Roads & Building Department
Government of Gujarat

Division _____

TENDER
FOR
ELECTRICAL WORK

Name of work _____

_____

_____

Estimated Cost Rs. _____

Date of Issue of Tender _____

Last Date of Receiving Tender _____

Name of Work _____

_____

_____

INDEX

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Last Date of Receipt of Tenders by R.P.A.D. Dt. ___/___/_____

OR

* **Downloading of tender documents**	**From date ___/___/_____**
Start & End Date	**upto date ___/___/_____ Till ___:___ hrs.**

Issued to M/s._____

_____

Divisional Accountant / D.A.O.
Executive Engineer..

*** (Only in case of Tender above Ten lakhs)**

MEMORANDUM

1.	Name of Work	...	...	....
2.	Estimated Cost	...	...	Rs. .....
3.	Earnest Money	...	1%	Rs. .....
4.	Validity period of tender offered	...	...	(90/120*) days from the stipulated date of receiving tender if tenders are invited off line and no modification shall be allowed after handing over the tender to postal authorities. In case of on line tenders, the validity period shall be counted from the date of opening on line tenders, in case of single cover system tenders and from the date of opening technical bid in case of two cover system tenders
5.	Security Deposit -			
	(i) In the form of small Savings or Narmada Bonds or FDR of schedule bank (of minimum one year time limit)	...	2.5%	Rs. .....
	(ii) To be deducted from bills (Security Deposit)	...	2.5%	Rs. .....
	(iii) Performance bond of schedule Bank (In case of tender estimating Rs. 30 lacs or more)	...	5%	Rs. .....
	Total	....	10%	Rs. .....
(6)	Time limit	...	...	..... Months

*** Strike out which ever is not appliable**

*Vide R & GD G.R. No. TNC -1088 - 1B/1 (13) /C dated 4/5/1993 & revised vide G.R. No. TNC - 1088/IB/18/(13)-C, dated 31/8/94 & TNC -10-2013-3 (Part 1)-C dated 19-11-13 & TNC -10-2013-3 (Part 2)-C dated 20-11-13

Deposit furnished in the form of interest bearing document as per Item .4 (i) can further be extended for renewal if so desired and communicated by the Contractor in writing before one month from the date expiry date. Similarly Security Deposit deducted as the Item No.4(ii) can also be converted into interest bearing fixed term securities of schedule and Nationalised Banks. if so desired and communicated by the contractor in writing. The security Deposit will be released against Bank Guarantee as provided in Clause 3.8 of General Conditions of Contract..

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

(Receipt No. ..... dated ..... from the Government Treasury or Sub-Treasury at ..... in respect of sum Rs.* ....is forwarded herewith represesenting the earnest money + (a) the full of value of which is to be absolutely forfeited to Government should I/We not deposit the full amount of security Deposit specified in the above memorandum in accordance with Clause I of the said conditions, otherwise the said sum of above Rs. ..... shall be refunded).

Date :

Place :

*Digital signature of the contractor

** Signature of the contractor

(Witness)*** (At the time of execution of contract document)

Name and Address _____(Occupation)_____

* Digital signature of contractor before submission of tender.

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

*** Signature of witness to Contractor's signature at the time of execution of Contract document

The Above tender is hereby accepted by me on behalf of the Government of Gujarat

dated the _____day of _____201_____

Signature of The Executive Engineer,

_____ Division

Note : The normal rate of Security Deposit is 5 percent for works upto Rs. 30 lacs and further 5% as performance bond for works above Rs. 30 lacs. Out of 5% of Security Deposit 50% is payable at the time of acceptence 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

Upto the day of 200

in the form of "Tender for Electrical Works" hereto annexed

2. The tenderers shall state precisely in his tender the ty e 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 he 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 in 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 Gr eral 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 Ex. Engr._____
Division.

Department_____

6. The Governor of Gujarat does not undertake to accept the lowest or any tender.

Date : - 200

Executive Engineer

Original

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 recknoed 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 reasoable 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 Atithi/Vishram Gruha 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 incumbant in Jilla Panchayat at today.

Signature(s)

Dated at

The Date of 200

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

Dated at

The day of 200

Executive Engineer.

Duplicate

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 reckned 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 Atithi/Vishram Gruha 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 incumbant in Jilla Panchayat at today.

Signature(s)

Dated at

The Date of 200

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

Dated at

The day of 200

Executive Engineer.

GENERAL CONDITIONS

1. The work of the Electrical Installation shall be carried out as per I.S. Specifications I.S. 732-Code Part I, II & 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 the 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 paise 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 ballpen. (G.R.B. & C. Dept. No. TNC-1175-1113-853/198 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 and 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 plus costs of work in hand 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 occuring in one is as binding as though occuring 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) Specification

On 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) Specifications

In 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 the permit as far as possible by the contractor himself. Though the R. & B. Dept. will help to arrange for the 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 the controlled materials during the month to the Ex. Engr. of Every calender 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 shall remain open for 90/120* days. The validity period shall be counted from the stipulated date of receiving tenders if tenders are invited off-line.
In case of online tenders the validity period shall be counted from the stipulated date of opening online tenders in case of single cover system tenders and from date of opening technical bid in case of two cover system tenders. (R & B.D. G.R. No. TNC-10-2013(2)-C dated 10-5-2013)
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) as above then the Government shall without prejudice to any right remedy, be at liberty to forfeit in full the said earnest money absolutely.

15. The contractor shall employ only such labourers who shall produce a valid certificate of having been vaccinated against small pox within ia 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 gives 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. Challan for earnest money @ 1% of the estimated cost must accompany the tender. Tenderer may pay earnest money upto Rs. 50,000 in cash or in the form of Crossed Demand Draft or in case of tenderer is member of only IEEMA DEPOSIT AT CALL receipts of Nationalised or scheduled Bank drawn in favour if Executive Engineer, Divisional Officer concerned. However in respect of the works estimated to cost above Rs. 50 lacs, the amount of earnest money in excess of Rs. 50,000 can be offered by the contractor, at his choice, in the form of Bank Guarantee of the Scheduled Bank only. The Bank Guarantee in such cases will be furnished in the following form. In such cases also, the amount of first Rs. 50,000 will paid only in the form of cash or crossed demand drafts or fixed deposit recepits or deposit at call recepits worth the validity period of not less than 6 months of the nationalised or Scheduled Banks.
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 alongwith the tender.

BANK GUARANTEE

Where as M/s._____ (hereinafter called the Tenderer) is desirous and prefered to tender for works in accordance with the terms and conditions of tender for the work of _____ and where as We, Bank, agree to give the tenderer a guarantee for the Earnest Money.

1. Therefore, we hereby affirm that we are guarantors on behalf of the Tenderer upto total rupees _____ in words) Rs. _____ (in figures) and we undertake to pay to Executive Enigneer _____ Division _____ Department of Government of Gujarat the _____ (name of Govt. previous notice of judicial or to be specified), upto his first written demand, without demur, without delay and without the necessity of a previous notice of judicial or administrative procedures and without the necessity to prove to the Bank the defects or shortcomings or debits of the contractor any sum within the limit of Rs. _____

2. We further agree that the Guarantee herein contained, shall remain in full force and effect during the period that would be taken for the acceptance of tender.
However, unless a demand of claim under this guarantee is made on us in writing on or before the _____ (Date to be specified - will not be less than 180 days from the date of opening the tender) we shall be discharged form all liabilities under the guarantee thereafter.

3. We undertake not to revoke the guarantee during it currency except with the previous consent of the Executive Engineer _____ Division _____ in writing.

4. We lastly undertake not to revoke the gurantee for any charge in consitution of the Tenderer or of the Bank.

Date **Signature & Seal of Guarantor** _____

* Strike out whichever is not applicable.

19. Wires of I.S.I. mark will be allowed to be used on the work.

20. The rates should be written both in words and figures inclusive of all taxes and duties.

21. The percentage additions in total amount tendered of any items is not allowed however if over all reduction in percentage is offered the same should be stated in the prescribed clause added at the end of schedule 'B' in words and figures. If no reduction is to be made the gap should be filled in by the world 'NIL'.

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

22. 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) That 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.

23. 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 occuring 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 totalling 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.

24. Battens shall be teakwood for acceptable quality and shall be varnished before fixing in position.

25. Wooden-cup board should be polished on both the sides.

26. Whenever Government materials are issued, the contractor shall be responsible for the safe custody and proper use of the materials.

27. Loose electric fitting connectionshould be done at the time of handing over possession of building to the concerned civil or adminstrative department and accordingly after taking over possession of these connection concerned Civil/ Administrative department is responsible for fittings.

28. (i) Late tenders (i.e. tender received after the specified time of opening) Delayad 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.

29. (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.

30. GST where recoverable shall be deducted from bills for payment according to rules Prevailing at the time o payment.

Signature ofcontractor/s

Executive Engineer,

Division

Pages 7 & 8 are for E-tendering of Electrical Tender Form only

DATA SHEET For Electrical E-Tendering

(A) **Details of Tender Item :**

Sr. No.	Name of Work	Estimated Tender Value (Rs. In _____)	EMD (Rs. In _____)	Tender fee In Rs.	Total Security Deposit	Period for Completion of Work
1	2	3	4	5	6	7

(B) Eligibility : Registered in _____ Class or above / Pre-qualification

(C) **Schedule for e-tendering is fixed as under :**

(i) Site Visit (If any) — On date ___/___/_____ ; ___ ; ___ hrs.
Venue :

(ii) Downloading of tender documents Start & End Date — From date ___/___/_____
upto date ___/___/_____ Till ___ ; ___ hrs.

(iii) Online submission of bid — Upto date ___/___/_____ Till ___ ; ___ hrs.

(iv) Submission of EMD and Tender fee — Submission in electronic format only through online by scanning and then the same should be sent in original to Superintending Engineer _____ Circle _____ at the time of tender opening or send the same through R.P.A.D. So as to reach Executive Engineer _____ Division _____ within 7 days from the last date of opening

(v) Online opening of Bid — On date ___/___/_____ & ___ ; ___ hrs.
Venue

(vi) Bid Validity Period — 90 / 120 days from the end date of downloading Bids

- Bidders can download the tender documents free of cost from the website. www. rnb.nprocure.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 contract (n) code solution- a division of GNFC Ltd., who are licensed Certifying Authority by Govt. of India.

(D) (i) Bid inviting authority — Executvie Engineer _____ Division

(ii) Bid Opening Authority

(E) Mode of Quoting Rates — Percentage premium or rebate in words and figures at the end of Schedule B

The list of certifying agencies are as mentioned under :

Sr. No.	Name of Certifying Agency	Website Address
1.	(n) Code solution (G.N.F.C.)	www.gnvfc.com.
2.	Safecrypt	www.safescrypt.com.
3.	TCS	www.tcs.-ca.tcs.co.in
4.	MTNL	www.mtnltrustline.com

As a result of E-tendering the information / Instructions on Pages 4 to 6 following may be read as mocified below :-

General Conditions from Page 4 to 6 are substituted for E-tendering as below :

6. Deleted

7. In addition to the above the bid will also be liable to be rejected 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 authorised 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 on line 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 Specifications

   (ii) The bidder or the person authorised 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.rnb.procure.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 E.M.D. & Tender fee 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 the bid. Accordingly offer o those shall be opened whose E.M.D. & tender Fee is received electronically. However for the purpose o realization of D.D. bidder shall send the D.D. in original to Superintending Engineer _____ Circle _____ at the time of tender opening or send the same through R.P.A.D. So a to reach Executive Engineer _____ Division _____ within 7 days from the last date of opening. Penaltative action for not submitting D.D. in original to E.E. by bidde shall be initiated. D.D. for Exemption Certificate is not necessary. However Exemption Certificate shall hav to be submitted electronically through online. If the contractor does not remit the tender fee & the earnes money within the specified time his registration will be held in abeyance for one year & his tendering code wi be cancelled for one year.

Any documents in supporting of tender bid shall be submitted in electronic format only through onlin (by scanning etc.) & hard copy will not be accepted separately." (R.&B Circular No. ५३५-१०२००८ ५-स, dated 18-1-2008 & R.&B.D.G.R. No. Parach-102008-5-C (Partfile) dated 27-11-08)

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

GENERAL CONDITIONS OF CONTRACT

1. Definition of terms :

In construing these general conditions and the annexed specification the following words shall have the meaning here assigned to them unless there is something in the subject or context inconsistent with such constructions :

The "GOVERNOR OF GUJARAT" shall include his successors and assigns.

The "Engineer" shall mean the Ex. Engineer, Electrical Division, for the time being attached to the Public Works Department of the Gujarat State or such other officer as may be appointed by the Ex. Engineer, Electrical Division to supervise the work on behalf of the Governor of Gujarat.

The "CONTRACTOR" shall mean the Tenderer whose tender, shall be accepted by the Governor of Gujarat, and shall include the tenderer's legal personal representatives or successors and assigns.

"PLANT" shall mean and include any machine, fixed or movable, used for the generation or transmission of power or actuated by power.

"WORK" or "WORKS" shall mean the whole of the plant and material to be provided and work to be done, executed or carried out by the contractor under the contract.

The "CONTRACT" shall mean all the documents by which the agreement by the contractor to be provided to execute or carry out the plant work or works shall be constituted or in or by which the terms of such agreement or any of them are contained or set forth specially as per these General conditions, any special conditions attached to or issued, with these conditions, the specification, the Drawings, the invitation for Tenders (if any) or any other letter, notice or document upon or with reference to which the Tender is made and the schedule of prices (if any) furnished by the contractor with his Tender.

The "SPECIFICATION" shall mean the specification annexed to these General conditions and the Schedule thereto (if any).

The "SITE" shall mean the whole of the premises, buildings and grounds in or upon which the Plant work or works is or are to be provided, executed, erected, done or carried out.

The"DRAWINGS" shall mean the drawings issued with the specification which will ordinarily be identified by being signed by the Engineer and any further drawings submitted by the contractor with his tender and duly signed by him and accepted or approved by the Engineer and all other drawings supplied or furnished by the contractor or by the Engineer in accordance with these General conditions.

The 'SPECIAL CONDITIONS' shall mean the special conditions of contractor (if any) attached to general condition.

The "SCHEDULE"shall mean the schedule or schedules attached to the specification.

2. Contractor to inform himself fully :

The contractor shall be deemed to have carefully examined the invitation for Tender (if any) the general and any special conditions, the specification and Drawings and the Schedule of price (if any). In case of disordance or want of agreement between or amongst the several things herein described as the grounds or data of the contract, then these conditions shall have precedence of and be held to be more correct and binding and in like manner detailed drawings shall be held to be more correct, and binding than general drawings and in like manner drawing made to a large scale, or for special instruction, shall be held to be more correct and binding than drawing made to a smaller scale, or for general instruction and figured dimensions shall be held to be more correct than dimensions by scale but subject nevertheless in case of doubt or dispute as to any of the matters aforesaid to the determination and decision of Engineer as hereafter is more particularly mentioned and provided always that nothing herein contained shall limit the powers of the Engineer hereinafter mentioned.

3. Security Deposit :

3.1 Security Deposit is required to be furnished by the contractor as gurantee money for performance of the contract and observance of Contract Conditions.

3.2 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 assigness 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.

3.3 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 pecent 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 cash / Security Deposit to be deducted from Running Bills that become payable to the contractor from time to time.

3.4 In respect of the tenders above Rs. thirty lacs the contractor shall pay first five percent of Security Deposit as specified in part 3.3 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.

3.5 The work-order to commence the work shall be issued only after the security deposit as per Para 3.3 and 3.4 is paid / furnished by the tenderer. If the tenderer fail to produce the security deposit as above the earnerst money paid by him shall be forfeited and his registration shall be held in abeyance for three years from the date of such default.

3.6 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 therefrom 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.

3.7 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.

3.8 The full amount of Security Deposit deducted in cash from running bills will be released proportionaly as indicated in table below on production of Bank Guarantee of schedule Bank provided the contractor produces 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 alongwith the application for extension in time limit.

Table of proportionate release of Security Deposit :

Sr.	Monetary Progress	Portion of Security Deposit 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 1.66% of the estimated cost of work, whichever is less.	Equal to the amount to be released

3.9 It will have to be ensured that Ten percent amount of security deposit in any form as permissible above is kept available with the employer till the actual date of completion of work.

3.10Fifty percentage of the Security Deposit alongwith performance bond shall become refundable within fifteen days after the final completion certificate is issued as per Clause-25. 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 as per clause-25. The remaining fifty percentage of the security deposit shall be refunded after the expitry of the Defect Liability period as per clause-33 after deducting therefrom the amount of expenses, if any, due to Government under this contract. **(See Performance bond below)** (Modified as per R & B Circular No. TNC-10-2013-3-(Part 1)-C dated 19-11-2013 and GR. No. TNC-10-2013-3-(Part-2)-C dated 20-11-2013)

Annexure

PERFORMANCE BOND

(The date of this bond must not be prior to the date of the instrument in connection with which it is given).

.....

Principal (Contractor)

.....

Surety (Bank)

.....

Sum of bond (express in words and figures)

.....

Contract No. and date of contract

.....

KNOW ALL MEN BY THESE PRESENTS, THAT WE, THE PRINCIPALS AND SURETY above named are held and firmly bound upto the ..... hereinafter called the Employer in the amount stated for payment of which sum, well and truley to be made, we bind ourselves, our heirs, executors, administrators and successors jointly and severally, firmly by these presents subject to the provisions of which the aforesaid Contractor on demand and without demand on a claim being made by the Employer.

THE CONDITION OF THIS OBLIGATION IS SUCH, that whereas the principals have entered in to a contract with the Employer numbered and dates as shown above and hereto attached for the execution of work .....

NOW THEREFORE, if the Principal shall well and truly perform and fulfill all the undertakings, convenants, terms, conditions and agreements of said contact during the original terms of the said Contract and any extensions thereof that may be granted by the Employer with or without notice to the surety and during the life or any guarantee required under the contract and shall also well and truly perform and fulfill all the Undertakings, convenants, terms, conditions and agreements of any all duty and unduly authorized modifications of said Contract that may hereafter be made, notice of which modifications to the surety being hereby waived or shall pay over, make good and reimburse to the Employer all loss and damages which the employer may sustain by reason of failure or default on the part of said Principal so to do.

We ..... further agree that the guarantee herein Contained shall remain in full force and effect during the period that would be taken for the validity of the said Contract, and that it shall continue to be enforceable till all the dues of the employer under or by virtue of the Contract have been fully paid and its claims satisfied or discharged or till the Employer certifies that the terms and conditions of the Contract have been fully and properly carried out by the said Contractor and accordingly discharges the guarantee. Unless a demand or claim under this guarantee is made on us in writing on or before the ..... we shall be discharged from all liability under this guarantee thereafter.

IN WITNESS WHERE OF, the above bounded parties have executed this instrument under their several seals on the date indicated above the name and corporate seal of each corporate partly being hereto affixed and these presents duly signed by its undersigned representatives, pursuant to authority of its governing body.

In the presence of witness individual

Principal

1. ..... as to ..... (seal)
2. ..... as to ..... (seal)
3. ..... as to ..... (seal)
4. ..... as to ..... (seal)

by ..... affix Corporate Seal

Attested Corporate surety

Business address

Affix by ..... corporate Seal

Title

For and on behalf of the Employer

4. 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.

5. 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 the contractor.

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 under the Supervision & Control of Governor of Gujarat through the officer duly authorised on his behalf.

6. Excess over Tender quantities, Extra items & Variations in Specifications, Drawings etc. :

6.1 The Engineer-in-charge shall have power to make any alterations additions in or 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 alternation 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 manner above specified as part of the work shall be carried out by the contractor in the same conditions in all respects on which he agreed to do the work and at the same rate as are specified in the tender for the main work.

6.2 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 rate whichever is less.

6.3 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 received, increased or decreased by the percentage by which the tender amount is more or less as compared 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 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.

(iii) If it is not possible to arrive at the rate from (1) 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.

6.4 If the additional or altered work, for which no rate is entered in the "Schedule or 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 accourding 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 final and conclusive.

7. Workmanship and Materials :

The work shall be carried out in all respects with workmanship and materials of the best and most substantial 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.

8. 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.

9. Subletting of contract :

The contractor shall not without the consent in writing of the Governor of Gujarat under the hand of the Engineer assign or sublet the contract nor make any sub contract with any person or persons for the execution of any portion of the work other than for raw materials, or for any part of the work of which the manufacturers are named on his contract.

10. 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 the 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 under clause 16 may arise or be occassioned 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 owning 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.

Until the work shall be or deemed to be taken over as hereafter provided the Contractor shall also indemnify to Governor of Gujarat from and against all claims and demands, suits, proceedings, cost and expenses in respect in respect of or in connection with any injury to person or damage to property by whomsoever sustained or by defective design work or materials made, done, furnished or supplied by the contractor. The Contractor shall also be responsible for thefts of any property of the Governor of Gujarat or of others committed by any employees of his own or his subcontractors and shall be liable for the costs of replacing any property stolen.

11. Insurance :

Subject as hereinafter provided the contractor shall at his own expense insure and at all times prior to the commencement of the period of maintenance keep insured against destruction or damage by fire or earthquake storm and tempest such plant and materials ordered for the work as may for the time being be upon the site for the full value of such plant and materials.

12. Materials brought on the site :

All materials, tools and tackle brought to and delivered upon the site for the purpose of the work shall from the time of their being so brought vest in and be the property of the Governor of Gujarat but may be used for the purpose of the work but for that purpose only and not on any account be removed or taken away by the contractor or any other person without the express permission in writing of the Engineer, but the Contractor shall nevertheless (Subject as hereinafter provided) be solely liable and responsible for any loss or destruction thereof or damage unless resulting from causes beyond the Contractor's control not being causes insurance against destruction or damage from which is provided for in clause 11. The Governor of Gujarat shall have a lien on such materials, tools and tackle for any sum which may to any time prior to the completion of the works be due or owing to him by the Contractor under in respect of or by reason of the Contract and shall be at liberty to sell and dispose of any of such materials, tools and tackle remaining after the completion of the works in such manner as he shall think fit, and to apply the proceeds in or towards the satisfaction of such sum or sums so due or owing as aforesaid but subject to such lien and power of sale and disposal such surplus materials, tools and tackle shall being to the contractor and may be removed and disposed of by him as he shall think fit after the lien is withdrawn by the Engineer in charge.

13. Default :

If the Contractor shall at any time fail in the opinion of the Engineer to proceed with, the work with due diligence and expedition, or shall refuse, neglect or omit to comply with any orders given to him in writing by the Engineer in accordance with the provisions of these conditions or shall commit any other breach of the provision of the contract, the Engineer shall be at liberty to give notice in writing to the Contractor to make good the failure neglect, omission or breach complained of and should the Contractor shall fail to comply with any such notice within such period as may be prescribed in such period as may be prescribed in such notice then and in such case the Governor of Gujarat shall be at liberty to employ workmen other than those of the contractor to perform and execute the work in respect of which the failure neglect or omission referred to in such notice shall have been committed or occurred. If the Governor of Gujarat shall think fit, it shall be lawful for him to enter into a new contract with any other persons, or person, for the execution of such part of the work as may not have been executed and in that event the Governor of Gujarat shall without incurring any liability to the Contractor be entitled to use all or any of the materials, tools, tackle or other things which may then be on site for the purpose of completing the work or any part thereof and to provide any additional materials, tools, or tackle required for the purpose and the cost of executing any such work and providing any such materials shall be paid by the contractor to the Governor of Gujarat on demand.

Subject to and after satisfaction of the lien of the Governor of Gujarat for any sum due to him by the Contractor for any expenses, cost or charges incurred in the completion of the work, all materials, tools, tackle or other thing remaining on the site and unsold after such completion shall forthwith hereafter be removed by the contractor.

14. Replacement of Defective work or material :

If during the progress of the work the Engineer shall notify in writing to the contractor that in his opinion the Contractor has executed any unsound or imperfect work, or has supplied any materials inferior in quality to those stipulated for by the Contractor, the contractor shall at his own expense, within ten days of his receiving the notice, proceed with due expedition to remove or after and reconstruct or replace the work, or as the case may be supplied fresh materials up to the standard of the specification. In place of the work or materials complained of by the notice (as the case may be) and in case the contractor shall fail to do so the Governor of Gujarat may after expiration of ten days from giving of such notice give a further notice in writing stating that the Governor of Gujarat intention so to do forthwith at the cost of the Contractor remove the work or materials complained of and perform all such work or (as the case may be) supply all such materials in place of those complained of as may be necessary or proper in order to comply with the Contractor and the cost as certified by the Engineer of any such removed and performance of work or

supply of materials shall be paid by the contractor to the Governor of Gujarat on demand, provided always that nothing 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 of 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.

15. 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.

16. Maintainence :

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 calender 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 furthur defect in the work made good of replace which may develop during the reminder 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. If any defects or alterations which Contractor shall become liable to make good or make under this clause be not made good or made (as the case may be) within such time as the Engineer may prescribe for the purpose, the Engineer may proceed 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 good or making shall be paid by the Contractor to the Government of Gujarat on demand.

17. Contractor's Representative & workmen :

The contractor Shall employ at least one competent representive, whose name or names shall have previously been communicated in writing to the Engineer by the Contractor to Superintend the carrying out the works. The said representative, of if more then one shall be employed then, one of such representative, shall always be 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 give 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.

17.A Minimum age of persons employed and employment of donkeys or other animals :

(i) The Contractor shall not employ any person who is under the age 15 years.

(ii) The contractor shall not employ donkeys or other animals with breaching of string or thin rope. The breaching must be attest three inches side and should be tape (Nawar).

(iii) No animal suffering from sores, lameness or emaciation or which is immature shall be employed on the work.

(iv) If contractor does not accept the proceeding conditions No. (i), (ii), & (iii) his tender shall not be accepted and his name shall be removed from the list of contractors.

(v) The Engineer shall remove from the work any person or animal found working which does not satisfy these conditions and to responsibility shall be accepted by the Governor of Gujarat for any delay caused in the completion of the work by such removal.

17.B One percent of work done and payable in bills be recovered as contribution towards building and other construction workers welfare cess the certificate of deduction of welfare cess shall be issued to the contractor (R.&B.D. G.R. No. S.S.R. -10-2004-IB-41(24)-C dated 2-12-2006).

18. 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 the receipt of the samples, express in writing to the contractor his approval or otherwise of the samples deposited, and all materials, plant and stores used in the execution of the works must be in every way equal to the deposited samples.

All the deposited samples will be returned to the contractor within one month of the work being taken over :

19. 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.

20. Terms of Payment :

Subject to any deduction which the Governor of Gujarat may be authorised to make under the contract, the Contractor shall be entitled upon the certificate of the Engineer to the effect hereinafter stated **payments of R.A.Bills shall be made to the contractor as per items, in measurable units executed according to the specifications.**

If at any time the contractor shall be prevented for any period of not less than 30 days from causes within the control of the Governor of Gujarat either first, from delivering on the site any plant or material ready in India for delivery or secondly from proceeding with the erection at any plant or materials which he had already delivered on the site, the Governor of Gujarat shall bear the cost of storage and protection, including insurance in accordance with clause II, of the plant and material during such period in the first of such of contractor shall be entitled to payment of 80% percent of the value certified as aforesaid of the plant or materials delivery of which shall have been so prevented within one month from the date on which as certified by the Engineer such plant or material are so ready as aforesaid provided that all portions thereof have been suitably and sufficiently marked as being property of the Governor of Gujarat and are delivered into the custody of some person approved by the Engineer who has granted a receipt thereof.

Installments shall be due and payable by the Governor of Gujarat within one month from the date of each certificate of the Engineer.

21. Certificates of Engineer :

Every applications to the Engineer for a certificate must be accompanied by a detailed claim in duplicate) setting forth (in the order of the Schedule for price if any) particulars of the Plant or materials delivered and work executed to the date of the claim, and the certificate as to such of the plant and work mentioned in the claim as is in the opinion the Engineer in accordance with the contract shall be issued within 14 days of the application. No application for a certificate shall be made within 14 days previous applications.

22. Certificate not to affect rights of the Governor of Gujarat of contractor :

The Engineer may be any certificate make any correction or modification in any certificate previously issued, by him, any payment shall be regulated and adjusted accordingly. No certificate of the Engineer shall nor shall any payments on account by the Governor of Gujarat to the Contractor, nor extension of time for the execution of the works by the contractor which may be granted by or behalf of the Governor of Gujarat affect or prejudice any of the rights of the Governor of Gujarat against the contractor under or relieve him any of his obligations for or in respect of the due performance of the contract, or be interpreted as approval of work done or of material supplied.

23. Suspension of Work :

The Governor of Gujarat shall any 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.

24. Damages for delay in completion :

(i) If the Contractor fails to complete the work under contract by the stipulated date, he shall pay liquidated damages of Rs. 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 Proportionate to by the time in relation to the value of 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.

(iii) The aggregate maximum of liquidated damages payable under this clause shall not exceed Rs 0.1 percentage of contract value per day and shall be subject to the maximum amount of ten percent of the estimated amount put to tender.

(iv) Delays requiring payment of ten percent liquidated damages of the amount put to tender for performance shall be sufficient cause 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. 15 lacs, for performance) and registration of the contractor shall also be kept in abeyance for three years from the date as fixed in all such cases.

24-A If the Contractor shall desire an extension of the time for completion of work on the ground of his having been unavoidably hindered in it execution or on any other ground he shall apply in writing to the Ex. Engr. before the expiration of the period stipulated in the tender or before expiration of 30 days from the date on which he was hindered as aforesaid on with the cause for making for extension occurred whichever, is earlier and the Ex. Engr. may if in his

opinion. There are reasonable and bonafide grounds for granting, and extension grant such extension as he thinks necessary or proper. The decision of the Ex. Engr. in this matter shall be final.

No applications for extension of time for completion of work shall be considered unless it is received by registered post in the office of the Executive Engr. or left at his office and obtained receipt there of duly signed by the Ex. Engr. or his nominee authorised in this respect.

The date of receipt of application by the Ex.Engr. shall be considered as the date of application for the purpose of counting the period as mentioned above.

24-B. "If the contractor or his workmen, or servants shall break, deface, injure or destroy and part of the building, or the work in question in/or which they may be working or any building, road fence, enclosure or glass-land or cultivated ground contingence to the premises on which the work or any part thereof is being executed or if any damage shall be done to the work from any cause whatever before completion of the work or before the completion of the maintenance period whichever is later or any damages occurred/caused due to normal flood or rain or if any imperfection 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 his own expenses or in default, the Engineer-in-charge may cause the same to be good by other contractor, and deduct expenses (of which the certificate of the Engineer-in-charge shall be final) from any sums that may then be due or may thereafter become due to the contractor or from his security deposit or the proceeds of sale thereof a sufficient portion thereof".

24-C Force Major Clause :

Neither party shall be liable to the other for any loss or damage occasioned by or arising out of acts 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 Usruped 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 _____ year(s) which is on the available record.

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

25. 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.

26. 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 received 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.

27. Disputes to be referred to Gujarat Public Works Disputes Arbitration Tribunal :

The disputes relating to this Contract in so far as they fall within the jurisdiction of Gujarat Public Works Disputes arbitration tribunal shall be referred to the said Tribunal of Gujarat State.

However the reference to Arbitration Tribunal under this clause will not stay fulfilment of obligations of the contractor or rights of the Engineer-in-charge under this contract, unless otherwise ordered to the contrary by the said Tribunal as Interim Relief measure.

(The following clause is to be deemed included in this conditions only when Plant or Machinery is included in the Contract).

28. 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 of 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

ferrogallic prints mounted on cloth, of all drawings as approved shall be supplied to the engineer by the contractor respectively and shall thereupon the signed by the contractor and become the property of the Governor of Gujarat.

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

In the event of the Contractor desiring to keep in his own possession a signed copy of the drawings as approved he 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.

29. 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 workmen like manner and materials of the best and approved qualities having regard to their respective uses.

30. Tests on site :

In all cases where the special conditions are provided for tests on the site whether of plant, materials or workmanship the Governor of Gujarat except where otherwise specifically 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 accorance 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.

31. Delivery of plants & 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.

32. 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 authorised representative shall attend on that date at that 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 portion so failing shall if required by the Engineer or by the Contractor be repeated within a time to be fixed by the Engineer and ithe 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 contract 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 percent per annum upon the amount withheld or deducted in respect of such plant.

33. Rejection of Defective work :

If the works, or any potion thereof shall not in the opinion of the Engineer on the stipulated tests (if any) being made in accordance with the contract satisfy the contract condition within three months after the date of completion the engineer may give notice in writing to the contractor setting for the particular of the defects of particularts 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 employ with the requirements of the contract condition within the time so 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 of 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 weeks 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 enforecement of

penalties or otherwise in respect of any delay in the completion of this work.

34. Use of plant of works pending making good :

If at expiration of the time specified for making good, altering or replacing the plant of works in any notice given by the engineer to the contractor under the last preceeding clause the contractor shall not have duly made good, altered or replaced the same in accordance with the contract the Governor of Gujarat shall be at liberty if he thinks fit to make use of the same for such time as shall be reasonably sufficient according to the circumstances to enable him, to make good after or replace the same (whichever he may see fit to do) provided that in respect of the period of such user, the Govt. of Gujarat shall not be entitled to any damages under clause 24 of these contditions land in the case of complete replacement the contractor shall be entitled to be paid in reasonable sum for the same.

35. Workman's compensation in case of injury :

The contractor shall be responsible for any compensation and shall pay to his workmen Compensation payable for injuries under, the workmen's Compensation Act, 1923 (VIII of 1923) hereinafter called the said Act. If such comensation is paid by Govt. as principal under sub-section (1) of section 12 of the said Act, on behalf of the Contractor, it shall be recoverable by Government from the contrator under sub section (2) of the said section such compensation shall be recovered iin the manner laid down in clause 3 and 19 of the condition of contract.

36. The Apprentices :

The contractors shall afford or procure as the case may be 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 knowlecge of the technique and work of their trade industry, calling or profession.

37. 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 iagainst any claim of the Government is available such a recovery shall be made from the contractor as arrears of land revenue.

38. Appointment of Local Labourers :

The Contractor should as far as possible obtain the requirement of labourers 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 labourers locally, suitable local labours should be utilized to the maximum extent possible.

39. Fairwages :

If a contractor fails to pay within '7' (seven) days to the labourer (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 labourer (s) workers from his (contractor's) bill or deposit(s) payable by the contractor afte 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 foce 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.

40. Licence for contract labour :

Before starting the work, the contractor will have to obtain the licence 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 labourers to be employed on the work and will have to supply two true copies of the said licence to the Deputy Executive Engineer before the work is started.

41. Deduction of GST from bills :

The following Tax deductions shall be made from each bill payable to the contractor (1) 1% of the value of amount payable towards SGST. (2) 1% of the value of amount payable towards CGST. TDS Certificate for taxes deducted will be issued to the contractor. (F.D.G.R. No. GST/1017/1097/GST Cell dated 15-9-18)

Signature of contractor/s

Executive Engineer,
Division

SCHEDULE 'A'

Schedule showing (approximately) the materials to be supplied from the Public Works Store for work Contracted to be executed and the rates at which they are to be charged for

Particulars	Approximate quantity	Rate at which the materials will be charged to the Contractor		Place of delivery
1	2	3	4	5
		Unit	Rate in Rupees	

Note : 1. The person or firms submitting the tender should see that the rates in the above schedule are filled up by the Engineer-in-charge before the issue of the form prior to the submission of the tender.

Note 2 : Store to be supplied to contractors for a work free of cost should be mentioned in Schedule 'A' in addition to schedule 'B' and the specification attached to the contract agreement form.

Signature of contractor/s

Executive Engineer.

SCHEDULE 'B'

Memorandum showing items of works to be carried out :

(For works Estimated below Rs. 5 lakhs)

Items No.	Quantities estimated but may be more or less	Item of work	Estimated Rates		Unit	Total amount according to estimated quantities
			In figures Rs. Ps.	Inwords		
1	2	3	4	5	6	7
		As per seperate sheet attached				

I/We am/are willing to carry out the work at ..... % above/below percent (should be written in figures and words) of the estimated rates mentioned above. Amount of my/our tender works out as under.

* Estimated amount		* Estimated amount	
Put to tender	Rs.....	Put to tender	Rs. .....
Deduct : .....% below	Rs.....	Add .....% above	Rs. .....
Net	Rs.....	Total	Rs. .....
In words		In words	

* (Please strike out whichever is not applicable).

Note 1 - All work shall be carried out as per Public Works Department Handbook and other specifications of Division or as directed.

Note 2 - All the columns is Schedule should be filled in ink and the total of the entries in the last column should be struck by the contractor under his signature.

Note 3 - Rates quoted include clearance of site (prior commencement of work and at its close) in all respects and hold good for work under all conditions, site, moisture, weather etc.

Note 4 - To be continued on additional sheets, if found necessary.

Signature of contractor/s **Executive Engineer.**

SCHEDULE 'B'

Memorandum showing items of works to be carried out :

(For works Estimated above Rs. 5 lakhs)

Items No.	Quantities estimated but may be more or less	Item of work	Tendered Rates		Unit	Total amount according to estimated quantities
			In figures Rs. Ps.	Inwords		
1	2	3	4	5	6	7
		As per seperate sheet attached				

(A) Total Tendered amount Rs. .....

(B) Rebate on above tendered amount (if any)..... % (in figure) Rs. .....

(.....in words)

(C) Net tendered amount (A - B) Rs. .....

In words (Rupees .....)

Note 1 - All work shall be carried out as per Public Works Department Handbook and other specifications of Division or as directed.

Note 2 - Rates quoted include clearance of site (prior commencement of work and at its close) in all respects and hold good for work under all conditions: site, moisture, weather etc.

Signature of contractor/s **Executive Engineer.**

SPECIFICATIONS FOR ELECTRICAL WORKS IN GOVERNMENT BUILDING SUBJECT TO THE GENERAL CONDITION OF CONTRACT IN FORCE (1986)

GENERAL

1. 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 and 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 discription :

(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 centres 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 before hand by the Ex. 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 diagrams of the same on drawings to be supplied when available by the Executive Engineer, Electrical Division, and to the satisfaction of the Ex. Engineer, Elct. Dn, and these wiring iplans 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 or drawings.

6. Cables :

6.1 All cables shall conform to releveant Indian Standards.

6.2 Conductors of all cable except the flexible cable shall be of aluminium. The smallest aluminium conductors for the 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 minimumcross sectional area of such a cables 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 armour or though 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 signle 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 out lets : Points and exhaust ifans

8.1 Incondescent lamps installed in residential and non-residential buildings shall be rated at 60 wattas & 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. sockets 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 know 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 electrods Resistance test

9.2.1.1 The insulation resistance shall be measured between earth and ithe whole system of conductors or any section there of 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 pressuere 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 tha 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 pahse 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 order 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 devided by the number if outlet or when PVC insulated cables are used for wiring 12.5 megohms divided by number lof 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 lbe 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 envelops of cables in all cases shall be tested for electric continuity and the electrical resistance of the same alongwith the earthing lead but excluding any added resistance or earth leakage circuit breaker measured from the connection with the earth electrode tlo any point in the earth continuity conductor in the completed installation shall not exceed one ohm.

9.2.3.1 Earth Elecrode 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 auxillary electrodes.

9.3 On completion of an electric installation (addition and alteration) a certificate shall be furnished by the contractor countersigned by the certified Supervisor under whose direction supervision the installation was carried out. This certificate shall be in the prescribed form las given in Appendix-'B' 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 socked. 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 handel 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 specificed in the schedule of work or in the special specification. The front shall be fitted with hinged pannel 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 inadvertantly 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 pannel.

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 pannel 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 of entry. The wiring through out the installation shall be such that there is no break in the neutral wire except in the form of a linked switchegear. 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 earthel neutral conductor of a multi-wire system or a conductor which is to be connected thereto, an indication of a permanent nature shall be provided to identify the earther neutral conductor. In this connection Rule 32(3) 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 thich 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 thichness, 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 securily 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. Alternatively, hinged itype 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 switch board. If there are attachments of base connections at the back of the switch board Rules 51(1) (c) of Indian Electricity Rules, 1956 isgall 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 pannal of teak wood or other suitable materials. such as bakelite, or with unbreakable glass doors in trak 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 inadvertenty parsonal 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 pannel.No fuse body shall be mounted within 2.5 cm. of any edge of the panel and ino 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-hydroscopic, 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 fusas 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 pannel or flame.

13.7 Marking of Apparatus :

a) Where a boards 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,	Three wire system-2 outer wires
Yellow, & blue,	Positive red & negative blue
Natural-black	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, a fuse on the phase or live conductor and a link on the neutral or earthed conductor of leach 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 instalations 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 road 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 explosed 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 Tripple 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 boards 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 unnecesary 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 atleast 2.5 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 on 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 switchborad pannel to swing through an angle of not less then 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 sicket outlets, or a load of 800 watts whichever is less. The power circuits shall be designed with a maximum of two outlets per circuits 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 isolater 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 iin a straight line without

any twist or cross in wires, on other ends of such holes.

(a) 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.

(b) 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 such size which permits easy drawing in. The end of conduit shall be neatly bushed with porcelain, wood or other approved material.

(c) 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.

15.2 Where a wall tube passes outside a building so as to be exposed to weather, the outer end shall be belt mounted 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 aproved 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 witin 7.5 mm of the surface, thr 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 celling with wood plugs presents 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 metal work 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 fit tings. 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 cord. 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

18.2 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

Bayonet lampholders and all those for use flexible pandants 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 netural, 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 whether. In verandahs and similar exposed situations where pandants are used, they shall be of fixed rod type.

21.0 Lamps :

All incondescent 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 Tongster Filament General Service electric lamps.

22.0 Fans, Regulators and Clamps :

22.1.0 Ceilling fans :

Ceiling fans including their suspension shall conform to "IS 374-1960 specification for electric ceiling fans and regulators (Revised) & to the follwing 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 togeher 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 togeher. Fan clamps for steel joint shall be fabricated from tested flat iron to fit in 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 mm^2 with copper and 1.5 mm^2 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 Interchargeability :
Similar part of all switches, lampholders, distribution fuse- boards ceiling roses, brackets, pendants, fans and all other fittings of the same type shall be interchargeabale in each installation.

25.0 Conduit Wiring System :

25.1.1 **Type and size of conduit** - All conduit pipes shall be conforming to "IS : 1653-1964, 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 II.

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 burles left to avoid damage to the insulation of conductors while puling them through such pipes;

TABLE-II MAXIMUM PERMISSIBLE NUMBER OF 250-V
GRADE SINGLE CORE CABLES THAT CAN BE DRAWN INTO
RIGID STEEL CONDUIT

(CLAUSE 6.5.1.1)

Size of cable		Size of conduit (mm)													
Nominal Crossectional area.	Number and Diameter in mm of wires	16		20		25		32		40		50		63	
		(No. of cable Max)													
		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+	–	–	2	–	5	4	8	7	–	–	–	–	–	–
	7/1.40*	–	–	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	6	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 'B' apply to runs of conduit which deflect from the straight by an angle of more than 15°.

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°.

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 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 necessary 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 inpspection 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 system.

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 mm^2 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 continuty 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 6.5.1.10 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 longe 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 oulets 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