted in electronic format only through online (by scanning) while uploading the bid. This submission shall mean that E.M.D. & Tender fee is received for purpose of opening the bid. Accordingly offer of those shall be opened whose E.M.D. & Tender fee is received electronically. However for the purpose of realization of D.D. bidder shall send the D.D. in original to Chairman APMC HUNJHA at the time tender opening or send the same through R.P.A.D. so as to reach to Chairman APMC Unjha within 7 days from the last date of uploading. If Tender fee and E.M.D. is not paid as shown in bid document, action to hold his registration in abeyance shall be taken and his E-tendering Code will be cancelled for one year. Any documents in supporting of tender bid shall be submitted in electronic format only through online (by scanning etc.) and hard copy will not be accepted separately."
14. The Governor of the State of Gujarat does not bind himself to accept the lowest or any tender or to give any reasons for the decision.
15. This notice of tender shall form part of the contract documents.

For and on behalf of Governor for the state of Gujarat.

Date _____

Signature _
Designation

Roads & Buildings (Electrical) Department
Contract for works
SECTION – 1
INFORMATION & INSTRUCTIONS FOR TENDERERS

1. **Mode of Submitting Tender :**

The tenders shall be submitted in Electronic format only on online Web site www.nprocure.com till the date & time shown above

Offers in Physical form will not be accepted in any case.

Bidders who wish to participate in online tenders will have to procure / should have legally valid Digital Certificate (Class-III) as per Information Technology Act – 2000 using which they can sign their electronic bids. Bidders can procure the same from any of the license certifying Authority of India as mentioned under;

Sr. No.	Name of Certifying agency	Website address
1.	(n) Code solution (G.N.F.C.)	www.gnfc.com
2.	Safecrypt	www.safecrypt.com
3.	TCS	www.tcs-ca.tcs.co.in
4.	MTNL	www.mtnltrustline.com

2. **Competency of Tender –** No contract will be awarded except to responsible bidders capable of performing the class of works contemplated. Before the award of the contract, any bidder may be required to show that he has the necessary facilities, experience, ability and financial resources to perform the work in satisfactory manner within in the time stipulated. Tenderer may be required to furnish the tender inviting authority with the statements as to their experience and their financial status. Tenderer shall be registered contractor in appropriate class of the Road & Buildings Department, Water Resources Department of Government of Gujarat.

3. **Tenderer to inform Himself :**

Tenderer will be deemed to have inspected the site and to have satisfied himself as to the nature of all works, all existing roads, water-way and other means of communication and access to and from the site of the work and the building that may be required for temporary purpose in connection with the construction, completion and maintenance of the works and must make his own inquiries as to work, yard sites and depot, and dumps as to acquisition of such additional sites, rates and areas as may be necessary for temporary purpose for constructing, completing and maintaining the works and availability of water for construction activities, power, quarries and labour.

4. **Payment of tender fee and Earnest money deposit :** "Demand Draft for Tender Fee. and E.M.D. in form of F.D.R. shall be submitted in electronic format only through online (by scanning) while uploading the bid. This submission shall mean that E.M.D. & tender fee are received for purpose of opening of bid. Accordingly offer of those shall be opened whose E.M.D & Tender fee is received electronically. However, for the purpose of realization of D.D. bidder shall send the D.D. in original to Chairman APMC Unjha at the time tender opening or send the same through R.P.A.D. so as to reach to Chairman APMC Unjha, within 7 days from the last date of uploading. Penltative action for not submitting D.D. in original to Chairman APMC Unjha by bidder shall be initiated.

Any documents in supporting of tender bid shall be submitted in electronic format only through online (by scanning etc.) (R&B circular No.5ZRv!_Z__(v5P;P4 dated 18.1.2008).

5. **Payment:-** The tenderer must understand clearly that the rates quoted are for completed works and include all costs due to labour, scaffolding plant, supervision, service works, power, royalties and octroi etc., and include all extras to cover the cost of night work if and when required and no claim for additional payment beyond the price/rates quoted will be entertained and the tenderers will not be entitled subsequently to make any claim on the ground of misrepresentation or on the ground that he was supplied with information given by any person (whether the member is the employee of Public Works Department or not). Any failure on his part to obtain all necessary information for the purpose of making his tender and filling the several prices and rates therein shall not relieve him from any risks or liabilities arising out of or consequent upon the submission of the tender.

6. **Tender Forms –** This form will state work to be carried out as well as the date of submitting and opening tenders and the time allowed for carrying out the work, also the amount of earnest money to be deposited with the tender and the amount of the security deposit to be paid by the successful tenderer and percentage. If any, to be deducted from bill. It will also state whether a refund of quarry fees, royalties, octroi, dues and ground rents will be granted. Copies of the specifications, designs and drawing and estimated rates, and any other documents required in connection with work which shall be signed by the Executive Engineer for the purpose of identification shall also be open for inspection by Contractor at the office of the Executive Engineer during office hours. However every 'blank' in the form of the e-tender and in the schedule and annexures must be filled up by the tenderer and must be submitted online.

7. **Quating of Rates :-**

The Tenderer shall quote the rate per unit for all items listed in Schedule B in figures as well as in words. Thereafter the system will work out the total amount of each item in Column of Schedule B and sum-up the total at the end of column on each page and on last page of Schedule B. After striking the total of all items, he may give rebate if he desires on the total amount so worked out and thereafter express in the figures, as the net amount of his offer which will be termed as "Tendered Amount".

- (a) Tenderers are normally not permitted to suggest any alternation in the works specified in the tender form or in the time allowed for carrying out the work or any other conditions of any sort. However, if it is felt necessary by the tenderer to have any conditions, he shall have to clearly mention the same in very clear terms in the appropriate section of technical bid. The tenderer will have to fill in necessary detail online in 'technical bid' and 'price-bid' separately. No such tender shall include more than one work but contractors who wish to tender for two or more works shall submit a separate tender for each work online.
- (b) If price-bid contains any conditions, the same shall be rejected outright.
- (c) It should be very clearly understood by all tenderers that the technical bid should be restricted only to technical matters and conditions / stipulations having financial implications. The 'Technical and Price' bids shall contain adequate cross reference wherever necessary to ensure clear and proper correlation of them with two bids without any ambiguity whatsoever. The price bid of main tender should not be disclosed in the technical bid.
- (d) The technical bid will be opened first online on / /2021 Or any other stipulated time thereafter by the competent tender opening authority of the Government. Bidders who wish may remain present. The technical bid shall be evaluated first and wanting details, if any, and clarifications in respect of conditions if any will be called from the tenderers. In such case, the contractor will be required to submit clarification / details (including with respect to conditions if any) within the stipulated time allowed for the purpose. If the contractor does not furnish the wanting details / clarification in time, his tender would be liable for rejection.
- (e) The conditions specified in technical-bid should invariably be accompanied by proper financial evaluation with mode of calculation specifying assumptions, quantities, rate and ceiling amounts for each condition and shall also accompany the information in the form starting (a) Sr. No. (b) Description of the condition (c) Financial evaluation. (Vide R&BD, GR No. TNC/7777/281-C, dated 30-9-92) (d) Ceiling amount to be added in price-bid, in case condition is not accepted.
- (f) Ceiling amounts shall be binding on the contractors and are liable to be added to the tender amount.
- (g) The evaluation as given by the contractor as modified by tender opening authority with the ceiling limit will then be intimated to all the bidders. No further opportunity shall be given to the contractors to modify/withdraw conditions at that stage. After completion of evaluation of the technical bid in all respects the competent authority will decide about date of opening of price-bid and the same will be intimated to the bidders. After opening of price-bid and their evaluation the tender inviting authority reserves the right to negotiate about the tender (s) further with any or all the contractors.

8.1 Earnest Money :-

Earnest money in specified form @ 1% of the estimated cost must be sent as specified in Instruction preceding electronically tenderer may pay earnest money in the form of crossed demand draft or fixed deposit or fixed deposit at call receipt with a validity period of not less than six months of Nationalised or scheduled bank or Narmada / shrinidhi F.D. R. drawn in favour of Executive Engineer/ Divisional Officer concerned.. Earnest money by cheque and bank guarantee shall not be accepted. (vide R&B D. G.R.No.TNC/1090(100)(4)-C, dated 4/11/2000). The contractors who have secured exemption certificate for payment of earnest money by depositing Lump sum earnest money Deposit need not pay earnest money, but produce the certified copy of the exemption certificate along with the tender electronically. If the contractor does not remit the tender fee and the earnest money within the specified time his registration will be held in abeyance for one year and his tendering code will be cancelled for one year.

If the contractor does not turn up to pay the Security Deposit and execute contract agreement within specified (or extended) time after intimation to him about acceptance of his offer, the earnest money paid for this work will be forfeited and such tenderer's tender shall be rejected and then according to aforesaid provision of tender, action to blacklist the contractor will be initiated without delay (Vide R & B D, GR No. Misc.-1097-90-1091/97-Z/C, dated 4-10-97 & Parach-102008-5-C-Partlife dated 27-11-08)

8.2 The Earnest Money submitted in the form of Deposit-at-call receipt shall need minimum validity of six months from the last date of online submission of tender. Tender not supported with tender fee, Earnest Money & documents on specified date to the tender inviting authority shall be rejected as NON RESPONSIVE. If the tenderer modifies or withdraws his tender, the Earnest Money (in case of EMD exemption certificate, proportionate amount equivalent to EMD of a particular tender) shall be forfeited and the tenderer may be disqualified from tendering for future works under the Government.

8.3 The Earnest Money will be returned to the unsuccessful tenderers. The Earnest Money will be returned to the successful tenderer after he furnishes security deposit and duly enters into the contract.

8.4 Within Ten days or within such time as may be decided by the Tender Inviting Authority from date of receipt of the letter accepting his tender, the successful tenderer shall furnish the required security deposit and attend the office of the Tender Inviting Authority for execution of the contract documents. If he fails to furnish the security deposit or execute the contract document, his Earnest Money (in case of EMD exemption certificate

equivalent amount therefrom) shall be forfeited and action to blacklist the contractor bill be initiated without delay (Vide R&BD, GR No. Misc-1097-90-1091-97-Z/C, dated 4-10-97)

- 9.0 Accompaniments of Tender : (to be submitted in physical/Electronic form as duly certified true copies)
The contractor shall have to furnish :
- (i) Demand draft of tender fee and F.D.R. for earnest money or Earnest Money Exemption Certificate.
 - (ii) Copy of Partnership Deed or Memorandum as well as Articles of Association in case of the company and intimate permanent addresses of his partners/Directors of Company. All copies submitted shall be duly attested if instructed to submit.
 - (iii) Copies of certificate regarding previous experience, if required.
 - (iv) GST number, registration and electrical license issued by authority.
 - (v) A certificate of Registration as approved contractor of prescribed category from authorities stipulated in Notice Inviting Tenders.
 - (vi) P.A.N. issued by Income Tax Department.
 - (vii) Copy of Provident Fund Registration – Code No.
 - (viii) Attach a affidavit of Rs. 100/- which clearly state that the bidder is not blacklisted or kept abeyance in last 10 years if instructed to submit.
 - (ix) A solvency certificate of an amount equal to 20 percent of the amount of work put to tender will have to be produced along with tender issued in current calendar year and will be considered as per form 5. It shall be of Scheduled Bank or Nationalized Bank or Bank Approved for Government business.
 - (x) Required other Annexures duly filled in when prequalification is involved.
Required documents are to be submitted in electronic format only as part of tender document failing which the tender will be rejected outright and will be considered as NON-RESPONSIVE.
- 10.0 Tender liable to be Invalid :
It may please be noted that the tender is liable to be considered invalid especially, if the requirements are not complied with.
- 11.0 Right of rejection of tenders :
- (i) Right is reserved by the Tender inviting Authority to reject any or all tender(s) without assigning any reason thereof.
 - (ii) In addition to the above, the tender will also be liable to be rejected outright if :
 - (a) The tenderer proposes any alteration in the work specified or in the time allowed for carrying out the work or in any condition.
 - (b) The tenderer or in the case of a firm, each partner or the person holding the power of attorney thereof does not digitally sign section-2 or signature/s is/are not attested by a witness.
 - (c) Any person who submits a tender shall fill forms online including the rates quoted for tender. No single tender shall include more than one work but contractors who wish to tender for two or more works shall submit a separate tender for each work online.
 - (d) If the tenderer adopts unhealthy / mal practice / corrupt practice for securing and performing contract.
- 12.0 Method of Tendering :
- 12.1 If the tender is made by an individual, it shall be digitally signed by the individual above his full name and current address.
- 12.2 If the tender is made by a proprietary firm, it shall be digitally signed by the proprietor above his full name and the full name of his firm with its current address.
- 12.3 If the tender is made by a firm or partnership, it shall be digitally signed by a partner of the firm holding the power of attorney and digital certificate for the firm. A certified copy of the power of attorney shall be provided in physical form along with other documents. A certified copy of the partnership deed, full name and current address of the firm and full names and the current addresses of all the partners of the firm shall also be provided along with other documents.
- 12.4 If the tender is made by a limited company or a limited corporation, it shall be digitally signed by a duly authorized person holding digital certificate for the company / corporation and power of attorney for signing the tender in which case a certified copy of the power of attorney shall be provided separately in physical form along with other documents. Such limited Company or Corporation may be required to furnish satisfactory evidence of its existence before the contract is awarded.
- 12.5 All digital signatures in the tender document shall be dated.
- 13.0 Deviation or modifications in Tender Documents :
- 14.1 All tenderers are cautioned that tender containing any condition and/or deviation from the contractual terms and conditions, specifications, quoting/offering rates/prices in different manner that specified in the tender and/or any other requirements of tender shall make the tender liable for outright rejection and shall be considered as non-responsive for all practical purposes. The decision of the Tender inviting authority in this regard shall be final and binding to the tenderer.
- 14.2 Alternative tenders are not acceptable.
- 15.0 Submission of tender :
- 15.1 Tender shall be submitted in an online manner only on website www.nprocure.com.
Last date & time of online submission : / /2021 upto Hrs.

- 15.2 Tender fee, EMD and other documents should be submitted in electronic format only through on line (by scanning) while uploading the bid. However for the purpose of realisation of D.D. the bidder shall send the D.D. in original to Chairman APMC Unjha at the time tender opening or send the same through RPAD. So as to reach Chairman APMC Unjha the office of tender inviting authority within seven days from the last date of opening. If tender fee and E.M.D. is not actually paid as shown in bid document, action to hold his registration in abeyance shall be taken and his E- tendering Code will be cancelled for one year. R & B D. Circular No.5ZRv!_Z__(v5v; dated 18-1-2008).
- 16.0 Evaluation of Tenders :
- 16.1 Technical evaluation will be made of the tender's proposed method and technique of construction, construction programme, sequence of components of the work, proposed resources assigned to do the work to determine the acceptability, adequacy and reasonability of rates, his past performance and present resourcefulness.
- 16.2 To assist in the examination, evaluation and comparison of tender, the tender inviting authority may ask tenderer individually for clarification of their tenders including breakdown of unit rates. The request for clarification and response shall be in writing but no change in substance of the tender shall be sought offered or permitted at that stage.
- 16.3 Award may be made to the tenderer whose responsive tender is determined to be the lowest evaluated tender and who meets the appropriate standards of capacity and financial resources.
- 17.0 Receipt of Payments :
Receipt of payment made on account of any work, when executed by a firm shall be signed by all the partners except where the contractors are described in their tender as firm in which case the receipt shall be signed in the name of the firm by one of the partners or by some other person having authority to give effectual receipts for the firm.
- 18.0 Opening of Tenders :
The Authorised Officer / competent authority shall open tender online on website www.nprocure.com on / /2021 at Hrs or any other suitable time thereafter, in his office in the presence of intending tenderers or their representative who wish to remain present at that time. He will enter the amount of the tenders in a comparative statement in a suitable form. In the event of a tender being accepted, the contractor shall, thereupon for the purpose of identification, sign copies of the specification and other documents mentioned in his tender.
- 19.0 General rules and directions :
- 19.1 No receipt for any payment made by a Contractor will be entertained by the Government in regard to any matter relating to his tender or the contract shall be valid and binding on the employer unless it is signed by the Authorised staff members of the Government.
- 19.2 All works shall be measured net by standard measure and according to the rules and customs of the R&B Department and no proposal to adopt alternative method will be accepted. The Executive Engineer's decision as to what is the usual method in use in the R&B Department will be final.
- 19.3 Under no circumstance shall Contractor be entitled to claim enhanced rate for any item in this contract except as provided in contract conditions.
- 19.4 The contractor shall not be permitted to tender for the work in which his near relative is working as the officer in the sphere of his jurisdiction in the Tender Inviting Authority.
Note : By term "near relative" is meant wife, husband, parents, children, brothers, sisters, uncles, aunts, cousins, and in-laws
- 19.5 The contractor should compulsorily furnish his latest address(es) including the latest address of his partners and the place(s) of filing his/their income-tax returns alongwith the tender. Any changes, in such addresses, during the tenure of contract should invariably and forthwith be intimated by the Contractor to the Executive Engineer.
- 20.0 Submission of additional information / documents :
In addition to various specified documents and information required to be submitted along with tender, the bidder may be required to provide any other document / relevant information as considered necessary by the tender inviting authority and the tenderer shall be required to provide the same as per the requirement of the tender inviting authority. Even the successful bidder may be required to provide the same as and when required by the authority during subsistence of the contract.
- 21.0 Bank :
Wherever the word "Bank" is used in this document, it would mean Schedule or Nationalised Bank only (R&BD, GR No. TNC/1090/100-(4)(c), dated 27-9-2002).
- 22.0 Tender validity period :
The tender for the work shall remain open for a period of 120/90 days counted from the date of opening price bids online tenders. Upto this period if any tenderer withdraws or makes any modifications or additions in the terms and conditions of his tender not acceptable to the Government (Public Works Department) then the Government shall without prejudice to any right remedy be at liberty to forfeit in full the said earnest money absolutely. In this connection G.r. R.&B No. TNC-IIB-22 (10)C dated 24/05/1990) and G.R.No.TNC-10-2013(02)-C dated 10/05/2013) should be referred to.

- 23.0 The successful contractor shall exhibit the board in prominent place of worksite showing the brief details of project/work under execution, financier, cost of work and broad details of inputs/specifications and targeted goals. (R&BD Grs Nos.TNC-1090-24-C dated 18-11-1991, 17-8-02 and 25-10-02)
- 24.0 The contractor will not use the premises of project / work under construction for his staff, labourers or for any other purpose. If he do so, market rent for such unauthorized used will be recovered. The marker rent will be decided by the Engineer-in-charge.
- 25.0 All statutory Taxes deductible at source under various acts and notifications by Government shall be deducted while making payment for which T.D.S. certificate shall be issued.

26.0 **Declarations :**

The tenderer will have to make declaration enlisted in the form attached herewith and shall affix his signature to the form in token of correctness of declarations made therein. (GR, R&BD No. TNC-IIB-22(10)-C, dated 24-5-90 should be refereed to).

DECLARATION FORM VSZFG 01D

- (i) I/We hereby declare that I/We have visited the site and fully acquainted myself/ourselves with the local situations regarding materials, labour and other factors pertaining to the work before submitting this tender.
- (ii) I /We hereby declare that I/We have carefully studied the conditions of contract, specifications and other documents of this work and agree for execute the same accordingly.
- (iii) We agree to receive payments, if delay is due to late receipt of grant-in-aid from Government for panchayat works (Applicable to panchayat works only)

DECLARATION CERTIFICATE(G.R. date 4-2-89 as revised by GR. No. TNC -1083/6681/4/C, dated 31-8-1994)

- (i) I/We hereby declare that my/our near relative are not working in this Division or in its sub-division as an Ex. Engineer, Deputy Executive Engineer, Assistant Engineer, Additional Assistant Engineer, overseer, Divisional Accountant, Store, Keeper, Manager or Atithi/Vishram Gruha and in the circle as a Superintending Engineer in addition for Panchayat works not working nor having posting as chairman of P.W committee or as incumbent in Jilla Panchayat at today.
27. If the tender rate of any item is higher by more than Ten percentage of the offer tender premium for rebate based percentage the payment of such item/s in running bill shall be made at sanctioned estimated rate plus/minus Percentage of accepted tender plus five percent of sanctioned estimate rate. The amount so with held shall be released in running bills in proportion to financial progress of items for which abnormally low rates are tendered. If no abnormally low rates are tendered, the amount so with held should be released in running bills in proportion to the progress of work. (R&B circular no.PARACH-102008-61-C,Dated 27-11-08 and even number dated 3-5-2013.)

28. Additional instruction regarding Security Deposite (Clause-1)

- 28.1 The Full amount of security Deposit deducted in cash from running bills will be released proportionally as indicated in table below on production of Bank Guarantee of schedule Bank provided the contractor produced Bank Guarantee for the period of six months beyond the stipulated period of completion of work. Further if the time limit of contract is extended the period of Bank Guarantee shall have to be extended for six months beyond the proposed extension of time limit and the contractor shall have to furnish the undertaking for this along with the application for extension in time limit.

Table of proportionate release of security Deposite :

Sr.	Monetary Progress	Portion of Security Deposite to be released	Against production of Bank guarantee of
1.	25 % of Tender cost	Equal to the amount retained from Running Bills or 0.625% of the estimated cost of work, whichever is less.	Equal to the amount to be released.
2.	50% of Tender cost	Equal to the amount retained from Running Bills or 1.25% of the estimated cost of work, whichever is less.	Equal to the amount to be released.
3.	75% of Tender cost	Equal to the amount retained from Running Bills or 1.88% of the estimated cost of work, whichever is less.	Equal to the amount to be released.

- 28.2 It will have to be ensured that Ten Percent amount of security deposit in any from as permissible above is kept available with the employer till the actual date of completion of work. (vide as per R&B Circular No. TNC - 10-2013-3-(Part-2)-C dated 20-11-2013)

Place —

(Digital Signature of the Contractor with seal) _____

E-Tendering of Electrical Tender from only.
Data sheet for Electrical E-Tendering

[A] Details of tender Item ::

Sr. No.	Name of work	Estimated Tender Value (Rs.....)	E.M.D. (Rs..... in)	Tender Fee (in Rs.)	Total Security Deposit	Period for completion of work
1						

[B] Eligibility Registered in

[C] Schedule for E-tendering is fixed as under ::

- [i] Site Visit (if any) :: On date Hours
- [ii] Downloading of Tender documents Start and End date :: From Date Up to date_
- [iii] Online Submission of bid :: Up to date
- [iv] Submission of E.M.D. and Tender Fee :: Submission in electronic format only through online by scanning and then the same should be sent in Original to the Chairman APMC Unjha / at the time of tender opening or sent the same through R.P.A.D. within 7-Days from the last date of opening.
- [v] Online Opening of Bid :: On Date
- [vi] Bid Validity Period :: 120/90 days from the last date of downloading bids.
- Bidders can download the tender documents free of cost from the Website. www.rnb.nrprocure.com.
 - Bidders have to submit bid in Electronic format only on above mentioned website till the Date & Time shown above.
 - Offers in physical form will not be accepted in any case.
- Bidders who wish to participate in online tenders will have to procure/should have legally valid Digital Certificate (Class-III) as per information Technology Act-2000 using which they can sign their electronic bids. Bidders can procure the same from any of the License certifying authority of India or can contact (n) code solution-a-division of GNFC Ltd., who are Licensed Certifying Authority by the Govt. of India.
- [D] [i] Bid Inviting Authority :: Chairman APMC Unjha..
- [ii] Bid Opening Authority :: Chairman APMC Unjha
- [E] Mode of quoting rates :: Percentage premium or Rebate in Words and figures at the end of the Schedule-B-

The List of Certifying agencies are as mentioned under ::

Sr. No.	Name of Certifying Agency	Website Address
1	[n] code solutions (G.N.F.C.)	www.gnvfc.com .
2	Safe crypt	www.safecrypt.com .
3	T.C.S.	www.tcs-ca.tcs.co.in
4	M.T.N.L.	www.mtnltrustline.com

As a result of E-tendering the information/instructions on Pages 6 to 7 following may be read as mentioned below ::

- 6 Deleted
- 7; In addition to the above the bid will also be liable for rejection if ::
 - [i] The bidder proposes any alteration in the work specified or in the time allowed for carrying out the work or any condition in the covering letter.
 - [ii] The bidder or the person authorized to sign on behalf of the bidder does not digitally sign the bid offer.
8. A Certificate of registration as approved contractor should be incorporated in electronically transmitted bid.
- 14 The tender for the work shall remain open for a period of 90/120 days counted from the last date of online submission of bid.
20. the rates should be expressed both in Words and figures inclusive of all taxes and duties.
22. The bid will also be liable ::
 - [i]The bidder proposes any alteration in the work specified or in the time allowed for carrying out the work or any condition or correction made in any code or mode of Schedule-B- or specification [ii] The bidder or the person authorized to sign on behalf of the bidder does not digitally sign the bid offer.
31. [i] The bids shall be offered in Electronic format only on online website www.rmb.nprocude.com/
www.....till the date and time shown on Page -2-supra.
31. [ii] Payment of tender fee and Earnest Money Deposit : Demand draft for tender fee and F.D.R. for E.M.D. shall be submitted in electronic format only through online (by scanning) while uploading the bid. This submission shall mean that E.M.D. and tender fee are received for purpose of opening of bid. This submission shall mean that E.M.D. and tender fee are received for purpose of opening the bid. Accordingly offer or those shall be opened whose E.M.D. and tender fee is received electronically. However for the purpose of realization of D.D. bidder shall send in original to Chairman APMC Unjha at the time of opening or send the same by R.P.A.D. so as to reach to the Chairman APMC Unjha within 7-days- from the last date of uploading. Penetrative action for not submitting D.D. in Original to the Executive Engineer by bidder shall be initiated. if the contractor does not remit the tender fee and earnest money within the specified time his registration will be held in abeyance for One Year and his tendering code will be cancelled for one Year.

Any documents in supporting of tender bid shall be submitted in electronic format only through online (by scanning etc.) and hard copy will not be accepted separately.

(R&B Circular No.PRC/102008/5/C dated 18.1.2008 and R&BD.G.R. No. Parach/102008/5/C dated 27.11.08)

GENERAL CONDITION OF CONTRACT FOR ELECTRICAL WORKS IN THE, BUILDING AND
COMMUNICATION
DEPARTMENT

GENERAL CONDITIONS OF CONTRACT

1. Security Deposit :

1.1 Security Deposit is required to be furnished by the contractor as guarantee money for performance of the contract and observance of Contract conditions.

1.2 The person/persons whose tender is accepted (hereinafter called the " Contractor " which expression shall, unless excluded by, or repugnant to the context include his Legal heirs, executors, administrators and assignees shall pay the total amount of Security Deposit :

(a) In respect of the tender upto Rs. Thirty lacs, equal to 5 (Five) percent of the estimated cost of the work put to tender.

(b) In respect of the work above thirty lacs, equal to 10(Ten) percent of the estimated cost of the work put to tender.

1.3 In respect of the tenders upto Rs. 30 lacs the contractor shall pay Five percent of security deposit in two parts as tender.

Part - I :- 2.5 percent in the form of Narmada Bond of Sardar Sarovar Narmada Nigam Ltd. or in any form of National Small saving (N.S.S.) Schemes or F.D.R. of any Schedule Bank to be paid within 10 days from the date of receipt of Acceptance letter of his offer.

Part II :- 2.5 percent in the form of Security Deposit to be deducted from Running Bills that become payable to the contractor from time to time.

1.4 In respect of the tenders above Rs. thirty lacs the contractor shall pay first five percent of Security Deposit as specified in part 1.3 above and for the remaining five percent, the contractor shall have to give Performance Bond to be produced within 10 days from the date of receipt of acceptance letter of his offer.

1.5 The Work-order to commence the work shall be issued only after the security deposit as per Para 1.3 and 1.4 is paid / furnished by the tenderer. If the tenderer fail to produce the security deposit as above the earnest money paid by him shall be forfeited and his registration shall be held in abeyance for three years from the date of such default as per Clause-3.

1.6 All compensation, Liquidated damages or other sums or money payable by the contractor to Government under the terms of this contract shall be deducted from or recouped by the realisation of a sufficient part of his security deposit, or from the interest arising there from or performance bond or from any sums which may due or may become due by Government to the Contractor on any account whatsoever and whether in respect of this contract, any other contract, or otherwise. In the event of his security deposit being reduced by reason of any such deduction or recoupment as aforesaid, the contractor shall within ten days thereafter, make good in cash or in Government securities transferred as aforesaid any sum or sums required to make good the shortfall in the amount of the security deposit.

1.7 The portion of security deposit deducted at 2.5 percent from Running Bills as Security Deposit can be converted into interest bearing securities or F.D.R. of Schedule Bank in the Name of Executive Engineer provided that the recovery of full amount of 2.5 % is made and that the contractor has expressly desired this in writing.

1.8 Fifty percentage of the Security Deposit along with performance bond shall become refundable within fifteen days after the final completion certificate is issued by authority. This action will be taken by the Chairman APMC Unjha and no proposal from concern in charge Engineer will be necessary. All dues under this contract or other contract, or otherwise shall be recovered from the aforesaid amount of fifty percentage of the said security deposit and the balance shall be refunded within fifteen days after the final certificate is issued. The remaining fifty percentage of the security deposit shall be refunded after the expiry of the Defect Liability period after deducting there from the amount of expenses, if any, due to Government under this contract. However, before release of balance of security deposit, the undertaking should be obtained from the contractor that he has paid royalty on mining materials and still any duties for royalty charges are to be paid, he undertakes to pay the same to the concerned Authority. "No due certificate" from Royalty Collecting authority should not be insisted upon. (Modified as per R & B Circular No. TNC 10-2013-3 (Part)-C dated 19-11-2013), No.CON 10-2016-02-C dated 24-10-2017 and No.TNC-10-2013-(4)-C dated 24/10/2017.

CLAUSE 2 : Liquidated damages for delay :-

(i) If the Contractor fails to complete the work under contract by the stipulated date, he shall pay liquidated damages of at the rate of 0.1* percentage of the contract value per day from the date of delaying the said work upto the date of completion and handing over to the Government.

(ii) However also if the contractor fails to complete any part of the work as designed in Schedule (c) by the time indicated against such part, he shall pay Liquidated damages per day from the date of delaying the said part of the work up to the date of completion of the said designated part at the rates shown in the said schedule of the contract value of such part for such failure till the said designated part. is completed.

(ii)The aggregate maximum of liquidated damages payable under clause No.2 shall not exceed Rs. 0.1 percentage of contract value per day and shall be subject to the maximum amount of ten percentage of the estimated amount put to tender.

(iv) Delays requiring payment of ten percentage liquidated damages of the amount put to tender for performance shall be sufficient causes for termination of contract and for forfeiture of security deposit including amount of performance bond in respect of works estimated to cost more than Rs.30 lacs, for. Performance and registration of the contractor shall also be kept in abeyance for three years from the date as fixed in all cases. (See Schedule (C) on Page No.48)

CLAUSE 3: Default by Contractor: If the Contractor shall neglect or fail to proceed with the work with due diligence or if he violates any of the provision of the Contract, the Engineer – in –charge shall give the Contractor a notice, identifying deficiencies in performance and demanding corrective action. Such notice shall clearly state that it is given under the provision of this clause. After service of such notice, the contractor shall not remove any plant, equipment and material from the site. The Government shall have a lien on all such plant, equipment and material from the date of such notice till the said deficiencies have been corrected as mentioned in the said notice.

If the contractor fails to take satisfactory corrective action within ten days after receipt of such notice, the Engineer-in-charge on behalf of Governor of Gujarat shall terminate the contract in whole. In case the entire contract is terminated, the amount of security deposit and performance bond if any together with the value of the work done but not paid for, shall stand forfeited to the Government. The plants, equipment and materials, held under this clause shall then be at the disposal of the Government to recover the amount equivalent to the liquidated damages and registration of the contractor shall be kept in abeyance for three years from the date as fixed in all such cases.

The Engineer-in –charge if necessary shall direct that a part or the whole of such plant, equipment and material be removed from the site within a stipulated period. If the Contractor fails to do so, the Engineer-in-Charge shall cause them or any part of them to be sold holding the net proceeds of such sale to the credit of the Contractor. After settlement of accounts, the lien by the Government of the contractor's remaining plant equipment and balances of materials shall be released.

Termination of the contract in whole shall be an adequate authority for the Engineer-in-charge to demand discharge of the obligations from the guarantors of the security for the performance.

CLAUSE 4: If the progress of any particular portion of the work under Contract is unsatisfactory, the Engineer-in-charge shall, notwithstanding that the general progress of the work is satisfactory, in accordance with Clause 2 be entitled to take necessary action under Clause 3 after giving the Contractor ten day's notice in writing and the contractor shall have no claim whatsoever for any compensation for any loss caused to him due to such action.

Clauses 1,2,3,4 as substituted vide G R No TNC/1091/1B-10/(11)-C dated 15-10-91 & 29-10-91 & G.R. No.TNC-1088/1B/18/(13)-C dated 31/8/94 and No. TNC-10/2002/14-C, dated 28/4/03 and 10-9-03)

CLAUSE 5: In any case in which any of powers conferred upon the Engineer-in-charge by clause-3 hereof shall have become exercisable and the same shall not have been exercised, the non-exercise thereof shall not constitute a waiver of any of the conditions hereof and such powers shall not with standing be exercisable at any future date.

CLAUSE 5 A: In the event of the Engineer-in –charge taking action under clause 3, he may if so desire take possession of all or any tools, plants, machineries materials and stores in or upon the work or the site there of or belonging to the contractor or procured by him and intended to be used for the execution of the work or any part thereof, by paying or allowing for the same in account at the contract rate or in case of contract rates not being applicable at such reasonable rate, as may be comparable to current market rates where ascertainable of similar articles and comparable condition, to be certified by the Engineer-in-charge. In the alternative the Engineer-in-charge may by notice in writing to the contractor or his clerk of the works foreman or other authorised agent require him to remove such tools, plants, machineries, materials or stores from the premises within a time to be specified in such notice and in the event of the contractor failing to comply with any such requisition , the Engineer-in-charge may remove them at the contractor's expenses or shall remove them by auction or private sale at the risk and cost of the contractor 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 removal shall be final and conclusive against the contractor.

CLAUSE 6: Extension of time: If the contractor shall desire an extension of the time for completion of the work on the ground of his having been unavoidably hindered in its execution or any other ground he shall apply in writing to the Engineer-in-charge before the expiration of the period stipulated in the tender or before the expiration of 30 days from the date on which he was hindered whichever is earlier and the Engineer-in-charge may, if in his opinion, believe that there are reasonable grounds for granting an extension, grant such extension as he thinks necessary or proper. The decision of the Engineer-in-charge in this matter shall be final

CLAUSE 7: As soon as the work is completed the contractor shall give a notice of such completion to the Engineer-in-charge and on receipt of such notice the Engineer-in-charge shall inspect the work and if he is satisfied that the work is completed in all respect then :-

(i) For all works costing upto Rs.50 lakhs (amount put to tender) the final measurements shall be recorded within 45 days from the date of physical completion of the work and the final bill shall be prepared within 45 days from the date of recording final measurement ., The completion certificate shall be issued within one month from the date of final measurement subject to the contractor fulfilling his obligation as provided in the contract and subject to the work being complete in all respects.

(ii) In respect of works costing more than Rs.50 lakhs (amount put on tender), the final measurements shall be recorded within 75 days from the date of physical completion of the work and the final bill shall be prepared within 75 days from the date of recording final measurements subject to the contractor fulfilling his obligations as provided in the contract and subject to the work being complete in all respects.

When separate period of completion have been specified for items or groups of items, the Engineer-in-charge shall issue separate completion certificate for such items or groups of items .

No certificate of completion shall be issued nor shall the work be considered to be complete till the contractor shall have removed from the premises, on which the work has been executed, all scaffolding, sheds and surplus materials, except such as are required for rectification of defects; rubbish and all huts and sanitary arrangements required for his workmen on the site in connection with the execution of the work, as shall have been erected by the contractor for the workmen and cleared all dirt from all parts of building(s) in, upon or around which the work has been executed or of which he may have possession for the purpose of the execution thereof and cleared floors, gutters and drains, cased doors and sashes, oiled locks and fastenings labeled keys clearly and handed them over to the Engineer-in-charge or his representative and made the whole premises fit for immediate occupation or use to the satisfaction of the Engineer-in-charge . if the contractor shall fail to comply with any of the requirements of these conditions as aforesaid, on or before the date of completion of the works, the Engineer-in-charge may , at the expenses of the contractor, fulfill such requirements and dispose of the scaffolding, or surplus materials and rubbish etc. as he thinks fit and the contractor shall have no claim in respect of any such scaffolding or surplus materials except for any sum actually released by the sale thereof less the Cost of fulfilling the requirements and any other amount that may be due from the contractor. If the expenses of fulfilling such requirements are more than the amount realized such disposal as aforesaid the contractor shall forthwith, on demand, pay such excess. The Engineer-in-charge shall also have the rights to adjust the amount of excess against any amounts that may be payable to the contractor.

CLAUSE 8: No payment shall be made for any work, estimated to cost less than rupees one thousand till after the whole of the said work shall have been completed and a certificate of completion given. But in the case of works estimated to cost more than rupees one thousand, the contractor shall on submitting a monthly bill therefore, be entitled to receive payment proportionate to the part of the work then approved and passed by the Engineer-in-charge, whose certificate of such approval and passing of the sum so payable shall be final and conclusive against the contractor., All such intermediate payments shall be regarded as payments by way of advance against the final payments only and not as payments for work actually done and completed and shall not preclude the Engineer-in-charge from requiring gad, unsound, imperfect or unskilled work to be removed and taken away and reconstructed or re-erected, nor shall any such payment be considered as an admission of the due performance of the contractor or any part therefore in any respect or the accruing of any claims, nor shall it conclude, determine, or affect in any way the power of the Engineer-in-charge as to the final settlement and adjustment of the accounts or otherwise or in any other way vary or effect the contract. The final bill shall be submitted by the contractor within one month of the completion of the work , otherwise the Engineer-in-charges certificate of the measurements and of the total amount payable for the work shall be final and binding on all parties.

CLAUSE 9: The rates for items of works shall be valid only when the items concerned is accepted as having been completed fully in accordance with the sectional specifications. In cases where the items of work are accepted as not so completed, the Engineer-in-charge may make payment on account of such items at such reduced rates as he may consider reasonable in preparation of final or on account bill.

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

CLAUSE 11: The contractor shall submit all the bills on the printed forms to be had on application at the office of the Engineer-in-charge. The charges to be made in the bills shall always be entered at the rates specified in the agreement or at the partly reduced rates subject to the approval by the Engineer-in-charge in the case of items not completed/executed as per agreements or in the case of any extra work ordered in pursuance of these conditions and not mentioned or provided for in the tender, at the rate here in after provided for such work

CLAUSE 12: If the specification of the work provides for the use of any special description of materials to be supplied from the Departmental Store or if it is required that the contractor shall use certain stores to be provided by the Engineer-in-charge (such materials and stores and the prices to be charged therefore as here in after mentioned being so far as practicable for the convenience of the contractor but not so as in any way to control the meaning or effect of this contract specified in the schedule or memorandum here to annexed) the contractor shall be supplied with materials and stores as may be required from time to time to be used by him for the purpose of the contract only, and the value of the full quantity of materials and stores so supplied shall be set off or deducted from any sum then deposit, or the proceeds of sale thereof, if the deposit is held in govt. Securities , the same or a sufficient portion thereof shall, in that case be sold for the purpose . All materials supplied to the contractor shall remain the absolute property of Govt. and shall on no account be removed from the site of the work, and shall at all time, be open to inspection by the Engineer-in-chare. Any such materials, unused and in perfectly good condition at the time of completion or termination of the contract , shall be returned to the Departmental store if the Engineer-in-charge so

requires by a notice in writing given under his hand, but the contractor shall not be entitled to return any such materials except with the consent in writing of the Engineer-in-charge and he shall have no claim for compensation on account of any such material supplied to him as aforesaid but remaining unused by him or for any wastage in or damage thereto.

For materials provided in schedule-A and consumed in excess quantities, the rates provided in Schedule A shall be increased/executed corresponding to the increased/decrease in the new rate payable for excess quantity as compared to the tender-rates. The rate for materials provided in extra items will be the issue rates plus storage charge ruling on the date of issue of such quantity of materials.

CLAUSE 12A: The contractor shall be entitled to use the materials supplied by the Department only to the extent of quantities of such materials required for execution of the work as per theoretical calculations. The Engineer-in-charge may however, on being satisfied that a large quantity of such materials is required for the execution of the work, permit the contractor to use such large quantity of the materials, Such permission shall be given in writing.

The contractor is bound to return in good condition such materials issued in excess of the requirements so worked out or in excess of the quantities so permitted to be used by the Engineer-in-charge if the contractor fails to return such extra materials within a period of 15 days from the date of the demand in writing of such materials being made by the Engineer-in-charge, he shall be charged for the excess materials at double the issue-rates for such materials specified in Schedule A of the contract Agreement.

CLAUSE 12 B: All the materials, such as lift materials etc which will be kept by contractor in special godown, for that only the contractor will be responsible if any incidents like theft, fire etc happen. For that insurance policy will be provided by the contractor to the Engineer in-charge against that materials. The godown shall be accessible to his agent at all times. No materials shall be allowed to be removed from the site of the work and any material required for the execution or installation of the work shall be taken out from the godown without the permission of the contractor and on his own responsibilities. The Engineer –in-charge will not be liable for that materials in any case.

CLAUSE 13: (1) The contractor shall execute the whole and every part of the work in the most substantial and workman-like manner and both as regards materials and in other respects in strict accordance with specifications.

The contractor shall also confirm exactly, fully and faithfully to the design, drawings and instructions in writing for the work signed by the Engineer-in-charge. the design and the drawings shall be lodged in the office of the site Engineer-in-charge to which the contractor shall be entitled to have access for the purpose of inspection at such office during office hours.

Where the instructions referred to above are not contained in separate letters addressed to the contractor the same shall be recorded in the work-order book, which shall be maintained and kept on the site of the work. The contractor shall be required to sign such entries in the work-order book in token of having noted the instructions. However, if the contractor fails to sign the work-order book for any reason whatsoever, the entry of the instructions in the work-order book shall be deemed to be the due notice to him of the said instructions. The work-order book shall be open for inspections to the contractor on the site of the work during office hours.

(2) The contractor will be entitled to receive one copy of the accepted tender along with the work order free of cost and will also be entitled to receive three sets of contract and working drawings according to the progress of work as and when needed, free of cost.

(3) The several documents forming the contract are essential parts of the contract and requirements occurring in one are binding as through occurring in all. They are intended to be mutually explanatory and complimentary and to describe and provide for a complete work.

In the event of any discrepancy in the several documents forming the contract or in any one document, the following order of precedence should apply.

(a) Dimension and quantities : (i) Drawings (ii) Schedule-B of the Tender form (iii) Specification.

On drawings, figures dimensions, unless obviously incorrect, will be followed in preference to scaled dimensions.

(b) Description: (I) Schedule-B of the Tender form :- (ii) Drawings (iii) Specifications. In the case of effective description or ambiguity, the Engineer-in-charge is entitled to issue further instructions directing in what manner the work is to be carried out. The contractor cannot take any advantage of any apparent error or omission in drawings or specifications and the Engineer-in-charge shall be entitled to make corrections and interpretations as necessary to fulfill the plans and specifications.

CLAUSE Extra/excess 14.1: The Engineer-in-charge shall have power to make any alterations in or addition to the original specifications, drawings, designs and instructions that may appear to him to be necessary or advisable during the progress of the work and the contractor shall be bound to carry out the work in accordance with any instructions in this connection which may be given to him in writing signed by the Engineer-in-charge and such alteration shall not invalidate the contract and additional work which the contractor may be directed to do in the manner above specified as part of the work shall be carried out by the contractor on the same conditions in all respects on which he agreed to do the main work and at the same rate as out by the contractor on the same conditions in all respects on which he agreed to do the main work and at the same rate as are specified in the tender for the main work.

14.2. Except that when the quantity of any item exceeds the quantity as in the tender by more than 10% the contractor will be paid for the quantity in excess of 10% at the rate entered in the S.O.R. of the year during which the excess in quantity is first executed or tender whichever is less (Modified as per R &B No.TNC-10-2017-01-C, dated 11-7-2017.

14.3. If the additional or altered work includes any class of work for which no rate is specified in this contract, then such class of work shall be carried out.

(i) At the rate derived from the item within the contract which is comparable to the one involving additional or altered class of work, where there are more than one comparable items, the item of the contract which is nearest in comparison with regard to class or classes of the work involved shall be selected and the decision of the Superintending Engineer as to the nearest comparable item shall be final and binding on the contractor.

(ii) If the rate cannot be derived in accordance with (I) above, such class of works shall be carried out at the rate entered in the Schedule of Rates of the Division for the year in which the tender was received, increased or decreased by the percentage by which the tender amount is more or less as compared to the amount arrived at the rates in the "Schedule of Rates" of the Division in the year in which the tender was received. If the Schedule of rates of the Division does not contain all the items the percentage increase or decrease of the tender shall be calculated considering such items which were included in the "Schedule of Rates" of the Division for the year and for materials consumed on such item the rate to be charged would be the basic rate taken into account for fixing the rate in S.O.R. referred to above instead of the rate. Stipulated in schedule 'A'.

(iii) If it is not possible to arrive at the rate from (I) and (ii) above, such class of work shall be carried out at the rate decided by the competent authorities on the basis of detailed rate analysis after hearing the contractor before a Committee of two superintending Engineers stationed at the same place or the nearest place.

14.4 If the additional or altered work, for which no rate is entered in the "Schedule of Rates" of the Division is ordered to be carried out before the rate is agreed upon, then the contractor shall within seven days of the date of receipt by him of the order to carry out the work, inform the Engineer-in-charge of the rate, which it is his intention to charge for such class of work and if the Engineer in charge does not agree to this rates, he shall by notice in writing be at liberty to cancel his order to carry out such class of work and arrange to carry it out in such manner as he may consider it advisable, provided always that if the contractor shall commence work or incur any expenditure in regard thereof before the rates shall have been determined as lastly herein before mentioned, then in such cases he shall only be entitled to be paid in respect of the work carried out or expenditure incurred by him prior to the date of the determination of the rate as aforesaid according to such rate or rates as shall be fixed by the Engineer-in-charge. In the event of the dispute, the decision of the Superintending Engineer of the Circle shall be final.

Where, however, the work is to be executed according to the designs, drawings and specifications recommended by the contractor and accepted by the competent authority, the alternation above referred to shall be within the scope of such designs, drawings and specifications appended to the tenders.

The time limit for the completion of the work shall be extended in the proportion that the increase in the cost occasioned by alternations bears to the cost of the original contract work and the certificate of the Engineer –in-charge as to such proportion shall be final and conclusive.

CLAUSE 15: No claim for any payment of compensation for change or restriction of work : If at any time after the execution of the contract documents the Engineer-in-charge shall for any reason whatsoever, require the whole or part of the work, as specified in the tender, to be stopped for any period or shall not require the whole or part of the work to be carried out at all or to be carried out by the contractor, he shall give notice in writing, stating the fact to the Contractor who shall thereupon suspend or stop the work totally or partially, as the case may be. In any such case, except as provided hereunder, the Contractor shall have no claim to any payment or compensation whatsoever except as provided hereunder 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 so derive in consequence of the full amount of the work not having been carried out, or on account of any loss that he may be put to on account of materials purchased or agreed to be purchased or for unemployment of labour required by him. He shall not have also any claim for compensation by reason of any alteration having been made in the original specifications, drawings, designs and instructions which may involve any curtailment of the work as originally contemplated.

(1) However, the contractor will be entitled for compensation for loss, if any on the date of notice, for the purchased materials or for the contract executed for the material to be purchased for such work. Such compensation will be paid only for actual loss for materials, if such materials so purchased or agreed to purchase is of required quantity/quality and was purchased/ contracted to be purchased only for the same work. But no compensation shall be granted to contractor on material for which advance has been given to contractor by Government. The amount of loss for such claim will be decided by in charge Engineer-in-charge.

(2) The contractor also will be entitled for compensation of unemployed labour for 7 days from the date of notice provided that in that opinion of Engineer-in-charge such labour working for 7 days prior to the notice and would not be in a position to get employment elsewhere within 7 days from the date of such notice. The contractor should try to employ such unemployed labour at other places from the date of such notice.

In case the Contractor does not agree with the decision of Executive Engineer regarding the amount of compensation or loss; it will be open for the contractor to appeal to Superintending Engineer-in –charge within one month from the date of knowledge of such decision. In such case the decision of Superintending Engineer will be final and binding to the Contractor.

The Contractor shall not be entitled for loss of any expected profit of such work.

(Vide G.R. NO.SSR/1090/IB/247(2) /C, dtd 28-06-1993 as amended by GR of even number dated 11/02/1999)

CLAUSE 15A : The contractor shall not be entitled to claim any compensation from Govt. on account of delay by Government in the supply of materials entered in Schedule 'A' where such delay is caused by (I) Non-supply due to short allotment of quota in case materials available under quota regulations. (ii) Difficulties relating to the supply of railway wagon (iii) Force majored. (iv) Act of God. (v) Act of the country's enemies or any other reasonable cause beyond the control of Government.

In the case of such delay in the supply of materials, Government shall grant such extension of time for the completion of the works as shall appear to the Engineer-in-charge to be reasonable in accordance with the circumstances of the

case. The decision of the Engineer-in-charge as for the extension of time shall be accepted as final by the contractors. (As modified Vide R&BD. G.R. No. TNC – 1096 IB – 143 (16) – C dated 11-1-99)

CLAUSE 16: Time limit for unforeseen claims: The contractor shall not be entitled to any compensation from Government on any account unless where allowed by the conditions of this contract. In such cases the contractor shall have to submit a claim in writing to the Engineer-in-charge within one month of the cause of such claim occurring.

CLAUSE 17 : Action & compensation in case of bad work : If at any time before the expire of Defects Liability period as detailed in Clause 17-A. It shall appear to the Engineer-in-charge or his sub-ordinate in charge of the work that/any work has been executed unsound, imperfect or unskilled workmanship or with materials of inferior quality or that any materials or articles provided by him for the execution of the work are unsound , or of a quality inferior to that contracted for or 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 for may have been passed, certified and paid for the contractor shall be bound forthwith to rectify, or remove and reconstruct the work so specified in whole or in part as the case may require, or if so required, shall remove the materials or articles so specified in whole or in part and provide other proper and suitable materials or articles at his own charge and cost, and in the event of his failing to do so within a period to be specified by the Engineer-in-charge in the written intimation aforesaid, the contractor shall be liable to pay compensation at the rate of one percent on the amount of the estimate of the rectification for every day not exceeding ten days during which the failure so. Continues and in the event of any such failure as aforesaid continuing beyond ten days, the Engineer-in-Charge may rectify or remove, and re-execute the work or remove and replace the materials complained of as the case may be at the risk and expense in all respects of the contractor. Should the Engineer-in-charge consider that any such inferior work or materials as described above may be accepted or made use of, it shall be within his discretion to accept the same at such reduced rates as he may fix therefore. However, the contractor shall be responsible for normal maintenance of the work till the final bill for the work is prepared by the departmental Officer.

Clause 17A: Defect liability period: The contractor shall be responsible to make good and remedy at his own expenses any defect which may develop or may be noticed before the period mentioned hereunder from the certified date of completion. The Engineer-in-charge shall give the contractor a notice in writing about the defects and the contractor shall make good the same within 15 days of receipt of the notice. In the case of failure on the part of the contractor, the Engineer-in –charge may rectify or remove or re-execute the work at the risk & cost of the contractor. The Engineer-in-charge shall be entitled to appropriate the whole or any part of the amount of security deposit towards the expenses, if any, incurred by him in rectification, removal or re-execution. The Defects Liability period shall be as under (a) for all works costing up to Rs. 50,000 (amount put to tender), the period shall be 3 months from the certified date of completion.

(b) for all works costing more than Rs. 50,000 and up to Rs. 1 crore (amount put tender), the period shall be 6 months from the certified date of completion.

(c) for major projects costing more than Rs. 1 crore (amount put tender), the period shall be 36 months from the certified date of completion or three monsoons whichever is later.

(d) for building works, other than original building works the period specified in (a), (b) or (c) shall be same.

(modified vide R&B D Circular No.PAC-11-102008-2076-N 31-8-2009, PRCH-102013(2076) 2759-N Dated 27-5-2013 and Circular No. TNC/10/2016/Clause. 17A(Correction/(1)C dated 12-5-2016)

CLAUSE 18: (1) For each work costing above Rs. One crore, the contractor shall have to engage minimum one graduate engineer. He will be given identity card by the contractor. The copy of Identity Card shall be furnish for the office of Deputy Executive Engineer, Executive Engineer and Superintending Engineer. The identified engineer should remain present on the site of the work. The contractor will have to produce the notarized certificate periodically (at least in the beginning and in the month of completion of the work to the effect that the said designated graduate engineer has not been appointed on any other work. If not found on site, the engineer in charge will give notice of this default to the contractor. If in spite of this notice, default continues, the action to hold the registration of defaulter contractor in abeyance for three year will be initiated. (R&B D. Circular No.SSR-10-2008-18-C dated 13-10-08 and No.५२५-१०२०१५-५५५, ८०.४/११/२०१५)

(2) Work to be open to inspections –Contractor or responsible agent to be Present : All Works under or in course of execution or executed in pursuance of the contract shall, at all times be open to the inspection and supervision of the Engineer-in-charge and his subordinates and the Contractor shall, at all times during the usual working hours, and all other times for which reasonable notice of the intimation of the Engineer-in-charge or his subordinate to visit the works shall have been given to the contractor , either himself be present to receive orders and instructions or have a responsible agent duly accredited in writing present for that purpose. Orders given to the contractor's duly authorized agent shall be considered to have the same force and effect as if they had been given to the Contractor himself.

CLAUSE 18A : Employment of a qualified site Engineer by the Contractor. For works estimated to cost above Rs. 100 lacs. Within 15 days of issue of work order the Contractor will have to furnish to the Deputy Executive Engineer-in-charge of the work the name, Qualifications, copy of marksheet, Colour Photograph and appointment order issued to such engineers engaged for this work, If 15 days after issue of work order such designated site Engineer do not resume or do not remain present on site of work, the recovery of the rate of Rs. 15,000/- per month per Engineer will be made from the bills/deposite/dues of the contractor. Such recovery shall be non refundable.

The Engineer so employed for the Government work must have sufficient experience to handle the work independently. Such an Engineer shall have to stay at the site of work and he shall not be entrusted with other duty except this work. In case the contractor or partner of the contractor firm is a Civil Graduate Engineer, Employment of separate Engineer will not be necessary provided that the Engineer partner himself attends the execution of the work on the site. (G.R.B. & CD No. RGN-602006-(35)-C, dated 31-5-07)

CLAUSE 19: Notice to be given before work is covered up: The contractor shall give not less than five day's notice in writing to the Engineer-in-charge or his subordinate in charge of the work before covering up or otherwise placing beyond the reach of measurement any work in order that the same may be measured and correct dimensions thereof taken before the same is so covered up or placed beyond the reach of measurement and if any work shall be covered up or placed beyond the reach of measurement without such notice having and if any work shall be covered up or placed beyond the reach of measurement without such notice having been given or consent obtained, the same shall be uncovered at the contractor's expenses and in default thereof no payment or allowance shall be made for such work or for the materials with which the same was executed.

CLAUSE 20: If the contractor or his workmen, or servants shall break, deface, injure or destroy any part of the building or the work in a question in/on which they may be working or any building, road, fence, enclosure or grassland or cultivated ground contiguous to the premises on which the works or any part thereof is being executed or if any damage shall be done to the work from any causes whatever before damage occurred/caused due to normal flood or rain or if any imperfections become apparent in it within three months from the grant of a certificate of completion, final or otherwise by the Engineer-in-charge, the contractor shall make good the same at own expenses or in default, the Engineer-in-charge may cause the same to be made good by other contractor, and deduct the expenses (of which the certificate of the Engineer-in-charge shall be final) from any sums that may thereafter become due to the contractor or from his security deposit or the proceeds of sale thereof or a sufficient portion thereof.

CLAUSE 20A: Neither party shall be liable to the other for any loss or damage occasioned by or arising out of God, such as "Unprecedented flood", volcanic eruption, earthquake or other convulsion of nature and other acts such as but not restricted to general strike, invasion, the acts of foreign countries, hostilities, or war like operations before or after declaration of war, rebellion, military or usurped power which prevent performance of the contract and which could not have been foreseen or avoided by a prudent person.

Note: "Unprecedented flood" means the flood crossing the High Flood Level of the past which is on the available record.

(Modified Vide R & B D.G.R. No/ TNC – 1096 – IB –143 – (16) – C dated 11-1-99)

CLAUSE 21: Contractor to supply plant, ladders, scaffolding etc. and is liable for damage arising from non-provision of lights, fencing etc. : The contractor shall supply at his own cost all materials (except such special materials if any, as may, in accordance with the contract to be supplied from the Public Works Department Stores), plant, tools, appliances, implements, ladders, cordage, tackle, scaffolding, and any temporary works which may be required for the proper execution of the work whether in the original, altered or substituted form and whether included in the specifications, or other documents forming part of the contract or referred to in these conditions or not and which may be necessary for the purpose of satisfying or complying with requirements of the Engineer-in-charge as to any matter or to which under these conditions he is entitled to be satisfied or which he is entitled to require together with carriage there for 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 settings out works and counting, weighing and assisting in the measurement or examination at any time and from time to time, of the work or the materials, failing this, the same may be provided by the Engineer-in-charge at the expenses of the Contractor and the expenses may be deducted from any money due to the Contractor under the contract or from his security deposit, or proceeds of sale thereof or of a sufficient portion thereof. The contractor shall provide all necessary fencing and lights required to protect the public from accident and shall also be bound to bear expenses of defence of every suit, action or other legal 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 costs which may be awarded in any such suit, action or proceedings to any such person, or which may, with the consent of the Contractor, be paid in compromising any claim by any such person.

CLAUSE 21A: The Contractor shall provide suitable scaffolds and working platforms, gangways and stairways, and shall comply with the following regulation in connection therewith.

(a) Suitable scaffolds shall be provided for workmen for all works that cannot be safely done from a ladder or by other means.

(b) A scaffold shall not be constructed, taken down or substantially altered except

(i) Under the supervision of a competent and responsible person.

(ii) Appointed by contractor and by competent workers possessing adequate experience in this kind of work.

(c) All scaffolds and appliances connected therewith and all ladders shall

(i) be of sound material

(ii) be of adequate strength having regard to the loads and strains to which they will be subjected and

(iii) be maintained in proper condition

(d) Scaffolds shall be so constructed that no part thereof can be displaced in consequence of normal use.

(e) Scaffolds shall not be overloaded and so far as practicable the load shall be evenly distributed.

(f) Before installing the lifting gear on scaffolds, special precaution shall be taken to ensure the strength and stability of the scaffolds.

F Df8GF IUZU U9JTF 5C, F 5f, B1GL DHATF. VG 8SfP56Gf. BFTZL SZJfGL Bf; ;fJRTL, JLP

(g) Scaffolds shall be periodically inspected by a competent person .

sHf SFUFDj IIST vJfZf JBtUJBT 5f, B1GL T5f; SZJfGL ZCXp

(h) Before allowing a scaffold to be used by his workmen, the Contractor shall, whether the scaffold has been erected by his workmen or not, take steps to ensure that it complies fully with the regulation herein specified.

shf TGF SFDNFZIV 5f, B1 AFWL CII S G CII TI 56 5fTGF SFDNFZIG T 5f, BGI p5Iiu SZJf NT 5C, f Slg8fS8Z TJU 5f, B1 VCL H6fJ, IJIGIDI VG; fZ AZfAZ CIIJf AFATGL BFTZL SZJfGL ZCXp

(i) Working platforms, gangways shall –

(i) be so constructed that no part thereof can dug unduly or unequally.

s8f SFRF DFRof HJfV VJfJf Df8GF 5H8If VG ;LOLV1 AFWTL JBT GLRGL AFATI bIf, Df ZfBJfGL ZCXp
! TGI SIL. 56 EPU JW 50TI S V; DfG ZLT HSL G HJH HL. VP

(ii) be/so constructed and maintained having regard to the prevailing conditions as to reduce as far as practicable risks of persons tripping or slipping and

Zf Df6; IUAOL S, 5; I 50 TJ HIBD AG T8, VIK ZfBJf Df8 5JTTF ; HIUI VG; fZ T AFWJf VG HE/ JfJf VG

(iii) be kept free from any unnecessary obstruction.

#P SIL. 56 HFTGF IAG H-ZL VJZIWYL DST ZfBJfP

(j) In the case of working platforms, gangways working places and stairways at a height exceeding 2.00 Mtr.(to be specified)

s9f ZP__ Df8Z YL JW pRf. Jf/ f SFRF DFRof HJfV VJfJf Df8 5H8If SFDGL HuIf VG ;LOLVIGL GR DHAGL HIUJf. ZCXp

(i) every working platform and every gangway shall be closely boarded unless other adequate measures are taken to ensure safety.

!f ; ;fDTLGF ALHF 5ZTF 5U, f G, JfIf CII TI NZS SFRf DFRof VG HJf VJfJf Df8G NZS 5H8I, UI, U HO, CIIJ HI. VP

(ii) every working platform and every gangway shall have adequate width, and

Zf NZS SFRF DFRof VG HJf v VJfJf Df8GF 5H8If 5ZTL 5CL/ f. Jf/ f CIIJf HI. V4 VG

(iii) every working platform, gangway, working place and stairway shall be suitably fenced.

#f NZS SFRF DFRof VG HJfV VJfJf Df8GF 5H8If SFDGL HuIf VG ;LOLVIG IhuI S9Zf CIIJf HI. VP

(k) Every opening in the floor of a building or in a working platform shall, except for the time and to the extent required to allow the access of person or the transport or shifting of materials be provided with suitable means to prevent the fall of persons or material.

sOf Df6; I VJfJf H. XS VYJf Df, ; fDfGL CZOZ Y. XS S VS :Y/YL ALH :Y/ , H. XSEf T8, f JBT VG T8, f 5ZTL DSfGGL OZ; S SFRF DFRof 5ZGL 5tIS B<, I HuIf 5Z VJf IhuI ; fWGI DSL ZfBJf S HYL SIL. Df6; S Df, ; fDfG 50L G HFI

(l) When persons are employed on a roof where there danger of falling from a height exceeding 3.00 Mtr.(to be specified) meters suitable precaution shall be taken to prevent the fall of persons or material.

s-f HIFYL 50L HJfGI EI CII TJ. #P__ sH6fJf Df8ZYL JW pRf. Gf Kf5Zf 5Z Df6; IG SFD ZfBJfDf VJfJf CII tIFYL Df6; I S Df, ; fDfG 50L G HFI T Df8 ; fJRTLGF IhuI 5U, f, JfGf ZCXp

(m) Suitable precautions shall be taken to prevent persons being struck by articles which might fall from scaffold or other working places.

sTf 5f, B1 S SFDfHGL ALHL HuIfV1 5ZYL 50 TJL RLHJ:TVIYL Df6; G . HF G YfI TDF8 ; fJRTLGF IhuI 5U, f, JfP

(n) Safe means of access shall be provided to all working platforms and other working places.

sYf AWF SFRF DFRof VG SFDGL ALHL HuIfVIV ; C, f. YL HJf Df8 ; ; fDT DfUIGL HIUJf. SZJfGL ZCXp

CLAUSE 22 : The contractor shall comply with the following regulations as regards the hoisting appliances to be used by him

P Slg8fS8Z JHG pRSJfGf ; fWGI Jf5Z T ; AWDf T6 GLRGL IGIDI G 5f, G SZJfGL ZCXp

(a) Hoisting machines and tackle including their attachments, anchorages and supports shall –

sSf JHG pRSJfGf I+I VG UZUOLJf/ f I+4 TDGL ; fYGF HIOF6H, UZ Df8GF ; fDfG VG 8Sf GLR DHAGf CIIJf HI. X ov

(i) be of good mechanical construction, sound material and adequate strength and free from patent defect, and

s!f ; fZL IH+S ZRfGfJf/4 DHAT J:TGF TDH 5ZTL TSfTJf/ f VG NBTL SIL. BFDL IJGfGf VG

(ii) be kept in good repair and in working order

Zf ; fZL NZ:T Cf, TDF VG Rf, I: YITDF ZfBJf HI. Xp

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

sBf Df, ; fDfG pR ROJfJf S GLR pTYZf VYJf, 8STI ZfBJfGf ; fWG TZLS J5ZfT NIZO IhuI HFT VG 5ZTL DHATf. Jf/ TDH NBTL ZLT BFDL IJGfGf CIIJf HI. VP

(c) Hoisting machines and tackles shall be examined and adequately tested after erection on the site and before use and be re-examined in position at intervals to be prescribed by Engineer-in-charge.

sUf JHG pRSJfGf I+I VG UZUOLJf/ f I+G SFDGF :Y/ U9Jf AFN VG p5IUDf, IWF 5C, f T5f; I HI. G 5ZTF 5Df6Df RSf; I, JfGf ZCX+ TDH CJf, fGf . HGZ IGIT SZ TJf ; DIIFTZA UI9J, I: YITDF TGL OZ T5f; SZJfGL ZCXp

(d) Every chain, ring, hook, shackle, swivel and pulley block used in hoisting or lowering materials or as a means of suspension shall be periodically examined.

sWf Df, ; fDfG pR ROJfJfGf S GLR pTYZfGf S, 8STI ZfBJfGf ; fWG TZLS J5ZfT 5tIS ; fS/4 ZLU4 VISOI SOL4 GSRf VG 5, la, IS JBtUJBT T5f; JfP

(e) Every crane driver or hoisting – appliance operator shall be properly qualified.

sRf 5tIS S. G v of. JZ S JHG pRSJfGf I+G Rf, S IhuI, FISfTJf/ f CIIJf HI. VP

(f) No person who is below age of 15 years shall be in control of any hoisting machine, including any scaffolds, nor shall give signals to the operator.

sKf !5 JQYI GURGI SIL. 56 JLISTG SIL. 5F,S ; ICT JHG pRSJF SIL. I+G IGI+S TZLS VYJF V15Z8ZG IGXFGLYI ; RGF V15JH4 SFD ZBI XSFX GCLP

(g) In the case of every hoisting machine and of every chain, ring hook, shackle, swivel and pulley block used in hoisting or lowering or as a means of suspension the safe working load shall be ascertained by adequate means.

sHf JHG pRSJFGF 5tIS I+ VG DF. ; FDFG pR ROFJJFGF S GLR pTFZJFGF S ,8SFJL ZFBJFGF ; FWG TZLS J5ZFTL 5tIS ; FS/4 ZLU4 SOL4 GSRF VG 5, lva, ISGL ; , FDT ZLT JHG p9fJJFGL XIST S8, I K T IInI ; FWGH JO GSSIL SZJFG ZCXP

(h) Every hoisting machine and all gears referred to in preceding regulation shall be plainly marked with the safe working load.

shfVfU/Gf LJIGDI HDF H6fJ, JHG pRSJFGF 5tIS I+ VG AWFH IUIZ SZ T ; , FDT ZLT S8, JHG p9fJL XS TD KP T RibB ,B, CIJ HIL VP

(i) In the case of hoisting machine having a variable safe working load, each safe working load and conditions under which it is applicable shall be clearly indicated.

s8f HNF HNF JHG ; , FDT ZLT pRSI XSFT4 pRSJFGF I+ 5Z4 ; , FDT ZLT pRSI XSFT 5tIS JHG VG S. Cf, TDF I+G T ,FU 50X T :508 NXfJJFG ZCXP

(j) No part of any hoisting machine or gear referred to in regulation 'g' above shall be loaded beyond the safe working load except for the purpose of testing.

s9f p5ZGF LJIGDI HDF H6fJ, JHG pRSJFGF SIL. 56 I+ S IUIZGF SIL. 56 EFU 5Z RSF ; 6L DF8 H-ZL CII T 1 ; JFI4 ; , FDT JHG SZTF JW JHG , FNJ GICP

(k) Motors, gears, transmissions, electric wiring and other dangerous parts of hoisting appliances shall be provided with sufficient safeguards.

s0f JHG pRSJFGF ; FWGGL D18Z4 IUIZ4 LJWTFCS ; FWGH JLH/LGF TFZ VG HIBDI EFU DF8 SZL ; , FDTGL HIUJF. SZJFGL ZCXP

(l) Hoisting appliances shall be provided with such means as will reduce to a minimum the risk of the accidental descent of the load.

s-f SIL. JHG VS:DFT GLR ; ZSI 50 TJ HIBD VIKEDF VIK ZC T 5DFZGL SIL. S ; UJO JHG pRSJFGF ; FWGDF SZJFGL ZCXP

(m) Adequate precautions shall be taken to reduce to minimum the risk of any part of a suspended load becoming accidentally displaced.

sTf , 8STF ZFB , f JHGDYI SIL. 56 EFU VS:DFT K8I 50L HJFG HIBD VIKEDF VIK ZC T DF8 5ZTL ; JRTL ZFBJFGL ZCXP

CLAUSE 23 : Measures for Prevention of Fire : The contractor shall not set fire to any standing jungle, tree bush wood or grass without a written permit from the Engineer-in-charge .

When such permit is given, and also in all cases when destroying cut or dug up tree, bush wood, grass etc. by fire, the contractor shall take necessary measures to prevent such fire spreading to or other-wise damaging surrounding property. When such permit is given and also in all cases when destroying cut or dug up tress, bush wood, grass etc. by fire, the contractor shall take necessary measures to prevent such fire spreading to or other-wise damaging surrounding property.

CLAUSE 24 : Liability of contractors for any damages done in or outside work area : Compensation for all damage done intentionally or unintentionally by Contractor's laborers whether in or beyond limits of Government property including any damage caused by the spreading of fire mentioned in the clause 22, shall be estimated by the Engineer-in-charge, or such other Officer as he may appoint and the estimates of the Engineer-in-charge , subject to the decision of the Superintending Engineer, on appeal , shall be final and the contractor shall be bound to pay the amount of the assessed compensation on demand, failing which the same will be recovered from the Contractor as damages in the manner prescribed in clause 1 or deducted by the Engineer-in-charge from any sums that may be due or become due from Government to the contractor under this contract or otherwise.

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

CLAUSE 25 : Work not to be sublet. Contract may be rescinded and security deposit forfeited for subletting it without approval or for bribing a public officer or if contractor becomes insolvent : The contract shall not be assigned or sublet without the written approval of the Engineer-in-charge. And if the contractor shall assign or sublet his contract or attempt to do so or become insolvent or commence any proceeding to get himself be adjudicated an insolvent or make any compromise with his creditors, or attempt to do so, the Engineer-in-charge may, by notice in writing rescind the contract, Also if any bribe, gratuity , gift loan, perquisite, reward or advantage, pecuniary or otherwise, shall either directly or indirectly be given, promised or offered by the contractor, or any of his servants or agents to any public officer or person in the employ of Government in any way relating to his office or employment, or if any such officer or person shall become in any way directly or indirectly interested in contract, the Engineer-in-charge may thereupon by notice in writing rescind the contract. In the event of contract being rescinded, the security deposit of the contractor shall thereupon stand forfeited and be absolutely at the disposal of Government and the same consequence shall ensure as if the contract had been rescinded under clause 3 hereof and in addition the contractor shall not be entitled to recover or be paid for any work therefore actually performed under contract .

CLAUSE 26 : Change in the constitution of firm to be notified : In the case of a tender by partners, any change in the constitution of a firm shall be forthwith notified by the Contractor to Engineer-in-charge for his information.

CLAUSE 27 : (1) Disputes to be referred to Tribunal : The disputes relating to this contract, so far as they relate to any of the following matters, Whether such disputes arise during the progress of the work or after the completion or abandonment thereof, shall be referred to the Arbitration Tribunal, Gujarat State, Gandhinagar.

- (i) The rates of payment under clause 5 for any tools, materials and stores, in or upon the works of the site thereof or belonging to the contractor or procured by him an intended to be used for execution of the work or any part thereof possession of which may have been taken by the Engineer-in-charge under the said clause-5
 - (ii) The Reduction in rates made by the Engineer-in-Charge under clause 9 from the items of works not accepted as completed fully in accordance with the sanctioned specifications.
 - (iii) The rate of payment for any class of work which is included in the additional or altered work carried out by the contractor in accordance with the instructions of the Engineer-in-Charge under clause 14 and the rates for which is to be determined under the said clause 14.
 - (iv) The rates of payment for materials already purchased or agreed to be purchased by the contractor before receipt of notice given by the Engineer-in-Charge under clause 15, and/or the amount of compensation payable to the contractor under the said clause for loss in respect of such materials.
 - (v) The amount of compensation which the contractor shall be liable to pay under clause 17 in the event of his failure to rectify, remove or reconstruct the work within the period specified in the written intimation or the amount of expenses incurred by the Engineer-in-Charge under the said clause 17 in rectifying, removing or re-executing the work or in removing and replacing the materials or articles complained of .
 - (vi) The reduction of rates as may be fixed by the Engineer-in-Charge under clause 17 for the inferior work or materials as accepted or made use of.
 - (vii) The amount of compensation payable by the contractor for damages as estimated and assessed under clause 23.
 - (viii) The amount payable to the contractor for the work carried out under clause 33 in accordance with the instructions and the requirements of the Engineer-in-Charge in a case where there are no specifications.
- (2) The provision of Section-21 of the GPWD dispute Arbi. Tribunal Act -92 & order issued by the Govt. in connection with this Act will now apply for Arbitration (As per Government in N. & W.R.D. letter No. SUT/1090/2679/K2 dtd. 9/2/94 .

(3) The provision of Arbitration Act. shall in so far as they are inconsistent with the provision of this act cease of to apply to any dispute arising from a works contract and all arbitration proceedings in relation to such dispute before an arbitrator, court of authority shall stand transferred to the Tribunal.

(4) The awards declared by the arbitrator should be speaking award, giving reasons and calculations for every item of claims. The decision will have to be implemented by all the departments of the State Government and Public Sector Enterprises of Gujarat. (Resolution F. D. No. PB/1088/735/KT/Sachivalaya/Gandhinagar 5th October 1988.)

(5) In case of dispute leading to the contractor or Government of Gujarat approaching to Court of Law, it shall be within the jurisdiction where the site of work is situated.

(6) The reference to arbitration proceeding under this clause shall not

(i) affect the right of the Engineer-in-charge under clause 5 to take possession of all or any tools plants materials and stores in or upon the works of site thereof belonging to the contractor or procured by him and intended to be used for the execution of the work or any part thereof.

(ii) Preclude the Engineer-in-charge from utilising the materials purchased by the contractor in any work or from removing such materials to other places, during the period the work is stopped or suspended in pursuance of notice given to the contractor under clause 15

(iii) Entitle the contractor to stop the progress of the work or the carrying out the additional or altered work in accordance with the provisions of clause 14 or as the case may be or clause 33.

CLAUSE 28 : Lump sum in estimates : When the estimate on which a tender is made includes lump sum in respect of part of the work, the contractor shall be entitled to payment in respect of the items of work involved or the part of the work in question at the same rates as are payable under this contract for such items, or if the part of the work in question is not in the opinion of the Engineer-in-charge capable of measurement the Engineer-in-charge may , as his discretion, pay the lump sum amount entered in the estimate and the certificate in writing of the Engineer-in-charge shall be final and conclusive against the contractor with regard to any sum or sums payable to him, under the provisions of this clause.

CLAUSE 29 : Action where no specifications :

In the case of work for which there is no such specification, such work shall be carried out in accordance with the Divisional Specification and in the event of there being no Divisional Specifications, then, in such case the work shall be carried out in all respects in accordance with the instructions and requirements of the Engineer-in-charge.

CLAUSE 30 : Definition of work : The expression “work” or “works” where used in these conditions shall, unless, there be something in the subject or context repugnant to such construction to mean the work, or the works, contracted to be executed under or in virtue of the contract, whether temporary or permanent and whether original, altered, substituted or additional .

CLAUSE 31 : Contractor's percentage whether applied to net or gross amount of the bill : Percentage referred to in the tender shall be deducted from / added to the gross amount of the bill before deducting the value of any stock issued.

Clause 32: Compensation under the workmen’s compensation Act : The contractor shall be responsible for and shall pay compensation to his workman payable under the Workman’s Compensation Act. 1923 (VIII of 1923) hereinafter called the said Act) for injuries caused to the workman. If such compensation recoverable by Government as principal under sub-section 12(1) of the said Act on behalf of the Contractor it shall be recoverable by Government from the contractor under sub section 12(2) of the said section. Such compensation shall be recovered in the manner laid down in clause 1 above.

CLAUSE 33-A

The Contractor shall be responsible for and shall pay the expenses of providing medical aid to any workmen who may suffer a bodily injury as a result of an accident. If such expenses are incurred by Government, the same shall be

recoverable from the contractor for with and be deducted, without prejudice to any other remedy of Government from amount due or that may become due to the Contractor.

Clause 33-B: The contractor shall provide all necessary personal safety equipment and first aid apparatus available for the use of the person employed on the site and shall maintain the same in suitable condition for immediate use at any time and shall comply with the following regulations in connection therewith.

(a) The workers shall be required to use the equipment so provide by the Contractor and Contractor shall take adequate steps to ensure proper use of the equipment by those concerned.

(b) When work is carried on in approximates to any place where there is a risk of drowning all necessary equipment shall be provided and kept for use and all necessary steps shall be taken for the prompt rescue of any person, in danger.

(c) Adequate provision shall be made for prompt first aid treatment of all injuries to be sustained during the course of the work.

Clause 34 : No compensation shall be allowed for any delay caused in the starting of the work on account of delay in making available the full site at a time.

Clause 35 : No claim for compensation shall be allowed for any delay in execution of the work on account of water standing in borrow pits or compartment.

Clause 36 : Entering upon or commencing any portion or work : The Contractor shall not enter upon or commence any portion or work except with the written authority and instruction of the Engineer-in-charge or of his subordinate in charge of the work. Failing such authority, the Contractor shall have no claim to ask measurement of or payment for work.

Clause 37 : Minimum age of person employed : (I) No Contractor shall employ any person who is under the age of 15 years.

Clause 37(1) : If the adult person are not available, then the children below the age of 15 (Fifteen years) should not be employed under any circumstance.

(2) The Engineer-in-charge or his agent is authorised to remove from the work any person or animal found working which does not satisfy these conditions and no responsibility shall be accepted by Government for any delay caused in the completion work by such removal.

Vf XZTl DHA G Cll TJL Sl. 56 jIIST S 5f6L SFD SZTq SZT Df, D 50 Tl TG SFD 5ZYL NZ SZJFGL ; tTF CJF, fGF . HGZG S TDGF VH8G K VG VElJ ZIT Sl. jIIST S 5f6L NZ SZJFYl UI, Sl. 56 lJ, A Df8 ; ZSfZGL Sl. HJFANZL ZXZ GICP

(3) The Contractor shall pay fair and reasonable wages to the workman employed by him in the contract undertaken by him in the event of any dispute arising between the Contractor and his workmen on the grounds that the wages paid are not fair and reasonable, the dispute shall be referred without delay to the Engineer-in-charge who shall decide the same. The decision of the Engineer-in-charge shall be conclusive and binding on the Contractor , but such decision shall not in any way affect the conditions in the contract regarding the payment to be made by Government at the section tender rates.

5IT CFY WZ, f Slg8fS8 Df8 SFD ZFB, SFDNFZIGSlg8fS8Z jIIFHAL JTG RSJJfG ZCXP RSJ, JIHAL G ClJfGF D; f 5Z Slg8fS8Z VG TDGF SFDNFZl JrR Sl. hWOl pElI YFI Tl T hWOl lJGF lJ, A CJF, fGF . HGZG ; l5JfDf VElJ VG T VU TVl lG6I Vf5XP CJF, fGF . HGZGl lG6I VG AWGStf ZCXP 5ZT Vf lG6IYl DHZ SZ, f 8g0ZGF NZ ; ZSfZ SZJFGL YL RSJ6lG, Ul Slg8fS8DFYl XZTlG SXl V ; Z YX GICP

(4) The contractor shall provide drinking water facilities to the workers/ laborers employed on Government works Amenities relating to sanitation shall also be provided to the workers/laborers employed on works (in urban areas) . if the contractor fails to comply with these provisions, the Engineer-in-charge shall give notice in writing and if the contractor does not provide this facility to the workers/ laborers within a period of ten days from the date of the notice in writing, the Engineer-in-charge shall thereupon make the arrangement for drinking water at the cost of the contractor. f ; ZSfZL SFD ZFB, f SFDNFZl o DHZlG 5lJfGF 5f6LGl ; UJO Slg8fS8Z 5Zl 5f0JfGL ZCXP sXCZl lJ: TEFZl Df SFDZFB, f SFDNFZlG: JrKTF lJfI S ; UJO l 56 5Zl 5f0JfGL ZCXP Slg8fS8Z Vf HlUJf . G5f, G SZJfDf lGQO/ HX Tl CJF, fGF . HGZ TG, lBT GlI8 ; Vf5X VGS lG8fS8Z VElJ, lBT GlI8 ; Gl TEFZl BYl NlG N ; Gl DNTDf SFDNFZl vDHZlG Vf ; UJO GCl Vf5 Tl CJF, fGF . HGZ Slg8fS8ZGF BR 5lJfGF 5f6LGl jIj : Yf SZXP

(5) The Contractor shall provide the amenity of proper shade and shelter to the workers/ labourers and their children on Government works as soon as the work starts. If the contractor fails to provide shed and shelter, the Engineer-in-charge shall provide the same at the cost of contractor.

SFD X- YFI S TZTH Slg8fS8Z ; ZSfZL SFD 5ZGF SFDNFZl DHZl VG TDGF Af/SIG IluI X0 VG VfzI Vf5JfGL ; UJO 5Zl 5f0JfGL ZCXP X0 VG VfzI: YfG 5Zf 5f0JfDf Slg8fS8Z lGQO/ HX Tl Slg8fS8ZGF BR CJF, f . HGZ 5Zf 5f0XP

Clause 38 : Method of payment : Payment to contractor shall be made by cheque drawn on any treasury within the division convenient to them, provided the amount exceeds Rs. 10 Amount not exceeding Rs. 10 will be paid in cash.

Clause 38-A : Any sum of money due and payable to the Contractor (including the security deposit returnable to the contractor) executing any Government work or work of any District Panchayat wholly financed as grant-in-aid under this contract shall be appropriated by any District Panchayat / Government and shall be set off against any claim of the Government/District Panchayat of Gujarat state by the District Panchayat of Gujarat State/Government for the payment of a sum of money arising out or under any other contract made by the contractor with the Government/District Panchayat of Gujarat State for the work wholly the contractor against any claim of the Government / District Panchayat of Gujarat state is available, such a recovery shall be made from the contractor as arrears of land revenue.

Clause 39 : Employment of scarcity labour : If Government declares a state of scarcity or famine to exist in any village situated within 16 kilometers of the work, the Contractor shall employ upon such parts of the work, as are suitable for unskilled labour, any person certified to him by the Engineer-in-charge or by any persons to whom, the Engineer-in-charge may have delegated this duty in writing to be in need of relief and shall be bound to pay to such persons, wages not below the minimum which Government may have fixed in this behalf. Any disputes which may

arise in connection with the implementation of this clause shall be decided by the Engineer-in-charge whose decision shall be final and binding on the contractor.

Clause 40 : The rates to be quoted by the Contractor must be inclusive of sales tax prevailing on due date of bid submission. However any subsequent changes in the tax structure by government after due date of bid submission will be compensated (d) on availability or submission of actual documentation. Contractor has to intimate engineer in charges regarding changes occurred in the tax structure after bid submission. If contractor fails to provide such information and if any financial obligation may arise due to change in tax structure same will be recovered from the contractor.

The contractor shall apply fair means of stock maintenance and shall adopt accounting standards as may be prescribed under GST. For arriving at the difference in procurement prices due to introduction of GST. It will be open for the Government to ask for original invoices, LR, weigh bridge slips, payment details and such other documents as may be required for the purpose.

If there is reduction in overall tax burden then proportional benefit of that shall be passed on to the Government.(TNC-10-2017-01-C, Dt.29/08/2017).

Clause 41 : The Contractor should, as far as possible, obtain his requirement of laborers skilled and unskilled, from the nearest Employment Exchange so as to utilize the local employment potential. If there are no local Employment Exchange or such Exchanges are not able to provide the required labour locally, suitable laborers should be utilised to the maximum extent possible.

Clause 42 : Fair Wages : If a Contractor fails to pay within '7' (Seven) days to the laborer(s) /worker(s) the minimum wages prescribed by the Government under the Minimum Wages Act. 1948 as in force from time to time, the Engineer-in-charge shall be at liberty to deduct the amount payable to the laborer/ workers from his (Contractors) bills or deposit(s) payable by the Contractor after making due inquiries and establishing the claim(s) of the laborer(s) /Workers(s). The contractor shall not be entitled to any payment of compensation on account of any loss that the Contractor may have to incur on account of the action as aforesaid. Before the action as aforesaid, is enforced, a notice in writing to the Contractor shall be issued by the Engineer-in-charge to pay the wages as per Minimum Wages Act in force at the relevant time. If Contractor does not act as aforesaid within seven days, then the action contemplated as above shall be taken against him.

Clause 43 : List of Machinery / tools and plants : The contractors shall also give a list of machineries in his possession and which they purpose to use on the work.

Clause 44 : Local labour on normal rates :

The contractor shall have to engage local labour and person seeking employment where available on normal rate.

Clause 45 : 1. Huts : The contractor shall build sufficient number of huts on a suitable plot of land for the use of the laborers according to the following specifications.

- (1) Huts of bamboos and grass may be constructed.
- (2) A good site shall be selected. High ground removed from jungle but well provided with trees shall be chosen wherever it is available. The neighborhood of rank jungle, grass or weeds should particularly be avoided. Camps should not be established close to large cuttings of earth work.
- (3) The lines of huts shall have open spaces of at least 10 m. between rows. When a good natural site cannot be procured, particular attention should be given to the drainage.
- (4) There should be no over-crowding. Floor spaces at the rate of 2.8 Sq.m. per head shall be provided. Care should be taken to see that the huts are kept clean and in good order.
- (5) The contractor must find out his own land. If he wants Government land, he should apply for it and pay assessment for it.
2. Drinking Water : The contractor shall as far as possible, provide an adequate supply of chlorinated pure potable drinking water for the use of laborers. This provision shall be at the rate of not less than 4.5 liters per head. No provision need-be made where there is a suitable nala, river or well within 0.4 km of the camp. However arrangement should as far as possible, be made to chlorinate water by chlorinated tablets for it is allowed for drinking purpose.
3. The contractor shall construct semi permanent latrines for the use of Laborers on the following scale, namely (a) Where female are employed, there shall be at least one latrine for every 25 females. (b) Where males are employed there shall be at least one latrine for every 25 males provided that where the number of males or female exceed 100, it shall be sufficient if there is one latrine for every 25 males or females, as the case may be upto the first 100 and one for every 50 thereafter.
4. Privacy in latrines: Every latrine shall be under cover and so partitioned off as to secure privacy, and shall have a proper door and fastenings.
5. Notice to be displayed outside latrines and urinals : (1) Where workers of both sexes are employed there shall be displayed outside each block of latrine and urinal a notice in the language understood by the majority of the workers For Men Only or For Women Only : as the case may be. (2) The notice shall also bear the figures of a man or of a woman, as the case may be.
6. Urinals: There shall be at least one urinal for male/female workers upto 50 employed at a time. Provided that where the number of male or female workmen, as the case may be, exceeds 50, it shall be sufficient if there is one urinal for every 50 males or females upto the first 50 and one for every 100 males or females or part thereof.
7. Latrines and Urinals to be accessible: (1) The latrines and urinals shall be conveniently situated and accessible to workers at all times at the establishment. (2) (1) The latrines and urinals shall be adequately lighted and shall

- be maintained in a clean and sanitary condition at all times (ii) Latrines and urinals other than those connected with a flush sewage system shall comply with the requirements of the Public Health Authorities.
8. Water for latrines and urinals: Water shall be provided by means of pipes or tanks or the rise, so also be conveniently accessible in or near the latrines and urinals.
 9. Bathing and washing places: (1) The contractor shall construct sufficient number of bathing places every unit of 20 persons being provided with a separate bathing place. (2) Washing places should also be provided for the purposes of washing clothes. Every unit of 30 persons shall have at least one washing place. (3) such bathing and washing place should be suitably screened and separate places provided for male and female workers . (4) Such facilities shall be conveniently accessible and shall be kept in clear and hygienic condition.
 10. Drainage: The contractor shall make sufficient arrangement for draining away the sewerage water as well as water from the bathing and washing places and shall dispose off this waste water in such as way as not to cause nuisance. The contractor should obtain a permission from the Gujarat Water Pollution Control Board, Gandhinagar if Water is so be drained in river or near the well . The contractor would put malaria oil once in a week in stagnant water round about the residence.
 11. Medical facilities: The contractor shall engage a medical officer with a traveling dispensary for a camp having 500 or more persons if there is no Government or other private dispensary situated within 6 k.m. from the camp.
 12. Conservancy and cleanliness: The contractor shall provide the necessary staff for effecting the satisfactory conservancy and cleanliness of the camp to the satisfaction of the Engineer-in-charge. At least one sweeper per 200 persons should be engaged. Conservancy staff should dump refuse in compost pit, away from the labour camp.
 13. Health Provisions : The District Health Officer of the District or the Deputy Director of Health Service shall be consulted before opening a labour camp and his instructions on matters, such as the water supply, sanitary convenience, the camp-site, accommodation and food supply shall be followed by the contractor.
 14. Precautions against epidemic: (a) The authorities in charge of the colonies should get the laborers inoculated against cholera and plague and vaccinated against smallpox at the time of recruitment, if they are not inoculated or vaccinated within 6 months or 3 years respectively prior to the date of recruitment. (b) When, in any labour camp there is an epidemic disease or is threatened with such an outbreak, the authorities in charge of the labour camps should ensure that all the inmates of the labour colonies are inoculated or vaccinated as the case may be , depending on the diseases, within 72 hours after the outbreak. (c) The authorities in charge of the labour colony should arrange to communicate by wire regarding the outbreak of the epidemic diseases on the very day of the outbreak, of the Mamlatdar of the Taluka, the District Health officer or to the Deputy Director of Public Health in charge of that area and the Director of Public Health. Thereafter they should continue to send daily reports to the above officers in the prescribed form regarding the progress of the epidemic disease. (d) When the authorities in charge of the labour colony suspect or have reason to believe that any immediate of the labour colonies is suffering from the infectious or contagious disease , they shall forthwith arrange for the segregation of such persons to isolated huts to be specifically provided for the purpose and also for their treatment (e) As regional malaria epidemic outbreaks are likely to occur in such project areas, the authorities in charge of the labour colonies should report promptly the occurrence of unusual incidence of cases of malaria and also inform the District Health Officer of the District, Deputy Director of Public Health (Malaria) and the Director of Public Health and also arrange to institute all necessary anti malarial measures as may be advised by the officials of the Public Health Department. (f) The authorities in charge of the colonies should also arrange to carry out any other measures that may be recommended by the officials of the Public Health Department necessary to prevent or control the spread of disease.
 15. Rest rooms: (1) In every place where in contract labour is required to halt at night in connecting with the contract works and in which employment of contract labour is likely to continue for three month or more, the contractors shall provide and maintain rest rooms or other suitable alternative accommodation within fifteen days of the employment of contract labour.
 - (2) If the amenity referred to in sub rule is not provided by the contractor within the period prescribed, the employer shall provided the same within a period of fifteen days of the expiry of the period laid down in the sub-rule (1).
 - (3) Separate rooms shall be provided for women employees.
 - (4) Effective and suitable provision shall be made in every rooms for securing and maintaining adequate ventilation for the circulation of fresh air and there shall also be provided and maintained sufficient and suitable natural or artificial lighting.
 - (5) The rest room or other suitable alternative accommodation shall be of such dimensions as to provide at least a floor area of 1. Sq. mt. For each person making use of rest rooms.
 - (6) The rest room or other suitable alternative accommodation shall be so constructed as to afford adequate protection against heat, wind, rain, and shall have smooth, hard and impervious surface.
 - (7) The rest rooms or other suitable alternative accommodation shall be at a convenient distance from the establishment and shall have adequate supply of whole some drinking water.
 16. Canteen Facilities : (1) In every establishment of contract work and wherein work regarding the employment of contract labour is likely to continue for six months and wherein contract labour numbering one hundred or more are ordinarily employed, the adequate canteen facilities shall be the contractor for the use of such contract labour within sixty days of the commencement of the employment of contract labour.

- (2) If the contractor fails to provide the canteen facilities within the time limit laid down the same shall be provided by the principal employer within sixty days of the time allowed to the contractor.
- (3) The canteen shall be maintained by the contractor or principal employees as the case may be in an efficient manner.
17. Accommodation in canteen : (1) The canteen shall consist of at least dining hall, kitchen, storeroom, pantry, and washing places separately for worker and for utensils.
- 2 (I) The canteen shall be sufficiently lighted at all times where any person has access to it.
- (ii) The floor shall be made of smooth and impervious materials and inside walls shall be lime-washed or color-washed at least once in each year, provided that the inside walls of the kitchen shall be lime-washed every four months.
- 3 (I) The premises of the canteen shall be maintained in clean and sanitary condition.
- (ii) Waste water shall be carried away in suitable covered drains and shall not be allowed to accumulate so as cause nuisance.
- (iii) Suitable arrangements shall be made for the collection and disposal of garbage.
18. Accommodation in dining hall : (1) The dining hall shall accommodate at a time, atleast 30% of the contract labour working at a time.
- (2) The floor area of the dining hall excluding the area occupied per dinner to be accommodated shall as prescribed in sub rule (1)
- (3) (I) A portion of the dining hall and service counter shall be partitioned and reserved for women workers, in proportion to their numbers. (ii) Washing places for women shall be separate and screened to secure privacy.
- (4) Sufficient table, stools, chairs or benches shall be available for the number of diners to be accommodated as prescribed in sub rule 1.
19. Equipment in canteen : (I)(i) There shall be provided and maintained sufficient utensils, crockery , cutlery, furniture and any other equipment necessary for the efficient running of the canteen.
- (ii) The furniture utensils and other equipment shall be maintained in a clean and hygienic condition.
- (2) (i) Suitable clean cloths for the employees serving in the canteen shall also be provided and maintained.
- (ii) A service counter, if provided , shall have a top of smooth and impervious materials.
- (iii) Suitable facilities including an adequate supply of hot water shall be provided for the cleaning of utensils and equipment.
20. Food stuff to be served : The food stuff and other items to be served in the canteen shall be in conformity with the normal food habits of the contract labour.
21. Prices to be displayed : The charges for food stuffs, beverages and any other item served in the canteen shall be based on "no profit, no loss" and shall be conspicuously displayed in the canteen.
22. Canteen to be run on "No profit no loss" basis : In deriving the prices of food stuffs and other articles served in the canteen, the following items shall not be taken into consideration as expenditure, namely.
- (i) The rent for the land and building.
- (ii) The depreciation and maintenance charges for the building and equipment provided for in the canteen.
- (iii) The cost of purchase, repairs and replacement of equipment including furniture, crockery, cutlery and utensils.
- (iv) The water charges and other charges incurred for lighting and ventilation.
- (v) The interest on the amount spent on the provisions and maintenance of furniture and equipment provided for in the canteen.

The local officers should check up whether, facilities as offered and which are admissible under the existing rules and orders are made available to the workers and enforce upon the contractors the necessity of adhering to the instructions for promotion of welfare of the workers according to the terms of the contract .

23. BOOKS OF ACCOUNTS AND REGISTRES OF THE CANTEEN : The books of accounts and registers and other documents used in connection with the running of the canteen shall be produced on demand to an inspector.
24. AUDIT OF THE ACCOUNTS OF THE CANTEEN: The accounts pertaining to the canteen shall be audited once every 12 months by registered accountants and auditors. Provided that the Labour Commissioner may approve of any other person to audit the accounts; if he is satisfied that it is not feasible to appoint a registered accountant and auditor in view of the site or the location of the canteen.

CLAUSE 46 : Contractor shall have to arrange for the supply of gumboots. Hand gloves, mask etc. invariably to the laborers/workers engaged by the contractor

CLAUSE 47 : FENCING AND LIGHTING :

(a) The contractor shall, unless otherwise specified, be responsible for the proper fencing, lighting grading and taking of the necessary safety measures for all works comprised in the contract and for the proper provision of temporary road, way, foot-way , guards, fences, caution notices, etc. as far as the same may be rendered necessary by reasons of the work for the accommodation of workmen, foot passengers or other traffic and of owners and occupiers of adjacent property and the public and shall remain responsible for any accident that may occur on account of his failure to take proper & timely precautions.

(b) All the arrangements made for fencing and lighting shall be maintained by the contractor through the currency of the contract till the physical taking over of the work by department.

CLAUSE 48 : LIABILITY OF ACCIDENTS TO PERSONS : Responsibilities and liabilities If the contractor under Workmen's Compensation Act are given in clause No.37 in addition following shall also apply :

- (a) On the occurrence of an accident, which result in death of workmen employed y the contractor or which is so serious as likely to result in death of any such workmen the contractor, shall within 24 hours of happening of such Government against all loss or damage sustained by the Government resulting directly or indirectly from his failure to give intimation in the manner aforesaid including the penalties or fines, if any, payable by the Government as a to the provisions of the said act in regard to such accident(s).
- (b) In the case of an accident, in respect of which compensation may become payable under Workmen's Compensation Act . whether by the contractor or by the Government as principal Employer, it shall be lawful for the Engineer-in-charge to retain out of money due and payable to the Contractor, such sum or sum of money as may, in the opinion of the Engineer-in-charge , be sufficient to meet such a liability, The opinion of the Engineer-in-charge shall be final regard to all matters arising under this clause.

CLAUSE 49 : One percentage of estimated cost of work put to tender for this work after deducting the cost of materials as per schedule A valued basic rates in the sanctioned estimate will be deducted from the Running Account Bills of contractors for testing of materials. For the materials like cable , wire, led fitting etc will be tested before use as per instructions of Engineer in charge at laboratory like NABL, ERDA etc. (G.R. B&C No. TNC-1085(4)-C dated 10-05-85 read with R & BD Circular No. UIGHGt5ZL5+qZ_!5qUIGPTZLB!\$! !ZfZ_!5f

CLAUSE 50 : REPORTS REGARDING LABOUR : The Contractor shall submit the following reports to the Engineer-in-charge:

- (a)(I) A daily report in the suitable form of the strength of labour, both skilled and unskilled employed by him on the work(s). The contractor shall increase or decrease the strength both skilled or un skilled . if directed by the Engineer-in-charge. The submission of such reports shall not, however , relieve the contractor of his responsibilities and duties regarding progress or any other obligation under the contract
- (ii) A classified weekly return in the suitable form of the number of person employed on the works during the preceding week.
- (iii) A weekly medical report in the suitable form showing the health of the contractor's camp. The number of persons ill or incapacities and the nature of their illness.
- (iv) A report of any accident, which may have occurred, to be sent within 24 hours of the occurrence.
- (v) Such other report as may be prescribed.

CLAUSE 51 : Treasure Trove : In the event of discovery by the contractor or his employees, during the progress of work of any gold, silver, oil or other minerals of any description and precious stones , treasures, coils, antiques, relic, fossils or other articles or value of interest whether geological, archaeological or any other such treasure & other things shall be deemed to be the absolute property of the Government and the contractor shall duly preserve the same to the satisfaction of the Engineer-in-charge , from time to time, and relieve the same to such persons as the Engineer-in-charge may appoint.

The contract shall take all reasonable precautions to prevent his workmen other person from removing or damaging any such articles or things , immediately after the discovery thereof and before removal acquaint the Engineer-in-charge with discovery and carry out his orders for the disposal of the same.

CLAUSE 52: Indemnity: The contractor shall indemnify the Government against all actions, suits, claims & demands through or made against the Department in respect of work of this contractor against any loss damage to Department in consequence of any action or suit being brought against the contractor for anything done or omitted to be done in execution of the work of this contract.

CLAUSE 53 :Insurance of Labour : The contractor shall be responsible to arrange for insurance of all labour, skilled and unskilled workers, supervisors etc. employed by him as per labour regulation of the State.

CLAUSE 54: Setting Out : The contractor shall be responsible for the true and proper setting out of the works and the correctness of positions, levels, dimensions and alignments of all parts of the work and for the provisions of all necessary instruments, appliance and labour in connection therewith . if , at any time during the progress of the work, any errors, appear or arise in the position , levels, dimensions or alignments of any part of the work, the contractor, on being required to rectify such errors by the Engineer-in-charge shall at his own expense do so to the satisfaction or the Engineer-in-charge . if however, such error is based on incorrect data supplied in writing by the Engineer-in-charge , the expenses of rectifying the same shall be borne by the Department. The checking of and setting out of any line or level by the Engineer-in-charge or his representative shall not in any way, relive the contractor of his responsibilities for the correctness of the error. The contractor shall carefully protect and observe all bench-mark, site-nails, page and other things used in setting out of the work(s).

CLAUSE 55 : Progress Schedule :

(a) The contractor shall furnish within one month (unless extended by the Engineer-in-charge) of the order to start the work, the progress schedule in quadruplicate indicating the date or starting. The monthly progress expected to be achieved and the anticipated completion date of each major item of work to be done by him, also indicating dates of, procurement and setting up the materials, plants and machinery. The schedule should include a statement of proposed general and detailed arrangements for caring out works, and of item , order and manner in such it is proposed that these shall be executed. The practice to the achievement towards completion of the work in the time limit and of the particular items on the dates specified in the contract and shall have the approval of the Engineer-in-charge. Further the dates for the progress , as in this schedule shall be adhered to.

(a) in case it is sound necessary, at any stage to alter the schedule. the contractor shall submit in good, time a revised schedule incorporating necessary modification proposed and get the same approved from the Engineer-in-charge . No revised schedule shall be operative without such acceptance in writing. The Engineer-in-charge is

further empowered to ask for more detailed schedule or schedule. any by week, for any item or items and the contractor shall supply the same as and when asked for.

- (b) The Engineer-in-charge shall have, at all times, the right, without in any way vitiating this contract forming grounds for any claim, to alter the order of the work of any part thereof and the contractor shall after receiving such direction, proceed in the order directed. The contractor shall also revise the progress. Schedules accordingly and submit four copies of the revised schedule to the Engineer-in-charge within seven days of the said Engineer's direction to alter the order of works.
- (c) The contractor shall furnish sufficient plant, equipment and labour and shall work such hours and shifts as may be necessary to maintain the progress of the work as per approved progress-schedule, The working and shift shall comply with all the Government regulations in force and shall be such, as may be approved by the Engineer-in-charge and the same not be varied without the prior approval of Engineer-in-charge.
- (d) The contractor shall from time to time . as may be required by the Engineer-in-charge. furnish the Engineer-in-charge with a statement in writing of the arrangements he proposes to adopt for the execution of this contract and the Engineer-in-charge may, if he considers necessary at any time advise alternation in the same. which the contractor shall adopt on notice thereof.
- (e) The progress-schedule(s) shall be in the form of progress chart, forms, statements and/ or reports as may be approved by the Engineer-in-charge.
The contractor shall submit four copies showing the progress of the work in the form of a chart etc. at periodical intervals as may be specified by Engineer-in-charge.
- (f) The approval of the progress schedules by the Engineer-in-charge shall not relieve the contractor of schedule required by the Engineer-in-charge shall not entitle the contractor to any extra payment.

CLAUSE 56 : Before starting the work, the contractor will have to obtain the license from the District Assistant Labour Commissioner under the Contract Labour (Regulation and Abolition) Act. 1970 and contract Labour (regulation and Abolition) Gujarat Rules 1972 after paying necessary fees and deposit on the basis of the number of labour to be employed on the work and will have to supply two true copies of the said license to the Deputy Executive Engineer before the work is started.

Clause 57. Mistake in contractor's Drawings

The contractor shall submit Such drawings as may be required and shall be responsible for any discrepancies, errors or omissions in any drawings or other particulars Supplied by him notwithstanding that Such drawings or particulars may have been approved by Engineer.

Clause 58. Patent Rights etc.

The contractor shall fully indemnify the Governor of Gujarat against all actions suits claims demands, costs, charges and expenses arising from or incurred by reason of any infringement or alleged infringement, of any, letters patent, design, trademark or name copyright or other protected rights in respect of any machine, plant, work materials thing or system or method of using, fixing, working or arrangement used or fixed or supplied by the contractor but this indemnity shall not extend or apply to any action, suit, claim, demand, cost charges or expenses arising from or incurred by reason of the use of the work or any part thereof otherwise than in the manner of for a purpose contemplated by the contract. All royalties and other similar payments which may have to be paid for the use of any machine, plant, work, material, thing, system or method as aforesaid (whether payable in one sum or by installments or otherwise) shall be covered by the contract price and payable by contractors.

In the event of any claim or demand being made or action or suit brought against the Governor of Gujarat in respect of any such matter or matters as all negotiations for the settlement of such claim or demand and Such action aforesaid the contractor shall be duly notified, thereof, and he shall conduct or suit also be conducted by him Subject if and so far as the Governor of Gujarat shall think proper Linder the Supervision & Control of Governor of Gujarat through the officer duly authorized on his behalf.

Clause 59. Workmanship and Materials -

The work shall be carried out in all respects with workmanship and materials of the best and approved qualities to the entire satisfaction of the Engineer who may reject any plant, Apparatus of material or workmanship which shall in his opinion be of defective quality any such rejection to be final and conclusive. The contractor shall at his own expenses provide all material labour, haulage, power, tools, tackles and apparatus necessary to execute and complete the works and plant in the manner aforesaid,

Clause 60. Use of work pending completion :

The Governor of Gujarat shall be at liberty at any time to put into beneficial use the whole or any part of the work, he may desire to use pending the formal completion and taking over of the same.

Clause 61. Protection and liability for accidents, Theft and Damage-

The Contractor shall at all items until the commencement of the period maintenance, as provided in clause 16 property and sufficiently cover up and protect all materials delivered on site from damage or injury by exposure to the weather and shall take every proper precaution against accident, damage or injury on ~he same from any cause, The contractor shall be and remain answerable and liable for all accident and damage thereto which until the commencement of the period of maintenance as provided for may arise or be occasioned bt the acts or omissions of the contractor or his workmen, agents, servants or

sub-contractors and all losses and damages arising from such accidents, damage or injuries as aforesaid shall be made good in the most complete and substantial manner by and at sole cost of the contractor and to the satisfaction of the Engineer.

Provided that should the Engineer certify, that the work has been completed but that owing to circumstances over which the contractor has no control the work cannot be taken over the contractor shall not be held liable for any loss of or damage to the work occasioned by such delay in taking over and occurring more than one month after date of completion of the work as certified by the Engineer. In this clause shall be deemed to deprive the Governor of Gujarat or effect any other rights or remedies under the Contract or otherwise which he may have in respect of such defects or deficiencies. No payment which have been made on account of materials delivered or work executed shall be looked on as acceptance of such or any work or materials.

Clause 62. Cutting away & making good

The tender is to include all necessary cutting and making good for the purpose of the contract of the wood work, walls, floors etc. of the site. The contractor will be held responsible for, and will have to make good at his own expense to the satisfaction of the Engineer, any damages to or disfigurement of the site which may have been caused by the acts or omissions of himself or his servants or agents in connection with the carrying out of the contract.

Clause 63. Maintenance:

The Contractor shall make good at his own expense all defects due to faulty design material, or workmanship on the part of the contractor which may during a period of 6 calendar months from the date, on which the work is certified by the Engineer to have been brought into beneficial use or if no such certificate is given from the date of the final payment for the work under clause 20 (which period is hereinafter called the "the period of maintenance") develop under proper use in the work or any part thereof by replacing plant materials or work or otherwise as may be necessary. Any such making good by the contractor shall in no case relieve him from his liability to make good any further defect in the work made good or replace which may develop during the remainder of such period of twelve months. If any such defects are clearly, caused by the fault of the Contractor and are liable to recurrence. The contractor shall make such alterations as are required to prevent any recurrence of such defects or alterations which Contractor shall become liable to make good or make under this clause be not, made (as the case may be) within such time as the Engineer may prescribed for the purpose, the Engineer may processed, to make good or make the same 'as the case may be) at the risk and expense of the Contractor, but without prejudice to any other right or remedies which the Governor of Gujarat may have against the Contractor in respect of his default in making good or making the same as aforesaid and the cost of any such making shall be paid by the Contractor to the Government of Gujarat on demand.

Clause 64 . Contractor's Representative & workmen

The contractor Shall employ at least one competent representative, whose name or names shall have Previously The said been communicated in writing to the Engineer by the Contractor to Superintend the carrying out the works Representative, of if more then one shall be employed then, one of such representative, shall always De present on the site during working hours and any written orders or instruction which the Engineer or his duly authorized representative, whose name shall have been previously communicated in writing to the contractor, may given to the said representative of contractor shall be deemed to have been given to the contractor. The Engineer shall be at liberty to object to any representative or person employed by the Contractor in the execution of or otherwise about the work who in the Engineers opinion shall misconduct himself or be incompetent or negligent and the contractor shall remove every person so objected to forthwith upon receipt from the Engineer of notice in writing requiring him to do so.

Clause 65 . Submission of Samples

The contractor shall not without written sanction of the Engineer use for the execution of the work any materials plant or stores of any type of description other than those specified in his tender. He shall, if required to do so, or at his options, deposit samples, at the office of the Engineer for approval and the Engineer shall within 14 days of file receipt of the samples, express in writing to the contractor his approval or otherwise of the sample, deposited, and all materials, plant and stores used in the execution of the works must be in every-way equal to he deposited samples. All the deposited samples will be returned to the contractor within one month of the work being taken over

Clause 66. Deduction from contract Price

The amount or all costs of works, expenses or other sums which under the contract shall be payable by the contractor to the Governor of Gujarat from any moneys due or becoming due by him to the Contractor under contract, without prejudice to the Governor of Gujarat, right to recover the same by the ordinary process of law.

Clause 67 . Suspension of Work:

The Governor of Gujarat shall pay to the contractor all proper expenses arising from suspensions of the works by order in writing of the Engineer or any other officer on behalf of the Governor of Gujarat unless such suspension is due of some default on the part of the Contractor or any sub-contractor under him.

Clause 68 . Time of taking over

The work shall for the purpose of all the provisions of these conditions be deemed to have been completed and taken over by the Governor of Gujarat when the Engineer, shall have certified in writing that it has been completed in accordance with the Contract conditions and such Certificate shall not be unreasonable withheld nor shall the Engineer delay its issue on account of commissions or defects which in his opinion do not effect the efficient use of the work. but such issue shall be without prejudice to the Contractor's liability to make good any such. omissions and defects with the greatest possible expedition.

Clause 69. Death & Bankruptcy

If the Contractor shall die, or become insolvent or bankrupt or have a receiving order made against him or compound with or make no proposal carrying on his business under inspection or for the benefit of his creditors, or commit an act of insolvency or bankruptcy, or being a corporation be ordered to be wound up or have a receiver of its business appointed the Governor of Gujarat shall be entitled forthwith by notice in writing to the Contractor his legal representatives to determine the contract and the Governor of Gujarat may in that event complete the contract in such time and manner and by such person as he shall think fit.

Clause 70. Contract Drawings:

The contractor shall submit to the Engineer for his approval on or before the dates stipulated for this purpose in the specification copies of all the drawings of the general arrangements of the plant as set out therein and of such detail drawings as may be reasonably necessary.

Within fourteen days from the receipt, by him of such copies the Engineer shall signify his approval or otherwise of the same and if he does not do so he shall be deemed to have approved thereof.

Within Fourteen days from the notification by the Engineer to the Contractor or his approval such copies, or in the absence of such notification within thirty days from the receipt of such copies, the copies in ink on tracing cloth or ferroallic prints mounted on cloth, or all drawings as approved shall be supplied to the Engineer by the Contractor respectively and shall there upon be signed by the contractor and become the property of the Governor of Gujarat.

Such signed copies of the drawings shall not be departed from in any way whatsoever except the written permission of the Engineer, during the execution of the works of the signed copies shall be always kept available for reference to the site.

In the event of the contractor desiring to keep in his own possession a signed copy of the drawings as approved by the Engineer shall supply three copies instead of two and in this case the Engineer shall sign the third copy and return the same to the Contractor.

Clause 71 . Manner of Execution, Quality of materials etc.

The plant shall be manufactured, constructed, provided put in position and maintained in the best and most substantial and workmanlike manner and materials of the best and approved qualities having regard to their respective uses.

Clause 72. Tests on site ::

In all cases where the special conditions are provided for tests on the site whether of plant, materials or workshop the Governor of Gujarat except where otherwise specially stipulated shall provide free of charge such labour, materials, fuel, stores, apparatus and instruments as may be requisitioned from time to time efficiently to carry out such tests in accordance with the condition.

Where electrical energy is required for tests on site and a supply is available on the site from an existing installation such electrical energy shall be supplied to the contractor by the Govt. free of charge at the pressure and frequency of the ordinary supply is available the electrical energy necessary for such tests shall be provided by the contractor.

Clause 73. Delivery of plants and materials ::

No plant materials shall be tendered for delivery until an intimation in writing shall have been given to the contractor by the Engineer that Governor of Gujarat is ready to take delivery.

Clause 74 Tests on completion ::

On the completion of the works on the site in accordance with the contract the contractor shall give the Engineer notice in writing of such completion. The Engineer shall after receipt of such notice by notice in writing under his hand for date and an hour on that date for the making of the test on site if any such are provided for the contract.

The Contractor shall carry out such tests upon the date and at the hour so fixed and if the Engineer or his authorized representative shall attend on that date at the hours such test shall be carried out in the presence of the Engineer or such representative.

If any portion of the plant fails under the tests to satisfy the contract conditions similar tests according to the contract of the period so failing shall if required by the Engineer or by the Contractor be repeated within a time to be fixed by the Engineer

and the provisions of this clause shall apply to such repeat 20 test as if they were the original tests and the contractor shall pay to the Governor of Gujarat all reasonable expenses to which he may be put by such tests.

If the tests or any repeated tests so required as aforesaid be not made by the Contractor on the date fixed as aforesaid for the same by the Engineer may proceed to make such test himself at the contractor's risk and expense.

If in any test under this clause the plant tested shall fail to satisfy the contract conditions the Governor of Gujarat shall as from the date stipulated by the contract for completion nevertheless have the right of using such plant until the same shall satisfy such conditions and such use shall be at the contractor's risk. In the event of the question whether the works have been completed in accordance with the condition or any question regarding such completion being submitted to Arbitration as any portion of the plant the Engineer may certify to be capable of being used on condition of paying to the contractor a sum calculated (according to the period or the use) at the rate of 5% (five percent) per annum upon the amount withheld or reduced in respect of such plant

Clause 75 Rejection of defective work ::

If the works, or any portion thereof shall not in the opinion of the Engineer on the stipulated tests[s] (if any) being made in accordance with the contract satisfy the contract condition within three months after the date stipulated for completion the engineer may give notice in writing to the contractor setting for the particular of the defects of particulars in respect of which the works in his opinion fail to comply with the contract conditions and requiring the contractor to make good, after or replace the same within such time to be specified in the notice as the engineer may consider reasonable and the Contractor shall make good, after or replace the same as required by such notice and so as to make it empty with the requirements of the contract condition, within the time specified. Should he fail to do so within that time the Governor of Gujarat may make good alter or replace the same as so required and the cost such making alteration good or replacement (less in the case of any replacement any sum which would have become due to the contractor under the contract in respect of the works replaced and which shall not have been paid to him) shall be paid by the contractor to the Governor of Gujarat on demand or should the Governor of Gujarat, not make good, after or replace any defective works in respect of which such notice as aforesaid shall be given within six week from the date of the given of such notice the contractor shall repay to the Governor of Gujarat all sums (if any) paid by him to the Contractor in respect of such works. Nothing contained in this clause shall prejudice or affect the rights of the Governor of Gujarat under the contract whether in the way of enforcement of penalties or otherwise in respect of any delay in the completion of this work.

Clause 76. The Apprentices:

The contractors shall afford or procure as the case maybe every facility to Indian apprentices for practical training in the factory. Owned managed controlled or patronized by them, so as to enable the Indian Apprentices to acquire full knowledge of the technique and work of their trade industry calling or profession.

Clause 77. Set-off Clause:

Any sums of money due to the Contractor (including the security deposit returnable to the contractor under this contract shall be appropriated by the Government and shall be set off against any claim of the Government for the payment of sum of a money arising out of or under any other contract made by the contractor with the Government. When no such amount for purpose of the recovery from the contractor against any claim of the Government is available such a recovery shall be made from the contractor as arrears of land revenue.

Clause 78. Fair wages:

If a contractor fails to pay with in '7' (seven) days to the laborer (s) worker(s) the minimum wages prescribed by the Government under the Minimum Wages Act, 1949 as in force from time to time the Executive Engineer or the officer of a equal rank shall be at liberty to deduct the amount payable to the laborer (s) workers from his (contractor's) bill or deposit(s) payable by the contractor after making due inquiries and shall not be entitled to any payment or compensation on account of any loss that he (contractor) may have to incur of the action as aforesaid. Before the action as aforesaid is enforced notice in writing to the contractor shall be issued by the Executive Engineer or the officer of the equal rank to pay the wages as per minimum Wages Act in force at the relevant time. If the contractor does not act as aforesaid within seven days then the action contemplated as above shall be taken against him.

Signature of contractor/s

Chairman
APMC UNJHA,

SPECIFICATIONS FOR ELECTRICAL WORKS IN GOVERNMENT BUILDING
SUBJECT TO THE GENERAL CONDITION OF CONTRACT IN FORCE
GENERAL

I. Wiring Rules:

The installation generally shall be carried out in conformity with relevant Indian Standard Specifications and code of practices prevalent, Indian Electricity Rules, 1956 and Indian Electricity Act, 1910 as amended from time to time.

2. Definition

The definition of terms shall be in accordance with Indian Standard code of Practice for Electrical wiring Installation IS- 732-1982 except for the definition of point in case of Internal Electrical Installation. For definition of point wiring an measurement of Electrical works IS-5908-1970 shall be referred to.

3. Voltage and Frequency of Supply:

All current consuming devices shall be suitable for frequency of 50 C/s and system of voltage meant for unless otherwise specified.

4. Layout of wiring and its description

(i) The wiring shall be carried out as per Schedule "power" wiring must be in screwed conduit and shall be kept separate and distinct from lighting wiring. All wiring must be done on the distribution system with main and branch distribution boards at convenient centers and without isolated fuses, All conductors shall be run as far as possible along the walls and ceiling as to be easily accessible and capable of being thoroughly inspected. The balancing of circuits will be arranged beforehand by the E Engineer Electrical Division.

(ii) Within one month of the taking over the installation, the contractor shall supply to the Ex. Engineer, Elect Division a complete set of wiring plans of the same on drawings to be supplied when available by the Executive Engineer, Electrical Division, and to the satisfaction of the Ex. Engineer, Elect. Dn. and these wiring plans shall be "Drawings" within the meaning of the term as used in the General Conditions of contract.

5. Conductors:

All conductors unless otherwise specified shall not be less than 1.5 Sq. mm for point wiring and 2.5 Sq. mm for mains. Conductors for power and lighting circuits shall be of adequate size to carry the designed circuit load without exceeding the permissible thermal limits for the installation. and such sizes will be stipulated in specifications and drawings.

6. Cables:

6.1 All cables shall conform to relevant Indian Standards.

6.2 Conductors of all cable except the flexible cable shall be of aluminium. The smallest aluminium conductors for final circuit shall have nominal cross-sectional area of not less than 1.5 Sq. mm. The minimum size of the aluminium conductors for power wiring shall be 4 sq. mm

6.3.1 Conductors of flexible cables shall be of copper. The minimum cross-sectional area of such a cable shall be 14.0193 mm. The flexible cable shall have uniform and adequate insulation.

6.3.2 Unless the flexible cables and conductors are protected by Armor or tough rubber or PVC Sheath, these shall not be used in workshops and other places where they are liable to mechanical damage.

6.3.3. Core flexible cables shall be used for connecting single phase Appliances for phase, neutral & earth connections.

7. Fall of Potential

The cross sectional area of all conductors inside buildings shall be so proportioned to their lengths that the drop in voltage between main fuses and the farthest point or any lamp shall not exceed three percent of the voltage of the consumer's with all the consuming devices in use.

7.1 If the CABLE SIZE is increased to avoid the voltage drop in circuit current rating of the cable shall be more than that for which the circuit is designed. In each circuit or sub circuit every cable shall have a current rating not less than that of the fuse which protects the circuit or sub circuit respectively for current higher than the full load current.

8. Ratings of lamps and fans socket outlets: Points and exhaust fans

8.1 Incandescent lamps installed in residential -and non-residential buildings shall be rated at 60 watts & 100 watts respectively.

8.2 Table fans and ceiling fans shall be rated at 60 watts, exhaust fan shall be rated according to their capacity

8.3 5 Amp. socket outlet points and 15 Amp. socket outlet points shall be rated at 100 watts and 1000 watts respectively for the purpose of load assessment unless actual values of the load are known or specified.

9. Tests:

9.1 Before the installation is commissioned following tests shall be carried out.

(1) Insulation Resistance test

(2) Polarity Tests of Switches

(3) Earth continuity tests

(4) Earth electrodes Resistance test

9.2.1.1 The insulation resistance shall be measured between earth and the whole system of conductors or any section thereof with all fuses in place and all switches closed, and except in earthed concentric wiring all lamps in position or both poles of the installation otherwise electrically connected together a direct current pressure of not less than twice the working pressure provided that it need not exceed 500 volts for medium voltage circuits where the supply is derived from the three wire D.C. or a poly phase A.C. System, the neutral pole of which is connected to earth either direct or through added resistance, the working pressure shall be deemed to be that which is maintained between the phase conductor and the neutral.

9.2.1.2 The insulation resistance shall also be measured between all conductors to one pole or phase conductor of the supply and all the conductors connected to the neutral or to the other pole or phase conductors of the supply with all lamps in position and switches in 'OFF' position and its value shall be not less than in that specified in Sub Clause 9.2.1.3.

9.2.1.3. The insulation resistance in Megohms measured as above shall not be less than 50 Megohms divided by the number of outlet or when PVC insulated cables are used for wiring 12.5 megohms divided by number of outlets.

9.2.1.4 Where a whole installation is being tested, a lower, value than that given by the formula, subject to a minimum of 1 megohm is acceptable.

9.2.1.5 A preliminary and similar test may be made before lamps, etc. are installed and in this event the insulation resistance to earth should be not less than 100 megohms divided by the number of outlet or when PVC insulated cables are used for wiring 25 megohms divided by number of outlets.

9.2.1.6 The term "Outlet" includes every switch except that a switch combined with a socket outlet, appliance or lighting fitting is regarded as one outlet.

9.2.1.7 Control rheostat heating and power appliance and electric sign may, if required, be dis-connected from the circuit during the test, but in that event the insulation resistance between the case or frame work, and all live parts of each rheostat, appliance and sign, shall be not less than that specified in the relevant Indian Standard Specification or where there is no such specification shall be not less than half a megohm.

9.2.2 Polarity Test:

9.2.2.1 In a two wire installation a test shall be made to verify that all switches in every circuit have been fitted in the same conductor through out & such conductor shall be labelled or marked for connection to the phase conductor or to the non- earthed conductor of the supply.

9.2.2.2 In a three wire or a four wire installation a test shall be made to verify that every non-linked single pole switch is fitted in a conductor which is labelled or marked for connection to one of the phase conductor of the supply.

9.2.2.3 The installation shall be connected to the supply for testing. The terminals of all switches shall be tested by a test lamp one lead of which is connected to the earth. Glowing of test lamp to its full brilliance, when the switch is in 'on' position irrespective of appliance in position or not shall indicate that the switch is connected to the right polarity,

9.2.3. Earth Continuity Test:

The earth continuity conductor including metal conduits and metallic envelopes of cables in all cases shall be tested for electric continuity and the electrical resistance of the same along with the earthing lead but excluding any added resistance or earth leakage circuit breaker measured from the connection with the earth electrode to any point in the earth continuity conductor in the completed installation shall not exceed one ohm.

9.2.3.1 Earth Electrode Resistance Test:

Earth electrode Resistance test may be carried out by Megger Earth Testers containing a direct reading ohm-meter, a hand driven generator and auxiliary electrodes.

9.3 On completion of an electric installation (addition and alteration) a certificate shall be furnished by the contractor Counter signed by the certified Supervisor under whose direction supervision the installation was carried out. This certificate shall be in the prescribed form as given in Appendix-V in addition to the test certificate required by Local Electrical Supply Authorities.

10, Joint and looping back:

Unless with the sanction of Ex. Engineer Electrical Divisions all joints in conductor shall be means of approved mechanical connectors in suitable and approved junction boxes but looping back system shall be preferable. In wiring unless otherwise specified Phase and live conduct shall be looped at the switch box where a neutral conductor can be looped from light, fan or socket. In non-residential buildings, neutral and earth continuity wire shall be brought to each of the switch boards should be of adequate size to accommodate at least one number of 5 Amps. socket outlet and control switch in future.

11. Switches:

Main Switchgears, Switch Board and their location

- 11.1 All main switches (other than those of iron clad pattern) carrying current of 10 Amp. and above shall be fitted for back connections - land shall be suitably protected.
- 11.2 All switches and circuit breakers shall be constructed in accordance with the I.S. 4237-1967, General requirement for switchgear and control gear for voltage not exceeding 1000 Volts and other relevant I.S. provided-also that spring shall be either of phosphor bronze or if steel shall be copper or Nickel plated and that handle shall be so fastened that they do not tend to unscrew or become loose
- 11.3 All main switches shall be either of metal clad enclosed pattern or of any insulated enclosed pattern which shall be fixed at close proximity to the point of entry of supply
- 11.4 Switch boards shall not be erected above gas, stoves, or sinks or within 2.5 m of any washing unit in the washing rooms of laundries or in the bath rooms, lavatories, toilets or kitchens.
- 11.5 Switch boards, if unavoidably fixed in places likely to be exposed to weather, to drip or to abnormal moist temperature the outlet casing shall be weather proof and shall be provided with glands or bushing of adopted to receive screwed conduit according to the manner in which cables are run. PVC and double flanged bushes shall be fitted in the holes of the switches for entry and exit of wires.
- 11.6 A switch board not be installed so that its bottom is within 1.25 m above the floor unless the front of the switch board is completely enclosed by a door or the switch board is located in a position to which only authorised persons have access.
- 11.7 Switch boards shall be recessed in the wall if so specified in the schedule of work or in the special specification. The front shall be fitted with hinged panel of other suitable material such as Bakelite in wood frame with locking arrangement, the outer surface of door being flush with the walls. Ample room shall be provided at the back for connections and at the front between the switchgear mountings and the door.
- 11.8 Equipments which are on the front of a switch board shall be so arranged that inadvertently personal contact with live parts is unlikely during the manipulation of switchgears, changing of fuses or like operations.
- 11.9 No holes other than the holes by means of-which the panel is fixed shall be drilled closer than 1.3 cms. from any edge of the panel.
- 11.10 The various live parts, unless they are effectively screened by substantial barriers of non-hydroscopic, no-inflammable insulating material, shall be so spaced that space shall not be maintained between such parts and earth.
- 11.11 The arrangement of gear shall be such that they shall be readily accessible and their connections to all instruments and apparatus shall also be traceable.
- 11.12 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 alive when their respective switches are in the off position.
- 11.13 No fuses other than fuses in instrument circuit shall be fixed on the back of or behind a switch board panel or frame.
- 11.14 All the metal switchgears and switch boards shall be painted, prior to erection with one coat of antirust primer, After erection they shall be painted with two coats of approved enamel or aluminium paint as required on all sides wherever accessible.
- 11.15 All switch boards connected to medium voltage and above shall be provided with 'Danger Notice Plate' conforming to relevant Indian Standards.

12. Control at Point of Commencement of Supply:

12.1 There shall be a linked main switchgear with fuse on each live conductor of the supply mains at the point gentry.. The wiring throughout the installation shall be such that there is no break in the neutral wire except in form of a linked switchgear. The neutral shall also be distinctly marked. In this connection Rule 32(2) of the Indian Electricity Rules, 1966 (See Appendix-'A') shall also be referred.

12.2 The main switchgear shall be situated as near as practicable to be termination of service line and shall be easily accessible without the use of any external aid.

12.3 On the main switchgear, where the conductor of a two-wire system or an earthen neutral conductor of a ulti wire system or a conductor which is to be connected thereto, an indication of a permanent nature shall be provided to identify the earthen neutral conductor. In this connection Rule 32(1) of Indian Electricity Rules, 1956 (see appendix 'A') shall be referred.

13.0 Switch Board & Distribution Boards:

Metal clad switch gear shall preferably be mounted on any of the following types of Board.

13.1 Hinged type Metal Boards:

These shall consist of a box made of sheet metal not less than 2 mm thick and shall be provided with a hinged cover to enable the board to swing open for examination of the wiring at the back, The joints shall be welded. A teak wood board, thoroughly protected both inside and outside with good insulating varnish conforming to IS :1347-1952 specification for varnish shellac, for General purpose, and of not less than 6.5 mm thickness, shall be provided at the back for attachment of incoming and outgoing cables. There shall be a clear distance of not less than 2.9 cm between the teak wood board and the cover, the distance being increased for larger boards in order that on closing of the cover, the insulation of the cables is not subjected to damage and no short length of cables is subjected to excessive twisting or bending in any case .The board shall be securely fixed to the wall by means of rag bolts, plugs or wooden Gutties and shall be provided with a locking arrangement and an earthing stud. All wires passing through the metal board shall be bunched. Alternately, hinged li type metal boards shall be made of sheet covering mounted on channel or angle iron frame.

Note: Such type of boards are particularly suitable for small switch-boards for mounting metal-clad switchgear connected to supply at low voltages.

13.2 Fixed type Metal Boards:

These shall consist of an angle or channel of iron frame fixed on the wall or on floor and supported on the wall at the top if necessary. There shall be a clear distance of one metre in front of the switchboard. If there are attachments of base connections at the back of the switch board Rules 51 (1) (c) of Indian Electricity Rules, 1956 is gall apply

Noten Such type of boards are particularly suitable for large switchboard for mounting large number or switchgears or higher capacity metal clad switchgears or both.

13.3 Teakwood Boards:

For small installations connected to a single phase 230 volts supply teak wood boards may be caused as main, boards or sub - board. These shall be of seasoned teak or other durable wood with solid back impregnated with varnish of approved quality with all joints dovetailed.

13.4 In large size medium voltage installations, before proceeding with the actual construction of the boards, a proper drawing showing the detailed dimensions and design including the disposition of the mountings, which shall be symmetrically and neatly arranged for arriving at the overall dimensions, shall be prepared and approved by the Engineer-in-charge.

13.5 Recessing of Boards:

Where so specified the switch boards shall be recessed in the wall. The front shall be fitted with a hinged panel of teak wood or other suitable materials. such as Bakelite, or with unbreakable glass doors in teak wood frame with locking arrangement, the other surface off the doors being flush with the walls. Ample room shall be provided at the back for connection and at the front between the switchgear mountings.

13.6 Arrangement of Apparatus:

- a) Equipment which is on the front of a switch board shall be so arranged that inadvertently personal contact with live parts is unlikely during the manipulation of switches, changing of fuses or like operation.
- b) No apparatus shall project beyond any edge of panel. No fuse body shall be mounted within 2.5 cm. of any edge of the panel and no hole other than holes by means of which the panel is fixed shall be drilled closer than 1.3 cms from any edge of the panel.
- c) The various live parts, unless they are effectively screened by substantial barriers of non-hygroscopic, non-inflammable insulating material, shall be so spaced that an arc cannot maintain between such parts and earth.
- d) The arrangement of the gear shall be such that they shall be readily accessible and their connections, to all instruments and apparatus shall also be easily traceable.
- e) 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 alive when their respective switches are in the 'OFF' position.
- f) No fuses other than fuses instrument circuit shall be fixed on the back of or behind a switchboard panel or frame.

13.7 Marking of Apparatus:

- a) Where a board is connected to voltage higher than 250 volts, all the apparatus mounted on it shall be marked in the following colours to indicate the different poles or phases to which the apparatus or its different terminals may have been connected.

Alternating Current	Direct Current
Three-phase-red, Yellow, & blue, blue Natural-black	Three wire system-2 outer wires Positive red & negative Natural-black

Where fuse-wire three phase Wiring is done, the neutral shall be in one colour and the other three wires in another colour.

- b) Where a board has more than one switch each such switch shall be marked to indicate which section of the installation it controls.
- c) All markings required under the rule shall be clear permanent.

13.8 Main & Branch Distribution Board:

13.8.1 Main and branch distribution boards shall be of any type mentioned in 13.1

13.8.2 Main distribution boards shall be provided with a switch or air circuit breaker on each pole of each circuit the phase or live conductor and a link on the neutral or earthed conductor of each circuit. The switches shall always be linked.

13.8.3 Branch Distribution Board:

13.8.3.1 Branch distribution boards shall be provided with a fuse or a miniature circuit breaker or both the adequate rating setting chosen on the live conductor of each circuit and the earthed neutral conductor shall be connected to a common link and be capable of being disconnected individually for testing purposes. At least one spare circuit of the same capacity shall be provided on each branch distribution board.

13.8.3.2 In residential installations, lights and fans may be wired on a common circuit such sub circuit shall not have more than total of ten points of lights, fans and socket outlets. The load of such circuit shall be restricted to 800 watts. If a separate fan circuit is provided, the number of fans in the circuit shall not exceed ten. Power sub-circuits shall be designed according to the load but in no case shall there be more than two outlets on each sub-circuits.

13.8.3.3 In industrial and other similar installations requiring the use of group control of switching operation, circuits, for socket outlets may be kept separate from fans and lights. Normally fans and lights may be wired on a common circuit, however, if need is felt separate circuits may be provided for the two. The load on any low voltage sub-circuit shall not exceed 3000 Watts. In case of new installation, all circuits and sub-circuits shall be designed by making provision of 20 per cent increase in load due to any future modification. Power sub-circuits shall be designed according to the load but in no case shall there be more than four outlets in each sub-circuits.

13.9 Installation of Distribution Boards:

- 13.9.1 The distribution fuse-boards shall be located as near as possible to the centre of the load they are intended to control.
- 13.9.2 These shall be fixed on suitable stanchion or wall and shall be accessible for replacement of fuses.
- 13.9.3 These shall be of either metal-clad type, or all insulated type. But, if exposed to weather or damp situations, they shall be of the weather proof type and, if installed where exposed to explosive dust, vapour or gas, they shall be of flame proof type.
- 13.9.4 Where two or more distribution fuse boards feed low voltage these distribution boards shall be:
- (1) Fixed not less than 2 m apart or,
 - (2) Arranged so that it is not possible to open two at a time, namely they are interlocked and the metal case is marked 'Danger 415 Volts', or
 - (3) Installed in a room or enclosure accessible to only authorised persons
- 13.9.5 All distribution boards shall be marked 'Lighting', 'Power', as the case may be and also marked with the voltage and number of phases of the supply. Each shall be provided with a circuit list giving details of each circuit which it controls and the current rating of the circuit and size of fuse-element.
- 13.9.6 Triple pole distribution boards shall not be generally used for final circuit distribution unless specific approval of Engineer-in-charge is obtained. In special cases where use of Trip, a pole distribution boards are inevitable they shall be of H. R.C. fuse type only.

13.10 Wiring and Distribution Board:

- 13.10.1 In wiring a branch board, total load of the consuming devices shall be divided, as far as possible, evenly between the number of ways of the board leaving the spare circuit for future extension.
- 13.10.2 All connections between pieces of apparatus or between apparatus and terminals on a board shall be neatly arranged in a definite sequence following the arrangement of the apparatus mounted thereon, avoiding unnecessary crossing.
- 13.10.3 Cables shall be connected to a terminal only by soldered or welded or crimped lugs using suitable sleeve, lugs or ferrules unless the terminal is of such a form that it is possible to securely clamp them without the cutting away of cable strands.
- 13.10.4 All bare conductor shall be rigidly fixed in such a manner that a clearance of at least 2.6 cms. is maintained between conductor of opposite polarity or phase and between the conductors and any material other than insulating material.
- 13.10.5 If required, a pilot lamp shall be fixed and connected through an independent single-pole switch and fuse to the bus bars of the board.
- 13.10.6 In a hinged type board, the incoming and outgoing cables shall be fixed at one or more points according to the number of cables on the back of the board leaving suitable space in between cables and shall also, if possible be fixed at the corresponding points on the switch board panel. The cables between these points shall be arranged to form a "U" or "S" shaped loop which shall be of such length as to allow the switch board panel to swing through an angle of not less than 90°

14.0 Capacity of Circuits:

- 14.1 Lights and fans may be issued on a common circuits and such a circuit shall not have more than a total of ten points of lights, fan and socket outlets, or a load of 800 watts whichever is less. The power circuits shall be designed with a maximum of two outlets per circuit generally when load is not known or specified. In non residential buildings at important District centres however one outlet per circuit may be preferred. The circuit shall be designed based on the loading of the circuit where, not specified the load shall be taken as 1 KW per outlet, Where the load is more than 1 KW it should be controlled by a isolator switch or miniature circuit breaker.

- 15.0 Passing Through Walls And Floors:
15,1 Where conductors pass through walls one of the following methods shall be employed. Care shall be taken to see that wires pass very freely through protective pipe or box and that the wires pass through in a straight line Without any twist or cross in wires, on other ends of such holes.
- A teak wood box extending through the whole thickness of the wall shall be buried in the wall and casings or conductors shall be carried so as to allow 1.3 cms. air space on three sides, of the casing conductor.
 - The conductor shall be carried either in a rigid steel conduit conforming to *IS : 1653-1964 specification for Rigid Steel conduits of Electrical wiring (Revised) or a rigid non- metallic conduit conforming to *IS: 2509 1963 specification for Rigid Non-Metalic conduits for Electrical Installations, or in a porcelain tube of FAICh size which permits easy drawing in. The end of conduit shall be neatly bushed with porcelain, wood or other approved material.
 - Insulated. conductors while passing through floors shall be protected from mechanical injury by means of rigid steel conduit (see *IS 1653-1964) to a height not less than 1,5 m above the floors and flush with the ceiling below. This steel conduit shall be earthed and securely bushed.
- 152 Where a wall tube passes outside a building so as to be exposed to weather, the Outer end shall be bent nrJoLlited and turned down wards, and properly bushed on the open end.
- 16.0 Fixing to Walls and Ceilings:
- Plugs for ordinary walls or ceilings shall be of well-seasoned teak or other approved hardwood not less than 5 cm long 2.5 cm. square on the inner end and 2 cm. square on the outer end. They shall be cemented into walls to within 7.5 mm of the surface, the remaining being finished according to the nature of the surface with plaster or lime punning.
- 16.1 Where owing to irregular crossing or other reasons the plugging of the walls or ceiling with, wood plugs present difficulties, the wood casing, wood batten, metal conduit, or cleat (as the case may be) shall be attached to the wall or ceiling in an approved manner. In the case of new building, wherever possible teak wood plugs shall be fixed in the walls before they are plastered.
- 16.2 To achieve neatness, plugging of walls or ceiling may be done by an approved type of asbestos, metallic or a fibre fixing plug.
- 17.0 Branch Switches:
Where the supply is derived from a three-wire or four-wire source, and distribution is done on the two wire system, all branch switches shall be placed in the outer or live conductor of the circuit and no single-phase switch or fuse shall be inserted in the middle wire, earth or earthed neutral conductor of the circuit. Single-pole switches (Other than for multiple control) Carring not more than 15 amperes may be of tumbler type which shall be ' ON' when the handle known is down.
- 18.0 Fittings:
Where conductors are required to be threaded through tubes or channels formed in the metalwork of fittings these must be free from sharp angles or projecting edges and such size that will enable them to be wired with the conductors used for the final sub Circuits without removing the boarding, taping or outer covering. As far as possible, all tubes and channels should be of sufficient size to permit 'Looping back; of wires cables and flexible cords other than those designed for high temperature shall not be used for wiring fittings except for portable fittings. All fittings must have not less than a half inch male nipple. Fiffings and lamp holders for gas filled lamps shall be adequately ventilated.
- 18.1 Where light fitting is supported by one or more flexible cords, the maximum weight to which the twin flexible cords may be subjected shall be as follows

Nominal cross sectional Area Mm ²	No. & Dia in mm of wires	Max. Permissible weight Kg
0.5	16/0.2	1.7
0.75	24/0.2	2.6
1.0	32/0.2	3.5
2.5	48/0.2	5.3
3.5	80/0.2	8.8
4	128/0.2	14.0

182 No inflammable shade shall form a part of light fitting unless such shade is well protected against all risks of fire. Celluloid shade or light fitting shall not be used under any circumstances.

18.3 Fitting of Wire:

The use of fitting wire shall be restricted to the internal wiring and the lighting fittings. Where fitting wire is used for wiring, for the sub-circuit loads shall be terminated in a ceiling zone or connector from which they shall be carried into the fittings.

19.0 Lamp Holders:

Lamp holders for use on brackets and the like shall be in accordance with *IS 1258-1967, specification for Boyonet lampholders and all those for use flexible pendants shall be provided with cord grips. All lampholders shall be provided with shade carriers. Where centre contact edison screw lampholders are used, the outer or screw contacts shall be connected to the middle wire, the neutral, and the earthed conductor of the circuit.

20.0 Outdoor Lamps:

External and road lamps shall have weather proof fittings of approved design so as to effectively prevent the admission of moisture. An insulating distance piece of moisture proof materials shall be inserted in the fittings. Flexible cord and cord grip lampholders shall not be used where exposed to weather. In verandahs and similar exposed situations where pendants are used, they shall be of fixed rod type.

21.0 Lamps:

All incandescent lamps, unless otherwise required and suitably protected, shall be hung at a height of not less than 2.5 m above the floor level. They shall be in accordance with IS : 418 : 1957 specification for Tungsten Filament General Service electric lamps.

22.0 Fans, Regulators and Clamps:

22.1.0 Ceiling fans:

Ceiling fans including their suspension shall conform to *IS 374-1960 specification for electric ceiling fans and regulators (Revised) & to the following requirements:

- (a) All ceiling fans shall be wired to ceiling roses or to special connector boxes, to which fans rod wires shall be connected and suspended from hooks or shackles, with insulators between hooks and suspension rods. There shall be no joint in the suspension rod, but if joints be avoidable then such joints shall be screwed to special couplers of 5 cm minimum length and both ends of pipes shall touch together within couplers, and shall in addition be secured by means of split pins-, alternatively, the two pipes may be welded.
- (b) Fans clamps shall be of suitable design according to the nature of construction of ceiling on which these clamps are fitted. In all cases fan clamps shall be fabricated from tested new metal of suitable sizes and they shall be as close fitting as possible. Fan clamps for reinforced concrete roots shall be buried with the casting and due care shall be taken that they shall serve the purpose. Fan clamps for wood beams shall be of suitable flat iron fixed on two sides of the beam and according to the size and section of the beam one or two mild steel bolts passing through the beam shall hold both flat irons together. Fan clamps for steel joint shall be fabricated from tested flat iron to fit rigidly to the bottom flange of the beam. Care shall be taken during fabrication that the metal does not crack while hammering to shape. Other fan clamps shall be made to suit the position, but in all cases care shall be taken to see that they are rigid and safe.

Note All fan clamps shall be so fabricated that fans revolve steadily.

- (c) Canopies on top and bottom of suspension rod shall effectively hide suspensions and connections to fan motors, respectively.
- (d) The lead-in-wire shall be of nominal cross-sectional area not less than 1.0 mm² with copper and 1.5 mm² with aluminium and shall be protected from abrasion.
- (e) Unless otherwise specified, the clear distance between the ceiling fan and the floor shall be less than 2.75 m.

22.2.0 Exhaust Fans:

For fixing of an exhaust fan, a circular hole shall be provided in the wall to suit the size of the frame which shall be fixed by means of rag-bolts embedded in the wall. The hole shall be neatly plastered with cement and brought to the original finish of the wall. The exhaust fan shall be connected to exhaust fan point which shall be wired as neat to the hole as possible by means of a flexible, cord, care being taken that the blades rotate in the proper direction.

23.0 Attachment of fittings and accessories:

23.1 In other than conduit wiring, all ceiling crosses, brackets, pendants and accessories attached to walls or ceilings shall be mounted on substantial teak wood block twice Varnished after all fixing holes are made in them. Blocks shall be not less than 4 cms. deep, Brass screws only shall be used for attaching fittings and accessories to their base blocks.

24.0 Interchangeability:

Similar part of all switches, lampholders, distribution fuse- boards ceiling roses, brackets, pendants, fans and all other fittings of the same type shall be interchangeable in each installation.

25.0 Conduit Wiring System:

25.1.1 Type and size of conduit - All conduit pipes shall be conforming to *IS: 1653-11964, furnished with galvanised or stove enamelled surface. All conduit accessories shall be of threaded type and under no circumstances pin grip type or clamp type accessories be used. No steel conduit less than 16 mm in diameter shall be used. The number of insulated conductors that can be drawn into rigid steel conduit are given in Table 11.

25.1.2 Bunching of cables - Unless otherwise specified, insulated conductors of AC supply -and DC supply shall be bunched in separate conduits.

25.1.3 Conduit-joints-Conduit pipes shall be joined by means of screwed couplers and screwed accessories only (*IS: 2667-1964).

Specification for Fittings for Rigid Steel Conduits for Electrical Wiring). In long distance strance straight runs of conduit, inspection type couplers at reasonable intervals shall be provided or running threads with couplers and jam-puts (in the latter case the bare threaded portion shall be treated with anti- corrosive preservative) shall be provided. Thread on conduit pipes in all cases shall be between 11 mm to 27 mm long sufficient to accommodate pipes to full threaded portion of couplers or accessories. Cut ends of conduit pipes shall have no sharp edges nor any or buries left to avoid damage to the insulation of conductors while puling them through such pipes;

TABLE-11 MAXIMUM PERMISSIBLE NUMBER OF 250-V GRADE SINGLE CORE CABLES THAT CAN BE DRAWN INTO RIGID STEEL CONDUIT (CLAUSE6.5.1.1)

Size of cable Nominal Cross sectional area.	Number and diameter in mm of wires	Size of conduit (mm)													
		16	:	20	:	25 (NO. of cable Max	:	32	:	40	:	50	:	63	:
		S	B	S	B	S	B	S	B	S	B	S	B	S	B
1.0	1/1.12	5	4	7	5	13	10	20	14	-	-	-	-	-	-
1.5	1/1.40	4	3	7	5	12	10	20	14	-	-	-	-	-	-
2.5	1/1.80	3	2	6	5	10	8	18	12	-	-	-	-	-	-
4	1/1.24 (3/1.06*) (7/0.85)	3	2	4	3	7	6	12	10	-	-	-	-	-	-
6	1/2.80 7/1.06*)	2	-	3	2	6	5	10	8						
10	1/3.55+ 7/1.40*)	-	-	2	-	5	4	8	7	-	-	-	-	-	-
		-	-	2	-	4	3	6	5	8	6	-	-	-	-

16	7/1.70	-	-	-	-	2	-	4	3	7	6	-	-	-	-
25	7/2.24	-	-	-	-	-	-	2	-	4	3	7	6	9	7
35	7/2.50		-	-	-	-	-	-	-	2	-	5	4	9	5
50	7/3.00+		-	-	-	-	-	-	-	2	-	5	4	6	5

*For Cu. Conductors only.

+For Al. Conductors only.

NOTE: 1. The cable shows the maximum capacity of conduits for the simultaneous drawing-in of cables. The table applies to 250 volts grade cable. The columns headed 'S' apply to runs of conduit which have distance not exceeding 4.25 M between draw in boxes, and which do not deflect from the straight by angle of more than 15". The columns headed 'I' apply to runs of conduit which deflect from the straight by an angle of more than 15.11.

NOTE: 2 In case of inspection type draw-in box has been provided and if the cables is first drawn through one straight conduit, then through the drawn box, and then through the second straight conduit, such systems may be considered as that of a straight conduit even if the conduit deflects through the straight by more than 15.0,

- 25.1.4 Protection against dampness- In order to minimise condensation or seating inside the tube, all outlets of conduit system shall be properly drained and ventilated, but in such a manner as to prevent the entry of insects as far as possible
- 25.1.5 Protection of conduit against rust -The outer surface of the conduit pipes, including all bends, unions, tees junction boxes, etc., forming part of the conduit system shall be adequately protected against rust particularly when such system is exposed is to weather. In all cases, no bare threaded portion of conduit pipe shall be allowed unless such bare threaded portion is treated with anti-corrosive preservative or covered with approved plastic compound.
- 25.1.6 Fixing of conduit - Conduit pipes shall be fixed by heavy gauge saddles, secured to suitable wood plugs or any other approved plug with screws in an approved manner at an interval of not more than one metre but on either side of couplers or bends or similar fittings, saddles shall be fixed at a distance of 30 cm. from the centre of such fittings.
- 25.1.7 Bends in conduit - All bends in the system including diversion shall be done by bending pipes, or by inserting suitable solid or inspection type normal bends, elbows or similar fittings; or by fixing cast iron inspection boxes whichever is more suitable. Conduit fitting shall be avoided as far as possible. On conduit system exposed to weather, where necessary, solid-type fitting shall be used. Radius of such bends in conduit pipes shall be not less than 7.5 cm. No length of conduit shall have more than the equivalent of four quarter bends from outlet. The bends at the outlets not being counted.
- 25.1.8 Outlets - All outlets for fitting switches etc., shall be boxes, of suitable metal or any other approved outlet boxes for other surface mounting or flush mounting systems,
- 25.1.9 Conductors - All conductors used in conduits wirings shall preferably be stranded. No single -core cable or nominal Cross-sectional area greater than 130 MM² shall be enclosed in a conduit and used for alternating current.
- 25.1.10 Erection and earthing of conduit - The conduit of each circuit or section shall be completed before conductors are drawn in. The entire system of conduit and permanently connected to earth conforming to the requirements specified under pipe in a workman like manner for a perfect continuity between each wire and conduit. Gas or water pipes shall not be used as earth medium. If conduit pipes are liable to mechanical damage, they shall be adequately protected.
- 25.2 Recessed. Conduit wiring system with Rigid Steel conduits - Recessed conduit wiring system shall comply with all the requirements for surface conduit wiring system specified in 6.5. 1.1 to 6.5. 1.1 0 and in addition, conform to the requirements specified in 6.5.2.1 to 6.5. 2.4.
- 25.2.1 Making of chase - The chase in the wall shall be neatly made and be of ample dimensions to permit the conduit to be fixed in the manner desired. 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.
- 25.2.2 Fixing of conduit in chase - The conduit pipe shall be fixed by means of staples or by means of saddles not more than 60 cm. 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 threaded joints of rigid steel conduit shall be treated with some approved preservative compound to secure protection against rust.
- 25.2.3 Inspection boxes - Suitable inspection boxes shall be provided to permit periodical inspection and to facilitate removal of wires, if necessary. These shall be mounted flush with the wall Suitable ventilating holes shall be provided in the inspection box covers.

25.2.4 Type of accessories to be used - All outlets such as switches and wall sockets, may be either or flush mounting type or surface mounting type.

(a) Flush mounting type - All flush mounting outlets shall be of cast iron mild steel boxes with a cover of approved insulating material or shall be a box made of a suitable insulating material. The switches and other Outlets shall be mounted on Such boxes as would be approved. The metal box shall be efficiently earthed with conduit by an approved means of earth attachment.

(b) Surface mounting type - If surface mounting type outlet box is specified, it shall be of any approved insulating material and outlet mounted in an approved manner.

25.2.5 When crossing through expansion joints in buildings. The conduit sections across the joint, maybe through flexible, conduits of the same size as the rigid conduit.

25.3 Conduit Wiring System with Rigid Non-Metallic Conduits:

Rigid Non-Metalic conduits are used for surface. recessed and concealed conduit wiring.

25.3.1 Type and size - All non-metallic conduits used shall conform to IS : 2509-1963 and shall be used with the corresponding accessories (See IS: 3419-1965) specification for Fittings for Rigid Non-Metallic Conduits).

25.3.2 Bunching off cables - Conductors of AC supply and DC Supply Shall be bunched in separate conduits. The number of insulated cables that may be drawn into the conduits are given in Table III. In this table space factor does not exceed 40 percent.

TABLE-111 MAXIMUM PERMISSIBLE NUMBER OF 250 V/1 TS GRADE SINGLE- CORE CABLES/THAT MAY BE DRAWN INTO RIGID NON-METALLIC CONDUITS

Size of cable

Nominal Cross sectional							

For Cu. Conductors only.

+For Al. Conductors only.

25.33 Conduit joints - shall be joined by means of screwed or plain Couplers depending on whether the conduits are screwed or plain. Where there are long runs of straight conduit. Inspection type couplers shall be provided at intervals. For conduit fittings and accessories reference may be made to IS : 3419-196S.

25.3.4 Fixing of conduits -The provision of 25.1.6 shall -apply except that the spacing between saddles or supports is a recommended to be 60 cms for rigid non-metallic conduits

25.3.5 Bends in conduit - Wherever necessary, bends or diversion may be achieved by bending the conduits (See 6.5.3.9) or by employing normal bends, inspection bends, inspection boxes, elbows or similar fittings.

25.3.6 Conduit fittings shall be avoided, as far as possible on outdoor system.

25.3.7 Outlets - All the outlets for fittings, switches, etc.. shall be boxes of substantial construction. In order to minimise condensation or sweting inside the conduit, all outlets of conduit system shall be properly drained and ventilated, but in such a manner as to prevent the entry of insects, etc. as far as possible.

25.3.8 For use with recessed conduit wiring system the provisions of 6.5.2.1 to 6.5.2.4 shall apply.

- 25.3.9 Heat may be used to soften conduit for bending and forming joints in case of plain conduits. As the material softens when heated, fitting of conduit in close proximity to hot surfaces should be avoided. Caution should be exercised in the use of the conduit in locations where the ambient temperature is 50°C or above. Use of such conduits in places where ambient temperature is 60°C or above is prohibited.

PVC INSULATED AND P.V.C. SHEATHED OR T.R.S. WIRING SYSTEM

26.0 GENERAL:

This system of wiring, is suitable for low pressure installation, and shall not be used in places exposed to sun and rain nor in damp places, provided they are sheathed in the special approved protective covering and well protected to withstand dampness.

26.1 Attachment to walls and ceiling:

- 26.1.1 All cables on brick walls, stone or plastered walls and ceiling shall be run on well-seasoned, perfectly straight and well-seasoned, perfectly straight and well varnished on four sides, teak wood or any approved hardwood battens not less than 10 mm finished thick, width of which shall be such as to suit total width of cables laid on the batten, prior to election, these shall be painted with one coat of varnish or approved paint of colour to match with surrounding. These battens shall be secured to wall and ceilings by flat head wood screws to raws plug or phill plug at an interval not exceeding 75 cm. Wood plug can be used only with special approval of the Engineer-in-charge. The flat head wood screws shall be counter within wood batten and smoothed down with file.

- 26.1.2 Where wiring is to be carried out along the face of the rolled steel joints a wooden batten of adequate width shall first be laid on the same and dipped to it as inconspicuously as possible. The wiring should then be fixed to this backing shall be suitably bushed to prevent the abrasion of the cables.

- 26.1.3 Attachment to false ceiling: In no case, the open wiring shall be run above the false ceiling without the approval of Engineer-in-charge.

- 26.20 Link clips : Only aluminium alloy clips/joint clips shall be used. The thickness shall be 0.32 mm (30 SWG) for lengths of 25 mm to 40 mm and 40 mm (28 SWG) for lengths of 50 mm to 80 mm. The width shall not be less than 8 mm in all these cases. Link clips/joint clips shall be so arranged that one single clip shall not hold more than two core or three single core TRS of PVC insulated and PVC sheathed upto 2.5 sq. mm above while a single clip shall hold a single twin core or two single core cables. The clips shall be fixed on varnished wood batten switch iron pins and space at interval of 15 cm both in the case of horizontal and vertical runs.

- 26.3.0 Bends in wiring : The wiring shall not in circumstances be bent so as to form an abrupt right angle but must be rounded off at the corners to a radius not less than six times the overall diameter of the cable.

26.4.0 Protection of wiring from Mechanical Damage:

- 26.4.1 In cases where there are chances of any damage to wiring, such wiring shall be drawn complying with all the requirements of conduit wiring system.

- 26.4.2 Such protective covering shall in all cases be fitted on all down drops within 1.5 m from the floor, or from floor level upto the switch board whichever is less.

- 26.5.0 Passing through floors: All cables taken through floor shall be enclosed in heavy gauge steel conduit extending 1.5 m above the floor or upto the switch board whichever is less and flush with the ceiling below or by means of any approved type of metallic covering. The ends of all conduits or pipes shall be neatly bushed with porcelain wood or other approved material. The conduit pipes, shall be security earthed.

- 26.6.0 Passing through walls : When conductors pass through walls, any one of the following methods shall be employed. Care should be taken to see that wires pass very freely through protective pipe or box and that wires pass through in a straight line without any twist or cross in wires on either ends of such holes.

(a) A box of teak wood or approved hard wood extending through the hole thickness of the wall shall be buried in the wall and casings or conductors and casing or conductors shall be carried so as to allow 1.3 cm air space on the three sides of the casing or conductor.

(b) The conductors shall be carried in an approved heavy gauge solid drawn or lap weld conduit or in porcelain tube of such a size that it permits easy drawing in, the ends of conduit shall be neatly bushed with porcelain, wood or other approved material.

- 26.6.1 Where a wall tube passes outside a building so as to be exposed to weather, the outer end shall be mounted and turned downwards and properly bushed on the open end. The conduit shall be neatly arranged so that the cables enter them without bending.
- 26.7.0 Buried cables : The TRS or PVC sheathed cable shall not normally be buried directly in plaster. Where so specified in the special specification they may be taken in teak wood channelling of ample capacity or conduit pipe buried in the wall.
- 26.8.0 Stripping of outer covering. While cutting and stripping of the outer covering of the cable care shall be taken that the sharp edge of the cutting instrument does not touch the inner insulation of the conductors. The protective outer covering of the cables shall be stripped off near connecting terminal and this protective covering shall be maintained upto the close proximity of connecting terminals as far as practicable. Care shall be taken to avoid hammering on link clips with any metal instrument after the cables are laid. Where junction boxes are provided they shall be made moisture proof with a plastic compound.

27.0 PAINTING WORK IN GENERAL:

- 27.1 Paints: paints, oils varnishes, etc, of approved make in original to the satisfaction of the Engineer-in-charge shall only be used.
- 27.2 Preparation of surface : The surface shall be thoroughly cleaned and dusted before painting is started. The proposed surface shall be inspected by Engineer-in-charge or his authorized agent and shall have received the approval before painting is commenced.
- 27.3 Application : Paint shall be applied with brush. The paint shall be spread as smooth & even as possible. Particular care shall be paid to revets, nuts, bolts and cover lapping. Before drawing cut, it shall be continuously stirred in the smaller containers with a smooth stick while it is being applied.
- Each coat shall be allowed to dry out sufficiently before a subsequent coat is applied.
- 27.4 Scope: Painting on old surface in indoor situations will not include primer coat except where specially mentioned in the schedule of work or special specification. However, where rust has formed on iron and steel surfaces the spots will be painted with one anti-rust primer coat.
- 27.5 Precautions: All furniture fixtures, glazing floors, etc, shall be protected by covering. All stains, smears, splashings, dropping of every kind shall be removed. While painting of wiring etc. it shall be ensured that painting of wall ceiling etc. is not spoiled in any way.
- 27.6 Painting of conduit and accessories : After installation surface of conduit pipes, fittings switch and regulator boxes, etc. shall be painted with two coats of approved enamel paint or aluminium paint as required to match the finish of surrounding wall, trusser, etc.

28. link clip

The clip for batten wiring shall be of Aluminium conforming to I.S. specification. No. 2415-1975.

APPENDIX -A

Important Clauses of Indian Electricity Rules, 1956. Following clauses of Indian Electricity Rules, 1956 shall in particular be taken care of in the execution of electrical works

Clause No.	Subject
3.	Authorization
29.	Construction, installation, protection, operation and maintenance of electric supply lines and apparatus.
31.	Cut-out on consumer's premises.
32.	Identification of earthed and earthed neutral conductors and position of switches and cutouts therein.
33.	Earthed terminal on consumer's premises.
34.	Handling of electric supply lines and apparatus.
41.	Distinction of circuits of different voltages.
42.	Accidental charge.
43.	Provisions applicable to protective equipment.
44.	Instructions for restoration of persons suffering from electric shock.
45.	Precautions to be adopted by consumers, owners, electrical contractors, Electrical workmen and suppliers.
46.	Periodical inspection and testing of consumer's installation.
48.	Precautions against leakage before connection.
50.	Supply to consumers.
51.	Provisions applicable to medium, high voltage installations.
58.	Point of commencement of supply.
59.	Precautions against failure of supply; Notice of failures.
61.	Connection with earth, (low and Medium Voltage system).
64.	Use of energy at high and extra-high voltage system.
67.	Connection with earth. (High & Extra-high voltage system),
68.	General conditions as to transformation and control of energy.

All clauses under Chapter VIII on Overhead Lines.

137.	Mode of entry.
138.	Penalty for breaking seal.
139.	Penalty for breach of rule 45.
140.	Penalty for breach of rule 82.
141.	Penalty for breach of rules

APPENDIX- 'B'

Form of Completion Certificate

I/We certify that the installation detailed below has been installed by me/us and tested and that to the best of my/our knowledge and belief, it complies with Indian Electricity Rules, 19bb. as well as the C.P.W.D. General Specification for Electrical Works, 1972. Electrical Installation at Voltage and system of supply

- (1) **Particulars of works:**
- | | |
|--------------------------------------|--|
| (a) Internal Electrical Installation | No. Total Load Type or system of wiring. |
| (i) Light point | |
| (ii) Fan point | |
| (iii) Plug point | |
| (a) 3 pin 5 Amp. | |
| (b) 3 pin 15 Amp. | |
| (b) Others: | |

- | Description | HP/KW |
|--|-------|
| (a) Motars: | |
| (i) | |
| (ii) | |
| (iii) | |
| (c) Other Plants: | |
| (d) If the work involves installation of over head line/or- under ground cable | |
| (a) (i) Type & Description of overhead line. | |
| (ii) Total length & No. of spans. | |
| (iii) No. of street light & its description | |
| (b) (i) Total length of under ground cable & its size. | |
| (ii) No. of joint. | |
| End joint | |
| Tee join | |
| St. through joint | |

2) **Earthing:**

- (i) Description of earthing electrode
- (ii) No. of earth electrodes
- (iii) Size of main earth lead

3) **Test Results:**

- | | |
|--|----------|
| (a) Insulation Resistance: | |
| a) Insulation resistance of the whole system of conductors to earth. | Megohms. |
| (ii) insulation resistance between the phase conductors and neutral. | Megohms. |
| Between phase R and neutral | Megohms |

Between phase Y and neutral Megohms

Between phase B and neutral Megohms

iii) insulation resistance between the phase conductors in case of polyphase supply.

Between phase R & phase Y Mpgohms

Between phase Y & phase B Megohms

Between phase B & phase R Megohms

(b) Polarity Test

Polarity of non linked single pole branch switches.

(c) Earth continuity Test :

Maximum resistance between any point in the earth continuity conductor including metal conduits & main earthing lead.

d) Earth Electrode Resistance:

Resistance of each electrode.

i) ohms

ii) ohms

iii) ohms

iv) ohms

e) Lighting Protective System

Resistance of the whole of lighting-protective system to earth before any bonding is effected with electrode and metal in/on the structure.

Signature of Supervisor
Contractor.

Signature of

Name & Address

Name & Address

SPECIFICATIONS

All Specification, standard. publication etc. specified mean the latest standards, publication etc. pertaining to Electrical Installation and should conform to the following wherever applicable.

- 1) Indian Electricity Act, 1910 with its amendments.
- 2) Indian Electricity Rules, 1956 and its amendments.
- 3) Indian Electricity supply Act, 1948.
- 4) Regulation for Electrical Equipment in building by I. E. F. Landon.
- 5) The Factory Act, 1948 and its amendments.
- 6) I.S.-732-1982 Part-1, 11 & III code of practice for Electrical wiring and fittings in buildings for low and medium voltages.
- 7) I.S.4064-1 1967 H.D. Air break switches and fuses for Voltages not exceeding 1100 volts.
- 8) I.S. 3043 - Earthing code of practice for
- 9) I.S. - 1554 Part-I - 1970 PVC insulated (Heavy duty) Electrical Cables for working voltages upto and including volts.
- 10) I.S. 694 - 1964 Part- 11 - PVC insulated cable with Aluminium conduits (revised) for voltages upto 110 volts,
- 11) I.S. 6908-1970 - Electrical installations in buildings. method of measurements of.
- 12) I.S. 4237-1967 - General requirement for switchgear and control gear for voltage not exceeding 1000 volts.
- 13) IS 1653-1964 - Rigid steel conduits for electrical wiring (revised)
- 14) IS 2509-1973 - Rigid steel conduits for electrical installation. (First revision).
- 15) IS: 1258-1967 – Bayonet lampholders (First revision).
- 16) IS: 418-1957 - Tungston- Filament General service electric lamps (Third revision).
- 17) IS 374-1966 - Fans and Regulators, ceiling type, electric (second revision).
- 18) IS 2667-1964 - Fittings for rigid steel conduits for electrical wiring.
- 19) IS 3419-1976 - Fitting for rigid non-metallic conduits (First revision).
- 20) National Electric Code, 1986.

ANNEXURE - I
Abstract of the wiring Rules of the institution of
Electrical Engineer
(referred to the specification) DEFINITIONS (see
Clause 2 of the Specification)

Systems:

All electrical system in which all the conductor and apparatus are electrically connected to a common source of supply.

- 1) **Earthed** : Effectually connected to the general mass of the earth. Solidly earthed means earthed without the intervention of a fuse, switch, circuit-breaker, resistor reactor or solenoid.
 - 2) **Uninsulated Conductor** : A conductor without provision, by the interposition of a dielectric or otherwise, for its insulation from earth.
 - 3) **Bare** : Not covered with insulating material.
 - 4) **Diaelectric** : anti material which offers high resistance to the passage of an electric current,
 - 5) **Bunch Conductor**: When more than, one conductor is contained within a single duct or groove or when they are run enclosed and not spaced part from each other.
 - 6) **Points**: In wiring as per IS : 5908-1970-Method of measurements of electrical installation in buildings.
 - 7) **Switch board** : An assemblage switchgear with or without instruments, but the term does not apply to a group of local switches in a final sub-circuit where each switch hits own installation base.
- Note : In the electricity (Factories Act) special regulations, 1908 and 1994, the term "Switchboard" includes "Distribution board".
- 8) **Single pole switch** : A switch suitable for closing and or opening a circuit on one phase or pole only.
 - 9) **Linked switches** : A switch the blades of which are so linked mechanically as to make or break all poles simultaneously or in a definite sequence.
 - 10) **Fuse Switch** A switch the moving part of which carries one or more fuses,
 - 11) **Three Wire System**:
 - a) **Outer Conductor**: Those between which there is the greatest difference of potential. This use of the word outer must not be confused with the use of the word when applied to the external conductor of a concentric main.
 - b) **Neutral Conductors**: The term includes the neutral conductor of a 3 phase 4 wire system, the conductor of a single phase or d.c. installation which is earthed by the supply undertaking (or otherwise at the source of the supply) and the middle wire or common return conductor, of a 3 wire d.c. or single phase a.c. system.
 - 12) **Semi enclosed machine**: One in which the ventilating openings in the frame are covered with-
 - a) Grids expanded metal or wire gauge, with openings of less than 1/4 inch so as to obstruct free ventilation.
 - b) Wire gauge, in which the openings are less than 1/4 inch but not less than 3/32 inch (diameter or width)
 - c) Screens with smaller openings than the above.
 - 13) **Totally - enclosed Machine** :

One in which the enclosing case and bearings are dust proof and which does not allow circulation of air between the inside and outside of the case.

- 14) Pipe Ventilated Machine: An enclosed in which the frame is so arranged that the ventilating air may be conveyed to it through a pipe attached to the frame, the ventilation opening maintained by the fanning action produced by the machine – itself.
- 15) Forced draught machine: An enclosed machine in which the ventilator air supply is maintained by an independent fan, external to the machine itself.
- 16) Projected Machine : One having end shield bearings and in which there is free access to the interior without opening doors or removing covers.

SWITCHES AND CIRCUIT BREAKERS

(See clause 11 of Specifications)

17) Switches and Circuit Breakers :

Switches and circuit breakers (rules 2b, 36 and 37) whether fixed separately or combined with lamps, holders or fittings must comply with the following requirements:

- a) Overheating must not take place at the point of contact or elsewhere, when the full current flows continuously.
- b) They must be so constructed or arranged that the contacts cannot accidentally close when left open.
- c) The basis must be so incombustible, non-conducting and moisture proof material.
- d) Circuit breaker as must be so arranged and place that no combustible material is endangered by the their acation.
- e) Unless placed in an engine room or in a compartment especially arranged for the purpose, they must their live parts covered. The coveres must be of incombustible material and must be either non-conducting or of rigid metal and clear of all internal mechanism. For more than 6 amperes, at pressure exceeding 125 Volts metal covers must be lined with insulating material.
- f) In position where they are liable to injury or come into contact with goods, they must be further protected by an open fronted box or other suitable guard.
- g) Handles must be insulated and so arranged that the hand cannot touch live metal or be injured through and adjacent fuse blowing.
- h) Switches having a handle projecting through an open slot in the cover, must not be used.

Signature of Contractor/s

Chairman APMC UNJHA

SECTION F-1 A

GENERAL REQUIREMENTS

1.1 Scope of works :

The work covered by electrical specification consists supplying and installing, electrical wiring system complete in strict accordance with this specification and the applicable drawing and subject to the terms and conditions of the contract.. It includes.

- (a) Conduit and wiring system for fans, lighting points bells, clocks sockets, etc. including fixing of lighting fixtures and fans etc and miscellaneous points.
- (b) Conduit and wiring system for exhaust fans, power sockets etc.
- (c) Panel boards, distribution boards. switch fuse units.
- (d) Complete power and lighting cable systems.
- (e) Grounding system.
- (f) Conduits system.

- (g) Street lighting system.

- (h) Other miscellaneous electrical work.

1.2 Completness of Contract:

Any work fittings accessories or apparatus which may not have been specifically mentioned in the specification but which are innecessary in the equipment for efficient working of the plant should be deemed to be included in the, contract and should be executed and provided by the contractors. All plant and apparatus should be complete in all the details, where such details, are mentioned in the specifications or not,

Three prints and one permanent negative of each of the finally approved drawings incorporating all the modifications proposed by the Department should be submitted. No modifications should be made in a drawing already approved by the Engineer-in-charge without his prior consent.

Approval of the contractor's drawing will not. relieve the contractor of any part of his obligation to meet all the requirements of the contract.

13 Guarantee:

The performance of all the equipment's and the installations should be guaranteed at least for a minimum period of one year from the date of taking over the installation by the Department. All equipment's must comply with the relevant IS-BS specifications,

1.4 Interchangeability:

All corresponding parts of similar plant and equipment should be. interchangeable in every way.

1.5 Tools:

All special tools required for dismantling and assembly of the equipment covered by the contract shall be supplied as obligation under the contract.

A list of items to be supplied by the Contractor should be submitted along with the tender.

SECTION F-2A

Specifications for Electrical Installation in Buildings

1. GENERAL

1.1 These specifications relate to the electrical installations in the buildings of P.W.D. Electrical. The specifications Cover general requirements to be fulfilled. These general specifications are supplemented by the specification for the particular buildings separately attached.

1.2 These specifications are governed by the General conditions of the contract attached hereto.

1.3 APPLICABLE RULES AND REGULATIONS:

1.3.1 Installation shall be carried out in conformity with the regulations for electrical equipments of buildings, published by-the institute of Electrical Engineers London (14th Edition 1966 and as amended upto date) herein after referred to, as the I.E.E. wiring regulations. Where these specifications. or the special specifications for the particular building attached hereto are at variance with the I.E.E. regulations these specifications or special specifications as the case may be, shall be to followed. The installation shall also comply with the requirements of the Indian Electricity Act, 1910 as amended upto date and rules issued there under and also the regulations for the Electrical Association of India. Where not specified otherwise, the installation should generally follow the Indian standard codes of practice and in their absence the relevant British Standard of practices. All the materials shall comply with the relevant Indian Standard of British Standard specifications.

1.4 DEFINITIONS:

1.4.1 The definition of terms in the I.E.E. Regulations shall apply in general.

1.5 DRAWINGS:

1.5.1 The preliminary drawings only indicate the general scheme of requirement. The exact position of all points, control switch boxes, nuns of wiring and/or conduits joint boxes, inspection boxes, mains, and sub-distribution boards, mains is etc. shall got approved by the Engineer-in-charge.. All circuits shall be clearly numbered lin wiring diagrams and building plans. The detailed design of a switch-board, special fixture or any other part of the electrical installation as may be called for by the engineer-in-charge shall also be supplied by the Contractor and should be got approved by the Engineer-in-charge,. Three sets of completion drawings and wiring diagrams showing the installations as executed shall be supplied by the contractor along with the completion certificate.

1.6 MATERIALS:

All materials shall be new and of the best quality conforming to the relevant I.S.B.S. specifications. They must be The product of reliable manufacturers of many years or standings. All like parts of materials shall be interchangeable. In case of equipments such as circuit breakers, switch f ' uses etc, a descriptive and illustrated literature shall accompany the tender. The names of manufacturers of various materials shall be furnished in proforma in Appendix-.I Samples of materials wherever required should be approved by the Engineer-in-charge before use in the installation. One set of such approved samples shall be deposited with the Engineer-in-charge. All materials shall be rust-proof or rendered rust proof by application of suitable paints. The supply of all equipments, switchgears etc. shall be complete with accessories, fittings and mountings as may be required-for their proper performance, and as specified in the relevant IS-BS Code of Practice and standards.

1.7 WORKMANSHIP:

1.7.1. Good workmanship and neat finished appearance are the prerequisites for complying with the clauses of these specifications. With a view to ensure fine workmanship the tenderers shall employ licensed wiremen, with an experience of not less than 5 years in the type of work they are engaged. The work should be done under supervisions of lincenced Electrical Supervisors with good educational qualifications land considerable experience.

1.7.2 Tenderers shall furnish the names of Supervisor and their wiremen who will be engaged in this work with details of their experience.

1.8 CO-OPERATIVE WITH CIVIL AND OTHER WORKS CONTRACTORS :

1.8.1. The tenderer, after the award of the contract shall co-operate with the civil and other contractors and shall co-ordinate his work with the work of other contractors with the least amount of dislocation and interference to the other works. Tenderers shall go through the drawings carefully and shall furnish the Engineer-in-charge with all the details of openings in the walls etc. they may be required for concealing any of the electrical equipments or accessories. Where the contractor fails to furnish such information as may be required for the purpose of concealing the equipments etc. they shall be made at his (Contractor) cost and expense. Any alteration to parts of the building shall be carried out with prior permission of the competent authority. All chases of the structural work shall be made good at the contractor's expense and brought to the original shape finish and colour.

1.9 TESTING:

The electrical contractor shall be completely responsible to the testing and commissioning of those installations covered by these specifications with the standard procedure, in obtaining permission of the Government Electrical Inspector. Any modification which is demanded by Government Electrical Inspector shall have to be carried out within the scope of the contract. The contractor shall submit four copies of drawings of installations as per regulations for shall be provided by the contractor for carrying out the installation work. All tests shall be carried out in the presence of the Engineer-in-charge or his authorized representative, and his approval obtained for the test results.

1.10 COMPLETION CERTIFICATE AND MAINTENANCE GUARANTEE:

1.10.1 After the completion of the installation and testing, the contractor should furnish a certificate in the proforma in Appendix- I 11, at the time of taking over the installation by the Department. The installation shall be guaranteed for a period of 12 months from the date of taking over by the Department. During the period of guarantee all defects in material or in workmanship shall be rectified or replaced free of cost to the Department.

1.11 TENDERER'S ABILITY:

1.11.1 In order to enable the Department to assess the ability of the tenderer to execute the work, the tenderer shall furnish evidence of his experience and capacity to carry out the work of the magnitude and nature.

1.12 RATES:

1.12.1 The rates of items shall include all taxes, transport, loading and unloading charge and all such charges that may be required to be incurred for the supply and installation of the materials at site. The rates shall be firm and variations in the market are not entertained. Break up figures as required in the schedule of work shall also be furnished. As far as possible indigenous materials only shall be included for supply. Where it is unavoidable, imported items may be included and tenderer should clearly indicate materials, quantity, rate and amount of these items.

1.13 STORAGE SPACE :

No covered storage space will be provided by the Department. The contractor has to make his own arrangement. However, the Department may give an open space near the place of execution where the contractor can build his own stores for executing the work.

1.14 DEPARTURE FROM SPECIFICATIONS:

The tenderer should clearly indicate departure, if any, from the specifications with reasons for the same.

1.15 EXTRA ITEMS:

Rates for extra items shall generally be derived from the rates already available in the schedule. Where it is not

possible, the rates shall be mutually agreed upon and the contractor shall furnish a detailed analysis of the rates claimed by him.

2.0 TECHNICAL SPECIFICATION:

2.1 Supply System:

The wiring installation shall be suitable for 3 phase 4 wire, 400-440 V 50 cycles system of supply. colour code of different phase shall be followed as per standard.

2.2 Wiring for Lights and Fans:

2.2.1 Looping system, of wiring shall be adopted. No joints shall be made at intermediate runs of cables and where they are unavoidable, such joints shall be through approved mechanical connections.

Point wiring

Point wiring shall consist of the branch wiring from the switch board together with the controlling switch or push as far as and including the ceiling rose or any other approved connector or socket, outlets. In case of more than one light being controlled by one switch, the wiring upto the ceiling rose of the first light including the switch shall be considered as a 'Primary point. Loop wiring from light shall be considered as a 'Secondary' point and rates shall be quoted separately, including final connections to fixtures and plugs.

2.2.3 Conductors:

No conductor for final sub circuit wiring for light and socket outlets shall have cross-section less than that of 2.5 sq.m. (aluminum).

2.2.4 Loading:

No final sub-circuit radiating from the fuse board of a sub-distribution board and wires with 25 sq. m. (Al.) cable shall carry more than 10 lights, fans or socket outlets or a connected load of 800 watts whichever is greater. The following wattages may be assumed for estimating the load on each sub-circuit unless otherwise known for specified.

Incandescent Lamps	100 watts
Ceiling fans	60 watts
5-A Socket Outlets (lighting)	100 watts
4. ft. fluorescent tube.	50 watts
5 ft. fluorescent tubes.	100 watts

In each sub-distribution board at least one way preferably two ways shall be left spare for future requirement. A wiring diagram giving the details of the exact utilization of the ways shall be prepared and fixed in the subdistribution board itself or any other easily accessible place. The ways of sub-distribution boards shall be accordingly numbered.

2.2.5 Local Control Switches (General):

Local control switches for circuit carrying not less than 5-5 shall be piano type and shall conform to relevant I.S. Standards. The switch shall be 'ON' when the knob is in the down position. All local control switches shall be connected in the phase or live conductor only and not in the neutral conductor, switches shall be fixed in iron clad box and shall be so placed that the centre of the switch box is 1.3 mtr, from the finished floor level unless otherwise stated. All switch boxes shall be provided with 1/8" thick perspex cover fixed to the switch box with chromium plated counter sunk screws (brass).

2.2.5A Switches (Two way):

- (a) Two way switches shall be piano type single pole, double throw, 250V suitable for flush mounting and of 5A - capacity as per the drawings. All switches shall be recessed in an embedded metal box.
- (b) Each box shall have suitable outlet for fixing conduits directly.
- (c) Each box shall have perspex cover painted inside with the wall colour, if required.
- (d) Each switch shall be suitable for the position in a corridor stairway I wiring.

2.2.5B Switch Boxes (General):

Electrical circuits shall be written suitably on the cover of all switch boxes, as approved by the Engineer-in-charge (Elect) whenever different phase are terminated in a switch box bakelite partition shall be provided. Each case shall be provided with a G. I. Earth stud nut and washers for earth connectors.

2.2.6 Ceiling Rose:

Ceiling rose shall be used on circuits having a voltage normally exceeding 200V. Only one flexible cord shall be attached to a ceiling rose. Only 3-pin 5A socket outlet shall be provided in lighting circuits. All socket outlets shall be provided with a control switch and they shall be mounted in switch boxes in an approved manner.

2.2.7 Fittings:

These shall be of approved type as specified in the tender schedule. The subcircuits leads should terminate in a ceiling rose or conductor in the fitting and internal connection made therefrom. Wherever these fittings are suspended they shall be done so through the conduits and ball and socket joints. All fittings shall be grounded by a G.I. conductor not less than 16 S.W.G.

2.2.8 Flexible wiring:

Flexible cords of not less than 23/0076 size shall be used. The weight of suspension shall be governed by I. E. E. Regulations.

2.2.9. Ceiling Fans:

All ceiling fans shall be wired to ceiling rose and suspended from a hook shackle or clamp and insulated from the same. All joints in the suspension rod shall be screwed and secured by means of split pins. The fans supplied by the Contractor shall be suitable for the ceiling or roof member as the case may be. For concrete roofs, fan hooks shall be buried in concrete during construction in an approved manner and securely bound to the reinforcement.

2.2.10 Conduits and Earthing:

All conduits feeding lighting and fan circuits shall be provided with earth continuity G.I. conductor as specified for power wiring. All conduits shall be as specified for power wiring.

2.3.1. Point wiring

Point wiring for power shall be as defined under section 2-2.2 and shall include the switches and sockets.

2.3.2. Loading:

All distribution board for power wiring shall be not less than 15A per way. Loading per way shall not exceed normally 100 watts. The following loads may be assumed if exact figures are not known. 3-Pin 15A Outlets 1,000 Watts 3-Pin 5A Outlets 100Watts

2.3.3 Wiring for Motors:

2.3.3.1. Final sub-circuits loop in motors shall be connected to separate ways of the Distribution board even if the current in the sub-circuit is less than 15A. No looping is permissible.

2.3.3.2 All wiring shall be carried in H.G. conduit as specified in I.S. specification for gauge for different sizes of conduits. When the motor is resiliently mounted flexible conduit with approved adapters shall be used for the last few feet. Where cables are used sufficient loop shall be left.

2.3.3.3 All switch fuse units controlling circuits feeding motor shall be provided with H.R.C. fuses or as specified.

2.3.3.4 The frame of every motor and its association control gear shall be earthed by two separate and distinct connections to earth connector shall be capable of carrying 3 times the rating of fuse or 1.1/2 time the setting of the circuit breakers but in no case less than No. 8 S.W.G. or 7064" or equivalent cross section of copper. Where practicable, the earth connections shall be visible for periodical inspection. Gas or water pipes shall not be used for earth connections.

2.3.3.5 Socket Outlets and Control Switches 5A and 15A:

All socket outlets shall be of 3 pin type, the third pin being connected to the earth stud of nearest distribution board by separate earthing wire. The socket shall conform to I.S : 1293/1938, single pole. piano type. Each socket outlets shall be provided with a control switch of appropriate rating and as specified. The switch and socket shall be mounted inside the iron clad box provided with 1/8" perspex cover as directed by the Engineer-in-charge or as specified in schedule of quantities. Inside switch box ample space shall be available around switches for connecting wires to switches. All socket outlets for power shall be mounted at the skirting level unless otherwise specified or as directed by the Engineer-in-charge

The three phase Plug receptacles shall have their earth terminals connected by independent earth wires to ring main earth strips on the building. In buildings where explosion proof fixtures are installed single phase plug receptacles as well as light points shall be connected to ring main ground bus installed in the building by separate earth wires of approved size.

Socket outlet shall have some. provision not to receive the matching plug unless the grounding pin is in correct position. The grounding pin of the plug shall make the contact first and break the contact last at the time of inserting or removing the plug respectively.

The grounding terminal shall be connected to the enclosed metal body by providing G.I. stud. nut washers welded to the box.

Each unit shall be suitable for flush mounting as required and indicated in the applicable drawings.

Combination unit of socket outlet and switch shall be complete with necessary internal wiring. The switch/socket shall be mounted on M.S. bracket enclosed in a box'.

2.4 Conduit Wiring:

2.4.1. Where conduit wiring is adopted the type and size of the conduit shall be as indicated in the drawing. The minimum of the conduit shall be 19 mm.

2.4.2. The contractor shall thoroughly study the structural arrangements of the buildings and wherever. necessary shall in consultation with Department's representatives at site, make suitable adjustments in the cable routings. earthing arrangements, and location boxes, fitting etc. with a view to avoid interference with any part of the building. structure. equipment or any other work in the building or to effect any improvement in the arrangement.

2.4.3 Protection of conduit against rust:

Conduit shall be given two coats of oxide ' paint before they are placed in position. All exposed conduit shall be painted after installation with the colour as approved by the Engineer-in- charge. This do not apply to galvanised conduit.

2.4.3.A Protection against insects and damp:

In order to minimise condensation or sweating inside the conduit. system shall be properly drained any ventilated in such a manner as to prevent the entry of insects.

2.4.4 Conduit shall first be installed as a complete system without cables and shall be continuous from Outlet to outlet from fitting to fitting and mechanically and electrically connected to all boxes and fittings.

2.5 SPECIFICATION FOR POWER CONTROL AND TELEPHONE CABLES

1. SCOPE:

i. The specifications cover the supply and installation of medium voltage power, control cables either in ground or trench depending on the conditions at site including accessories for the same. The work in general. consists of supplying, laying. jointing terminating and connecting all. 1. 1. KV APLSTS PVC power and control cables.

ii. The contractor shall supply all accessories including jointing and terminating materials, compound. Tapes supporting materials, cleats cables lugs, concrete stabs. bricks sand, cable markers etc. as required to make the installation work including digging and back filling of the trenches as required

II. SPECIFICATION:

I All power cables to be supplied mentioned as 'APLSTS' in the Schedule should be mass impregnated. non-draining. paper insulated lead sheathed, double steel tape armoured and must comply with the latest ISI BS specifications.

i. ii. All cabling materials such as cable compound, cable lugs, tapes shall be of approved quality acceptable to the type recommended by the manufacturer of the cable for which it is used and approved by the Department.

- III. Installation of all equipment shall also conform to the applicable. Codes and practice as per the IS and shall be executed to comply with the latest Indian Electricity rules as regards the safety, earthing of equipments and other essential provisions specified therein.
- IV. Only approved make of cable shall be used. ICC and CCJ will be preferred.
- V. The cables shall generally be laid as per is Code of practice.

GENERAL RULES CABLE LAYING

- i. Installation shall be carried out in a neat, workmen like manner by skilled experienced and competent workmen in accordance with the standard practices.
- ii. Cables shall be laid preferably in one piece length to avoid joints. If straight joints are found necessary, these can be introduced with prior approval of the Engineer-in-charge. The cost of the straight joint however, shall not be borne by the Department. But in no case joint shall be within the conduit G. I. pipe and duct.
- iii. Proper care should be exercised in handling the cable to avoid formation of kink etc. and should it become necessary a cable be bent to a radius not less than 20 times the overall diameter of the cable.
- iv. Method of installation, routing of cable etc. shall in every case be subject to the Department's approval and the contractor shall modify and or certify at no extra cost to the Department any portions of the installation which do not meet with the Department's approval. All damages to the civil and other works on this account shall be made good by the contractor at no extra cost to the Department.

The electrical contractor while notifying the building contractor for such work shall furnish the proper drawings, fully explaining the work involved or indicate at site actual work to be carried out as may be required by the building contractor. The electrical of- any Such work as soon as the electrical work with respect to the same has been completed.

- V. Where cables pass through hume pipes, contractor shall fix hard wood bushed round the cables at the ends of hume pipes. Where the cables pass through the floors or chambers and in such other situations as the Engineer shall require, the contractor shall seal cable holes in a manner approved by Engineer-in charge. Where cable pass through roads nallahs, etc. cables must be protected by Class 'A' Hume pipe of diameter not less than 6" (15cms.)
- vi. The cable route shall be the shortest and these shall be minimum interference with built up areas, lawns etc.
- vii. Care shall be exercised for providing suitable props for supporting other service lines on earth at the time of excavation. Where cutting of a lawn become inevitable it should be with the approval of the Engineer-in charge.
- viii. Excavation of the trenches shall be executed with vertical sides and the trenches shall be kept as- straight as possible. The exact location of each trench shall be settled by the Engineer- in-charge. On the site when the contract is in a position to commence each portion of the work.

The trench shall be not less than 1/2 meter wide and 90 cms deep. If more, cables are to be laid, the width should be suitably increased.

- ix. After the cables are laid, the trench shall be filled in layers, the, earth in each layer being well rammed by spraying water and consolidated and sufficient. allowance made for settlement. The extra earth over the trench should be removed from the place of trench to a place as decided by the Engineer- in-charge at site.
- x. Ends of cables shall be properly sealed to prevent entry of moisture prior to installation.
- xi. Where it is as specified as 112 core cables the 112 core shall be a neutral conductor having reduced section.
- xii. For all multicore cables each core and tails shall be brought out, marked and or Coloured in on approved manner.
- xiii. Cables termination shall be done with suitable compression brass glands in the case of PVC cables and cast iron triturating boxes in the case of APLSTS cables. The armour should be connected to the right main earth in building with duplicate earth wires as per the relevant IS/BS specification.

The core insulation over each conductor shall however be retained through out the run of the conductor upto the end where lugs shall be fitted thereon for connection. The lugs shall be fitted by means of approved solder and flux such as aleap. and Fyre No. 7 liberally used. The joint shall be mechanically. strong and pressure tested.

2.6 DISTRIBUTION BOARDS AND PANELS:

General Requirements:

- 2.6.2 All distribution panels shall comply with I.E.E. Rules 60- 61. A clear distance of 0.91 b metre in front of the switch board shall be kept, Where bare connections or attachments are provided at the back of the switch board the space behind the panel shall be either less than 0,299 metre or more than 0.762 main width there shall be a passage way from the furtherest, outstanding part of any attachment or conductor. If the space behind the switch board exceeds 0.70 main width. there shall be a passage way from either end of the switch borad clear to hight of 1.928 m width 0 299 in. All wiring connection shall be made neatly arid securely.
- 2.6.2 For crocoites carrying more than 10 Amps. tinned cable sockets shall' be used. All connections shall be so made as to form their own diagram Circuit shall be clearly numbered to correspond to wiring diagram Names of the distribution boards shall be painted as directed by the Engineer-in-charge. All the switch fuse units and isolators D. Bs. shall be complete with earthing studs lugs neutral bar link, H.R.G. fuses and of approved make.
- 2.6.3 Skeleton type panels shall have a rigid form work adequately braced and supported. The switch and distribution boards shall be neatly arranged in the frame. The details of the frame work arid the arrangement of switches shall be got approved by the Engineer-in-charge before the panel is fabricated.
- 2.6.4 All cubical type panels shall have rigid supporting frames adequately braced over which sheet metal shall be nearly secured. All switches, distribution boards etc. shall be -,fly arranged on the panels and all connections made from the back of switches. The panels shall be rendered dust and vermin-proof. The interior of the panels shall not be accessible to unauthorized persons.
- 2.6.5 The recess type boards shall be embedded in wall in a cupboard with a metal hinged door with locking arrangement. In all recessed conduit work all distribution boards shall be recessed. Where recessing is not possible, free standing panel may be provided as approved by the Engineer-in-charge.
- 2.6.6 All individual components i.e. switch fuse units D.Bs etc. shall be connected by earth continuity wire of appropriate size with the main earth bus of the panel D. B. etc. The panel switches or D. Bs. shall be earthed by the less than 2 distinctive paths to earth. Earthing of metallic parts of exposed metal shall not be effected through any structural metal work which houses the installation. Where metallic parts are not required to be earthed and are liable to become alive should the installation of the contractor become detective such metallic parts shall be separated by durable non-conducting material from any structural work.
- (a) Power panels shall be 3 phase, 4 wire, 400,230 volts for the distribution of 3 phase or single phase power loads. Lighting panels shall be 3 phase 4 wire 400/230 volts for single phase lighting load distribution on all 3 phase.
 - (b) All panels shall be done or protected front type with no mechanical or electrical defects.,
 - (c) Bus bars shall be of electrolytic copper or aluminium as specified and the properly tinned sizes as indicated on applicable drawings as required.
 - (d) All knock outs for branch circuits, conduit entries shall be drilled in and filled as required. For lighting panels the top and bottom cover plates shall be removable type.
 - (e) Main disconnect device for all panel boards shall be of switches of disconnect type and of the size as (i) Buses shall be securely supported so that ordinary vibrations will not cause any of the parts to become loose:
 - (j) All barriers and supports of current carrying parts shall be of Moisture resistant insulating material and shall not be adversely affected by arcing.
 - (k) The locations of panels shown in the drawings are only tentative, Panels may be located at a place approved by the Engineer-in-charge.
 - (l) All civil works connected with fixing such as grouting chiasing and making good shall be the tenderer's responsibility.
 - (m) Wires adequate capacity with proper size of.lugs shall be used for inter connections.
 - (n) Panel should be self supported on angle channel iron frame work. It should be preferably of bolted construction in case of transportation and flexibility. The frames shall be of the required size for the mounting of the equipment on it. It shall be bolted or grouted rigidly after levelling and alignment.
 - (o) The cupboard and D.B. should be of such size s, to be accommodated in the excising room as per I.S. rules and I.S. codes of practice for installations of Medium voltage switch gear

- (p) Fabrication drawing showing the detailed dimensions and panels and its components indicating the frame work. earthing positioning of switches, D.Bs. cable boxes, adopter chambers etc. shall be furnished to the Engineer-in-charge for his approval. All material to be got approved by the Engineer-in-charge. Panel should be guaranteed for satisfactory operations for a period of one year after handing over.
- (q) The panel should be painted with anticorrosive paint suitable for humid and salty atmosphere on two coats of primer.

Switch Gears, Powers Panels D. B. and S. F. Us.

- 2.6.8 The main busbar shall have continuous current rating as specified with neutral bar having half of full load rating of the phase busbar. The sizes of the bus bars shall be so selected that the current density in bar does not exceed 150 amps. per Sq.m. for copper. The length of bus-bar chamber should be as suitable length to fix all the switches etc. as per the prevailing standards, clear spacing of two adjacent buses shall be 1 1/2" minimum bar should be itaped all along with colour coated 11 KV grade PVC tape. The maximum internal of support for each unsupported length shall exceed 600 mm.

The bus bar shall be of copper/aluminum and fabricated to the relevant standards specification. In case alluminium bus bar is used special with high conductivity alluminium bus bar alloy E 91 C frame conforming to E.S.S. 2898 shall be used. The current density shall not exceed 800A per sq. inch. Hylam barriers will be provided over the joints to prevent any short circuit.

The bus enclosings shall be made out not less than 16 gauge M.S. sheet construct on with angle iron support. All interconnections between bus bars S.F. Us. and D, Bs. shall be of adequate size and details Of Such inter connection shall be furnished to the Engineer-in-charge for his approval.

The bus bar shall be air insulated extensible type rectangular one. The bus bars chamber shall be dust tight by providing gaskets secured properly so as to tender it vermin proof.

The Combination Fuse-switch unit should comply with IS 4064 BS 861 and BBS 2510 wherever applicable, It should be suitable to accommodate High Repturing Capacity Cartridge Fuse links complying with IS ~208 or BS 88 and having a certified rupturing capacity of not less than 35 MVA at 440 volts (ACS duly). The switch gear (panes. D. Bs. etc.) shall be installed generally as per IS-Part- 13072 and lias specified and shown in drawings. All fuse switch units shall be provided with non-deteriorating HRC fuse links complying with IS 2208-1962 and having rupturing capacity of 35 MVA at 415 volts or as Specified.

All switches above 60 amps. rating shall be provided with Suitable size adapted boxes. All switches mounted on the top of the busbars shall be provided with detachable type reverse entry adapter boxes. Suitably engraved labels shall be provided for each circuit as well as for the board.

indicated shall be mounted directly below the panel or through a short thread conduit of required size.

- (f) The main disconnect for all panel boards shall have an entry suitable for PVC armoured cable from bottom.
- (g) All panel boards shall be provided with an earthing terminal arid lug for connection to the grounding system.
- (h) Temperature rise of all electrical parts shall not be more than 30011 with full load amseres at room temperature. A meters sector switches and LMH met re shall be provided where specifically mentioned. Small Wiring fort he interconnecting shall be colour coded and provided with numbered fuses for easy identification of circuits.
- (a) The distribution boards should be totally enclosed metal clad complying with B. S. 214. The M. S. sheet steel enclosures for recessed D. Bs- shall be of riot less than 14 guage.
- (b) The D.B. shall be with hinded door and the locking arrangements as approved by the Engineer-in-charge.
- (C) All the components shall be enclosed in the enclosure. The mounting of D. B. shall be got approved by the Engineer- in-charge before carrying out the installation.
- (d) The D. Bs. shall have proper size cut Outs for conduits entry or cable entry as required and these shall be made on site
- (e) Adequate spacing shall be provided inside the D. Bs. for easy removal of the fuses and carry out the inter connection.
- (f) A set of insulating barriers have to be provided between incoming breakers switches and fuses

Switchfuse Units:

- (a) All the D.P.T.P and T.P.N. switch fuse units shall be totally enclosed iron clad quick make, quick break type to best Indian make conforming to the I.S. or B.S. 3185 specifications. All the switch fuse units shall have mechanical interlock with a door, so that the door cannot be opened when the switches are in 'ON' position. The switches should be of double break solution type to ensure safety.
- (b) Each T.P. & T.P.N. switch fuse unit shall be earthed with two distinct earth connections.
- (c) Suitable insulator shall be provided between phase.
- (d) There shall be suitable neutral link in the fuse box.
- (e) All T.P. & T.P.N. switch fuse units shall be rated for 500 volts and D.P. (required for single phase Supply) and S-P.N, switches for 250 volts.
- (f) The H.R.C. cartridge fuse shall conform to H.S, 88 (1952).
The O.C.Bs. ACB shall be suitable for 400/440 volts 3 phase 50 cycle supply capable of interrupting a fault MVA of not less than 31. The circuit breaker shall conform to the BSS-936-1940 BSS 3659 with such tripping arrangement as may be required under special specifications for the building. Efficient and foolproof mechanical interlocking shall be provided for the safe operation and maintenance. The rate shall be inclusive of the first filling of oil.

2.7 Instrumentation

The instruments and meters wherever necessary shall be housed in special sheet steel box located between switch fuse units and bus bar chambers. The instruments etc. shall be mounted on the hinged cover with their dial flushed. All instruments shall have protective H. R. C. fuse links. All interconnections and small Wiring shall be neatly dressed arranged and duly coloured for easy identification of circuits.

Meters shall be provided as required in the Schedule, Meters shall be dead head and be suitable for 400/440 volt 3 phase 4 wire 50 cycle (unbalanced load) Supply.

Each selector switch shall be 3 point and of minimum 250 volts grade with silver tipped contacts suitable for metering circuits, current transformers shall be of 5VA burden and commercial metering accuracy Indicating lamps shall be panel mounting type preferably of 250V grade. Every unit shall be prewired and interconnected to the system for its required indicating performance. Indicating lamps shall have independent circuit fuse.

2.8 FIXING OF LIGHTING FIXTURES:

1. Location of fixtures their manner of fixing mounting height etc. are indicated in relevant drawing. Actual location and levels shall however be arrived at site, in co-ordination with other services etc. and prior approval of the Engineer-in-charge regarding the actual location. Manner of fixing shall be obtained before the work is taken in hand.
2. In all cases the contractor shall provide necessary interconnection wiring earthing painting etc. all necessary to complete installation. the contractor shall also test and commission the fixtures during completion of the work.
3. General arrangement of fixtures layout is indicated in drawings. Care shall be taken to see that all light fixtures are in a row in a room or particular area, are in absolute line and plumb and are symmetrically disposed with respect to finished surfaces of walls columns beams etc.
4. The inter-connections wiring from the light outlet point up to the fixture shall be carried out by means of flexible copper wire of section not less than 1.5 mm².
5. All fixtures suspended by means of conduits shall be done with all and socket joints or as per approved design.

2.9 TELEPHONE SYSTEM :

1. Empty conduiting shall be done, recessed or exposed to surface along with pull boxes, junction boxes and telephone outlet boxes, in areas and locations indicated in the relevant drawing as per materials and methods as described in regard to conduiting under section " Wiring in Conduits" except the G.I pull wires of gauge not less than 20 SWG shall be kept pulled through conduits in all sections so that in future telephone wires can be pulled easily.
2. Location shown on the drawing are approximate and final location shall be decided in the field by the Engineer-in-charge

SECTION - G

SPECIFICATION FOR EARTHING

1. Installation of Earthing Plates :

All Installation of earthing shall conform to Indian Electricity Rules, IS-3043 latest edition and E.E. The copper earth plates should be tinned before installation. The earth plates of copper 60 cm x 60 cm x 3.515 mm thick size as mentioned in the schedule be in separate pits at least 150 cms to 300 cms. away from the building at a depth necessary to reach moist earth surface but with a minimum depth of 2.5 mtr from the finished ground level upto the top vertical dodge of earth electrode . The earth plate shall be throgly cleaned to remove all dirt from the surface and be tinned property for electrical contact with the pit, put over the vertical edge of earth plate (with top and of of pipe provided with a closed to couyler). Alternative layers of salt and coke shall be provided surrounding the plate. The pits shall be filled when the plates are in position and with the approval of Engineer-in-charge.

To facilitate watering the pit, a concrete compartment should be made with funnel with mesh and cover plate as per rules provided in ISI regulation. The masonry endousures shall be 25 cm x 25 cm x 25 cm (deep) with C.I. lid of 23 cm x 30 cms size. After installation, the earthing resistance of each earth plate should be measured by resistance meggar in the presence of Engineer-in-charge, three days after the completion of earthing work, and the value should conform to regulations.

SOR Make Approved

Makes of items should be within listed maks of prevailing schedule of rates and approved by Engineer incharge for nin SOR items make as for approved by Engineer incharge.