Bhavnagar Municipal Corporation

NOTICE INVITING ON-LINE TENDER

DETAILS ABOUT ON-LINE TENDER

Department Name	**Solid Waste Management Department (Bhavnagar Municipal Corporation)**
IFB No/Tender Notice No.	**BMC/SWM/2024-25/03**
Name of Project	**Beautification work for Iconic Road work under Nirmal Gujrat 2.0 Grant.**
Name of Work	**Beautification work for existing 18 mt. wide and 1.5 km long Iconic Road from Mahila Collage to Bhavnagar Airport in the city under Iconic Road, 'Nirmal Gujrat 2.0' Grant for Bhavnagar Municipal Corporation.**
Estimated Contract Value (INR)	**1,01,69,492.00(Excluding GST)**
Class of Registration required	**Class "C" and ABOVE**
Type of Contract	**Percentage Rate Tender**
Period Of Completion(in Months)	**6 Months**
Bidding Type	**Open**
Tender Currency Type	**Single**
Tender Currency Settings	**IndianRupee (INR)**
Joint Venture	**Not Applicable.**
Rebate	**Not Applicable.**

TENDER FEES &EMD DETAILS

Bid Document Fee (Rs.)	**3600.00 (Non-Refundable) (only DD)**
Bid Document Fee Payable To	**Commissioner, Municipal Corporation, Bhavnagar**
Bid Security/EMD(INR)	**1,01,695.00(only DD)**
Bid Security/EMD In Favor Of:	**Commissioner, Municipal Corporation, Bhavnagar**
Defect Liability Period	**36 months(Three Year) of the date of successful completion**
EPF registration no.	**The bidder shall have to submit valid certificate of registration for having EPF and ESIC number.**
Security Deposit- **Retention Money.** (i) **Cess**	Total 5% of Sanctioned Amount **5% from each RA Bill** as **Retention Money.** 1% cesswillbedeductedfromeach R.A.bill
SPECIAL CONDITION FOR SUBMISSION OF BG,SD,FDR:-	**For SD, FDR or Bank guarantee issued by State Bank of India will not be accepted. Bidder should submit FDR or Bank guarantee issued by other nationalized bank only.**

TENDERSCHEDULE&OTHERDETAILS

Bid Document Downloading Start Date	23/01/2025
Bid Document Downloading End Date	07/02/2025 -18:00 pm
Pre-Bid Meeting Date & time	28/01/2025 ,12:00 pm
Last Date & Time for Receipt of Bids(Submission of Bid)	07/02/2025 -18:00 pm **(online - Submission of Bid) ,** 11/02/2025 -17:00 pm **(PHYSICAL DOC - Submission ofBid)**
Bid OpeningDate (Preliminary Stage)	11/02/2025 -17:10 pm
Price Bid Opening Date	11/02/2025
BidValidity Period	**180 Days**
Remarks	1. **The EMD shall be produced in the form of DD only(Except SBI bank). EMD in any other form shall not be accepted.** 2. **Scanned copy of registration certificate, Similar Nature Of work experience certificate 3A will have to be uploaded compulsory.** 3. **CLASS OF REGISTRATION REQUIRED FOR BIDDER MUST BE " C " AND ABOVE. Demand Draft for tender fee & Emd shall be submitted in Electronic Formate through online scanning alongwith all the supporting documents such as Registration, Bank Solvency Certificate etc. while uploading thebid. Offer of those will be opened whose EMD & Tender fee is received electronically alongwith the bids. however for the purpose of realization of Demand Draft, bidder shall send them in original alongwith all the required documents mentioned in the tender documents through RPAD/Speed post/Reg AD so as they reach to the office of Exe. Engg. – Solid Waste Management Dept. Bhavnagar Municipal Corporation during office hours between 23/01/2025 to 11/02/2025 17:00 pm. Penaltative action shall identinitiated for not submitting the supporting documents in original to E.E. by bidder. Hard copy will not be accepted and considered.Successfull Bids (Preliminary & Technical Bid), if possible will be opened on the 11/02/2025, 17:10 pm at the DMC(admin)'s office - BMC**

OTHERDETAILS

OfficerInvitingBids:	**Executive Engineer – Solid Waste Management Department , Bhavnagar Municipal Corporation**
Bid Opening Authority:	**Tender committee**
Address :	**2nd Floor, Solid Waste Management Department, Bhavnagar Municipal Corporation, Sir, Mangalsinhji road, Kalanala, Bhavnagar-364001.**
Contact Details:	**Solid Waste Management Department - Exe. Engg. 9979945333 swmexnbmc@gmail.com**

GENERALTERMS&CONDITION

1	**The general terms & conditions are as per tender documents.**
2	**The cost of Tender document will not be refund under any circumstances.**
3	**The EMD shall be produced in the form of DD only(Except SBI bank). EMD in any other form shall not be accepted.**
4	**The offer shall bevalid for 180 days from the dateof opening ofBid.**
5	**TenderswithouttenderdocumentfeesEarnestMoneyDeposit(EMD)andwhichdonot fulfill all or any of the condition or submitted incomplete in any respect will be rejected.**
6	**Not more than one tender for single work shall be submitted by a tenderer. Bidder can submit the bid for the package individual. Bidder can apply as individual.**
7	**Conditional tender shall not be accepted.**
8	**Bhavnagar Municipal Corporation reserves the right to accept lowest responsive offer based on evaluation of package or rejects any or all tenders without assigning any reason.**
9	**Thenoticeshallformapart ofcontract document.**
10	**The tenderer are advised to read carefully the instruction and Eligibility criteria i.e. contained in the tender documents.**
11	**Theinternetsite addressforE- Tenderiswww.nprocure.com**
12	**Thedetailsofabovenoticewillbeavailableonwww.nprocure.com**
13	**In case bidders need any clarifications or if training required to participate in online tenders,they can contact (n)Procure** **Support team:-** **(n)ProcureCell** **403, GNFC Info tower, S.G. Road,** **Bodakdev,Ahmadabad–380054(Gujarat)** **ContactNo. +91-79-26854511, 26854512, 26854513 (EXT:501, 512, 516, 517, 525)** **TOLLFREENUMBER:1-800-233-1010(EXT:501, 512, 516, 517,525)**
14	**Bidders who wish to participate in this E-Tender will have to procure valid digital certificateas per information Technology Act 2000. Bidders can procure this certificate from any of the Government approved certifying agency i.e. consultancy services.**
15	**Bidders shall upload the tender documents after remit the tender fee and EMD in form of DD as mentioned above & same will be scan with all documents & purpose of realization of DD bidder shall sent original through RPAD up to datethe last day of uploading. This should be asperdetailsgivenonlineanditshouldberemittedbeforethelastdateofuploadingthetender. The intending bidders have to scan all necessary related documents. The biddersshould submit all forms electronically only.**
16	**The tender document for these work are available only in Electronic format which Bidder can be download free of cost.**
17	**Bidder shall submit their offer in Electronic format on above mentioned website on or before the scheduled date and time as mentioned after Digitally Signing the same. No offer in physical form will be accepted and any such offer if received by the Bhavnagar Municipal Corporation will be out rightly rejected.**
18	**The Technical Bid will be opened on the specified date online on website http://www.nprocure.com. Bidders or their representative who wish to participate in online tender opening can log on to http://www.nprocure.com on the due date and time, mark their presence and participate in online tender opening. Bidders who wish to remain present at BHAVNAGAR MUNICIPAL CORPORATION premiseatthetimeoftenderopeningcandoso.Onlyonerepresentativeof eachfirmwillbe allowed.**

19	**Interested bidders can view detailed tender notice and download tender documents from thewebsite i.e.http://www.nprocure.com**
20	**Bidders who wish to participate in online tender have to register with the website through the "New User Registration" link provided on the home page. Bidder will create login id & password on their own in registration process.**
21	**Bidderswho wish to participate ine-Tenderneed to filldata inpredefinedformsoftender fee, EMD, experience details and Price bid only.**
22	**Bidder should upload scan copies of reference documents in support of their eligibility of the bid.**
23	**After filling data in predefined forms bidders need to click on final submission link to submit their encrypted bid.**
24	**Bidders are requested to read carefully all instruction before submitting bid. Bidders also have to scan all documents without fail.**
25	**"D.D. for EMD & D.D. for 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. & TENDERFEEARERECEIVEDFORPURPOSEOFOPENINGTHEBID.Accordingly offer of those shall be opened whose E.M.D. & Tender Fee is received electronically;however,forthepurposeofrealizationofD.D.biddershallsendtheD.D.inoriginalthrough R.P.A.D.Soastoreachtoconcernedofficeasmentionedinthetenderdocumentswithin upto date from the last date of uploading i.e., 2024. For not submitting D.D. in original bidder shall be banned to participate in any tender of the Bhavnagar Municipal Corporation Board for period of 3 years as a penalties action.Anydocumentinsupportingoftenderbidshallbesubmitted inelectronicformatonlythrough online (by scanning etc.) & hard copy will not be accepted separately.**
26	**EXPERIENCE** **a)** The Applicant shall provide evidence that their firm has been actively engaged in the civil works construction of such type of civil work during the last 3 years in the role of prime contractor/partner. The work completed as sub-contractor shall not be considered for evaluation. **b)** Particular Construction Experience The applicant shall provide evidence that it has successfully completed or substantially completed within the last Three years i.e. from 01/04/2021, the works may have been executed by the Applicant as prime contractor or proportionately substantially completed works means those works that 100% completed as on date. And continuing satisfactorily on the date of application for this, the Certificate from the employer shall be submitted along with the application incorporating clearly the Contract value-billing amount, date of commencement of works. Satisfactory performance of the contractor and any other relevant information should be forwarded in enclosed forms. The works completed/ substantially completed during the current financial year will also be considered for counting the particular construction experience.
27	**QUALIFYING CRITERIA OF APPLICANT** The applicant who is not capable of meeting requirement listed below shall not be qualified for the works. Post qualification will be based on Applicants all the following minimum criteria regarding their particular experience, financial position, personnel and equipment capabilities and other relevant information as demonstrated by the Applicant's responses in the forms attached to the Letter of Application. The qualifications, capacity and resources of proposed subcontractors will not be taken into account in determining the Applicant's compliance with the qualifying criteria. The applicant to, note specifically that all information given including those in the form of various formats must be supported by certificates from respective authorities (not less than Executive Engineer or equivalent). a) Average Annual financial turnover during the last 3 years i.e. from 01/04/2021, should be at least 30% of the estimated Cost. (C.A. Certificate must be attached). b) Experience of having successfully completed Civil works/Similar works during last 3-years ending last day of month previous to the one in which applications are invited should be either of the following: (Experience certificate of Govt./Semi Govt body) if form-3A Submitted of Combined/Package work, the details of Component wise work and amount as per criteria shown in form-3A is necessary Submission of completion certificate in Form-3A format. And Form-3A of Completed Work in Joint Venture are not Valid. The valid is Form-3A of Completed work by agency only. (Copy of From-3A must be attached). i) Three Civil/Similar completed works costing not less than the amount equal to 40% of the Estimated cost Rs.1.01 Crore. OR ii) Two Civil/Similar completed works costing not less than the amount equal to 50% of the Estimated cost

	Rs. 1.01 Crore. OR iii) One Civil/Similar completed works costing not less than the amount equal to 80% of the Estimated cost Rs. 1.01 Crore. AND c) The Contractors/Companies having registration of Gujarat State PWD/CPWD of Registration "Class-C" (Must be attached). d) The Contractors/Companies having solvency certificate of National and Schedule Bank amounting as (20% of Tender Amount.) (Must be attached). **4A. Average Annual financial turnover during the last 3 years:** 1 Average Annual financial turnover during the last 3 years, ending 31/03/2024 of the previous financial year : 2 Attested copies of C.A. Certificate must be attached. : **4B. No. of works completed as per following (The details shall be furnishing in prescribed):** 1 Note: Nos. of works with: its amount completed during Last 3 years from 01/04/2021 to till date (for eligibility) : (i) 40% of tender amount or more : (ii) 50% of tender amount or more : (iii) 80% of tender amount or more : 2 Attested copies of completion Certificates for each completed from the client mentioned shall have to be attached. **4C. Solvency Certificate of Nationalized & Schedule Bank for (20% of tender amount)** 1 Solvency Certificate of Nationalized Bank for current year of (20% of tender amount) : 2 Attested copies of same certificates shall have to be attached. : (Note: No exemption is allowed in Solvency Certificate) **e) G.S.T. Certificate copy (Must be attached)** **f) I.T. Return copy of Last Three Years only (Must be attached) .** **g) Pan Card copy (Must be attached)** **h) P.F Registration copy (Must be attached)** **i) List of Tools and Machinery copy (Must be attached)** **J) List of Technical & Non-Technical staff copy (Must be attached)** **k) Original Affidavit of Anti-blacklisting on Non-Judicial stamp paper of Rs. 300/- (must be attached**)
28.	**DISQUALIFYING CRITERIA** Even though the applicants meet the above criteria, they are subject to be disqualified if applicant has: - Made misleading or false representation in forms, statements and attachments submitted, or Records of poor performance during the last 5 years as on the date of application such as abandoning the work, rescinding of contract for which the reasons are attributable to the non-performance of the contractor, inordinate delays in completion, consistent history of litigation awarded against the applicant or any of its constituents or financial failure due to bankrupt etc
29	**The rate should be quoted including of all tax but exclusive of GST.**

Contractor Signature

Executive Engineer
Solid Waste Management Department
Bhavnagar Municipal Corporation

BHAVNAGAR MUNICIPAL CORPORATION

NameofWork:- **Beautification work for existing 18 mt. wide and 1.5 km long Iconic Road from Mahila Collage to Bhavnagar Airport in the city under Iconic Road, NirmalGujrat 2 Grant for Bhavnagar Municipal Corporation.**

Executive Engineer
Solid Waste Management Department
Bhavnagar Municipal Corporation

MEMORANDUMOFWORKSINBRIEF

	Details of Works	
1)	**Nameofwork**	**Beautification work for existing 18 mt. wide and 1.5 km long Iconic Road from Mahila Collage to Bhavnagar Airport in the city under Iconic Road, Nirmal Gujrat 2 Grant for Bhavnagar Municipal Corporation.**
2)	**EstimatedCost-**	**Rs. 1,01,69,492.00**
3)	**EarnestMoney-**	**Rs.1,01,695.00.00**
4)	**Validityperiodoftender offered**	**180 Days**
5)	**Security Deposit-** **Retention Money.** (i) **Cess**	Total 5% of Sanctioned Amount **5% from each RA Bill** as **Retention Money.** 1% cesswillbedeductedfromeach R.A.bill
`6)	**Time allowed for completion oftheworkfromthe date of written order to commence**	**AsPerNIT**
7)	**Other details**	
	(i) **Dateonorbeforewhichthetendermustbesubmitted Online.**	**AsPerNIT**
	(ii) **Modeofsendingthe tender** **(b)Tenderssentbypost willbe Outright rejected.** **Descriptionessentialtobemade onbid** **Modeofquotingratein Schedule"B"**	a) Onlinethroghe-tenderingonly. a) Nameof Work. b) LastdateofReceivingthe tender
		Infiguresaswellaswords**Rs.AsPerNIT**

Executive Engineer
Solid Waste Management Department
Bhavnagar Municipal Corporation

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Clause 20 Damagetocontractwork-in-progressanddamagestosurroundingproperties

Clause 20-A Damages due to acts of God and unprecedented floods

Clause 21 Contractortosupplyplant,ladders,scaffoldingetc.andisliablefordamagearisingfromnon provision of lights, fencing etc.

Clause21-ARegulationsforscaffolds,workingplatforms,gangwaysandstairways

Clause 21-B Regulations for hoisting appliances

Clause22 Measuresforpreventionof fire

Clause 23 Liabilitiestocontractorsforanydamagesdoneinoroutsidework

Clause 24 Deleted

Clause25 Deleted

Clause26 Worknottobesublet,consequencesforunauthorizedsubletting,bringingandbecoming insolvent.

Clause27 Sumspayablebywayofcompensationtobeconsideredasreasonablecompensationwithout reference to actual loss

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Clause 36 Royalties

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Clause 37-A Liability of the contractor in case of accidents

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Clause 45Deleted

DATASHEET forB-1 E-Tendering

DetailsofTender Item:

Sr. No.	NameofWork	Estimated TenderValue (Rs.)	EMD (Rs.)	Tende Feein (Rs.)	TotalSecurity Deposit	Period for Completion of work
1.	**Beautification work for existing 18 mt. wide and 1.5 km long Iconic Road from Mahila Collage to Bhavnagar Airport in the city under Iconic Road, Nirmal Gujrat 2 Grant for Bhavnagar Municipal Corporation.**	**AsPerNIT**	**AsPerNIT**	**AsPer NIT**	**AsPerNIT**	**AsPerNIT**

(B) Eligibility:Registrationin**' C'&AboveClassorabove**/Pre-qualification:**Samework Experience Certificate.**

(C) Schedulefore-tenderingisfixedasunder :

(i) SiteVisit(ifany) : Ondate : As per NIT
: **Venue** **:BMC**

(ii) Downloadingoftender : From date :**AsPerNIT**
Documentsstart&Uploading end uptodate : **AsPerNIT**
date

(iii) Onlinesubmissionsofbid: uptodate *:***AsPerNIT**

(iv) Submission of EMD, Tender fee and other in physical formduringofficehours : Submissioninelectronicformatonlythrough only through online by scanning and documents then the same should be sent in original throughR.P.A.D./SpeedpostSoastoreachtheoffice ofBidOpeningAuthority. Executive Engineer, Solid Waste Management Department, 2nd Floor, Bhavnagar Municipal Corporation, Sir Mangalsinhji road, Kalanala, Bhavnagar-364001.

(v) OnlineopeningofTender: **AsPerNIT**

(vi) BidValidityPeriod : 180Daysfromtheenddateof Downloading Bids

- Bidderscandownloadthetenderdocumentsfreeofcostfromthewebsite https://tender.nprocure.com/
- BiddershavetosubmitBidinElectronicformatonlyonabovementionedwebsitetillthedate & time shown above.
- Offersinphysicalformwillnotbeacceptedinany case.
- Otherrequireddocumentsasmentionedbelow
  - RegistrationCertificateofApprovedcontractor
  - Banksolvencycertificate.(Minimum20%EstimateAmmount)
  - Partnership deed / Power of Attorney with certificate of registration of Firm (In case of partnership Firm)
  - ThreeYearIncomeTaxReturnfiled.
  - 3ACertificate
  - AgencymustproducePANCardNo,GST certificate,
  - Agencymustattachlistofworkon Hand,AttachWorkOrder Copy.
  - AgencyMustproduceC.ACertifiedturnovercertificateofthetenderamount equal to or more than tender amount for last three years.

- Agency mustproduce SelfAttached mentioning notblack listed in any work earlier or left work unfinished till date.
- AgencywillhavetoproduceEMDinformofFDRasmentionedinthe tender notice. (Note: EMD Exemption is not allowed.)

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 theirelectronicbids.BidderscanprocurethesamefromanyofthelicensecertifyingAuthorityof India or can contract (n) code solution – a division of GNFC Ltd., who are licensed Certifying Authoirty by Govt. of India.

(vii)	(i)	BidInvitingAuthority	Executive Engineer,Solid Waste Management Department Bhavnagar Municipal Corporation
(viii)	(ii)	BidOpeningAuthority	Executive Engineer, Solid Waste Management Department Bhavnagar Municipal Corporation
(D)		ModeofQuotingRates	Percentageinwordsand figures at the end of Schedule B

NOTICEINVITING TENDERS

1. The work is estimated to cost **of** **Rs.AsPerNIT**This estimate however, is given as a rough guide.
2. The work is required to be completed within **AsPerNIT**as per the terms of the contract conditions.
3. ThecontractorswhosenamesareborneoftheapprovedlistofcontractorsofGujaratStateR&B Deptt / W.R. D . in **'C' Class & Above**will be permitted to tender. Not more than one tendershall be submitted by a contractor or by a firm of contractors. No two or more concerns in whichan individual is interested as a proprietor and/ or a partner shall tender for the execution of thesame work. If they do so, all suchtenders shall be liable to be rejected.
4. Bid Document can be downloaded & submitted in Electronic Format on Online website : www.nprocure.com**from****As Per NIT**
5. Copies of other drawings and documents pertaining to tender and signed for the purpose of identification by the Accepting Officer or his accredited representative will be open for inspection bytenderersatthefollowingofficesduringworkinghoursbetweenthedates mentionedinclause-5 above.
   (a) Executive Engineer, Solid Waste Management Department Bhavnagar Municipal Corporation
6. Tenderers areadvised tovisitthe sitesufficiently inadvance of the date fixed for submission of the tender. A tenderer shall be deemed to have full knowledge of all the relevant documents samples, site etc; whether he inspects them or not.
7. Submission of a tender by tenderer implies that he has read this notice and all other contract documents and has made himself aware of the scope and specification of the work to be done and of conditions and rates at which stores, tool and plant etc. will be issued to him, by Governmentand local conditions and other factors bearing on the execution of the works.
8. The bidder should quote his bid premium or rebate at the end of Schedule-B. If he do not wish to quote premium or rebate, he should indicate "at par" in the blank space preceding "% above / below"in Schedule-B.Thereafterheshouldworkout andindifcate the offeredbid amount both in words in figures in Schedule-B.
9. Allratesshallbe quotedonE-Tendering System.
10. The tender for the works shall not be witnessed by a contractor or contractors who himself / themselves has/have tendered or who may and has/have tendered for the same works. Failure to observe this condition shall render the tender of the contractor tendering, as well as of those witnessing the tender, liable to rejection.
11. Theoffered bid willbe opened at **As Per NIT**hours on **As Per NIT**in the presence of bidders who maychoose to remain present in the office of the Bid opening Authority Specified in Bid documents.
12. ATenderershallsubmitthetenderwhichsatisfieseachandeveryconditionlaiddowninthis notice and tender documents, failing which the tender will be liable to be rejected.
13. The Commissioner, Bhavnagar Municipal Corporation does not bind himself to accept the lowest or any tender or to give any reasons for the decision.

Date:.....

Executive Engineer
Solid Waste Management Department
Bhavnagar Municipal Corporation

FORM B-1

Solid Waste Management Department

PERCENTAGERATETENDERANDCONTRACTFOR WORKS

કામો માટેનું ટકાવારી –દરવાળુ ટેન્ડર અને કોન્ટ્રાક્ટ

Nameofwork:Beautification work for existing 18 mt. wide and 1.5 km long Iconic Road from Mahila Collage to Bhavnagar Airport in the city under Iconic Road, Nirmal Gujrat 2 Grant for Bhavnagar Municipal Corporation..

1. Competency of Tenderer – No contract will be awarded except to responsible bidders capable of performingtheclassofworkscontemplated.Beforetheawardofthecontract,anybiddermayberequired to show that he has the necessary facilities, experience, ability and financial resources to perform thework in satisfactory manner with in the time stipulated. Contractor may be required to furnish the department with the statement as to their experience and their financial status.

2. Tenderer will be deemed to have inspected the site and to have satisfied as to the nature of all works, all existing roads, water-way and other means of communication and access to and from the site and work and the building that may be required for temporary purpose in connection with theconstruction,completionandmaintenanceoftheworksandmustmakehisownenquiriesasto work, yard sites and depot, and dumps and as to acquisition of such additional sites and areas as may be necessary for temporary purpose for construction, completing and maintaining the works.

2.1 (i)TheBidsshallbeofferedinElectronicformatonlyononlinewebsite www.nprocure.comtill the date and time shown on Page 2 supra.

(ii)Payment ofTenderFee andEarnest Money Deposit:Demand Draft for EMD and Tender fee respectively shall be submitted in electronic format only through online (by scanning) while uploading the bid. This submission shall mean that EMD & tender fee are received for purpose of opening the bid. Accordingly offer of those shall be opened whose EMD& tender fees is received electronically. However for the purpose of realization of D.D. bidder shall send the D.D. in original through RPAD so as to reach to Executive Engineer Solid Waste Management Department , Bhavnagar Municipal Corporation within mention dates from the last date of uploading. Penaltative action for not submitting D.D. in Original to E.E. by bidder shall be in initiated. D.D. for Exemption Certificate is not necessary. However exemption certificate shall have to be submitted electronically through online. Any documents in supporting of tender bid shall be submitted electronic format only through online (by scanning etc.) & hard copy will not be a accepted separately".

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

ContractorstopleasereadthisCarefully:કોન્ટ્રાકટરોએ નીચે મુજબની વિગતો કાળજી પૂર્વક વાંચવા વિનંતી છે.

1. The percentage in Schedule 'B' must be given in figures. Amount thus worked out must also be entered in column must be struck out by the tenderer.

2. If the tender is taken in favour of the company, a power of attorney in favour of the person who may have signed the tender for the company must accompany the tender.

3. Solvency certificate of a Bank or a Revenue officer of an amount up to 20% of the tendered cost plus the amount of works on hand still to be executed will have to be produced by the contractor.

4. Challan for earnest money @ 1% of the estimated cost must accompany the tender. Tenderer may pay earnest money up to Rs.**1,01,695/-** in the form of Crossed Demand Draft at-call receipts with a validity period of 12 months of Nationalised or Scheduled Bank(Except SBI Bank) drawn in favour of Commissioner Shri - Bhavnagar Municipal Corporation.Earnest money by cheque & Bank Guarantee shall not beaccepted. (vide R & B D G.R. No. TNC/1090/(100) (4)-C dated 4-11-2000)

   The contractors who have secured exemption certificate for payment of earnest money by depositing lump sumearnest money deposit need not pay earnest money, but produce thecertifiedcopytheexemptioncertificatealong with thetender.Ifthecontractordoes notturnupto pay the security deposit and execute contract agreement within specified (or extended) time after intimation to him about acceptance of his offer, the earnest money paid for this work will be forfeited and according toclause-1 of this tender form tenderer'stender shallbe rejected and then according to aforesaid provision of tender, action to black list the contractor will be initiated without delay. (Vide R & B D.G.R. No. Misc-1097-90-1091/97-Z/C dated 4-10-97)

5. TheContractor shallhaveto furnishPANandintimate I.T.wardunderwhich heis assessed..

6. Copiesofcertificateasregardspreviousexperience, ifany,mustaccompany thetender.

Declaration showing all works on handwith the Contractor and the value of works thatremains to be executed in each case must accompany the tender.

7. All pages ofSchedule 'A' and 'B' and specifications should be digitally initialled by the Contractor.

8. Inaddition totheabove,thetenderwillalsobeliabletoberejectedoutrightit.
   (i) The bidder proposes any alteration in the work specified or in the time allowed forcarryingouttheworkoranyconditionorcorrectionmadeinanycodeormodeofSchedule-B or Specifications.
   (ii) The bidder or the person authorized to sign on behalf of the bidder does not digitally sign the bid offer.

Signatureof theContractor

Executive Engineer
Solid Waste Management Department
Bhavnagar Municipal Corporation

DECLARATIONFORM

(i) I/We hereby declare that I/We have visited the site and fully acquainted myself/ourselves with the local situations regarding materials, labour and other factors pertaining to the work before submitting this tender.

(ii) I /We hereby declare that I/We have carefully studied the conditions of contract, specificationsand other documents of this work and agree for execute the same accordingly.

iii)We agree to receive payments, if delay is due to late receipt of grant – in – aid fromGovernment for panchyat works. (Applicable to panchayat works only)

DECLARATIONCERTIFICATE(G.R.date4-2-89asrevisedbyGR.No.TNC–1083/6681/4/C, dated 31-8-1994)

(iv) 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, DivisionalAccountant,StoreKeeper,ManagerorAtithi/VishramGruhaand inthecircleasaSuperintendingEngineer inadditionforPanchayatworks notworkingnorhaving posting as chairman of P.W committee or as incumbunt in Jilla Panchayat at today

Signatory's Name (Partnership firm, all partners are required to sign)

Place :

Date :

General Rules and Directionsforthe Guidance of Contractors

1. All works proposed to be executed by the contractor shall be notified in a form of invitation to tender pasted on a board hung up in the office of the Executive Engineer Solid Waste Management Department-Bhavnagar Municipal Corporationand signed by the Executive Engineer Solid Waste Management Department BMC.

   This form will state work to be carried out as well as the date of submitting and opening tenders and the time allowed for carrying out the work, also the amount of earnest money to be deposited with the tender and the amount of the security deposit to be paid by the successful tenderer and percentage, if any, to be deducted from bill. It will also state whether a refund of quarry fees, royalties, octroi dues and ground rents will be granted. Copies of the specifications, designs and drawing and estimated rates, and any other documents, required in connection with work which shall be signed by the Executive Engineer Solid Waste Management Department BMCfor the purpose of identification shall also be open for inspection by Contractor at the office of the Executive Engineer Solid Waste Management Department during office hours.

   Where the works are proposed to be executed according to the specifications recommended by a contractor and approved by a competent authority on behalf of the Governor of Gujarat, such specifications with designs and drawing shall form part of the accepted tender.

2. The Bidder or the person authorized to sign digitally on behalf of the bidder shall sign the bid document. The copy of legal status of bidder (Partnership Deed or Articles of Association of the company) alongwith other documents to be dispatched physically.

3. Receiptsforpaymentmadeonaccountof anywork,whenexecutedbyafirm,shall also besigned by all the partners except where the Contractors are described in their tender as a firm in which case the receipts shall be signed in the name of the firm by one of the partners or by some other person having authority to give effectual receipts for the firm.

4. The words “at what rate, he is willing to undertake each items of work in second line of this instruction may be substituted to read as at what percentage above or below he is willing to undertake the work”.

5. The officer competent to dispose off the tenders shall have the right of rejecting all or any of the tenders.

6. No receipt for any payment alleged to have been made by a Contractor in regard to any matter relating to this tender or the contract shall be valid and binding on Government unless it is signed by the Executive Engineer Solid Waste Management Department.

7. The memorandum of the work to be tendered for and the schedule of materials to be supplied by Public Works Department and there rates shall be filled in and completed by the office of the Executive Engineer Solid Waste Management Department before the tender form is issued. If a form issued to an intending tendererhas notbeenso filled inandcompleted, he shallrequest thesaid officerto have it done before he completes and delivers his tender.

8. Undernocircumstances shall anyContractorbe entitled toclaimenhancedratefor anyitems in this contract.

9. Every contract shall, unless exempted in writing by the Executive Engineer Solid Waste Management Department concerned, produce alongwith this tender a solvency certificate of his financial ability from the Collector of the District within which he resides or a Banker’s certificate. If he fails to produce such a certificate his tender will not be considered.

10. Themeasurementsofworkwillbetakenaccordingtotheusualmethodinuseinthe PublicWorks Departmentandnoproposalstoadoptalternativemethodswillbeaccepted.The Executive Engineer Solid Waste Management Department decision as to what is the usual method in use in the Bhavnagar Municipal Corporation will be final.

11. TheInsuranceCompany'sbondwillnotbeacceptedagainstthesecuritydeposit.

12-AIn event of any error or discrepancy in write up of tender documents the contractor will not take any undue advantage of such error or discrepancy and The Executive Engineer Solid Waste Management Department shall have powers to interpret and decide correct meaning of contradictory erraneous writing .

12. Thecontractorwillhave toconstructa shed for storing controlled and valuable materials issued to him under schedule 'A' of the agreement at work-site having double locking arrangement. The materials willthenbetakenforuseinthe presenceoftheDepartmentperson.Nomaterialswill be allowed to be removed from the site ofwork.

13. No foreign exchange will be released by the Department for the purpose of plant and machinery required for the execution of the work contracted for.

14. Controlledmaterials(EssentialityCertificate)

(i) As regard controlled materials, the Public Works Department will help to arrange for the permit as far as possible and help the Contractor in securing the same. All incidental charges met with in procuring these materials shall be borne by the Contractor himself. Though the Public Works Department will help to arrange for the permit as far as possible and help the Contractorin obtaining the materials, it shall not accept any responsibilityfor any loss or damage on account of delay caused to the Contractor while obtaining the same.

(ii) The contractor shall submit to the Executive Engineer Solid Waste Management Departmenton close of everycalender month the monthly returns in the prescribed forms as to the receipts and actual use of the controlled materials during the month.

(iii) The contractor shall permit the Executive Engineer Solid Waste Management Departmentor his representative to inspect the stock of the controlled materials stored by him at any time whenever the Executive Engineer or his representative so desire (s).

15. The tender for the work shall remain open for a period of120 days counted from the last date of on line submission of bid.

16. This condition shall apply only when the work is awarded to Labour Co-operative society. (1) If the members of by dividing work in group and give work to piece workers, the every purpose of the scheme would be defected. Therefore the Labour Co-operative Societies will not sublect the work and the work will be executed by the members labourers of the society.

(2) In case where th works required to be carried out by the labourers other than the mebers of the labours co-operative societies within the man days more than 25%, prior permission of the Executive Engineer will be necessary.

(3) The labour Co-operative Societies shall have to allow the officers of the Co-operation Department to examine for audit purpose the museter rolls as and when required.

(4) Labour co-operative societies shall have to submit a quarterly return staining the monthly attendance of man days on the muster rolls of member labourers on each to the District Register as well as Executive Engineer.

(5) If the Labour Co-operative Society is found violating the terms and conditions mentioned above the labour Co-operative Society will be liable for the cancellation of work contract and or registration as decided by the Executive Engineer. (vide GM No. LCS-1081 / (8) – H, dated 4-6-1986).

TENDERFORWORK

I/ We hereby tender for the execution for the Governor of Gujarat (hereinbefore and hereinafter referred to as Government) of the work specified in the underwritten memorandum within the time specified in such memorandum at +_____Percent below / above in the estimated rates specified inSchedule'B'(memorandumshowing itemof workstobe carriedout)and in accordanceinallrespects with the specifications, designs, drawings and instructions in writing referred to in this tender and in Clause13oftheannexureconditionsofcontractandagreethatwhenmaterialsfortheworkareprovided byGovernment,suchmaterialsandtheratestobepaidforthemshallbeasprovidedinschedule'A' hereto.

*Strike outwhich ever is not applicable
+In Figuresas wellas words.

MEMORANDUM–યાદી

(ક)જુદા જુદા પેટા કામોનો સમાવેશ કરવામાં આવેલતો તેવા કામોની યાદી અલગથી આપવી	૧) **Name of Work**	**Development & Beautification work for 18 mt. wide and 1.5 km long Iconic Road from Mahila Collage to Bhavnagar Airport in the city under Iconic Road, Nirmal Gujrat 2 Grant for Bhavnagar Municipal Corporation.**
(ખ) **Estimated Contract Value (INR)**		**Rs.AsPerNIT**
(ગ)**Earnest Money Deposit (EMD)**	1%	**Rs.AsPerNIT**
Security Deposit-Retention Money.		Total 5% of Sanctioned Amount **5% from each RA Bill** as **Retention Money.**
(ii) **Cess**		1% cesswillbedeductedfromeach R.A.bill

* Vide R & BDG.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.

(f) Timeallowedforthecompletionofworkfromdateofwrittenordertocommence**AsperNIT.**

GiveSchedulewherenecessary,showingdatesbywhichthevariousitemsaretobecompleted:

(g) Should this tender be accepted, I /We hereby agree to abide by fulfill all the terms and provisions of the conditions of the contract annexed here to so faras applicable and in default thereofto forfeit and pay to Government in Office the sums of money mentioned in the said conditions.

(ReceiptNo…….dated…….fromtheGovernmentTreasuryorSub-Treasuryat ……in respect of sum Rs. ……is forwarded herewith representing the earnest money + (a) the full of value of which is to beabsolutely forfeited to Government shouldI/We not deposit the full amount of security deposit specified in the above memoranduminaccordancewithClauseIofthesaidconditionsotherwisethesaidsumofaboveRs. …..... shallbe refunded.)

Contractor …… Address / ,……Dated the ……Day of ……200…..... 200
(Witness)…….……
…….……
(Address)……..
(Occupation)…….

The tender is hereby accepted by me on behalf of the Governor of Gujarat.
Datedthe…….Dayof……200…….

EXECUTIVEENGINEER(orhisauthorisedassistant ..... Division.

+Strike out(a) ifnocashEarnest Money is tobe taken* Amountto bespecified in words and figures

xSignatureofContractorbeforesubmissionoftender

Note:Thenormalrateof SecurityDepositis 5percentfor uptoRs.15 lacs andfurther 5% as performance bond for works above Rs. 15 lacs. Out of 5% of Security Deposit 50% is Payble at the time of acceptance of tender and the balance by deducation from progress bills.

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TERMS & CONDITIONS OF CONTRACT

CLAUSE1 :Security Deposit :

The person/persons whose tender may be accepted [here- in after called the Contractor, which expression shall unless excluded by or repugnant to the context include his heirs, executors, administrators and assignees] shall [within 10 days of the receipt by him of the notification of the acceptance of his tender] deposit with Municipal Commissioner cash or Government securities endorsed to the Municipal Commissioner sum sufficient which will make up the full security deposit specified in the tender.

If the amount of the security deposit to be paid in lump sum within the period specified above is not paid the tender contract already accepted shall be considered as cancelled. The security deposit lodged by Contractor shall be refunded after the expiry of the Defects Liability period after deducting dues, if any, which become liable to be recovered from the Contractor under the terms and conditions of this Agreement.

Sr. No.	Security Deposit & Retention Money	Description for payment and release.
1	**5%of Capital work** (Civil + Mechanical) amount as mentioned in tender document as **Security deposit**	Contractor shall provide in the form of crossed demand draft / pay order / BG in favour of the Municipal Commissioner, Bhavnagar on any Nationalized Bank / Schedule bank / Banks mentioned in BMC circular Bank / Schedule bank/Banks mentioned in BMC circular, payable at Bhavnagar only. **5% will be released after Completion of Civil and Mechanical Work** and after due clearance from Audit Department of BMC without any interest. The amount will be paid as per the payment terms and conditions of Bhavnagar Municipal Corporation.
2	**5% from each RA Bill** as **Retention Money.** Bhavnagar Municipal Corporation reserves the rights to increase or decrease Percentage for Deduction of Retention Money**.**	Retention money shall be refunded only **after completion of the defect liability period of 36 months** and after rectifying the defects found, if any, within defect liability period and after due clearance from Audit Department of BMC without any interest as intimated by Bhavnagar Municipal Corporation.

Note: - Release of Any kind of Performance Security will be subjected to that any defect if found shall have to be rectified /complied as per the direction given by Engineer in Charge, within the said periods and after due clearance from Audit Department of Bhavnagar Municipal Corporation.
Or

After tender accepted 2.50% Security deposit is to be paid in form of FDR/BG pledge in the name of **Commissioner**, Municipal Corporation, Bhavnagar from any nationalized Bank, reputed Schedule Bank, and valid for three year and 2.50% Security deposit amount will be deduct from running bills of the contractor. The 5.00% amount of security deposit will be kept up to defect liability period of 3(three) years and 5.00% as performance bond is to be inform of FDR/BG in the name of **Commissioner**, Municipal Corporation, Bhavnagar at the time of agreement and same will be Kept up to Completion Certificate of the Work and 1% amount of running bill will be deducted from the bill as labour cess. Prices quoted by the bidder shall be firm for the entire period of Contract without any escalation. And prevailing income tax deducted from each bill and Income tax will be deducting from contractors each bill as per prevailing rate of Government.

CLAUSE2: Liquidateddamages fordelay :-

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

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

*AScorrected vide B &C D GRNo. TNC– 1091– 1B–10 /(11) –C, dated 29-6-92.

(iii) The aggregate maximum of liquidated damages payable under clause No.2 shall not exceed 0.10 Percentageofcontractvalueperdayandshallbesubjecttothemaximumamountoftenpercentageofthe estimated amount put to tender.

(iv) Delays requiring payment of tenpercentage liquidated damages of the amount put to tender for performance shall be sufficient causes for termination of contract and for forfeiture of security deposit including amount of performance bond in respect of works estimated to cost more than Rs.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 cases. (See Schedule (C)on Page No 48)

CLAUSE3 :Default by Contractor :

If the Contractor shall neglect on fail to proceed with the work with due diligence or if he violates any of the provision of the Contract, the Executive Engineer Solid Waste Management Department shall give the Contractor a notice, identifying deficiencies in performance and demanding corrective action. Such notice shallclearly state that it is given under the provision of this clause. After service of such notice, the contractor shallnotremove any plant, equipmentand materialfromthe site. The Governmentshall havea lien on allsuch plant,equipmentandmaterialfromthedateofsuchnoticetillthesaiddeficiencieshavebeencorrected as mentioned in the said notice.

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

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

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

CLAUSE 4:

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

(Clause 2,3 and 4 are substituted vide GR NO. TNC –1091/IB-10/(11)-C , dated 15-10-91 & modified byGR dated 29-10-91 & G.R.No. TNC-1088/IB/18/(13)-C dated 31-8-94 and No. TNC/10/2002/14-C, dated 28- 4-03 and 10-9-03)

CLAUSE 5:

In any case in which any of powers conferred upon the The Executive Engineer Solid Waste Management Department by clause-3hereofshallhavebecomeexercisableandthesameshallnothavebeenexercised,thenon-

exercise thereof shall not constitute a waiver of any of the conditions hereof and such powers shall not with standing be exercisable at any future date.

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

CLAUSE6:Extensionoftime:
If the contractor shall desire an extension of the time for completion of the work on the ground of his having been unavoidably hindered in its execution or any other ground he shall apply in writing to the Executive Engineer Solid Waste Management Department before the expiration of the period stipulated in the tender or before the expiration of 30 days from the date on which he was hindered whichever is earlier and the Executive Engineer Solid Waste Management Department, if in his opinion, believe that there are reasonable grounds for granting an extension, grant such extension as he thinks necessary or proper. The decision of the The Executive Engineer Solid Waste Management Department in this matter shall be final

CLAUSE 7:
AssoonastheworkiscompletedthecontractorshallgiveanoticeofsuchcompletiontotheEngineer-in- charge and on receipt of such notice the Engineer-in-charge shall inspect the work and if he is satisfied that the work is completed in all respect then :-

(i) For all works costing upto Rs.50 lacs (amount put to tender) the final measurements shall be recorded within45daysfrom thedateofphysicalcompletionoftheworkandthefinalbillshallbepreparedwithin 45 days from the date of recording final measurement. The completion certificate shall be issued within one month from the date of final measurement subject to the contractor fulfilling his obligation as provided in the contract and subject to the work being complete in all respects.

(ii) Inrespectof works costingmorethan Rs.50 lacs(amount putontender), thefinalmeasurementsshall berecordedwithin75daysfromthedateofphysicalcompletionoftheworkandthefinalbillshallbeprepared within 75 days from the date of recording final measurements subject to the contractor fulfilling his obligations as provided in the contract and subject to the work being complete in all respects.

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

No certificate of completion shall be issued nor shall the work be considered to be complete till the contractor shall have removed from the premises, on which the work has been executed, all scaffolding, sheds and surplus materials, except such as are required for rectificationof defects; rubbish and all huts and sanitary arrangements required for his workmen on the site in connection with the execution of the work, as shall have been erected by the contractor for the workmen and cleared all dirt form all parts of building(s) in, upon or around which the work has been executed or of which he may have possession for the purpose of the execution thereof and cleared floors, gutters and drains, cased doors and sashes, oiled locks and fastenings labeled keys clearly and handed them over to the Engineer-in-charge or his representative and made the whole premises fit for immediate occupation or use to the satisfaction of the

Engineer-in-charge.ifthecontractorshallfailtocomplywith anyoftherequirements ofthese conditions as aforesaid, on or before the date of completion of the works, the Engineer-in-charge may , at the expenses of the contractor, fulfill such requirements and dispose of the scaffolding, or surplus materials and rubbish etc. as he thinks fit and the contractor shall have no claim in respect of any such scaffolding or surplus materials except for any sum actually released by the sale thereof less the Cost of fulfilling the requirements and any other amount that may be due from the contractor. If the expenses of fulfilling such requirements is more than the amount realised such disposal as aforesaid the contractor shall forthwith,on demand, pay such excess. The Engineer-in-charge shall also have the rights to adjust the amount of excess against any amounts that may be payable to the contractor.

CLAUSE8:

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

CLAUSE 9:

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

CLAUSE10:Billsto be submittedmonthly:

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

CLAUSE 11:

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

CLAUSE 12:

If the specification of the work provides for the use of any special description of materials to be supplied from the Departmental Store or if it is required that the contractor shall use certain stores to be provided by the Engineer-in-charge (such materials and stores and the prices to be charged therefore as here inafter mentioned being so far as practicable for the convenience of the contractor but not so as in any way to control the meaning or effect of this contract specified in the schedule or memorandum here to annexed) the contractor shall be supplied with materials and stores as may be required from time to time to be used

by him for the purpose of the contract only, and the value of the full quantity of materials and stores so supplied shall be set off or deducted from any sum then deposit, or the proceeds of sale thereof, if the deposit is held in govt. Securities , the same or a sufficient portion thereof shall, in that case be sold for the purpose . All materials supplied to the contractor shall remain the absolute property of Govt. and shall on no account be removed from the site of the work, and shall at all time , be open to inspection by the Engineer-in-charge. Any such materials, unused and in perfectly good condition at the time of completion or termination of the contract , shall be returned to the Departmental store if the Engineer-in- charge so requires by a notice in writing given under his hand, but the contractor shall not be entitled to return any such materials except with the consent in writing of the Engineer-in-charge and he shall have no claim for compensation on account of any such material supplied to him as aforesaid but remaining unused by himor for any wastage in or damage thereto.

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

CLAUSE12A:
The contractor shall be entitled to use the materials supplied by the Department only to the extent of quantities of such materials required for execution of the work as per theoretical calculations. The Engineer-in-charge may however, on being satisfied that a large quantity of such materials is required for the execution of the work, permit the contractor to use such large quantity of the materials. Such permission shall be given in writing.

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

CLAUSE12B:
All stores and materials such as cement, if the consumption of which exceeds 25 tons and steel etc. supplied to the contractor by Government shall be kept by the contractor in separate godown provided with a double lock. The key of one of the lock shall remain with the Engineer-in-charge or his agent. The godown shall be accessible to the Engineer-in-charge or his agent at all times. No materials shall be allowed to be removed from the site of the work and any material required for the execution of the work shall be taken out from the godown only in the presence of a duly authorised agent of the Engineer-in-charge

CLAUSE13:
(1) The contractor shall execute the whole and every part of the work in the most substantial and workman-like manner and both as regards materials and in other respects in strict accordance with specifications.

The contractor shall also confirm exactly, fully and faithfully to the design, drawings and instructions in writingfortheworksignedbytheEngineer-in-charge.Thedesignandthedrawingsshallbelodgedinthe office of the site Engineer-in-charge to which the contractor shall be entitled to have access for the purpose of inspection at such office during officehours.
Where the instructions referred to above are not contained in separate letters addressed to the contractor the same shall be recorded in the work-order book, which shall be maintained and kept on the site of the work.Thecontractor shallberequiredtosignsuchentireinthework-orderbookintokenofhavingnoted the instructions. However, if the contractor fails to sign the work-order book for any reason whatsoever, the entry of the instructions in the work-order book shall be deemed to be the due notice to him of thesaid instructions. The work-order book shall be open for inspections to the contractor on the site of the work during office hours.

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

(3) The several documents forming the contract are essential parts of the contract and requirements occurring in one is binding as through occurring in all. They are intended to be mutually explanatory and complimentary and to describe and provide for a complete work.
In the event of any discrepancy in the several documents forming the contract or in any one documents , the following order ofprecedence should apply.

(a) Dimensionandquantities:(i)Drawings (ii)Schedule-BoftheTender form(iii) specification.

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

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

CLAUSE 14.1:
The Engineer-in-charge shall have power to make any alterations in or addition to the original specifications, drawings, designs and instructions that may appear to him to be necessary or advisable during the progress of the work and the contractor shall be bound to carry out the work in accordancewith any instructions in this connection which may be given to him in writing signed by the Engineer-in-chargeandsuchalternationshallnotinvalidatethecontractandadditionalworkwhichthe contractormay be directed to do in the manner above specified as part of the work shall be carried out by the contractor onthesameconditionsinallrespectsonwhichheagreedtodothemainworkandatthesamerateasoutbythecontracto ron thesameconditionsinallrespectsonwhichheagreedtodothemainworkandatthe same rate as are specified in the tender for the main work.

14.2. Except that when the quantity of any item exceeds the quantity as in the tender by more than 30% the contractor will be paid for the quantity in excess of 30%at the rate entered in the S.O.R. of the year duringwhichtheexcessinquantityisfirstexecutedandforthematerialsconsumedinexcessquantitythe rateforthematerialstobechargedwouldbethebasicratetakenintoaccountforfixingtherateforthe S.O.R.aboveinstead oftheratestipulated inschedule–A.

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

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

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

(iii) If it is notpossibleto arrive at the rate from (i)and (ii) above, such class of work shallbe carried out at the rate decided by the competent authorities on the basis of detailed rate analysis after hearing the contractor beforea Committeeof two Superintending Engineers stationed atthe sameplace or the nearest place.

14.4 If the additional or altered work, for which no rate is entered in the "Schedule of Rates" of the Division is ordered to be carried out before the rate is agreed upon, then the contractor shall within seven daysofthedateofreceiptbyhimoftheordertocarryoutthework,informtheEngineer-in-chargeofthe rate, which it is his intention tochargefor such class of work and if the Engineer in charge does notagree 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 aforesaidaccording 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 be the designs, drawings and specification recommededby the contractor and accepted by the competent authority , the alternation above referred to shall be within the scope of such designs, drawing and specifications appended to the tender.

The time limit for the completion of the work shall be extended in the proportion that the increase in the cost occasioned by shall be final and conclusive.

14.5 For excess in item of well sinking the rates for sinking in depth beyond the designed depth shallbe as per the rate quoted by the contractor in the statement of variation, if no rates of variation in sinking are quoted the rate payable shall be the tender rate for sinking at designed level increased by the difference of schedule of rate for sinking at designed depth and sinking at final depth.

CLAUSE15:Noclaim forany paymentof compensationforchange orrestriction of work

If at any time after the execution of the contract documents the Engineer-in-charge shall for any reason whatsoever, require the whole or part of the work, as specified in the tender, be stopped for any period or shall not require the whole or part of the work to be carried out at all or to be carried out by thecontractor, he shall give notice in writing, stating the fact to the Contractor who shall thereupon suspend or stop the work totally or partially, as the case may be. In any such case , except as provided hereunder, the Contractor shall have no claim to any payment or compensation whatsoever except as provided hereunder on account of any profit or advantage which he might have derived from the execution of the workinfullbutwhichhedidnotsoderivein consequenceof thefullamountof the worknothavingbeen carriedout,oronaccountofanylossthathemaybeputtoon accountofmaterials purchasedoragreedto be purchased or for unemployment of labour required by him. He shall not have also any claim for compensation by reason of any alteration having been made in the original specifications, drawings, designs and instructions which may involve any curtailment of the work as originally contemplated.

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

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

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

TheContractorshallnotbeentitledfor lossofanyexpectedprofitofsuchwork.
(VideG.R. NO.SSR/1090/IB/247(2)/C,dated28-6-1993asamendedbyGR ofevennumberdated11-2- 1999)

CLAUSE15A: ThecontractorshallnotbeentitledtoclaimanycompensationfromGovt.onaccountof

delaybyGovernmentinthesupplyofmaterialsenteredinSchedule‘A’wheresuchdelayiscausedby(i) Non-supply due to short allotment of quota in case materials available under quota regulations. (ii) Difficulties relating to the supply of railway wagon (iii) Force majeures. (iv) Act of God. (v) Act of the country’s enemies or any other reasonable cause beyond the control of Government.

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

CLAUSE16:Timelimitforunforeseenclaims:
Thecontractorshallnotbeentitledtoanycompensationfrom Governmentonanyaccountunlesswhereallowedby the conditions of this contact. In such cases the contractor shall have to submit a claim in writing to Executive Engineer Solid Waste Management Department within one month of the cause of such claim occurring.

CLAUSE17: Action& compensationincaseofbadwork :
If at any time before the expire of Defects Liability period as detailed in Clause17-A . It shall appear to the Engineer-in-charge or his sub-ordinate in charge of the work that/any work has been executed unsound, imperfect or unskilled workmanship or with materials of inferior quality or that any materials or articles provided by him for the execution of the work are unsound , or of a quality inferior to that contracted for or are otherwise not in accordance with the contract, it shall be lawful for the Engineer-in-charge to intimate this fact in writing to the contractor and then notwithstanding the fact that the work, materials or articles complained for may have been passed, certified and paid for the contractor shall be bound forthwith to rectify, or remove and reconstruct the work so specified in whole or in part as the case may require, or if so required, shall remove the materials or articles so specified in whole or in part and provide other proper and suitable materials or articles at his own charge and cost, and in the eventof his failing to do so within a period to be specified by the Engineer-in-charge in the written intimation aforesaid, the contractor shall be liable to pay compensation at the rate of one percent on the amount of the estimate of the rectification for every day not exceeding ten days during which the failure so continues and in the event of any such failure as aforesaid continuing beyond ten days, the Engineer-in-Charge may rectify or remove, and re-execute the work or remove and replace the materials complained of as the case may be at the risk and expense in all respects of the contractor. Should the Engineer-in-chare consider that any such inferior work or materials as describedabove may be accepted or made use of, it shall be within his discretion to accept the same at such reduced rates as he may fix therefore .
However, the contractor shall be responsible for normal maintenance of the work till the final bill for the work is prepared by the departmental Officer.

Clause17A:Defectliabilityperiod:
The contractor shall be responsible to make good and remedy at his own expenses any defect which may developor may be noticed before the period mentioned hereunder from the certified date of completion. The Engineer-in- charge shall give the contractor a notice in writing about the defects and the contractor shall make good the same within 15 days of receipt of the notice. In the case of failure on the part of the contractor, the Engineer-in –charge mayrectifyorremoveorre-executetheworkattherisk&costofthecontractor.TheEngineer-in-chargeshallbe entitled to appropriate the whole or any part of the amount of security deposit towards the expenses, if any,incurred by him in rectification, removal orre-execution. The Defects Liability period shall be 12 months of the date of successful completion.

CLAUSE18:Workto beopen toinspections–Contractor orresponsible agentto be present: -
All Works under or in course of execution or executed in pursuance of the contract shall, at all times be open to the inspection and supervision of the Engineer-in-charge and his subordinates and the Contractor shall, at all times during the usual working hours, and all other times for which reasonable notice of the intimation of the Engineer-in-charge or his subordinate to visit the works shall have been given to the contractor, either himself be present to receive orders and instructions or have a responsible agent duly accredited in writing present for that purpose. Orders given to the contractor’s duly authorised agent shall be considered to have the same force and effect as if they had been given to the Contractor himself.

CLAUSE18:
(i) G.R.B.& CD NO. RGN-6090-UO 24(42)-C, dated 26-11-90.

Employment of a qualified site Engineer by the Contractor. The Contractor shall. Employ full-time technically qualified staff during the execution of this work as under :-

1. TwograduateCivilEngineersandthreediplomaCivilEngineerswhencostoftheworktobeexecuted is more than Rs.50 lakhs.

2. One graduate & two Diploma, Civil Engineers when the cost of the work to be executed is more than Rs.15 lakhs but less than Rs.50 lakhs.

3. Minimum two Diploma Civil Engineer when the cost of work is less than Rs.15 lakhs but more than Rs.5 lakhs.

4. MinimumoneDiplomaCivilEngineersfortheworkwhenthecostofworktobeexecutedislessthan Rs. 5 lakhs. The Engineer so employed for the Government work must have sufficient experience to handle the work independently. Such an Engineer shallhave to stay at the siteof work and he shallnot be entrusted with other duty except this work.

In case the contractor or partner of the contractor firm is a Civil Graduate Engineer, Employment of separate Engineer will not be necessary provided that the Engineer partner himself attends the execution of the work on the site.

CLAUSE19 :Noticeto be givenbefore work iscovered up :

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

CLAUSE20:

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

CLAUSE20A:

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

Note:"Unprecedentedflood"meansthefloodcrossingtheHighFloodLevelofthepast..... Year(s) whichisontheavailable record.

(ModifiedVide R& BD.G.R. No/ TNC –1096 – IB–143 – (16)– C dated 11-1-99)

CLAUSE 21: Contractor to supply plant, ladders, scaffolding etc. and is liable for damage arising from non-provision of lights, fencing etc. :

The contractor shall supply at his own cost all materials (except such special materials if any, as may, in accordance with the contract to be supplied from the Public Works Department Stores), plant, tools, appliances, implements, ladders, cordage, tackle, scaffolding, and any temporary works which may be required for the proper execution of the work whether in the original, altered or substituted form and whether included in the specifications, or other documents forming part of the contract or referred to in theseconditionsornotandwhichmaybenecessaryforthepurposeofsatisfyingorcomplyingwith

requirements of the Engineer-in-charge as to any matter or to which under these conditions he is entitled tobesatisfiedorwhichheisentitledtorequiretogetherwithcarriage therefore toandfromthework.The contractor shall also supply without charge the requisite number of persons with the means and materials necessary for the purpose of settings out works and counting , weighing and assisting in the measurement or examination at any time and from time to time, of the work or the materials, failing this, the same may be provided by the Engineer-in-charge at the expenses of the Contractor and the expenses may be deducted from any money due to the Contractor under the contract or from his security deposit, or proceeds of sale thereof or of a sufficient portion thereof. The contractor shall provide all necessary fencingandlightsrequiredtoprotectthe publicfromaccident andshallalso beboundtobearexpenses of defense of every suit, action or other legal proceeding, at law that may be brought by any person forinjury sustained. Owing to neglect of the above precautions and to pay any damages and costswhich may be awarded in any such suit, actionor proceedings to any such person , or which may, with the consentof the Contractor, be paid in compromising any claim by any such person.

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

(a) Suitablescaffoldsshallbeprovidedforworkmenforallworksthatcannotbesafelydonefroma ladder or by other means.

(b) Ascaffoldshallnotbeconstructed,takendownorsubstantially alteredexcept

(i) Underthesupervisionofa competentandresponsible person.

(ii) appointedbycontractorandbycompetentworkerspossessingadequateexperienceinthis

kindof work.

(c) Allscaffoldsand appliancesconnected therewithandallladdersshall

(h)be of sound material

(ii) beofadequatestrengthhavingregardtotheloadsandstrainsto whichtheywillbesubjectedand

(iii) bemaintained inpropercondition

(d) Scaffoldsshallbe soconstructedthatnoparttherеof canbe displacedinconsequenceofnormaluse.
(e) Scaffoldsshallnotbeoverloadedandsofar aspracticable theloadshallbeevenlydistributed.

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

(g) Scaffoldsshallbe periodicallyinspectedbyacompetentperson.

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

(i)Working platforms,gangwaysshall–besoconstructed thatnoparttherеof candagundulyor unequally.

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

(iii) bekeptfreefromany unnecessary obstruction.

(j)Inthecaseofworkingplateforms,gangwaysworkingplacesandstairwayaataheightexceeding …..(to be specified)everyworkingplatformandeverygangwayshallbecloselyboardedunlessotheradequatemeasures are taken to ensure safety.

(i) everyworkingplatformand everygangwayshallhaveadequate width,and

(ii) everyworkingplatform,gangway,workingplace andstairwayshallbesuitablyfenced.

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

(l)Whenpersonsareemployedonaroofwheretheredangeroffallingfromaheightexceeding (4.25 mt)14 ‘ (to be specified) meters suitable precaution . Shall be taken to prevent the fall of persons ormaterial.

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

(n) Safemeansofaccessshallbeprovided toallworkingplatformsandotherworking places.

CLAUSE 21B : The contractor shall comply with the following regulations as regards the hoisting appliances to be used by him

(a) Hoistingmachinesandtackleincludingtheirattachments, anchoragesandsupportsshall–

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

(ii) bekeptingood repairandinworkingorder

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

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

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

(e) Everycranedriver orhoisting–applianceoperatorshallbe properly qualified.

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

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

(h) Every hoisting machine and all gears referred to in preceding regulation shall be plainly marked with

the safe working load.

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

(j)Nopartofanyhoistingmachineorgearreferredtoinregulation‘g’aboveshallbeloadedbeyondthe safe working load except for the purpose of testing.

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

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

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

CLAUSE22:MeasuresforPrevention ofFire:
The contractor shall not set fire to any standing jungle, tree bush wood or grass without a written permit from the Engineer-in-charge.
Whensuchpermitis given,andalso inallcaseswhendestroyingcutorduguptree,bushwood,grassetc. by fire, the contractor shall take necessary measures to prevent such fire spreading to or other-wise damaging surrounding property.When such permit is given and also in all cases when destroying cut or dug up tress, bush wood, grass etc. by fire, the contractor shall take necessary measures to prevent such fire spreading to or other-wise damaging surrounding property.

CLAUSE23: Liabilityofcontractors foranydamages doneinor outsideworkarea :
Compensation for all damage done intentionally or unintentionally by Contractor’s labourers whether in or beyond limits of Government property including any damage caused by the spreading of firementioned in the clause 22, shall be estimated by the Engineer-in-charge, or such other Officer as he may appoint and the estimates of the Engineer-in-charge , subject to the decision of the Superintending Engineer, on appeal , shall be final and the contractor shall be bound to pay the amount of the assessed compensation on demand, failing which the same will be recovered from the Contractor as damages inthe manner prescribed in clause 1 or deducted by the Engineer-in-charge from any sums that may be due or become due from Government to the contractor under this contract or otherwise.

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

CLAUSE 24 : deleted

CLAUSE 25 : deleted

CLAUSE 26 : Work not to be sublet. Contract may be rescindedand security deposit forfeited for subletting it without approval or for bribing a public officer or if contractor becomes insolvent : The contract shall not be assigned or sublet without the written approval of the Engineer-in-charge. Andif the contractor shall assign or sublet his contract or attempt to do so or become insolvent or commence anyproceedingtogethimselfbeadjudicatedaninsolventormakeanycompromisationwithhis creditors, orattempttodoso,theEngineer-in-chargemay,bynoticeinwritingrescindthecontract,Alsoifany bribe, gratuity , gift loan, perquisite, reward or advantage, pecuniary or otherwise, shall either directly or indirectly be given, promised or offered by the contractor, or any of his servants or agents to any publicofficer or person in the employ of Government in any way relating to his office or employment, or if any such officer or person shall become in any way directly or indirectly interested in contract, the Engineer- in-chargemaythereuponbynoticeinwritingrescindthecontract.Intheeventofcontractbeing rescinded, the security deposit ofthe contractor shall thereupon stand forfeited and be absolutely atthedisposalofGovernmentandthesameconsequenceshallensureasifthecontracthadbeenrescinded underclause3thereofandinadditionthecontractorshallnotbeentitledtorecoverorbepaidforany work therefore actually performed under contract .

CLAUSE 27: Sums payable by way of compensation to be considered as reasonable compensation without reference to actual loss :
All sums payable by a contractor by way of compensation under any of these conditions shall be considered as a reasonable compensation to be applied to the use of Government without reference to the actual loss or damage sustained and whether any damage has or had not been sustained.

CLAUSE28 :Changein the constitution offirm to be notified :
In the case of a tender by partners, any change in the constitution of a firm shall be forthwith notified by the Contractor to Engineer-in-charge for his information.

CLAUSE29:WorkstobeunderdirectionsofSuperintendingEngineer:
All works to be executed under the contract shall be executed under the direction and subject to the approval in all respects of Superintending Engineer of the Circle for the time being, who shall be entitled to direct at what point or points and in what manner they are to be commenced and from time to time carried on.

CLAUSE30 :(1)Disputesto bereferred toTribunal:
The disputes relating to this contract, so far as they relate to any of the following matters, Whether such disputes arise during the progress of the work or after the completion or abandonment thereof, shall be referred to the Arbitration Tribunal, Gujarat State.

(iii) The rates of payment under clause 5 for any tools, materials and stores, in or upon the works of the site thereof or belonging to the contractor or procurred by him an intended to be used for execution ofthe work or any part thereof possession of which may have been taken by the Engineer-in-charge under the said clause-5

(iv) The Reduction in rates made by the Engineer-in-Charge under clause 9 from the items of works not accepted as completed fully in accordance with the sanctioned specifications.

(v) Therate of payment for any class of work which is included in the additional or altered work carried out by the contractor in accordance with the instructions of the Engineer-in-Charge under clause 14 and the rates for which is to be determined under the said clause 14.

(vi) The rates of payment for materials already purchased or agreed to be purchased by the contractor before receipt of notice given by the Engineer-in-Charge under clause 15, and/or the amount of compensation payable to the contractor under the said clause for loss in respect of such materials.

(vii) The amount of compensation which the contractor shall be liable to pay under clause 17 in the eventof his failure to rectify, remove or reconstruct the work within the period specified in the written intimationortheamountofexpensesincurredbytheEngineer-in-Chargeunderthesaidclause17inrectifying, removing or re-executing the work or in removing and replacing the materials or articles complained of .

(viii) The reduction of rates as may be fixed by the Engineer-in-Charge under clause 17 for theinferior work or materials as accepted or made use of.

(ix) The amount of compensation payable by the contractor for damages as estimated and assessed under clause 23.

(x) The amount payable to the contractor for the work carried out under clause 33 in accordance withthe instructions and the requirements of the Engineer-in-Charge in a case where there are nospecifications .

(2) TheprovisionofSection-21oftheGPWDdisputeArbi.TribunalAct –92&orderissuedbytheGovt. inconnection withthis Act willnow apply for Arbitration (As per Governmentin N. &W.R.D. letter No. SUT/1090/2679/K2 dt. 9/2/94 .

(3) The provision of Arbitration Act .,shall in so far as they are inconsistent with the provision of this act ceaseoftoapplytoanydisputearisingfromaworkscontract andallarbitrationproceedings inrelationto such dispute before an arbitrator, court of authority shall stand transferred to the Tribunal.

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

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

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

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

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

CLAUSE 31 :Deleted

CLAUSE32 :Lump sumin estimates :
When the estimate on which a tender is made includes lump sum in respect of part of the work, the contractor shall be entitled to payment in respect of the items of work involved or the part of the work in question at the same rates as are payable under this contract for such items, or if the part of the work in question is not in the opinion of the Engineer-in-charge capable of measurement the Engineer-in-charge may , as his discretion, pay the lump sum amount entered in the estimate and the certificate in writing of the Engineer-in-charge shall be final and conclusive against the contractor with regard to any sum orsums payable to him, under the provisions of this clause.

CLAUSE33 :Action whereno specifications :
In the case of work for which there is no such specification, such work shall be carried out tin accordance with the Divisional Specification and in the event of there being no Divisional Specifications, then, in such case the work shall be carried out in all respects in accordance with the instructions andrequirements of the Engineer-in-charge.

CLAUSE34 :Defination of work:
The expression “work” or “works” where used in these conditions shall, unless, there be something in the subject or context repugnent to such construction to mean the work, or the works, contracted to be executedunderorinvirtueofthecontract,whethertemporaryorpermanentandwhetheroriginal,altered, substituted or additional .

CLAUSE35:Contractor’spercentagewhetherappliedtonetorgrossamountifthebill: Percentage referred to in the tender shall be deducted from / added to the gross amount of the bill before deducting the value of any stock issed. (This clause shall be applicable only for B-1 tender)

CLAUSE36 :Nonrefundof quarryfees &Royalties :
The contractor shall pay the royalty to the competent authority / local body as per rules. The contractor shall furnish quarterly the statement showing quantity of quarried materials, from whom purchased (with

full address of the seller) and copies of bills for purchase to the District Officer of the Mining and Geology Department of authority competent to levy royalty in the area of work. Contractor shall also furnish such additional information as regards royalty payment to the Royalty authority. The royalty charges paid shall be borne by the Contractor and shall not be reimbursed by the Executive Engineer (Authority :- R & B D Circular No. TNC – 2286 – UO – 39 (19) – C dated 23-10-1989.)

Clause37:Compensationundertheworkmen'scompensationAct:
The contractor shall be responsible for and shall pay compensation to his workman payable under the Workman's Compensation Act. 1923 (VIII of 1923) hereinafter called the said Act) for injuries caused to the workman. If such compensation is paid by Government as principal under sub-section 12(1) of the said Act on behalf of the Contractor it shall be recoverable by Government from the contractor under sub section12(2)of thesaidsection.Suchcompensationshallbe recoveredin the mannerlaid down inclause 1 above.

CLAUSE37-A
The Contractor shall be responsible for and shall pay the expenses of providing medical aid to any workmen who may suffer a bodily injury as a result of an accident. If such expenses are incurred by Government, the same shall be recoverable from the contractor forthwith and be deducted, without prejudice to any other remedy of Government from amount due or that may become due to theContractor.

Clause37-B:
The contractor shall provide all necessary personal safety equipment and first aid apparatus available for the use of the person employed on the site and shall maintain the same in suitable condition forimmediate use at any time and shall comply with the following regulations in connection therewith.
(a) The workers shall be required to use the equipment so provide by the Contractor and Contractor shall take adequate steps to ensure proper use of the equipment by those concerned.
(b) When work is carried on in proximity to any place where there is a risk of drowning all necessary equipment shall be provided and kept for use and all necessary steps shall be taken for the prompt rescue of any person, in danger.
(c) Adequate provision shall be made for prompt first aid treatment of all injuries to be sustained during the course of the work.

Clause 38:
The quantities shown in the tender are approximate and no claim shall be entertained for quantities of workexecutedbeinglessthanthoseenteredinthetender.Inthecaseofincreaseinthequantitiesbymore than 30%the new rate will be paid to the contractor for the quantities in excess of 30%The rates for the increased quantities as aforesaid will be fixed in the manner specified in clause – 14

Clause 39 :
Employment of famine or other labour : The contractor shall employ any famine, convict or other labour of particular kind or class, if ordered in writing to do so by the Engineer-in-charge.

Clause 40 :
No compensationshallbeallowedfor anydelay caused in the starting ofthework onaccountofdelay in making available the full site of land at a time.

Clause 41 :
No claim for compensation shall be allowed for any delay in execution of the work on account of water standing in borrow pits or compartment. The rates are inclusive of hard or cracked soil, excavation in mud, sub soil water or water standing in borrow-pits and no claim for an extra rate shall be entertained unless otherwise expressly specified.

Clause42: Enteringupon orcommencing anyportion orwork :

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

Clause43: Minimumage ofperson employed :

(I) NoContractorshall employanypersonwhois undertheage of15 years.

Clause43 (I) (A) :

The employment of donkeys and / or other animals and the payment of fair wages : For Asphalt work(s) as far as possible, only the adult persons should be employed by the contractor. If the adultperson are not available, then the children below the age of 15(Fifteen years) should not be employed under any circumstance.

(II) No contractor shall employ donkeys or other animals with branching of string or thin rope.The branching must be at least three inches wide and should be of tape (Nawar).

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

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

(V) The Contractor shall pay fair and reasonable wages to the workman employed by him in the contract undertaken by him. In the event of any dispute arising between the Contractor and his workmen onthe grounds thatthe wages paid are notfair and reasonable, the dispute shallbe referred withoutdelay to the Engineer-in-charge whoshall decide the same. The decision of the Engineer-in-charge shall be conclusiveandbindingontheContractor,butsuchdecisionshallnotinanywayaffectthe conditions in the contract regarding the payment to be made by Government at sanctioned tendered rates.

(VI) The contractor shall provide drinking water facilities to the workers/ labourers employed on Government works Amenities relating to sanitation shall also be provided to the workers/labourers employed on works (in urban areas) . If the contractor fails to comply with these provisions, the Engineer-in-charge shall give notice in writing and if the contractor does not provide this facility to the workers/ labourers within a period of ten days from the date of the notice in writing, theEngineer-in-charge shall thereupon make the arrangement for drinking water at the cost of the contractor.

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

Clause44: Method of payment :

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

Clause 44 A : Any sum of money due and payable to the Contractor (including the security deposit returnable to the contractor) executing any Government work or work of any District Panchayat wholly financed as grant-in-aid under this contract shall be appropriated by any District Panchayat / Government and shall be set off against any claim of the Government/District Panchayat of Gujarat state by theDistrict Panchayat of Gujarat State/Government for the payment of a sum of money arising out or under any other contract made by the contractor with the Government/District Panchayat of Gujarat State fortheworkwhollythecontractoragainstanyclaimoftheGovernment/DistrictPanchayatofGujaratstate is available, such a recovery shall be made from the contractor as arrears of land revenue.

Clause 45 :Deleted

Clause46 :Employment ofscarcity labour :
If Government declares a state of scarcity or famine to exist in any village situated within 16 kilometersof the work, the Contractor shall employ upon such parts of the work, as are suitable for unskilled labour, any person certified to him by the Engineer-in-charge or by any persons to whom, the Engineer-in-charge may have delegated this duty in writing to be in need of relief and shall be bound to pay to such persons, wages not below the minimum which Government may have fixed in this behalf. Any disputes whichmayarise in connection with the implementation this clause shall be decided by the Engineer-in-charge whose decision shall be final and binding on the contractor.

Clause 47: Deleted

Clause 48: The rates to be quoted by the Contractor must be inclusive of sales tax . No extra paymenton this account will be made to the contractor.

Clause 49 : The Contractor should, as far as possible , obtain his requirement of labourers skilled and unskilled , from the nearest Employment Exchange so as to utilise the local employment potential. Ifthere are no local Employment Exchange or such Exchanges are not able to provide the required labour locally, suitable labourers should be utilised to the maximum extent possible.

Clause50 : Fair Wages :
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. 1948 as in force from time to time, the Engineer-in-charge shall be at liberty to deduct the amount payable to the labourer/ workers from his (Contractors) bills or deposit(s) payable by the Contractor after making due inquiries and establishing the claim(s) of the labourer(s) /Workers(s).
The contractor shall not be entitled to any payment of compensation on account of any loss that the Contractor may have to incur on account of the action as aforesaid. Before the action as aforesaid, is enforced, a notice in writing to the Contractor shall be issued by the Engineer-in-charge to pay the wagsas per Minimum Wages Act in force at the relevant time. If Contractor does not act as aforesaid within seven days, then the action contemplated as above shall be taken against him.

Clause 51: Deleted

Clause52:List of Machinery :
The contractors shall also give a list of machineries in his possession and which they propose to use onthe work.
Clause 53: (i) In case , the roller deployed by Department for the use on contract work is kept idle bythe contractor for want of adequate labour and materials, the contractor will have to pay rental charges as per prevailing rules even though the items of rolling and watering are to be carried out by the department.

(ii)IfthecontractordoesnotplanhisprogrammesoastosuittherequirementoftheDepartment,the proportionate rental charge on roller shall be recovered from the contractor.

Clause54: Locallabour on normal rates :
Thecontractorshallhavetoengagelocallabourandpersonseekingemploymentwhereavailableon normal rate.

Clause 55 : deleted

Clause 56: The contractor shall employ only such labour who shall produce a valid certificate of having been vaccinated against small-pox withina period of last three years.

Clause 57 :
1 Huts : The contractor shall build sufficient number of huts on a suitable plot of land for the use of the laborers according to the following specifications.
(1) Hutsof bamboos andgrass may be constructed.
(2) A good site shall be selected. High ground removed from jungle but well provided with tress shall be chosen wherever it is available. The neighborhood of rank jungle, grass or weeds should particularly

be avoided. Camps should not be established close to large cuttings of earthwork.

(3) The lines of huts shall have open spaces of at least 10 m. between rows. When a good natural site cannot be procured, particular attention should be given to the drainage.

(4) There should be no over-crowding. Floor spaces at the rate of 2.8 Sq.m. per head shall be provided. Care should be taken to see that the huts are kept clean and in good order.

(5) The contractor must find out his own land. If he wants Government land, he should apply for it and pay assessment for it.

2. **Drinking Water :** The contractor shall as far as possible, provide an adequate supply of chlorinated purepotabledrinkingwaterfor the useoflabourers. This provisionshall be at the rateof not less than 4.5 liters per head . No provisionneed-be madewhere thereis a suitable nala, river or wellwithin 0.4 km of the camp. However arrangement should as far as possible, be made to chlorinate water by chlorinated tables before it is allowed for drinking purpose.

3. ThecontractorshallconstructsemipermanentlatrinesfortheuseofLabourersonthefollowingscale, namely(a)Where female are employed , there shall be at least one latrine for every 25 females . (b) Where males are employed there shall be at least one latrine for every 25 males provided that where the number of males or female exceed 100 , it shall be sufficient if there is one latrine for every 25 males or females , as the case may be up to the first 100and one for every 50 thereafter.

4. **Privacy in latrines :**Every latrine shall be under cover and so partitioned off as to secure privacy , and shall have a proper door and fastenings.

5. **Noticetobedisplayedoutsidelatrines and urinals :** (1)Whereworkersofboth sexesareemployed thereshallbedisplayedoutsideeachblockoflatrineandurinalanoticeinthelanguageunderstoodby the majority f the workers For Men Only or For Women Only: as the case may be.

   (2)Thenoticeshallalso bearthefigures ofa man orof awomen,as the casemay be .

6. **Urinals :** There shall be at least one urinal for male/female workers up to 50 employed at a time . Provided that where the number of male or female workmen, as the case may be, exceeds 500, it shall be sufficient if there is one urinal for every 50 males or females up to the first 500 and one for every 100 males or females or part thereof.

7. **Latrines and Urinals to be accessible :** (1) The latrines and urinals shall be conveniently situatedand accessible to workers at all times at the establishment . (2)(i) The latrines and urinals shall be adequately lighted and shall be maintained in a clean and sanitary condition at all times (ii) Latrines andurinalsotherthanthoseconnectedwithaflushsewagesystemshallcomplywiththerequirements of the Public Health Authorities.

8. **Waterfor latrines and urinals :** Water shallbe provided by means ofpipesortanks orotherwise,so also be conveniently accessible in or near the latrines and urinals.

9. **Bathing and washing places :** (1) The contractor shall construct sufficient number of bathing places.Every unit of 20persons being provided with a separate bathing place. (2) Washing places should also be provided for the purposes of washing clothes. Every unit of 30 persons shall have at least one washing place. (3) Such bathing and washing places should be suitably screened andseparate places provided for male and female workers . (4) Such facilities shall be conveniently accessible and shall be kept in clean and hygienic condition.

10. **Drainage** : The contractor shall make sufficient arrangement for draining away the sewerage wateras well as water from the bathing and washing places and shall dispose off this waste water in such as way as not to cause nuisance. The contractor should obtain a permission from the Gujarat Water PollutionControl Board, Gandhinagar if Water is so be drained in river or near the well . The contractor would put malaria oil once in a week in stagnant water round about the residence.

11. **Medical facilities :** The contractor shall engage a medical officer with a traveling dispensary for a camp having 500 or more persons if there is no Government or other private dispensary situated

within 6 km. from the camp.

12. **Conservancy and cleanliness:** The contractor shall provide the necessary staff for effecting the satisfactory conservancy and cleanliness of the camp to the satisfaction of the Engineer-in-charge . Atleast one sweeper per 200 persons should be engaged. Conservancy staff should dump refuge in compost pit, away from the labour camp.

13. **Health Provisions :** The District Health Officer of the District or the Deputy Director of Health Service shall be consulted beforeopening a labour camp and his instructions on matters, such as the water supply, sanitary convenience, the camp-site, accommodation and food supply shall be followed by the contractor.

14. **Precautions against epidemic :** (a) The authorities in charge of the colonies should get the labourers innoculated against cholera and plague and vaccinated against smallpox at the time or recruitment , if they are not innoculated or vaccinated within 6 months or 3 years respectively prior to the date of recruitment. (b) When, in any labour camp there is an epidemic disease or is threatened with such an outbreak, the authorities in charge of the labour camps should ensure thatall the inmates of the labour coloniesareinnoculatedorvaccinatedasthecasemaybe,dependingonthediseases,within72hours after the outbreak. (c) The authorities in charge of the labour colony should arrange to communicate by wire regarding the outbreak of the epidemic diseases on the very day of the outbreak , to the MamlatdaroftheTaluka,theDistrictHealthofficerortotheDeputyDirectorofPublicHealthin

charge of that area and the Director of Public Health. Thereafter they should continue to send daily reports to the above officersin the prescribedform regarding theprogress of the epidemicdisease.(d) When the authorities in charge of the labour colony suspect or have reason to believe that any immediate of the labour colonies is suffering from the infectious or contagious disease , they shall forthwith arrange for the segregation of such persons to isolated huts to be specifically provided for the purpose and also for their treatment(e) As regional malaria epidemic outbreaks are likely tooccur in such project areas, the authorities in charge of the labour colonies should report promptly the occurrence of unusual incidence of cases of malaria and also inform the District Health Officer of the District, Deputy Director of Public Healthy (Malaria) and the Director of Public Health and also arrange to institute all necessary anti malarialmeasures as may be advised by the officials of the Public Health Department. (f) The authorities in charge of thecolonies should also arrange to carry out anyother measures that may be recommended by the officials of the Public Health Department necessary to prevent or control the spread of disease.

15. **Rest rooms:** (1) In every place where in contract labour is required to halt at night in connection with the contract works and in which employment of contract labour is likely to continue for three monthor more, the contractors shall provide and maintain rest rooms orother suitable alternative accommodation withinfifteen days of the employment of contract labour.

(2) If the amenity referred to in sub rule is not provided by the contractor within the period prescribed,the employer shall provide the same within a period of fifteen days of the expiry of the period laid down in the sub-rule (1).

(3) Separaterooms shallbe providedfor women employees.

(4) Effective and suitable provision shall be made in every rooms for securing and maintaining adequate ventilation for the circulation of fresh air and there shall also be provided and maintained sufficient and suitable natural or artificial lighting .

(5) The rest room or other suitable alternative accommodation shall be of such dimensions as to provide at least a floor area of 1. Sq. mt. For each person making use of rest rooms.

(6) The rest room or other suitable alternative accommodation shall be so constructed as to afford adequate protection against heat, wind, rain, and shall have smooth, hard and impervious surface.

(7) Therestroomsorothersuitablealternativeaccommodationshallbeataconvenientdistancefromthe establishment and shall have adequate supply of whole some drinking water.

CLAUSE 58 : Deleted

CLAUSE 59 : Deleted
CLAUSE 60 : Deleted

CLAUSE61 : FENCING AND LIGHTING:

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

(b) Allthearrangements madeforfencingandlightingshallbemaintainedbythe contractorthroughthe currency of the contract till the physical taking over of the work by department.

CLAUSE62:LIABILITYOFACCIDENTSTOPERSONS :

Responsibilities and liabilities lf the contractor under Workmen's Compensation Act are given in clause No.37.In addition following shall also apply:

(a) On the occurrence of an accident, which result in death of workmen employed by the contractor or which is so serious as likely to result in death of any such workmen the contractor, shall within 24 hours of happening of such accident(s) intimate, in writing to Engineer-in-Charge the fact of such accidents. The contractor shall idemnity Governmentagainst all loss or damage sustained by the Government resulting directly or indirectly from his failure to give intimation in the manneraforesaid including the penalties or fines, if any, payable by the Government as a to the provisions of the said act in regard to such accident(s).

(b) In the case of an accident, in respect of which compensation may become payable under Workmen's Compensation Act. whether by the contractor or by the Government as principal Employer, it shall be lawful for the Engineer-in-charge to retainoutofmoneydueandpayabletotheContractor,suchsumorsumofmoneyasmay,intheopinionoftheEngineer- in-charge, be sufficient to meet such a liability, The opinion of the Engineer-in-charge shall be final regard to all matters arising under this clause.

CLAUSE63 :ACCESS TOSITEANDWORK ON SITE :

The Engineer may , if he considers fit from time to time, enter upon any land(s) which may be in possession of the contractor under this contract for the purpose of executing any work notincluded in this contract by agents or by other contractors, at this opinion and the contractor shall, in accordance with the requirements of the Engineer-in –charge , afford all reasonable facilities for execution of the work including occupation of lands by structure or otherwise for any other contractor employed by the Government and his workmen for the workmen of the Government who may be employed in the executiononornear thesiteoftheworknotincludedinthecontractorofanycontractinconnectionwith or ancillary to the work and in default, the contractor shall be liable to the Government for any delay or expensesincurredbyreasonofsuchdefault.Providedalways thatifdamagearising.Makeastatementof thesame to the Engineer-in-charge who shallfrom time totime,assess thevalue in his judgementof such damage and the Government shall from time to time pay to the contractor the amounts (if any) acceptedas justified by the Engineer-in-charge :

CLAUSE64:REPORTS REGARDINGLABOUR :

TheContractorshallsubmitthefollowing reportstotheEngineer-in-charge :

(a) (I) A daily report in the suitable form of the strength of labour, both skilled and unskilled employedbyhimon thework(s).Thecontractorshallincreaseordecreasethestrengthbothskilledor unskilled

.ifdirectedby the Engineer-in-charge.Thesubmissionofsuchreports shall not,however,relieve the contractor of his responsibilities and duties regarding progress or any other obligation under the contract

(ii) A classified weekly return in the suitable form of the numberof person employed on the works during the preceeding week.

(iii) A weekly medical report in the suitable form showing the health of the contractor's camp. Thenumber of persons ill or incapacited and the nature of their illness.

(iv) Areportof anyaccident,which may haveoccurred, tobe sent within24hoursofthe occurrence.

(v) Suchother reportas may be prescribed.
(vi)

CLAUSE65: TreasureTrove:
In the event of discovery by the contractor or his employees, during the progress of work of any gold, silver, oil or other minerals of any description and precious stones , treasures, coins, antiquites, relic, fossils or other articles or value of interest whether geological, archaeological or any other such treasure &otherthingshallbedeemedtobetheabsolutepropertyoftheGovernmentandthecontractorshallduly preservethesametothesatisfactionoftheEngineer-in-charge,formtimetotime,andrelievethesameto such persons as the Engineer-in-charge may appoint.
Thecontract shalltake all reasonable precautions to prevent his workmen otherperson from removing or damaging any such articles or things , immediately after the discovery thereof and before removal acquaint the Engineer-in-chargewith discovery and carry out his orders for the disposal of the same.

CLAUSE66 :Indemnity :
The contractor shall indemnify the Government against all actions, suits, claims & demands through or made against the Department in respect of work of this contractor against any loss damage to Department in consequence of any action or suit being brought against the contractor for anything done or omitted to be done in execution of the work of this contract.

CLAUSE67:InsuranceofLaborus :
Thecontractorshallberesponsibletoarrangeforinsuranceofalllaboures,skilledandunskilledworkers, supervisors etc. employed by him as per labour regulation of the State.

CLAUSE 68:Setting Out :

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

CLAUSE69 :Cement Register:
A register in theprescribedformshowingday-to-dayreceipt, consumption andbalanceof cement onsite ofworkwillbe maintainedby theDepartment,which shall invariablybesigneddailyby thecontractoror his authorised representative in token of its correctness.

CLAUSE70:MaterialsandWorksTestRegister:
A register in the prescribed from showing day-to-day receipt, consumption and balance of cement on site of work by the Department and every entry thereof shall invariably be signed by the Contractor or his authorisd representative in taken of its correctness.

CLAUSE71:ProgressSchedule:
(a) The contractor shall furnish within one month (unless extended by the Engineer-in-charge) of the order to start the work, the progress schedule in quadruplicate indicating the date or staring. The monthly progress expected to be achieved and the anticipated completion date of each major item of work to be done by him, also indicating dates of, procurement and setting up thematerials, plants andmachinery. The schedule should include a statement of proposed general and detailed arrangements for carrying out works, and of item , order and manner in such it is proposed general and detailed arrangements for caring out works, and of item, order and manner in which it is proposed that these shall be executed. Thepractice to the achivement towards completion of the work in the time limit and of the particular items on thedates specified in the contract andshallhave the approval ofthe Engineer-in-charge.Further the dates for the

progress , as in this schedule shall be adhered to.

(a) in case it is sound necessary, at any stage to alter the schedule. the contractor shall submit in good, time a revised schedule incorporating necessary modification proposed and get the same approved from the Engineer-in-charge . No revised schedule shall be operative without such acceptance in writing. The Engineer-in-charge is further empowered to ask for more detailed schedule or schedule. any by week, for any item or items and the contractor shall supply the same as and when asked for.

(b) The Engineer-in-charge shall have, at all times, the right, without in any way vitiating this contract forminggrounds for any claim, to after the order of the work of any part there of and the contractor shall after receiving such direction, proceed in the order directed. The contractor shall also revise the progress. Schedules accordingly and submit four copies of the revised schedule to the Engineer-in-charge within seven days of the said Engineer's direction to alter the order of works.

(c) The contractor shall furnish sufficient plant, equipment and labour and shall work such hours and shifts as may be necessary to maintain the progress of the work as per approved progress-schedule, The working and shift shallcompany with all the Government regulations in force and shall be such, as may be approved by the Engineer-in-charge and the same not be varied without the prior approval of Engineer-in-charge.

(d) The contractor shall from time to time . as may be required by the Engineer-in-charge. furnish the Engineer-in-charge with a statement in writing of the arrangements he proposes to adopt for the execution of this contract and the Engineer-in-charge may, if he considers necessary at any time advise alternation in the same. which the contractor shall adopt on notice thereof.

(e) The progress-schedule(s) shall be in the form of progress chart, forms, statements and/ or reports as may be approved by the Engineer-in-charge.
The contractor shall submit four copies showing the progress of the work in the form of a chart etc. at periodical intervals as may be specified by Engineer-in-charge.

(f) The approval of the progress schedules by the Engineer-in-charge shall not relieve the contractor of schedule required by the Engineer-in-charge and shall not entitle the contractor to any extra payment.

CLAUSE 72:

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

CLAUSE 73 : One percent of estimated cost put to tender for this work after deducting the cost of materials as per Schedule 'A' valued at basic rate in the sanctioned estimate shall be deducted from the running accountbills of the contractor for testing the quality of materials and workmanship, no additional testingcharges in addition to the above shall be recovered from the contractor (Applicable to R & B Works only) (G.R.No. R & B TNC-1085-4-C, Dated 20-12-91)

The engineer in charge will get the cement nad steel tasted in laboratories ofGERI, Engineeringcollages, Polytechnics,Engineers india Ltd., DGTD and other laboratoriesapproved by R&B or water resources department or industries department and the test results of these laboratories will be binding to the contractor above suitability of use of materials (R&B D GR NO.TNC-1088-IB- 220-18-C dated: 31- 5-05. However in respect of works involving use of asphalt,the contractor will set up the site testing laboratory and will provide testing instruments etc. as under:

Laboratory: Thecontractorwillconstructpuccastructureofminimum25squaremeterareaduly connected with water and electric supply to house site testing Laboratory.

Instruments : The contractor will provide and install the instruments as per following. I.S. Standard tocarry out the test prescribed therein.

1. PenetrationtestasperI.S.1203
2.Softening point testas per I.S. 1204
3.Ductility test as perI.S. 1208
4.Viscocitytestas per I.S.1206
5.Specificgravity test as per I.S.1202

TheinstrumentsprovidedshouldbeasperI.S.Standard,socertifiedandberegularlyandperiodically calibrated. FrequencyoftestswillbeasindicatedinspecificationsandasreferredinR.&B.D.G.R.No.

SSR-1099-IB/91(9)-cdated26-7-1999

Clause 74 : GST

The prices shall be quoted exclusive of GST which shall be paid extra at prevailing rate if applicable for GST while the price schedule. Statutory variation if any during the currency of contract shall have to borne by the agency which shall be not be reimbursed.

The rate should be quoted including of all tax but exclusive of GST.

Annexures:Theinformationinthefollowingannexuresspecimensshouldbefurnishedon separate letter pad if necessary.

ANNEXURE - 1

(ReferredtoConditionNo.-2GeneralRulesandDirectionfortheguidanceofContractors.) To
TheExecutive Engineer-SWM PLACE:Bhavnagar
Bhavnagar Municipal Corporation: DATE:

Details regarding my / our partners our Company (in the case of limited Company) Names, address(es) , telephone number(s) income tax etc. are as under :

Sr no	Name(s) of Person/Partner Director of the company	Fulladdressof the place of business (with pin code)	Telephone No.(s) (office)	Residential address(es) (Resi)	Telephone No.(s)	Full address of income tas office wardwhere incom taxreturnis filed
1	2	3	4	5	6	7

I/We hereby agree to intimateyou about change if any, in the above-mentioned address(es) andtelephone No. (s) within Fifteen days of its occurrence till my/our deposit, for the said work paid byme/us is not returned to me/us.

DatedSignatureof Tenderer

ANNEXURE-2

PERFORMANCEBOND
(Seeclauseno. 1)

(Thedateofthisbondmustnotbepriortothedateoftheinstrumentinconnectionwithwhichitisgiven
)

Principal(Contractor)

Surety(ScheduledorNationalised Bank)

Sumofbond(expressinwordsandfigures)Rs. Contract

No. and date of Contract

KNOWALLMENBYTHESEPRESENT,THATWE,THEPRINCIPALSANDSURETY:Above namedareheldfirmlybounduntothe.....hereinaftercalledtheEmployerin the amount stated for payment of which sum, well and truly 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**Tree plantation with and without treeguard**

NOW THEREFORE, if the Principal shall well and truly perform and fulfill at the undertakings, convenants, terms, conditions and agreements of said contract 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 undulyauthorised 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 anddamages which the employer maysustainbyreason offailureordefaultonthe 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 discharge or till the Employer certifies that the terms and conditions and accordingly discharges the guarantee. Unless a demand or claim under this guaranteeismadeonusinwritingonorbeforethe.....weshall bedischargedfrom allliabilityunder this guaranteethereafter.

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 heretoaffixed and these presents duly signed by its undersigned representatives, pursuant to authority of its governing body.

Inthepresenceofwitness

Principal

1……asto ..... (seal)
2……asto ..... (seal)

3……asto ..... (seal)
4……asto ..... (seal)
by… .....affixCorporateSeal

Attested

Corporatesurety

_____
Business address _____

_____
Affix by.....corporateSeal

_____

_____
Title

_____
Forand on behalfofthe Employer

ANNEXURE -3

LISTOFWORKSALREADYCOMPLETEDBYTHETENDERER

Sr. No.	Nameof work	Place	Cost on completion	Timetakenin months To completethewo	Remarks
1	2(a)	2(b)	3	4	5

Note:Necessarycertificatefromofficeconcernedshallbeattachedwiththetender

ANNEXURE -4

LISTOFPLANTANDMACHINERYINGOODWORKINGORDERAVAILABLEWITH TENDERER

Sr. No.	Plant or Machinery	Location	Age of Machinery	Make	Capacity	Approxima Value	Remark
1	2(a)	2(b)	3	4	5	6	7

ANNEXURE -5

DECLARATIONREGARDIGWORKS ONHAND WITHTENDERER

Sr. No.	Nameof wo	Place	Estimate Cost	Dateof issue of work orc	Stipulate period o completi	Amount workdon ondateo filling tender	Brief details delay i any	Remark
1	2(a)	2(b)	3	4	5	6	7	8

Note 1 : Amount of work in column 6 should be given up to the month previous to the month in which tenders are invited.

Note2:Necessarycertificatefromtheofficerconcernedshallbeattachedwith the tender.

SCHEDULE - 'A'

Scheduleshowing(approximately)thetobesuppliedfromthePublicworksStore forwork Contracted to be executed and the rates at which they are to be charged for

Particular	Approximatequantity	Rateatewhichthematerialswillb charged to the contractor		Placeofdelivery
		Unit	Ratein rupees	
-- NIL--				

Note5:Thepersonorfirmssubmittingthetendershouldseethattheratesintheaboveschedule are filled up by the Engineer-in-charge before the issue of the form prior to the submission of the tender.

Note6:StoretobesuppliedtoContractorsforaworkfreeof costshouldbementionedinSchedule'A' in addition to schedule 'B' and the specification attached to the contract agreement form.

Signature of Contractor

Executive Engineer
Solid Waste Management Department
Bhavnagar Municipal Corporation

SCHEDULE 'B'

Memorandumshowing itemsofworkstobecarriedout:

itemsNo.	Quantities estimated ou maybemore less	itemofwork	Tendered Rates	Unit	Totalamou according estimated quantities
1	2	3	4	5	6
		ASPERATTCHED SHEDULE OF QUANTITY			

I / We am /arewilling to carry outthe work at …….%above/below .percentage (should be written in figures and words) of the estimatedratesmentionedabove.
Amountofmy/ourtenderworksoutasunder.

EstimatedAmountputto
Tender Rs. _____
Deduct _____% Below.
NetRs. _____
Rs. In words_____
_____

EstimatedAmountputto
Tender Rs. _____
Add_____% Above.
TotalRs. _____
Rs. In words_____
_____

Notes1-AllworkshallbecarriedoutasperPublicWorksDepartmentHandbookandother specifications of Division or as directed.

Notes2 - Allthecolumns inScheduleshouldbefilledinink andthetotaloftheentries inthe lastcolumn should be struck by the contractor under his signature.

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

Notes4- Tobecontinuedon additionalsheets, iffound necessary.

SCHEDULE - C
(seeclauseNo.-2)

Time Schedule, for completion of different designated parts of the work and rate of liquidated to be paid by theContractor,ifhefailstocompletethepartofworkwithinstipulatedtimelimitisasdetailedbelow
:

TimeSchedule of Completion

Percentageoftimeofthetotal time limit	Percentageofwork	Rateofliquidateddamagesperday
1	2	3
EarthWork		
25%	16%	0.1%
50%	50%	0.1%
75%	75%	0.1%
100%	100%	0.1%
BuildingWork		
25%	10%	0.1%
50%	40%	0.1%
75%	80%	0.1%
100%	100%	0.1%
Roadwork		
25%	25%	0.1%
50%	50%	0.1%
75%	75%	0.1%
100%	100%	0.1%

(Ascorrected viedB&CD GR. No.TNC -1091 -IB- 10/(11)- C, dated 29-6-92)

Executive Engineer
Solid Waste Management Department
Bhavnagar Municipal Corporation

BANKGUARANTEE

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 **Bhavnagar Municipal Corporation** and where as We, Bank agree to give the tenderer a guarantee for the Earnest Money.

1. Therefore,weherebyaffirmthatweareguarantorsonbehalfoftheTendereruptototal rupees (in words)Rs. _____(in figures) and we undertake to payto**Bhavnagar Municipal Corporation** DepartmentofGovernmentofGujaratthe_____ (name of Govt. previous notice of judicial or to be specified). Up to 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, unlessademandofclaimunderthisguaranteeismadeonusinwritingonorbeforethe _____(Date to be specified – will not be less than 180 days from the date of receiving the tender) we shall be discharged from all liabilities under the guarantee thereafter.

3. Weundertakenottorevoketheguaranteeduringitcurrencyexceptwiththepreviousconsentofthe **Bhavnagar Municipal Corproation**inwriting.

4. We lastly undertake not to revoke the guarantee for any change in constitution of the Tenderer or ofthe Bank .

Date Signature&SealofGuarantor

Bank Address

Executive Engineer
Solid Waste Management Department
Bhavnagar Municipal Corporation

Bhavnagar Municipal Corporation

Nameof Work:-Beautification work for existing 18 mt. wide and 1.5 km long Iconic Road from Mahila Collage to Bhavnagar Airport in the city under Iconic Road, NirmalGujrat 2 Grant for Bhavnagar Municipal Corporation.

ABSTRACT

sr no	Elements to be incorporated	Numbers of each elements	Cost (Rs/per article)	Total Cost
1	Sculpture and fountains at the roundabout / crossing junctions	Sculpture -2	6,00,000 /- per sculpture	24,00,000/-
		Fountain – 2 (at 2 roundabouts)	Fountain :- 5,00,000/-	
			fountain Gardening :- 1,00,000/-	
2	Pedestrian footpath (floor paintings, paver block designs)	1000 Sq. mt.	500 RS / SQ. MT	5,00,000/-
3	Sitting arrangements on furniture lane Benches	for sitting with shade :- 80	Bench with shade :- 25000/ -Perbench	10,00,000/-
4	Waste to wonder murals	Waste to wonder :- 5	Murals :- 2,00,000	10,00,000/-
5	LED display boards	LED display board - 3	LED display board :- 10,00,000	30,00,000/-
6	LED kiosk	LED kiosk :- 16	LED display board :- 1,50,000	24,00,000/-
7	Led kiosk (floor mounted)	LED kiosk (floor mounted) - 3	LED kiosk (floor mounted) 4,00,000	12,00,000/-
8	Litterbins	100 litterbins	5000/--Perlitterbins	5,00,000/-
		Total		1,20,00,000/

Signature of the Contractor

Executive Engineer
Solid Waste Management Department
Bhavnagar Municipal Corporation

Bhavnagar Municipal Corporation

Name of Work:-Beautification work for existing 18 mt. wide and 1.5 km long Iconic Road from Mahila Collage to Bhavnagar Airport in the city under Iconic Road, NirmalGujrat 2 Grant for Bhavnagar Municipal Corporation.

"SCHEDULE - B"

PERCENTAGE RATE TENDER

Item No. and Description	Quantity	Rate	Per	Amount
PROVIDING, FIXING AND FITTING Sculpture and fountains with fountain gardening@ subhashnagar chawk at triangle circle and @Munideri at the round or other suitable roundabout/crossing junctions				
Item No. 1				
Excavation for foundation upto 1.5 m depth including sorting out and stacking of useful materials and disposing off the excavated stuff upto 50 Meter lead.(A) Loose or soft soil	75.00	117.07	Cum	8780.25
Item No. 2				
Excavation for foundation upto 1.5 m depth including sorting out and stacking of useful materials and disposing off the excavated stuff upto 50 Meter lead.(C) Hard Murrum	75.00	256.11	Cum	19208.25
Item No. 3				
Providing and laying cement concrete 1:2:4 (1-Cement : 2- Coarse sand : 4- graded stone aggregates 20 mm nominal size) and curing complete including cost of formwork in (A) Foundation and Plinth (upto 10 ton)	8.00	3931.93	**Cum**	31455.44
Item No. 4				
Providing and laying controlled cement concrete M.250 and curing complete including the cost of form work but excluding the cost of reinforcement reinforced concrete work in (A) Foundations, footings, Base of columns and Mass concrete. (upto 10 ton)	8.00	4514.70	**Cum**	36117.60
Item No. 5				
(i) Uncoursed Rubble Masonry with hard stone of approved quality in foundations and plinth in Cement Mortar 1:6 (1-cement : 6-coarse sand including levelling up etc. complete (upto 10 ton)	**15.00**	2500.01	**Cum**	37500.15
Item No. 6				
Brick work using common Brunt clay building bricks having crushing strength not less than 35 Kg./Sqcm. In foundation and plinth in cement mortar 1:6 (1cement : 6 fine sand) (B) Conventional (up to 10 ton) UP TO PLINTH LEVEL	19.00	**4021.02**	**Cum**	76399.38

Item No. 7				
Providing and fixing Pre cast concrete Kerb stone of grey cement based concrete block 30 cm length,30 cm height and 15 cm thick of M250 grade concrete as per approved design and including excavation for fixing in proper line and level, filling the joint with C:M 1:3 (1:cement 3: fine sand) & joint finish with cement slurry to match the surface of kerb stone with necessary excavation etc Complete.shade and pattern as Approved & directed by Architects/enginner in charge. With oil paint	30.00	**361.64**	**Rmt**	10849.20
Item No. 8				
20mm thick sand faced cement plaster on walls upto height 10 metres above ground level consisting of 12mm thick backing coat of C.M. 1:3 (1-cement : 3-sand) and 8mm thick finishing coat of C.M. 1:1 (1-cement : 1-sand) etc. complete.	80.00	326.10	Rmt	26088.00
Item No. 9				
Providing TMT Bar FE 500D reinforcement for R.C.C. work including bending, binding and placing in position complete upto floor two level	800.00	76.21	Kg.	60968.00
Item No. 10				
Water conection with necessary fitting	2.00	1100.00	**Nos**	2200.00
Item No. 11				
PVC Footsteps	8.00	125.00	Nos	1000.00
Item No. 12				
Providing,supplying, making, eracting and Fixing M.S.safety grill of required patern for windows/Door using M.S. polished bars, M.S.Flats and rectangular CRC pipes of required size at required spacing as per design and hold fast with coach bolts including cutting, hoisting, fixing in position with one coat of primer and two coats of matt finished oil painting etc. complete.	320.00	108.07	kg	34582.40
Item No. 13				
submersible water pump 0.50 h.p	2.00	**10100.00**	**Nos**	20200.00
Item No. 14				
ELECTRIC CONECTION Charges	2.00	**5050.00**	**Nos**	10100.00
Item No. 15				
Providing and laying polished kota stone slab 25mm thick in risers of steps,skirting Dedo and pillars laid on 10mm thick cement mortar 1:3 (1-Cement : 3 coarse sand) and jointed with gray cement slury mixed with pigment to match the shade of slab including rubbing and polishing etc. complete. (upto 10 ton)	100.00	1056.25	Sqm	105625.00

Item No. 16				
Fountain	2.00	330400.00	**Nos**	660800.00
Item No. 17				
sculpture	2.00	373003.01	nos	746006.02
Item No. 18				
Fountain Gardening – plantation	2.00	73009.00	**Nos**	146018.00
Pedestrian footpath (floor paintings, paver block designs)				
Item No. 19				
Design with detailed estimate, drawings , specifications approved by SWM department	1000.00	423.50	**Sqm**	**423500.00**
Sitting arrangements on furniture lane Benches, for sitting with shade(1 QTY= 2 benchs with corrugated G.I. sheet shades)				
Item No. 20				
Bench Providing, casting, hoisting, installing Cast Iron Polish Garden Bench with **corrugated G.I. sheet** shade Capacity 3 Seater(dimension of one bench l=1550 mm,b=458 mm, h=770 mm, seat hight=410 mm) achieve finished look etc. complete as directed by engineer in charge/ SWM department. Sample shall be approved before execution of work. (Gem product id 5116877- 32104497785 of one bench)	40	21186.45	**Nos**	**847458.00**
Waste to wonder murals				
Item No. 21				
Design fabricating/ constructing and installation of Waste to wonder murals. Design with detailed estimate, drawings approved by SWM department.	**5**	169491.60	**Nos**	**847458.00**
LED display board				
Item No. 22				
Installation and Commissioning of Outdoor Mild Steel Led Display System(fully Programmable High Brightness Outdoor Advertising), material of cabinet - mild steel, aspect ratio - 16:9, Max. pixel pitch - 10 mm, Length of LED display system - 211-220 cm, Hight of LED display system - 181-190 cm, Brightness - Calibrated Minimum - 5000 Nits, Life of Light Source - 100000 Hours, Duty cycle - 24*7, IP Rating - IP 65 front, IP Rating - IP 64 Rear, one year Warranty, ISO certificates- yes, fixing LED screen with 2 pole Mounting, Led Full colour Boards Are Large and hence to be mounted With Proper Bottom Supports, with Fixing it Stand alone display with ISI marked Steel support strucure all framing fitting complete work with as directed by engineer in charge/ SWM department arrangement.(as per Gem portal -	3.00	847457.67	Nos	2542373.00

Gem Id 5116877-52279191596)				
LED kiosk				
Item No. 23				
Installation and Commissioning of HINLED DISPLAY SYSTEMS 5000 Nits Brightness, Outdoor Mild Stee Led Display System Type of LED Display System Outdoor Material of the Cabinet Mild Steel Aspect Ratio 16:9 Maximum Pixel Pitch (mm) 10 Length of LED Display System (cm) 61 - 70 Height of LED Display System (cm) 181 - 190 Brightness - Calibrated Minimum (Nits) 5000 Life of Light Source (Hours) 50000 IP Rating (Front) IP65, ISO certificates- yes, fixing LED screen with pole Mounting, Led Full colour Boards hence to be mounted With Proper Bottom Supports, with Fixing it Stand alone display with ISI marked Steel support strucure all framing fitting complete work with as directed by engineer in charge/ SWM department arrangement.(as per Gem portal - Gem Id 5116877-31732495918)	16	127118.63	Nos	2033898.00
Led kiosk (floor mounted)				
Item No. 24				
Installation and Commissioning of GLOBUS Intel Color LED touch Screen Type Of Information Kiosk Intel Core i5 Computer Kiosk, Outdoor, Type Of Information Kiosk - Processor Based, Type Of Enclosure - Mild Steel, Processor Make- Intel, Processor Configuration- Intel Core i5, Processor Speed (GHz)- 2 ,Operating System (Pre-loaded) - Window 10 , Memory (GB) 8, Storage/HDD (GB) 999, Display Size (inches) – 55 , with floor Mounting mounted With Proper Bottom Supports, all fitting complete work with as directed by engineer in charge/ SWM department arrangement.(as per Gem portal - Gem Id 5116877-58635569297)				
Providing & Fixing Unbranded Stainless Steel Dust Bin 2 Bin Mounted with 3 Pole capacity 50 lt				
Item No. 24				
CONSTRUCTION Material of Pole with stand and container (Bin) Stainless Steel Grade 304 Pole dia (in mm) - Must declare 38 Pole height (in mm) - Must declare 1200 Pole pipe thickness (in mm) - Must declare 2.0 Container wall (SS Sheet) thickness (in mm) 3 Type of wall Non perforated Type of Lid on container Swing type Plugged outlet for washing and draining - No Ground Clearance from the pole stand to bottom sheet of dust bin (in cm) 50 GENERIC	50	8474.58	Nos	423729.00

Description of store Stainless Steel Pole Mounted SS Dust Bin Type of Bin 2 Bin Mounted with 3 Pole Shape of bin Round Capacity of each Bin (container) (in Ltrs) 50 REPORTS AND CERTIFICATION Agreed to furnish all the test reports and certificates to buyer/consignee on demand Yes Dustbin shall be separate for Dry and wet Waste shall be provided (Green and Blue Colour Demarcation on it, along with BMC logo on side) and finishing & fixing as per instruction of SWM department.				
			Total amount RS.	**10169492.00**

I/We am/are willing to carry out the work @ _____% Above / Below_____Percentage (should be writen 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. **1,01,69,492**=00	Put to Tender Rs. **1,01,69,492**=00
Add % Rs.	Deduct %Rs.
Total Rs.	Total Rs.
(In Words	(In Words

Stamp with Signature of Contractor

Executive Engineer
Solid Waste Management Department
Bhavnagar Municipal Corporation

GENERAL TECHNICAL SPECIFICATIONS FOR BUILDING WORKS

Circle :_____

Division :_____

SPECIFICATIONS OF MATERIALS

INDEX

GENERAL

STANDARD TECHNICAL SPECIFICATIONS

Sr. No. of the item in the schedule 'B' of tender	Sr. No. of application Specification	Sr. No. of the item in the schedule 'B' of tender	Sr. No. of application Specification	Sr. No. of the item in the schedule 'B' of tender	Sr. No. of application Specification	Sr. No. of the item in the schedule 'B' of tender	Sr. No. of application Specification	Sr. No. of the item in the schedule 'B' of tender	Sr. No. of application Specification	Sr. No. of the item in the schedule 'B' of tender	Sr. No. of application Specification
1		26		51		76		101		126	
2		27		52		77		102		127	
3		28		53		78		103		128	
4		29		54		79		104		129	
5		30		55		80		105		130	
6		31		56		81		106		131	
7		32		57		82		107		132	
8		33		58		83		108		133	
9		34		59		84		109		134	
10		35		60		85		110		135	
11		36		61		86		111		136	
12		37		62		87		112		137	
13		38		63		88		113		138	
14		39		64		89		114		139	
15		40		65		90		115		140	
16		41		66		91		116		141	
17		42		67		92		117		142	
18		43		68		93		118		143	
19		44		69		94		119		144	
20		45		70		95		120		145	
21		46		71		96		121		146	
22		47		72		97		122		147	
23		48		73		98		123		148	
24		49		74		99		124		149	
25		50		75		100		125		150	

GENERAL TECHNICAL SPECIFICATIONS FOR BUILDING WORKS

GENERAL:

1. In the specifications, "as directed" / "Approved" shall be taken to mean "as directed" / "approved" by the Engineer-in-charge.
2. Wherever a reference to any Indian Standard appears in the specifications, it shall be taken to mean as a reference to the latest edition of the same in force on the date of agreement.
3. In "Mode of Measurement" in the specifications wherever a dispute arises in the absence of specific mention of a particular point or aspect, the provisions on these particular points, or aspects in the relevant Indian Standards shall be referred to.
4. All measurements and computations, unless otherwise specified, shall be carried out nearest to the following limits :
   (i) Length, width and depth (height) ..... 0.01 Metre.
   (ii) Areas ..... 0.01 Sq. Mt.
   (iii) Cubic Contents ..... 0.01Cu.Mt.

In recording dimensions of work, the squence of length, width and height (depth) or thickness shall be followed.

5. The distance which constitutes lead shall be determined along the shortest practical route arid not necessarily the route actually taken. The decision of the Engineer-in-charge in this regard shall be taken as final.
6. Where no lead is specified, it shall mean "all leads".
7. Lift shal1 be measured from plinth level.
8. Upto "floor two level" means actual height of floor (Maxi. 4 M.) upto 3 Mt. above plinth level.
9. Definite particulars covered in the items of work, though not mentioned or elucidated in it, specifications shall he deemed to be included therein.
10. Reference to specifications of materials as made in the detailed specification of the items of work is in the form of a designation containing the number of the specification of the material and prefix 'M' e.g. 'M-5'.
11. Approval to the samples of various materials given by the Engineer-in-charge shall not absolve the contractor from the responsibility of replacing defective material brought on site or materials used in the work found defective at a later date. The contractor shall have no claim to any payment or compensation whatsoever on account of any such materials being rejected by the Engineer-in-charge.
12. The contract' rate of the item of work shall be for the work completed in all respects.
13. No collection of materials shall be made before it is got approved from the Engineer-in-charge.
14. Collection of approved materials shall be done at site of work in a systematic manner. Materials shall be stored in such a manner as to prevent damage, deterioration or intrusion of foreign matter and to ensure the preservation of their quality and fitness for the work.
15. Materials, if and when rejected by the Engineer-in-charge, shall be immediately removed from the site of work.
16. No materials shall be stored prior to, during and after execution of a structure in such a way as to cause or lead to damage or overloading of the various components of the structure.
17. All works shall be carried out in a workmanlike manner as per the best techniques for the particular item.
18. All tools, templates, machinery and equipment for correct execution of the work as well as for checking lines, levels, alignment of the works during execution shall be kept in sufficient numbers and in good working condition on the site of the work.
19. The mode, procedure and manner of execution shall be such that it does not Cause damage or over loading of me various components of the structure during execution or after completion of the structure.
20. Special modes of construction not adopted in general Engineering practice, if proposed to be adopted by the Contractor, shall be considered only if the contractor provides satisfactory evidence that such special mode of construction is safe, sound and helps in speedy construction and completion of work to the required strength and quality. Acceptance of the same by the Engineer-in-charge shall not, however, absolve the contractor of the responsibility of any adverse effects and consequences of adopting the same in the course of execution of completion of the work.
21. All installations pertaining to water supply and fixtures thereof as well as drainage lines and sanitary fittings shall he deemed to be completed only after giving satisfactory tests by the Contractor.

22. The contractor shall be responsible for observing the rules and regulations imposed under "Minor Minerals Act", and such other law's and rules prescribed by Government from time to time.

23. All necessary safety measures and precaution (including those laid down in the various relevnt Indian Standards) shall be taken to ensure the safety of men, materials and machinery on the works as also of the work itself.

24. The testing charges of all materials shall be borne by the Contractor unless recovery a£ one percent towards usting charges is separately made.

25. Approval to any of the executed items for the work does not in any way relieve the contractor of his responsibility for the correctness, soundness and strength of the structure as per the drawings and specification.

SPECIFICATIONS OF MATERIALS

M-l Water

1.1 Water shall not be salty or brackish and shall be clean, reasonably clear and free from objectionable quantities of silt and traces of oil and injurious alkalies, salts, organic matter and other deleterious material which will either weaken the mortar or concrete or cause efflosrescence or attack the steel in R.C.C: Container for transport, storage and .handling of water shall be clean. Water shall conform to the standards specified in I.S. 456-1978.

1.2 If required by Engineer-in-charge it shall be tested by comparison with distilled water. Comparision shall be made by means of standard cement tests for soundness, time of setting and mortar strength as specified in I.S. 269-1976. Any indication of unsoundness, change in time of setting by 30 minutes or more or decrease of more than 10 percent in strength of mortar prepared with water sample when compared with the results obtained with mortar prepared with distilled water shall be sufficient cause for rejection of water under test.

1.3 Water for curing mortar, concrete or masonary should not he too acidic or too alkaline. It shall .he free of elements which significantly affect the hydration relation or otherwise interfere with the hardening of concrete during curing or those which produce, objectionable stains or other unsightly deposits on concrete or mortar surfaces.

1.4 Hard and bitter water shall not be used for curing.

1.5 Potable water will be generally found suitable for curing mortar or concrete.

M-2. Lime

2.1 Lime shall be hydraulic lime as per I.S. 712-1973. Necessary test shall be carried out as per I.S. 6,932 (Parts I to X) 1973.

2.2 The following field tests for limes are-to be carried out:

(1) A very rough idea can be formed about the type of lime by its visual examination i.e. fat lime bears pure white colour, lime in form of porous lumps of dirty while colour indicates quick lime, and solid lumps are the unburnt lime stone.

(2) Acid tests for determining the carbonate content in lime. Excessive amount of impurities and rough determination of class of lime.

2.3 Storage shall comply with I.S. 712-1973. The slaked lime, if stored, shall be kept in a weather proof and damp-proof shed with impervious-floor and sides to protect it against rain, moisture, weather and extraneous materials mixing with it. All lime that has been damaged in any way shall be rejected and all rejected materials shall be removed from site of work.

2.4 Field testing shall be done according to I.S. 1624- 1974 to show the acceptability of materials.

M-3. Cement

3.1 Cement shall be ordinary portland slag cement as per I.S. 269-1976 or Portland slag cement as per I.S. 455-1976.

M-4. .White Cement

4.1 The white cement shall conform to I.S.,80412"-E 1978.

M-5. Coloured Cement

5.1 Coloured cement shall be with white or gray portland cement as specified in the item of the work.

5.2 The pigments used for coloured cement shall be of approved quality-and shall not exceed 10% of cement used in the Mix, The mixture of pigment shall be properly grounded to have a uniform colour and shade. The pigments shall have such properties to provide-for dutability under exposure to sunlight and weather.

5.3 The pigment shall have the property such that it is neither affected by the cement nor detrimental to it.

MS. Sand

6.1 . Sand shall be natural sand, clean, well graded, hard strong durable and gritty particle free from injurious-amounts of dust clay, kankar nodules, soft or flaky particles Shale, alkali, salts-organic matter, loam, mica or other deleterious sunstance and shall be got approved, from the Engineer-in-charge. The sand shall not contain more than 8 percent of silt as determined by field test. If necessary the sand shall be washed to make it clean.

6.2 Coarse Sand :

The fineness, modulus of coarse sand shall not be less than 2.5 and shall not exceed 3.00. The sieve analysis of coarse shall be as under:

I.S. Sieve Designation	Percentage by Weight Passing sieve	I.S. Sieve Designation	Percentage by Weight Passing sieve
4.75 mm	100	600 Micron	30-100
2.36 mm.	90 to 100	300 Micron	5-70
1.18 mm.	70-100	150 Micron	0-50

6.3. Fine Sand

The fineness modulus shall not exceed 1.0. The sieve analysis of fine sand shall be as under :

I.S Sieve Designation	Percentage by weight Passing through	I.S. Sieve Designation	Percentage by Weight Passing through
4.75 mm.	100	600 Micron	40-85
2.36 mm	100	300 Micron	5-50
1.18 mm	70 – 100	150 Micron	0-10

M-7. Stone Dust

7.1. This shall be obtained from crushing hard black trap or equivalent.. It shall not contain- more than 8% of silt as, determined by field test with measuring cylinder. The method of determining silt contents by field test is given as under:

7.2. A sample of stone dust to be tested shall be placed without drying in 200mm. measuring cylinder. The quantity of . the sample shall be such that it fills the cylinder upto 100 mm. mark. The clean water shall be added upto 150 mm. mark. The mixture shall be stirred vigorously and the content allowed to settle for 3 hours.

7.3 The height of sill visible as settled layer above the stone dust shall be expressed as percentage of the height of the stone dust below. The stone dust containing more than 8% silt shall be washed so as to bring the silt content within the allowable limit.

7.4 The fineness modulus of stone dust shall not be less than 1.80.

M-8 Stone Grit

8.1 Grit shall consist of crushed or broken stone and be hard strong, dense, durable, clean, of proper gradation and free from skin or coating likely to prevent adhesion of mortar Grit shall generally be cubical in shape and as far as possible flaky elongated pieces shall be avoided. It shall generality comply with the provisions of I.S. 383-1970. Unless special stone of particular quarries is mentioned, grit shall be obtained from the best black trap or equivalent hard stone as approved by the Engineer-in-charge. The grit shall have no deleterious reaction with cement.

8.2 The grit shall conform to the following gradation as per sieve analysis :

I.S Sieve Designation	Percentage by weight Passing through	I.S. Sieve Designation	Percentage by Weight Passing through
12.50 mm.	100%	4.75 mm	0-20%
10.00 mm	85-100%	2.36 mm.	0-25%

8.3. The crushing strength of grit will be such as to allow the concrete in which it is used to built up the specified strength of concrete.

8.4. The necessary tests for grit-shall carried out as per the requirements of I.S. 2386 (Parts I to VII) 1963, as per instructions of the Engineer-in-charge. The necessity of test will be decided by the Engineer-in-charge.

M-9 Cinder:

9.1 Cinder is well burnt furnace residue which has- been fused of sintered into lumps of varying sizes. .

9.2. Cinder aggregates shall be well burnt furnace residue obtained from furnace using coal fuel only. It shall be sound clean free from clay, dirt, ash or other deleterious matter.

9.3. the average grading for cinder aggregates shall be as mentioned below :

I.S Sieve Designation	Percentage Passing	I.S. Sieve Designation	Percentage Passing
20 mm.	100	4.75 mm	70
10 mm	86	2.36 mm.	52

M.10. Lime Mortar

10.1 Lime shall conform to Specification M-2. Water shall conform to specification M-l.
Sand shall conform to specification M-6.

10.2. Proportion of Mix :

10.2.1 Mortar shall consist of such proportions of slaked lime and sand as may be specified in the item. The slaked lime and sand be measured by volume.

10.3 Preparation of mortar :

10.3.1 Lime mortar shall be prepared by wet process as per I.S. 1625-1971. Power driven mill shall be used for preparation of lime mortar. The slaked lime shall be placed in the mill in an-even layer .and ground for .the 180 revolution's with a sufficient water. Water shall be added as required during grinding (care being taken not to add more water) that will bring the mixed material to-a consistency-of stiff paste. Thoroughly wetted sand shall then be added evenly and the mixture ground for another 180 revolutions.

10.4 Storage:

10.4.1. Mortar shall always be kept damp, protected from san and rain till used up, covering it by tarpaulin or open sheds.

10.5. Use :

10.5.1. All mortar shall be used as soon as possible after grinding. It should be used oft the day en which it is prepared. But in no case mortar made earlier than 36 hours shall be permitted for use.

M-11 Cement Mortar :

11.1. Water shall conform to specification M-l. Cement shall conform to specification M-3. Sand shall conform to M-6.

11.2. Proportion of Mix :

1-1.2.1. Cement and sand shall be mixed to specified proportion, sand being measured by measuring boxes. The proportion of cement will be by volume on the basis of 50 Kg./Bag of cement being equal to 0.0342 Cu.m. The mortar may be hand mixed or machine mixed as directed.

11.3. Preparation of mortar:

11.3.1 In hand mixed mortar cement and sand in the specified proportions shall be thoroughly mixed dry on a clean Impervious platform by turning over at least 6 times or more till a homogenous mixture of uniform colour is obtained. Mixing platform shall be so arranged that no deleterious extraneous material shall get mixed with mortar-or mortar shall flow out. While mixing, the water shall be gradually added and thoroughly-mixed to form a stiff plastic mass of uniform colour so that each particle of sand shall be completely covered with a film of wet cement. The water cement ratio shall be adopted as directed.

11.3.2 The mortar so prepared shall be used within 30 minutes of adding water. .Only such quantity of mortar shall be prepared as can be used within 30 minutes.

M-12. Stone Coares Aggregate for Nominal Mix Concrete

12.1 Coarse aggregate shall be machine crushed stone of black trap or equivalent and be hard, strong, dense, durable, clean and free from skin and coating likely to prevent proper adhesion of mortar.

12.2 The aggregate shall generally the cubical in .shape. Unless special stones of particular quarries arc mentioned aggregates shall be machine crushed from the best black trap or equivalent hard stone as approved. Aggregate shall have no deleterious reaction with cement. The size of the coarse aggregate for plain-cement concrete and ordinary reinforced cement concrete shall generally be as per the table given below. "However in case of reinforced cement concrete the maximum limit may be restricted to 6 mm. less than the minimum lateral clear distance between bars or 6 mm. less than the cover, whichever is smaller.

TABLE

I.S. Sieve Designation	Percentage passing for single sized aggregates of Nominalsize.			I.S. Sieve Designation	Percentage passing for single sized aggregates of Nominalsize.		
	40 mm	20mm	16 mm		40mm	20mm	16mm
80 mm.	—	—	—	12.5 mm.	—	—	—
63 mm.	100	__	—	10 mm.	0.5	0.02	0.30
40 mm.	85-100	100	—	4.75 mm.	—	0.5	0.5
20 mm.	0-20	85-100	100	2.35mm	—	—	—
16 mm.	—	—	85-100				

Note : This percentage may be varied .some what by Engineer- in-charge when considered necessary for obtaining better density and strength of concrete.

12.3 The grading test shall be taken in the beginning and at the change of source of materials. The necessary test indicated in I.S. 383-1970 and I.S, 456-1978 shall have to be carried out to ensure the acceptability. The aggregates shall be stored separately and handled in such a manner as to prevent the intermixing of different aggregates, If the aggregates are covered will dust they shall be washed with water to make them clean.

M-13. Blak Trap or Equivalent Hard Stone Coares.

13.1. Aggregate For Design Mix Concrete : Coarse aggregate shall be of machine crushed stone of black trap or equivalent hard stone and be hard strong dense, durable clean and free from skin and coating likely to prevent proper adhesion of mortar.

13.2. The aggregates shall generally be cubical in shape. Unless special stones of particular quarries are mentioned, aggregate shall be machine crushed from4he best, black trap or equivalent hard stones as approved. Aggregate shall have no deleterious reaction with cement.

13.3. The necessary tests indicated in I.S. 383-1970 and I.S. 456-1978 shall have to the carried oat to. ensure the acceptability of the material.

13.4. If aggregate is covered with dust it shall be washed with water to make it clean..

M-14. Brick Bats Aggregate

14.1. Brick bat aggregate shall be broken from well burnt or slightly over burnt and dense brick. It shall be homogeneous in texture roughtly cubical in shape, clean and free from dirt of any other foreign material. The brick bats shall be of 40 mm. to 50 mm. size unless otherwise specified in the item. The under burnt of over burnt brick bats shall not be allowed.

14.2. The brick' bats shall be measured by volume by suitable boxes or as directed.

M-15. Brick

15.1.The bricks shall be hand or machine moulded and made from suitable soils and klin-burnt. They shall be free Iron crack and nodules of free lime. They shall have smooth rectangular faces with sharp corners and shall be of uniform colour.

The bricks shall be moulded with a frog of 100mm. x 40 mm. and 10mm. to 20 mm. deep on one of its flat sides. The bricks shall not break when thrown oft the ground from a height of 600 mm.

15.2. The size of modular bricks shall be 190 mm. x 90 mm. x 90 mm.

15.3. The size of the conventional bricks shall be as under :

(9" x 4 3/8 " X2 3/4 ") 225 x 110 x 75 mm.

15.4. Only bricks of one standard size shall be used on one work. The following n-.rrances shall be permitted in the conventional size adopted in a particular work.

Length ± 1/8 " (3.0 mm.) Width : ±1/16" (1.50 mm,.) Height :± 1/6" (1.50 mm.)

15.5. The crushing strength of the bricks shall not be less than 35 Kg./Sq.Cm. The average water absorption shall not be more than 20 percent by weight. Necessary tests for crushing strength and water absorption etc. shall be carrieel. out as per I.S. 3495 (Part-I to IV) 1976.

M-16 Stone

16.1. The stone shall be of the specified variety such as Granite/Trap Stone/Quarzite or any other type of good hard stones.

The stones shall be obtained only from the approved quarry and shall be hard, sound, durable and free from defects like cavities, cracks, sand holes, flaws, injurious veins, patches of loose or soft materials etc. and weathered portions and other structural defects or imperfections tending to affect their soundness and strength. The stone with round surface shall not be used. The percentage of water absorption shall not be more than 5% of dry weight, when tested in accordance , with I.S. 1134- 1974. The minimum crushing strength of the stone shall be 200 Kg./Sq.Cm. unless otherwise specified.

16.2. The samples of the stone to be used shall be got approved before the work is started.

16.3. The Khanki facing stone shall be dressed by chisel as specified in the item for khanki facing in required shape and size. The face of stone shall be so dressed that the bushing on the exposed face shall not project by more than 40 mm. from the general wall surface and on face to be plastered it shall not project by more than 19 mm. nor shall it have depressions more than 10 mm. from the average wall surface.

M-17. Laterite stone

17.1 Laterite stone shall be obtained from the approved quarry. It shall be compacted in texture, sound, durable and free from soft patchs. It shall have a minimum crushing strength of 100 Kg./Sq.Cm. in its dry condition. It shall not absorb water more than 20% of its own weight, when immersed for 24 hours in water. After quarrying the stone shall be allowed to weather f6r some time before using in work.

17.2. The stone shall be dressed into regular rectangular blocks so that all faces are free from -waviness and uneveness, edges true and square.

17.3 Those types of stone in which white clay occure, should not be used.

17.4 Special corner stones shall be provided where so directed.

M-18. Mild Steel Bars

18.1 Mild steel bars reinforcement for R.C.C. work shall conform to I.S, 432 (Part-II) 1966 and §hail be of tested quality. It shall also comply with relevant part of I.S. 456- 1978.

18.2 All the reinforcement shall be clean and free from dirt, paint, grease, mill scale or loose or thick rust at the time of placing.

18.3 For the purpose of payment, the bar shall be measured correct upto 100 mm. length and weight payable worked out at the rate specified below :

1.	.6 mm.	0,22 Kg./Rmt.	8	20 mm.	2.47 Kg./Rmt.
2.	8 mm.	0.39 Kg./Rmt.	9.	22. mm.	2.98 Kg./Rmt.
3.	10mm.	0.62 Kg./Rmt.	10.	25 mm.	3.85 Kg./Rmt.
4.	12 mm.	0.89 Kg./Rmt.	11.	28 mm.	4,83 Kg./Rmt.
5.	14 mm.	1.21 Kg./Rmt.	12.	32 mm.	6.3.1 Kg./Rmt.
6.	16mm.	1 .58 Kg./Rmt,	13.	36 mm.	7.99 Kg./Rmt.
7.	18 mm.	2.00 Kg./Rmt.	14.	40 mm.	9.86 Kg/Rmt.

M-19. High Yield Strength Steel Deformed Bars

19.1. High yield strength steel deformed bars be either cold twisted or hot/rolled, shall conform to I.S. 1739-1966 and I.S.1139-1966 respectively.

19.2. Other provision and requirements shall conform to specification No. M-18. for Mild steel bars.

M-20 High Tensile Steel Wires

20.1. The high tensile wires for the use in prestressed concrete work shall conform to I.S. 2090-1962.

20.2. The tensile strength of the high tensile steel bars shall be as specified in the item. In absence of the given strength, the minimum strength shall be taken as per para 6.1 of I.S. 1785-1962, Testing shall be done as per I.S. requirements.

20.3. The high tensile steel shall be free from loose mill scale, rust oil, grease, or any other harmful matter. Cleaning of steel bars may be carried out by immersion in solvent solution, wire brushing or passing through a pressure box containing carborundum.

20.4. The high tensile wire shall be obtained from manufactures in coil having diameter not less than 350 times the diameter of wire itself so that wire springs back straight on being uncoiled.

M-21 Mild Steel Binding Wire

21.1. The mild steel wire-shall be of 1.63 rnm. or 1.22 mm. (16 or 18 guage) diameter and shall conform to I.S. 280- S 972.

21.2. The use of black wire will be permitted for binding reinforcement bars, ft shall be free from rust, ojl paint, grease, loose mill scale or any other undesirable coating which may prevent adhesion of cement mortar.

M-22. Structural Steel

22.1. All structural steel shall conform to I.S. 226-1965. The steel shall be free from the defects mentioned in I.S. 226-1975 and shall have a smooth finish. The material shall be free from loose mill scale, rust pits or other defects affecting the strength and durability. Rivet bars shall conform to I.S. 1148-1973.

22.2, When the steel is supplied by the Contractor test certificates of the manufacturers shall be obtained according to I.S. 226-1975 and other relevant Indian Standards.

M-23. Galvanised Iron Sheets

23.1 The galvanised iron sheets shall be plain or corrugated .sheets of specified in item. The G.I. Sheets all conform to I.S 277-1977. The sheets shall be undamaged in carriage and handling either by rubbing off of zinc coating or otherwise they shall have clean and bright surface and shall be free from dents, holes, rust or white powdery deposit.

23.2. The length and width Of G.I. sheet shall be as directed as per site condition.

M-23-A; G.I. Valleys gutter ridges

23.A.1. The G.I. ridges and hips shall be of plain galvanised sheets class-3 of the thickness as specified item. These shall be 600 mm. in width and properly bent up to shape without damage to the sheets in process of bending.

23.A.2. Valleys gutters and flashings shall also be galvanised sheet of thickness as specific in item, Vallev's shall be 900 mm. wide overall and fishing shall be 380 mm. wide overall. They shall be bent (o the required shape without damage to the sheet in (he process of bending.

M-24. Asbestos Cement Sheets

24.1. Asbestos cement sheets plain, corrugated or semi corrugated shall conform to I.S. 459-1970. The thickness of fee sheets shall be as specified in the item. The shells shall be free front all defects such as cracks, holes deformities, chipped edges or otherwise damaged.

24.2. Ridged-& Hips

24.2.1. Ridges and hips shall be of same thickness at that of A.C. sheets. The types of ridges suitable for the type of sheets and location's.

24.2.2. Other accessories to be used in roof such as flashing pieces, caves filler pieces, valley gutters, north light and ventilator curves, barge boards etc. shall be standard manufacture and shall be suitable for the type of sheets and location.

M-25. Mangalore Pattern Roof Tiles

25.1. The Mangalore pattern tiles shall conform to I.S. 654-1972 for Class AA or Class 'A' type as specified in item. Samples of the tiles to be provided shall be got approved from the engineer in charge. Necessary tests shall be carried out as directed.

M-26. Shuttering

26.1. The shuttering shall be either of Wooden planking of 30 mm. minimum thickness with or without steel lining or of steel plates stiffened by steel angles. The shuttering shall be supported on battens and beams and props of vertical ballies properly cross braced together so as to make the centering rigid. In places of bullie props, brick pillar of adequate section built in mud mortar may 6e used.

26.2. The form work shall be sufficiently strong and shall have camber, so that it assumes correct shape after deposition of the concrete and shall be able to resist forces caused by vibration of live load of men working *over* it and other incidental loads associated with it. The shuttering snail have smooth and even surface and its joints shall not permit leakage of cement grout.

26.3. If at any stage of work during or after placing concrete in the structure, the form work sags or bulges out beyond the required shape of the structure, the concrete shall be removed and work redone with fresh concrete and adequately rigid form work. The complete form work shall be got inspected by and got approved from the Engineer-in-charge, before the reinforcement bars are placed in position.

26.4. The props shall consist of bullies having 100 mm. minimum diameter measured, at mix length and 80 *mm,* at thin end and shall be placed as per design requirement. These shall rest squarely on wooden sole plates 40 mm; thick and minimum bearing are if 0.10 sq. m. laid on sufficiently hard base.

26.5. Double wedges shall further be provided between the sole plate and the wooden props so as to facilitate tightening and easing of shuttering" without jerking thei concrete.

26.6 The. timber used in shuttering shall not be so dry as to absorb water from concrete and swell or bulge nor so green or wet *as* to shrink after erection. The timber shall be properly sawn and planed on the sides and surface coming in contact with concrete. Wooden form work with metal sheet lining or steel plates stiffened by steel angles shall be permitted.

26.7 As far as practicable, clamps shall be used to hold the forms together and use of nails and spikes avoided.

26.8 The surface of timber shuttering that would come in contact with concrete shall be well wetted and coated with soap solution before the concreting is done. Alternatively coat of raw linseed oil or oil of approved manufacturer may be applied in place of soap solution. In case of steel shuttering either soap solution or raw linseed oil shall be applied after thoroughly cleaning the surface. Under no circumstances black or burnt oil shall be permitted.

26.9 The shuttering for beams and slab's shall have camber of 4 mm. per metre (1 in 250) or as directed by the Engineer-in-charge so as to offset the subsequent deflection. For cantilevers, the camber at free end shall be 1/50 of the projected length or as directed by the Engineer-in-Charge.

M-27. Expansion joints- Premoulded filter:

27.1 .The item provides for expansion joints in R.C.C. frame structures for internal joints, as well as exposed pints, with the use of premoulded bituminious joint filler.

27.2. Premoulded bituminous joint filler, i.e. performed strip of expansion joint filler shall not get deformed or broken by twisting, bending or other handling when exposed to atmospheric condition. Pieces of joint filler that have been damaged shall be rejected.

27.3 Thickness of the pro-moulded joint filler shall be 25 mm. unless otherwise specified.

27.4 Premoulded bituminuous joint filler shall conform to I.S. 1838-1961

M-28. Expansion joints-Copper strips & hold fasts:

28.1 The item provide for expansion joints in R.C.C. frame structure for internal joint as well as for exposed joints with the use of necessary copper strip and holdfasts.

28.2 Copper sheet shall be of 1.25 mm. thick and of 1.25 mm. width with the 'U' shape in the middle. Copper strip shall have holdfast of 3 mm. diameter copper rod fixed to the plate soldered on strip at intervals of about 30 cm. or *as* shown in the drawing or as directed. The width" of each flange (horizontal side) of the copper plate to be embedded in the concrete work shall be 25 mm. Depth of 'U' to be provied in the expasion joint, in the copper plate shall be of 25 mm.

M-29. Teak wood:

29.1 The leak wood shall be of good quality as required for the item to be executed. When the kind of wood is not specifically mentioned, good Indian teak wood as approved shall be used.

29.2 Teak wood shall generally be free from large, loose, dead or cluster knots, flaws, shakes, warps, twists bends, or any other-defects. H shall generally be uniform in substance and of stright fibres as far as possible. It shall be free from rot, decay, harmful fungi and other defects of harmful nature which will affect the strength durability of its usefulness for the purpose for which it is required. The colour shall be uniform as far as possible. Any effort like painting, using any adhesive or resins materials made to hide the defects shall render the pieces liable to rejection by the Engineer in-charge.

293. All scantlings; planks etc. shall be sawn in straight lines and planes in the direction of grains and of uniform thickness.

29.4. The tolerances in the dimensions shall be allowed at the rate of 1.5 mm. per face to be planed.

29.5. First class teak wood : 29.5.1. First clalss teak wood shall have no individual hard and sound knots, more than 6 sq. cm. size and the aggregate area of such knots shall not be more than *1%* of area of piece. The timber shall be closed grained.

29.6 Second Class Teak wood: 29.6.1. No individual hard and sound knots shall be more than 15 sq. *cms.* in size and aggregate area of such knots shall not exceed 2% of the area of piece.

M-29. A. Non-teak wood:

The non teak wood shall be chemically treated, seasoned as per IS Specifications and of good quality. The type of wood shall be got approved Before collecting the same on site. Fabrication of wooden members shall be started only after approval.

For this purpose wood of Bio, Kalali, Siras, Bchda, Jamun, Sisoo will be used for door frames where as only Kalali, Siras, Halda, Kalam etc, will be permitted for shutters after proper seasoning and chemical treatment.

The non-teak wood shall be-free from large, loose, dead of cluster knots, flows shakes, warps, bends or any other defect. It Pigtail-be uniform in substance and of straight fibers as far as possible. It shall be free from rots, decay harmful fungi and other

defects of nature which effect the strength, durability or it usefulness for the purpose for which it is required. The colour of wood shall be uniform as far as possible. The scantlings planks etc. shall be sawn in straight lines and planes in the direction of grain and uniform thickness.

The department will use the Agency to produce certificate from Forest Department in event of Dispute and the decision of the Department shall be final and binding to me contractor.

The tolerance in the dimension shall be allowed as 1.5 mm. per face to be planed.

M-30. Wooden flush door shutters (solid core):

30.1. The solid core type flush door shutters shall be decorative or non-decorative type as specified in the drawing. The-size and thickness of the shutter shall be as specified in drawings or as directed. The limber, species for core shall be used as per I.S. 2202 - (Part-I) 1980. The timber shall be free from decay and insect attack. Knots and knot holes less than half the width of cross-section of the members in which they occur may be permitted. Pitch pockets, pitch streaks and harmless pin holes shall be permissible except in the exposed edges of the core members. The commercial plywood, cross-bands shall conform to I.S. 303-1275.

30.2. The face panel of the shutters shall be formed by gluing by the hot press process on both face of the core with either ply wood or cross-bands and face veneers. The hopping rebating opening of glazing Venetian etc. shall be provided if specified in the drawing.

30.3. All edges of the door shutters shall be square. The shutters shall be free from twist or warp in its plane. Both faces of the shutters shall be sand papered to smooth even texture.

30.4. The shutters shall be tested for

(1) End immersion test.: The test shall be carried out as per l.S. 2202 (part-I) 1980. There shall be no delamination at the end of the test.

(2) Knife Test: The face panel when tested in accordance with l.S. 1659-1979 shall pass the test.

(3) Glue adhesion test :The flush door shall be tested for glue adhesive test in .accordance with KS..2202 (Pan 4) 1930, The shutters shall be considered to have passed the test if no delamination occurs in the-glue lines in the plywood and if no single delamination more than 80 mm. in length and more than 3 mm. in depth has occnred in the assembly glue lines between the . plywood face and the style and rail. Delamination at the comer shall be measured continuously around the comer. Delamination at the knots, knot holes and other permissible wood defects shall not be considered in assessing the sample.

30.5. The tolerance in size of solid core type flush door shall be as under.

In Normal thickness ±1.2 mm. In Normal height ± 3 mm.

30.6. The thick of the shutters .shall be uniform throughout with a permissible variation of not more than 0.8 mm. when measured at any two points.

M-31. Aluminium doors, windows, ventilators

31.1 Aluminium alloy used in the manufacture of extruded window sections shall conform to I.S. designation HEA-WP of I.S.: 733-3975 and also to I.S. Designation WVG-WP of I.S. 1285-1975. The Section shall be as specified in the drawing and design. The fabrication shall be done as directed.

31.2. The hinges shall be cast or extruded aluminium hinge of same type as in window but of large size.

313. The hinges shall normally be of 50 mm. projecting type. Non-projecting type of hinges may also be used if directed.
The handles of door shall be of specified design. A suitable lock for the door operatable either from outside or inside shall be provided. In double shutter door, the first closing shutter shall have concealed aluminium alloy bolt at top and bottom.

M-32. Rolling Shutters:

32.1. The rolling shutters shall conform to 1 .S. 6248-1979. Rolling shutters shall be supplied of specified type with accessories. The size of the rolling shutters shall be specified in the drawings. The shutters shall be constructed with interlocking lath sections formed from cold rolled steel strips not less than 0.9 mm. thick and 80 mm: wide for shutters upto 3.5mm., width not less than L25 mm. thick and 80 mm; wide for shutters 3.5 mm in width and at above unless otherwise specified.

32.2. Guide channels shall be of mild steel deep channel section and of rolled pressed or built up (fabricated) joint construction. The thickness of sheet used shall not be less than 3.15mm.

32.3. Hood covers shall be made of M.S. Sheets not less than 0 92 mm. thickness. For shutters having width 3.5 Meter and

above, the thickness of M.S. Sheet for the hood cover shall *be* not less than 1.25 mm.

32.4. The spring shall be of best quality and shall be manufactured from tested high tensile spring steel wire or strip of adequate strength to balance the shutters in all position. The spring pipe shaft etc. shall be supported on strong M.S. or malleable C.I. brackets. The brackets shall be fixed on or under the lintel as specified with raw plugs and screws bolts etc.

32.5. The roiling shutters shall be of self rolling type up to 8 Sq. in. clear area without ball bearing and up to 12 sq. m. clear area with ball bearing. If the rolling shutters are larger, then gear operated type shutters shall be used.

32.6. The locking arrangement shall be provided at the bottom of shutter at both ends. The shutters shall be opened from outside.

32.7.The shutters shall be completed with door suspention shafts, locking arrangements, pulling hooks, handles and other accessories.

M-33. Collapsible. Steel-Gate:

33.1. The collapsible steel gate shall be in one or two leaves and size as per approved drawings or as specified. The gate shall be fabricated from best quality mild steel channels, flats etc. Either steel pulleys or ball bearings shall be provided in every double channel. Unless otherwise specified the particulars of collapsible gate shall be as under :

(a) Pickets: These shall be of 20 mm. M.S., channels of heavy sections unless otherwise shown on drawings. The distance centre to centre of pickets shall be 12 cms. with an opening of 10 cms.

(b).Pivoted M.S. flats shall be 20 mm x 6 mm.

(c) Top and bottom guides shall be from tee or flat iron of approved size.

(d) The fittings like stoppers, fixing hold fasts, locking cleats, brass handles and cast iron rollers shall be of approved design and size.

M-34. Welded Steel Wire Fabric :

34.1. Welded steel wire fabric for general purpose shall be manufactured from cold drawn steel wire "as drawn" or galvanised steel conforming to I.S. 226-1975 with longitudinal and transverse wire securely connected at every intersection by a process of electrical resistance welding and conforming to I.S. 4948-1974. It shall be fabricated and finished in workmanlike manner and shall be free from injurious detects and shall be rustproof. The type of mesh shall be oblong or square as directed. The mesh sizes and size of wire for square as well as oblong welded steel wire fabric shall be as directed The steel wire fabric in panels shall be in one whole piece in each panel as far as stock size permit.

M-35. Expanded Metal Sheets :

35.1. The expanded metal sheets shall be free from flaws, joints, broken strands, laminations and other harmful surface. Expanded metal steel sheet shall conform to I.S. 412-1975, except that blank sheets need not be with guaranteed mechanical properties. The size of the diamond mesh of expended metal and dimensions of strands (width and thickness) shall be as specified. The tolerance in nominal weight of expanded metal sheets shall be of + 10 percent.

35.2 Expanded metal in pannels shall be in one whole piece panel each as far as stock size permit. The expanded metal sheets shall be coated with suitable protective coating to prevent corrosion.

M-36. Mild Steel Wire (Wire Gauze Jali) :

36.1 Mild steel wire, may be galvanised, as indicated. All finished steel wire shall be well cleanly drawn to !he dimensions and-size of wire as specified in item. The wire shall be sound, free from splits, surface flaws, rough jagfied and imperfect edges and other harmful surface defects and shall conform to I.S. 280-1978.

M-37. Plywood :

37.1. The plywood for general purpose shall conform I:S. 303- 1975.

Plywood is made by cementing together thin boards or sheets of wood into panels. There are always an odd number of layers 3, 5,7, 9 ply etc. The plies are placed so that grain of each layer is right angle to the grain in the adjacent layer.

37.2. The chief advantages of plywood over a signal board of the same thickness is the more uniform strength of the plywood, along the length and width of the plywood and greater resistance to cracking and splitting with change in moisture content,

37.3. Usually synthetic resins are used for gluing, pherolic resins are usually cured in a hot press which compresses and simultaneously heats the plies between hot plates which maintain a temperature of 90 degree. C. to 140 degree C. and a pressure of 11 to 14 Kg/Sq. Cm. on the wood. The times of healing may be anything from 2 to 60 minutes depending upon thickness.

37.4. When water glue are used, the wood absorbs so much water that the finished plywood must be dried carefully. When synthetic resins are use as adhesive finished plywood must be exposed to an atmosphere of controlled humidity until the proper amount of moisture, has been absorbed.

37.5. According to I.S. 303-1975 the plywood for general purpose shall be of three grades namely BWR, WWR and CWR, depending upon the adhesives used for bonding and veneers, and it will be farther classified into six types namely AA. AB. AC, BB, BC and C,C based on the quality of the two faces, each face being of three finds namely, A, B. and C. After pressing, the finished ply wood should be reconditioned to a moisture content not less than 8 percent and not more than 16 percent.

37.6. Thickness of ply wood Boards :

TABLE

Board	Thickness	Board,	Thickness	Board	Thickness	Board	Thickness
3 ply	3mm	5 ply	5mm	7 ply.	9mm	9 ply.	16mm.
	4 mm.		6mm.		13mm.		19 mm.
	5 mm:		8mm.		16mm.	11 Ply.	19 mm.
	6 mm.		9mm.	9 Ply.	13mm.		22mm.
							25 mm.

M.38. Glass:

38.1 All glass shall be of the best quality, free from specks, bubbles, smokes, veins, air holes blisters and other defects. The kind of glass to be used shall be mentioned in the item or specification or in the special provisions or as shown in detailed drawings. Thickness of glass panes shall be uniform. The specifications of different kinds of glass shall be as under:

38.2.Sheet Glass:

38.2.1. In absence of any specified thickness or weight in the item or detailed specifications of the item of work, sheet glass shall be weighing 73 Kg/Sq.m. for panes upto 600 mm x 600 mm.

38.2.2. For panes larger than 600 mm. x 600 mm. and upto 800 mm. x 800 mm. the glass weighing not less than 8.75 Kg/Sq m. shall be used. For bigger panes upto 900 mm. x 900 mm. glass weighing not less than 11.25 Kg/Sq. m. shall be used.

38.2.3. Sheet glass shall be paten, flattened glass of best quality and for glazing and framing purposes shall conform to I.S.: 1761 -1960. Sheet glass of the specified colours shall be used, if so shown on detailed drawings or so specified. For important buildings and for panes with any dimension over 900 mm. plate glass of specified thickness shall be used.

38.3. Plate Glass. 38.3.1. When plat, glass is specified, it shall be 'Polished patent plate glass' of best quality. It shall have both the surface ground flat and parallel and polished to obtain clear undistrubed vision and reflection. The plate glass shall be of the thickness mentioned in the item or as shown in the detailed drawing or as specified. In absence of any specified thickness the thickness of plate glass to be supplied shall be 6mm and a tolerance of 0.20 mm. shall be admissible.

38.4. Obscured Glass : 38.4.1. This type of glass transmits light so that vision is partially or almost completely obscured. Glass shall be plain rolled, figured, ribbed or fluted or frosted glass as may be specified as required. The thickness and type of glass shall be as per details on drawings or at specified or as directed.

38.5. Wired Glass: 38.5.1. Glass shall be with wire netting embedded in a sheet of plate glass electrically welded 13 mm. Georgian square mesh may be used. Thickness of glass shah riot be less than 6 mm. Wired glass shall be of type and thickness as specified.

M-39. Acrylic Sheets:

39.1. Acrylic sheet shall be of thickness as specified in the item and of an specified shape and size as the case may be. Panels may be flat or curved. It should be light in weight. It shall be colourless or coloured or opaque as specified in the item. Colourless sheet shall be as transparent as the finest optical glass, its light transmission rate shall be about 95%. Transparency shall not bef affected for the sheets of larger thickness. It shall be extremely .resistant to sunlight, weather and low temperatures. It shall not show any significant yellowing or change in physical properties or loss of light transmission over a longer period of use. The sheet Shall be impact resistant also. Sheets should be available in complete range of standard transparent, translucent and opaque colours. Sheets shall be of such quality that they can be cut bent and jointed as desired. Solution for the joints shall be used as per the requirement of manufacturer.

M-40. Particle board : 40.1. The particle boards used for face panels shall be of best quality free from any defects. The particle boards shall be made with phenoimaldehyde adhesive. The particle boards shall conform to I.S. : 3087-1965. "Specification for wood particle board for general purpose". The size and the thickness shall be as indicated.

M-41. Expanded polystyrene of framed styroper slabs :41.1. The expanded polystytrene ceiling boards and files shall be of approved make and shall be of size, thickness, finish and colour as indicated. It shall be of high density and suitable for use as insulating material. The insulating material shall be like slab of Thermocole etc.

M-42. Resin bonded fibre glass : 42.1 The resin bonded fibre glass tiles, or rolls shall be of approved make and shall be of sizes, thickness and finish as indicated.

42.2. For test of Minerral wool thermal insulation Blanket I.S.: 3144/1965 shall be followed.

42.3. Insulation wool blanket shall be with following coverings on one or both sides as indicated.

(1) Bituminised hessain Kraft paper suitable for use in position where moisture has to be excluded.

(2) Hessian cloth or Kraft paper for keeping out dust.

(3) G.I. wire netting, suitable for surfaces to be plastered over.

M-43. Fixtures and fastenings :

43.1. General:

43.1.1. The fixtures and fastenings, that is, butt, hinges, tee and strap hinges, sliding door bolts, tower bolts, door latch, bath room latch, handles, door stoppers, casement window fasteners, casement stays and ventilators catch shall be made of the metal as specified in the item or its specifications.

43.1.2. They shall be of iron, brags, aluminium, chromium plated iron, chromium plated brass, copper oxidised iron, copper oxidised brass or anodised aluminium as specified.

43.1.3. The fixtures shall be heavy, medium or light type. The fixtures and fastenings shall be smooth finished and shall be such as will ensure ease of operation.

43.1.4. The samples of fixtures and fastenings shall be got approved as regards quality and shape before providing them in position.

43.1.5. Brass and anodised aluminium fixtures and fastenings shall be bright finished.

43.2. Holdfasts: 43.2.1. Holdfasts shall be made from mild steel flat 30 cm. length and one of the holdfasts shall be bent at right angle and two nos. of 6 mm. diameter holes shall be made in it for fixing it to the Farme with screws. At the other end, the holdfast shall be forked and bent at right angles in opposite directions.

43.2. Butt hinges:

43.3.1. Railway standard heavy type butt hinges shall be used when so specified. 43.3.2. Tee and strap hinges shall be manufactured from M.S. Sheet.

43.4. Siding door bolts (Aldrops): 43.4.1. The aldrops as specified in the item shall be used and shall be got approved.

43.5. Tower bolts (Barrel Type): 43.5.1. Tower bolts as specified in the item shall be used and shall be got approved.

43.6. Door latch : 43.6.1. The size of door latch shall be taken as the length of latch.

43.7. Bathroom Latch : 43.7.1. Bathroom latch shall be similar to tower bolt.

43.8. Handle: The size of the handles shall be determined by the inside grip length of the handles. Handles shall have a base plate of length 50 mm. more than the size of the handle.

43.9. Door Stoppers: 43.9.1. Door stoppers shall be either floor door stopper type or door catch type. Floor stopper shall be of overall size as specified and shall have a rubber cushion.

43.10. Door Catch : 43.10.1. Door catch shall be fixed at a height of about 900 mm. from the floor level so that one part of the catch is fitted on the inside of the shutter and the other part is fixed in the wall with necessary wooden plug arrangements for appropriate fixity. The catch shall be fixed 20 mm. inside the face of the door for easy operation of catch.

43.11. Wooden Door Stop with hinges : 43.11.1. Wooden door stop of size 100 mm x 60 mm x 40 mm shall be fixed on the door frame with a hinge of 75 mm size and at a height of 900 mm. from the floor level. The wooden door stop shall be provided with 3 coats of approved oil paint.

43.12. Casement window Fastener: Casement window fastener for single leaf window shutter shall be left or right handled

as directed.

43.13. Casement stays (Straight Peg Stay) :43.13.1. The stays shall be made from a channel section having three holes at appropriate position so that the window can be opened either fully or partically as directed. Size of the stay shall be 250 mm. to 300 mm. as directed.

43.14. Ventilator Catch: 43.14.1. The pattern and shape of the catch shall be as approved.

43.15. Pivot: 43.15.1. The base and socket plate shall be made from minimum 3 mm. thick plate and projected pivot shall not be less than 12 mm. diameter and 12 mm. length and shall be firmly riveted to the base plate in case of iron pivot and in single piece base plate in the case of brass pivot.

M-44.

Paints: 44.1 (A) Oil paints :

44.1.1. Oil paints shall be of the specified colour and shade, and as approved. The ready mixed paints shall only be used. However, if ready mixed paint or specific shade or tint is not available, white ready mixed paint with approved stainer will be allowed. In such a ease, the contractor shall ensure that the shade of the paint so allowed shall be uniform.

44.1.2. All the paints shall meet with following general requirements :

(i) Paint shall not show excessive setting in a freshly opened full can and shall easily be redispressed with a paddle to a smooth homogeneous state. The paint shall show no curdling, livering, caking or colour separation and shall be free from lumps and skins.

(ii) The paint as received shall brush easily, possess good leverling properties and show no running or sagging tendencies.

(iii) The paint shall not skin within 48 hours in a three quarters filled closed container.

(iv) The paint shall dry to a smooth uniform finish free from roughness, grit, unevenness and other imperfections.

44.1.3. Ready mixed paint shall be used exactly as received from the manufacturers and generally according to their instructions and without any admixtures whatsoever.

44.2. (B) Enamel Paints:

44.2.1. The enamel paint shall satisfy in general requirements as mentioned in specification of oil paints. Enamel paint shall conform to I.S. 2933-1975.

M-45 French polish :

45.1. The french polish of required tint and shape shall be prepared with the below mentioned ingredients and other necessary materials:

(i) Denatured spirit of approved quality (ii) Chandras (iii) Shellac (iv) Pigment.

45.2. The french polish so prepared shall conform to I.S.: 348-1968.

M-46 Marble chips for marble mosaic terrazzo:

46.1. The marble chips shall be of approved quality and shades. It shall be hard, sound, dense and homogeneous in texture with crystalline and coarse grains. It shall be uniform in colour and free from stains, cracks decay and weathering.

46.2. The size of various colours of marble chips ranging from the smallest upto 20 mm. shall be used where the thickness of top wearing layer is 6 mm. size. The marble chips of approved quality and colours only as per grading as decided by the Engineer-in- charge shall be used for marble mosic tiles or works.

46.3 The marble chips shall be machine crushed. They shall be free from foreign matter, dust etc. Except as above, the chips shall conform to I. S.: 2114-1962.

M-47. Flooring Tiles: 47.1. (A) Plain Cement tiles :

47.1.1. The plain cement tiles shall be general purpose type. These are the tiles in the manufacturer of which no pigments are used. Cement used in the manufacture of tiles shall be as per Indian Standards.

47.1.2. The tiles shall be manufactured from a mixture of cement and natural aggregates by pressure process. During

manufacture, the tiles shall be subjected to a pressure of not less than 140 Kg/Sq. Cm. The proportion of cement to aggregate in the backing of the tiles shall be not less than 1:3 by weight. The wearing face through the tiles are of plain cement, shall be proviedd with stone chips of 1 to 2 mrn. size. The proportions of cement to the rnarble chips aggregate in the wearing layer of the tiles shall be three parts of cement to one part chips by weight. The minimum thickness of wearing layer shall be 3 mm. The colour and texture of wearing layer shall be uniform throughout its face and thickness. On removal from mould, the tiles shall be kept in moist conditions continuously at least for seven days and subsequently, if necessary, for such long period as would ensure their conformity to requirements of I.S.: 1237-1980 regarding strength resistance to wear and water absorption.

47.1.3. The wearing face of the tiles shall be plain, free from projections, depressions and crackes and shall be reasonably parallel to the back face of the tile. All angles shall be right and all edges shall be sharp and true.

47.1.4. The size of tiles shall generally be square shape 24.85 Cm. x 24.85 Cm. or 25 Cm. x 25 Cm. The thickness of tiles shall be 20 mm.

47.1.5. Tolerance of length and breadth shall be plus or minus one millimeter. Tolefance on thickness shall be plus 5 mm.

47.1.6. The tiles shall satisfy the tests as regards transverse strength resistance to wear and water absorption as per I.S : 1237-1980.

47.2. (B) Plain Coloured Tiles :

47.2.1. These tiles shall have the same specification as per plain cement tiles as per (A) above except that they shall have a plain wearing surface wherein pigments are used. They shall conform to I.S. 1237-1980.

47.2.2. The pigment used for colouring cement shall not exceed 10 percent by weight of cement used in the mix. The pigments synthetic or otherwise, used for colouring tiles shall have permanent colour and shall not contain materials detrimental to concrete.

47.2.3. The colour of the tiles shall be specified in the item or as directed.

47.3. (C) Marble mosaic tiles :

47.3.1. These tiles have, the same specifications as per plain cement tiles except the requirements as stated below:

47.3.2. The marble mosaic tiles shall conform to I. S. 1237-1980. The wearing face of the tiles shall be mechanically ground and filled. The wearing face of tiles shall be free from projections, depressions and cracks and shall be reasonably parallel to the back face of the tiles. All angles shall be right angles and all edges shall be sharp and true.

47.3.3. Chips used in the tiles be from smallest upto 20 mm. size. The minimum thickness of wearing layer of tiles shall of 6 mm. For pattern of chips to be used on the wearing face, a few samples with or without their full size photographs as directed shall be presented to the Engineer-in-charge for approval.

47.3.4. Any particular samples, if found suitable shall be approved by the Engineer-in-charge, or he may ask for a few more samples to be prepared indicating roughly the particular sized chips to be more-or less in the samples presented. The samples have to be made by the contractor till a suitable sample is finally approved for use in the work.

The Contractor shall ensure that the tiles supplied for the work shall be in conformity with the approved sample only, in terms of its dimensions, thickness of backing layer and wearing surface, materials, ingredients, colour shade, Chips, distribution etc. required.

47.3.5. The tiles shall be prepared from cement conforming to Indian Standards or coloured portland cement generally depending upon the colour of tiles to be used or as directed.

47.4. (D) Chequered Tiles :

47.4.1. Chequered tiles shall be plain cement tiles or marble mosaic tiles. The former shall have the same specification as per (A) above and the latter as per marble mosaic tiles as per (C) except as mentioned below :

47.4.2. The tiles shall be of nominal size of 250 mm. x 250 mm. or as specified. The centre to centre distance of chequer shall not be less than 25 mm. and not more than 50 mm. The overall thickness of the tile shall be 22 mm.

47.4.3. The grooves in the chequers shall be uniform and straight. The depth of the grooves shall not be less than 3 mm. The chequered shall be plain, coloured or mosaic as specified. The thickness of the upper layer measured from the top of the chequers shall not be less than 6 mm. The tiles shall be given the first grinding with machine before delivery to site.

47.4.4. Tiles shall conform to relevant I.S. 1237-1930.

47.5 (E) Chequered Tiles for Stair cases :

47.5.1. The requirements of these tiles shall be the same as chequered as per (D) above except in following respects;

(1) The length of a tile including nose shall be 330 mm.

(2) The minimum thickness shall be 28 mm.

(3) The nosing shall have also the same wearing layer as at the top.

(4) The nosing edge shall be rounded.

(5} The front portion of the tile for a minimum length of 75 mm. from and including the nosing shall have grooves running parallel to nosing and at centre not exceeding 25 mm. Beyond that the tiles shall have normal chequer pattern.

M-48. Rough Kotah Stone :

48.1. The kotah stones shall be hard, even, sound, and regular in shape and generally uniform in colour. The colour of the stone shall generally be green. Brown colour stones shall not be allowed for use. They shall be without any softveins, cracks or flows.

48.2 The size of the stones to be used for flooring shall be of size 600 mm x 600 mm and/or size 600 mm x 450 mm, as directed. However smaller sizes will be allowed to be used to the extent of maintaining required pattern. Thickness shall be as specified.

48.3. Tolerance of minus 30 mm. on account of chisel dressing of edges shall be permitted for length as well as breadth. Tolerance in thickness shall be $\pm$ 3 mm.

48.4. The edges of stones shall be truly chiselled and table rubbed with coarse sand before paving. All angles and edges of the stone shall be true, square and free from chipping and me surface shall be true and plain.

48.5 When machine cut edges are specified, the exposed edges and the edges at joints shall be machine cut. The thickness of the exposed machine cut edges shall be uniform.

M-49. Polished Kotah Stones.

49.1. Polished kotah stone shall have the same specifications as per rough kotah stone except as mentioned below :

49.2. The stones shall have machine polished smooth surface. When brought on site, the stones shall be signle polished or double polished depending upon its use. The stones for paving shall generally be single polished. The stones to be used for dedo, .skirting, platforms, sink, veneering, sills, steps, etc. where machine polishing after the stones are fixed in situ is not possible, shall be double polished.

M-50. Dholpur Stone Slab :

50.1 Dholpur stone slab shall be of best quality as approved by the Engineer-in-charge The stone slab shall be even, sound and durable, regular in shape and of uniform colour.

50.2. The size of the stone shall be specified in the item or detailed drawings or as approved by the Engineer-in-charge. The thickness of the stone shall be as specified in the item of work with the permissible tolerance of plus or minus 2 mm. The provisions in respect of polishing as for polished Kotah stone shall apply to polished Dholpur stone also. All angles and edges of the face of the stone slab shall be fine chiselled or polished as specified in the item of work and all the four edges shall be machine cut.

All angle and elges of the stone slab shall be true and plane.

50.3 The sample of stone shall be got approved from the Engineer-in-charge for shade and tint for a particular work. It shall be ensured that the stones to bemused in a particular work shall not differ much in shade or tint from the approved sample.

M-51. Marble Slab:

51.1. Marble slab shall be white or of other colour and of best quality as approved by the Engineer-in-charge.

51.2. Slabs shall be hard, uniform and homogeneous in texture. They shall have even crystalline grain and free from defects and cracks. The surface shall be machine polished to an even and perfectly plant surface and edges machine cut true and square. The rear face shall be rough to provide key for the mortar.

51.3. Marble slabs with natural veins, if selected shall have to be laid as per the pattern given by the Engineer-in-charge. Size of the slab shall be minimum 450 mm x 450 mm. and preferable- 600 mm x 600 mm. However, smaller sizes will be allowed to be used to the extent of maintaining required palter.

51.4. The slab shall not be thinner than the specified thickness at its thinnest part. A few specimen of finished slab to be used shall be deposited by the Contractor in the office for reference.

51.5. Except as above, the marble slabs shall,conform to I.S. 1130-1969.

M-52. Granite Stone Slab :

52.1. Granite shall be of approved colour and quality. The stone shall be hard, even, sound regular in shape and generally uniform in colour. It shall be without any soft veins, cracks of flows.

52.2. The thickness of the stone shall be as specified in the items.

52.3. All exposed face shall be double polished to tender truly smooth and the even reflecting surface. The exposed edges and corners shall be rounded off as directed. The exposed edges shall be machine cut and shall have uniform thickness.

M-53 P.V.C Flooring:

53.1. P. V.C sheets for P.V.C. floor covering shall be of homogeneous flexible type, conforming to I.S. 3452-1966. The P.V.C. covering shall neither develop any toxic effect while put to use nor shall give off any disagreeable odour.

53.2 Thickness of flexible type covering tiles shall be as specified in the description of the item.

53.3. The flexible type shall be backed with hessain or other woven fabric. The following tolerances shall be applicable on the nominal dimension of the sheet rolls or tiles :

(a) Thicknesst 0.15 mm

(b) Length or Width :

1. 300 mm. square tiles	± 0.20 mm.	39.00 mm. square tiles	±0.30 mm.
2. 600mm. " "	± 0.40mm.	4. Sheets and rolls	± 0.10 percent

53.4. Adhesive:

53.4.1. The adhesive for PVC flooring shall be of the type and make recommended by the manufacturers of PVC sheets/tiles.

M-54. Facing tifes :

54.1. The facing tiles (burnt clay facing bricks) shall be free from craks, flaws and nodules of free lime. They shall be thoroughly burnt and shall have plane rectangular faces with parallel sides and sharp straight right edgled faces. The texture of the finished surface that will be exposed when in place, shall conform to an approved sample consisting not less than four stretcher bricks each representing the texture desired. The facing tiles shall have a pleasing appearance, sufficient resistance to penetration by rain and greater durability than common bricks. The tiles shall conform to I.S. 2691-1972.

54.2. The standard size effacing brick tiles shall be 19 x 9 x 4 cms. The facing brick tiles shall be provided with frog which shall conform to I.S. 1077-1976.

54.0. The permissible tolerance in dimensions specified above shall be as follows :

Size Tolerance for

	1st class Brick	**2nd class Brick**
19 Cm.	± 6mm.	±10 mm.
9cm.	± 3mm.	± 7mm.
4cm.	±1.5 mm	±3 mm.

54.4. The tolerance for distoration or warpage of face or edges of individual brick from a plane surface and from a straight line respectively shall be as follows:

Facing dimensions Permissible tolerance

Max. below 19 cms.Max. 2.5mm.

-do- above 19 cm.Max. 3.0 mm.

54.5. The average compressive strength obtained as a sample of five dies when tested in accordance with the procedure laid as per I.S. 1077-1976 shall be not less than 175 Kg/Sq. Cm. The average compressive strength of any individual bricks shall be not less than 160 Kg/Sq.Cm.

54.5. The average water absorption for five bricks files shall not exceed 12 percent of average weight of brick before testing.

The absorption for each individual bricks snail not exceed 25 percent.

54.7. The brick tiles when tested in accordance with I.S. 1077-1976, the rate of efflorescence shall not be more than 'Slightly effloresced.'

M-55. White glazed tiles :

55.1. The tiles shall be of best quality as approved by the Engineer-in-charge. They shall be flat and true to shape. They shall be free from craks, crazing, spots, chipped edges and corners. The glazing shall be of uniform shade.

55.2. The tiles shall be nominal size of 150 mm. x 150 mm. unless otherwise specified. The maximum variation from the stated sizes, other than me thickness of tile, shall be plus or minus 1.5 mm. The thickness of tile shall be 6 mm. Except as above the dies shall conform to I.S. 777 1970.

M-56. Galvanised iron pipes and fittings : 56.1. Galvanised iron pipe shall be of the medium type and of required diameter and shall comply with I.S.I 239-1979. The specified diameter of the pipes shall refer to the inside diameter of the bore. Clamps, screw and all galvanised iron fittings shall he of the standard 'R' or equivalent make.

M-57. Bib cock and stop cock :

57.1. A bib cock is a draw off tap with a horizontal inlet and free outlet. A stop cock is a valve with a suitable means of connection for insertion in a pipe line for controlling or stopping the flow.

57.2. They shall be of screw down type and of brass chromium plated and of diameter as specified in the description of the item. They shall conform to I.S. 781-1977 and they shall be of best Indian make. They shall be polished bright.

57.3. The minimum finished weight of bib cock and stop cock shall be as given below :

Diameter	Bib cock	Stop cock	Diameter	Bib cock	Stop cock
8 mm	0.25 Kg.	0.25 Kg.	15 mm.	0.40 Kg.	0.40 Kg.
10 mm.	0.30 Kg.	0.35 Kg.	20 mm.	0.75 Kg.	0.75 Kg.

M-58. Gun metal wheel valve : 58.1. The gun metal wheel valve be of approved quality. These shall be gun metal fitted with wheel and shall be of gate valve opening full way and of the size as specified. These shall conform to I.S. 778-1971. **M-59. White glazed porcelain wash basin :**

59.1. Wash basin shall be of white porcelain first quality best Indian make and it shall conform to I.S. 2556 (Part-IV) 1972 and I.S. 771-1979.

The size of the wash basin shall be as specified in the item, Wash basin shall be of one piece construction with continued over-flow arrangements. All internal angles shall be designed so as to facilitate cleaning. Wash basin shall have single tap hole or two holes as specified. Each basin shall have a ciruclar waste hole which is either rabaled or bevelled internally with 65 mm. diameter at top and 10 mm. depth to suit the waste fining. The necessary stud slot to receive the bracket on the under side of (he basin shall be provided. Basin shall have an internal soap holder recess which shall fully drain into the bowl.

59.2 White glazed pedestal of the quality and colour as that of the basin shall be provided where specified in the item. It shall be completely recessed at the back for reception of supply and wash pipe. It shall be capable of supporting the basin rigidly and adequately and shall be so designed as to make the height from floor to lop of the rim of basin 750 mm. to 800 mm. as directed.

M-60. European type water closet/with low level flushing :

60.1. The European type water closet shall be white glazed porcelain first quality and shall be of wash down type conforming to I.S. 2556-1973 and I.S. 771-1979.

60.2. 'S' trap shall be provided as required with water seal not less than 50 mm. The solid plastic seat and cover shall be of the best Indian make conforming to I.S. 2548-1980. They shall be made of moulded syntactic materials which shall be tough and hard with high resistance to solvents and shall be free from blisters and other surface defects and shall have chromium plated brass hinges and rubber buffer of suitable size.

M-61. Orissa type water closet: 61.1. The specification of Orissa type white glazed water closet of first quality shall conform to I.S. 2556 (Pan-Ill) 1981 and relevant specification of Indian type water closet except that pan will be with the integral squatting pan of size 580 mm. x 440 mm. with raised footrest.

M-62. Indian type water cioset:

62.1. The Indian lype white glazed water clcset of first duality shall be of size as specified in (he item and conforming to I.S.

771-1979 and I.S. 2556 (Part-II) 1981. Each pan shall have integral flushing ring of suitable type with adequate number of holes alround as directed to have satisfactory flushing. It shall also have an inlet at back or front for connecting flush pipe as directed. The inside of the bottom of the pan shall have sufficient slope from the front towards the outlet and surface shall be uniform and smooth.

Pan shall be provided with l00 mm. diameter 'P' or'S' trap with approximately 50 mm. water seal and 50 mm. diameter vent horn.

M-62.A Foot Rests : 62-A-l. A pair of white glazed-earthen ware rectangular foot rests of minimum size 250 mm. x 130 mm. 20 mm. shall be provided with water closet.

M-63. Glazed Earthen Ware Sink :

63.1. The glazed earthen-ware sink shall be specified size, colour and quality. The sink shall conform to I.S. 771 Part-II-1979. The brackets for sinks shall conform to I.S. 775-1970.

63.2. The pipes shall conform to I.S. 1239-Part-11973 and I.S. 404-1962 for steel and lead pipes respectively 32 mm. brass waste coupling of standard pattern with brass chain and rubber plug shall be provided with sink.

M-64. Glazed earthen ware Lipped type flat back urinal/corner type urinal: 64.1 The lipped type urinal shall be flat back or corner type as specified in the item and shall conform to I.S. 771-1979. It shall be of best Indian make and size as specified and approved by the Engineer-in-charge. The flat back or corner type urinal must be of 1st quality free from any defects, cracks, etc.

M-65. Low level enamel flushing tank : 65.1. The low level enamel flushing tank shall be of 15 litres capacity. It shall conform to I.S. 774-197 *It* the flushing cistern shall be of best quality and free from any defects. The flushing tank shall have outlet 32 mm. diameter. The outlet shall be connected with W.C. Pan by lead pipe or P.V.C. pipe as specified. The flushing tank shall be provided with inlet and outlet for fixing G.I. inlet pipes and over-flow pipes. The flushing cistern shall be provided with chromium plated handle for flushing. The fluushing tank shall be provided with bracket of cast iron so that it can be fixed on wall at specified height. The brackets shall conform to I.S. 775-1970.

M-66. Cast iron flushing cistern: 66.1. The cast iron flushing cistern shall be of 15 litres capacity. It shall conform to I.S. 774-1971. The flushing cistern shall be of best quality free from any defects. The flushing cistern shall have outlet of 32 mm. diameter. The outlet shall be connected to lead pipe of 32 mm. diameter. The lead pipe shall conform to I.S. 404 (Part-I) 1962. For fixing G.I. inlet pipes and overflow pipe 20 mm. dia. inlet and outlet shall be provided. The flushing cistern shall be provided with galvanised iron chain and pull of sufficient length and shall be got approved from the Engineer-in-charge. The cast iron flushing cistern shall be painted with one coat of anticorrosive paint and two coats of paints. The flushing cistern shall be fixed on two C.I. brackets. The C.I. brackets shall conform to I.S. 775-1970.

M-67. Flush cock: 67.1. Half turn flush cosfc (Heavy weight) shall be of gun metal chromium plated of diameter as specified in the description of the item. The flush cock shall conform to relevant Indian Standard.

M-68. Cast iron pipes and fittings :

68.1 All soil, waster, vent and antisyphonage pipes and fittings shall conform to I.S. 1729-1964. The pipe shall have spigot and socket ends with head on spigot end. The pipes and fittings shall be true to shape, smooth, cylindrical, their inner and outlet surfaces being as nearly as practicable concentric. They shall be sound and nicely cast and shall be free from cracks, laps, pinholes or other imperfection and shall be neatly dressed and carefully fettled. 68.2. The end of pipes and fittings shall be reasonable square to their axis.

68.3.The sand cast iron pipes shall be of the diameter as specified in the description and shall be in lengths of 1.5 M. 1.8 M. and 2 M. including socket ends of the pipe unless shorter lengths are either specified or required at junctions etc. The pipes and fittings shall be supplied without ears unless specified or directed otherwise.

Toferances:

68.4.1. The Standard weights and thickness of pipes shall be as shown in the following table : A tolerance upto minus 10 per cent may however be allowed against these standard weights.

Sr. No.	Nominal dia. of bore	Thickness	Overall Weight of Pipe excluding ears 2 m. long		
			1.5 m.long	1.8m. long.	2m. long
1.	75 mm.	5.0 mm.	12.83 Kg.	16.52 Kg.	18.37 Kg.

2.	100 mm	5.0mm	18.14 Kg.	21.67 Kg.	24.15 Kg.

68.4.2. A tolerance upto minus 1*5* pescent in thickness and 20 mm. in length will be allowed. For fittings tolerance in lengths shall be plus 15 mm. and minus 10 mm.

68.4.3. The thickness of fittings and their socket and spigot dimensions shall conform to the thickness and dimensions specified for the corresponding sizes of straight pipes. The tolerances in weights and thickness shall be the same as for straight pipes.

M-69. Nahni Trap:

69.1. Nahni trap shall be of cast iron and shall be sound and free from porosity or other defects which affect serviceability. The thickness of the base metal shall not be less than 6.5 mm. The surface shall be smooth and free from craze, ships and other flaws or any other kind of defects which affect serviceability. The size of nahni trap shall be as specified and shall be of self cleansing design.

69.2. The nahni trap shall be of quality approved by the Engineer-in-charge and shall generally conform to the relevant Indian Standards.

69.3. The Nahni trap provided shall be with deep seal, minimum 50 mm, except at places where trap with deep seal can not be accommodated. The cover shall be cast iron. Perforated cover shall be provided *on* the trap of appropriate size.

M-70. Gully Trap:

70.1 Gully trap shall conform to I.S. 651-1980. It shall be sound, free from defects such as fire cracks. The glaze of the traps shall be free from crazing. They shall give a shart clear note when struck with light hammer. There shall be no broken blisters.

70.2. The size of the gully trap shall be as specified in the item.

70.3. Each gully trap shall have one C.I. grating of square size corresponding to the dimensions of inlet of gully trap. It will also have a water tight C.I. cover with frame inside dimensions 300 mm; x 300 mm., the cover with frame inside dimension, 300 mm. x 300 mm., the cover weighing not less than 4.53 Kg. and the frame not less than 2.72 Kg. The grating cover and frame shall be of sound and good casting and shall have truly square machined seating faces.

M-71. Glaze Stone Ware Pipe And Fitting :

71.1. The pipes and fittings shall be of best quality as approved by the Engineer-in-charge. The pipe shall be of best quality manufactured from stone-ware of fire clay, salt glazed thoroughly burnt through the whole thickness, of a close even texture, free from air blows, fire blisters, crack and other imperfactions, which effect the serviceability. The inner and outer surfaces shall be smooth and perfectly glazed. The pipe shall be capable to-withstand pressure of 1.5 m. lead without showing sign of leakage. The thickness of the wall shall not be less than l/12th of the internal dia. The depth of socket shall not be less than 38 mm. The socket shall be sufficiently large to allow a joint of 1 mm. around the pipe.

71.2. The pipes shall generally conform to relevant I.S. 651 -1980.

M-72. Wall Peg Rail:

72.1. The aluminium wall peg rail shall have three aluminium pegs of approved quality and size. It shall be fixed on leakwood plank of size 450 mm. x 75 mm. x 20 mm. The teakwood shall be french polished or oil painted as specified.

M-73. G.I. Water Spot:

73.1. The G.I. pipes of 40 mm. dia shall be of medium quality and specials shall be of 'R' brand or equivalent brand of best approved quality.

73.2. The pipe shall have length as required for the thickness of wall in which it is fixed, and at the outside end tee and bend cut at half the length shall be provided and at other end coupling shall be provided to have better fixing. The water spount shall be provided as per detailed drawing or as directed.

M-74. Asbestos Cement Pipe (A.C. Pipe):

74.1. The asbestos cement pipe of diameter as specified in the description of the item shall conform to I.S. 1626-1980. Specials like bends, shoes cowls, etc. shall conform to relevant Indian Standards. The interior of pipe shall have a smooth finish, regular surface and regular, internal diameter. The tolerance in all dimensions shall be as per I.S. 1626-Part-11980.

M-75. Crydon Ball Valve : 75.1. Ball valve of screwed type including polthylene float and necessary lever etc. shall be of the size as mentioned in the description of item and shall conform to I.S. 1703-1977.

M-76. Bitumen Felt For Water Proofing And Damp Proofing : 76.1 Bitumen felt shall be on the fibre bases and shall be type 2, self finished grade-2 and shall conform to I.S. 1322-1970.

M-7.7 Select Earth :

77.1. The selected earth shall be that obtained from excavated material or shall have to brought from outside as indicated in the item. If item does not indicate anything, the selected earth shall have to be brought from outside.

77.2 The selected earth shall be good yellow soil and shall be got approved from the Engineer-in-charge. la no case black cotton soil or similar expansive and shrikable soil shall be used. It shall be clean and free from all rubish and perishable materials, stones or brick bats. The clods shall be broken to a size of 50. mm or less, Contractor shall make his own arrangement at his own cost for land for borrowing selected earth. The stacking of material shall be done as directed by the Engineer-in-charge in such a way as not to interfere with any constructional activities and in proper stacks.

77.3 When excavated material is to be used, only selected stuff got approved from the Engineer-in-charge shall be used. It shall be stacked separately and shall comply with all the requirements of selected earth mentioned above :

M-78. Barbed Wire :

78.1 The barbed wire shall be of galvanised steel and it shall generally conform to I.S. 278-1978. The barbed wire shall be of type-I whose nominal diameter for line wire shall be 2.5 mm. and point wire 2.24 mm. The nominal distance between two bars shall be 75 mm. unless otherwise specified in the item. The barbed wire shall be formed by twisting together two line wires, one containing the barbs. The size of the line and point wires and barb spacings shall be as specified above. The permissible deviation from the nominal diameter of the line wire and point wire shall not exceed ±0.08 mm.

78.2 The barbs shall carry four points shall be formed by twisting two point wires, each two turns, lightly round one line wire, making altogether four complete turns. The barbs shall be so finished that the four points are -set and loked at right angles to each other. The barbs shall have a length of not less than 13 mm. and not more than 18 mm. The point, shall be sharp and cut at an angle not greater than 35 degree of the axis of the wire forming the barbs.

78.3 The line and point wire shall be circular section free from scale and other defects and shall be uniformly galvanised. The line wire shall be in continuous length and shall not contain any weld other than those in the rod before it is drawn. The distance between two successive splices shall not be less than 15 meters.

78.4 The lengths per 100 Kg. of barbed wire I.S. type I shall be as under

Nominal 1000 metre Minimum 834 Metre Maximum 1066 Metre.

SECTION-4

DETAILED SEPCIFICATIONS-EXCAVATION

4.0.0 (a) Excavation for foundation upto 1.5 M depth including sorting out and stacking useful materials disposing of the excavated stuff upto 50 metre lead-in loose or soft soil.

1.0. General: 1.1. Any soil which generally yields to the application of pickaxes and shovels, phawaras, rakes or any such ordinary excavating implement or organic soil, gravel, silt, sand turfloam, clay, peat etc., fall under this category.

2.0 Clearing the site : 2.1 The site on which the structure is to be built shall be cleared and all obstructions, loose stone, materials and rubbish of all kind, bush, wood and trees shall be removed as directed: The materials so obtained shall be property of the Government and be conveyed and stacked as directed within 50 M. lead. The roots of the trees coming in the sides shall be cut and coated with a hot asphalt.

2.2 The rate of site clearance is deemed to be included in the rate of earth work for which no extra will be paid.

3.0 Setting out: After clearing the site, the center lines will be given by the Engineer-in-charge. The contractor shall assume full responsibility for alignment, elevation and dimension of each and all parts of the tractor shall assume fu; responsibility for alignment elevation and dimension of each and all parts of the work. Contractor shall supply labourers, materials, etc. required for setting out the reference marks and bench marks and shall maintain them a long as required and directed.

4.0 Excavation : The excavation in foundation shall be carried out in true line and level and shall have the width and depth as shown in the drawings or as directed. The contractor shall do the necessary shoring and shutting or providing necessary slopes to a safe angle, at his own cost. The payment for sue precautionary measures shall be paid separately if not specified. The bottom of the excavated area shall be evelled both longitudinally and transfersely as directed by removing and watering as required. No earth filling will be allowed for bringing it t o level, if by mistake or any; other reason excavation is made

deeper or wider that shwon on the plan or directed. The extra depth or width shall be made up with concrete of same proportion as specified for the foundation concrete at the cost of the contractor. The excavation upto 1.5 m. depth shall be measured under this item.

5.0. Disposal of the excavated studd : 5.1. The excavated stuff of the selected type shall be used in filling the trenches and plinth or levelling the ground in layers including ramming and watering etc.

5.2. The balance of the excavated quantity shall be removed by the contractor from the site of work to a place as directed with lead upto 50 M. and all lift.

6.0. Mode of measurement and payment:

6.1. The measurement of excavation in trenches for foundation shall be made according to the sections of trenches shown on the drawing or as per sections given by the Engineer-in-charge. No payment shall be made for surplus excavation made in excess of above requirements or due to slopping and sloping back as found necessary on account of conditions of soil and requirements of safety.

6.2. The rate-shall be for a unit of one cubic metre.

4.0.0. (B) Excavation for foundation upto 1.5 M. depth including sorting out and stacking of useful materials and disposing of the excavated stuff upto 50 metre lead in dense or hard soil.

1.0. Dense or Hard Soil: Any soil which generally require close application of picks or jumpers or scarifiers to loosen it stiff clay, gravel and rubbee stone etc. fall-under this category.

2.0. Workmanship : The relevant specification of item No. 4.0.0. (A) shall be followed except that the excavation work shall be carried out in dense or hard soil.

3.0. Mode of measurement and payment:

3.1. The relevant specification of item No. 4.0.0. (A) shall be followed.

3.2. The rate shall be for a unit of one cubic metre.

4.0.0. (C): Excavation for foundation upto 1.5. M. depth including sorting out and stacking of useful materials and disposing of the excavated stuff upto 50 meter in lead-hard murrum.

1.0. Hard murrum: The hard murrum shall be clean of good binding quality and of approved quality obtained from approved quarries, of disintegrated rocks which contain silicons material and natural mixture of clay of calcarions origin. The size of hard murrum shall not be more than 20 mm.

2.0. Workmanship : The relevant specification of item No. 4.0.0. (A) shall be followed except that the excavation work shall be carried in hard murrum.

3.0. Mode of measurement and payment:

3.1. The relevant specification of item No. 4.0.0. (A) shall be followed.

3.2. The rate shall be for a unit of one cubic metre.

4.0.0.(D) Excavation for foundation upto 1.50 M. depth including sorting out and stacking of useful materials and disposing of the excavated stuff upto 50 meter lead-soft rock not requiring blasting.

1.0. Workmanship:

1.1. The relevant specification of item No. 4.0.0. (A) shall be followed except that the excavation shall be carried out for foundation upon 1.5 m. lift in soft-rock not requiring blasting.

1.2. The excavation in soft or disintegrated rock shall be carried out by crow bards, pickaxes or pneumatic drills or any other suitable means. . .

1.3. If contractor desires to resort to blasting, he can do so with permission of the Engineer-in-charge but nothing extra shall be paid to him.

1.3. If contractor desires to resort to blasting, he can do so with permission of the Engineer-in-charge but nothing extra stall be paid to him.

1.4. The materials available from soft rock excavation shall be properly Stacked within 50m. lead and 1.5. m. lift and shall be «he property of department.

1.5. The classification of strate of the foundation soil shall be done by the Engineer-in-charge and shall be acceptable to the

contractor.

1.6. However this shall include the type of rock and boulder which may quarried or split with crow bars. Latcrite and congromerate also come under this category.

2.0. Mode of measurement and payment:

2.1. The relevant specification of item No.4.0.0. (A) shall be followed.

2.2. The rate shall be for a unit of one cubic metre.

4.0.0. (E): Excavation for foundation upto 1.5 M. depth including sorting out and stacking of useful materials and disposing of the excavated stuff upto 50 meter lead in hard rocks.

1.0. Workmanship:

1.1. The relevant specification of item No. 4.0.0. (A) shall be followed except that the excavation for foundation work shall be carried out in hard rock.

1.2. Excavation shall be done by blasting to the dimensions shown in the drawings or as directed. The blasting shall be carried out only with written permission of the Engineer-in-charge. All the laws, regulations etc., pertaining to the precautions, acquisition, transport, storage, landing and use of explosives shall be-rigidly followed. The Magazine for the storage for the explosive shall be built to the design and specifications of explosive authority and located at the approved site. No unauthorized persons shall be admitted into the magazine and when not in use it shall be kept securely locked. No matches or imflamable materials shall be allowed in the Magazine. The Magazine shall have en effective lightning conductor. The rules of explosive 1940 revised from time to time shall be followed strictly for obtaining, handling, undertaking blasting work.

1.3. The contractor shall be responsible for damage to property, workmen, public due to any-accident due to use of explosives and blasting operations.

1.4. Precautions:

1.4.1. The blasting operation shall remain in charge of competent and experienced supervisor and workmen who are thoroughly acquainted with the details of handling explosives and blasting operations. The blasting shall be carried out during fixed hours of the day, preferably during the mid-day-lunch hours or at the close of the work as ordered in writing by the Engineer-in- charge. The hours of blasting shall be notified in advance to the people in the vicinity. All the charges shall be prepared by the man in charge only.

1.4.2. Red danger flags shall be displayed prominently in all directions during the blasting operations.

1.4.3. People except those who actually light the fuse shall be prohibited from entering into this area. The flag shall be stationed as 200 m. from the firing site in all directions and all persons including workmen shall be excluded from the flagged area at least 10 minutes before the firing warning whistle being sounded for this purpose.

1.4.4. During excavation in rock by blasting, the lowest 15 cm. of the stratas shall be blasted with light charges so as not to shatter or weaken the underlying rock on which the foundation will be actually laid. If excavation in rock is done to larger width and lengths than those shown on the drawings or as directed, no payment shall be made for such over break. If excavation is done to depth greater than shown on the drawings or directed, excess depth shall be made up with foundation grade concrete as directed at the contractor's cost.

1.4.5. The charged hole shall be drilled to the required depth and in suitable places when blasting is done with powder, the fuse cut to the required length shall be inserted in the holes and the powder dropped in the powder shall be gently tamped with copper rod with rounded ends. The explosive powder shall then be covered with trapping materials which shall be tamped lightly but firmly. When blasting is done with dynamite and other high explosive, dynamite cartridges shall be prepared by inserting the square cut ends of fuse into the detonator, and finished with dippers at the open ends. The detonator should be gently pushed into the primer leaving one third of the copper exposed outside. The primer shall be housed into the explosive. Bore holes shall be of such size that the cartridges can be easily passed down. The holes shall be cleared of all debris and explosive inserted. The space for about 20 cms. above the charge shall then be gently filled with dry clay pressed home and rest of the tamping is firmed with any convenient materials gently packed with a wooden cover.

1.4.6. At a time, not more than 20 such charges shall be prepared and fired. The man in charge shall blow a whistle in a recognised manner for cautioning the people. All the people shall then be required to move to safe distances. The charges shall be lighted by the man in charge only. The man in-charge shall count the number of explosions, He shall satisfy himself

that all the charges have been exploded before allowing the workmen to go to the work rite.

1.4.7. The contractor shall be fully responsible to strictly follow the prevailing rules and procedures regarding blasting Procedures.

1.5. Misfire:

1.5.1. In case of a misfire the following procedure shall be observed : 1.5.2. Sufficient time shall be allowed to account for the delayed blast. The man in charge shall inspect all the charges and determine the missed charge.

1.5.3. If it is the blasting powder charge, it shall be completely flooded with water. A new hole shall be drilled at about 45 C.m. from the old and fired. This should blast the old charge. Should it not blast the old charge, the procedure shall be repeated till the old charge is blasted.

1.5.4. In case of charge of gelatine, dynamite etc., the man in charge shall gently remove the lamping and the primer with detonator. A fresh detonator and primer shall then be used to blast the charge. Alternatively the hole may be cleared of one foot of lamping and the direction then ascertained by placing a stick in the hole. Another hole may then be drilled 15 cm. away and parallel to it. This hole shall then be charged fired when the misfired hole should explode at the same time. The man in charge shall report to the office at once all cases of misfire, the cause of the same and what steps were taken in connection therewith.

1.5.5. If a misfire has been found to be due to defective detonator or dynamite, the whole quantity in the box from which defective article was taken must be sent to the authority as directed for inspection to ascertain whether all the remaining materials in the box are also defective or not.

1.6. Accidents : 1.6.1. The contractor shall be solely responsible for any accident during the entire procedure of handling explosive and blasting and shall pay necessary compensation to persons affected or damage to lands or properly etc., due to the blasting without extra claims on the department.

1.7. Account: 1.7.1. A Careful and day-to-day account of explosives shall be maintained by the contractor in an approved manner and shall be open to inspection of the Engineer-in-charge at all times. Surprise visit may also be paid by the Engineer-in-charge to the storage and in case of any unaccountable shortage or unsatisfactory accounting, the contractor shall be liable to be penalised by forfeiture of part or whole of his Security Deposit or by cancellation of lender in which case he shall not be entitled for any compensation.

1.8. Disposal of Excavated materials :

1.8.1. No materials excavated from foundation trenches of whatever kind they may be, are to be placed even temporarily nearer than 1.5m. of distance prescribed by the Engineer from the outer edge of excavation. All materials excavated shall remain the property of Government. Rate for excavation includes sorting out of useful materials and stacking them separately as directed within the specified lead. Materials suitable and useful for backfilling or other use shall be stacked in convenient places but not in such a way as to obstruct free movement of men, animals and vehicles or encroach upon the area required or constructional purpose. The site shall be left clean of all debris on completion.

1.8.2. Disposal of excavated materials is subject to the following :

Unsuitable materials obtained from clearing site and excavation shall be disposed off within a lead of 50 metres as directed.
Useful materials obtained from clearing site and excavation shall be stacked within a lead of 50 M. beyond the building area as directed. Materials suitable for back filling shall be stacked at convenient places within a lead of 50 M. from the structure for reuse. Useful stones from rock excavation shall be stacked neatly within a lead of 50 M. and will be allowed to be used by the contractor on payment at rates laid down in the contract or if not so oaid down, at schedule of rates of the Division or at a mutually agreed rates if there are no such rates in the Schedule of rates.

1.8.3. If surplus materials arc required to be conveyed beyond 50 M. conveyance will be paid for under a separate item.

2.0. Mode of measurement and payment:

2.1. The work shall be measured for the work limited to the dimensions shown on drawings or directed. Excavation to dimensions in excess of the above will not be measured or paid for and if so ordered by the Engineer the contractor shall have to fill up the excess depth with cement concrete specified for foundation without extra payment.

2.2. Driving of sounding bards, drill holes to explore the nature of substratum upto a total length of meter distributed in 2 or 3 places in each foundation if necessary, will be considered incidental work and will not be paid for separately.

2.3. Removal of slips and blows in the foundation trenches will not be .measured or paid for.
2.4. If it is necessary in the opinion of the Engineer-in-charge to carry foundation below the levels shown on the plants, the excavation for the first 1.5 M. of additional depth will be included in the quantity for the particular classification and will be paid for as extra work at rate to be decided under the general conditions of contract unless the contractor is willing to accept payment as tendered rates.
2.5. The rate shall be for a unit of one cubic metre.

4.001 (A): Excavation for foundation for depth from 1.50 *M.* to 3.0 M. including sorting out and stacking of useful materials and disposing of the excavated stuff upto 50 M. in lead-loose or soft soil.

1.0. Workmanship: 1.1. The relevant specifications of item No. 4.0.0. (A) shall be followed except that the excavation work shall be carried out in loose or soft soil with lift 1.5 M. to 3.0 M.

2.0 Mode of measurement and payment:

2.1. The relevant specification of item No. 4.0.0. (A) shall be followed.
2.2. The excavation work of lift 1.5 M. to 3.0 M. shall be measured under this item.
2.3. The rate shall be for a unit of one cubic metre.

4.001. (B) Excavation for foundation for depth from 1.5. M. to 3.0 M. including sorting out and stacking of useful materials and disposing of excavated stuff upto 50 M. lead in Dense or Hard soil.

1.0. Workmanship: The relevant specification of item No. 4 0.0. (B) shall be followed except that the excavation work shall be carried out with 1.5 M. to 3.0 M. lift in dense or hard soil.

2.0. Mode of measurement and payment:

2.1. The relevant specification of item No. 4.0.0. (A) shall be followed.
2.2. The excavation work from 1.5 to 3.0 M. shall be measured under this item.
2.3. The rate shall be for a unit of one cubic metre.

4.001.(C): Excavation for foundation for depth from 1.5 M. to 3.0 M. including sorting out and stacking of useful materials and disposing of excavated stuff upto 50 M. lead in Hard murrum.

1,0. Workmanship: 1.1. The relevant specification of item No. 4.0.0. (C) shall be followed except that the excavation work shall be carried out from 1.5 M. to 3.0 M. lift in hard murrum.

2.0. Mode of measurement and payment:

2.1. The relevant specification of item No. 4.0.0. (A) shall be followed.
2.2. The excavation work from 1.5 M. to 3.0 M. Shall be measured under this item.
2.3. The rate shall be for a unit of one cubic metre.

4.001. (D): Excavation for foundation for depth 1.5 M. to 3.0 M. including sorting out and stacking of useful material and disposing of excavated stuff upto 50 M. lead in soft rock not requiring blasting.

1.0. Workmanship : The relevant specification of item No. 4.0.0. (D) shall be followed except that the excavation work shall be carried out from 1.5 m to 3.0 M. lift in soft rock not requiring blasting.

2.0. Mode of measurement and payment:

2.1. The relevant specification of item No. 4.0.0. (A) shall be followed.
2.2. The excavation work from 1.5 M. to 3.0 M. lift shall be measured under this item.
2.3. The rate shall be for a unit of one cubic metre.

4.001.(E): Excavation foundation for depth 1.5 M to 3.0 M. including sorting out and stacking of useful material and disposing of excavated stuff upto 50 M. lead in hard rock.

1.0. Workmanship: 1.1. The relevant specification of item No. 4.0.0. (E) shall be followed except that the excavation work shall be carried out from 1.5 M. to 3.0 M. lift in hard rock.

2.0. Mode of measurement and payment:

2.1 The relevant specification of item No. 4.0.0. (A) shall be followed.
2.2. The excavation work from 1.5 M. to 3.0 M. lift shall be measured under this item.
2.3. The rate shall be for a unit of one cubit metre.

4.002. (A): Excavation for foundation for depth 3.0 M. to 5.0 M. including sorting out and slacking of useful materials and disposing of the excavated stuff upto 50 M. lead in loose of soft soil.

1.0. Workmanship : 1.1. The relevant specifications of item No. 4.0.0. (A) shall be follwed except that the excavation work

shall be carried out from 3.0 M. to 5.0 M. lift in loose of soft soil.

2.0. Mode of measurement and payment:

2.1. The relevant specifications of item No. 4.0.0. (A) shall be followed.

2.2. The excavation work from 3.0 M. to 5.0 M, lift shall be measured under this item.

2.3. The rate shall be for a unit of one cubic metre.

4.002. (B): Excavation for foundation for depth from 3.0 M. to 5.0 M-including sorting out and slacking of useful materials and disposing of the excavated stuff upto 50 M. lead in Dense or Hard soil.

1.0. Workmanship: **1.1.** The relevant specifications of item No. 4.0.0. (B) shall be followed except that the excavation work shall be carried out from 3.0 M. to 5.0 M. lift in Dense or Hard soil.

2.0. Mode of measurement and payment:

2.1. The relevant specifications of item No. 4.0.0. (A) shall be followed.

2.2. The excavation work from 3.0 M. to 5.0 M. lift shall be measured under this item.

2.3. The rate shall be for a unit of one cubic metre.

4.002. (C): Excavation for foundation for depth from 3.0 M. to 5.0 M including sorting out and stacking of useful materials and disposing of the excavated stuff upto 50 M. lead in Hard murrum.

1.0. Workmanship: **1.1.** The relevant specifications of item No. 4.0.0. (C) shall be followed except that the excavation work shall be carried out from 3.0 m. to 5.0 M. in hard murrum.

2.0. Mode of measurement and payment:

.2.1. The relevant specifications of item No. 4.0.0. (A) shall be followed.

2.2. The excavation work from 3.0 M. to 5.0 M. lift shall be measured under this item.

2.3. The rate shall be for a unit of one cubic metre.

4.002 (D): Excavation for foundation for depth from 3.0 M. to 5.0 M including sorting out and stacking of useful materials and disposing of the excavated stuff upto 50 M. lead in soft rock not requiring blasting.

1.0. Workmanship: 1.1. The relevant specifications of item No. 4.0.0. (D) shall be followed except that the excavation work shall be carried out from 3.0 M. to 5.0 M. in soft rock not requiring blasting.

2.0. Mode of measurement and payment:

2.1. The relevant specifications of item No. 4.0.0. (A) shall be followed.

2.2. The excavation work from 3.0 M. to 5.0 M. lift shall be measured under this item.

2.3. The rate shall be for a unit of one cubic mefre.

4.002.(E) :Excavation for foundation for depth from 3.0 M. to 5.0 M including sorting out and stacking of useful materials and disposing of excavated stuff upto 50 M. lead in Hard rock.

1.0. Workmanship: 1.1. The relevant specifications of item No. 4.0.0. (E) shall be followed except that the excavation work shall be carried but from 3.0 M. to 5.0 M. in hard rock.

2.0. Mode of measurement and payment:

2.1. The relevant specifications of item No. 4.0.0. (A) shall be followed.

2.2. The excavation work from 3.0 M. to 5.0 M. lift shall be measured under this item.

2.3. The rate shall be for a unit of one cubic metre.

4.003.(A): Extra for additional depth more than 5.0 M. for excavation for foundation including sorting out and stacking of useful materials disposing of the excavated stuff upto 50 M. lead in loose or soft soil.

1.0. Workmanship: **1.1.** The relevant specifications of item No. 4.0.0. (A) shall be followed except that the excavation work shall be carried out from more than 5.0 M. lift in loose or soft soil.

2.0. Mode of measurement and payment:

2.1. The relevant specifications of item No. 4.0.0. (A) shall be followed.

2.2. The rate shall be paid extra over and above the rate of No. 4.002. (E) for carrying out excavation work for additional depth from 5.0 M. and above.

2.3. The rate shall be for a unit of one cubic metre per metre.

4.003. (B): Extra for additional depth more than 5.0 M. for excavation for foundation including sorting out and stacking of useful materials disposing of excavated stuff upto 5.0 M. lead in Dense or hard soil.

1.0. Workmanship: 1.1. The relevant specifications of item No. 4.00. (B) shall be followed except that the excavation work shall be carried out from more than 5.U hi. lift in dense or hard soil.

2.0. Mode of measurement and payment:

2.1. The relevant specifications of item No. 4.0.0. (A) shall be followed.

2.2. The rate shall be paid extra over and above the rate of item No. 4002. (B) for carrying out excavation work for additional depth from 5.0 M. and above.

2.3. The rate shall be for a unit of one cubic metre per metre.

4.003. (C): Extra for additional depth more than 5.0 M. for excavation for foundation including spiting out and stacking of useful materials disposing of excavated stuff upto 5.0 M. lead in Hard murrum.

1.0. Workmanship: 1.1. The relevant specifications of item No. 4.0.0. (C) shall be followed except that the excavation work shall be carried out from more than 5.0 M. lift in hard murrum.

2.0. Mode of measurement and payment:

2.1. The relevant specifications of item No. 4.0.0. (A) shall be followed.

2.2. The rate shall be paid extra over and above the rate of item No. 4.002. (C) for carrying out excavation work for additional depth from 5.0 M. and above.

2.3. The rate shall be for a unit of one cubic metre per metre.

4.003.(D): Extra for additional depth more than 5.0 M. for excavation for foundation including sorting out and stacking of useful materials disposing of excavated stuff 5.0 M. lead in soft rock not requiring blasting.

1.0. Workmanship : 1.1. The relevant specifications of item No. 4.0.0. (D) shall be followed except that the excavation work shall be carried out from more than 5.0 M. lift in soft rock not requiring blasting.

2.0. Mode of measurement and payment:

2.1. The relevant specifications of item No. 4.0.0. (A) shall be followed.

2.2. The rate shall be paid extra over and above the rate of item No. 4.002 (D) for carrying out excavation work for additional depth from 5.0 M. and above.

2.3. The rate shall be for a unit of one cubic metre per metre.

4.003.(E): Extra for additional depth more than 5.0 M. for excavation for foundation including sorting out and stacking a useful materials disposing of excavated stuff upto 50 M. lead in hard rock.

1.0. Workmanship: 1.1. The relevant specifications of item No. 4.0.0. (E) shall be followed except that the excavation work shall be carried out from more than 50 M. lift in hard rock.

2.0. Mode of measurement and payment:

2.1. The relevant specifications of item No. 4.0.0. (A) shall be followed.

2.2. The rate shall be paid extra over and above the rate of item No. 4.002 (E) for carrying out excavation work for additional depth from 5.0 M. and above.

2.3. The rate shall be for a unit of one cubic metre per metre.

4.12. Filling available from excavated earth (excluding rock) in trenches, plinth sides of foundations, etc. in layers not exceeding 20 CM in depth, consolidating each deposited layer by ramming and watering.

1.0. Workmanship:

1.1. The earth to be used for. filling shall be free from salts, organic or other foreign matter. All clods of earth shall be broken.

1.2. As soon as the work in foundation has been completed and measured, the site of foundation shall be cleared of all debris, brick bats, mortar dropping etc; and filled with earth in layers not exceeding 20 Cms. Each layer shall be adequately watered, rammed and consolidated before the succeeding layer is laid. The earth shall be rammed with iron rammers where feasible and with the butt ends of crow-bars, where rammer cannot be used.

1.3. The plinth shall be similarly filled with earth in layers not exceeding 20 Cms. adequately watered and consolidated bramming with iron or wooden rammers. When filling reaches finished level, the surface shall be flooded with water for atleast 24 hours and allowed to dry and then rammed and consolidated.

1.4. The finished level of filling shall be kept to shape intended to be given to floor.

1.5. In case of large heavy duty flooring like factory flooring, the consolidation may be done by power rollers, where so specified. The extent of consolidation required shall also be as specified.

1.6. The excavated stuff of the selected type shall be allowed to be used in filling the trenches and plinth. Under no

circumstances black cotton soil be used for filling the plinth.

2.0. Mode of measurement and payment:

2.1. The payment shall be made for filling in plinth and trenches. No deduction shall be made for shrinkage or voids, if consolidated as instructed above.

2.2. The rate shall be for a unit of one cubic metre.

4.24. Filling in plinth with sand under floors including watering, ramming consolidating and dressing etc. complete.

1.0. Materials: 1.1. Sand shall conform to M. 6.

2.0. Workmanship : 2.1. The relevant specifications of item No. 4.12 shall be followed except that sand shall be filled in undo, floors, including watering, ramming, consolidating and dressing etc. complete.

3.0. Mode of measurement and payment:

3.1. The relevant specifications of item No. 4.12 shall be followed.

3.2. The rate includes cost of collecting carting sand with all lead and labour for filling the same in plinth under floors.

3.3. The rate shall be for a unit of one cubic metre. .

4.004. : Filling in foundation and plinth with murrum or selected soil in layers of 20 cm. thickness including watering, ramming and consolidating etc. complete.

1.0. Materials : 1.1. Murrum shall be clean of good binding quality, and of approved quality obtained from approved pots/quarries of disintegrated rocks which contain silicons materials and natural mixture of clay of calcarions origin. The size of murrum shall not be more than 20 mm.

2.0. Workmanship : 2.1. The relevant specifications of item No. 4.12 shall be followed except that the murrum or selected soil shall be filled in foundation and plinth in 20 cms. layers including consolidating, ramming, watering, dressing etc. complete.

3.0. Mode of measurement and payment:

3.1. The relevant specifications of item No. 4.12 shall be followed.

3.2. The rate includes cost of collecting and carting murrum/or selected earth of approved quality with all lead and labour required for filling in trenches and plinth.

3.3. The rate shall be for a unit of one cubic metre.

4.005. Filling in foundation and plinth with brick-bats/chhara in layers of 20 cms. thickness including watering ramming and consolidating etc. complete.

1.0. Materials : Bricks bats shall conform to M. 14.

2.0. Workmanship : The relevant specifications of item No. 4.12 shall be followed except that brick-bats of burnt bricks shall be filled in foundation and plinth in 20 cms. layers including watering, ramming, consolidating etc. complete.

3.0. Mode of measurement and payment:

3.1. The relevant specifications of item No. 4.12 shall be followed.

3.2. The rate includes cost of collecting and carting brick/chhara with all lead and labour required for filling in trenches and plinth.

3.3. The rate shall be for a unit of one cubic metre.

4.27. Boring holes 3.5 M. deep in ordinary soil (for cast in situe piles) and getting out the soil and disposal of the surplus excavated soil as directed within a lead of 50 M. for following diameter for piles (i) 200 mm. (ii) 250 mm. (iii) 300 mm.

1.0. Workmanship:

1.1. The ground shall be roughly levelled and after making the position of piles, the holes shall be bored with aspiral angle to the 3.5 M. depth and specified diameter using boring guide.

1.2. The bore holes shall be truly vertical and uniform bore throughout of specified diameter. After boring to the required depth, the bore shall be cleared off the loose soil and disposal of surplus excavated stuff as directed within a lead of 50 M.

2.0. Mode of measurement and payments:

2.1. The rate for boring holes shall include :-

(a) Roughly levelling the ground in positions where piles are to be provided.

(b) Making the positions of piles by pegs and boring guide and also for shifting of boring guide.

(c) Bailing out water, if any met with during boring.

(d) Disposal of surplus excavated oil wi'Uin a lead of 50 M. and
(e) All tools, plants, equipments and tuoour required for satisfactory completion of work.
2.2. The rate shall be for a unit of one number.

4.28. Extra for under reaming inside the bore holes for under reamed piles of following nominal diameter, (i) 200 mm. (ii) 250mm. (iii) 300 mm.

1.0. Workmanship : The relevant specifications of item No. 4.27 shall be followed except that after boring to the required depth, the bore shall be enlarged at the bottom by an under reamer 2 to 2 1/2 times the diameter of the bore as directed. It shall be ensured that the bore for the pile shall be enlarged to the correct diameter.

2.0. Mode of measurement and payment:
2.1. The relevant specifications of item No. 4.27 shall be followed.
2.2. The rate shall be paid extra over and above the rate of item No. 4.27 under reaming the piles.
2.3. The rate shall be for a unit of one Number.

SECTION-5

DETAILED SPECIFICATIONS - PLAIN & RCC WORKS

5.1.6. Providing and laying in foundation and plinth/under floods lime concrete with hard broken aggregate 40 mm. nominal size and 40% mortar comprising of 1 Lime putty : 2 fine sand and curing complete excluding cost of form work.

1.0. Materials: 1.1. Water shall conform to M-l. Sand shall conform to M-6. Lime shall conform to M-2. Graded aggregated 40 mm, nominal size shall conform to M-l2.

2.0. Workmanship:
2.1. General 2.1.1. Before starling the concrete the bed of the foundations trenches shall be cleared of all loose materials and watered and rammed as directed.

2.2. Proportion of Mix :
2.2.1. The proportion of lime, sand and aggregate shall be specified in the item of the work and shall be measured by volume.
2.2.2. The lime mortar shall consist of proportion of 1 Lime putty : 2 sand volume. The lime mortar shall be prepared by wet process Power driven mill shall be used for preparation of lime mortar. The slaked lime shall be placed in the Mill in even layers and ground for 180 revolutions with sufficient water. The water shall be added as required during grinding (and care shall be taken not to add more water) so that it will bring the mixed materials to a consistency of stiff paste, throughly wetted sand shall then be added evenly and the mixture ground for another 180 revolutions.
2.2.3. Lime mortar shall be kept damp, protected from sun and rain till used-up, covering it by tarpauline or open sheds.
2.2.4. All the lime mortar shall be used as soon as possible after grinding. It should be used on the day of which it is prepared but in no case mortar made earlier than 36 hours shall be permitted for use.

2.3. Mixing : 2.3.1. The concrete shall be mixed in mechanical mixer. Mixing shall be continued until there is uniform distribution of the material and the mass is uniform in colour and consistency but in no case mixing shall be done for less than 2 to 3 minutes.

2.4. Laying & Compacting: 2.4.1. The concrete shall always be used while quite fresh. It shall be laid (not thrown) in layers not exceeding 150 mm: in thickness and shall be well and quickly_ rammed with wooden or iron rammers, till the required compaction is achieved. The concrete laid shall not be of too fluid consistency. After it has been mixed no more water shall be added, but the surface during and after compaction shall be kept damp. In laying consecutive layers, the layer east shall be well watered and made rough before the upper layer is laid. The concrete shall be kept continuously wet for period of 7 days from the date of placing or until it is built over whichever is more.

2.5. Mode of measurement and payment:
2.5.1. The concrete work shall be measured in length, breadth and depth as specified on drawing or as directed, correct upto nearest centimetre and cubical content shall be worked out nearest upto two places or decimals.
2.5.2. The rate shall be for a unit of one cubic metre.

5.1.8. Providing and laying in foundation and plinth/under floors lime concrete with graded bricks aggregate 40 mm. nominal size and 40% mortar comprising of 1 Lime Putty : 9 find sand and curing complete excluding cost of form work.

1.0. Materials : 1.1. Water shall conform to M-1. Lime mortar shall conform to M-10. Brick bats aggregates 40 mm. nominal size shall con form to M-14.

2.0. Workmanship : 2.1. The relevant specifications of item No. 5.1.6.'Shall be followed except that brick aggregate shall be

ued instead of graded stone aggregate.

3.0. Mode of measurement and payment:

3.1. The concrete work shall be measured in length, breadth and depth as specified in drawing or as directed, correct upto larest centimetre and cubical content shall be worked out upto two places of decimals. 3 2. The rate shall be for a unit of one cubic metre.

5 3.2. (A) Providing and laying cement concrete 1:3:6(1 cement: 3 coarse sand: 6 graded stone aggregate 40 mm. nominal size) and curing complete excluding the cost of form work in foundations and plinth.

1.0. Materials: 1.1. Water, shall conform to M-l. Sand shall conform to M-6. Cement shall conform to M-3. Stone aggregate 40 mm. nominal size shall conform to M-12.

2.0. Workmanship:

2.1. General: 2.1.1. Before starting concrete bed of foundation treaches shall be cleared of all loose materials, levelled, watered and rammed as directed.

2.2. Proportion of Mix : 2.2.1. The Proportion of cement, sand and coarse aggregate shall be one part of cement, 3 parts of sand, 6 parts of stone aggregates and shall so measured by volume.

2.3. Mixing : 2.3.1. The concrete shall be mixed in a mechanical mixer at the site of work. Hand mixing may however be lowed for smaller quantity of work if approved by the Engineer-in-charge. When hand mixing is permitted by the Engineer-in-charge in case of break-down of machineries and in the interest of the work, it shall be carried out on a water tight platform and care shall be taken to ensure that mixing is continued until the mass is uniform in colour and consistency. However such cases 10% more cement than otherwise required shall have to be used without any extra cost. The mixing in mechanical mixer shall be done for a period 1 to 2 minutes. The quantity of water shall be sufficient to produce a dense concrete of required workability for the purpose.

2.4. Transporting & Placing the concrete :

2.4.1. The concrete shall be handled from the place of mixing to the final position in not more than 15 minutes by the method s directed and shall be placed into its final position, compacted and finished within 30 minutes of mixing with water i.e. before the setting commences.

1.4.2. The concrete shall be laid in layers of 15 cms. to 20 cms.

2.5. Compacting: 2.5.1. The concrete shall be rammed with heavy iron rammers and rapidly to get the required compaction and allow all the interestices to be filled with mortar.

2.6. Curing : 2.6.1. After the final set, the concrete shall be kept continuosly wet, if required by ponding for a period of not less than 7 days from the dale of placement.

2.7. Mode of measurement and Payment:

2.7.1. The concrete shall be measured for its length breadth and depth, limiting dimensions to those specified on plan or as directed.

2.7.2. The rate shall be for a unit of one cubic metre.

5.3.3.(A) Providing and laying cement concrete 1:4 : 8 (1 cement: 4 coarse sand: 8 graded stone aggregate 40 mm. nominal size) and curing complete excluding cost of form work in foundations and plinth.

1.0. Materials: 1.1. Water shall conform to M-l. Cement shall conform to M-3. Sand shall conform to M-6. Stone aggregate 40 mm. nominal size shall conform to M-12.

2.0. Workmanship : 2.1. Relevant specifications of item No. 15.3.2. shall be followed except that cement concrete shall be mixed in the proportion of 1 : 4 : 8 instead of 1 : 3 : 6 by volume.

2.0. Mode of measurement and payment:

3.0. The concrete shall be measured for its length, breadth and depth, limiting dimensions to those specified on plans or directed.

3.1. The rate shall be for a unit of one cubic metre.

5.3.14 (A) Providing and laying cement concrete 1:3:6(1 cement: 3 coarse sand: 6 crushed stone aggregate 20 mm. nominal size) and curing complete including cost of form work in wall caps/coping.

1.0. Materials & Workmanship : 1.1. Thcr relevant specification of item No. 5.3.2 (A) shall be followed except that the work shall be carried out for coping and wall caps, except the stone aggregate 20 mm. nominal size shall be used for the concrete work of wall caps/coping.

2.0. Mode of measurement and payment: 2.1. The relevant specifications of item No. 5.3.2. (A) shall be followed except

that the rate includes cost of necessary form work.

2.1. The rate shall be for a unit of one cubic metre per metre.

53.3. (B): Providing and laying brick bats cement 1:4 : 8 (1 cement: 4 coarse sand: 8 graded brick bats) and curing complete excluding the cost of from work in foundation and plinth.

1.0. Materials: 1.1. Water shall conform to M-l. Cement shall conform to M-3. Sand shall conform to M-6. Brick bat shall conform to M-14.

2.0. Workmanship: 2.1. The specification of this item shall be followed as per item No. 5.3.3. except that the proportion of brick bat cement concrete shall be 1 : 4 : 8 i.e. 1 part of cement, 4 parts of coarse sand and 8 parts of graded brick bat by volume, using graded brick bat as coarse aggregate instead of stone aggregate.

3.0 Mode of measurement and payments:

3.1. The concrete work shall be measured in length, breadth and depth as specified on drawing limiting dimensions to those specified on drawings or as directed.

3.2. The rate shall be for a unit of one cubic metre.

5.3.4. (a) : Providing and laying cement concrete 1 : 5 : 10 (1 cement: 5 coarse sand : 10 graded stone aggregate 40 mm. nominal size) and curing complete, excluding the cost of form work, for foundation and plinth.

1.0 Materials: 1.1. Water shall conform to M-l, Cement shall conform to M-3. Sand shall conform to M-6. Stone aggregate 40 mm. nominal size shall conform to M-12.

2.0. Workmanship: 2.1. The relevant specification of item No. 5.3.2. (A) shall be followed for the work except that the work is to be carried out in cement concrete 1 : 5 : 10.

3.0. Mode of measurement and payment:

3.1. The concrete shall be measured for its length, breadth and depth, limiting dimensions to those specified on plans or as directed.

3.2.The rate shall be for a unit of one cubic metre.

5.3.8. (A) : Providing and laying cement concrete 1: 5 : 10 (1 cement: 5 coarse sand, 10 graded brickbats 10 mm. nominal size) and curing complete excluding, cost of form work in foundation and plinth.

1.0. Materials: 1.1. Water shall conform -to M-1, sand shall conform to M-6. Cement shall conform to M-3. Brick bats shall conform to M-14.

2.0. Workmanship : 2.1. The relevant specification of item No. 5.3.4 shall be followed except that brick bats aggregate shall be used instead of stone aggregate.

3.0. Mode of measurement and payment:

3.1. The relevant specification of item No. 5.3.4.shall be followed.

3.2. The rate shall be for a unit of one cubic metre.

5.3.2. (B): Providing artd laying brick bat cement concrete : 1 : 3 : 6 (1 cement: 3 coarse sand : 6 graded brick bats) and curing complete excluding cost of form work in foundation and plinth.

1.0. The specification of item No. 5.3.2. A shall be followed for mode of measurements and payment except that it excludes the cost of form work.

2.2. The rate shall be for a unit of one cubic metre.

5.4.18. Providing throating or plaster drip and moulding to R.C.C. Chhajas.

1.0. Materials: Water shall conform to M-l. Cement shall conform to M-3. Sand shall conform to M-6. Cement mortar shall conform to M-l 1.

2.0. Workmanship : 2.1. The work shall be carried out as directed. The proportion of mix for finishing touching shall be in CM. 1:2 by volume. Curing shall be done for not less than 7 days. The work shall be carried out in best workman like manner.

The throating or plaster drip, and moulding shall be one centimetre in thickness.

5.7.5. Extra for providing and mixing water proofing or plaster drip and moulding shall be one centimetre in thickness.

2.0. Workmanship : 2.1. The propotions of materials for the cement concrete shall be mentioned with the specifications of that item. The quantity of water proofing materials to be added and the method of addition shall be as specified by manufacturers.

2.2. Mixing 2.2.1. The mixing of the water proofing materials in cement, water or concrete shall be done according to the specifications of the manufacturer.

3.0. Mode of measurement and payment:

3.1. The payment is extra over and above the rate of concrete for mixing water proofing proper.

3.2. The rate shall be for a unit of one Hire of Kg. per quintal of cement in which water proofing material is added.

5.7. 1. Providing and laying damp proof course 25 mm. thick cement concrete 1:2:4(1 cement, 2 coarse sand, 4 stone aggregate 10 mm. nominal size) and curing complete.

1.0. The specifications of item No. 5.3.1.(A) of ordinary concrete with, or without reinforcement shall be followed except that the size of the stone aggregate shali he 10 mm. nominal size and the concrete work shall be carried out in 25 mm. thick damp proof course.

2.0. Mode of measurement and payment:

2.1.The rate includes cost of all material and labour required to complete the item.

2.2. The rate shall be for a unit of one sq. metre.

5.3.13. Providing and laying cement concrete 1:2:4(1 cement: 2 coarse sand, 4 graded stone aggregate 20 mm. nominal size) and curing complete excluding cost of form work in (A) foundation and plat, (B) Independent piers, columns and pillars upto floor two level.

1.0. Materials : Water shall conform *to* M-l. Cement shall conform to M-3. Sand shall conform to M-6. Grit shall conform to M-8. Graded stone aggregate 20 mm. nominal size shall conform to M-12.

2.0. General:

2.1. The concrete mix is not required to be designed by preliminary tests. The proportion of the concrete mix shall be 1 : 2 : 4 (1 cement: 2 coarse sand ; 4 graded stone aggregate 10 mm. nominal size) by volume. Concrete work shall have exposed concrete surface or as specified in the item.

2.2. The designation ordinary M-100, M-150, M-200, M-250 specified as per. I.S. Corresponding approximately to 1 : 3 : 6, 1 : 2 : 4, 1 : 1 1/2 : 3 and 1:1:2 nominal mix of ordinary concrete by volume respectively.

2.3. The ingredients required for ordinary concrete containing one beg of cement of 50 Kg. by weight (0.0342 Cu. M.) for different proportions of mix shall be as under:

Grade of concrete	Total quantity of dry aggregate by volume per 50 Kgs. of cement to be taken as the sum of individual volume of fine and coarse aggregates, maximum	Proportion of fine aggregate to coarse aggregate	Quantity of water per 50 Kgs. of cement maximum.
1	2	3	4
M-100 (1 : 3: 6)	300 Liters	Generally 1 : 2 for fine aggregate	34 Liters
M-150 (1 : 2 : 4)	2.20 “	to coarse aggregate by volume	32 “
M-200 (1 :1 1/2 :3)	160 “	but subject to and upper limit	30 “
M-250 (1:1:2)	100 “	of 1 : 1 1/2 and lower limit 1 : 3	27 “

2.4. The water cewment ratios shall not more than those specified in the above table. The cement content of the mix specified in the Table shall be increased if the quantity of water in a mix has to be increased to overcome the difficulties of placement and compaction so that the water-cement-ratio specified in the Table is not exceeded.

2.5. Workability of the concrete shall be controlled by maintaining a water-cement-ratio that is bound to give a concrete mix which is just sufficiently wet to be placed and compacted without difficulty with the means available.

2.6. The maximum size of coarse aggregate shall be as large as possible within the limits specified but in no case greater than one fourth of the minimum thickness of the member, provided that the concrete can be placed without difficulty so as to surround all reinforcement thoroughly and to fill the comers of the form.

2.7. For reinforced concrete work, coarse aggregates having a nominal size of 20 mm. are generally considered satisfactory.

2.8. For heavily reinforced concrete members as in the case of ribs of main beems, the nominal maximum size of coarse aggregate should usually be restricted to 5 mm. less than the minimum, clear distance between the main bars, or 5 mm. less than the minimum cover to the reinforcement whichever is smaller.

2.9. Where the reinforcement is widely spaced as in solid slabs, limitations of size of the aggregate may not be important and the nominal maximum size may sometimes be as great as OF greater than the minimum cover.

2.10. Admixture may be used in concrete only with approval of Engineer-in-charge based upon the evidence that with the passage of time, neither the compressive strength of concrete is reduced nor are other requisite qualities of concrete and steel impaired by the use of such admixtures.

3.0. Workmanship:

3.1. Proportioning : Proportioning shall be done by volume, except cement which shall be measured in terms of bags of 50 Kg. weight. The volume of one such bag being taken as 0.0342 Cu. metre. Boxes of suitable sizes shall be used for measuring sand aggregate. The size of the boxes (internal) shall be 35 cms. x 25 cms. and 40 Cms. deep. While measuring the aggregate and sand, the box shall be filled without shaking ramming or hammering. The proportioning of sand shall be on the basis of its dry volume and in case of damp sand, allowances for bulkage shall be made.

3.2 Mixing:

3.2.1. For all work, concrete shall "be mixed in a mechanical mixer which alongwith other aecessories shall be kept in first class working condition and so maintained throughout the construction. Measured quantity of aggregate, sand, cement required for each batch shall be poured into the drum of the mechanical mixer while it is continuously running. After about half a minute of dry mixing, measured quantity of water required for each batch of concrete mix shall be added gradually and mixing continued for another one and a half minute. Mixing shall be. continued till materials are uniformly distributed and uniform colour of the entire mass is obtained and each individual particle of the coarse aggregate shows complete coating of mortar containing its proportionate amount of cement. In no case shall the mixing be done for less than 2 minutes after all ingredients have been put into the mixer.

3.2.2. When hand mixing is permitted by the Engineer-in-charge for small jobs or for certain other reasons, it shall be done on the smooth watertight platform large enough to allow efficient turning over the ingredients of concrete before and after adding water. Mixing platform shall be so arranged that no foreign material gets mixed with concrete nor does the mixing water flow out. Cement in required number of bags shall be placed in a uniform layer on top of the measured quantity of fine and coarse aggregate, which shall also be spread in a layer of uniform thickness on the mixing platform. Dry coarse and fine aggregate arid cement shall then be mixed thoroughly by turning over to get a mixture to uniform colour. Specified quantity of water shall then be added gradually through a rose-can and the mass turned over till a mix of required consistency is obtained. In hand mixing, quantity of cement shall be increased by 10 percent above that specified.

3.2.3. Mixers which have been out of use for more than 30 minutes shall be throughly cleaned before putting in a new batch. Unless otherwise agreed to by the Engineer-in-charge the first batch of concrete from the mixture shall contain only two thirds of normal quantity of coarse aggregate. Mixing plant shall be thoroughly cleaned before changing from one type of cement to another. .

3.3. Consistency: 3.3.1. The degree of consistency which shall depend upon the nature of the work and methods of vibration of concrete, shall be determined by regular slump tests in accordance with I.S. 1199-1959. The slump of 10 mm. to 25 mm. shall be-adopted when vibrators are used and 80 mm. when vibrators are not used.

4.4. Inspection:

3.4.1. Contractor shall give the Engineer-in-charge due notice before placing any concrete in the forms to permit him to inspect and accept the false work and forms as to their strength, alignment, and general fitness but such inspection shall not relieve the contractor of his responsibility for the safety of men, machinery, materials and for results obtained. Immediately before concreting, all forms shall be thoroughly cleaned.

3.4.2. Centering design and its erection shall be got approved from the Engineer-in-charge. One carpenter with helper shall invariably be kept present throughout the period of concreting. Movement of labour and other persons shall be totally prohibited for reinforcement laid in position. For access to different parts, suitable mobile platforms shall be provided so that steel reinforcement in position is not disturbed. For ensuring proper cover, mortar blocks of suitable size shim be cast and tied to the reinforcement. Timber, kapachi or metal pieces shall not be used for this purpose.

3.5. Transporting and laying:

3.5.1. The method of transporting and placing concrete shall be as approved. Concrete shall be so transported and placed that no contemination segregation or loss of its constituent material takes place.

All form work shall be cleaned and made free from standing water, dust, show or ice immediately before placing of concrete.

No concrete shall he, placed in any part of the structure untill the approval of the Engineer-in-charge has been obtained.

3.5.2. Concreting shall proceed continuously over the area between construction joints. Fresh concrete shall not be placed against concrete which has been in position for more than 30 minutes unless a proper construction joint is formed. Concrete shall be compacted in its final position within 30 minutes of its discharge from the mixer. Except where otherwise agreed to by the Engineer-in-charge concrete shall be deposited in horizontal layers to a compacted depth of not more than 0.45 metre when internal vibrators are used and not exceeding 0.30 metre in all other cases.

3.5.3. Unless otherwise agreed to by the Engineer-in-charge, concrete shall not be dropped into place from a height exceeding 2 metres. When truoking or chutes arc used they shall be kept close and used in such a way as to avoid segregation. When concreting has to be resumed on a surface which has hardened, it shall be roughened, swept clean, thoroughly wetted and covered with a 13 mm. thick layer of mortar composed of cement and sand in the same ratio as in the concrete mix itself. This 13 mm. layer of mortar shall be freshly mixed and placed immediately before placing of new concrete. Where concrete has not fully hardened, all laitance shall be removed by scrubbing the wet surface with wire or bristle brushes, care being taken to avoid dislodgernent of any panicles of coarse aggregate. The surface shall then be thoroughly wetted, all free water removed and then coated with neat cement grout. The first layer of concrete to be placed on this surface shall not exceed 150 mm. in thickness and shall be well rammed against old work, particular attention being given to corners and close spots.

3.5.4. All concrete shall be compacted to produce a dense homogeneous mass with the assistance of vibrators unless, otherwise permitted by the Engineer-in-charge for exceptional cases, such as concreting under water, where vibrators cannot be used. Sufficient vibrators in serviceable condition shall be kept at site so that spare equipment is always available in the event of breakdowns.

Concrete shall be judged to be compacted when the mortar fills the spaces between the coarse aggregate and begins to cream up to form an even surface. Compaction shall be completed before the initial setting starts i.e. within 30 minutes of addition of wafer to dry mixture. During compaction, it shall be observed that needle vibrators are not applied on reinforcement which is likely to destroy the bond between concrete and reinforcement.

3.6. Curing: Immediately after compaction, concrete shall be protected from weather, including rain, running water, shocks, vibration, traffic, rapid temperature changes, frost and drying out process. It shall be covered with wet sacking, hassain or other similar absorbant material approved, soon after the initial set and shall be kept continuously wet for a period of not less than 14 days from the date of placement. Masonary work over foundation concrete may be started after 48 hours of its laying but curing of concrete shall be continued for a minimum period of 14 days.

3.7. Sampling and Testing of concrete :

3.7.1. Samples from fresh concrete shall be taken as per I.S. 1199-1959 and cubes shall be made, cured and tested at 7 days or 28 days as per requirements in accordance with I.S. 516-1959. A random sampling procedure shall be adopted to ensure that each concrete batch shall have a resonable chance of being tested i.e. the sampling should be spread over the entire period of concreting and cover all mixing units. The minimum frequency of sampling of concrete of each grade shall be in accordance with following :

Quantity of concrete in the work	No. of samples	Quantity of concrete in the works	No. of samples
1-5Cmt.	1	16-30Cmt.	3
6-15Cmt.	2	31-50	4

51 and above 4 + one additional for each additional 50 M. or part thereof.

NOTE : At least one sample shall be taken from each shift. Ten test specimens shall be made from each sample, five for testing at 7 days and the remaining five at 28 days. The samples of concrete shall be taken on each day of the concreting as per above frequency. The number *of* specimens may be suitably increased as deemed necessary by the Engineer-in-charge when procedure of tests given above reveals a poor quality of concrete and in other special cases.

3.7.2. Tire average strength of the group of cubes cast for each day shall not be less than the specified cube strength of 150 Kg/Cm at 28 days. 20% of the cubes cast for each day may have value less than the specified strength provided the lowest value is not less than 85% of the specified strength. If the concrete made in accordance with the proportions given for a particular grade docs not yield the specified strength, such concrete shall be classified as belonging to the appropriate lower, grade concrete made in accordance with the proportions given for a particular grade shall not, however, be placed in a higher grade on the ground that the test strength are higher than the minimum specified.

3.8. Stripping:

3.8.1. The Engineer-in charge shall be informed in advance by the contractor of his intention lo strike the form work. While fixing the time for removal of form work, due consideration shall be given to local conditions, character of the structure, the weather and other condition that influence the setting of concrete and pf the materials used in the mix. In normal circumstances (generally where temperatures are above 20 ° C) and where ordinary concrete is used, forms may be struck after expiry of periods specified in item No. 9.1 (A) for respective item of form work.

3.8.2. All form work shall be removed without causing any shock or vibration as would damage the concrete. Before the soffit and struts are removed, the concrete surface shall be exposed, where necessary in order to ascertain that the concrete has sufficiently hardened. Centring shall be gradually and uniformly lowered in such manner as to permit the concrete to take stresses due to its own weight uniformly and gradually. Where internal metal ties are permitted, they or their removable parts shall be extracted without causing any damage to the, concrete and remaining holes filled with mortar. No permanently embeded metal part shall have less than 25 mm. cover to the finished concrete surface. Where it is intended to re-use the form work, it shall be cleaned and made good to the satisfaction of the Engineer-in- charge. After removal of form work and shuttering, the Executive Engineer shall inspect the work and satisfy by random checks that concrete produced is of good quality.

3.8.3. Immediately after the removal of forms, all exposed bolts etc., passing through the cement concrete member and used for shuttering or any other purpose shall be cut inside the cement concrete member to a depth of at least 25 mm. below the surface of the concrete and the resulting holes be filled by cement mortar. All fine caused by form joints, all cavities produced by the removal of form ties and all other holes and depressions honeycomb spots, broken edges or corners and other defects shall be thoroughly cleaned, saturated with water and carefully pointed and rendered true with mortar of cement and fine aggregate mixed in the proportions used in the grade of concrete that is-being finished and of as dry consistency as is possible to use. Considerable pressure shall be applied in filling and pointing to ensure thorough Riling in all voids. Surfaces which are pointed shall be kept moist for a period of 24 hours.

If rock pockets/honeycombs in the opinion of the Engineer in- charge are of such an extent or character to effect the strength of the structure materially or to endanger the, life of the steel reinforcement, he may declare the concrete defective and require the removal and replacement of the portions of the structure affected.

4.0. Mode of measurement and payment:

4.1. The consolidated cubical contents of concrete work as specified in item shall be measured. The concrete laid in excess of section shown on drawings or as directed shall not be measured. No deduction shall be made for

(a) Ends of dis-similar materials such as joits, beams, posts, girders, rafters, purline trusses, corbels and steps etc upt 500 Sq. Cm. in section.

(b) Opening upto 0.1 Sq. M.

4.2. The rate includes cost of all materials, labour, tools and plant required for mixing, placing, position, vibrating and compacting, finishing, as directed, curing and all other incidental expenses for producing concrete lied strength The rate excludes the cost of form work.

4.3. The rate shall be for a unit of one cubic metre.

5.4.1. Providing and laying cement concrete 1:2:4 (1 cement: 2 coarse sand : 4 graded stone aggregate 20 mm. nominal size) and curing complete excluding cost of form work and reinforcement for reinforced concrete, work in :

(A) Foundations footing, base of columns and mass (C) Slabs, landings, shelves, balconies, internals beams girders and centilever upto floor two level (D) Columns, pillars, posts, and struts upto floor two level, (F) Staircase upto floor two level, (K) Vertical and horizontal fins upto floor two level.

1.0. Materials & Workmanship :

1.1. The relevant specification of item No 5.3.13. shall be followed except that the work shall be carried out for reinforced concrete work for work as specified in item 1.2. In addition, the following stipulations shall be followed for:

(a) The bars shall be kept in position by the following mathods:

(i) In case of beam and slab construction, sufficient number of precast cover blocks in cement mortar 1:2(1 cement: 2coarse sand) about 4 cms. x 4 cms. section and of thickness equal to the specified cover shall be placed between the bars and shuttering as lo secure and maintain the requisite cover of concrete over the reinforcement.

In case of cantilevered or doubly reinforce beams of slabs, the main reinforcing bars shall be held in position by introducing chain spacers or supports bars at 1.0 to 1.2 metres centres.

(ii) In case of columns and walls, the vertical bars shall be kept in position by means of timber temphates with slotes accurately out in them The temphtes shall be removed after concreting has been done below it. The bars may also be suitably tied by means of annealed steel wires to the shuttering to maintain their position during concreting.

1.2. All bars projecting from pillars, columns, beams, slabs, etc., to which other bars and concrete are to be attached or bounded to later on, shall be protected with a coat of thin neat cement grout, if the bars are not likely to be incorporated with succeeding mass of concrete within the following 10 days. This coat of thin neat cement shall be removed before concreting.

2.0. Mode of measurement and payment:

2.1. Relevant specifications of item No. 5.3.13 shall be followed.

2.2. The volume occupied by reinforcement shall not be deducted from R.C.C. work.

2.3. The rate shall be for a unit of one cubic metre.

5.4.4. Providing and laying cement concrete 1:2:4(1 cement: 2 coarse sand: 4 graded stone aggregate 20 mm. nominal size) for reinforced concrete chhajas not exceeding 10 cms. thickness upto floor level including finishing the exposed surface with cement mortar 1 : 3 (1 cement: 3 fine sand) to give a smooth and even surface centering and form work and curing complete excluding cost of reinforcement.

1.0. Materials & Workmanship :

1.1. The cement mortar shall conform to M-l 1.

1.2. The relevant specifications of item No. 5.3.13 and 5.4.1 shall be followed except that the work shall be carried out for reinforced concrete chhajas not exceeding 10 cms. in thickness.

1.3. The specifications for form work and centering shall be as per item No. 9.1

1.4. The finishing work in cement mortar 1:3(1 cement: 3.fine sand) shall be carried out as per specifications of item No. 17.59(1). Before the plastering is done, the surface of the concrete shall be raked for proper bond.

2.0. Mode of measurement and payment:

2.1 The relevant specifications of item No. 5.3.13 and 5.4.1 shall be followed except that the work of chhajas upto 10 cms. shall be carried out including centering form work and finishing the surface with cement mortar 1 :3 (1 cement: 3 fine sand).

2.2. The rate shall be for a unit of one cubic metre.

5.4.10. Providing Mild Steel reinforcement of R.C.C. work including bending binding and placing in position etc. complete upto floor two level.

1.0. Materials : 1.1. Mild steel bars shall conform to M-18. Mild steel binding wires shall conform to M-21.

2.0. Workmanship :

2.1. The work shall consist of furnishing and placing reinforcement to the shape and dimensions shown as on the drawings or as directed.

2.2. Steel shall be clean and free from rust and loose mill scale at the time of fixing in position and subsequent concreting.

2.3. Reinforcing steel shall conform accurately to the dimensions given in the bar bending schedules shown on relevant drawings. Bars shall be bent cold to specified shape and dimensions or as directed using a proper bar bender, operated by hand or power to attain proper radius of bends. Bars shall not be bent or straightened in a manner that will injure the material. Bars bent during transport o handling shall be straightened before being used on me work. They shall not be heated to facilitate bending. Unless otherwise specified, a 'U' type hook at the end of each bar shall invariably be provided to main reinforcement. The redius of the bend shall not be less than twice the diameter of the round bar and the length of straight part of the bar beyond the end of the curve shall be at least four times the diameter of the round bar. In case of bars which are not round and in case of deformed bars, the diameter shall be taken as the diameter of circle having an equivalent effective area. The hooks shall be suitably encased to prevent any splitting of the concrete.

2.4. All the reinforcement bars shall be accurately placed in exact position shown on the drawing sand shall be securely held in position during placing of concrete by annealed binding wire not less than 1 mm. in size, and by using stay blocks or metal chair spacers, metal hangers, supporting wires or other approved devices at sufficiently-Close intervals. Bars shall not be allowed to sag between supports nor displaced during concreting or any other operations of the work. All devices used for positioning shall be of non-corrodible material. Wooden and metal supports shall not extend to the surface of concrete, except where shown on drawings. Placing bars on layers of freshly laid concrete as the work progresses for adjusting bar spacing shall not allowed.-Pieces of broken stone or brick and wooden blocks shall not be used. Layers of bars shall be separated by spacer bars, precast mortar blocks or other approved devices. Reinforcement after being placed in position shall be maintained

in a clean condition until completely embedded m concrete. Special care shall be exceeded to prevent any displacement of reinforcement in concrete already placed. To prevent reinforcement from corrosion, concrete cover shall be provided as indicated on drawing. All the bars prodruding from concrete and to which other bars are to be spliced and which are likely to be exposed for a period exceeding 10 days shall be protected by a thick coast of neat cement grout. .

2.5. Bars crossing each other where required shall be secured by binding wiles (annealed) of size not less than I mm. in such manner that they do not slip over each other at the time of fixing and concreting.

2.6. As far as possible, bars of full length shall be used. In case this is not possible, overlapping of bars shall be done as directed. When practicable, overlapping bars shall not touch each other, but be kept apart by 25 mm. or 1.25 times the maximum size of the coarse aggregate whichever is greater by concrete between them. Where not feasible, overlapping bars shall be bound with annealed wires not less than 1 mm. thick twisted tight The overlaps shall be staggered for different bears and located at points along the span where neither shear nor bending movement is maximum.

2.7. Whenever indicated on the drawings or desired by the Engineer-in-charge, bars shall be joined by couplings which shall have a cross-section sufficient to transpit the full stresses of bars. The ends of the bars that are joined by coupling shall be upset for sufficient length so that the effective cross section at the base of threads is not less than normal corss-section of the bar. Threads shall be standard threads. Steel for coupling shall conform to I.S. 226.

2.8. When permitted or specified on the drawings, joints of reinforcement bars shall be butt-welded so as to transmit their full stresses. Welded joints shall preferably be located at points when steel will not be subject to more than 75 per cent of the maximum permissible stresses and welds so staggered that at any one section not more than 20 percent of the rods are welded. Only electric arc welding using a process which excludes air from the molten metal and conforms to any or all other special provisions for the work shall be accepted. Suitable means shall be provided for holding bars securely in position during welding. It shall be ensured that no voids are left in welding and when welding is done in two or three stages, previous surface shall be cleaned properly. Ends of the bars shall be cleaned of all loose scale, rust, grease, paint and other foreign matter before welding. Only competent welders shall be employed on the work. The M.S. electrodes used for welding shall conform to I.S. 814. Welded pieces of reinforcement shall be tested. Specimen shall be taken from the actual site and their number and frequency of test shall be as directed.

3.0. Mode of measurement and payment:

3.1. For the purpose of calculating consumption, wastage shall not be permitted beyond 5 percent. Excess consumption over 5% will be charged at penal rate.

3.2. Reinforcement shall be measured in length including overlaps, separately for different diameters as actually used in the work. Where welding or coupling is resorted to, in place of lap joints, such joints shall be measured for payment as equivalent length of overlap as per design requirement. From the length so measured, the weight of reinforcement shall be calculated in tonnes on the same basis of as per M-18 eventhough steel is supplied to the contractor by the department on actual weight. Length shall include hooks at the ends. Wastage and annealed steel wire for binding shall not be measured and the cost of these items shall be deemed to be included in the rate for reinforcement.

3.3. The rate for reinforcement includes cost of steel binding wires its carting from Department a store to work site., cutting, bending, placing; binding and fixing in position as shown on the drawings and as directed. It shall also include all devices for keeping reinforcement in approved position, cost of joining as per approved method and all wastage and spacer bars.

3.4. The rate shall be for a unit of one Kg.

5.4.11. High yield deform bars steel inforcement for R.C.C. work including bending, binding and placing in position complete upto floor two level.

1.0. Materials : 1.1. Cold twisted steel bars (high yield strength steel deformed bars) shall conform to M 19. Mild steel binding wires shall conform to M-21.

2.0. Workmanship: 2.1. The specifications of item No. 5.4.10. shall be followed except that the cold twisted steel bars shall be used with or without hooks at the ends. Deformed bars, without hooks shall, however, comply with relevant anchorage requirements.

3.0. Mode of measurement and payment:

3.1. The relevant specifications of item No. 5.4.10 shall be followed.

3.2. The rate shall be for a unit of one Kg.

5.4.13. Extra for additional lift of concrete for all R.C.C. work above floor two level excluding cost of reinforcement.

1.0. Materials & Workmanship: The relevant specifications of item No. 5.4.1. shall be followed for the work except that the R.C.C. work shall be done for ground floor i.e. above plinth level to first floor level.

2.0. Mode of measurement and payment:

2.1. The relevant specifications of item No. 5.4.1. shall be followed except that the rate shall be for extra lift above plinth to floor two level, over and above the rate of concrete at floor two level.

2.2. The rate shall be for a unit of one cubic metre.

5.4.13. (A) Extra for additional lift of reinforcement steel for all R.C.C. work above floor two level.

1.0. Materials & Workmanship : 1.1. The relevant specifications of item No. 5.4. 10. or 5.4.11. as may be applicable, shall be followed except that the work shall be carried out above floor two level for each floor.

2.0. Mode of measurement and payment:

2.1. The relevant specifications of item No. 5.4.10. or 5.4.11, as may be applicable, shall be followed except that the work shall be carried out above floor two level.

2.2. The rate shall be for unit of one Kg. per floor.

5.6.2. Providing upto floor two level precast cement concrete jali or grill 1:2:4(1 cement: 2 coarse sand : 4 graded stone aggregate 6 mm. nominal size.) reinforced with 1: 6 mm. dia. mild steel wire including roughening, cleaning, fixing and finishing in cement mortar 1: 3 and curing complete.

(A) 50 mm. thick (B) 40 mm. thick/C) 25 mm. thick (D) 75 mm thick. (E) 100 mm. thick.

1.0. Materials: 1.1 Water shall conform to M-l. (2) Cement shall conform to M-3. (3) Sand shall conform to M-6. (4) Mortar shall conform to M-11 (5) Aggregates shall conform to M-12 (6) Mild steel wire shall conform to M-21 (7) Shuttering shall conform to M-26.

2.0. Workmanship:

It shall be of cement concrete 1 : 2 : 4 (1 cement: 2 coarse sand; 4 graded stone aggregate 6 mm. nominal size), reinforced with 1.6 mm. dia mild steel wire unless otherwise specified. The thickness of jali shall be as specified in the item.

The jali shall be set in position true to line and level before the jembs silles and soffits of the opening are plastered. It shall then be properly cemented with cement mortar 1 : 3 : (1 cement: 3 sand) and rechecked for levels. Finally the jambs, sills and soffits shall be plastered gripping the Jali uniformly on all sides.

3.0. Mode of measurement and payment:

3.1. The item shall be measured in square metre.

3.2. The rate shall be for 1 unit of one square metre.

5.8.1. Providing and laying controlled concrete M-150 and curing complete excluding the cost of form work and reinforcement concrete work in:

(A) Foundations, footings, base of columns, and mass concrete. (B) Walls from top of foundations/level upto floor two level. (C) Slabs, landing shelves, Balconies, lintels, beams, girders, and cantilever, upto floor two level, (D) Columns, pillars, posts, and struts upto floor two level (E) Staircase upto floor two level. (F) Vertical and horizontal fins upto floor two level.

1.0. Materials : 1.1. Water shall conform to M-l. Cement shall conform to M-3. Sand shall conform to M-6. Grit shall conform to M-8 Coarse aggregate shall conform M-12 B.

2.0. General :

2.1 The relevant specifications of item No. 5.4.1. of ordinary concrete shall be followed except that the concrete mix shall be designed from preliminary tests, the proportioning of cement and aggregates shall be done by weight and necessary precautions shall be taken in the production to ensure that the required work cube strength is attained and maintained. The controlled concrete shall be in grades of M-100, M-150, M-200, M-250, M-300, M-350, & M-400, with prefix controlled added to it. The letter 'M' refers to mix and numbers specify 28 days works cube compressive strength of 150 mm. cubes of the mix expressed in Kg./Cmt.

2.2 The porportion of cement, sand and coarse aggregates shall be determined by weight, the weight batch machine shall be used for maintaining proper control over the porportion of aggregates as per mix design.

The strength requirements of different grades of concrete shall be as under:

Grade of Concrete	Compressive strength of 1 5 cms. 28 days, conducted in accordance Preliminary test Work test Min.	cubes in Kg./Cmt. at with I.S. 516-1959. Min.
M-150	200	150
M-200	260	200
M-250	320	250
M-300	380	300
M-350	440	350
M-400	500	400

In all cases, the 28 days compressive strength specified in above table above be the criteria for acceptance or rejection of the concrete.

Where the strength of a concrete mix as indicated by tests, lies in between the strength of any two grades specified in the above table, such concrete shall be classified in for all purposes-as concrete belonging to the lower of the two grades between which its strength lies.

3.0. Workmanship :

3.1. The proportions for ingradients chosen shall be such that concrete has adequate workability for conditions prevailing on the work in question and can be properly compacted with means available except where it can be shown to the satisfaction of the Engineer-in-charge, that the supply of properly graded aggregate of uniform quality can be maintained till the completion of work. Grading of aggregate shall be controlled by obtaining the coarse aggregates, in different sizes and beingint hem in the right proportions as required. Aggregate of different sizes shall be stocked in separate stock piles. The required quantity of material shall be stock piled several hours, preferably a day before use. The grading of coarse and fine aggregate shall be checked as frequently as possible, the frequency for a given job being determined by the Engineer-in-charge to ensure that the suppliers are maintaining the uniform grading as approved for samples used in the preliminary tests.

3.2. In porportioning concrete, the quantity of both cement and aggregate shall be determined by weight. Where the weight of cement is determined by accepting the maker's weight per bag a reasonable number of bags shall be weighted separately to check the net weight. Where cement is weighted frombulk stocks at site and not by bags, it shall be weighted separately from the aggregates. Water shall either be measured by volume in calibarated tanks or weighed. All measuring equipments shall be maintained in clean, and serviceable condition. Their accuracy shall be periodically checked.

3.3. It is most important to keep the specified water cement ratio constant and at its correct value. To this end, moisture content in both fine and coarse aggregates shall be determined by the Engineer-in-charge, according to the weather conditions. The amount of mixing water shall then be adjusted to compensate for variations in the moisture content. For determination of moisture, content in the aggregates, I.S. 2389 (Part-III) shall be referred to. Suitable adjustments also be made in the weights of aggregates due to variation in their moisture content. Minimum quantity of cement used in concrete shall not be less than 220 Kg./M 3 in plain concrete and not less than 250 Kg/M3 in reinforced concrete.

4.0. Mode of measurement and payment:

4.1. The relevant specifications item No, 5.4.1. shall be followed except that the controller concrete R.C.C. work for work as specified in item shall be measured under this item. The rate excludes cost of form work.

4.1. The rate shall be for a unit of one cubic metre.

5.8.2. Providing and laying controlled cement concrete M-200 and curing complete, excluding the cost of form work and reinforcement for reinforced concrete work in :

(A) foundations, footings, base of columns and mass concrete. (B) walls from top of foundation upto floor two. level, (C) Slabs, landing, shelves, balconies lintels, beams, girders and cantilever upto floor two level.. (D) Columns, pillars posts and struts upto two level. (E) Stair cases upto floor two level. (F) Vertical and horizontal fins upto floor two level.

1.0. Mode of measurement and payment:

The relevant specifications of item No. 5.8.1. shall be followed except that the grading of concrete shall he controlled concrete M 200 grades for the work as specified in item.

2.0. Mode of measurement and payment:

2.1.The relevant specifications of item No. 5.8.1. shall be followed.

2 .2. The rate shall be for one cubic metre.

5.8.3. Providing and laying controlled cement concrete M-250 and curing complete excluding the cost of reinforcement for reinforced concrete work in :

(A) Foundations, footings, bases of columns and the like and mass concrete (B) Walls from top of foundation level upto floor two level (C) Slabs, landings shelves, balconies, beams, girders and centilever upto floor two level. (D) Columns, pillars, struts upto two level.

1.0. Materials & Workmanship: 1.1. The relevant specifications of item No. 5.8.1. shall be followed except that the grading of concrete shall be controlled concrete M-2SO grades for the works as specified in the item.

2.0. Mode of measurement and payment:

2.1 The relevant specifications of item No. 5.8.1.shall be followed.

2.2. The rate shall be for a unit of one cubic metre.

5.00.1. Providing and laying ordinary cement concrete 1:2:4(1 cement: 2 coarse sand : 4 graded stone aggregates 20 mm. nominal size) and finishing smooth with curing etc., complete including the cost of form work but excluding the cost of reinforcement of R.C.C. work in :

(I) Slabs upto 8 cms. thickness (II) Slab having more than 8 cms. and upto 10 cms. thickness (III) Slab having more than 10 cms. and upto 13 cms. thickness. (IV) Slab having more than 13 cms. and upto 15 cms. thickness.

1.0. Materials & Workmanship : 1.1. The relevant specifications of item No. 5.4.1. shall be followed for concrete work and relevant specifications of item No. 9.1 shall be followed for form work and centering work. The concrete surface shall be smooth finished in cement mortar 1 : 3 (1 cement: 3 fine sand) as per item No. 17.59 (1). The thickness of the slab shall be as specified in the item.

2.0. Mode of measurement and payment:

2.1. The relevant specifications of item 5.4.1. shall be followed except that the item includes cost for providing form-work and centering work as directed.

2.2. The rate shall be for a unit of one cubic metre.

5.002. Providing and laying controlled cement concrete M-150 and finishing smooth with curring etc. complete including the cost of form work but excluding the cost of reinforcement for R .C .C. work in:

(I) Slabs upto 8 cms. thickness (II) Slabs more than 8 cms. and upto 10 cms. (III) Slabs more than 10 cms. and upto 13 cms. (IV) Slabs more than 13 cms. and upto 15 cms.

1.0. Materials & Workmanship: 1.1. The relevant specifications of item No. 5.8.1. shall be followed for concrete work and item no. 9.1 shall be followed for form work and centering. The concrete surface shall be smooth finished with cement mortar 1: 3 (1 cement, 3 fine sand) as per item No. 17.59 (1). The thickness shall be as specified in the item.

2.1. Mode of measurement and payments :

2.1. The relevant specifications for item No. 5.8.1. shall be followed except that the item shall include the cost and form work and centering.

2.2. The rate shall be for a unit of one cubic metre.

5.003. Providing and laying ordinary cement concrete 1:2:4 (1 cement, 2 coarse sand, 4.graded stone aggregates 20 mm. nominal size) exposed work with curing etc. complete, including the cost of form work but excluding the cost of reinforcement for R.C.C. work in (I) Slab upto 8 cms. thickness (II) Slabs having more than 8 cms. and upto 10 oms. thickness. (III) Slabs having more than 10 cms. and upto 13 cms. thickness (IV) Slabs having more than 13 cms. and upto IS cms. thickness.

1.0. Materials & Workmanship: 1.1. The relevant specifications of item No. 5.4.1. shall be followed for concrete work and that of form work, and centering work shall be followed as per item No. 9.1. and 9.7. The thickness of the slab shall be as specified in the item.

2.0 Mode of measurements and payment:

2.1. The relevant specifications of item No. 5.4.1. shall be followed except that form work and centering work shall be included in the item.

2.2. The rate shall be for a unit of one cubic metre.

5.004. Providing and laying controlled cement M-1SO exposed work with curing etc. complete including the cost of form work but excluding the cost of reinforcement for R.C.C. work in:

(I) Slabs upto 8 cms. thickness (II) slabs having more than 8 cms. and upto 10 cms. thickness. (III) Slabs having more than 10 cms. and upto 13 cms. thickness (IV) Slabs having more than 13 cms. thickness.

1.0 Materials & Workmanship: 1.1. The relevant specifications of item No. 5.4.1. shall be followed for controlled concrete and the relevant specifications of item No. 9.1. and 9.7. shall be followed for exposed concrete form work and centering work. The thickness of the slab shall be as specified in the item.

2.0 Mode of measurements and payment:

2.1. The relevant specifications of item No. 5.8.1. shall be followed except that the form work and centering work shall be included in the item.

2.2. The rate shall be for a unit of one cubic metre.

5.005. Providing and laying ordinary cement concrete 1:2:4(1 cement: 2 coarse sand : 4 graded stone aggregate 20 mm. nominal size) for R.C.C. lintel including finishing smooth with curring etc. complete including the cost of form work but excluding the cost of reinforcement.

1.0. Materials & Workmanship : 1.1. The relevant specifications of item No. 5.4,1. shall be followed for concrete work, relevant specifications of item No. 17.59 (I) for finishing work and relevant specifications of item No. 9.1 shall be followed for form work and centering work. The concrete work shall be followed for the form work and centering work for exposed concrete work.

2.0. Mode of measurement and payment:

2.1. The relevant specifications of item No. 5.8.1. shall be followed except that the item includes the cost of form work and centering work for exposed concrete work.

2.2 The rate shall be for a unit of one cubic metre.

5.006. Providing and laying ordinary cement concrete 1:2:4(1 cement: 1 coarse sand : 4 graded stone aggregate 20 mm. nominal size) and finishing smooth with curing tie. complete including the cost of form work but excluding reinforcement for R.C.C. work in:

(A) Beams : (I) Having cross sectional area 0.05 to 0.08 Sq. metre (II) Haying cross sectional area more than 0.08 Sq. mt. upto 0.12 Sq. mt. (III) Having cross sectional area more than 0.12 Sq. mt. upto 0.18 Sq. mt.

(B) Columns : (I) Having cross sectional area 0.05 to 0.08 Sq. Mt. (II) Having cross sectional area more than 0.08 Sq. mt. and upto 0.12 Sq. mt. (III) Having cross sectional area more than 0.12 Sq.mt. and upto 0.18 Sq. int.

1.0. Materials & Workmanship: 1.1. The relevant specifications of item No. 5.4.1. shall be followed for concrete work and item No. 9.1 shall be followed for form work and centering work. The finishing shall be done in cement mortar 1: 3 (cement : 3 fine sand) as per item No. 17.59 (I). The cross sectional area of beam shall be specified in item.

2.0. Mode of measurements and payment:

2.1 The relevant specifications of item No. 5.4.1. shall be followed but the form work and centering work shall be included in the item.

2.2. The rate shall be for a unit of one cubic metre.

5.007. Providing and laying controlled cement concrete M-150 exposed work with curing etc. complete including the cost of form work but excluding the cost of reinforcement for R.C.C. work in :

(A) Beams: (I) Having cross sectional area 0.05 to 0.08 Sq. nit. (II) Having cross sectional area more than 0.08 Sq. mt. upto 0.12 Sq. mt. (III) Having cross-sectional area more than 0.12 Sq.mt. upto 0.18 Sq.mt.

(B) Columns: (I) Having cross sectional area of 0.05 to 0.08 Sq. mt. (II) Having cross sectional area more than 0.08 Sq. mt. and upto 0.12 Sq.mt. (III) Having cross sectional area more than 0.12 Sq.mt. and upto 0.18 Sq.mt.

1.0. Materials & Workmanship: 1.1. The relevant specifications of item No. 5.8.1. shall be followed for controlled concrete

work for work as specified in item for M-200 and relevant specifications of item 9.1 and 9.7 shall be followed for the form work and centering work for exposed cement work.

2.0. Mode of measurements and payment:

2.1 The relevant specifications of item No. 5.8.1. shall be followed excepted (hat the form work and centering work shall be included in the item.

2.2. The rate shall be for a unit of one cubic metre.

5.008. Providing and .laying contralcd cement concrete M-200 exposed work with curing etc. complete including the cost of form work but excluding the cost of reinforcement for R.C.C. work in

(A) Beams: (I) Having cross sectional area 0.05 to 0.08 Sq. mt. (II) Having cross sectional area 0.08 Sq. mt upto 0.12 Sq. ml. (III) Having cross sectional area 0.12 Sq. mt. upto 0.18 Sq. mt.

(B) Columns : (I) Having cross sectional area 0.05 to 0.08 Sq. mt. (II) Having cross sectional area more than 0.08 Sq. mt. and upto 0.12 Sq. mt. (III) Having cross sectional area more than 0.12 Sq. mt. and uplo 0.18 Sq. mt.

1.0. Materials & Workmanship: 1.1. The relevant specifications of item No. 5.8.1. shall be followed for controled concrete work as specified in item for M-200 and relevant specifications of item 9.7 and 9.1 shall be followed for the form work and centering work for exposed cement work.

2.0. Mode of measurements and payment:

2.1 The relevant specifications of item No. 5.8.1. shall be followed except that item includes the cost of form work and centering work for exposed work.

2.2. The rate shall be for a unit of one cubic metre.

5.009. Providing and laying controlled cement concrete M- 250 exposed work with curing etc. complete including the cost of form work tut excluding the cost of reinforcement for R.C.C. work in

(A) Beams : (I)Having cross sectional area 0.05 to 0.08 Sq. ml, (II) Having cross sectional area more than 0.08 Sq. mt. and upto 0.12 Sq. mt. (III) Having cross sectional area more than 0.12 Sq. mt. and upto 0.18 Sq. mt.

(B) Columns : (I) Having cross sectional area 0.05 to 0.08 Sq. mt. (II; Having cross sectional area more than 0.08 Sq. mt. and upto 0.12 Sq.mt. (III) Having cross sectional area more than 0.12 Sq. mt. and upto 0.18 Sq. int.

1.0 Materials & Workmanship : 1.1 The relevant specifications of item No. 5.8.1. shall be followed for controlled concrete work for the work as specified in the item for M-250 and the relevant R.C.C. lintels shall be carried out.

2.0. Mode of measurement and payment:

2.1. The relevant specifications of item No. 5.4.1. shall be followed except that the cost of form work finishing and centering shall be included in the item.

2.2. The rate shall be for a unit of one cubic metre.

SECTION-6
DETAILED SPECIFICATIONS - MASONARY WORK

6.12. (A) Brick work using common burnt clay building bricks having crushing strength not less than 35 Kg./Sq. Cm. in foundations and plinth in cement mortar 1 : 5 (1 cement: 5 fine sand) modular bricks.

1.0 Materials : Water shall conform to M-l. Cement shall conform to M-3. Sand shall conform to M-6. Brick shall conform to M-15. Cement mortar shall conform to M-11.

2.0. Workmanship:

2.1. Proportion:

2.1.1. The proportion of the cement mortar shall be 1 : 5 (1 cement: 5 fine sand) by volume.

2.2. Wetting of bricks : 2.2.1. The bricks required for masonry shall be thoroughly wetted with clean water for about two hours before use or as directed. The cessation of bubbles, when the bricks are welted with water is an indication of through wetting of bricks.

2.3. Laying:

2.3..I. Bricks shall be laid in English bond unless directed otherwise. Half or cut bricks shall not be used except when necessary to complete to bond; closers in such case shall be cut to required size and used near the ends of walls.

2.3.2. A layer of mortar shall be spread on full width for suitable length of the lower course. Each brick shall first be properly bedded and se: home by gently tapping with handle of trowel or wooden mallet. It side face shall be flushed with mortar before the next brick is laid and pressed against it. On completion of course, the verticle joints shall be fully filled from the top with mortar.

23.3. The walls shall be taken up truly in plumb. AH courses shall be laid truly horizonal and all vertical joint shall be truly vertical. Vertical joints in alternate course shall generally be directly one over the other. The thickness of brick course shall be kept uniform.

2.3.4. The brick shall be laid with frog upwards. A set of tools comprising of wooden straight edges, mason's sprit level, square half metre rub, and pins, string and plumb shall be kept on the site of work for frequent checking during the progress of work.

2.3.5. Both the faces of walls of thickness greater than 23 cms. shall be kept in proper place. All the connected brick work shall be kept not more than one metre over the rest of the work. Where this is not possible, the work shall be raked back according to bond (and not left toothed) at an angle not steeper than 45 degrees.

23.6. All fixtures, pipes, outlets of water, hold fasts of doors and windows etc. which are required to be built in wall shall be embedded in cement mortar.

2.4. Joints:

2.4.1. Bricks shall be so laid that all joints arc quite flush with mortar. Thickness of joins shall not exceed 12 mm. The face joints shall be raked out as directed by taking tools daily during the progress of work, when the mortar is still green so as to provide key for plaster or pointing to done.

2.4.2. The face of brick shall be cleaned the very day on which the brick work is laid and all mortar dropping removed,

2.5. Curing. 2.5.1. Green work shall be protected from rain suitably. Masonry work shall be kept moist on all the faces for a period of seven days. The top of masonry work shall be kept well welted at the close of the day.

2.5. Preparation of foundation bed : 2.6.1. If the foundation is to be laid directly on the excavated bed, the bed shall be levelled, cleared of all loose materials, cleaned and wetted before starting masonry. If masonry is to be laid on concrete footing, the top of concrete shall be cleaned and moistened. The contractor shall obtain the engineer's approval for the foundation bed, before foundation masonry is started. When puccas flooring is to be provided flush with the top to plinth, the inside plinth offset shall be kept lower than the outside plinth top by the thickness of the flooring.

3.0. Mode of measurements and payment:

3.1. The measurements of this item shall be taken for the brick masonry fully completed in foundation upto plinth. The limiting dimensions not exceeding those shown on the plans or as directed shall be final. Battered, tappered and curved portions shall be measured net.

3.2. No deduction shall be made from the quantity of brick work, nor any extra payment made for embedding in masonry or making holes in respect of following items :

(1) Ends of joints, beams, posts, girders, rafters, purlins, trusses, corbel steps etc. where cross sectional area does not exceed 500 Sq.Cm.

(2) Openings not exceeding 1000 Sq. Cm.

(3) Wall plates and bed plates, bearing of slabs, chhajjas and the like whose thickness does not exceed 10 Cms. and the bearing does not extend to the full thickness of wall.

(4) Drainage holes, and recesses for cement concrete blocks to embed hold fasts for doors, windows etc.

(5) Iron fixtures, pipes upto 300 mm. dia; hold fasts and doors and windows built into masonry and pipes etc. for concealed wiring.

(6) Forming chases of section not exceeding 350 Sq. Cm. in masonry.

3.3. Apertures for fire places shall not be deducted nor shall extra labour required to make splaying of jambs, throating and making Arches over the aperture be paid for separately.

3.4 The rate shall be for a unit of one cubic metre.

6.12. (B) Brick work using common burnt clay building bricks having crushing strenght not less than 35 Kg/Sq. Cm. In foundations and plinth in cement mortar 1 : 5 (1 cemen. : 5 fine sand) conventional bricks.

1. Materials : Cement mortar of proporation 1 : 5 shall conform to M-11. Conventional bricks shall conform toM-15.

2. Workmanship : The relevant specifications of item No. 6.12 (A) shall be followed except that the masonry work shall be carried out by using conventional bricks.

3.0. Mode of measurements and payment:

3.1. The relevant specifications of item No. 6.12 shall be followed.

3.2. The rate shall be for a unit of one cubic metre.

6.13. (A) Brick work using common burnt clay building bricks having crushing strength not less than 35 Kg/Sq. cm. In foundation and plinth in cement mortar 1:6 *(*1cement, 6 fine sand), with modular bricks.

1.0. Materials: Cement mortar of proportion of 1:6 shall conform to M-l 1. Bricks shall conform to M-15.

2.0. Workmanship: 2.1. The relevant specifications of item No. 6.12. (A) shall be followed except that the bricks to be used shall be modular bricks and the proportion of cement mortar is 1:6.

3.0. Mode of measurements and payment:

3.1. The relevant specifications of item No. 6.12 (A) shall be followed.

3.2. The rate shall be for a unit of one cubic metre.

6.13. (B) Bricks work using common burnt clay building bricks having crushing strength not less than 35 Kg/Sq. Cm. In foundation and plinth in cement mortar 1:6(1 cement: 6 find sand) with conventional bricks.

1.0. Materials: Water shall conform to M-l, Cement mortar shall conform to M-l1. Bricks shall conform to M-15.

2.0. Workmanship: 2.1. The relevant specifications of item No. 6.12. (A) shall be followed except that the bricks to be used shall be conventional bricks and proportion of cement mortar-shall in C.M. 1 : 6.

3.0. Mode of measurements and payment:

3.1. The relevant specifications of item No. 6.12. (A) shall be followed.

3.2. The rate shall be for a unit of one cubic metre.

6.0.01 (A) Brick work using common burnt clay building bricks having crushing strength not less than 35 Kg/Sq. Cm. In foundation and plinth in cement mortar 1:8 (1 cement: 8 find sand) with Modular bricks.

1.0. Materials: Water shall conform to M-l, Cement mortar shall conform to M-l 1. Bricks shall conform to M-15.

2.0. Workmanship : 2.2. The relevant specifications of item No. 6.12 (A) shall be followed except that the proportion of mortar shall be CM. 1: 8.

3.0. Mode of measurements and payment:

3.1. The relevant specifications of item No. 6.12. (A) shall be followed.

3.2. The rate shall be for a unit of one cubic metre.

6.0.01 (B) Brick work using common burnt clay building bricks having crushing strength not less than 35 Kg/Sq. Cm. in foundation and plinth in cement mortar 1:8(1 cement: 8 find sand), with conventional bricks.

1.0. Materials : Water shall conform to M-1. Brick shall conform to M-15. Cement mortar shall conform to M-l 1.

2.0. Workmanship : 2.1. The relevant specifications of item No. 6/12. (A) shall be followed except that the proportion of cement mortar shall be 1:8 and bricks used shall be conventional bricks.

3.0. Mode of measurements and payment:

3.1. The relevant specifications c f item No. 6.12. (A) shall be followed.

3.2. The rate shall be for a unit of one cubic metre.

6.0.02. (A) Brick work using commonburnt clay building bricks having crashing strength not less than 35 Kg/Sq. Cm. in foundation and plinth in lime mortar 1: 1.5 (1 Lime putty, 1.5. find sand) modular bricks.

1.0. Materials: Lime mortar of proportion (1:1.5) shall conform to M.10. Bricks shall conform to M-15.

2.0. Workmanship : The relevant specifications of item No. 6.12. (A) shall be followed except the masonry work shall be carried out in lime mortar 1:1.5(1 Lime putty 1.5 find sand) in foundation and plinth.

3.0. Mode of measurements and payment:

3.1. The relevant specifications of item No. 6.12. (A) shall be followed.

3.2. The rate shall be for a unit of on cubic metre.

6.0.02 (B) Brick work using common burnt clay building bricks having crushing strength not less than 35 Kg/sq. Cm. in foundation and plinth in lime mortar 1:1.5(1 Lime putty: 1.5 fine sand) conventional bricks.

1.0. Materials & Workmanship: The relevant specifications of item No. 6.12. (A) and 6.0.02 (A) shall be followed except that the masonry work shall be carried out in lime mortar 1: 1.5 (1 Lime putty: 1.5. fine sand) in foundation and plinth.

2.0. Mode of measurements and payment:

2.1. The relevant specifications of item -No. 6.12. (A) shall be followed.

6.0.03. (A) Brick using common burnt clay building brick having crushing strength not less than 35 Kg/Sq. Cm. in foundation and plinth in lime mortar 1.2(1 Lime putty : 2 find sand) modular bricks.

1.0. Materials & Workmanship : The relevant specifications of item No. 6.12. (A) and 6.00. (A) shall be followed except that the masonry work shall be carried out in lime mortar 1 : 2 (l Lime putty: 2 find sand) in foundation and plinth.

2.0. Mode of measurements and payment:

2.1. The relevant specifications of item No. 6.12. (A) shall be followed.

2.2. The rate shall be for a unit of one cubic metre.

6.0.0.3 (B) Brick work using common burnt clay building bricks having crushing strength not less than 35 Kg/Sq. Cm. in foundation and plinth in Lime mortar 1 : 2 (1 Lime putty : 2 fine sand) conventional bricks.

1.0. Materials & Workmanship: The relevant specifications of item No. 6.12. (A) and 6.0.0.3 (A) shall be followed except that the masonry work shall be carried out in lime mortar 1 :2 (1 Lime : 2 fine sand) using conventional brick in foundation and plinth.

2.0. Mode of measurements and payment:

2.1. The relevant specifications of item No. 6.12. (A) shall be followed.

2.2. The rate shall be for a unit of one cubic metre.

6.19 (A) Brick work using common burnt clay building bricks having crushing strength not less than 35 Kg/ per sq. Cm. for super structure above plinth level upto floor two level in cement mortar 1:5(1 cement; *5* fine sandy modular bricks.

Materials: Brick shall conform to M-15. Cement mortar shall conform M-11.

2.0. Workmanship:

2.1. The relevant specifications of item No. 6.12. (A) shall be followed except that the masonry work shall be carried out above plinth level to floor two level i.e. for ground floor.

2.2. The frames of doors, windows, cupboards etc. shall be housed into the brick work at the correct location and level as directed. The heavy steel doors, window frames etc. shall be built in with brick work, but for ordinary steel doors and windows required opening for frames, hold-fasts etc. shall be left in the wall and frames embedded later on in order to avoid damage to the frames.

2.3. Necessary scaffolding shall be provided. The supports of the scaffolding shall be sound and strong tied together with horizontal pieces over which the scaffolding planks shall be fixed. Simple scaffolding shall be allowed normally. In this case scaffolding hole shall rest in hold header horizontal coarse only. Minimum number of holes shall be left in brick work for supporting horizontal scaffolding holes.

The contractor is responsible for providing and maintaining sufficiently strong scaffolding so as to withstand all loads likely to come upon it.

2.4. For the face of brick work, where plastering is to be done, joints shall be racked out to a depth not less than thickness of joints. The face of brick work shall be cleaned and mortar dropping removed on very same day that brick work is laid.

3.0. Mode of measurement:

3.1. The masonry work of G.F. i.e. above plinth level to floor two level shall be measured and paid under this item.

3.2. Brick work in parapet shall be included in the corresponding masonry item of storey immediately below the floor above which the parapet is built.

3.3. No deduction shall be made from quantity of brick work. No extra payment shall be made for embedding in masonry

or making holes in respect of following items :

(1) Ends of joints, beams, posts, girders, rafters, purlins truses corbel, steps etc. where cross sectional area docs not exceed 500 Sq.Cm.

(2) Opening not exceeding 1000 Sq. Cm.

(3) Wall plate, sand bed plates, bearing of slab, chhajjas and like whose thickness does not exceed 10 Cms. and the hearing does not extend the full thickness of wall.

(4) Drainage holes and recesses for cement concrete blocks to embed hold fasts for doors, windows etc.

(5) Iron fixtures pipes upto 300 mm. dia. hold fasts of doors, and windows built into masonry and pipes etc. for concealed wiring.

(6) Forming charges of section not exceeding 350 Sq. Cm. in masonry.

(7) Apertures for fire places, shall not be deducted nor shall extra labour required to make spaying of Jambs, throating and making trenches over the aperture be paid for separately.

3.4. The rate shall be for a unit of one cubic metre.

6.19.(B) Brick work using common burnt clay building bricks having crushing strength not less than 35 Kg/sq. cm. for super structure above plinth upto floor two level in cement mortar 1:5. (1 cement; 5 fine sand) conventional bricks.

1.0. Materials & Workmanship : The relevant specifications of item No. 6.19. (A) shall be followed except that brick masonry work shall be carried out with conventional bricks.

2.0. Mode of measurements and payment:

2.1. The relevant specifications of item No. 6.19 (A) shall be followed.

2.2. The rate shall be for a unit of one cubic metre.

6.20. Extra for brick in super structure above floor two level.

1.0. Materials & Workmanship: The relevant specifications of item masonry work to be carried out shall be followed except that this work is for additional lift of one floor above floor two level.

2.0. Mode of measurements and payment:

2.1. The relevant specifications of item No. 6.19 (A) masonry work shall be followed.

2.2 The extra payment shall be made for additional life above floor two level to each additional floor overand above the rate of masonry work.

2.3. The rate shall be for a unit of one cubic metre.

630.1. (A) Half brick masonry in common burnt clay building bricks having crushing strength not less than 35 kg/sq. cm. in cement mortar 1:4(1 cement: 4 coarse sand) in super structure above plinth level upto floor two level with modular bricks.

1.0 Materials: Bricks shall conform to M -15. Water shall conform to M-l. Cement shall conform to M-3. Sand shall conform to M-6. Cement mortar shall conform to M-11.

2.0. Workmanship:

2.1. Relevant specifications of bricks, wetting and laying of bricks, joints, curing etc. shall conform to item No. 6.19 (A) except the brick work of half bricks shall be carried out.

2.2. Cement mortar used in masonry work shall be in proportion of 1 part of cement and 4 parts of sand by volume.

2.3. All bricks shall be laid strecher wise, breaking joints with those in the under and lower courses. The wall shall be taken truly plumb. All courses shall be laid truly horizontal and all vertical joints shall be truly vertical. The bricks shall be laid with frogs upwards. A set of masons tools shall be maintained on work as required for Sequent checking.

3.0 Mode of measurement and payment.

3.1. The half brick masonry work in foundation and plinth shall be measured under this item, the limiting dimensions shall not exceed those shown in the plan or as directed. Any work done extra over the specified dimensions shall fee ignored.

3.2. The relevant specifications of item No. 6.12 shall be followed. The length shall be measured nearest to one Cm.

3.3. The rate shall be for a unit of sq. metre.

630.1. (B) Half brick masonry in common burnt clay builiding bricks having crushing strength not less than 35 kg/sq. cm. in

cement mortar 1 : 4 (1 cement: .4 coarse sand) for superstructure above plinth level upto floor two level with conventional bricks.

1.0. Materials & Workmanship : 1.1 The relevant specifications of item No. 6.30 (A) shall be followed for bricks, wetting of bricks, joints, curing, except that the bricks to be used shall be conventional bricks instead of Modular bricks.

2.0. Mode of measurements and payment: 2.1. The limiting dimensions shall no. exceed those shown in the plan or as directed. Any work done extra over specified dimensions shall be ignored.

6.30II. (A) Half brick masonry in common burnt clay building bricks having crushing strength not less than 35 Kg/sq. cm. in cement mortar 1:5(1 cement: 5 coarse sand) in foundation and plinth modular bricks.

1.0. Materials & Workmanship: The relevant specifications of item No. 6.30.1 (A) shall be followed except the half brick masonry work shall be carried out in cement mortar 1:5(1 cement: 5 coarse sand) with modular bricks in foundation and plinth.

2.0. Mode of Measurement and payment:

2.1. The relevant specifications of item No. 6.30 (I)-A shall be followed.

2.2. The rate shall be for a unit of one sq. metre.

6.30. II. (B) Half brick masonry in common clay building bricks having crushing strength not less than 35 Kg/sq. cm. in cement mortar 1:5(1 cement: 5 coarse sand) in foundation and plinth using conventional bricks.

1.0. Materials & Workmanship : The relevant specifications of item No. 6.30.(I)-A shall be followed except that the half bricks work shall be carried out in cement mortar 1: 5 (1 cement: 5 coarse sand) in foundation and plinth using conventional bricks.

2.0. Mode of measurements and payment:

2.1. The relevant specifications of item No. 6.30. (I)-A shall be followed.

2.2. The rate shall be for a unit of one Sq. metre.

6.30. III. (A). Half brick masonry in common burnt clay building bricks having crushing strength not less than 35 kg/sq.cm. in lime mortar 1 :1.5 (1 Lime putty 1: 1.5 coarse sand) in foundation and plinth with modular bricks.

1.0. Materials: Modular bricks shall conform to M-15. Water shall conform to M-l Lime mortar of proportion L.M. 1: 1.5 (1 Lime putty : 1.5 coarse sand) shall be conform to M-10.

2.0. Workmanship: The relevant specifications of item No. 6.30 (I)-A shall be followed except that half brick masonry work shall be carried out in Lime Mortar 1:1.5 (1 Lime putty: 1.5 coarse sand) in foundation and plinth using conventional bricks.

3.0. Mode of measurements and payment:

3.1. The relevant specifications of item No. 6.30 (I)-A shall be followed.

3.2. The rate shall be for a unit of one sq. metre.

6.30. III (B) Hall brick masonry in common burnt clay building bricks having crushing strength not less than 35 kg/sq. cm. in lime mortar 1 : 1.5 (1 lime putty : 1.5 coarse sand) in foundation and plinth using conventional bricks.

1.0. Materials : Conventional bricks shall conform to M-15. Water shall conform to M-l. Lime mortar of proportion L.M. 1 : 1.5 (1 Lime putty : 1 coarse sand) shall be conform to M-10.

2.0. Workmanship: The relevant specifications of item No. 6.30 (I)-A shall be followed except that half brick masonry work shall be carried out in Lime Mortar 1:1.5 (Lime putty : 1.5 coarse sand) in foundation and plinth using conventional bricks.

3.0. Mode of measurements and payment:

3.1. The relevant specifications of item Na. 6.30 (I)-A shall be followed.

3.2. The rate shall be for a unit of one Sq. metre.

6.30. IV. (A) Half brick masonry in common burnt clay building bricks having crushing strength not less than 35 kg/sq. cm. in cement mortar 1 : 5 : (1 cement: 5 coarse sand) with hoop iron 25 mm x 1.6 mm. or equivalent reinforcement fit every third coarse embedded in cement mortar in foundation and plinth with modular bricks.

1.0. Materials: Bricks shall conform to M-15. Water shall conform to M-1. Cement shall conform to M-3. Sand shall conform to M-6. Cement mortar shall conform to M-l1. M.S. reinforcement shall conform to M-18.

2.0. Workmanship:

2.1. Relevant specification of bricks; wetting and laying of bricks, joints, curing, scaffolding etc. shall conform to item No. 6.30 (I)- A except the following:-

2.2. Cement mortar used in masonry work shall be proportion to 1 part of cement and 5 parts of sand by volume and shall conform to M-11, and this work is for half brick thickness for partitions walls.

2.3. The hoop iron 25 mm x 1.6 mm. or equivalent reinforcement shall be provided at every third course. The ends of reinforcement shall be fully embeded in main walls on both sides as directed. Reinforcement shall be placed on the top of the bottom-most course. Laps shall be of 15 cms. of mild steel bars of hoop iron.

2.4. The joints in the course, where reinforcement is placed shall admit of mortar cover to the reinforcement.

3.0. Mode of measurement and payment;

3.1. The rate nail be for half brick masonry work including providing specified reinforcement, the limiting dimensions not exceeding those in the plan or as directed. The length shall be measured nearest to one Cm.

3.2. Any work done extra over specified dimensions shall be ignored.

3.3. The rate shall be for a unit of one Sq. metre.

6.30. IV (B) Halt brick masonry in common burnt clay building bricks having crushing strength not less than 35 kg/sq. cm. in cement mortar 1 : 5 (1 cement: 5 coarse sand) with hoop iron 25 mm. x 1.6 mm or equivalent reinforcement at every third course embedded in cement mortar in foundation and plinth, with conventional bricks.

1.0. Materials & Workmanship : 1.1. The relevant specifications of item No. 6.31.1(A) shall be followed except that the work is to be carried out with conventional bricks instead of Modular bricks.

2.0. Mode of measurements and payment:

2.1. The rate shall be for brick work, including providing specified reinforcement, the limiting dimensions not exceeding those shown in the plan or as directed. The length shall be measured nearest to one Cm.

2.2. The work done extra over specified dimensions shall be ignored.

2.3. The rate shall be for a unit of one Sq. metre.

6.33: (A) Extra for half brick masonry in superstructure above floor two level in Modular bricks.

1.0 Materials & Workmanship : 1.1. The relevant specifications of item Mo. 6.30 (A) *&* 6.30 (B) shall be followed except that this work is for additional lift of each floor above floor two level using Modular bricks.

2.0. Mode of measurements and payment:

2.1. The payment shall be made for the half brick masonry work carried out above floor two level for each additional lift over and above the payment of work upto floor two level. 2.2. The rate shall be for a unit of one sq. metre per floor.

6.33. (B) Extra for half brick masonry work in superstructure above floor two level. Conventional bricks.

1.0. Materials & Workmanship: The relevant specifications of item No. 6.30 (A) & 6.30 (B) shall be followed except that this work is for additional lift of each floor above floor two level using conventional bricks.

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item No. 6.33 (A) shall be followed.

2.2. The rate shall be for a unit of one Sq. metre per floor.

6.55. (1) Hall bricks thick Honey comb brick work with burnt clay building bricks having crushing strength not less than 35 kg/sq. cm. in C.M. 1 : 4 (1 cement. 4 coarse sand)

1.0. Materials : Bricks shall conform to M-15 Cement of proportion shall conform to M-11.

2.0. Workmanship : The relevant specifications of item No. 6.32. (A) shall be followed except that the masonry work shall be carried out Honey-comb in thickness of half b ricks in cement mortar 1:4 (1 cement: 4 coarse sand) and where directed with all lifts.

3.0. Mode of measurements and payment:

3.1. The honey-comb work shall be measured in Sq. metres. The full area of honey-comb work shall be measured without deduction for openings.

3.2. The rate shall be for a unit of one square metre of wall surface.

SECTIONS DETAILED SPECIFICATIONS - RUBBLE MASONRY WORKS

7.6. (I) Uncoursed rubble masonry with hard stone approved quality in foundations and plinth in cement mortar 1:6 (1 cement : 6 coarse sand) including levelling etc. complete.

1.0. Materials : The cement mortar shall conform to M-l1. Stones shall conform to M-16.

2.0. Wo kmanship:

2.1. Dressing of stones : Stone used for uncoursed rubble masonry work shall be hammer dressed on the sides, and beds in such a way as to close up with the adjacent stone in the masonry work as strongly as possible. The face, stones shall be dressed in such amanner as to give a specified Pattern such as Blygonal tucing etc. The tace of the stones shall be so dressed that busing on the exposed face shall not project by more than 40 mm. from the general wall surface and on the face to be plastered. It shall not project by more than 19 mm. nor shall have depressions more than 10 mm. from the average wall surface.

2.2. Laying : All the stone shall be sufficiently wetted before laying to prevent absorption of water from mortar. The wall shall be built true to plumb (or true to required batter when so specified). All connected walls in a structures shall normally be raised up uniformly and regularly. However if for any specific reason, one part of masonry is required to be left behind, the wall shall be racked back at an angle not steeper than 45 . Vertical Toothed joints in masonry shall not be allowed. The work shall be carried out regularly and masonry of any day will not be raised by more than 1 metre in height.

2.3. The stone shall be laid in an uncoursed fashion or randon facing etc. However the masonry is required to be brought to level at various stages viz. plinth level, window still level, roof level and any other level specifically shown inthe drawings. This may be done by first by adjusting the laying or stones to one level and then by providing levelling coarse of cement concrete 1: 6 : 12 (1 cement: 6 sand : 12 graded stone aggregate 20 mm. nominal size) or as otherwise specified.

2.4. Proper bonding shall be achieved by closely filling in adjacent stones as well as by using bond stones or through stones as described herein below. Face stones shall extend back sufficiently and bond well with the masonry. The stone shall be carefully set so as to break joints and avoid formation of vertical joints. The depth of stone from the face of wall inwards shall not be less than weight or breadth at the face. The hearting or interior filling of the wall shall consist of rubble stones which may be of any shape. Neither the face stone nor the hearting stone shall be so small to pass through circular ring of 150 mm. internal diameter in any direction nor shall any of them shall have minimum thickness 100 mm.

2.5. All stone shall be carefully laid, hammered down by a wooden mallet into position and solidly embedded in mortar, chips and spawls of stone may be used wherever necessary to avoid thick mortar beds or joints at the same time ensuring that no hollow space is left anywhere in the masonry. The chips used shall not be more than 20% by volume of masonry. The hearting shall be laid nearly level with face stones except that at about one metre intervals vertical bond stone or plums projecting about 150 to 200 mm. shall be firmly embedded to form vertical bonding in masonry.

2.6. Bond stones : Bond stones or through stones running right across the thickness of .the wall shall be provided in walls upto 600 mm. thick. In thicker walls two stones overlaping each other by atleast 150 mm. shall be provided across the thickness of the wall to form bond stones. There shall be atleast one bond stone for every 0.5 Sq. M. of wall surface. The bond stone shall be marked by a distinguishing letter during construction for subsequent verification and shall be laid staggered in subsequent layers.

2.7. Quoins: The quoins or corners stone shall be selected stone nearly dressed with hammer and/or chisel to form the required corner angle and laid header and stretcher alternatively. The bed and top surface of quoins shall be chiselled dressed to give horizontal joints. The quoins shall have a uniform chisel draft of at least 25 mm. width at four edges of each exposed face, all the edges of the same face being in one plane. No quoins stone shall be smaller than 0.025 Cum. in volume.

2.8. Jamb Stones: The jamb stone shall be made with stone specified for quoins, except that the stone provided on the jambs shall have their length equal to thickness of wall upto 600 mm. and a line of headers shall be provided for walls thicker than 600 mm. as specified for bond.

2.9. Joints: All the joints shall be completely filled with mortar and their width shall not exceed 25 mm. When plastering or pointing is not required to be done, the joints shall be struck flush and finished simultaneously while laying the stone. Otherwise the joints shall bo racked to a minimum depth of 20 mm. by a racking tools, during progress of laying while the mortar is still green.

2.10. Scaffolding : Single or double scaffolding -ha!' be used. The scaffolding shall be strong and sound. The holes left in

masonry for supporting scaffolding shall be filled And made good before plastering.

2.11. Curing: Gree work shall be projected from rains by suitably covering the same. Masonry shall be kept constantly moist on all the faces for a period of atleast 7 days. The top of masonry shall be flooded at the close of the day.

3.0. Mode of measurements & payment: 3.1. All work shall be measured on the basis of finished dimensions and measured net except where otherwise specified. Only specified dimensions shall be allowed. Anything extra shall be ignored. The masonry work in foundation and plinth shall be measured under this item. No deduction shall be made nor extra payment made for the following :

(a) Ends of joints, beams, posts, girders, rafters, purlins, trusses, corbels, etc. each upto 500 Sq. cm. in section.

(b) Opening each upto 0.1 sq. m.

(c) Wall plates and bed plates bearings of chhaja and like upto 10 cm. depth (bearing of floor and roof slabs shall be deducted from masonry).

(d) Drain holes and recesses for cement concrete blocks to embed hole fasts for doors windows.

(e) Building in the masonry iron fixtures pipes upto 300-mm. dia. hold fasts of doors and windows.

(f) Forming cheses in masonry upto section of 350 Sq. Cm.

3.2. The rate shall be for a unit of one cubic metre.

7.6 (II) Uncorsed rubble masonry with hard stone of approved quality in foundations and plinth" in cement mortar 1 : 5 (1 cement, 5 coarse sand) including levelling up etc. complete.

1.0. Materials & Workmanship: The relevant specifications of item No. 7.6. (I) shall be followed except that the proportion of cement mortar shall be in C.M. 1:5(1 cement: 5 coarse sand).

2.0. Mode of measurements & payment: 2.1. The relevant specifications of item No. 7.67 (I) shall be followed.

2.2. The rate shall be for a unit of one cubic metre.

7.6. (III) Uncoarsed rubble masonry with hard stone of approved quality in foundation and plinth in lime mortar 1 : 1.5 (1 lime putty: 1.5 coarse sand) including levelling etc. complete.

1.0. Materials : Lime mortar shall conform to M-10. The rubble shall conform to M-16.

2.0. Workmanship : The relevant specifications of item No. 7.6 (I) shall be followed.

3.0. Mode of measurements & payment:

3.1. The relevant specifications of item No. 7.6 (I) shall be followed.

3.2. The rate shall be for a unit of one cubic metre.

7.17. (A) Coarscd rubble masonry with hard stone of approved quality in foundation and plinth in cement mortar 1 : 6 (1 cement: 6 coarse sand) etc. complete.

1.0 Materials : 1 Cement mortar shall conform to M-l 1. The stone shall conform to M-16.

2.0 Workmanship :

2.1. Dressing Stone: The face stone shall be hammer dressed so as to give approximately rectangular blocks. They shall be squared on bed and side joints. The bed joints shall be rough chisel dressed for a depth of atleast 50 mm. back from the faces and the side joints shall be so dressed to a depth of atleast 40 mm. back from the face, such that no portion of the dressed surface is more than 10 mm. from a straight edge held against the surface. The remaining portions of surface shall not project above the chisel dressed bed and side joints. The bushing on the face shall not project by more than 40 mm. on an exposed face and 10 mm. on a face to be plastered. The hammer dressed stone shall also have a rough tooling for a minimum width of 25 mm. along the four edges of the face of the stone.

2.2. Laying: 2.2.1. All stones shall be wetted before laying. The wall shall be built up truly plumb (or to required batter where so specified).

All connected masonry in a structure shall normally be raised up uniformly and regularly. However if for any specific reasons one part of wall is required to be left behind, such wall shall be raked back at an angle not steeper than 45°. Vertical Toothed joints in masonry shall not be allowed. The work shall be carried up regularly and masonry on any day shall not be raised by more than 1 metre in height.

2.2.2. All the courses shall be laid truly horizontal. The height of course shall not be less than 150 mm. nor more than 300mm. Face stone shall be laid in alternate header and strecher Fashion.

They shy 11 be so arranged as to break joints by atleast 75 mm. Stones shall be laid with grains horizontal so that the load is

transmitted along the direction of their maximum crushing strength The depth of :«.one shall not be less than the height or breadth. The breadth of a face stone shall also be not less than 150mm. Each face stone shall be of the same height in any given course. The courses shall be built in perpendicular to the pressure which the masonry will bear. In case of battered walls (such as retaining walls) the beds of the stone and the plane of courses shall be laid with their bed prependicular to the battered face.

2.2.3. The hearting or the interior filling of the wail shall consist of flat bedded stone carefully laid on their proper beds in mortar, chips and spawls of stone being used where necessary to avoid excessive use of mortar, care being taken to sec that no hollow space is left any where in the masonry. Chips shall not be used below the hearting stone to bring these upto the level of stones. The use of chips shall be restricted to be, filling of interstices between the hearting stone but the volume of chips shall be limited to 15% of the total volume of the masonry for masonry.

2.3. Bond Stones: The relevant specifications of item No. 7.6. (I) para 2.6. shall be followed except that the hard stone shall be provided for atleast 1.8 m. length of every course.

2.4. Quoins: The quoins, which shall be of the same height as the course to which it belongs shall be formed from elected stone of atleast 400 mm. length. They shall be laid square or beds as stretcher and headers alternatively. The beds shall be rough, chisel dressed to a depth of atleast 100 mm. These stones shall have a minimum uniform chisel drafts of 25 mm. width at four edges. All the edges being in the same plane, quoins stone shall not be smaller than 0.025 cum. in volume and it shall also be not less than 300 mm. in length, 25% of them being not less 500 mm. in length.

2.5. Joints : All the bed joints shall be horizontal and all sides joints shall be vertical. Face joints shall not be more than 10 mm. thick. All joints shall be properly and completely filled with mortar. On cases where no plastering or pointing is required to be done the joint shall be struck flush and finished simultaneously while laying stones. In other cases the joint shall be raked to a minimum depth of 20 mm. by raking tools during the progress of work while the mortar is still green.

2.6. Curing: The relevant specifications of item No. 7.6. (I) para 2.9. shall be followed.

3.0. Mode of measurements & payment:

3.1. The relevant specifications of item No. 7.6(I) shall be followed.

3.2. The rate shall be for a unit of one cubic metre.

7.17. (B) Coarsed rubble masonry with stone of approved quality in foundations and plinth in cement mortar 1:5(1 cement : 5 coarse sand) etc. complete.

1.0. Materials & Workmanship: The relevant specifications of item No. 7.17 (A) shall be followed except that the proportion of cement mortar shall be C. M. 1: 5 (1 cement 1:5 coarse sand).

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item No. 7.17 (A) shall be followed.

2.2. The rate shall be for a unit of one cubic metre.

7.17. (C) Coarsed rubble masonry with stone of approved quality in foundation and plinth in CM. 1:4(1 cement: 4 coarse sand) etc. complete.

1.0. Materials & Workmanship : The relevant specifications of item No. 7.17 (A) shall be followed except that proportion of mortar shall be C. M. 1:4 (1 cement: 4 coarse sand).

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item No. 7.17 (A) shall be followed.

2.2. The rate shall be for a unit of one cubic metre.

7.17. (D) Courses rubble masonry with stone of approved quality in foundations and plinth in C. M. 1: 3 (1 cement: 3 coarse sand) etc. complete.

1.0. Materials & Workmanship : 1.1. The relevant specifications of item No.7.17 (A) shall be followed, except that the proportion of mortar shall be C.M. 1 : 3 (1 cement: 3 coarse sand).

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item No. 7.17 (A) shall be followed.

2.2. The rate shall be for a unit of one cubic metre.

7.19. (A) Coarsed rubble masonry with stone of approved quality for superstructure above plinth level upto floor two level in C.M. 1 :6 (1 cement 6 coarse sand) etc. complete.

1.0. Materials & Workmanship :

The relevant specifications of item No. 7.17 (A) shall be followed except that the coarsed rubble masonry work shall be carried out for superstructure above plinth level upto floor two level.

1.2. Single or double scaffolding may be used. The scaffolding shall be strong and SOUIK . In .case single scaffolding is used, the holes shall be carefully made good as directed.

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item No. 7.17 (A) shall be followed.

2.2. The rate shall be for a unit of one cubic metre.

7.75. Precast concrete block masonry (including quoin block, jamb block, closer etc. witJi solid concrete blocks of approved size made of cement concrete 1:3:6 Mix. (1 cement: 3 coarse sand: 6 graded stone aggregate of 20 mm. and down gauge) in foundation and plinth in cement mortar 1:6.

1.0 Materials : (a) Aggregate shall conform to M-12 (b) Sand shall conform to M-6. Cement shall conform to M-3.

1.1. The solid cement concrete block shall be precase with concrete of 1: 3 :6 mix (1 cement; 3 coarse sand: 6 graded stone aggregate).

1.2. A block shall be deemed to be solid if the solid material is not less than 75% of the trial volume of the block calculated from over all dimensions.

1.3. The concrete mix used for blocks shall not be richer than 1 part by volume of cement 3to 6-parts by volume of combined aggregate.

The actual size of the blocks shall be one of the following.

Size-A 39 x 30 x 19 cms. Size-B 39 x 20 x 19 cms. Size-C 39 x 10 x 19 cms.

The size other than those specified above may be used with the approval of Engineer-in-charge.

1.5. The blocks may be either machine made or hand made. The concrete mix, the mixii g of concrete, the manufacture of b socks, curing arid drying shall be in accordance with para-6 to 10 under I.S. 2185-1967.

1.6. Faces of blocks shall be flat and rectangular. Surface finish shall be rendered smooth or plastered with cement mortar 1: 3 (1 cement: 3 coarse sand).

1.7. The average compressive strength of eight blocks when determined in the manner described in I.S.: 2185 1967 shall not be less than 50 Kg/Sq. Cm. of gross area. The strength of lowest individual block shall not be less than 75 percent of average compressive strength of eight blocks.

1.8. Concrete blocks shall be stored and stacked properly in such a way as to avoid any contact with moisture at site. They snail be stock plied on planks or other supports free from contact with ground and covered to protect against wetting. Cement under mortar of-proportion 1 : 6 shall conform to M-l1.

2.0. Workmanship:

2.1. The blocks need not be wetted before or during laying in the walls. In case climatic conditions so required, the top and the sides of block may only be slightly moistured so as to prevent absorption of water from the mortar and ensure the development of required bond with mortar.

2.2. Operations of laying precast cement concrete block masonry shall be carried out in accordance with instructions detailed in I.S. 6042-1962. The mortar shall not be spread so much ahead of the actual laying of the units that it tends to stiffon and loose its plasticity, thereby resulting in poof bond. For most of the work; the joints, both horizontal and vertical shall be 10 mm. thick except in the case of extended Joint construction. The mortar joints shall be struck off flush with wall surface and when the mortar has started stiffening, it shall be compressed with rounded or U-shaped ool. The mortar shall be pressed against the units with a jointing tool after the mortar has stiffened in effect intimate contact between the mortar and the masonry it and obtained a weather tight joint.

2.3 Quoins & closers: Special quoins blocks (with a return face equal to half the length of normal face) shall be cast for all building blocks and slabs for external work. Proper half length closers shall be cast and rot cut from full size blocks. The returned ends of blocks for door and windows reveals and quoins shall be finished with a fair face in the mould.

2.4. Only double scaffolding shall be used, The scaffolding shall be strong and sound. No holes in the masonry for supporting shall be allowed.

2.5. Curing: The curing of concrete block masonry shall be carried out for 7 days.

3.0. Mode of measurements & payment:

3.1. The relevant specifications of item No. 7.6 (I) shall be followed.

3.2. The work of concrete block masonry in foundation and plinth shall be measured under this item.

3.3. The rate shall be for a unit of one cubic metre.

7.82.(A) Percast concrete block masonry in partition walls 10 cms. thick with solid block of approved size (including quoins, blocks, jamb blocks, clossers etc.) made of C.C. 1:3:6(1 cement; 3 coarse sand; 6 graded stone aggregates 20 mm. and down guage) in C.M. 1:4.

1.0 Materials: The relevant specifications of item No. 7.75 shall be followed except that the precast concrete blocks shall be size suitable for 10 cms: size partition wall i.e. size 'C' and the proportions of cement mortar shall be in cement mortar 1 : 4 (1 cement: 4 coarse sand).

2.0 Workmanship: The relevant specifications of item No. 7.75 shall be followed except that the work shall be for precast concrete block partition walls of 10 cms. thickness.

3.0. Mode of measurements & payment:

3.1. The relevant specifications of item No. 7.75 shall be followed.

3.2. The rate shall be for a unit of one Sq. metre.

7.0.0. White stone bela masonry block in coarse in superstructure with stone of approved quality in lime mortar 1 : 1.5 (1 Lime Putty: 1.5 fine sand) including raking out joints etc, complete.

1.0 Materials : The stone or beta shall be white hard sand stone bela or block. The stone shall be sound hard rough and durable. It shall be free from sking. Thickness of bela or block shall not be less than 15 cms. or as directed. The mortar used shall consist one part of lime putty and 1.5 parts of find sand Lime mortar shall conform to M-10.

2.0. Workmanship:

2.1. Dressing of stone: Stone shall be chiselled dressed on all the sides so that all six side shall be in a rectangular shape and all the stones shall be so dressed that the bushing of the exposed face shall not project nor depressioned from the general wall surfaces. The size of bela or block shall be as per thickness of the wall to be constructed or as directed.

2.2. Laying: All the stone shall be sufficiently wetted before laying to prevent absorptionof water from mortar. All connected walls in a structure shall normally be raised up uniformly and regularly. The vertical joint shall not be allowed and also it shall not be more than 12 mm. in thickness.

2.3. Proper bonding shall be made by laying bela or block side by side each other with lime mortar on bed as well as in between two bela or block vertically.

2.4. Bond stones: Bond stones or through stones running right across the thickness of the wall shall be provided in walls upto 450 mm. thick. In thicker walls[1] two bellas or blocks over laying each other by atleast 150 mm. each other shall be provided across the thickness of the wall to form bond stone, such bond stone shall be atleast one for every 10 Sq. nit, area of the wall surface.

2.5. Joints : All the joints shall be completely filled up with mortar and their thickness shall not exceed by 12 mm. When plastering or pointing is not required to be done, the joints shall be struck flush and finished, simultaneously while laying the stone. Otherwise the joints shall be racked to a minimum depth of 20 mm. during process of laying while mortar is still green.

2.6. Scaffolding : Single or double scaffolding shall be used. It shall be strong and sound. The holes left in masonry for supporting shall be made good before plastering.

2.7. Curring: Green work shall be cured for a period of 7 days continuously.

3.0. Mode of measurements & payment:

3.1. The work shall be measured on the basis of finish dimensions. No deduction shall be made nor extra payment shall be made for the following:

(a) Ends of joints, beams, posts, girders, rafters, purlins, truses, corbels, etc. each upto 500 Sq. cms. in section (b) Opening each upto 0.10 Sq. M. (c) Small plates and bed plates, bearing of chhajas and like upto 10 cms. depth (bearing or floor and roof slabs shall be deducted from masonry), (d) Drain holes and recesses for cement blocks to embedded holdfasts for doors and windows etc.

3.2. The rate shall be for a unit of one cubic metre.

7.0.0.2. White stone bela masonry work in partition wall upto 15 cms. thickness in C.M. 1:4(1 cement: 4 coarse sand).

1.0 Materials & Workmanship : The relevant specifications of item No. 7.0.0.1 as .above shall be followed except that the proportion of mortar shall be C.M. 1:4(1 cement: 4 coarse sand)

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item No. 7.6. (I) shall be followed.

2.2. The rate shall be for a unit of one Sq. metre.

7.0.0.3. While stone bela masonry block in coarse in superstructure with stone of approved quality in C.M. 1:5(1 cement : 5 coarse sand) including raking to joints etc. complete.

1.0. Materials & Workmanship : The relevant specifications of item No. 7.0.0.1. as above, shall be followed except that the proportion of cement mortar shall he. in C. M. 1: 5 (1 Cement: 5 coarse sand).

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item No. 7.6. (I) shall be followed.

2.2. The rate shall be for a unit of one cubic metre.

7.0.0.4. White stone bela masonry block in coarse in superstructure with stone of approved duality in C.M. 1:6(1 cement; 6 coarse sand) including raking the joints etc. complete.

1.0. Materials & Workmanship: The relevant specifications of item No. 7.0.0.1. shall be followed except that the proportion of cement mortar shall be 1:6(1 cement: 6 coarse sand).

2.0. Mode of measurements & payment:

2.1 The relevant specifications of item No. 7.6. (I) shall be followed.

2.2. The rate shall be for a unit of one cubic metre.

SECTION - 9

DETAILED SPECIFICATIONS - CENTERING & FORM WORK

9.1. (A) Providing form work of ordinary timber planking so as to give a rough finish including centering shuttering, strutting and propping etc. height of propping and centering below supporting floor to celling not exceeding 4 m. and removal of the same for in site reinforced concrete and plain concrete work in foundations, footing, bases of columns, and mass concrete.

1.0. Materials:

1.1. The shuttering to be provided shall be of ordinary timber planks and shall conform to M-26.

1.2. The dimensions of scantlings and battens shall conform to the design. The strength of the wood shall not be less than that assumed in the design.

2.0. Workmanship : 2.1. The form work shall conform to the shapee lines and dimension as shown on the plans and be so constructed as to remain sufficiently rigid during the placing and compacting of the concrete. Adequate arrangements shall be made by the contractor to safe-guard against any settlement of the form work during the course of concretting and after concreting. The form work of shuttering, centering, scaffolding bracing etc. shall be as per design.

2.2. Cleaning & Treatment of forms: 2.2.1. All rubbish, particularly chippings shaving and saw dust shall be removed from the interior of the form before the concrete is placed and the form work in contact with concrete shall be cleaned and thoroughly welted or treated. The surface shall be then coaled with soap solution applied before concreting is done. Soap solution for the purpose shall be prepared by dissolving yellow soap in water to get consistency of paint. Alternatively a coat of raw linseed oil or form oil of approved manufacture may be applied in case steel shuttering is used. Soap solution or raw linseed oil shall be applied after thoroughly cleaning the surface. Care shall be taken that the coaling does not gel on construction joint surface and reinforcement bars.

2.3. Stripping time : 2.3.1. In normal circumstances and where ordinary cement is used forms may be struck after expiry of following periods.:

(a) Sikes of walls columns and vertical faces of beam - 24 to 48 hours.

(b) Beam soffits. (Props left under) - 7 days.

(c) Removal of props slabs

(i) Slabs spanning upto 4.5 m. - 7 days (ii) Spanning over 4.S mm. -14 days.

(d) Removal of props to beams and Arches

(i) Spanning upto 6m.-14 days. (ii) Spanning over 6 m. - 2 days.

2.4. Procedure when removing the form work : 2.4.1. All form work shall be removed without such shock or vibrations as would damage the reinforced concrete surface. Before the soffit form work and struts arc removed, the soffits and the concrete surface shall be exposed where necessary in order to ascertain that the concrete has sufficiently hardened.

2.5. Centering : 2.5.1. The centering to be provided shall be got approved. It shall be sufficiently strong to ensure absolute safetly of the form work and concrete work before, during and after pouring concrete. Watch should be kept to see that behaviour of centering and form work is satisfactory during concreting. Erection should also be such that it would allow removal of forms in proper sequence without damaging either the concrete or the forms to be removed.

2.5.2. The props of centering sha!l be provided on firm foundation or base of sufficient strength to carry the loads without any settlement.

2.5.3. The centering and form work shall be inspected and approved by the Engineer- in-charge before concreting. But this will not relieve the contractor of his responsibility for strength, adequacy and safety of form work and centering. If there is a failure of form work or centering, contractor shall be responsible for the damages to the work, injury to life and damage to property.

2.6. Scaffolding:

2.6.1. All scaffolding, hoisting arrangements and ladders etc. required for the facilitating of concreting shall be provided and removed on completion work by contractor at his own expense. The scaffolding, hoisting arrangements and ladders etc. shall be strong enough to withstand all live, dead and impact loads expected to act and shall be subject to the approval of the Engineer-in-charge. However, contractor shall be solely responsible for the safely of the scaffolding, hoisting arrangement, ladders, work and workman etc.

2.6.2. The scaffolding, hoisting arrangements and ladders shall allow easy approach to the work spot and afford easy inspection.

2.6.3. The rate is applicable to all conditions of working and height uplo 4 mts. The rate shall include the cost of materials and labour for various operations involved such as :

(a) Splayed edges, notching, allowance for operlaps and passing at angles, battens centering, shuttering, strutting, propping bolting, nailing, wedging, easing, striking and removal.

(b) Filleting to form stop chamferred edges or splayed external angles not exceeding 20 mm. width to beams, columns and the like.

(c) Temporary openings in the forms for pouring concrete, if required, removing rubbish etc.

(d) Dressing with oil to prevent adhesion of concrete with shuttering and

(e) Raking or circular culling.

2.7. Re-Use : 2.7.1. Before-re-use, all forms shall be inspected by Engineer-in-charge and their suitability ascertained. The forms shall be scarred, cleaned, and joints gone over, repaired where required. Inside surface shall be retreated to prevent adhesion of concrete.

3.0. Mode of measurements & payment:

3.1. Form work shall be measured as the area in square meters of shuttering in contract with concrete except in the case of inclined member and portion of curved pro-file and upper side in which case only area of underside shall be measured for payment.

3.4. Form work to secondary beams shall be measured up to the sides of main beams but no deduction shall be made from the form work of the main beam at the inter section point. No deduction shall be made from the form work of a column at inter section of beams.

3.5. The rate is for the completed item.

3.6. The rate shall be for a unit of one Sq. metre.

9.1. (A) (I) Extra for providing form work of ordinary timber planking so as to give a rough finish including centering, shuttering, strutting and propping etc. height of propping and centering below supporting floor to ceiling in between 4m. to 5 m. and removal of the same ofr in situ reinforced or plain concrete work in foundation, footings, bases of columns etc. and mass concrete.

1.0. Materials & Workmanship : 1.1. The relevant specifications of item No. 9.1. (A) shall be followed except that the height of propping and centering below supporting floe- to ceiling exccoding-4 m. but not exceeding 5 m.

2.9. Mode of measurements & payment: 2.1. The payment shall be made extra over and above the payment made upto 4 mt. height. The relevant specifications of tern 9.1 (A) shall be followed. The rate shall be for a unit of one Sq. metre.

9.1. (B) (I) Providing form work of ordinary timber planking so as to give a rough finish including centering shuttering, of strutting, and propping etc. height of propping and centering below supporting floor to ceiling not exceeding 4 m. and removal of the same for in-site reinforced and plain concrete work in flat surface such as soffits of slabs, landing and the like floors etc. upt 200 mm. in thickness.

1.0 Materials & Workmanship: 1.1. The relevant specifications of item No. 9.1. (A) shall be followed except that the work is to be carried out for flat surface such as soffits of slabs, landings and the like for floors etc. upto 200 mm, in thickness.

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item No. 9.1. (A) shall be followed.

2.2. The rate shall be for a unit of one Sq. metre.

9.1. (B)(II) Providing form work of ordinary timber planking so as to give a rough finish including centering, shuttering, 8 rutting and propping etc. height or propping and centtering below supporting floor to ceiling not exceeding 4 m. and removal of the same for in-situ reinforced and plain concrete work in flat surfaces such as sofits of slabs, landings and the like floors etc. above 200 mm. in thickness.

1.0. Materials & Workmanship : 1.1. Relevant specifications of item No. 9.1. (A) shall be followed except that the work is for floors etc. above 200 mm. in thickness.

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item No. 9.1. (A) shall be followed.

2.2. The rate shall be for a unit of one Sq. metre

9.1. (C) Providing form work of ordinary timber plankings so to give a rough finish including centering, shuttering strutting and propping etc. height of propping and centering below supporting floor to ceiling not exceeding 4 m. and removal of the same for in-situ reinforced concrete and plain concrete work in vertical surfaces such as walls (any thickness) partitions.

1.0. Materials & Workmanship : The relevant specifications of item No. 9.1. (A) shall be followed except that the form work shall be carried out for vertical surfaces such as walls of any thickness, partitions etc.

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item No. 9.1 .(A) shall be followed.

2.2. The rate shall be for a unit of one Sq. metre.

9.1. (G) (i) Providing form work of ordinary timber planking-so as to give a rough finish including centering, shuttering, uniting and propping etc. height or propping and centering below supporting floor to ceiling not exceeding 4 m. and removal of the same for in-situ reinforced and plain concrete work in columns, pillars posts, and struts, square rectangular, polygonal in plan.

1.0. Materials & Workmanship: 1.1. The relevant specifications of item No. 9.1. (A) shall be followed except that the works for columns, pillars, posts and struts square, rectangular, polygonal in plan.

2.0. Mode of measurements & payment.:

2.1. The relevant specifications of item No, 9.1. (A) shall be followed.

2.2. The rate shall be for a unit of one Square metre.

9.1.(H) (1) Providing form work of ordinary timber planking so as to give a rough finish including centering, shuttering, strutting and propping etc. height of propping and centering below supporting floor to ceiling not exceeding 4 m. and removal of the same for in-situ reinforced and plain concrete work in side and soffits of beams, beam haunchings, cantilevers, girders bressumers and lintels not exceeding 1 M. in depth.

1.0 Mode of measurements & payment:

1.1. The relevant specifications of item No. 9.1. (A) shall be followed.

1.2. The rate shall be for a unit of one Sq. metre.

9.1.(H) (2)Providing form work of ordinary timber planking so as to give a rough finish including centering, shuttering, strutting and propping etc. Height of propping and centering below supporting floor to ceiling not exceeding 4 m. and removal of the same for in-situ reinforced and plain concrete work insides and soffits of beam, haunchings cantilevers, girders, bressumers and lintels exceeding 1 M. in depth.

1.0. Materials & Workmanship: 1.1. The relevant specifications of item No. 9.1. (A) shall be followed except that the work is for side and soffits of beams, beams haunchings, cantilevers, girders, bressumers, and lintels exceeding 1 M. in depth.

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item No. 9.1. (A) shall be followed, except that the work is for side and soffits of team, beam haunchings, cantilevers, girders, bressumers, and lintels, exceeding 1 M. in depth.

2.2. The rate shall be for a unit of one Sq. metre.

9.1. (I) (i) Providing form work of ordinary limber planking so as to give a rough finish including centering, shuttering, strutting, and propping etc. height of propping and centering below supporting floor to ceiling not exceeding 4 M. and removal of the same for in-situ reinforced and plain concrete work in edges of slabs and breaks in floor and walls.

1.0. Materials & Workmanship: 1.1. The relevant specifications of item No. 9.1. (A) shall be followed except that the work is for edges of slabs and breaks in floors and walls.

2.0. Mode of measurements & payment:

2.1. The length and breadth shall be measured nearest to one Cm.

2.2. The rate shall be for a unit of one Sq. metre.

9.1.(J). Providing form work of ordinary timber planking so as to give a rough finish including centering, shuttering, strutting, and propping etc., height of propping and centering below supporting floor to ceiling not exceeding 4 M. and removal of the same for in-situ reinforced and plain concrete work in edges of slabs and breaks in floor and walls.

1.0. Materials & Workmanship: 1.1. The relevant specifications of item No. 9.1. (A) shall be followed except that the work is for edges of slabs and breaks in floors and walls.

2.0. Mode of measurements & payment:

2.1. The length and breadth shall be measured nearest to one Cm.

2.2. The rate shall be for a unit of one Sq. metre.

9.1. (K) Providing from work of ordinary timber planking so as to give a rough finish including centering, shuttering, strutting, and propping etc., height of propping and centering below supporting floor to ceiling not exceeding 4 M. and removal of the same for in-situ reinforced and plain concrete in small surfaces such as cantilevers ends, brackets, and ends of the steps, caps, and bases to pilasters and columns and the like.

1.0. Materials & Workmanship: 1.1. The relevant specifications of item No. 9.1. (A) shall be followed except that the work is for small surface such as cantilever ends, brackets and ends of steps, caps, and bases to pilasters and columns and the like.

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item No. 9.1. (A) shall be followed.

2.2. The rate shall be unit of one Sq. metre.

9.1.(L) Providing form work of ordinary timber planking so as to give a rough finish including centering, shuttering, strutting, and propping etc., height of propping and centering below supporting floor to ceiling not exceeding 4 M. and removal of the same for in-situ reinforced and plain concrete in chullah hoods, weather sheds, chhajas carbels etc. including edges.

1.0. Materials & Workmanship: 1.1. The relevant specifications of item No. 9.1. (A) shall be followed except that the work is for chullah hoops, weather-sheds, chhajas, carbels etc. including edges of the same.

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item No. 9.1. (A) shall be followed.

2.2. The rate shall be for a unit of one Sq. metre.

9.1.(M) Providing form work of ordinary timber planking so as to give a rough finish including centering, shuttering, strutting, propping etc. height of propping and centering below supporting floor to ceiling not exceeding 4 M. and removal of the same for in-situ reinforced and plain concrete work in staircase with slopping or stepped soffits including risers and stringers excluding landing.

1.0. Materials & Workmanship: 1.1. The relevant specifications of item No. 9.1. (A) shall be followed except that the work is for staircases, with slopping or stepped soffits including risers and stringers excluding landing.

2.0. Mode of measurement & payments:

2.1. The relevant specifications of item No. 9.1. (A) shall be followed.

2.2. The rate shall be for a unit of one Sq. metre.

9.1.(Q) Providing form work of ordinary timber planking so as lo give a rough finish including centering, shuttering, strutting, and propping etc. height of propping and centering below supporting floor to ceiling not exceeding 4 M. and removal of the same for in-situ reinforced and plain-concrete work in vertical fins and vertical sun breakers.

1.0. Materials & Workmanship : 1.1. The relevant specifications of item No. 9.1. (A) shall be followed except the work is for vertical fins and vertical sun breakers.

2.0 Mode of measurements & payment:

2.1. The relevant specifications of item No. 9.1. (A) shall be followed.

2.2. The rate shall be for a unit of one Sq. metre.

9.2. Extra for providing form of work with sheathing of steel sheets so as to give a fair finish in

(A) Foundation, footings, base of columns etc. and mass concrete.

(B) Flat surfaces such as soffits of slab, landing and the like.

(i) Floors etc. upto 200 mm. in thickness.

(ii) Floor etc. above 200 mm. in thickness.

(C) Vertical surfaces such as walls (Any thickness), partitions.

(D) Columns, pillars, posts and struts,

1. Square, rectangular, breassumers, and lintels not exceeding 1 mm. depth.

2. Sides and offits of beams, beam haunchings, cantilevers, girders, breassumers and lintels exceeding 1 mm. in depth.

(I) Edges of slabs, and breaks in floors and walls.

(K) Small surface such as cantilever ends, brackets, and ends of steps, caps and bases to pillars and columns including edges.

(L) Chollar woods wheather sheds, chhajjas, coroeds etc. and the like.

(M) Stair cases with sloping or steeped soffits, including risers, skingers, excluding landing.

(Q) Vertical fins and vertical sun breakers.

1.0. Materials & Workmanship : 1.1. The relevant specifications of item No. 9.1. (A) to(Q) shall be followed except that the extra rate shall be paid for using sheathing of steel sheets, and plates of steel or plywood instead of ordinary timber plank, to obtain a desired smooth exposed finish of surface. The surface shall be presentable without further treatment.

2.0. Mode of measurements & payment:

2.1. The measurement of form work shall be taken for the form work done with steel sheathing, extra over and above the rate of form work of the respective item of form work done. The relevant specification of respective item No. 1. A to Q shall be followed.

2.2. The rate shall be for a unit of one Sq. metre.

SECTION-10

DETAILED SPECIFICATIONS – MASONARY WORK

10.1. (A) Providing wood work in frames of doors, windows clerestory windows and other similar work, wrought, framed and fixed in position, Indian Teak wood.

1.0 Materials : Wood in frames shall conform to M-29.

2.0. Workmanship : 2.1. The item covers the requirement of frames for doors, windows, clerestory windows their supply and fixing.

2.2. Frames: 2.2.1. All members of the frames shall be exactly at right angles. The right angle shall be checked from inside surface of the respective members.

2.2.2. All members of frames shall straight without any warp or bow and shall have smooth surface well planed on the three sides exposed at right angles to each other. The surface touching the wall may not be planed unless it is required in order to straighten up the member or to obtain the overall size, within the tolerances specified.

2.2.3. Frame shall have dovetail joints. When clerestory windows are included, it shall be provided by having full length one piece post for door or windows and clerestory window extending the frame on top at the head to the required extent. Homs shall not be provided in the head of the frame. When no sills arc provided, the vertical posts of the frame in the ground floor shall be embedded in the sill masonry for 10 cm. on upper floors, the vertical posts shall be fixed in the floor or masonry by

forming notches 10 mm. deep. Slight adjustment or spacing as necessary shall be done to have the hold fasts in the joints of masonry course. The frame shall be erected in position and held plumb with strong support from both sides and built in masonry as it is being built. The transom shall be through tenoned into the mortices of the jamb post to the full width of the jamb post and the thickness of the tenon shall be not less than 15 mm.

2.3. Tolerance : Unless specially mentioned otherwise tolerance of ± 1.5 mm. shall be allowed for each wrought face.

2.4. The tenons shall be closely fitting into the mortices and suitably pinned with wood dowels not less than 10 mm. dia. metre. The depth of rebates for housing the shutter shall be as shown in the detailed drawing or as directed.

2.5. The contact surface of tenon and mortice shall be treated before putting together with an adhesive of approved make.

2.6. Minimum number of three hold-fasts shall be fixed on each side of door and windows frames, one at the centre point and the other two at 30 cm. from the top and the bottom of the frames. In case of windows and ventilators frames whose height is less I M. two hold-fasts, on each side shall be fixed at quarter points of the frames. The size of each hold-fast shall be 300 x 25 x 6 mm. and of mild-steel with split end. The hold-fast shall be fixed with screws to frames.

2.7. Mild steel hold fasts shall be protected with a coating of coal asphalt tar. The surface of frame abutting the masonry or concrete faces shall be properly treated by applying a coat of approved coaling.

3.0. Mode of measurements & payment:

3.1. The linear dimensions shall be measured correct up to 1 cm. The quantity shall be worked out correct to 2 places of decimals of a cu. m.

3.2. The rate shall be for a unit of 10 cu. diameter.

10.4. (A) Providing wood work in trusses, purlins, rafters, posts, post plates, wall plates, and like wrought, framed, hoisted and fixed in position, Indian teak wood.

1.0. Materials: The teak wood shall conform to M-29.

2.0. Workmanship:

2.1. The relevant specifications of item No. 10.1. (A) shall be followed except that the wood work shall be carried out in trusses, purlins, rafters, posts, post plates, wall plates and like wrought framed.

2.2. The work shall be carried oat as per detailed drawings supplied by the Departmental and as directed.

2.3. The length of each members shall be in one piece or as directed.

3.0. Mode of measurements & payment: The length, breadth and depth shall be measured nearest to 1 cm. of unfinished member.

The rate shall be for a unit of 10 cubic decimetre.

10.5. (A) Providing wood work in frames of false ceiling, partition etc. swan and put up in position - Indian teak wood.

1.0. Materials: The teak wood shall conform to M-29.

2.0. Workmanship: The relevant specifications of item No. 10.1. (A) shall be followed except that the wood work shall be for false ceiling, partitions, etc. swan and put up in position.

3.0. Mode of measurements & payment:

3.1. The relevant specifications of item No. 10.1. (A) shall be followed.

3.2. The rate shall be for a unit of ten cubic decimetre.

10.12. (A)(I) Providing and fixing 35 mm. thick fully panelled shutters for doors, windows, and clerestory windows including anodised aluminium butt hinges with necessary screws, Indian Teak Wood.

1. Materials:

1.1. Wood for shutter shall conform to M-29. (2) Glass shall conform to M-28. (3) Anodised aluminium butt hings shall conform to M-43.

2.0 Workmanship: The item covers the requirement of preparation of shutters for doors, windows, clerestory windows, their supply and fixing.

2.2. Shutters:

2.2.1. Panelled shutters shall be constructed in the form of timber frame work of styles and rails with panel inserted of type as specified in the detailed drawings. Panel shall be fixed by providing grooves in the style and rails. The styles and rails shall be joined to each other by mortise and tenon joints at right angles.

2.2.2. All members of the shutters shall be straight without any warp or bow and shall have smooth, well planed faces at right

angles to each other.

2.2.3. The size of styles and rails shall be as per drawing or as directed. Styles and rails of shutters shall be made of one piece only.

2.3. Timber panelling:

2.3.1 Thickness of the panel shall be as specified in the item as shown in the drawing or as directed. If the panel is made from more than one piece, the pieces shall be finished as shown inthe detailed drawings and shall be joined with continuous groove with specified size. The end pieces of the panel and the top and bottom of the panel shall be provided with continuous tongue to frame into groove of the frame shutter. An air space of 1.5 mm. shall be left in the groove of frame shutter while fixing the panel in it.

2.3.2 The faces of the panel as well as various pieces of the panel shall be closely filled to the sizes of the grooves.

2.3.3. Finishings of the corners of raised panel edges shall be done as shown in drawings or as directed.

2.5. Fixtures & Fastenings: 2.5.1. The rate shall include anodised aluminium butt hinges including fixing with iron screws. The size and number of hinges shall be as per table given in annexure-1.

3.0. Mode of measurements & payment:

3.1. The rate for shutter includes cost of providing block and clear for keeping the shutter in open position as directed.

3.2. The dimensions of the shutter shall be measured clear size of the shutter in close position between the grooves of the frame.

3.3. The rate shall be for a unit of one sq. metre.

10.12. (A)(II) Providing and fixing 35 mm. thick fully glazed shutters for doors, windows and clerestory windows including anodised aluminium butt hinges with necessary streces, Indian teak wood.

1.0. Materials : Teak wood shall conform to M-29. Glass shall conform to M-38. Anodised aluminium butt hinges shall conform to M-43.

2.0. Workmanship : 2.1. The relevant specifications of item No. 10.12(A) I shall be followed except that the 35 mm. thick shutters fully glazed for doors, windows and clerelstory windows including aluminium butt hinges with necessary screws.

2.2. Glazing:

2.2.1. The glass panels shall be embodied in putty and secured to the rebate by wooden beads or mouldings shape and size as approved with counter sunk screws of suitable size.

2.2.2. The glass pane) shall be properly cut to fit the rebates of the frames and sashes fully with a light minus margin of about 1.5. mm. on all sides. Before glazing, the frame shall be primed and prepared for painting so that wood may not draw oil out of putty.

The rebate shall be putted to an extent to provide bedding all round the glass.

2.2.3. The glass shall then be bedded in putty and fitted to frames with wooden beads or mouldings as directed and secured with counter sunk screw. The screw shall be spaced not more than 100 mm. from each corner and not more than 200 mm. apart.

2.2.4. The size of the rebate in the frame and size and shape of beads or moulding shall be as per detailed drawings or as directed. The beds or. mouldings shall have mitred corners.

3.0. Mode of measurements & payment:

3.1. The relevant specifications of item No. 10.12.(A)(I) shall be followed.

3.2. The rate shall be for a unit of one sq. metre.

10.12 (A)(III) Providing and fixing 35 mm. thick partly panelled and partly glazed shutters, or doors, windows including anodized aluminium butt hings with necessary screws, Indian teak wood.

1.0. Materials : Teak wood shall conform to M-29 Glass shall conform to M-38. Anodised aluminium butt hinges shall conform to M-43.

2.0. Workmanship: The relevant specifications of item No. 10.12. (A)(I) and 10.12 (A)(II) shall be followed except that the 35 mm. thick shutters shall be partly panelled and partly glazed for door windows clerestory windows etc. as per drawings.

3.0. Mode of measurements & payment:

3.1. The relevant specifications of item No. 10.12. (A)(I) shall be followed.

3.2. The rate shall be for a unit of one sq. mene.

10.13.(A)(I): Providing and fixing 35mm. thick fully panelled, shutters for doors, windows and clerestory windows including black enamelled M.S. Butt hinges with necessary screws. Indian Teak Wood.

1.0. Materials & Workmanship: 1.1. Relevant specifications of item No. 10.12 (A) shall be followed except that the hinges shall be of black enamelled M.S. Butt type hinges. The hinges, bolts, and other items of iron-mongery with moving parts shall be properly oiled by the contractor before handing over the building.

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item No. 10.12 (A) I shall be followed.

2.2. The rate shall be for a unit .of one sq. metre.

10.13. (A)(II) Providing and fixing 35 mm. thick fully glazed shutters for doors windown and clerestory windows including black enamelled M.S. Butt hinges with necessary screws. Indian Teak wood.

1.0. Materials & Workmanship: The relevant specifications of item No. 10.12 (A) I shall be followed except that the hinges shall be of black enamelled M.S. Butt hinges, bolts and other items of ironmongery with moving parts shall be properly oiled by the contractor before handling over the building.

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item No. 10.12 (A) (I) shall be followed.

2.2. The rate shall be for a unit of one sq. metre.

10.13. (A)(III) Providing and fixing 35 mm. thick partly panelled and partly glazed shutters for doors windows and clerestory windows including black enamelled M.S. Butt hinges with necessary screws, Indian Teak Wood.

1.0 Materials of Workmanship: The relevant specifications of item No. 10.12 (A) II shall be followed except that the hinges shall be black enamelled M.S. butt type hinges. The hinges, bolts and other items of Ironmongery with moving parts shall be properly oild by the contractor before handing over the building.

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item No. 10.12 (A) (I) shall be followed.

2.2. The rate shall be for a unit of one Sq. metre.

10.15. (A)(I) Providing and fixing 25 mm. thick fully panelled, shutters for cup-boards etc. including anodised aluminium butt hinges with necessary screws Indian Teak Wood.

1.0. Materials : First class Indian teak wood for shutters shall conform to M-29. Glass shall conform to M-38. Anodised aluminium butt hinges shall conform to M-43.

2.0. Workmanship : 2.1. The relevant specifications of item No. 10.12 (A) (I) shall apply except that the thickness of shutter shall be 25 mm. for cup-boards.

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item No. 10.12 (A) (I) shall be followed.

2.2. The rate shall be for a unit of one sq. metre.

10.15. (A)(II) Providing and fixing 25 mm. thick fully panelled shutters for cup-boards etc. including anodiswed aluminium butt hings with necessary screws. Indian teak wood.

1.0. Materials & Workmanship: The relevant specifications of item No. 10.12 (A) (II) shall apply except that the thickness of shutters shall be 25 mm. thick and fully glazed for cupboards.

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item No. 10.12 (A) (I) shall be followed.

2.2. The rate shall be for a unit of one sq. metre.

10.15. (A)(III) Providing and fixing 25 mm. thick partly panelled and partly glazed shutters for cup-boards etc. including anodised aluminium butt hinges with necessary screws, Indian Teak Wood.

1.0. Materials & Workmanship : The relevant specifications of item No. 10.12 (A) (I) and 10.12 (A) (II) shall be followed except that the thickness of shutters shall be 25 mm. thick and partly panelled and partly glazed shutters as per drawing for cub-boards.

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item No. 10.12 (A) (I) shall be followed.

2.2. The rate shall be for a unit of one sq. metre.

10.16. (A)(I) Providing and fixing 25 mm. thick fully panelled shutters for cup-boards etc. including black enamelled M.S. Butt hinges with necessary screws, Indian Teak Wood.

1.0. Materials & Workmanship: 1.1. The relevant specifications of item No. 10.12 (A) (I) shall apply except that the wood for shutters shall be Indian teak wood and .black enamelled M.S. Butt hinges arc to be used instead of anodised aluminium bull hinges and thickness of shutter shall be 25 mm.

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item No. 10.12 (A) (I) shall be followed.

2.2. The rate shall be for a unit of one sq. metre

10.16. (A)(II) Providing and fixing 25 mm. thick fully glazed shutters for a cup-boards etc. including black enamelled M.S. bull hinges with necessary screws. Indian Teak wood.

1.0. Materials & Workmanship : The relevant specifications of item No. 10.15 (A) (II) shall be followed except that the fully glazed shutters of 25 mm. thickness shall be of Indian teak wood and fixed in position with black enamelled butt hinges for cup-boards.

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item No. 10.12 (A) (I) shall be followed.

2.2. The rate shall be for a unit of one sq. metre.

10.16. (A)(III) Providing and fixing 25 mm. thick partly panelled and partly glazed shutters for cup-boards including black enamelled M.S. butt hinges with necessary screws. Indian Teak Wood.

1.0. Materials & Workmanship : The relevant specifications of item No. 10.15 (A) (I) & 10.15 (A)(II) shall be followed except that the shutters shall be partly panelled and partly glazed of 25 mm. thickness of Indian Teak wood fixed with black enamelled butt hinges for cup-boards.

2.0. Mode of measurements & payment:

2.1 The relevant specifications of item No. 10.12 (A) (I) shall be followed.

2.2. The rate shall be for a unit of one sq. metre.

10.23. Providing and fixing 35 mm. thick panelled glazed or panelled and glazed shutters for doors, windows and clerestory windows, including anodised aluminium butt hinges with necessary screws. Indian Teak wood shutters with (A) Plywood, (B) Particle Board (C) Hard Board, (D) Asbestos sheet panels.

1.0. Materials: Indian teak wood for shutters shall conform to M-29. Glass shall conform to M-38.

(A) Plywood shall conform to M-37.

(B) Particle board shall conform to M-40. Anodised aluminium bull hinges shall conform to M-43.

(C) Hard board shall of best quality and shall be as approved by Engineer-in-charge.

(D) A.C. sheet shall conform to M-24.

2.0. Workmanship:

2.1. The relevant specifications of item No. 10.12 (A) (I) shall apply to this item except that the work is shuttered with (A) plywood (B) partical board (C) hard board panels (D) A.C. sheets panels as specified in item.

2.2. The shutters shall be prepared by fitting styles and rails (lop, bottom, lock and frieze) as for panelled leaves with simple chamfer on edges only. The styles and rails shall be grooved with just sufficient width for received panels and plain panels of specified type panels shall be filled into the grooves.

3.0. Mode of measurements & payment:

3.1. The relevant specifications of item No. 10.12 (A) (I) shall be followed.

3.2. The rate shall be for a unit of one sq. metre.

10.24. Providing and fixing 35 mm. thick panelled glazed or panelled and glazed shutters for doors, windows and clerestory windows includir-2 black enamelled M.T. bull hinges with necessary screws. Indian Teak Wood shutters with (A) Plywood (B) Particle board (C) Hard board (D) Asbestos sheet panels.

1.0. Materials & Workmanship: 1.1. The relevant specifications of item No. 10.23 shall be followed except that the hinges shall be of black enamelled M.S. Bull hinges instead of anodised aluminium butt hinges and shutter with (A) Plywood (B) Particle board (C) Hard board (D) Asbestos sheet panels as specified in item.

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item No. 10.12 (A) (I) shall be followed.

2.2. The rate shall be for a unit of one sq. metre.

10.30. Providing and fixing flush door shutters, solid core construction with frame of 1st class hard wood with cross band and face veener or plywood face panels including anodised aluminium butt hinges with necessary screws (A) Non-decorative type and block board core. (2) 35 mm. thick.

1.0. Materials : Rush door shall conform to M-30. Plywood shall conform to M-37. Anodised aluminium butt hinges shall conform to M-43.

2.0. Workmanship:

2.1. The relevant specifications of item No. 10.23 shall be followed excpet that the shutters be non-decorative type and block board core with face venner or plywood, with 35 mm. thickness.

2.2. Ready made shutters shall be correct size and shall fit into the door or other openings without excessive scraping of edges. Adding of battens etc. to make up to the size shall not be allowed.

3.0. Mode of measurements & payment:

3.1. The relevant specifications of item No. 10.12 (A) (I) shall be followed.

3.2. The rate shall be for unit of one sq. metre.

10.37. Extra for using bright finished M.S. Piano hinges of anodised aluminium butt hinges in flush doors shutters (A) Nickel Plated Piano hinges.

1.0 Materials & Workmanship : 1.1. The relevant specifications of item No. 10.30 shall be followed except that the nickel plated piano hinges shall be provided fixed. It shall conform to the latest Indian Standards and shall be got approved by the Engineer-in-charge.

2.0. Mode of measurements & payment:

2.1. The extra payment shall be made on Sq. M. basis of door over and above the item No. 10.30 for providing bright finish M.S. Piano hinges instead of anodised aluminium butt hings.

2.2. The rate shall be for unit of one sq. metre.

10.39. Extra for providing vision panel not exceeding 0.1 sq. m. in all types of flush doors. (A) Rectangular or square.

1.0. Materials & Workmanship :

1.1. The relevant specifications of item No. 10.30 shall be followed except that the vision panel not exceeding 0.1 sq. m. shall be provided.

1.2. The glass panels shall conform to M-38 and this item is for extra work of providing vision panel retangular of square not exceeding 0.1 sq. m. in all types of flush doors.

2.0. Mode of measurements & payment:

2.1. The payment shall be made over and above of item No. 10.30 for this extra work on shutters in which vision panels are provided.

2.2. The rate shall be for a unit of one sq. metre of door area.

10.51. Providing and fixing 30 mm. thick wire gauze shutters using galvanished M.S. Wire of I.S. gauze designation 85-G with wire of 0.56 mm. dia for doors, windows, and clerestory windows including anodised aluminium butt hinges with necessary screws : Indian Teak Wood.

1.0. Materials : Wire gauze jali shall conform to M-36. The teak wood shall conform to M-29. Anodised aluminium butt hinges shall conform to M-43.

2.0. Workmanship : 2.1. Specifications for item No. 10.12 (A)(I) shall be adopted for shutter, and fixtures and fastenings except that 30 mm. thick wire gauze shutter shall be provided.

2.2. Wire gauze shuttering:

2.2.1. The finished sizes of the wooden components like styles, rails, mountings shall be as per the panelled doors. Each leaf shall have 2 panels of wire gauze as per drawings or as directed.

2.2.2. The styles, rails etc. shall be rebated 12 mm. along the side where they received the gauze. The galvanished iron webbing of 0.56 mm. dia mesh shall be used unless otherwise specified. The webbing shall be at 90° to 12 mm. along both sides of the rebate and fixed securely to the styles and rails and mounting by 12 mm. galvanised iron staples at about 7.5 cms. Intervals staggered spacing. Teak wood fillets of the size 10 mm. x 10 mm. shall be securely and neatly fixed with small screws, spaced

about 7.5 cm. centres around the rebate for each panel of webbing. After the fillets arc pressed well into the angle to hold the gauze in two laces, the exposed edge of fillets shall be neatly rounded. The gauze shall be tightly stretched during fixing. The space between fillet and the rebate where the webbing is bent shall be neatly finished with putty so that cut end of webbing may not be visible. Each shutter shall be fitted with a pair of anodised aluminium butt hinges with necessary iron screws.

3.0 Mode of measurements & payment:

3.1 The relevant specifications of item No. 10.12 shall be followed.

3.2 The rate shall be for a unit of one sq. metre.

10.53. Providing and fixing 30 mm. thick wire gauze shutters using galvanished M.S. wire of wire gauze designation 85 G with wire of 0.56 mm. dia. for doors, windows, and clerestory windows including bright finished or/and black enamelled M.S. butt hinges will necessary screws. Mango wood or equivalent quality.

1.0. Materials & Workmanship : The relevant specifications of item No. 10.51 shall be followed except that the hinges to be used shall be bright finished or/and black enamelled M.S. butt hinges with screws and the wood shall be Mango wood or equivalent quality of non-teak wood.

2.0. Mode of measurements & payment:

2.1. The, relevant specifications of item No. 10.12 shall be followed.

2.2. The rate shall be for unit of one sq. metre.

10.54. Extra for providing and fixing galvanised M.S. Wire gauze of I.S. gauge designation 140 G. to doors, windows and clerestory windows with wire of dia. 0.71 mm. instead of I.S. guage designation 85-G. with wire of dia. 0.56 mm.

1.0. Materials & Workmanship : 1.1. The relevant specifications for item No. 10.51. *&* 10.53 shall be followed for this item except that the diameter of wire shall be 0.71 mm. of I.S. Gauge designation 140-G instead of 0.56 mm. diameter I.S. gauge designation 85 G.

2.0. Mode of measurements & payment:

2.2. The payment shall be extra over and above the payment for galvanised M.S. wire gauze.

2.1. The rate I.S. gauge designation 85 G. shall of one sq. ml. of doors and windows shutters.

10.74. Providing and fixing 12 mm. thick and 100 mm. wide pelmet of flat pressed 3 layer venerred particle board solid core with 25 mm. diameter aluminium curtain rod and brackets including fixing with 25 mm. x 3 mm M.S. flat 10 cms. long and plugs etc. complete.

1.0. Material: (1) 3 layers veneered particle board solid core shall conform to M-40. (2) 25 mm. diameter auminium curtain rod and 25 mm. x 3 mm. x 10 cms. long M.S. fiat and plugs shall of best approved quality as directed.

2.0. Workmanship:

The work shall be done as per drawing and description given in the item of work, the wooden planks shall be planed smooth and even on the exposed surface.

The pelmet shall be fixed to level by means of 10 cms. long x 25 mm. x 3 mm. M.S, fiat brackets lent in the form of angle and wooden plug fixed in the wall using wooden screws. For pelmet upto 1.5 metre long two such brackets shall be used and additional bracket provided for longer pelmet at the rate of one per metre length extra. The curtain rods shall be fixed by suitable brackets at the ends to the pelmet as directed.

3.0. Mode of measurements & payment:

3.1. Pelmets shall be measured in running metres along the sides and face.

3.2. The rate shall be for a unit of one running metre.

10.84. Providing and fixing 40 mm. panelled, glazed or panelled and glazed partitions fixed to frames with iron screws etc. complete with Indian teak wood (Frames to be paid separately)

Materials: Indian Teak wood shall conform to M-29. Glass shall conform to M-38. Iron screws shall of best approved quality. Plywood, asbestos shall conform to relevant specifications of material.

Workmanship : The work shall be done as per detailed drawing or as directed The wooden frames shall be of sizes as indicated in the drawing and description of item. They shall be planed and finished smooth and even. The vertical styles and rails shall be framed by tenon and mortise joints. The panels which may be planks, asbestos, plywoods, glass or any other materials specified shall be fixed in the grooves made in the styles and rails or by means of rebate and beading, fixed by suitable screws. When glazing is used as panels, the glass shall be fixed by using putty in addition to beading. The putty shall

be used before applying beading material.

3.0 Mode of measurements & Payment:

Portitions shall be measured in square metres of the net area of the filler materials provided.

10.85 Providing and fixing decorative ply wood 4 mm. thick in partitions including fixing to frame with screws etc. complete with 50 mm. x 12 mm. teak wood beading. (Frames to be paid separately.)

1.0 Materials : 4 mm. thick decorative plywood shall be of best approved quality. Teak wood beading and screws shall be best approved quality as directed.

2.0 Workmanship : The relevant specifications shall be the same as per that of item No. 10.84 except that partitions shall be with 4 mm. thick decorative plywood and with teak wood beading.

3.0. Mode of measurements & payment:

The specifications shall be same as that of tiem No. 10.84.

The rate shall be for unit of one square metre.

10.86. Providing and fixing plain Asbestos cement sheet 6 mm. thick inpartition including fixing to frames with screws etc. complete with 50 mm. x 12 mm. deodar wood beading (Frames to be paid separately).

1.0. Materials : Plain A.C. Sheets shall conform to M-24. Deodar wood beading shall conform to M-29 A.

2.0. Workmanship : The relevant specifications of item No. 10.84 shall be followed same except that plain asbestos cement sheet 6 mm. thick shall be used in partition and Deodar wood beading of size 50 mm. x 12 mm. size shall be used.

3.0. Mode of measurements & payment:

3.1. The relevant specifications of item No. 10.84 shall be followed except that the rate excludes cost of frame work.

3.2. The rate shall be for unit of one Sq. metre.

10.88. Providing and fixing in partition 4 mm. thick medium hard board of approved quality including fixing to frames with screws etc. complete with 50 x 12 mm. Teak wood beading (Frame to be paid separately).

1.0. Materials : The hard board shall be 4 mm. thick and of best quality and make as approved. Teak wood beading shall conform to M-29.

2.0. Workmanship : The relevant specifications of item No. 18.84. shall be followed except that the hard board of 4 mm. thickness shall be used in partion and teak wood beading 50 x 12 mm. size shall be used.

3.0. Mode of measurements & payment:

3.1. The relevant.specifications of item No. 10.84 shall be followed, except that the rate excludes cost of frame work.

3.2. The rate shall be for a unit of one square metre.

10.96. 25 mm. thick wooden shelves supported on 40 x 40 x 6 mm. T or L Iron brackets fixed at suitable distance not exceeding 75 cms. apart with Mango wood or equivalent quality.

1.0. Materials : The mango wood shall conform to M-29 A. Structural steel shall conform to M-22.

2.0 Workmanship : The mango wood or equivalent quality nonteak wood shelves shall be(prepared from 25 mm. thick planks. The planks shall be planed smooth. The planks shall be used in single piece upto 30 cms. width. The shelves shall be fitted in position by fixing 40 x 40 x 6 mm. T or L Iron brackets. The spacing of brackets shall not be more than 75 cms. The 40 x 40 x 6 mm. T or L Iron brackets shall be fixed firmly in position by embedding the same in concrete. The shelves shall be fixed as directed. The season teak wood battons of 35 x 12 mm. shall be fixed on open side as directed.

3.0. Mode of measurements & payment:

3.1. The shelves shall be measured in Sq. metre. The length and breadth of shelves shall be measured net.

3.2. The rate is inclusive of batton provided.

3.3. The rate shall be for unit of one sq. metre.

10.97.40mm tick wood shelvels supported on 40 x 40 x 6 mm. T or L Iron brackets fixed at suitable distance but not exceeding 75 Cms. apart with Mango wood or equivalent quality.

1.0. Materials & Workmanship : The relevant specifications of item No. 10.96 shall be followed except that the thickness of shelves shall be 40 mm. Thick teak wood battons shall be provided of 50 x 12 mm. on all open sides.

2.0. Mode of measurements & payment:

2.1. The relevant specification of item No. 10.96 shall be followed.

2.2. The rate. shall be for upit of one sq. metre

10.99 Providing and fixing M.S. round or square *burs* with M.S. flats at required spacing inwooden frames of windows and clerestory windows.

1.0 Materials : M.S. bars flats shall conform to M-18 and M- 22 respectively.

2.0. Workmanship:

2.1The M.S. bars shall be fabricated as shown in the drawing or as directed. It shall conform to I.S. 226-1975 and I.S. 961 and I.S. 1977-1975. the M.S. bars of shall be fixed at the required spacing in mild steel flats, after drilling holes in the latter. The diameter and spacing of these bars shall be as mentioned in the drawing or as directed. The bars shall be passed through drill holes drilled inio the mild steel flats, fixed in the recess in the frames. The flats shall be fixed with iron screws.

3.0. Mode of measurements & payment:

3.1. The rate shall be for the M.S. round or square bars with M.S. provided and fixed in position as per the specifications for the completed item.

3.2. The rale shall be for a unit of one Kg.

10.100. (A) Providing and fixing M.S. Grills of required Pattern to wooden frames of windows frames of windows etc. with M.S. flatfc at required spacing and frame alround, square, or round bars with round headed bolts and nuts or by screws : Plain Grill.

1.0. Materials : The structural steel shall conform to M-22.

2.0. Workmanship:

2.1. The M.S. Grill shall be prepared as per the drawings or as directed for fixing to wooden frames of windows etc.

2.2. The grin shall be fabricated to the designs and patterns shown in the drawings and the weight shallbe as directed, and the joints shall be rivetted or welded as shown in the plan or as directed. The grill so formed shall be fixed into the frames of the windows etc., before they are erected in position. The outside strip frame of the grill shall be housed to its full thickness into the recess cut into the frame of the windows etc. The grill shall be fixed to the frame with number of bolts and nuts of screws viz. bolt nut/screw per 30 cm. of the length of outer strip subject to a minimum of 2 Nos. on each side of the frame or as indicated in the drawings or as directed.

2.3. The bolts and nuts or screws shall be counter sunk and shall be fixed with the top of their heads Hush with the face of frame strips.

3.0. Mode of measurements & payment:

3.1 No payment shall be made for weight of screws, bolts, nuts etc. Only weight of grill shall be paid.

3.2. The rate shall be for unit of one Kg.

10.100 (B) Providing and fixing M.S. grill of required pattern to wooden frames of windows etc. with M.S. plates, at required spacings and frame alround, square or round bars with round headed bolts and nuts or by screws and with ornamental grill.

1.0. Materials & Workmanship : 1.1. The relevant specifications of item No. 10.100 (A) shall be followed except that the work is for ornamental grill.

2.0. Mode of measurements & payment:

2.1. The relevant Specifications of item No. 10-100(A) shall be followed.

2.2. The rate shall be for unit of one Kg.

10.102. Providing and fixing hard drawn steel wire fabric 75 x 25 mm. mesh of weight not less than 7.75 Kg. per Sq. M. to window frames etc. including 60 x 20 mm. beading of teak wood.

1.0. Materials: Hard drawn steel wire fabric of 75 x 25 mm. mesh shall conform to M-34. Teak wood beading shall conform to M-29.

2.0. Workmanship : The steel wire fabric *75* x 25 mm. mesh of weight not less than 7.75 Kg. per Sq. M. to windows frames etc. shall be fabricated as per detail drawing. The wire fabric shall be fixed to windows frame by leak wood beading of 60 x 20 mm. size by means of screws.

3.0. Mode of measurements & payment:

3.1. The wire mesh (Hard drawn) shall be measured net clear opening of frame of windows in which mesh is fitted. Nothing shall be paid extra for fixing mesh in groove below leak wood beadings.

3.2. The rate shall be for unit of one sq. metre.

10.103. Providing and fixing fly proof galvanised M S. Wire gauge of I.S. Gauge designation 85 G. with wire of dia 0.56 mm.

to windows ind clerestory windows including 60 x 20 mm. beading of Indian Teak Wood.

1.0. Materials : The fly proof galvanised M. S. wire gauge shall conform to M-36. Teak wood beading shall conform to M-29.

2.0. Workmanship : The relevant specifications of item No. 10.102 shall be followed except that the fly proof galvanized M.S. wire gauge of I.S. gauge designation 85-G with wire of 0.56 mm. shall be provided.

3.0. Mode or measurements & payment:

3.1. The relevant specifications of item No. 10.102 shall be followed.

3.2. The rate shall be for unit of one square metre.

10.120. Providing and fixing, first class Indian teak wood, 75 x 60 mm. moulded hand rails in straight lengths completed.

1.0 Materials: First class Indian teak wood shall conform to M-29.

2.0 Workmanship : The teak wood hand rail shall of size 75 x 60mm. The hand rail shall be prepared from first class Indian teak wood. The hand rail shall be mouldod as per detail dfawings.

The hand rail shall be fixed in straight length as per detail drawings with screws. The relevant specifications of item No. 10.4 shall be followed except that the teak wood work shall be for a railing of specified size.

3.0. Mode of measurements & payment:

3.1. The hand rail shall be measured in running metre.

3.2. The rate shall be for unit of one running metre.

10.00 (I) Providing and fixing glazed louvered Glass windows and ventilators with teak wood frame 10 x 75 mm. size including 3 coats of oil painting to wood work etc. complete.

1.0. Materials: lndian teak wood shall conform to M-29. Glass shall conform to M-38.

2.0. Workmansh ip : The relevant specifications of item No. 10.1 (A) shall be followed for frame work except that the frame work of 10 x 7 cms. size of required size ventilators shall be provided with glazed glass louvers. The glass louvers shall be provided as directed. In the groove of 1.25 cms. depth made in frames, the thickness of glass shall be 5 mm. and glass shall be glass of best quality. The ventilation blades shall slope down towsardsthe outside at an angle of 45°.

3.0. Mode of measurements & payment:

3.1. The area of opening within the frame in which louvers are fixed shall be measured in sq. metres.

3.2. The rate includes painting 3 coats to wood work with ready mix paint.

3.3. The rate shall be for a unit of one square metre.

10.00 (Il) Providihg and fixing with wooden louvers Plant 12 mm. thick windows and ventilators with teak wood frame 10 x 7 cms. size including 3 coats of oil painting to wood work etc. complete.

1.0. Materials & Workmanship : The relevant specifications of item No. 10.00 (I) shall be followed except that the teak wood planks 12 mm. thick louvers shall be provided.

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item No. 10.00 (I) shall be followed.

2.2. The rate shall be for unit of one square metre.

SECTION-II

DETAILED SPECIFICATIONS-STEEL SHUTTERS, WINDOWS, VENTILATORS

11.2 (A) Steel work riveted, in built up sections, framed work including cutting, hoisting fixing in position and applying a priming coat of red lead paint. In beam and joints, channels, angles tees, flats with connecting plates or Angle cleats as in main & cross beams, Hop and jack rafters, purlins connected to common rafters and the like.

1.0. Materials: The structured steel work shall conform to M 22. Red lead paint primer shall conform to I.S.: 102-1962.

2.0. Workmanship:

2.1. The steel sections'as specified or required shall be cut, square and to correct lei.gths, as per drawings and design. The cut

ends exposed to view shall be finished smooth; No. two pieces shall be welded or other wise jointed to make up the required length of member, except as indicated in the drawing or as directed. All straightening and shaping to form shall be done by application of pressure and not by hammering. Any bending or cutting shall be carried out in such a menner as not to impair the strength of the metal. All operations shall be done in cold state unless otherwise directed/permitted.

2.2. Steel riveted or bolted in built up section,fram work.

2.2.1. The steel structure as shown in the drawings or as per direction of the the Engineer-kin-chargc shall be laid out on level platform to full scale and to full size or in parts. A steel tape shall be used for measurements to ensure maximum accuracy.

2.2.2. Wooden templates 12 mm. to 19 mm. thick or metal sheet template shall be made to correspond to each connecting gussest plate and rivet holes shall be accurately marked on them and drilled. The templates shall be laid on the steel members, and holes of the steel members shall also be marked for cutting. The base of steel columns and the position of Anchor bolts shall be carefully set out.

2.2.3. All stiffeners shall be formed by pressure and where practicable, the metal shall not be cut and welded in making these. In major works or where so specified, shop drawings giving complete details and information for the fabrication of the component parts of the structure, including location type size, length and details of rivets, bolts, or weld shall be prepared in advance of the actual fabrication and as approved. The drawings shall indicate the shop and field rivets and bolts. The steel members shall be distinctly marked or stencilled with paint with the identification mark as given in the shop drawings. The bars shall be thickened at the ends, so as to provide for screwed threads and gradually tapered off to meet their normal section.

Great accuracy shall be observed in fabrication of various member, so that these can be assembled without being unduly packed, strained or forced into position and when built up, shall be true and free from twists, bniks, buckles, or open joints. Before making holes individual members for fabrication, the steel work intended to be rivetted or bolted together shall be assembled or clamped properly and tightly so as to ensure close abutting or lapping of the different members. All stiffeners shall bear tightly both at top and bottom without being drawn or caulked. The abutting joints shall be cut or dressed true and straight and fitted close together.

Web splice plates and fillers under stiffeners shall be cut to fit within 3 mm. or flange Angles, web plates of Girders shall have not cover plates, shall have their ends flush with the top of angles forming the flanges unless otherwise required. The web plates when spiced shall have clearance of more than 6 mm.

The erection, clearance for cleared ends of members connecting steel to steel shall preferably be not greater than 1.5 mm. The erection clearance at the ends of beams without web cleats shall not be more than 3 mm. at each end but where for a practical reason greater clearance is necessary, suitably designed seating shall be provided.

Pins and rollars shall be accurately turned to gauge. These shall be straight and smooth and free from flows. The roller bearing shall be provided with adequate arrangement for holding the girders or truss resting on it. In columns caps and bases, the ends of shafts together with the attached gussets Angles, channels etc., after rivetting together shall be accurately machanised so that the parts connected butt against each other over the entire surfaces of contract connecting angles or channels shall be fabricated and placed in position, with greater accuracy so that they are not undully reduced in thickness by machining.

The ends of bearing stiffners shall be machanised or ground to fit tightly both at the top and bottom. All holes shall generally be drilled to the required size and at required position. Sub punching shall be permitted, provided it is done 3 mm. or less in diameter and reamered thereafter to the required size. The holes for rivets and bolts shall be larger by 0.4 to 6 mm. than the nominal diameter of rivets or black bolts depending upon the diameter of rivets.

Holes shall have their axis perpendicular to th6 surface-bored through. The drilling or reamering shall be free from butts, and the holes should be clean and accurate. Holes for counter shunk bolts shall be made in such a manner that their heads fit flush with the surface after fixing.

The fabrication work shall be completed in workshop as far as it is practicable to do so. Site joints shall be done with rivets and fitted bolts or black bots, as shown in the drawings or as directed. Generally the following principles shall govern the use of rivets turned and fitted bolts, and black bolts.

(i) Rivets and turned and fitted bolts shall be used where the connection is such that slip under load has to be avoided.

(ii) Black bolts may be used very sparingly where a force is carried through a connection without impact, vibraction or reversal of stresses.

2.2.4. Rivetting : The parts assembled for rivetting shall be in close contact with each other and the bearing stiffeners shall

bear lightly both at top and bottom without being drawn or caulked. Members to be rivetted shall be properly pinned or bolted and rigidly held together while rivetting. Drilling of holes shall not be permitted except to draw the parts together and the drifting tools so used shall have maximum diameter not exceeding the nominal diameter of rivets or bolts Drifting done during assembling shall not distort the metal or enlarge the holes.

The shanks of rivets shall project beyond the plate-surface sufficiently so as to fill the hole thoroughly and from the required head after rivetting.

The rivetting shall be done by hydraulic or preumetic process. However, where such facilities are not available, hand riveting may be permitted. The rivet shall be heated red hot, care being taken to control the temperature of heating so as not to bum the steel. Rivets of diameter less than 10 mm. may be fitted cold. Rivets shall be of heat finish with heads full and of equal size. All loose, burnt or badly formed rivets with concentric or diffident heads shall be cut out and replaced. The heads of rivets shall be central to shanks and shall grip the assembled members firmly. In cutting out rivets, care shall be taken so as not be injure the assembeed, members, caulking or recuppying shall not be permitted.

For testing rivets, hammer weighing approximately 0.25 kg. shall be used. Both heads of the rivets shall be tapped, slack rivets will give a hollow sound and a jar.

All rivet heads shall be palinted with red lead paint within a week of their fixing.

2.2.5. Bolting all bolt heads and nuts shall be hexagonal and of equal size unless specified otherwise. The screwed heads shall conform to I.S.: 1363-1960 and the threaded surface shall not be tapered.

The bolts shall be of such length so as to project two clear threads beyond the nuts when fixed in position and these shall fit in the holes without any shakes. The nut shall be fit in the threaded ends of bolts properly. Where turned and fitted bolts are required to be used in place of rivets they shall be provided with washers not Jess than 6 mm. thick so that the nut when tightened shall not bear on the unthreaded body of the bolt. Tappered washers shall be provided for all heads and nuts bearing on levelled surfaces. The threaded portion of the bolts shall not be within the thickness of the parts bolted together. The faces of the bolt heads and nuts abutting against steel members shall be machine finished. Where there is a risk of the nut being removed or becoming loose due to vibrations or reversal of stresses, these shall be secured from slackening by the use of locknuts, spring washers cross-cutting or harmerring down of threads as directed.

Bolts, nuts and washers shall be thoroughly cleaned and dipped in double bolied linseed oil before use. The whole steel work shall be painted with a coat of priming coat of red lead, as per relevant specifications of painting.

3.0. Mode of measurements & payment:

3.1. The steel work shall be measured in general as under.

(a) All work shall be measured 6n the basis of finished dimensions as fixed at site and measured net unless specified otherwise.

(b) The weight of steel sections, steel strips in finished work shall be calculated from standard weight on the same basis on which steel is supplied to the Contractor by department or those given in relevant I.S. if steel is arranged by the contractor.

(c) The weight of steel plates and strips shall be taken from relevant I.S. based on 7.85 Kg/sq. metre for every milimetre Sheet thickness if steel is supplied by the contractor, otherwise, the weight shall .be calculated on the basis on which steel is supplied to the contractor by department.

(d) Unless otherwise specified weight of clearets, brackets, packing pieces, bolts, nuts, washwers, distance pieces, separators, diapharam gusset (taking over all square dimensions) fish plates etc. shall be added to the weight of respective items.

(e) In rivetted work allowance to be made of weight of rivet hands. No deductions shall be made for rivet or bolt holes excluding holes for anchore or holding down bolts.

(f) For forged steel and steel castings, weight shall be calculated on the basis of 7850 kg/cum.

(g) Unless otherwise specified an addition of 2.5 percent of the weight of structure shall be made for shop and site rivet heads in rivetted steel structure.

(h) Unless otherwise specified, no allowance shall be made for the weld metal in case of welded steel structure.

(i) Dimensions other than cross sections and thickness of plates shall be measured to nearest 0.001 m.

(j) Mill tolerance shall be ignored when weight is determined by calculation.

3.2. The rate includes cost of all material, labour, erection, hoisting, scaffolding protective measure, required for proper completion of the item of work. This shall also included conveyance and delivery handling, loading, unloading and storing etc. required for completing the item described above including necessary wastage involved.

3.3. The rate shall be for a unit of one quintal.

11.2 (D) Steel work rivetted in built up section, framed work including cutting, hoisting, fixing in position and applying a priming cost of red lead paint in trusses, and trussed purlins, upto 25 mm. span and 15 M overall height.

1.0. Materials & Workmanship : The relevant specifications of item No. 112 (A) shall be followed except that the work shall be for trusses and trussed purlins upto 25 mm. span and 15 M overall height.

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item No. 11.2 (A) shall be followed.

2.2. The rate shall be for unit of one quintal.

11.4. (A) Steel work welded in built up sections frame work including cutting, hoisting, fixing in position and applying a priming coat of red lead paint. In beams and joints, channels, angles, tees, flats, with connecting plates or angle cleats as in main and cross beams. Hip and jack rafters, purlins, connected to common rafters and the like.

1.0. Materials & Workmanship :

1.1. The relevant specifications of item No. 11.2 (A) shall be followed except that the steel work shall be done by welding.

1.2. Welding shall generafly be done by electric process. Gas welding shall be resorted to using oxyacehylane flame with specific appro70val. Gas welding shall not be permitted for structural steel work.

1.3. The work shall be done as shown in the shop drawings which should clearly indicate various details of the joints to be welded, shop and site weldes as well as type of electrodes to be used. Symbol for welding on plans and shop drawing shall be according to I.S. 813-1961. As far as possible every effort shall be made to limit the welding that must be done after improper welding that is likely to be done due to heights and difficult position on scaffoldings etc The welding work shall conform to I.S. 816-1969.

1.4. Preparation of surfaces : Surfaces which are to be welded together shall be free from loose mill scale, rust, paint, grease or other foreign matter. A coating of boiled linseed oil shall be permitted.

1.5. Assembly for welding : Before welding is commenced, the plates shall first be brought together and firmly clamped or spot welded at specified distance. The temporary connection has to be strong enough to hold the plates accurately in place without displacement.

1.6 Precautions :

All operations connected with welding and cutting equipment shall conform to safety requirement given in I.S. 818-1968.
The following points shall be borne in mind during the process of welding :

(a) Welds shall be made in flat position wherever practicable.

(b) Are length, voltage and smperage shall be suited to the thickness of material, type of groove and other circumstances of the work.

(c) The segments of welding shall be such that where possible, the members which offer the greatest resistance to compression are welded first.

1.7. The defective welds which shall be considered harmful to the strength shall cut out and rewelded.

1.8. Finished welds and adjacent parts shall be protected with clean boiled linseed oil and after all stag has been removed welds and adjacent parts shall be painted after the same are approved.

1.9.All the members shall be thoroughly cleaned of rust, scales, dust etc. and given a priming coat of red lead paint before fixing them in position, ting of welding to be added in the specification I.N. 12.2.2.12. (i) to (viii).

2.0 Mode of measurements & payment:

2.1 The relevant specifications of item No. 11.2 (1) shall be followed.

2.2 The rate shall be for unit of one quintal.

11.4 (D) Steel work welded in built up sections framed work including cutting, hoisting, fixing in position and applying a priming coat of Red paint in trussess and trussed purlines upto 25 m. span and 15 mm. overall height.

1.0 Materials & Workmanship :

The relevant specifications of item No. 11.4 (A) shall be followed except that the work shall be for trusses and trussed purlins upto 25 m. span and 15 m. overall height.

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item No. 11.4. (A) shall be followed. 2.2. The rate shall be for unit of one quintal.

11.6. Providing and fixing in position collcpsiblc shutters with vertical chanels 20 x 10 x 2 mm. braced with flat iron diagnal 20 x 5 mm. size with top and bottom rails T Iron 40 x 40 x 6 mm. with 38 mm. dia steel pulleys complete with bolts, units, locking arrangements, stoppers, handles, including a priming coal of red lead paint.

1.0. Materials: The collepsible steel gate shall conform to M-33.

2.0. Workmanship: T-Rails shall be fixed to the floor and to the lintel at top by means of Anchor bolts, embedded in cement concrete on floor and lintel. The anchor bolts shall be placed approximately at 45 mm. ccntrers alternatively in the two flanges of the T Iron. In the bottom runner (T-Iron) shall be embedded in the floor and proper groove shall be formed along the runner for-the purpose. The collepsible gate shall be fixed at the sites by fixing the end double chanels in the T-iron rail and also by hold fasts bolted to the end double chanel and fixed in the masonry of the side walls or the otherwise, In case where the collepsible gate is not required to the lintel beams or slop above, a tee iron suitably designed may be fixed at the top embedded in masonry and provided with necessary clamps and roller arrangement at the top.

All the adjoining work damaged while fixing of gate shall be made good to match the existing work without any extra payment.

All the members of the collepsible gate including T-Iron shall be thoroughly cleaned of rust, scales, dust etc. and given a priming coat of red lead before fixing them in position.

3. Mode of measurements & payment:

3.1. The collepsible gale shall be measured in sq. metre. The height of the gate shall be measured as the length of double chanels and breadth from outside to outside of the end fixed double chanels in open position of the gate. The rate includes providing handles, locking arrangements, stoppers etc.

3.2. The rate shall be for unit of one sq. metre.

11.7. Providing and fixing 1 mm. thick M.S. sheet sliding shutters both frame and diagnal braces of 40 x 40 x 6 mm. Angle iron 3.15 mm. M.S. gusset plates at junctions and comers. 25 mm. dia pulley 40 x 40 x 6 mm. Angle and T-iron guide rail at top and bottom respectively wilh handles, stoppers and locking arrangements etc. including applying priming coat of red lead paint.

1.0. Materials: M.S. sliding shutters shall be lubricated of M.S. component as given in the description of item. M.S. sheets 1 mm. thick shall be fixed to the frame wilh rivets or welds as approved. The shutters shall be provided wilh top and bottom guide rails of Agncls or T-iron as specified and 25 mm. dia. steel pulleys at trie top. The frame shall be revitted and/or welded and wherever revetting shall be done 3.15 mm. gusset plates shall be provided at the junctions.

2.0. Workmanship :

2.1. The shutters shall be single or double leaf Gutters as specified. The guide rails shall be sufficiently long and continued along the wall on both ends so that the sliding shutters can rest against walls, living full opening when so required.

2.2. The guide rails shall be fixed to the floor by means of anchor bolts embedded in the cement concrete floor. The steel section at the top shall be suitably supported from the walls. Two channel sections shall be suitably fixed vertically below the extreme clamps in the wall and floor to avoid the shutters from going out of the supports at the top and bottom. A suitable clamping arrangement will be provided at cither end of the opening to avoid the shutters from rolling back into opening.

2.3. All the adjoining work damaged while fixing shall be made good to match the existing work.

2.4. All members of the sliding shutter including T-iron shall be thoroughly cleaned of rust, scales, dust elc. and given a priming coat of red lead before fixing them in position.

3.0. Mode of measurements & payment:

3.1. The sliding doors shall be measured in sq. metre. The height of the shutters shall be measured from outside to cut of the guide rail and width outside to outside of shutters including vertical channels in side. The rate includes providing handles, stoppers and locking arrangements etc. complete.

3.2. The rate shall be for unit of one sq. metre.

SECTION-12

DETAILED SPECIFICATIONS - LABOUR FOR FIXING FIXTURES & FASTENING

12.4. Fixing metallic lower bolts of size with necessary screws etc. complete (tower bolts and screws to be paid under separate items) :

1.0 Workmanship:

1.1. This item provide for labour fixing metallic tower bolts of any size with screws, nuts etc.

1.2. The cower bolls shall be fixed in proper position as shown in the drawings or as directed. There shall be fixed truly vertical or horizontal as the case may be.

1.3. The screws shall be driven home with screw driver. In not case the screws shall be hammered in.

1.4. All recesses and seats shall be cut to the exact size for counter sinking etc. where so required.

1.5. Care shall be taken to see that no gaps arc left between the fitting and the surface meant to receive the fittings.

1.6. The fittings shall be properly cleaned and left inoriginal finish after fixing.

2.0. Mode of measurements & payment:

(1) Cutting of holes, recesses and seats involved in process of fixing.

(2) Cost of filling and cushing materials where so required forper seating of new fittings.

(3) Cost of nails etc. for temporary positioning of fitting.

(4) Cost of cleaning materials like old washed dhoti, stain remove, etc.

(5) Cost of making good the over cut recesses or holes, if any.

(6) Cost of making hole of required size on the wooden frame for housingg the bolt for locking.

2.2. The rale including cost of labour involved in all operations required for proper completion of the items, including carraige, handling, fixing etc. complete.

2.3. The rate shall be for unit of one number.

12.5. Fixing metallic flush bolts of sizes with necessary screws etc. complete (flush bolts and screws shall be paid under separate item).

1.0. Workmanship:

1.1. The relevant specifications shall be followed as per item No. 12.4 except for fixing metallic flush bolts instead of tower bolts.

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item No. 12.4 shall be followed.

2.2. The rate shall be for unit of one number.

12.8. Fixing metallic or plastic door handles of sizes with necessary screws etc. complete (door handles and screws to be paid under separate items):

1.0. Workmanship:

1.1. The relevant specifications of item No. 12.4 shall be followed except fixing.

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item No. 12.4 shall be followed.

2.2. The rate shall be for unit of one number.

12.10. Fixing metallic gate and shutters hooks and eyes of sizes (hooks and eyes to be paid under separate item)

1.0. Workmanship:

1.1. The relevant specifications shall be followed as per item No. 12.4 except that the fixing of eye and hooks instead of tower bolts.

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item No. 12.4 shall be followed.

2.2. The rate shall be for unit of one number (Hook & Eye).

12.11. Fixing metallic door latches of sizes with necessary screws (door latches and screws to be paid under separate items):

1.0 Workmanship : 1.1. The relevant specifications of item No. 12.4 shall be followed except that fixing metallic door latches instead of lower bolts.

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item No. 12.4 shall be followed.

2.2. The rate shall be for unit of one number.

12.12. Fixing metaqllic mortise night latches with necessary screws including making necessary screws holes in wooden door shutters etc. complete (mortise night latches and screws to be paid under separate items)

1.0. Workmanship : 1.1. The relevant specifications of item No. 12.4 above shall be followed except that die fixing mortise night latches instead of tower bolts.

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item No. 12. shall be followed.

2.2. The rate shall be for a unit of one number.

12.18. Fixing metallic ball catchers 100 mm. dia. (Ball catchers to be paid under separate item):

1.0. Workmanship : 1.1. The relevant specifications of item No. 12.4 shall be followed same except fixing of ball catchers 100 mm. dia.

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item No. 12.4 shall be followed.

2.2. The rate shall be for a unit of one number.

12.20. Fixing metallic casement window fasteners, with necessary screws etc. complete (Casement window fasteners and screws to be paid under separate item):

1.0. Workmanship : 1.1. The relevant specifications of item No. 12.4 shall be followed except fixing metallic casement windows fasteners.

2.0. Materials & Workmanship :

2.1. The relevant specifications of item No. 12.4shall be followed.

2.2. The rate shall be for a unit of one number.

12.21. Fixing metallic casement stays of sizes with necessary screws etc. complete (Casement stays and screws to be paid under separate items)

1.0. Workmanship : 1.1. The relevant specifications of item No. 12.4 shall be followed except fixing of metallic casement stays.

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item No. 12.4 shall be followed.

2.2. The rate shall be for a unit of one number.

12.24. Fixing metallic cup-board or ward robe locks of sizes with necessary screws etc. complete (Locks and screws to be paid separately).

1.0. Workmanship : The relevant specifications of item No. 12.4 shall be followed except that fixing metallic cup-board or ward robe locks of size with necessary screws etc. complete.

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item No. 12.4 shall be followed.

2.2. The rate shall be for a unit of one number.

12.25. Fixing metallic or plastic cup-board or ward robe knobs of size with necessary screws/bolts etc. complete (knobs and screws/bolts to be paid separately.)

1.0. Workmanship: The relevant specifications of item No. 12.4 shall be followed except that fixing of metallic or plaswlic cup-board or ward robe knobs of sizes with necessary screws/bolts etc. complete.

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item No. 12.4 shall be followed.

2.2. The rate shall be for a unit of one number.

12.26. Fixing metallic floor door stoppers of sizes with rubber cushion, screws etc. to suit shutter thickness complete. (Floor door stopper with rubber cushion and screws to be paid under separate items.)

1.0 Workmanship: 1.1. The relevant specifications of item No. 12.4 shall be followed except that fixing of metallic floor doorstopers.

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item No. 12.4 shall be followed.

2.2. The rate shall be for a unit of one number.

12.28 Fixing metallic door handles or knobs for mortice locks with necessary screws etc. complete (doors, handles/knobs and screws to be paid separately).

1.0. Workmanship: The relevant specifications of item No. 12.4 shall be followed except that fixing of metallic doorhandles or knobs for mortice with necessary screws etc. complete.

24. Mode of measurements & payment:

2.1. The relevant specifications of item No. 12.4 shall be followed.

2.2. The rate shall be for a unit of one number.

SECTION-13

DETAILED SPECIFICATIONS FOR GLAZING

13.1. Providing and fixing sheet glass, selected quality (typc-C) bedded in putty and fixed with wooden beading including cost of wooden beading of rist class teak wood and necessary cutting of glass 5 mm. thick.

1.0. Materials: The glass shall conform to M-38. The wood beading shall conform to M-29. Putty shall conform to I.S. : 419-1967.

2.0. Workmanship:

The glass shall be sheet glass of selected quality of 5 mm. thick.

2.1. Size of glass for glazing shall allow a clearance of 2.5 mm. between the edges of glass and the wood or metal surrounds. The clearance may be increased, provided the depth of the rebate of groove is sufficient to provide not less than 1.5. cm. cover to the glass. The detailed process or glazing shall be as specified in I.S. 3548-1966.

2.2. All stains from the surface of glass shall be removed and cleaned with thinner or spirit without any extra payment.

2.3. Wooden beading:

2.3.1. The size of the wood beads for glass panes shall be 1.5 cms. x 3 cms. unless otherwise specified. Beads shall be secured to wooden frames with either panels pains or screws and to metal frames in the way provided for in the frame.

2.3.2. Sufficient putty compound shall be applied to the rebate so that when the glass has been pressed into the rebate, a bed of compound not less than 1.5 mm. thick will remainbctween the glass and the rebate. There should also be surplus of compound squeezed out above the rebate which should be stripped aqt an angle not undercut to prevent water accumulating. Beads should be bedded with compound against the glass and wood beads should also be bedded against the rebate.

Care should be taken to see that no voids arc left between the glass and the bead.

3.0. Mode of measurements & payment:

3.1. All measurements of cutting shall, unless otherwise stated, be held to include the consequent waste.

3.2. Each pane of glass shall be measured to the nearest 0.5 cms."both in width and height/length.

3.3. Irregular shaped or circular panes shall be measured as the smallest rectangular area from which the irregular or circular pane can be cut.

3.4. The rate includes cost of materials labour, required for complete of the item including hoisting, carriage, temporary erections like scaffolding etc.

3.5. The rate also includes: ‘

(i) The wastages and breakage involved in the process, (ii) Oiraight cutting on glass and glazing putty, teak wood beading glass, pins, etc. complete.

3.6. The rate shall be for a unit of sq. metre.

13.1.(II) Providing and fixing sheet glass selected quality (Type-C) bedded in putty and fixed with wooden beading including cost of wooden headings of first class teak wood and necessary cutting of glass 6mm. thick.

1.0. Materials & Workmanship : 1.1. The relevant specifications of item No. 11.3 shall be followed except that the sheet glass of selected quality of 6 mm. thick.

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item No. 13.1 (I) shall be followed.

2.2. The rate shall be for a unit of one sq. metre.

13.3. (C) Providing and fixing rough cast wired glass 6 mm. thick bedded in putty and fixed with wooden beadings including the cost of wooden beadings of Indian teak wood and necessary cutting of glass wired figured glass.

1.0. Materials: Wired figured glass shall conform to M-38. Wooden beading shall conform to M-29. Putty shall conform to I.S.419-1967.

2.0. Workmanship : The relevant specifications of item No. 13.1 (I) shall be followed except that the wired figures glass of 6 mm. thick shall be used.

3.0. Mode of measurements & payment:

3.1. The relevant specifications of item No. 13.1 (I) shall be followed.

3.2. The rate shall be for a unit of one sq. mt.

13.5. (3) Providing and fixing sheet glass ordinary quality bedded in the putty and fixed with wooden beading including the cost of wooden beading of first class teak wood and necessary cutting of glass 3 mm. thick.

1.0. Materials: Glass shall conform to M-38. Wooden beading shall conform to M-29. Putty shall conform to I.S. 419-967.

2.0. Workmanship : 2.1.1. The specifications of this item shall be followed as per item No. 13.1 (I) except that the sheet glass of ordinary quality shall be used and thickness of sheet glass shall be 3 mm. thick.

3.0. Mode of measurements & payment:

3.1. The relevant specifications of item No. 13.1 0) shall be followed.

3.2. The rate shall be for a unit of one sq. metre.

13.5. (4) Providing and fixing sheet glass ordinary quality, bedded in putty and fixed with wooden beadings including the cost of wooden beadings of first class teak wood and necessary cutting of glass 4 mm. thick.

1.0. Materials & Workmanship: The relevant specifications of item No. 13.5 (3) shall be followed, except that the thickness of ordinary sheet glass shall be 4 mm.

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item No. 13.1 (I) shall be followed.

2.2. The rate shall be for a unit of one sq. metre.

13.7. Extra for using ground glass (Frosted or obscured on one side) instead of plain glass.

1.0. Materials: Glass shall conform to M-38. Wooden beading shall conform to M-29. Putty shall conform to I.S. 419-967.

2.0. Workmanship : The specification of this item shall be followed as per item No. 13.1 except that ground glass (Frosted or obscured on one side) shall be used.

2.0. Mode of measurements & payment:

2.1. The payment shall be made on Sq. ml. basis extra over and above the payment for plain glass for using ground glass (Frosted or obscured).

2.2. The relevant specifications of item No. 13.5 (III) shall be followed.

2.3. The rale shaH be for a unit of one sq. metre.

13.11. (A) Diference in cost of"material and labour involved in method of glazings if changed in item No. 13.1. to front and

back puttied and sprigged or fixed with glazing pins:

1.0. Materials & Workmanship : 1.1. The relevant specifications of item No. 13., shall be followed except that the glazing is to be done by front and back putting and sprigged or fixed with glazing pins.

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item No. 13.1 (I) and 13.1 (II) shall be followed.

2.2. The extra rate for extra cost involved shall be paid over and above item No. 13.1 (1) & 13.1. (II).

2.3. The rate shall be for a unit of one sq. metre.

13.12. Griding, polishing and round of edges glass or glazing sheets :

1.0. Materials: The glass shall conform to M-38.

2.0. Workmanship: The edges of glass or glazing sheets shall be grind polished and rounded of such that it renders uniform took throughout the length and shall be neatly finished. The work halls be carried out in best workman's like manner.

3.0. Mode of measurements & payment:

3.1. The edges of glass round, polished and rounded off shall be measured in metre.

3.2. The rate shall be for a unit of one running metre.

SECTION-14
DETAILED SPECIFICATIONS OF ITEMS - PAVING & FLOOR FINISHING AS PER "SCHEDULE OF RATES"

14.2. (A) 40 mm. thick marble chips flooring rubbed and plished (i.e. Terrazzo) to granolithic finishing with under layerly 30 mm. thick cement concrete (1: 2:4) (1 cement: 2 coarse sand: 4 graded stone aggregate 10 mm. and down gauge) and top layer 10 mm. thick with white, black and black marble chips of required sizes from 1 mm. to 4 mm. nominal size laid in cement marble power mix 3 : 1 (3 cement: 1 marble powder by weight in proportion 4 : 7 (4 cement marble powder mix, 7 marble chips by volume): Dark shade pigment with ordinary cement (in top layer only).

1.0. Materials : Water shall conform to M-l. Cement shall conform to M-3. Sand shall conform to M-6. Stone grit shall conform to M-8.

The pigment incorporated in icrrazzo shall be of permanentcolour and shallconform to requirement mentioned in Appcndix_A in I.S.: 2l14-1962. Marble chips shall conform to M-46. The marble powder shall pass through I.S. Sieve Terrazzo-30.

2.0. Workmanship: 2.1. Terrazzo finish shall be laid over a layer of base concrete in case of ground floor. When the tcrrazzo floor is laid over R.C.C. slabs a cushing layer consisting of 75 mm. thick lime concrete shall be provided below the terrazzo floor. The terrazzo flooring shall consist of an under layer of cement concrete and layer of terrazzo which shall be laid monolthically.

2.2. Under Layer: 2.2.1. The under layer shall be of cement concrete mix 1:2:4. The maximum size of aggregate used shall not exceed 10 mm. Specification for cement concrete shall be followed as per Item No. 5.4.1.

2.3. Tcrrazzo topping : 2.3.1. The topping shall have mix of ordinary cement and marble powder inproportion (3 : 1) (3 cement: 1 marble powder: 7 marble powder by weight) and marble aggregate shall be mixed in proportion 4 : 7 (4 cement marble chips by volume). The thickness of concrete and cushioning layer shall not be less than 10 Cms. and 7.5 Cms. respectively. The minimum thickness of under layer and lopping shall be 40 mm.

2.4. Panels :2.4.1. The floor, both while laying the under layer and topping shallbc divided into panels not exceeding 2 sq.m. in area so as to reduce the risk of cracking due to differential shrinkage or expansion of terrazzo and sub-floor. The joints be so located that the layer dimensions of any panel do net exceed 2 M. The panels shall preferably be separated by means of dividing strips. However where the butt joints arc provided, the bays shall be laid alternatively allowing for an interval of adcast 24 hours between the laying of adjacent bays.

2.5. Mixing Materials: 2.5.1. With a view to avoid variation in colour, mixing shall be done in trough or tub, and the complete

quantities of cement and pigment required for one unit shall oe mixed at the beginning of the work. Colour cement and pigment mix shall be dry mixed with marble powder. The mix thus obtained shall be mixed with aggregate. Care shall be taken not to get the materials into a head as this would result in coarser aggregates moving on the sides and cement to the centre. To the dry mix thus prepared, water shall be added in small quantities while materials are being worked to get a mix of proper consistency. The mixture shall be plastic but not so wet to flow. The mix shall be used within half an hour of mix of addition of water during preparation laying.

2.6. Laying:

2.6.1. The base shall be divided into panels with the help of dividing strips including the strips required for decorative design upto the finished surface level of the floor. Screed strips shall be used where the dividing strips are not used. The base shall be cleaned of all dust, dirst laintancc and any loose materials. It shall be then welted with water mopped and smeared with cement slurry at 2.75 Kg/sq. mt. Under layer shall be then spread and levelled with a scrccding board. The top surface shall be left rough to provide a good bound to the terrazzo.

2.6.2. The terrazzo topping shall be laid while the under layer is still plastic but has hardened enough to prevent cement from rising to the surface. This is normally achieved between 18 to 24 hours after laying of under layer. A cement slurry preferably of the same colour as the topping shall be brushed on the surface immediately before laying the topping. The terrazzo mix shall be laid to a uniform thickness on the screed.bed and be complete thoroughly by taping or rolling and trowelled smooth. Excessive trowlling or rolling in early stages shall be avoided as it results in working up cement to the surface which will produce a surface liable to cracking and will require more grinding to expose marble chip. The terrazzo surface shall be lamped trowelled, and brought one to required level by a straight edge and steel floats in such a manner that the maximum amount of marble chips come up and arc spread uniform over the surface and no part of the surface is left without chips.

2.7. Curing: 2.7.1. The surface shall be left dry for air curing for a period of 12 to 18 hours. Thereafter, water shall be allowed to stand overnight in pools for a period of a minimum of four days. The floor shalfbe prevented from being subjected to extreme temperature.

2.8. Grinding and finishing:

2.8.1. Grinding and finishing shall be done cither by hand or by machine. In case of manual grinding, the process of grinding shall begin after two days, while in case of machine grinding, the process shall be started after seven days after completion of laying.

2.8.2. First grinding shall be done by carborundum stones of 60 grit size. The surface shall then be washed clean and grouted with a grout of cement or/and colouring matter in the same mix and proportion as the topping in order to fill any pin holes that appear. It shall be allowed to dry for 24 hours and wet cured for four days in the same manner as mentioned in para 2.7 above.

2.8.3. The second grinding shall be done with carborundum stone of 80 grit size. The surface shall then be prepared as after first grinding. The third grinding shall be done with carborundum stone of 120 to 150 grit size. The surface shall then be washed again and allowed to dry for 12 hours, and wet cured four days as before. The fourth grinding shall be done with carborundum stone of 320 to 400 grit size. The surface shall again be washed clean rubbed hard with felland slightly moistened Oxalic acid powder @ 5 gms. per sq. metre of floor surface. After the finishing work is over, the surface shall be washed with dilute oxalic acid solution and dried for floor polishing, machine fitted with felt or hession bobs shall then be run over it until floor shines. In case waxpolishcd surface is required, wax-polished shall be applied on the surface with the help of soft linen over a clean and,dry surface. The polishing machine fitted with bobs shall be run over it, clean saw dust shall be spread over the floor surface and polishing machine again operated which will remove excess wax and leave glossy surface. Floor shall not be left slippery.

3.0. Mode of measurements & payment:

3.1. Terrazzo flooring shall be measured as laid in sq. melrcs. Length and breadth shall be measured for visible area of work done. No deduction shall be made for, nor extra for any opening in floor or area up to 0.10 sq. metres. The rate shall cover laying the floor at different levels in the same room or court-yard and nothing extra shall be paid on that account.

3.2. The rate includes the cost of all materials and labour involved in all operations described above. The rate shall also not

include dividing strip.

3.3. The rate shall be for a unit of one sq. metre.

14.2. (B) 40 mm. thick marble chips, flooring rubbed and polished (i.e. Tcrrazzo) to granolithic finish with under layer 30 mm. thick cement concdretc 1:2:4(1 cement: 2 coarse sand: 4 graded stone aggregate 10 mm. and down gauge) and top layer 10 mm. thick with white, black or white and black marble chips, of required sizes form 1 mm. to 4 mm. nominal size laid in cement marble powder mix 3 : 1 (3 cement: 1 mzrble powder mix by weight in proportion 4 : 7 (4 cement: 7 marble power: 7 marble chips by volume): light shade pigment with white cement (in top layer only).

1.0. Materials & Workmanship: 1.1. The relevant specifications of item No. 14.2 (A) shall be followed, except Light shade pigment with white cement shall be used in top layer.

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item No. 14.2 (A) shall be followed.

2.2. The rate shall be for a unit of one sq. metre.

14.2 (C) 40 mm. thick marble chips, flooring rubbed and polished (i.e. Terrazzo) to granolithic finish with under layer 30 mm. thick cement ccncdrete 1:2:4(1 cement: 2 coarse sand : 4 graded stone aggregate 10 mm. and down,gauge) and top layer 10 mm. thick with white, black or white and black marble chips of required sizes form 1 mm. to 4 mm. nominal size laid in cement marble powder mix 3 : 1 (3 cement: 1 marble powder mix by weight) in proportion 4 : 7 (4 cement: marble power: 7 marble chips by volume). Medium shade pigment with approx.«50% white cement and 50% ordinary cement (in top layer only).

1.0. Materials & Workmanship :

1.1.The relevant specifications of item No. 14.2 (2) shall be followed, except that medium shade pigment with approximately 50% white cement 50% ordinary cement in lop layer only shall be used.

2.0, Mode of measurements & payment:

2.1. The relevant specifications of item No. 14.2 (A) shall be followed.

2.2. The rate shall be for a unit of pne sq. metre.

14.2. (D) 40 mm. thick marble chips, flooring rubbed and polished (i.e. Terrazzo) to,granolithic finish with under-layer 30 mm. thick cement concdrcte 1 : 2 : (1 cement: 2 coarse sand : 4 graded stone aggregate 10 mm. and down gauge) and top layer 10 mm. thick with while, black or white and black marble chips of required sizes form 1 mm. to 4 mm. nominal size laid in cement marble powder mix 3: 1 (3 cement: 1 marble powder mix by weight) in proportion 4 : 7 (4 cement: marble power: 7 marble chips by volume). White cement withoul any pigment (in top layer only).

1.0. Materials & Workmanship : 1.1. The relevant specifications of item No. 14.2 (2) shall be followed, except that while cement without an/pigment in top layer shall be used.

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item No. 14.2 (A) shall be followed.

2.2. The rate shall be for a unit of one sq. metre.

14.2 (E) 40 mm. thick marble chips, flooring rubbed and polished (i.e. Terrazzo) to granolithic finish with under layer 30 mm. thick cement concdrete 1 : 2:4 (1 cement: 2 coarse sand : 4 graded stone aggregate 10 mm. and down gauge) and top layer 10 mm. thick with white, black or white and black marble chips of required sizes form 1 mm. to 4 mm. nominal size laid in cement marble powder mix 3 : 1 (3 cement: 1 marble powder mix by weight) in proportion 4 : 7 (4 cement: marble power: 7 marble chips by volume): light shade pigment with ordinary cement (in top layer only). 14).

1.0. Materials & Workmanship : 1.1. The relevant specifications of item No. 14.2 (A) shall be followed, except that the light shade pigment with ordinary ce'ncnt (in top layer only) shall be used.

2.0. Mode of measurements. & payment:

2.1. The relevant specifications of item No. 14.2 (A) shall be followed.

2.2. The rate shall be for a unit of one Square metro.

14.4 (A) Marble chips skirting (tcrrazx.o) of dcdo nbbed and polished to granolithic finish top layer 6 mm. thick with white

and black or white and black marble chips of sizes from smallest to 4 mm. nominal size laid in cement marble powder mix 3 : 1 (3 cement: 1 marble powder by weight) in proportion of 4 : 7 (4 cement: 7 marble chips by volume) 20 mm. thick with under layer 14 mm. thick in cement plaster 1:3(1 cement: 3 coarse sand): Dark shade pigment with ordinary cement (in top layer only).

1.0 Materials : 1.1 The relevant specifications of item No. 14.2 (A) shall be followed.

2.0. Workmanship:

2.1. Under layer: The under layer for terrazzo on vertical surfaces like skirting and dedoes shall be of stiff cement mortar 1: 3 (1 cement: 3 coarse sand) finished rough so as to give a good'bond to the topping.

2.2. Terrazzo topping shall not be less than 6 mm. thick and the combined thickness of under layer and topping shall be not less than 20 mm. The other details shall be followed same as per specifications of item No. C 24 except that the light shade pigment with white cement in top layers shall be used.

3.0. Mode of measurements & payment:

3.1. The skirting and dedo shall be measured in square metres correct to'two places of decimals. The height shall be measured from the finished level of floor.

3.2. The rate shall be for a unit of one sq. metre.

14.4. (B) Marble chips skirting (terrazzo) of dedo rubbed and polished to granolithic finish top layer 6 mm. thick with white, black or white and black marble chips of sizes from smallest to 4 mm. nominal size laid in cement marble powder mix 3 : 1 (3 cement: 1 marble powder by weight) in proportion of 4 : 7 (4 cement marble powder mix : 7 marble chips by volume) 20 mm. thick with under layer 14 mm. thick in cement plaster 1 : 3 (1 cement: 3 coarse sand): medium shade pigment with approximate 50% white cement and 50% ordinary cement (In top layer only).

1.0. Materials & Workmanship : 1.1. The relevant specifications of item No. 14.4 (A) shall be followed except that the light shade pigment with white cement in top layers only sshall be used.

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item No. 14.4 (A) shall be followed.

2.2. The rate shall be for a unit of one square metre.

14.4. (C) Marble chips skirting (lerrazzo) of dedo rubbed and polished to granolithic finish top layer 6 mm. thick with white, black or white and black marble chips of sixes from smallest to 4 mm. nominal size laid in cement marble powder mix 3 : 1 (3 cement: 1 marble powder-by weight) in proportion of 4 : 7 (4 cement marble powder mix: 7 marble chips by volume) 20 mm. thick with under layer 14 mm. thick in cement plaster 1 : 3 (1 cement: 3 coarse sand): medium shade pigment with approximate 50% in cement plaster 1:3(1 cement: 3 coarse sand): medium shade pigment with approximate 50% white cement and 50% ordinary cement (in top layer only).

1.0 Materials & Workmanship: The relevant specifications of item No. 1-4.4 (A) shall be followed except that the medium shade pigment with approximate 50% while cement and 50% ordinary cement in top layers only shall be used.

2.0. Mode of measurements & payment:

2.1. The relevant specifications jof item No. 14.4 (A) shall be followed.

2.2. The rate shall be for a unit of one Sq. metre.

14.4. (D) Marble chips skirting (terrazzo) of dedo rubbed and polished to granolithic finish top layer 6 mm. thick with white, black or while and black marble chips of sizes from smallest to 4 mm. nominal size laid in cement marble powder mix 3 : 1 (3 cement: 1 marble powder by weight) in proportion of 4 : 7 (4 cement marble powder mix : 7 marble chips by volume) 20 mm. thick with under layer 14 mm. thick in cement plaster 1:3(1 cement: 3 coarse sand): medium shade pigment with approximate 50% in cement plaster 1:3(1 cement: 3 coarse sand) : white cement without any pigment (In top layer only).

1.0 Materials & Workmanship : The relevant specifications of item No. 14.4 (A) shall be followed except that the while cement without any pigment in top layers shall be used.

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item No. 14.4 (A) shall be followed.

2.2. The rate shall be for a unit of one Sq. metre.

14.4. (E) Marble chips skirting (terrazzo) of dedo rubbed and polished to granolithic finish top layer 6 mm. thick with white black or while and black .narble chips of sizes from smallest to 4 mm. nominal size in cement marble powder-mix 3 : 1 (3 cement: 1 marble powder by weight) in proportion 4: 7 (4 cement marble powder mix 7 marble chips by volume) 20 mm. thick with underlayer 14 mm. thick in cement plaster 1:3(1 cement 3 coarse sand) light shake pigment with ordinary cement (In top layer only):

1.0. Materials & Workmanship:. 1.1. The relevant specifications of item No. 14.4 (A) shall be followed and except that the light shade pigment with ordinary cement in top layers only shall be used.

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item No. 14.4 (A) shall be followed and except that the light shade pigment with ordinary cement in top layers only shall be used.

2.1. The rate shall be for a unit of one sq. metre.

14.16. Providing and laying cushioning layer on R.C.C. slab consisting of 75 mm. thick lime concrete using brick aggregate of 20 mm. nominal size 50% mortar comprising of 1 lime: 2 fine sand.

1.0. Materials : 1.1. Water shall conform to M-l. Lime mortar of proportion 1 : 2 shall conform to M-10. Brick aggregate 20 mm. nominal size shall conform to M-14.

2.0. Workmanship : 2.1 The relevant specifications of item No. 4.18 shall be followed except that the proportion of mix shall be 50% mortar comprising of 1 lime: 2 coarse sand and the size of brick aggreghate shall be 20 mm. nominal size. The lime concrete work shall be carried out ir. 7.5 cms. average thickness as a cushioning layer on R.C.C. slab.

3.0. Mode of measurements & payment:

3.1. The line concrete work shall be measured for visible area of work done.

3.2. The rate shall be for a unit of one sq. metre.

14.19. Precast terrazzo (Mosaic) tiles 20 mm. thick with white, black or white and black marble chips of sizes upto 6 mm. laid in floors, treads of steps and landings on a bed of 25 mm. average thickness of lime mortar 1 : 1.5. (1 lime putty : 1.5. Fine sand) or C.M. 1: 6 jointed with neat cement slurry mixed with pigment to match the shade of the tiles including rubbing and polishing complete with precast tiles of: Light shades, using white cement.

1.0. Materials: 1. Water shall conform to M-l. Cement shall conform to M-3. Lime Mortar shall conform to M-10. Cement mertar shall conform to M-l 1. The precast terrazzo tiles of 20 mm. thick shall be of light shade using white cement and conform to M-47.

2.0. Workmanship: 2.1. The wo»k shall be carried out as per l.S. 1443-1972.

2.2. Bedding:

2.2.1. Before spreading the mortar, the sub-base of the floor shall be cleaned of all dirt, scum and loose materials and then well wetted without forming any pools of water on the surface.

2.2.2. In case of R.C.C. floors, the top shall be left a little rough, all points of level for the finished surface shall be marked out The lime mortar of proportion 1: 1.5 (lime putty: 1.5 fine sand) or cement mortar of proportion C.M. 1:6 as directed shall be then evenly and smoothly spread over the base. Bedding layer of mortar shall be not less tftan 10 mm. and average thickness of bedding shall be 25 mm.

23. Laying:

23.1. Before laying the terrazzo (Marble/Mosaic) tiles, the tiles shall be thoroughly wetted with water. Neat cement group of required consistency at 4.4. Kg. cement/sq.mt. shall be spread on the mortar bed. The tiles shell be laid on the neat cement float and shall be evenly and firmly bedded to the required level and slope. There shall be no hollows left. The joints shall be of uniform thickness and in straight line as per the pattern.

23.2. The surface of flooring shall be checked frequently with a straight edge at-lcast two metres long so as to obtain a true surface with required slope.

2.3.3. The tiles which are fixed in the floor adjoining the wall shall go about 10 mm. under plaster. Skirting or dedo shall be left unfinished for about 50 mm, above finished floor level and unfinished strip them left earlier shall be finished.

2.3.4. In places where full tiles cannot be fixed, the tiles shall be cut to the size and smoothened at edges to give straight and true joints.

2.3.5. After the tiles have been laid, the surplus cement slurry and the joints shall be cleaned and washed fairly deep before cement hardens.

2.3.6 The day after tiles, have been laid, the joints shall be cleaned of grey cement grout with a wire brush to a depth of about 5 mm. and then grouted with white cement with or without pigment to match the shade of the topping of tiles. The same cement slurry shall than be spread over the whole surface in a thin coat to protect the surface from abrasive damage and to fill pin holes that may exist on the surface.

2.4. Curing: 2.4.1. The flooring shall be kept wet with damp sand or water for seven days. It shall be kept undisturbed atleast for 14 days. The grinding shall normally be commenced after 14 days.

2.5. Polishing:

2.5.1. After the tiles are properly cured, first grinding shall be done with carborundum stone of 48 to 60 grade grit fitted in machine. Water shall be properly used during grinding. When the chips-show up and the floor has been uniformly rubbed, it shall be cleaned with water, baring all pin holes. It shall be covered with a thin coat of white cement mixed with or without pigments to match the colour of the topping of the tiles. Pin holes if any shall thus be filled. This grout shall be kept moist for a week. Thereafter second grinding shall be started with carborundum of 120 grit. Grouting and curing shall follow again. Final grinding shall be done when other works are finished. The machine shall be fitted with carborundum of grit 220 to 350 using water in abundance. The floor sha!! then be washed clean with water. Oxalic acid powder shall than be dusted at 33 grams per square metre on the surface and the surface rubbed with machine fitted with hessian bobs or rubbed hard with pad of woolen rags. The floor shall then be washed clean and dried with a soft cloth or linen. The" finished floor shall not sound hollow when tapped with a mallet.

2.5.2. If any tile is disturbed or damaged it shall be refitted or replaced properly jointed and polished.

2.5.3. Testing of the tiles shall be carried out by the contractor at his own cost as per I.S. requirement for required tests.

3.0. Mode of measurements & payment:

3.1. Terrazzo tiles flooring shall be measured in sq. metres for visible area of work done.

3.2. No deductions shall be made nor extra paid for any opening in the floor area upto 0.1 sq. mt.

Nothing extra shall be paid for use of cut tiles or for laying the floors at different levels in the same room or court yarn. Mosaic tiles laid indoor boarders and bands etc. shall be measured in the same item and nothing extra shall be payable on account of these or similar bonds formed of half or multiples of half size standard tiles/or other uncut tiles.

3.3. The treads of stairs and steps paved with tiles without nosing shall also be measured under this item.

3.4. Extra rate shall however be paid for such area where width of treads does not exceed 30 cms.

3.5. The rate shall include the cost of all materials, labour involved in all the operations as described above.

3.6. The rate shall be for a unit of one sq. metre.

14.19. (B) Precast Terrazzo (Marble/Mosaic) tiles 20 mm. thick with white black or white and black marble chips of size upto 6 mm. laid in floors, treads of steps and landing on a bed of 25 mm. average thickness of lime mortar 1 : 1.5 (1 lime putty : 1.5 fine sand) or C.M. 1 : 6 jointed with neat cement slurry mixed with pigment to match the shade of the tiles, including rubbing and polishing complete with precast tiles of medium shades using approximately 50% white cement and 50% ordinary cement.

1.0. Materials & Workmanship : 1.1. The relevant specifications of item No. 14.19 (A) shall be followed except that the precast terrazzo (marble mosaic) tiles shall be medium shades using approximately 50% white cement and 50% ordinary cement.

2.0. Mode of measurements & payment: 2.1. The rate shall be for a unit of one sq. metre.

19.19. (C) Precast terrazzo marble mosaic tiles 20 mm. thick with white black or white and black marble stone chips of size upto 6 mm. laid in floors, treads of step and landing on a bed of 25 mm. average thickness of lime mortar 1 : 1.5 (1 Lime putty : 1.5 fine sand) or Cm. 1.6 jointed wivh near cement slurry mixed with pigment to match the shade of tiles including

rubbing and polishing complete with precast tiles of dark shade using ordinary cement.

1.0. Materials & Workmanship : 1.1. The relevant specifications of item No. 14.19 (A) shall be followed except that the precast tiles shall be of Dark shade using ordinary Portland cement.

2.0. Mode of measurements & payment:

2.1. The mode of measurements and payment shall be same as item No. 14.19 (A).

2.2. The rate shall be for a unit of one sq. metre.

14.21. (A) Precast terrazzo (Marble/Mosaic) tiles 20 mm. thick with marble chips of. size upto 6 mm. in skirting and risers of steps not exceeding 30 cms. in height on 10 mm. thick cement plaster 1:8(1 cement; 8 coarse sand) jointed with neat cement slurry including rubbing and polishing complete with tiles of light shades using white cement.

1.0. Materials : Water shall conform to Ml. Cement Mortar shall conform to M-l1. The precast tcrrazzo (Marble/Mosaic) tiles of light shades using white cement tiles 20 mm. thick shall conform to M-47.

2.0. Workmanship : The work shall be carried out for skirling as dedo. Before fixing precast terrazzo (Mosaic marble) tiles of shade and size as specified, the surface shall be prepared by heavy scarping, making joints etc. to the required line, level and piurnb. The surface shall be thoroughly wetted before commencing .the laying work. Thereafter about 10 mm. thick backing of cement mortar in specified proportion shall be applied on the surface in true like and level generalloy as per specifications of plaster item.

2.2. Fixing : The black of each tile to be fixed shall be smeared with cement paste of matching colour and the mosaic tiles shall then be gently tapped against the surface, with a wooden mallert. The skirting shall be done only after the flooring is completed. Any pipes coming out of the wall through the dedo or skirting shall only be at the intersections of the horizontal and vertical joints. The tiles shall not have staggered joints. The joints shall be true to entire line both ways and vertical joints shall be in iinc with joints of flooring. Tiles shall be fixed as close as possible to the adjoining tiles and any difference in the thickness of the mosaic tiles shall be evened but in the cement paste so that all the tiles faces are set in conformity with one another. The skirting shall project uniformly and not more than 6 mm. thickness beyond the finished surface above. Top of skirting of dedo shall be truely horizontal. The risers of steps,- skirting or dedo shall rest on top of treads of flooring wherever required. The tiles shall be cut (sawn) and thin edges stnoothened before use.

2.3. Curing : Curing shall be done for 7 days continuously.

2.4. Finishing : Skirling and dedo shall be hand polished to have an even smooth and shining surface. In case of skirting only 10 mm. x 10 mm. grove shall be provided at the junction of cement plaster and cemcnuiles.

3.0. Mode of measurements & payment:

3.1. The terrazo tiles with light shade using white cement base shall be paid under this item. The length shall be measured along finished surface of the riser, skirting or dedo, correct to a centimetre height measured from finished or treads or floor to the top (under side of treads in case of steps).

3.2. The rate shall include all materials and labour required for all the operations involved and described above.

3.3. The rate shall be for a unit of one sq. metre.

14.21.(B) Precast terrazzo tiles 20 mm. thick with marble chips of size upto 6 mm. in skirting and risers of steps not exceeding 30 cms. in height on 10 mm. thick cement plaster 1:3(1 cement 3 coarse sand) jointing with neat cement slurry including nibbing and polishing complete with tiles of medium shades using approximately 50% while cement and 50% ordinary cement.

1.0. Materials & Workmanship : 1.1. The relevant specifications of item No. 14.21 (A) shall be followed except that the work is for using tiles of medium shades using approximately 50% white cement and 50% ordinary cement.

2.0. Mode of measurements & payment:

2.1. The mode of measurements and payment shall be followed same as item No. 14.21 (A).

2.2. The rate shall be for a unit of one sq. metre.

14.21. (C) Precast tcrrazzo tiles 20 mm. thick with marble chips of sizes upto 6 mm. in skirting and risers of steps not exceeding 30 cms. in height on 10 mm. thick cement plaster in C.M. 1:3(1 cement; 3 sand) jointing with neat cement slurry incuding rubbing and polishing complete, with tiles of Dark shade using ordinary cement.

1.0. Materials & Workmanship : 1.1. The relevant specifications of item No. 14.21 (A) shall be followed except that the

tiles of dark shade using Portland cement shall be used.

2.0. Mode of measurements & payment:

2.1. The mode of measurements and payment shall be followed as per item No. 14.21 (A).

2.2. The rate shall be for a unit of one sq. metre.

14.25. (A) Chequered tcrrazzo tiles 2 mm. thick with marble chips of size upto 6 mm. in floor on 25 mm. thick bed of like mortar 1:1.5 (LLimePutty: 1.5 coarse sand) or C.M. 1:5 jointed with neat cement slurry mixed with pigment to match the shade of the tiles including rubbing and polishing etc. complete, light shade using white cement.

1.0. Materials : Water shall conform to M-l. White cement shall conform to M-4. Lime mortar of proportion 1 : 1.5 shall conform to M-10. Cement mortar shall conform to M-l 1. Chequered tiles shall conform to M-47 D.

2.0. Workmanship : 2.2. The relevant specifications of item No. 14.21 (A) shall be followed except that cheqyuered tiles of light shade using white cement shall be used.

3.0. Mode of measurements & payment:

3.1. The relevant specifications of item No. 14.21 (A) shall be followed.

3.2. The rate shall be for a unit of one sq. metre.

14.25 (B) Chequered terrazzo tiles 25 mm. thick with marble chips of sizes upto 6 mm. in floors on 25 mm. thick bed of like mortar 1: 1.5 (1 Lime Putty : 1.5 coarse sand) or C.M. 1:6 jointed with neat cement slurry mixed with pigment to match the shade of the tiles including rubbing and polishing etc. complete medium shade using approximate 50% white cement and 50% ordinary cement.

1.0. Materials & Workmanship : 1.1. The relevant specifications of item No. 14.25 (A) shall be followed except that the chequered tiles of medium shade using approximate 50% white cement and 50% ordinary cement shall be used.

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item No. 14:25 (A) shall be followed.

2.2. The rate shall be for a unit of one sq. metre.

14.25(C) Chequered tcrrazzo tiles 25 mm. thick with marble chips of sizes upto 6 mm. floors on 25 mm_t thick bed of like mortar 1 : 1.5 (1 Lime putty : 1.5 coarse sand) or C.M. 1.6 jointed with neat cement slurry mixed with pigment to match the shade of the tiles including rubbing and polishing complete" Dark shade using ordinary cement.

1.0. Materials & Workmanship : 1.1. The relevant specifications of item No. 14:25 (A) shall be followed except that chequered tiles or dark shade using ordinary cement shall be used.

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item No. 14.25 (A) shall be followed.

2.2. The rate shall be for a unit of one Sq. metre.

14.26 (A) Chequered terrazzo tiles 28 mm. thick with Marble chips of size upto 6 mm. in treads of stairs and staircases in 12 mm. thick bed of like mortar 1 : 1.5 (1 Lime putty : 1.5 coarse sand) or C.M. 1.6 jointed with neat cement slurry mixed with pigment to match the shade of tiles including rubbing and polishing complete, Light shade using white cement.

1.0. Materials & Workmanship : 1.1. The relevant specifications of item No. 14.25 (A) shall be followed except that the chequered tiles 28 mm. thick of light shade using white cement shall be used in treads, stair cases etc.

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item No. 14.25 (A) shall be followed.

2.2. The rate shall be for a unit of one Sq. metre.

14.27. (B) Chequered tcrrazzo tiles 28 mm. thick with marble chips of sizes upto 6 mm. in treads of stairs and staircases in 12 mm. thick bed of like mortar 1 : 1.5. (1 Lime p'utty: 1.5 coarse sand) or C.M. 1 : 6 jointed with neat cement slurry mixed with pigment to match the shade of tiles including rubbing and polishing complete; Medium shade using approximately 50% wiute cement and 50% ordinary cement.

1.0. Materials & Workmanship : 1.1. The relevant specifications of item No. 14.25 (A) shall be followed except that the chequeretktiles 28 tnn}. thick of medium shade using approximately 50% while and 50% ordinary cement shall be used in treads of ttair, staircases etc.

2.1. The relevant specifications of item No. 14.25 (A) shall be followed.

2.2. The rate shall be for a unit of one Sq. metre.

14.27 (C) Chequered tenazzo tiles 28 mm. thick with marble chips of sizes of uptc 6 mm. in treads of stairs and staircases in 12mm. thick bed of like mortar 1: 1.5(1 Lime putty: 1.5 coarse sand) or CM. 1 :6 jointed with neat cement slurry mixed with pigment to match the shade of tiles including rubbing and polishing complete: Dark shade using ordinary cement.

1.0. Materials & Workmanship : 1.1. The relevant specifications of item No. 14.25 (A) shall be followed except that the chequered tiles 28 mm. thick of dark shade using ordinary cement shall be used in treads of stair, staircases etc.

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item No. 14.25 (A) shall be followed.

2.2. The rate shall be for a unit of one sq. rrietre.

14.29. White glazed tiles 6 mm. thick in flooring treads of steps and landings laid on a bed of 12 mm. thick cement mortar 1: 3 (1 cement: 3 coarse sand) finished with flush pointing inwhite cement.

1.0. Materials : Water shall conform to M-l. Cement mortar shall conform to M-11. White glazed tiles shall conform to M-55.

2.0. Workmanship:

2.1. Bedding:

2.1.1. The sub-grade shall be cleaned, wetted and mopped- The bedding shall then be laid evenly over the surface tamped and corrected to desired level and allowed to harden enough to offer a rigid cushion to tiles and to enable the mason to place wooden planks across and squat on it.

2.1.2. The white glazed tiles shall be laid on cement mortar bedding of 12 mm. thick in C.M. 1 : 3 The mortar shall have sufficient plasticity for laying and there shall be no hard lumps that would interfere with the evenness of bedding. The base shall be cleared and well wetted. The mortar shall then be spread in thickness not less than 10 mm. at any place and average 12 mm. thickness. The proportion of the cement mortar shall be as specified in the item.

2.2. Fixing tries:

2.2.1. The tiles before laying shall be soaked in water for atleast two hours. Neat grey cement grout at 3.3. Kg/Cement/Sq. mt. of honey like consistency shall be spread bver the mortar bedding as directed. The edges of the tiles be smeared with neat cement slurry. The tiles shall be well pressed and gently tapped with a wooden mallet till they are properly bedded and in level with the adjoining tiles. There shall be no hollows in bed or joints. The joints between the tiles shall be as thin as possible in straight line or as per pattern.

2.2.2. The tiles shall not have staggered joints. The joints shall be true to centre line both ways. The Nehni trap coming in the flooring shall be so positioned that its grating shell replace only one tile as far as possible. Where full size tiles cannot be fixed, they shall be cut (Swan) to the required size and the edges rubbed smooth to ensure straight and true joints. The joints shall be filled with grey cement grout with wire brush of trowel to a depth of 5 mm. and loose material removed. White cement shall be used for pointing the joints. After fixing the tile finally in an even plane the flooring shall be kept wet and allowed to nature undisturbed for 7 days.

2.3. Cleaning: 2.3.1. The surplus cement grout that may have come out of the joints shall be cleared off before it sets. Once the floor has set, it shall be carefully washed, cleared by dilute acid and dried. Proper precaution and measures shall be taken to ensure that the tiles are not damaged inany way till the completion of the construction.

3.0. Mode of measurements & payment:

3.1. The work done shall be measured in sq. mt. for visible area of work done. The length and width of the flooring shall be measured not between the faces of skirting or dedos or plastered face of wall as the case may be. The paving under dado or skirting shall not be measured. No deduction shall be made nor extra paid for any opening in the floor of area upto 0.1 sq. mt. Nothing extra shall be paid for laying the floors at different levels in the same rooms.

3.2. The rate shall be for a unit of one sq. metre.

14.32. White glazed tiles 5 mm, thick in skirting, risers of steps and dado on 10 mm. thick cement plaster 1:3 (1 cement: 3 coarse sand) and jointed with white cement slurry.

1.0. Materials:

Water shall conform to M-l. Cement mortar shall conform to M-11. White glazed tiles shall conform to M-55.

2.0. Workmanship:

2.1. Preparation of Surface : In case of brick masonry wall, the joints shall be raked-out to a depth of atleast 15 mm, while the masonry is being laid. In case of concrete wall, the surface shall be chiselled and roughened with wire brushes. The surface shall be cleaned and wetted thoroughly before commencing the laying work.

2.2. Laying:

2.2.1. The wall surface shall be covered 10 mm. thick plaster of cement mortar 1: 3 mix and allowed to harden. The plaster shall be roughened with wire brushes both way. The back of tiles shall be floated with grey cement slurry and edges with white cement slurry set in bedding mortar. The tiles shall be gently tapped in position one after die other keeping the joints as thin as possible. Top of skirting or dado shall be truly horizontal and the joints vertical or as per required pattern.

2.2.2. Risers of steps, skirting and dado shall rest on top of treads or flooring. Where full size tiles cnanot be fixed, they shall be cut to the required size and the edges be smoothened.

2.2.3. The joints shall be cleaned and flush pointed with white cement. The surface shall be kept wet for seven days. After curing the surface shall be washed clean.

3.0. Mode of measurements & payment:

3.1. The rate shall include the cost of all materials and labour required for various operations described above. Risers of steps, skirting and dado shall be measured in square metres. Length and height shall be measured along the finished face of the skirting or dado including curves, where special such as covers, internal and external angles, etc. used. The length and height shall be measured correct to the centimetre except in case of risers and skirting where height shall be measured correct to 3mm.

3.2. The rate shall be for a Unit of one sq. metre.

14.34. Providing and fixing 50 mm. infernal or external angles of white glazed tiles.

1.0. Materials:

Water shall conform to M-1. Cement shall conform to M-11. Glazed tiles shall conform to M-55.

2.0. Workmanship: 2.1. The relevant specifications of item No. 14.32 shall be followed except that the internal or external angles of glazed tiles shall be of thickness not less than the tiles with which they are used. The fixing shall be done as per directions.

3.0. Mode of measurements & payment:

3.1. Rate shall be including the cost of materials and labour involved in all the operations described above. Internal o external angles of glazed tiles shall be measured in running metres correct uplp a centimetre, length being measured on the exposed face of the special at its centre line. No extra payment shall be made for corner places at angles junctions of cover beads and cornices for using cut length of special.

3.2. The rate shall be for a unit of one running metre.

14.36 (A) Providing and laying marble stone slabe flooring over 20 mm. (Average) base of cement mortar 1:6 (1 cement: 6 coarse sand) or L.M. 1 : 1.5 laid and jointed with grey cement slurry including rubbing and polishing complete: Marble slab 25 mm thick.

1.0. Materials:

Water shall conform to M-l. Lime mortar shall conform to M-10: Cement mortar shall conform to M-ll. Marble stone slab 25mm. thick shall conform to M-51.

2.0.Materials:

2.1. Dressing of slabs: Every stone shall be cut to required size and fine chisel dressed to give a smooth and even surface on all sides to the full depth. A straight edge laid along the sides of the stone shall be fully in contact with it. Chisel dressing shall also be done on top surface to remove any waviness. The sides and top surface of marble slabs shall be machine rubbed or table rubbed with hoarse sand before using. All angles and edges of slabs shall be true, square and free from chippings.

2.2. The thickness of stone shall be 25 mm. The allowable tolerance shall be 2 mm. allowable. The tolerance shall be 15 mm. in length and breadth.

2.3 Bedding: Bedding of marble slabs sha'l either be lime mortar 1: 1.5 (1 Lime putty : 1.5 coarse sand or cement mortar

1 : 6 (1 cement: 6 coarse sand of average thickness 20 mm. thick as given in description of item. Minimum thickness at any place shall not be less than 10 mm.

2.4. Laying : The surface of sub grade shall be cleared wetted and mopped. Mortar of specified mix and thickness shall then be spread on an area sufficient to receive one marble slab. The slab shall be washed clean before laying. It shall be laid on top pressed and tapped gently to bring it in level with other slabs. It shall then be lifted and laid a side. The top surface of the mortar shall then be corrected by adding fresh mortar at hollows, or depressions. The mortar shall then be allowed to harden it over this surface cement slurry of honey like consistency at 4.4 Kg. of cement per sq. metre. The edges of slabs already paved shall be buttered with grey cement. The slab shall then be gently placed in position and tapped with wooden mallet till it is properly bedded in level with and close to the adjoining slab. The joints shall be as fine as possible: Surplus cement on the surface of the slabs shall be removed. The slab fixed in the floor adjoining the walls shall enter not less than 10 mm. under the plaster skirting or dado. The junction between the walls and floors shall be finished neatly. The finished surface shall be true to level and slopes as directed.

2.5. Curing : The floor shall be cured for a minimum period of seven days.

2.6. Polishing and finishing: Uncveness at the meeting edges of slab shall be removed by fine chiselling. Finishing etc. shall be done as per relevant specifications of item No. 14.21 (A) of terrazo tiles flooring except that cement slurry with/or without pigments shall not be applied on the surface before each polishing.

3.0. Mode of measurements & payment:

3.1. Marble swtone flooring with various kinds of marble shall be measured in sq. metre. The length and breadth shall be measured between the finished face of skirting or dado or wall plaster. No deduction shall be made nor extra shall be paid for any openings in the floor of area upto 0.05 sq. mt. Nothing extra shall be paid for laying stone at different levels in the same room. Treads and steps of stairs paved with marble stone slabs shall also be measured under flooring.

3.2. The rate shall be for a unit of one sq. metre.

14.43. (A) Kotah stone slab (Polished, Green colour) flooring over 20 mm. (average) thick base of cement mortar 1:6(1 cement: 6 coarse sand) or lime mortar 1: 1.5 laid over and jointed with grey cement slurry including rubbing and polishing complete 25 mm. thick.

1.0. Materials : 1.1. Water shall conform M-l. Lime mortar shall conform to M-10. Cement mortar shall conform to M-11 polished kotah stone shall conform to M-49.

2.0. Workmanship :

2.1 Each slab shall be cut to the required size and shape and fine chisel dressed at all the edges.

The sides thus dressed shall have a full contact if a straight edge is laid along. The sides shall be table rubbed with coarse and before paving. All angles and edges of the slabs shall be true square and free form clippings and giving aplane surface. The thickness shall be 25 mm. (Average) as specified in the item but not less than 20 mm. at any place of the slab.

2.2 Bedding for the kotah stone slabs shall be cement mortar 1 : 6 (1 cement; 6 coarse sand) or L.M. 1 : 1.5. of average thickness 20 mm. as given in the description of the item. Sub grade shall be cleaned, wetted and mopped. Mortar of the specified mix and thickness shall be then be spread on an area sufficient to receive one kotah stone slab. The slab shall be washed clean before laying. It shall be laid on top pressed, tapped gently to bring it in level with the other slabs. It shall then be lifted and laid aside. Top surface of the mortar shall then be corrected by adding fresh mortar at hollows or depressions. The mortar shall then be allowed to harden bit. Over this surface, cement slurry of honey like consistency shall be applied. The slab shall then be gently placed in position and lapped with wooden mallet till it is properly pedded in level with and close to the adjoining slab. The joint shall be as fine as possible. The slabs fixed in the floor adjoining the wall shall enter not less than 10 mm. under the plaster, skirting or dado. The junction between the wall floor shall be finished neatly. The finished surface shall be ture to levels and slopes as directed.

2.3 The floor shall be kept wet for a minimum period of 7 days, so that bedding and joints set properly.

2.4 Polishing shall be normally commenced after 14 days of laying the stone slab. First polishing shall be done with carborundum stones of 120 grade grit fitted in the heavy machine and then second polishing shall be done with carborundum stone of 220 to 350 grade grit fitted in heavy machine. Water shall be properly used during polishing. The stone shall then be washed clean with water. When directed by the Engineer-in-charge wax polish of approved quality shall be applied on the surface with the help of soft cloth over a clean and dry surface. Then the polish machine fitted with bobs shall be run over it.

2.5. The holes required for Nahni traps, pipes any other fittings shall be made without any extra cost.

3.0. Mode of measurements & payment:

3.1 The rate shall include the cost of all materials and labour involved in all the operations described above. The kotah stone flooring shall be measured in square metres correct to, two places of decimal, length and breadth shall be measured correct to a centimeter and between the finished face of skirting dado or wall plaster and no deduction shall be made nor extra paid for any opening in floor of areas upto 0.1sq. mt.

3.2 The rate shall be for a unit of one sq. metre.

14.43 (B) Kotah stone slab flooring over 20 mm. (average) thick base of cement mortar 1:6 (1 cement: 6 coarse sand) L.M. or 1: 1.5 laid over and jointed with grey cement slurry including and polishing complete 30 mm. thick.

1.0. Materials & Workmanship " 1.1. The relevant specifications of item No. 14.43 (A) shall be followed except that the thickness of stone shall be 30 mm.

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item No. 14.43 (A) shall be followed.

2.2. The rate shall be for a unit of one sq. metre.

14.44. Kotah stone slab 25 mm. thick in riser of steps, dado and pillars laid on 10 mm. thick cement mortar 1:3(1 cement: 3 coarse sand) jointed with grey cement slurry including rubbing and polishing etc. complete.

1.0. Materials : Water shall conform to M-l. Cement mortar shall conform to M-11. Kotah stone slab 25 mm. thick shall conform to M-49.

2.0. Workmanship: 2.1. The relevant specifications of item No. 14.43 (A) shall be followed except that the kotah stone shall be fixed for risers of steps, dado or skirting in C.M. 1:3 and the polishing shall be done manually instead of machine polishing.

3.0. Mode of measurements & payment:

3.1. The risers of steps, skirting or dado shall be measured in sq. metre. Length shall be measured along the finished faces of risers, skirting or dado, Height shall be measured from finished level of treads or floor to top. Lining of pillars shall be measured under this item.

3.2. The rate shall be for a unit of one sq. metre.

14.46. (A) Rough chiselled dressed (Kotah stone green) stone flooring over 20 mm. thick base of cement mortar 1 : 5 (I cement: 5 coarse sand) or L.M. 1: 1.5 including pointing with cement mortar 1: 2 (1 cement: 2 stone dust) etc. complete. 25 mm. thick

1.0. Materials : Water shall conform to M-l. Line mortar shall conform to M-10. Cement mortar shall conform to M-11. Rough chisel dressed stone shall conform to M-48.

2.0. Workmanship:

2.1. The relevant specifications of item No. 14.43(A) shall be followed except that the rough chisel dressed stone of 25 mm. thickness of approved quality are to be fixed on cement mortar bedding in C.M. 1 : 5 or L.M. 1 : 1.5 of 25 mm. average thickness.

2.2. Dressing of stone slab : Every stone slab shall be cut to the required size and shape and rough chisel-dressed on top, if required, so that the dressed surface shall not be more than 6 mm. from straight edge placed on it. The sides shall also be chisel-dressed to a minimum depth of 20 mm. so that the dressed edge shall at no place be more than 30 mm. from straight edge butted against it. Beyond this depth, the sides may be dressed slightly splayed so as to form an inverted 'V' shaped joint with adjoining slab. The surface shall be reasonable true and plane and all the angles and edges shall be square and free from drippings. Where the stone slabs arc to be used for nosing, exposed edges shall be rough chisel-dressed to full depth and cut to the uniform thickness.

2.3. The thickness of the stone slab shall be 25 mm. with permissible tolerance of ± 2 mm.

2.4. Laying : The surface of the sub-grade concrete shall be cleaned, wetted and mopped. "The bedding of specified mortar mix shall be spread under each slab to the specified thickness. The slab shall be washed clean before laying. It shall be then laid-on top pressed so that all hollows underneath filled up and surplus mortar works up through the joints. The top shall be tapped and brought level to the adjoining slab. The thickness of the joints shall rot exceed 5 mm. Subsequent slabs shall be laid in the same manner.

2.5. Curing & Finishing : Any surplus mortar on the surface of the slab shall be cleaned off and joints finished lush. The joints shall be raked out uniformly to a minimum depth of 12 mm. wheat he mortar is still green, the slabs which are fixed In the floor adjoining the wall shall enter not less than 12 mm. under the plaster, skirting or dado. The junctions between wall plasters and floor shall be finished neatly and without waviness. The pointing shall be done with CM. 1: 2. The pointing shall be cured for minimum period of seven days. The finished floor shall not sound hollow when tapped with wooden mallet and the finished surface shall be true to level and slopes as directed.

3.0. Mode of measurements & payment:

3.1. The relevant specifications of item No. 14.43 (A) shall be followed.

3.2. The rate shall be for a unit of one sq. metre.

14.46 (B) Rough chisel dressed (Kotah stone green) stone flooring over 20mm. thick base of cement mortar 1:5 (1 cement, 5 coarse sand) or Lime Mortar 1: 1.5 including pointing with cement 1 : 2 (1 cement: 2 stone dust) etc. complete 40 mm. thick..

1.0.1.1. The relevant speculations of item No. 14.46 (A) shall be followed except that the thickness of stone slab shall be 40 mm. thick.

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item No. 14.46(A) shall be followed.

2.2. The rate swhall be for a unit of one sq. metre.

14.71. (A) Cement concrete flooring for I.P.S. 1:2:4 (for Indian Patents tones) (1 cement: 2 coarse: sand: 4 graded stone aggregate 20 mm. nominal size) laid in one layer finished with a floating, coat of net cement 40 mm. thick.

1.0. Materials: Water shall conform to M-l. Cement shall conform to M-3. Sand shall conform to M-6. Stone aggregate 20 mm. nominal size shall conform to M-12.

Cement concrete 1:2:4 proportion measured by volume shall conform to relevant specification or ordinary grade 1:2:4 concrete.

2.0. Workmanship:

2.1. The cement concrete flooring of 40 mm thick (Average) is to be laid as per the site condition. The concrete shall be mixed in a mechanical mixer at the work. Hand mixed may however be allowed for smaller quantities of work and in case of failure of machines or as permitted by the Engineer-in-charge. It shall carried out on a water tight platform and care shall be taken. to ensure that mixing is continued until the mass is uniform in colour and consistency. However, in such cases 10% more cement than otherwise required shall have to be used without any extra cost. The mechanical mixing shall be done for period of 1/2 to 2 minutes. The quantity of water shall be just sufficient of produce a dense concrete of required workability for the purpose. Flooring of specified thickness shall be laid in accordance with approved pattern or as directed. Finishing operation shall start shortly after the cessation of beating and shall be spread over a period one to six hours depending upon the temperature and atmospheric conditions. The surface shall be left for some time till moisture disappears from it. Fresh quantity of cement shall be mixed with water to form a thick slurry and spread over the surface while the concrete is still green. Use of dry cement or cement and sand mixture sprinkled on this surface to stiffen the concrete or absorb excessive moisture shall not be permitted. The cement slurry shall then be properly pressed twice by means of iron floats, once, whent he slurry is applied and the second time when cement starts setting and finished smooth. The surface shall be marked with string or B.R.C. fabric jali to make the surface non-slippery as and when directed. The junction of floors with wall plaster, dado or skirting shall be rounded off where so required upto 25 mm. radius. Flooring in lavatories and bath rooms shall be laid after fixing of water closet and squatting pans and floor traps which shall be plugged while laying the floors and opened after the floors are completed. Any damage, done to water supply or sanitary fittings during execution of work shall be made good.

2.2. After the final set, the concrete shall be kept continuously wet, if required by ponding for a period of not less than 7 days from the date of placement,

2.3. The form work shall be provided if necessary as directed by the Engineer-in-charge. Concreting shall be done as per alternate bay method with necessary centering either by mastic or cement mortar as directed.

3.0. Mode of measurements & payment:

3.1. The rate shall include the cost of all materials and labour involved in all the operations described above. No deduction

shall be made or extra paid for any opening upto 0.1 sq. mt. In area in the floor, nothing extra shall be paid for laying the floor at different levels in the same room or the courtyard.

2.2 The rate shall be for unit of one sq. metre.

14.71 (B) Cement concrete flooring (Indian patent stone) 1:2:4 (1 cement: 2 coarse sand: 4 graded stone aggregate 20 mm. nominal size) laid in one layer finished with floating coat of neat cement: 50 mm. thick.

1.0. Mode of measurements & payment:

1.1. The relevant specifications of item No. 14.71 (A) shall be followed except that the thickness of concrete flooring shall be 50 mm.

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item No. 14.71 (A) shall be followed.

2.2. The rate shall be for a unit of one sq. metre.

14.74 Cement concrete pavement (25 mm. to 50 mm. thick) with 1:2:4 (1 cement: 2 coarse sand: 4 stone aggregate 20 mm. nominal size) including finishing with a floating coat of neat cement complete.

1.0. Materials & Workmanship : 1.1. The relevant specifications of item No. 14.71 (A) shall be followed except that the thickness of concrete flooring vary from 25 mm. to 50 mm.

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item No. 14.71 (A) shall be followed except that thickness shall be measured correct upto 1 mm. flooring laid in borders, margins and treads of steps, shall be measured under item or flooring in respective of width.

2.2 The rate shall be for a unit of one cubic metre.

14.81. (C) 20 mm. thick precast concrete tile with aggregate of sizes upto 6 mm. laid in floors, treads of steps and landings on 20 mm. thick bed of cement mortar 1 : 6 (1 cement: 6 coarse sand) or L.M. 1: 1.5 jointed with neat cement slurry with pigment to match the shade of the tiles complete with precast .tiles of Dark shades using ordinary cement.

1.0 Materials: Water shall conform to M-l. Cement shall conform to M-3. Sand shall conform to M-6. Lime mortar 1: 1.5 shall conform to M-10. Cement mortar shall conform to M-11. Tiles shall conform to M-47 (A). Cement concrete tiles shall conform to I.S. 1237-1959 and pigments to be admixded with mortar or for grouting shall conformt oI.S. 2114-1962.

2.0. Workmanship:

2.1 The tiles shall be laid on the sub-grade of concrete of the R.C.C. slab. Bedding shall be in lime mortar 1: 1.5 or cement mortar (1:6). The amount of water added shall be minimum required for sufficient plasticity and workability in C.M. or lime mortar where the ingredients shall be thoroughly mixed dry, hard lumps removed and water added to give a good workability.

2.2. The base shall be cleaned of ail dust, dirt and scum and properly wetted without allowing water pools. For a bedding of cement mortar the mortar shall be then spread evenly over the base of two rows of tiles and three to five metres in length. The top shall be kept rough so that cement slurry can be absorbed. The thickness of the bedding shall be not less than 10 mm. at any place. The laying of tiles shall be commenced with neat cement slurry of honey-like consistency and shall be spread over the mortar bed over an area sufficient to receive about 20 tiles. The tiles shall then be fixed in this grout one after the other, each tile being gently tapped and properly bedded in line and level with the adjoining tiles. The joints shall be as narrow as possible and normally shall not exceed 1.5 mm. After the day's work tghe excess cement slurry on top shall be cleaned as also the joints with a broom stick and washed before the slurry sets hard. Next day the joints shall be filled with the cement grout of the same shade as the matrix of the dies. Tiles which are fixed in the floor adjoining the wall shall go a minimum of 10 mm. under the wall plaster, skirting or dado. For the purpose, plaster etc. may be left unfinished by about 50 mm. above the proposed finished level of the floor. The unfinished strip shall be plastered after laying the floor tiles. Where full die cannot be used, tile shall be cut to the size to be used.

2.3. The flooring shall be cured for 7 days.

3.0. Mode of measurements & payment:

3.1. The rate shall include the cost of all materials and labout involved in all the operations described above.

3.2. The rate shall be for a unit of one sq. metre.

14.86. Chequered precast concrete dies 22 mm. thick with aggregate of sizes upto 6 mm. in floors, treads of steps and landings

on 20 mm. thick bed of C.M. 1 : 6 (1 cement: 6 sand) or like mortar 1 : 1.5 (1 lime putty 1.5 coarse sand) jointed with neat cement slurry with pigment to match the shade of tiles.

1.0. Materials : 1.1. The relevant specifications of item No. 14.25 (A) shall he followed.

2.0. Workmanship: 2.1. The relevant specifications of item No. 14.21 (A) shall be followed except that chequered precast cement concrete tiles 22 mm. thick shall be used in floors, treads of steps and landings on average 20 mm. thick bed of C.M. 1: or L.M.1 : 1.5.

3.0. Mode of measurements & payment:

3.1. The relevant specifications of item No. 14.21 (A) shall be followed.

3.2 The rate shall be for a unit of one sq. metre.

14.87. Extra for rubbing and polishing the precast cement concrete tiles in flooring, skirting or dado.

1.0. Workmanship:

1.1. Grinding and rubbing shall normally be commenced after 14 days of laying the tiles, except for skirling or small areas, machine shall be used for the purpose.

1.2. First grinding shall be done with carborundum stones of 48 to 60 grade grit fitted in machine. Water shall be properly used during grinding. When the chips show up and the floor has been uniformly rubbed, it shall be cleaned with water baring all pin holes. It shall then be covered with a thin coat of grey or white cement mixed with or without pigments to march the colour of the topping of the tiles. Pin holes if any shall thus be filled. This grout shall be kept moist for sufficient period as directed. Thereafter, second grinding shall be started with carborundum of 120 grit. Grouting and curing shall be followed again. Final grinding shall be done when other works arc finished. The machine shall be fitted with carborundum of grit 220 to 350 using water in abundance. The floor shall then be washed clean with water. Oxalic acid powder shall then be dusted as needed on the surface and the surface rubbed with machine filled with hessain bobs or rubbed hard with pad of woollen rags. The floor shall then be washed cleaned and dried with a soft cloth of linen. The finished floor shall not sound hollow when tapped with a mallet.

1.3. If any tile is disturbed or damaged it shall be refitted or replaced properly jointed and polished.

1.4. For skirting dado or small areas where it is not possible to do machine polishing all the above operations are to be done manually.

2.0 Mode of measurements & payment:

2.1 The rate shall include the cost of all materials and labour involved in all the operations as described above.

2.2. The rate shall be for a unit of one sq. metre.

14.90. Providing and laying brick on edge flooring laid dry, grouted with C.M. 1 : 6 (1 cement: 6 coarse sand) including finishing the joints flush, curing etc. complete.

1.0. Material: Water shall conform to M-l. Cement mortar shall conform to M-l1. Brunt bricks shall conform to M-15.

2.0. Workmanship:

2.1. The flooring shall be laid on concrete sub-grade where so provided. The slope in the floor shall be provided in the sub-grade. Where sub-grade is not provided, the earth below shall properly stopped, watered, rammed and consolidated. Before laying the flooring it shall be moistured. Plinth masonary offsets shall be depressed so as to allow the sub-grade concrete to rest on it.

2.2. Laying : The brick shall be laid in plain, diagonal horring bond, or other pattern as directed. The brick shall be dry laid properly and set home by gentle tapping. On completion of the portion of flooring, the vertical joints shall be grouted with C.M. 1 : 6 and all joints shall be finished flush. The joints shall be as fine a-s possible and not exceeding 5 mm. These points shall be filled with cement mortar 1:6.

2.3. Curing : The brick paving shall be cured for 7 days.

3.0. Mode of measurements & payment:

3.1. The length and breadth shall be measured correct to a centimeter between skirting dado or wall plaster. No deductions shall be made nor extra paid for any opening upto 0.1 sq. ml. in area in the floor. Nothings extra shall be paid for laying the floors at different levels in the same room or courtyard.

3.2. The rate shall be for a unit of one sq. metre.

SECTION-15
DETAILED SPECIFICATIONS OF ITEMS AS PER 'SCHEDULE OF RATES

15.1. Providing corrugated G. I. sheets roofing fixed with galvanised iron 'J' or 'L' hook bolts, and nuts 8 mm. dia with bitumen and G.I. limpet washers filled with white lead complete excluding the cost of purline, rafters and trusses. (1) 1.8 mm. thick sheet.

1.0 Materials : Corrugated G.I. sheets shall conform to M-24.

2.0. Workman.ship :

2.1. Spacing of purlines : One purlin shall be provided at the ridge and one at the caves. The spacing of other purlines for 0.8 mm. thick G.I. sheet shall not exceed 1.80 metres. The purlin shall coincide with the centre line of the end lap. The ridge purlins shall be placed in such a way that the ridges can be fixed properly. The portion overhanding the wall support shall not be more than one fourth of the specing of purlins.

2.2. The lop surface of the purlins shall be painted before the sheets are fixed over them. Embedded portions of purlins shall be finished with two coats of coal-tar.

2.3. Laying of Sheets :

2.3.1. The sheets shall be laid in purlins to a true plane with the line of corrugations truly parallel or normal to the sides of area to be covered. The sheets shall not generally be built into gables and parapets. They shall be bent up along their side edges close to the wall, and the junction shall be protected by suitable flushing or by projecting drip course.

2.3.2. The laps at end shall be provided 150 mm. minimum for roof slopes 1 in2 (1 vertical: 2 horizontal) and steeper but 200 mm. shall be provided for flatter slopes than those above. The side lap shall be provided two ridges of corrugations at each side.

2.3.3. The sheets shall be cut to the dimensions of the shape of the roof either along their lengths or their width or in slant across the line of corrugations at hips and valleys. The sheets shall be cut carefully with a straight edge and chisel to give a straight finish. The sheets shall be laid such that the laps arc turned away from the usual direction of local heavy rain.

2.3.4 Fixing of Sheets:

2.3.4.1. Sheets shall be fixed to the purlins or other roof members such as hips of valley rafter etc. with 'J' or 'L' galvanised hook bolts, and galvanised nuts 8 mm. dia, with bitumen impel washers and G.I. washers. Limpet washers with white lead shall be used. Length of hook bolt shall be varried to suit the suit the requirement. Bolls shall be sufficiently long so that after fixing the project above the top of their nuts by not less than 12 mm. the grip of 'J' or 'L' hook bolts on the side of purlins shall not be less than 25 mm. There shall be minimum of three hooks bolts placed at the ridge of corrugations in each sheets in every purlin, and their spacing shall not exceed 300 mm. coach screw shall not be used for fixing the sheets to purlins, where the slopes of roof are not less than 2 1/2 horizontal). (1 vertical: 2 1/2 horizontal). Sheets shall be jointed together at the side laps by galvanished iron bolts and nuts 25 mm. x 6 mm. size each bolt with a bitumen and G. I. limpet washer filled with white lead. Where the overlaps at the sides extend to two corrugations these bolts shall be placed zig-zag over the two over lapping corrugations, so that the ends of the overlaping sheets arc drawn lightly towards each other. The spacing of same bolls shall not exceed 600 mm. along each of the staggered rows.

2.3.5. Holes for all bolts stall be drilled and not punched in the ridges of the corrugations from the under side, while the sheets are on the ground. The holes in the sheets shall be atleast 50 mm. from the edge. Sheets drilled wrongly shall be rejected. The holes in the washers shall be of the exact diameter of hook, bolts or the scam bolls. The nuts shall be tightened from above to give a leak-proof roof.

2.3.6. The roof when complete shall be true to lines and slopes and shall be lead-proof.

3.0. Mode of measurements & payment:

3.1 The measurements of the C.G.I. sheet roof shall be taken for finished work insuperficial area in general plane (not girthed on the roof). The laps between the C.G.I. sheets both at their ends and along the side edges shall not be measured. The overlaps of C.G.I. sheets over the valley piece and their underlap under the ridge, hip and flashing piece shall be included in the measurements.

3.2. No deductions in measurements shall be made for openings for chimney stacks, sky light etc., of area upto 0.40 sq. mt. nor extra be paid for extra labour in cutting and for wastage etc., in forming such openings.

3.3 The rate of roof shall include the cost of all materials and labour involved in all operations described above. The rate all includes the cost of provision, erection and removal of the scaffolding, benching, ladders, templates and tools required for the proper erection and completion of the work. The rate includes the cost of purlincs, rafters and trusses.

3.4 The rate shall be for a unit of one sq. metre.

15.7. Providing ridges or hips 600 mm. overall in plain G.I. sheets fixed with G.I. 'J' or 'L' hooks bolts and nuts 8 mm. dia G.I. limpet and bitumen washer etc. complete 0.80 mm. thick sheet.

1.0. Materials: The G.I. valley gutters and ridges shall conform M-23. A.

2.0. Workmanship:

2.1. The relevant specifications of item No. 15.1 shall be followed except that the work shall be carried out for ridges or hips. The overlaps for ridges and hips or either side over the C.G.I., sheets and end legs shall be minimum 225 mm. width of the ridges and hips shall be as described in the item.

2.2. Ridges shall be fixed to the purlins with same 8 mm. dia. G.I. hook bolts and nuts and bitumen and G.I. limpet washers, which fix the sheets for the purline. Hips shall be fixed to the roof members with the same 8 mm. dia. G.I. hook bolts and nuts and bitumen and G.I. limpect washers which fixed the sheets. Atleast one of the fixing bolts shall pass through the end laps of the ridges and hips on other sides. If this is not possible, extra hook bolt shall be provided. End laps of ridges and hips shall be jointed together by galvanised firon seam bolts and G.I. washers. There shall be atleast two such bolts in each end lap.

2.3. Ridges and hips shall fit ia squarely on the sheets.

3.0. Mode of measurements & payment:

3.1. The measurements of ridges or hips shall be taken for finished work in length along their centre lines.

3.2. No laps shall be measured.

3.3. The payment for ridges and hips be made in a similar way as in case of C.G.I. sheet roofing.

3.4. The rate shall be for a unit of one running metre.

15.8. Providing valleys 900 mm. overall in plain 1.6 mm. thick G.I. sheet Class -3 fixed with 'J' or 'L' hook bolts and nuts and 8 mm. diameter G.I. Limpet and bitumen washers complete.

1.0. Materials: 1.1. The G.I. valleys 900 mm. overall in galvanised plain sheet of 1.6 mm. thickness shall be of class-3. The valleys shall be 900 mm. wide overall and flashing shall be 380 mm. wide overall. These shall be bent to the required shape without damage to the sheets in the process of bending.

2.0. Workmanship:

2.1. The relevant specifications of item No. 15.1 shall be followed except that the work shall be carried out for G.I. Valleys 900 mm. overall with G.I. sheets 1.6 mm. thickness.

2.2. Wherever the edge of a roof sheeting or valey gutter is turned up against a wall, the edge shall be weather proofed with a flashing. Flashing shall be bent to shape and fixed. Lap over the sheet shall be not less than 150 mm. over the roofing sheets. The end laps between the flashing sheets shall not be less than 225 mm.

2.3. The flashing shall be inserted into brick work or masonary joints to a depth of 50 mm. These joints shall be filled with, cement mortar (1:3). The flashing shall be well secured to the masonry whenever flashing has to be laid at a slope, it shall be stepped at each course of masonry, the step being out back at angle of not less than 30 degrees to the vertical.

2.4. Valleys shall be bent to shape and shall have end lap and projection on either side under C.G.I, sheet not less than 225 mm. Valleys shall be fixed to the roof members below, with same 8 mm. dia. G.I. hook bolts and nuts and bitumen and G.I. limpet washer which fixes the sheets to these members. Atleast one of the fixing bolts shall pass through the end laps of the valley piece. If necessary, extra bolts shall be provided for this purpose.

3.0. Mode of measurements & payment:

3.1. The measurement for valleys shall be taken, for finished work in length along their centre lines.

3.2. No laps shall be measured.

3.3. The rate excludes the cost of boarding underneath which shall be paid separately.

3.4. The rate of dashing includes the cost of mortar for fixing in wall and other labour and materials required for it.

3.5. The rate shall be for a unit of one running metre.

15.10. Providing and fixing 150 mm. wide 450 mm. overall semicircular plain. G.I. sheet class-3 Gutter with iron brackets 40 mm. x 3 mm. size bolts nuts, washers etc. including making necessary connections with rain water pipes: 0.80 mm. thick.

1.0. Materials: 1.1 These shall be of plain galvanised sheets Class -3 of 0.80 mm. thickness. The gutter shall be desirned to carry the maximum discharge from the roof without flowing over and shall be constructed wherever possible with shank channel or gutter.

2.0. Workmanship :

2.1. The longitudunal edges, shall be turned back to the extent of 12 mm. and beaten to form a rounded edge. The ends of the sheets at junction of pieces shall be hooked into each other and beaten flush to avoid leakages.

2.2. The size of gutters shall be as specified in the item.

2.3. The gutter shall be laid with a minimum fall 1 in 120 Gutter shall be true to line and slope and shall be supported on fixed M.S. Flat iron brackets bent to shape or any other suitable bracket.

3.0. Mode of measurements & payment:

3.1. The measurements of gutters shall be taken for finished work in length along their centre lines. No laps shall be measured.

3.2. The rate of gutter shall include the cost of all labour and materials specified above, including all specials such as angles, junctions, dropends or funelshaped connecting pieces, step ends etc. flat iron brackets and bolts and nuts required for fixing the latter to the roof members.

3.3. The rate shall be for a unit of one running metre.

15.20. (A) (I) Providing asbestos cement sheets roofing fixed with G.I. plain and bitumen washers complete excluding cost of purlins, rafters and trusses : 7 mm. thick corrugated sheet.

1.0. Materials : 1.1. Asbestos cement sheets shall conform to M-24.

2.0. Workmanship :

2.1. The maximum spacing of purlins shall be 1.6 metres in case of 7 mm. thick A.C. sheets and 1.4. metres for 6 mm. thick A.C. sheets.

2.2. Laying and fixing of Sheets: The sheets shall be laid on the purlins and other roof members as per code of practice. Top bearing surfaces of all purlins and other roof members shall be is one plane so that the sheets when being fixed shall not be required to be forced down to rest on the purlins. The finished roof shall present uniform slope and the line of corrugation shall be straight and true. The sheets shall be laid with smooth side upwards. Corrugated sheets shall be laid starting at the eaves either from left to right or right to left depending upon the direction of wind before actual laying of the sheets is started. The purlins spacing and the size of sheets shall be checked to ensure that the arrangements shall provide the laps required and the specified overhang at the eaves. In case the sheets are laid from right to left, the first-sheet shall be laid uncut but the remaining sheets in the bottom row shall have the top left hand corners cut or mitred. The sheets in the second and other immediate rows shall have bottom right hand corner of the first sheet cut. AU other sheet except the last sheets shall have both bottom right hand corners and top left hand corners cut. The last sheet shall have only top left hand corner cut. The last of the top row sheets shall have the bottom right hand corner cut with exception of the last sheet which shall be left uncut. If the sheets are laid from left to right, the first sheet shall be laid and cut and the remaining procedure shall be reversed.

2.3. The free overhang of the sheets at the eaves shall not exceed 400 mm. in case of 7 mm. thick sheets and 300 mm. in case of 6 mm. thick sheets.

2.4. The mitre described above is necessary to provide snug fit. Where 4 sheets meet at a lap the length of mitre shall be 150 mm. and the width of mitre shall be equal the width of the side lap. The cutting may be done with ordinary wood saw at site.

2.5. Laps : The sheet shall be laid with an end lap of 150 mm. minimum. In case of roof with a pitch flatter than 1 vertical to 2½ horizontal (Approx. 22°) or in the case of very exposed situations appropriate larger laps may be provided.
The sheets shall be laid with side lap of half a corragan.

2.6. Fixing Accessories: The sheets shall be secured to the purlins and other roof members by means of 8 mm. dia galvanized iron bolts (J) type hook bolls in case of angle iron purlins and "L" type bolts in case of R.S. joints, precast concrete or timber purline, and nuts bearing on galvanised iron washers and bitumen washers. The grip of 'J' or 'L' bolts on the side of purlins shall not be less than 25 mm. Each galvanised iron 'J' or 'L' hook bolts shall have a bitumen washer and galvanised iron washer placed Over the sheets before the nuts is screwed down from above. On each purlin there shall be one hook bolt on the crown adjacent to the side lap on cither side. Bitumen washer shall be of approved quality. The G.I. flat washer shall be 25 mm. in diameter and 1.60 mm. thick and bitumen washer shall be 35 mm. in dia. and 1.5 mm. thick with hole to suit the required size of fixing accessory. Each nut shall be screwed lightly at first. After a dozen or more sheets are laid, the nuts shall be tightened to ensure a leak-proof joint and also nuts tightened only to extent so as to prevent damage to the sheets. The length of the 'J" bolls or crank bolts shall be 75 mm. more then the depth of purlins for single sheets fixing and 90 mm. more where two sheets overlap or where ridges or other accessories are lo be fixed. The minimum length of coach screw for timber purlins shall be 110 mm.

2.7. Holes: The holes for fixing the sheet shall be drilled in the centre of end lap of sheets to suit the purlins i.e. on the centre line of the purlins, if these are of timber and square head coach screws are used, or as close as possible to the back of purlins if 'J' or 'L' bolts arc used as with steel angles or precast concrete or timber purlins. Holes for hook bolts etc. shall be 2 mm. more than the diameter of the fixing bolls. No holes shall be nearer than 40 mm. lo any edge of sheet or accessory.

3.0. Mode of measurements & payment:

3.1. The relevant specifications of item 15.1. shall be followed except that the over lap of the corrugated sheets over valley gutters, roof lights, caves, filler pieces and underlay of ihe corrugated sheets below ridges, hips, north light curves, flashing pieces, roof light sheets and barge board shall be included in the measurement. No deduction shall be made for holes cut for extractors or cowl type ventilators. Deducations shall be made for roof light sheets.

3.2. The rate shall be for a unit of one sq. metre.

15.20. (A) (III) Providing asbestos cement sheets roofing fixed with G.I. plain and bitumen washers complete excluding the cost of purlins, rafters and trusses : 6 mm. thick corrugaled sheets.

1.0. Materials & Workmanship : The relevant specifications of Item No. 15.20 (A) (I) shall be followed except that the thickness of A.C. sheets shall be 6 mm.

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item No. 14.20 (A) (I) shall be followed.

2.2. The rate shall be for a unit of one sq. metre.

15.25. (D) Providing and fixing ridges and hips in asbestos cement sheets roofing with G.I. 'J' or 'L' hook, bolts and nuts 8 mm. dia. G.I. plain and bitumen washers complete : North light adjustable ridges.

1.0. Materials : 1.1. The ridges and hips of Asbestos cement sheets roofing shall conformt o M-24.

2.0. Workmanship :

2.1. The relevant specifications of item No. 14.21 (A) (I) shall be followed except that the work is lo be carried out for ridges and hips in A. C. Sheet roofing.

2.2. The ridges shall be laid as per manufacture's instructions with rolls of the two wings in case of adjustable ridges, fitting closely and with a separation of serrated ridges registering correctly with the sheet underneath. The staggered lapping of two wings of adjustable ridge section and the lap between the adjacent pieces on the same wing of ridges shall be as per manufacturer's instructions. The end portionof the wing of the adjustable ridges which project beyond verges of the roof shall be cut and trimmed off neatly.

2.3. Hips : In laying hip pieces, serrations to suit the corrugation in the sheets below should be cut inthem so that they shall be snug fit over the sheets. The wings of ridges shall Le fixed to the sheet below with seam boils and nuts 8 mm. dia. G.L. 'J' or 'L' hook bolls and bitumen and G.I. washers which fix the sheets to the purlines. In addition, in north %hl adjustable ridges, the roll of the two wings shall be jointed together at their crown, with 8 mm. dia. G.I. scam bolls and nuts at the rate of two numbers per pair wings. Each scam bolt shall be provided with one bitumen and a pair of G.I. washers. Where the plain wing angular or plain wing adjustable ridges are used, the gaps formed by roofing corrugation and the wings shall be filled with C.C. (1:2:4) upto a full length of the overlaps. The exposed face shall be finished perpendicular to the sheeting. Wings of hips shall be fixed to tehr roof members below with the same. 8 mm. dia. G.I. 'J' or 'L' bolls and end nut which fix

the sheets to the member. In addition, they shall be secured to the sheet below with 8 mm. dia. G.I. seam bolts, nuts and washers so that taken together with hook bolts, there shall be bolt on each wing at least at every fifth corrugation of the sheets below in case of corrugated and at least every second corrugation of the sheet below in case of semi-corrugated sheets. Each seam bolt shall be provided with one bitumen and pair of G.I. washers.

3.0. Mode of measurements & payment:

3.1. Measurements of ridges, hips and other accessories shall be for nished work and die length shall be taken along the centre line. The lap shall not be measured. The under lap of ridges under expansion joint pieces shall be measured.

3.2. The rate shall be for a unit of one running metre.

15.26. Filling cement concrete 1:2:4(1 cement: 2 coarse sand: 4 graded stone aggregate 12.5 mm. nominal size) in gaps of A.C. sheet corrugation and wings of ridges.

1.0. Materials : Water shall conform to M-l. Cement shall conform to M-3. Coarse sand shall conform to M-6. Stone grit shall conform to M-8.

2.0. Workmanship : 2.1. The relevant specifications of item No. 5.4.1. of C.C. shall be followed except that the work shall be for filling gaps of A. C. Sheet corrugation and wings of ridges.

3.0. Mode of measurements & payment;

3.1. The measurements of filling gaps in ridges, hips of A.C. sheet corrugation and wings or ridges shall be for finished work. The length shall be measured along the centre line.

3.2. The rate shall be for a unit of one running metre.

15.27 (III) Providing and fixing asbestos cement roofing accessories with galvanised iron 'J' or 'L' hook bolts and nuts G.I. plain and bitumen washer etc. complete : North light and ventilator curves.

1.0. Materials & Workmanship :

1.1. The relevant specifications of item No. 15.10 (I) shall be followed except that the work is tarried out for accessories for asbestos cement roofing north light and ventilator curfves.

1.2. The accessories such as north light and ventilator curves shall be laid and secured with same G.I. hook bolts to secure the sheets to the roof, or with separate G.I. hook bolts to the roof members below and/or with 8 mm. dia. G.I. seam bolts, nuts and washers to the sheeting, generally as per manufacturer's written instructions.

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item No. 15.25 (D) shall be followed.

2.2. The rate shall be for a unit of one running metre.

15.29 (I) Providing and fixing asbestos cement socketed half round eaves gutter with bolts, nuts, bitumen washer etc. and flat iron brackets 40 mm. x 3 mm. size including asbestos rope and plastic roofing compound in joints complete: 150 mm. nominal size.

1.0. Materials & Workmanship

1.1. The relevant specifications of item No. 15.10 (I) shall be followed except that the asbestos cement socked half round eaves gutter shall be provided. The size of gutter shall be 150 mm. nominal.

1.2. Gutters shall be laid with a minimum fall of 1 in 120 which should increase where possible. Gutters shall be tur eto line and slope and shall be laid with requisite accessories such as drop ends, nozzles, angles and union slips, as directed. The size of outlet of dropends and nozzles shall be the same as the size of rain water pipe into which they discharge water. Gutters and their accessories shall be supported by M.S. flat/iron bracket. Where these are required to be fixed to the side of rafter they shall be fixed with 40 him. by 3 mm. section bent to shape and fixed rigidly to the sides of the rafter with 3 Nos. of 10 mm. dia. bolts, nuts and washers. The brackets shall overlap the rafter not less than 300 mm. and connecting bolts shall be 115 mm. centres.

1.3. Where the brackets are to be fixed with purlins, these shall consist of 40 x 3 M.S. flat iron bent to shape with one and turned at a right angle and fixed to the purlins face with a 10 mm. bolt, but and washer. The perpendicular over handg portion of 40 mm. x 3 mm. bracket shall be stiffended by another 40 x 3 mm. flat bent to right angle shape with its longer leg connected to the bracket with two numbers of 6 mm. dia. M.S. bolts, nuts and washwers and its shorter legs fixed to the face of purlins with one number 10 mm. dia. bolts, nuts and washers. The overhang of the vertical portion of the flat iron bracket from the face of the purlin shall not exceed 225 mm.

1.4. Requisite slope in the gutter shall be given in the line of bracket. The brackets shall be placed at not more than 900 mm. centres.

1.5. The gutters shall be fixed to the brackets with 2 Nos. 8 mm. dia. G. I. seam bolts and nuts, each bolt and nut being equipped with a pair of bitumen and G. I. washers. These connecting bolts shall normally be above the water line of gutter.

1.6. Spigot and socket end of gutters of socketed half round gutter and their accessories shall be connected together at their laps with one row of 8 mm, dia. G. I. bolts and nuts. Each of the bolts and nuts shall be provided with a pair of bitumen and a pair of G. I. washers. The gap between socket and spigot shall be packed with approved plastic roofing compound and flanked on the both sides with 6.35 mm. dia. asbestos rope. The connecting G.I. Bolt shall be then tightened so that the lapped joint becomes leak-proof. The outer face of packed asbestos rope shall not be further than 6mm. from the edges of the spigot and socketed ends. Where both ends of gutters and/or their accessories to be connected together are spigot ends, they shall be laid as butt jointed with 1.5 mm. gap in between over union clips. The union clips connected to the two butt ends of the gutter or other sections with twp rows. The gap between union clips and ends of gutter sections or accessories shall be packed with plastic roofing compound flanked with edges of 6.35 mm. dia. asbestos ropes as before. The whole joint shall be made leak-proof by tightening the bolt.

2.0. Mode of measurements & payment:

2.1. The asbestos socketed half round eaves gutter shall be measured for finished work and the length shall be measured along the centre line.

2.2. The rate of gutters shall include the cost of providing and fixing accessories such as dropends, stop ends, nozzles and fixing union clips together with bolts, nuts and washers.

2.3. The rate shall be for a unit of one running metre.

15.29. (II) Providing and fixing Asbestos cement stocketed half round eaves gutters with bolus, nuts, bitumen washers etc. and flat won brackets 40 mm. x 3 mm. size including Asbestos rope and plastic roofing compound in joints etc. complete. 300 mm. nominal size.

1.0. Materials & Workmanship :

1.1. The relevant specifications of item No. 15.29 (I) shall be followed except that the size of the Asbestos socketed eaves half round gutter shall be 300 mm. nominal size.

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item No. 15.29 (I) shall be followed.

2.2. The rate shall be for a unit of one running metre.

15.51. Tiled roofing with Mangalore pattern roof tiles including teak reepers of size 50 mm. x 25 mm.

1.0. Materials : (1) Mangalore pattern roof tiles shall conform to M-25 (2) Teak wood battern shall conform to M-29.

2.0. Workmanship:

2.1. Laying: The maximum distance between centre to centre of rafters shall be not more than 600 mm. Teak wood reepers 50 mm. x 25 mm. shall be nailed to each rafter at central distances suited to the size of the tiles by means of nails 50 mm. long. The reepers shall be well seasoned teak wood and shall be straight places of uniform size and colour and not shorter than the length necessary to cover at least four rafter. The under face and sides of the reepers shall be planed before fitting up. Joints shall come over the rafters. The joints of two adjacent rows of reepers shall not come over the same rafter. At the eaves, there shall be two reepers of such thickness and shape that the uniformity of the top slope of the roof shall be preserved.

2.2. The work of valleys shall be executed as under:

Galvanised iron sheet 1200 mm. wide and 1.25 mm. thick shall be used for valleys. The sheet shall extended by about 450 mm. under tiles on either side in a depth of 100 mm. at centre. The sheet shall be carried 75 mm. into the wall and set with cement mortar unless flashing is specified. The laps, if any, on the slope shall be 300 mm. The sheets shall be laid over the reepers and nailed. Two repers 50 mm. x 25 mm. each shall be fixed over the galvanised iron sheet 150 mm. away from the centre line of the valley on either side to keep the tiles and mortar from falling into the gutter of the valley.

2.3. Laying: The tiles shall be laid from the eaves towards the ridges after fitting of the reepers, the rebate of the tiles resting fully against the reepers. The joints of the hips and ridges tiles and also those between them and the plain tiles shall be set in and well grouted with lime mortar and, the mortar surface painted and finished off with a mixture of red panint and portland cement to preserve of colour. The finished slop of roof shall be uniform ridges to eaves. The eaves line shall beprefectly staight, horiaonml and parallel to each other. The end ever gable shall be protected by lime borders and neatly finished.

2.4. At the side of valleys and for 230 mm. on either side of the roof at valleys, cement plastering 12mm. thick shall be done to prevent the rain water from the gutter leaking by the side of valleys.

2.5. At the eaves, wind tie shall be pieced over the ends of the last tiles and secured by means of galvanised iron washers and scraws 25 mm. into the rafte to prevent tiles from being blown up. Care shall be taken (p put the screws in the ridges and not in the gutter of the tiles, where, full tiles are not necessary, half tiles manufactured for the purpose shall be used.

3.0. Mode of measurements & payment:

3.1. The measurements of the roof shall be taken for finished work for superficial area flat in the plane of the roof and not girthed. Laps shall not be measured.

3.2. No deduction in measurements of roof shall be made for openings of area upto 0.40 sq. mt. nor shall any extra be paid for labour and wastage in forming such openings.

3-3. The rate includes the cost of all materials and labour including ridges, hips, eaves and battens.

3.4. The rate shall be for a unit of one sq. metre.

15.75. Providing and fixing five course water proofing treatment felt consisting of second and fourth course of blown bitumen or/and residual bitumen applied hot 1.20 kg./sq. mt. of area for each course and first course with fibre base self finished felt type 2 Grade-I, fifth and final course of stone grit 6 mm. and down size or pea sized gravel spreaded at 0.008 cum/sq. mt. including preparation of surface, excluding grading complete.

1.0. Materials : The tarfelt shall conform to M-76. The bitumen primer shall conform to I.S. 3388-1965. The bitumen shall conform to I.S. 702-1961. The grit or gravel shall conform to M- 8.

2.0. Workmanship:

2.1. Preparation of surface :

2.1.1. Well defined cracks other than hair cracks in the roof structure shall be cut to 'V' section cleaned and filled up flush with cement sand slurry or with bitumen conforming to I.S. 702-1961. The surface to be treated shall have a minimum slope of 1 in 120. The grading shall be carried out prior to the application of water proofing treatment by cement mortar or line surkhi mortar or as specified in description of item.

2.1.2. The surface of room, part of parapet and gutters, drain mouths etc. over which the water proofing treatment is to be applied, shall be cleaned of all foreign matter such as fungus, moss and dust by wire burshing and dusting.

2.1.3. Drain outlet shall be suitably placed with respect to the roof gradient to ensure rapid drainage and prevent local accumulation of water on the roof, surface, masonry drain mouth, shall be widen sufficiently and rounded with cement mortar.

2.1.4. Form cast iron drain outlets, a groove shall be cut all round to touch the treatment.

2.1.5. When a pipe passess through a roof on which water proofing treatment is to be laid, a cement, concrete angle fillet shall be built round it and the water proofing treatment taken over the fillet.

2.1.6. In case of parapet wall over 450 mm. in height for tucking in the waterproofing treatment, a horizontal groove 75 mm. wide and 65 mm. deep at minimum height of 150 mm. above roof level shall be left in the vertical face at the time of construction, the horizontal face of the groove shall be shaped with cement mortar 1:4.

2.1.7. In case of low parapet where the height does not exceed 450 mm. no groove shall be provided and the water proofing treatment shall be carried right over the top.

2.1.8. In case of existing R.C.C. and stone walls cutting the chase for tacking in the water proofing treatment is not recommended.

2.1.9. At the junction between the roof and verifical face of the parapet wall, a fillet 75 mm. in radius shall be constructed.

2.1.10. At the drain mouths the fillet shall be suitably cut back and rounded off for easy application of water proofing treatment and easy flow or water.

2.1.11. Outlet at every low dividing wall about less than 300 mm. in height shall be rounded smooth and corners rounded off for easy application of water proofing treatment.

2.2. Priming coat:

2.2.1. Bitumen primer shall conform to I.S. 3385-1965. A priming coat consisting of bitumenous solution of low vicosity shall be applied with brush on the roof and wall surface at specified per unit area to assist adhesion of bonding materials as specified in the description of the item.

2 2.2. Where a floating treatment of water proofing with self finished bitumen felt is required i.e. where water proofing treatment is required to be isolated from the roof structure, layer el bitumen saturated felt (underlay) shall be spread over the of surface arid tucked into the flashing grooves, to keep the underlay free from the structure no bonding materials shall be ued below underlay. Overlaping to the adjoining strip of underlay shall be minimum of 75 mm. at sides and 10 mm. at ends and shall be sealed with the same bonding materials, as used for the self finished felt treatment. The underlay shall be of type-1 saturated felt conforming to I. S. 1322-1970.

2 3. Laying of Felt:

2.3.1. The self-finished tarfelt shall be cut to the required lengths, brushed clean of dusting materials, laid out flat on the oof to eliminate curls and subsequent stretching. The felt shall be laid in length running at right angles to the direction of run off gradient commencing at the lowest level and working upto crest, so that the lower laps of the adjacent felt layer offer minimum obstruction to the flow of water. The fell shall not be laid in a single piece of very long lengths as it is likely to shrink 6 to 8 metres are suitable length. The roof shall be cleaned and dried before the felt treatment is begun. Each length shall be laid in position and rolled up for a distance of half it slengths. The hot bonding materials heated to correct working temperature as specified by manufacture shall be poured on to the roof across the full width of the felt as the later is steadily unrolled and pressed down. The excess of bonding materials which squeezes out at the ends shall be removed as ‘he laying proceeds. The pouring shall be so regulated that correct weight of the bonding materials as per unit area is spread uniformly over the surface when the first half of the tarfelt has been bonded to the roof, the other half shall be rolled up and then unrolled on the hot bonding materials in the same way. Subsequent strips shall also be laid in the same manner. Each strip shall overlap the preceeding one by at least 75 mm. at the longitudinal edges and 100 mm. at the ends. All overlaps shall be firmly bonded with hot bitumen. Streaks and trailings of bitumen near edges of laps shall be levelled by heating the overlaps with blow lamp and levelling down unevenness.

2.3.2. Third layer of bonding materials in four course treatment shall be carried out in similar manner after the flashing has been complete.

2 3.3. Water proofing treatment shall be carried out in the drain pipe or outlets by atleast 100 mm. The water proofing treatment laid on the surface shall overlap the upper edge of water proofing treatment in the drain outlets by atleast 100 mm. Flashing felt shall be laid as flashing. Wherever junction of vertical horizontal surface occurs longitudinal laps shall be 100 mm. The 1ower layer of flashing felt shall overlap the roofing felt by 100 mm. on vertical and sloping faces. Last course of flashing shuld not be of stone, grit or pea sized gravel but it shall be replaced by providing two coats of bitumen solution of approved quantity.

2.3.4. The lower edge of flashing shall overlap the flat portion of the roof and the upper edge of the flashing shall be tucked to the horizontal groove 75 mm. thick wide, 65 mm. deep provided at minimum height of 150 mm. from top of the roof surface. The flashing treatment shall be firmly held in place in the grooves with wooden wedges at intervals and the grooves shall be followed with cement mortar 1 : 4 (1 cement: 4 coarse sand) or cement concrete (1 : 2 : 4)(1 cement: 2 coarse sand : 1 graded stone aggregate 6 mm. nominal size) and surface finished smooth with the rest of wall. The cement work shall be cured for 7 days. When dry, the exposed plaster joints of grooves shall be pointed with bitumen and two coats of bitumenous solution shall be applied on the vertical and sloping surface of flashing.

2 3.5. After the lop flashing felt layer has been laid, the penultimate layer of bonding materials shall be applied over the roofing felt and horizontal overlap, and vertical and sloping surface of flashing shall be spread uniformly over the hot bonding materials on the horizontal roof surface and pressed into it with wooden roller.

2 3.6. The material for surface finish shall be spread as described in the item over top layer.

2 3.7. If ballooning occurs the defects may be rectified as under:

2 3.8. Remove the gravel on the ballooned surface. Then cut open and squeeze out the trapped vapour by firm pressure applied by hand, seal the bitumer felt so lifted back on the surface by applying additional bitumen, finally seal the cut with piece of bitumen felt with bitumen application.

3.0. Mode of measurements & payment:

3 1. The measurements for this item shall be taken as under:

(a) Waterproofing of roof with bitumen shall be measured in sq. mt. length and breadth shall be measured correct to centimetre.

(b) Measurement shall be taken for the superficial area of roofing and flashing treatment including flashing over the parapet

wall, low dividing walls and expansion joints and at the pipe projections etc. Overlapping and tucking into flashing groover shall not be pleasured.

(c) Sloping and vertical surface of water proofing treatment shall be measured under the four or five course treatment as the case may be irrespective of the fact that the final course of grit or gravel is replaced by bitumen primer.

(d) In measurements, no deduction shall be made for either openings or recesses for chimney stacks roof lights etc. for areas upto 0.40 sq. mt. nor anything extra shall be paid or extra labour and materials in forming such openings. For similar area exceeding 0.40 sq. mt. deduction shall be made in measurements for full opening but nothing extra shall be paid for extra labour and materials in forming such openings.

(e) The grading (coba bedding) shall be paid separately but cleaning of surface and treating the cracks shall not be paid separately.

(f) Cutting of horizontal grooves in parapet walls for tucking in wawa proofing treatment shall not be measured or paid separately.

3.2. The rate includes cost of all materials and labour.

3.3. The rate shall be for a unit of one sq. metre.

15.87 (A) Providing and fixing on wall face C.I. rain water pipe including filling the joints with spun yam socked in neat cement slurry and cement mortar 1 : 2 (1 cement: 2 fine sand) 75 mm. dia.

1.0. Materials : Water shall conform to M-l. The C.I. rain water pipes and fittings shall conform to M-68. Cement mortar shall conform to M-11.

2.0. Workmanship:

2.1. C.I. rain water pipes shall be of the specified diameter and shall be in full lengths of 1.8 metres including socket ends of the pipes unless shorter lengths are required at junctions with fittings.

2.2. Fixing : The pipe and fillings shall be fixed in vertical alignment unless otherwise specified and shall be secured to the walls at joints with M.S. clamps. The clamps shall be M.S. sheet 30 mm. bent to required shape and size so as to fit tightly on the socket of-pipe when tightened with screw bolts. It shall be formed out of two semi-circular pieces, hinged with 6 mm. dia. M.S. pin on one side and provided flanged ends on the other side with holes to fit in the screw boll and nut 40 mm. long. The clamps shall be provided with hook made out of 275 mm. long, 10 mm. dia. M. S. bar rivetted to the ring at the centre of one semicircular piece. The clamps shall be fixed to the walls. The damps shall be kept above 25 mm. clear of finished face of wall so as to facilitate cleaning and painting the pipes.

2.3. The pipe shall be fixed vertically. The spigot of the upper pipe shall be properly fitted in the socket of the lower pipe such that there is uniform annular space for filling with the jointing materials. The annular space between the spigot and socket shall be filled with a few turns of spun yarn socked in cement slurry or blown bitumen 85/25 grade. These shall be pressed home by caulking tools. The joints shall then be filled with stiff cement mortar 1:2(1 cement: 2 fine sand) well pressed with caulking tools and finished smooth at top at an angle of 45° sloping up. The joints shall be kept wet atleast for 7 days by typing four fonds of gunny bag to the pipe and keeping it moist constantly.

3.0. Mode of measurements & payment:

3.1. The relevant specifications of item No. 15.93 (B) of A.C. rain water pipes shall be followed except that the C. I. rain water pipe shall be fixed.

3.2. The rate shall be (or a unit of one running metre.

15.88. (A) Providing and fixing M.S. Holder bat clamps of approved design to C. I. or S.C.I, pipes embedded and including cement concrete blocks (100 mm. x 100 mm. x 100 mm. size in 1 : 2 :4 (1 cement 2 coarse sand: 4 graded, stone aggregate 20 mm. nominal size) and cost of cutting holes and making good the walls etc. complete: 75 mm. dia.

1.0. Materials Workmanship:

1.1. The relevant specifications of item No. 15.94 (B) shall be followed except that the M. S. holder bat clamps of approved design shall be for C. I. rain water pipe-75 mm. dia.

1.2. The bat clamps shall be fixed as directed with C. C. blocks of 100 mm. x 100 mm. x 100 mm. The relevant specification of item No. 5.4.1. shall be followed for concrete work.

2.0. Mode of measurements & payment:

2.1. The bat clamp of M. S. holder suitable for 75 mm. dia. shall be measured for finished item.

2.2. The rate includes cost of all materials and labour etc. required for satisfactory completion of this item.

2.3. The rate shall be for a unit of one Number.

15.93 (A) Providing and fixing and embedding sand C I. rain water pipe in the mason surrounded with 12 mm. thick cement mortar of the same mix as that of masonry : 75 mm. dia pipe.

1.0. Materials: Water shall conform to M-1. Cement mortar shall conform to M-11. The C. I. pipe and fittings shall conform to M-68.

2.0. Workmanship:

2.1. The relevant specifications of item No. 15.87 (A) shall be followed except the C. I. pipe 75 mm. dia. shall be embedded in masonry surrounded with 12 mm. thick cement mortar.

2.2. The pipes shall be fixed in the masonry work as it proceeds. The pipe shall be kept vertical or to the line as directed. The pipe shall have minimum surroundings of 12 mm. thick cement mortar at every portion of external surface. The length shall be caulked with spun yarn and cement mortar as soon as the next length of pipe is placed in position. The socket end the pipe shall be kept closed till the next length of pipe is fitted and jointed to prevent any brick-bats or concrete or pieces of wood falling in and chocking the pipes.

3.0. Mode of measurements & payment:

3.1. The relevant specifications of item No. 15.87 (A) shall be followed.

3.2. The rate shall be for a unit of one running meter.

15.93 (B) Providing and fixing on wall face asbestos cement rain water pipe including jointing with spun yarn soaked in bitumen and cement mortar 1:2(1 cement 2 coarse sand) complete 80 mm. dia.

1.0. Materials : 1.1. Asbestos cement pipes of 80 mm. dia. shall conform to I. S. : 1626-1960 for pipes fixed on wall face. A.C. pipe shall conform to M-74.

2.0. Workmanship:

2.1. Asbestos cement rain water pipes and fittings shall be of the diameter, size and type specified in the item. The pipe shall be fixed in full lengths of 2 metre as far possible. All the pipes shall be fixed on wall face at locations indicated on drawings or as ordered by the Engineer-in-charge. Pipe shall be secured to face of wall below all joints by M.S. clamps with wooden gutties.

2.2. The spigot of the upper pipe shall be property fitted into the socket ol the lower pipe such that there is uniform annular pace for fitting with the jointing materials. One third depth of annular space between the socket and the spigot shall be filled with spun-yarn socked inbitumatic jointing compound and shall be pressed home by means of a caulking tool. The remaining 2/3 depth of the joints shall be filled in with stiff cement mortar 1 : 2 and shall be pressed with caulking tool and finished smooth at top at an angle 45° sloping up.

3.0. Mode of measurements & payment:

3.1. The pipe shall be measured including all fittings along its length in running metre. No allowance shall be made for the portion of pipe length entering the sockets of the adjacent pipe or fittings.

3.2. The rate includes the cost of all materials and labour involved in all the operations including jointing.

3.3. The rate shall be for a unit of one running metre.

15.93 (C) Providing and fixing on wall face Asbestos cement rain water pipe including jointing with spun yarn soaked in bitumen and cement mortar 1 : 2 (1 cement: 2 coarse sand) complete : 100 mm dia.

1.0. Materials & Workmanship :

1.1. The relevant specifications of item No. 15.93 (B) shall be followed except that the diameter of pipes shall be 100 mm.

2.0. Mode of measurements & payment:

2.1. The pipe shall be measured including all fittings along its length in running metre. No allowance shall be made for the portion of pipe length entered into the sockets of the adjacent pipe of fittings.

2.2. The rate incudes the cost of all materials and labour involved in all the operations including jointing.

2.3. The rate shall be for a unit of one running metre.

15.94 Providing and fixing for A. C. pipe on wall plugs and standard holder bat clamps comprising of two semi circular halves of flat iron and cast iron base screwed on wooden plugs : 80 mm. dia.

1.0. Materials & Workmanship :

1.1. The bat clamps shall consist of a cast iron base with a projecting 'I' shaped lay, teeth web of which the semicircular halves of the flat iron clamps are bolted. The base on the holder bat clamp shall be screwed on a pair of wooden plugs fixed in the wall with screw sloted driven through the holes in the base. The screws shall be not less than 75 mm. long for 80 mm. diameter pipes and 100mm.for 100 mm. diameter pipes. The plugs shall be fixed in the wall to a depth of 150 mm. in cement mortar 1: 2 centrally to the holes in the base of the bat clamps and with their front face projecting to such a length from the brick face that when the bat clamp is fixed, the outer base of its base shall be flush with the plaster face of the wall. The plugs shall be 110 mm. x 50 mm. wide at face increasing to 160 mm. x 70 mm. width at rear and shall be 70 mm. deep through out.

2.0. Mode of measurements & payment:

2.1. The work shall be measured on number basis of clamps prescribed with accession including cost of all materials and labour Involved in all the operation including jointing etc. complete fixing in position etc. complete.

2.2. The rate shall be for a unit of one number.

15.94(C) Providing and fixing for A.C. pipe on wall plugs and standard holder bat clamps comprising of two semi circular halves of flat iron and cast iron base screwed on wooden plugs: 100 mm. dia.

1.0. Materials & Workmanship : 1.1. The relevant specifications of item No. 15.94 (B) shall be followed except that the standard holder bat clamps shall be for A.C. pipe of 100 mm. dia.

2.0. Mode of measurements & payment:

2.1. The work shall be measured on number basis of clamps including cost of all materials and labour involved in all the operation including jointing, fixing in position etc. complete.

2.2. The rate shall be for a unit of one number.

15.95(A) Providing and fixing on wall face asbestos cement fittings for rain water pipe including jointing with spun yarn soaked in bitumen and cement mortar 1:2(1 cement: 2 coarse sand) Bend of required degree-80 mm. dia. without door. 100 mm. without door.

1.0. Materials : 1.1. The bend of required degree and size as specified in item shall be of best quality and make as approved by the Engineer-in-charge. The fittings shall conform to I.S. 1626-1960.

2.0. Workmanship: 2.1. The fitting (bends of required degree) shall be fixed as per relevant specifications of item No. 1593 (B) except that the A.C. bends of required degree shall be provided instead of pipe.

3.0. Mode of measurements & payment: 3.1. The rate shall be for a unit of one member.

15.95 (B) Providing and fixing on wall face Asbestos cement fittings for rain water pipe including jointing with spun yarn soaked in bitumen and cement mortar 1:2 (1 cement: 2 coarse sand) offset 5C :nm. (2) 80 mm. dia. (3) 100 mm. dia..

1.0.Materials & Workmanship: 1.1. The relevant specifications of item No. 15 .9 5 (A) shall be followed except that the off set 50 mm. of specified size of A.C. pipe shall be used instead of bends.

2.0. Mode of measurements & payment: 2.1. The rate shall be for a unit of one number.

15.95 (C) Providing and fixing on wall face Asbestos cement fittings for rain water pipe including jointing with spun yam soaked in bitumen and cement mortar 1 : 2 (1 cement: 2 sand) off set 75 mm. (2) 80 mm. dia. (3) 100 mm. dia.

1.0. Materials & Workmanship : 1.1. The relevant specifications of item No. 15.95 (A) shall be followed except thai offset 75 mm. specified size of A.C. Pipe shall be provided instead of bends.

2.0. Mode of measurements & payment: 2.1. The rate shall be for a unit of one number.

15.95 (J) Providing and fixing on wall face Asbestos cement fittings for rain water pipe including jointing with spun yarn soaked in bitumen and cement mortar 1:2(1 cement: 2 coarse sand) junction equal angle. (3) 80 mm. dia. without door. (5) 100mm. dia. without door.

1.0. Materials & Workmanship: 1.1. The relevant specifications of item No. 15.95 (A) shall be followed except that junction of angle of specified size of A. C. Pipe shall be provided instead of Bends.

2.0. Mode of measurements & payment: 2.1. The rate shaH be for a unit of one number.

15.95 (K) Providing and fixing on wall face Asbestos cement fittings for rain water pipe including jointing with spun yam soaked in bitumen and cement mortar 1:2 (1 cement: 2 coarse sand) 1 junction of equal double angle. (3) 80 mm. dia. without door. (5) 100mm. dia with out door. .

1.0. Materials & Workmanship 1.1. The relevant specifications of item No. 15.95 (A) shall be followed except that junction of equal double angles of A. C. rain water pipe of specified size shall be provided instead of A.C: bend.

2.0. Mode of measurements & payment: 2.1. The rate shall be for a unit of one number.

15.95 (L) Providing and fixing wall face Asbestos cement fittings for A.C. rain water pipe including jointing with spun yarn soaked in bitumen and cement mortar 1: 2 (1 cement: 2 coarse find): Standard shoe (2) 80 mm. dia. (3) 100 mm. dia.

1.0. Materials & Workmanship : 1.1. The relevant speciftcafcon of item No. 15.95 (A) shall be followed except that the standard shone of A.C. Pipe of specified size shall be provided instead of bend.

2.0. Mode of measurements & payment: 2.1. The rate shall before unit of one number.

SECTION-16

DETAILED SPECIFICATIONS FOR CEILING LINING AS PER "SCHEDULE OF RATES"

16.3 (A) Providing and fixing wooden planks ceiling with tongued and grooved jointing and wood screws (frame work and cover Fillets in be measured and paid separately) : Indian Teak Wood (i) 12 mm. thick (ii) 20 mm. thick (iii) 25 mm thick.

1.0. Materials : 1.1 The India Teak wood shall conform to M-29.

2.0.Workmanship:

2.1. General : The planks shall be clean sawn in the direction of the grain, cut, square and straight. Each plank shall have tongued and grooved jointing. On exposed faces, it shall planed for full face.

2.2 The frame for supporting the ceiling may be wooden or metal and the size and the other details of frame work shall be as directed. Suspenders of M.S. angles or other sections may be used for suspending the frame. Use of wooden suspenders shall be permitted, the bottom surface of the frame shall be checked and corrected to true surface and slope.

2.3. Fixing: Planks of specified timber and thickness shall be used. The width of the planks shall not be more than 100 mm. upto 20 mm. thick planks and 150 mm. for planks above 20 mm. thick and length shall not exceed 3 metres. The planks shall be of uniform width except in the first and last lines of planks adjacent to the walls where remaining additional odd width shall be adjusted equally on both sides. The minimum length of planks in finished work shall be such that it will span at least two spacings of the supporting frame work except where shorter lengths are unavoidable. The planks shall be planed true on the exposed sides.

2.4. The longitudinal edges of the planks shall be jointed with tongued and grooved type joints as described in the item.

2.5. The outer lines of planks shall be accurately fixed parallel and close to the wall. Each subsequent polank shall be carefully jointed up. The plank shall be fixed to the frame above with two screws at each and joint of frame and one at every intermediate joint. (The screws shall not be thinner than designation 8 and of a length not less than twice the thickness of the boards) The screws shall be counter sunk and the screw holes filled with putty or sloping out way. The unexposed face of planks shall be treated with wood preservative before the board is fixed.

3.0. Mode of measurements & payment:

3.1. The supporting frame, cover fillets and suspenders shall not be included in rate of ceiling.

3.2. No deductions in measurements shall be made for opening not exceeding 0.40 Sq. m. and no extra payment shall be made for forming such openings.

33. Each type of work in ceiling shall be measured separately.

3.4. The rate shall be for a unit of one sq. metre.

16.4. Providing and fixing fibre insulation board lining with butt jointing and nails (frame work and cover fillets to be measured and paid separately, (i) 12 mm. thick (ii) 18 mm. thick (iii) 25 mm. thick.

1.0. Materials: 1.1. The fibre insulation board of specified thickness shall conform to I.S. 3348-1965.

2.0. Workmanship:

2.1. Fixing: The work shall be carried out as per detailed drawings for panel arrangements.

2.2. All boards are subject to slight movements due to moisture and temperature changes, and this shall be allowed for in fixing. Preferably the board shall be stored up for a atleast 24 hours before use in the same environment as the one in they are to be fixed.

2.3. Frame Work : The studs and grounds for fixing the boards shall be spaced at 300 mm. to 450 mm. centres both ways, the actual spacing selected depending on the width of the cut board inthe panel arrangements. All edges of the boards shall be supported. Intermediate supports shall be provided at dedo heights for pircurerails and cornices etc. 2.4. Planked battens 40 mm x 20 mm. shall be used for grounds on solid walls. The batten shall be pluged to wall as described under. The batten shall be fixed on apering plugs with 50 mm. Jong wood screws. The tapering plug shall be trapeszoidal in shape having base 50 x 50 mm. at bottom 38 x 38 mm. at top with depth of 50 mm. Plugs shall be embedded in C. m. 1 : 3 and shall be placed at 450 x 500 mm. centres. The plugs shall treated with coal tar and battens shall be treated with wood preservative before use. On uneven walls faces the battens shall be plugged and fitted with packing pieces at the back where necessary. The frame shall be treated with wood preservative before boards are nailed on.

Nailing shall be done by nails have a shank diameter of 2.5 mm. and head diameter of about 8 mm. Nails shall have length as per requirement. The nails shall be placed at supports at 100 mm. to 150 mm. centre in centre and edges 75 mm. centres. Minimum clearance for nails from edges shall be 10 mm. The nails shall be rustless where the nail heads are exposed. Where the joints are to be covered with beading, felt headed (clout) nails shall be used instead of lost head nails.

3.0. Mode of measurements & payment:

3.1. The relevant specifications of item No. 16.3 (A) shall be followed.

3.2. The rate shall be for a unit of one sq. metre.

16.13 (I) Providing and fixing plywood lining with butt jointing and nails (frame work and cover fillets to be measured and paid for separately) 6 mm. thick ply.

1.0. Materials : 6 mm. thick plywood shall conform to M-37.

2.0. Workmanship: The relevant specification of item 16.4 shall be followed except that 6 mm. thick plywood shall be fixed in lining.

3.0. Mode of measurements & payment:

3.1. The relevant specifications of item No. 16.4 shall be followed..

3.2. The rate shall be for a unit of one sq. metre.

16.13 (II) Providing and fixing plywood lining with but jointing and nails (frame work and cover fillets to be measured and paid for separately) 9 mm. thick ply.

1.0. Materials & Workmanship : 1.1. The relevant specifications of item No. 16.13 (I) shall be followed except that the thickness of plywood to be fixed shall be 9 mm.

2.0. Mode of measurements & payment:

2.l.The relevant specifications of item No. 16.4 (A) shall be followed.

2.2. The rate shall be for a unit of one sq. metre.

16.21. (I) Providing and fixing plain asbestos sheet lining with but jointing and woods (frame work and cover fillets to be paid for separately). Class-A 6.5 mm. thick.

1.0. Materials: 1.1. Plain A.C. Sheets 6.5 mm. tliick shall be conform to M-24.

2.2. Workmanship:

2.1 The relevant specifications of item No. 16.4 shall be followed except that the plain A. C. Sheet class-A of 6.5 mm. thickness shall be fixed in lining.

2.2 In fixing asbestos cement sheets, case shall be taken to avoid fixing as this may cause cracking if the supporting structure expands or shrinks. The sheet shall be fixed with wood screws to wooden ground and the screw holes shall be drilled slightly longer than the screws. Asbestos sheet may also be advantageously fixed on to walls with cement plaster backing. The screws

shall be fixed at 150 mm. to 200 at supports. The boards shall be fitted cither with wooden cover fillets or asbestos strips as described in item.

3.0. Mode of measurements & payment:

3.1. The relevant specifications of item No. 16.4 shall be followed.

3.2. The rate shall be for a unit of one sq. metre.

16.21. (II) Providing and fixing plain asbestos sheet lining with but jointing to wood screws (frame work and cover fillets to be paid for separately). Class-B 5 mm. thick.

1.0. Materials & Workmanship : 1.1. The relevant specifications of item No. 16.21 (I) shall be followed except that the plain A. C. sheet of class-B. 5 mm. thick shall be fixing in lining.

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item No. 16.21 (I) shall be followed.

2.2. The rate shall be for a unit of one sq. metre.

SECTION -17

DETAILED SPECIFICATIONS FOR PLASTERING AND PAINTS AS PER "SCHEDULE OF RATES"

17.58.(I) 10 mm. thick cement plaster in single coat on fair side pf brick concrete walls for interior plastering upto floor two level and finished even and smooth in (i) C.M. 1:3.

1.0. Materials: 1.1. Water M-l. The cement mortar of proportion 1 : 3 shall conform to M-13.

2.0. Workmanship:

2.1. Scaffolding : Wooden ballies, bamboos, planks, treaties and other scaffolding shall be sound. These shall be properly examined before erection and use. Stage scaffolding shall be provided for ceiling plaster which shall be independent of the walls.

2.2. Preparation of back-ground:

2.2.1. The surface shall be cleaned of all dust, loose mortar droppings, traces of algae, efflorescence and other foreign matter by water or by brushing. Smooth surface shall be roughened by wire brushing if it is not hard and by racking if it is hard. In case of concrete surface, if a chemical retarder has been applied to the form work, the surface shall be roughened by wire brushing and all the resulting dust and loose particles cleaned off and care shall be taken that none of the retarders is left on the surface. Trimming of projections on brick/concrete surface where necessary shall be carried out to get an even surface.

2.2.2. Raking of joints in case of masonry where necessary shall -be allowed to dry out for sufficient period before carrying out the plaster work.

2.2.3. The work shall not be soaked but only damped evenly before applying the plaster. If the surface becomes dry such area shall be moistened again.

2.2.4. For external plaster, the plastering operation shall be started from top floor and carried downwards. For internal plaster, the plastering operations may be started wherever the building frame and cladding work arc ready and the temporary supporting ceiling resting on the wall of the floor have been removed. Ceiling plaster shall be completed before starting plaster to walls.

2.3. Applications of plaster :

2.3.1. The plaster about 15 x 15 cms. shall be first applied horizontally and vertically al not more than 2 metres intervals over the entire surface to serve as gauge. The surfaces of these gauges shall be truly inplane of the finished plastered surface. The mortar shall then be applied in uniform surface slightly more than the specified thickness, then brought to a true surface by working a wooden straight edge reaching across the gauges with small upward and sideways movement at a time. Finally, the surface shall be finished off true with a trowel or wooden float according as a smooth or a sandy granular texture is required. Excessive trowelling or overworking the float shall be avoided. All comers, arrises, angles and junctions be truly vertical or horizontal as the case may be and shall be carefully finished. Rounding or chamfering corners, arrises junctions etc. shall be carried out with proper templates to the size requried.

23.2. Cement plaster shall be used within half an hour after addition of water. Any mortar or plaster which is partially set shall be rejected and removed forthwith from the site.

2.3.3. In suspending the work at the end of the day, the plaster shall be left out clean to the line both horizontally and vertically. When recommending the plaster, the edges of the old work shall be scraped clean and wetted with cement putty before plaster is applied to the adjacent areas to enable the two to properly join together. Plastering work shall be closed at the end of the day on the body of the wall arid nearer than 15 cm. to any corners or arrises. Horizontal joints in plaster work shall not also occur on parapet tops and copings as these invaiiably lead to leakage. No portion of the surface shall be left out initially to be packed up later on.

2.3.4. Each coat shall be kept damp continuously rill the next coat is applied or for a minimum period of 7 days. Moistening shall commence as soon as plaster is hardened sufficiently. Soaking of walls shall be avoided and only as much water as can be readily absorbed shall be used, excessive evaporation on the sunny or windward side of building in hot air or dry weather shall be prevented by handing mattings or gunny bags on the outside of the plaster and keeping them wet.

3.0. Mode of measurements & payment:

3.1. The rate shall include the cost of all materials, labour and scaffolding etc. involved in the operations described under workmanship.

3.2. All plastering shall be measured in square metres unless, otherwise specified. Length, breadth or height shall be measured correct to a centimetre.

3.3. Thickness of the plaster shall be exclusive of (he thickness of the key i.e. grooves or open joints in brick work, stone work etc. or space between laths. Thickness of plaster shall be average thickness with minimum 10mm. at any point on this surface.

3.4. This item includes plastering upto floor two level.

3.5. The measurement of wall plastering shall be taken between the walls or partition (dimensions before plastering being taken) for length and from the top of floor or skirting to ceiling for height. Depth of cover of cornices if any shall be deducted.

3.6. Soffits of stairs shall be measured as plasterijng on ceilings. Flowing soffits shall be measured separately.

3.7. For jambs, soffits, sills etc. for openings not exceeding 0.5 sq. ml. each in area for ends of joits, beams, posts, girders, steps, etc. not exceeding 0.5 sq. mt. each in area and for openings exceeding 0.5 sq. mt. and not exceeding 3.00 sq. mt. in each area deductions and additions shall be made in the following manner:

(a) No deductions shall be made for ends of joints, beams, posts etc. and openings not exceeding 0.5 sq. mt. each and no addition shall be made for reveals, jambs, soffits, sills etc. of these opening for finish to plaster around ends of joints, beams posts etc.

(b) Deduction for openings exceeding 0.5 sq. mt. but not exceeding 3 sq. mt. each shall be made as follows and no addition shall be made for reveals, jambs, soffits, sills etc. of these openings.

(i) When both faces of all wall are plastered with same plaster, deduction shall be made for one face only.

(ii) When two faces of wall are plastered with different types of plasters or if one, faces is plastered and the other pointed, deductions shall be made from the plaster or pointing on the side of frame for door, window etc. on which width of reveals is less than that on the other side but no deductions shall be made on the other side. Where width of reveals on both faces of all are equal, deductions of 50% of area of opening on each face shall be made from area of plaster and/or pointing as the case maybe.

3.8. For openings having door frames equal to projecting beyond the thickness of wall, full deduction for opening shall be made from each plastered face of the wall.

3.9. In case of openings of area above 3 sq. mt. each, deduction shall be made for opening but jambs, soffits and sills shall be measured.

3.10. The rate shall be for a unit of one sq. metre.

17.58. (II) 10 mm. cement plaster in single coat on fair side of brick/concrete walls for interior plastering upto floor two level and finished even and smooth in C.M. 1:4.

1.0. Materials & Workmanship : 1.1. The relevant specifications of item No. 17.84 (I) shall be followed except that the proportion of mortar is C.M. 1 :4 instead of C. M. 1:3.

2.2. Mode of measurements & payment:

2.1. The mode of measurements and payment shall be the same as for item No. 17.58 (I).

2.2. The rate shall be for a unit of one sq. metre.

17.58. (III) 10 mm. cement plaster in single coat on fair side of brick/concrete walls for interior plastering upto floor two level and finished even and smooth in C.M. 1:6.

1.0. Materials & Workmanship : 1.1. The relevant specifications of item No. 17.58 (I) shall be followed except mat the proportion of mortar is Cement Mortar 1:6.

2.0. Mode of measurements & payment:

2.1. The mode of measurement and payment shall be followed same as item No. 17.38 (I).

2.7 The rate shall be for a unit of one sq. metre.

17.61. (I) 20 mm. thick cement plaster in single cost on rough side of single or half brick wall for interior plastering upto floor two level, finished even and smooth in cement mortar 1:3(1 cement: 3 sand).

1.0. Materials & Workmanship : 1.1. The relevant specifications of item No. 17.59 (I) shall be followed except that the thickness of item plaster shall be 20 mm. The plastering work shall be in single coat on rough side of half brick wall for interior plastering upto floor two level, finished even and smooth in C.M. 1:3.

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item No. 17.59 (I) shall be followed.

2.2. The rate shall be for a unit of one sq. metre.

17.61. (II) 20 mm. thick plaster in single coat on rough side of single or half brick wall for interior plastering upto floor two level, finished even and smooth in cement mortar 1:4(1 cement: 4 sand).

1.0. Materials & Workmanship : 1.1. The relevant specifications of item No, 17.59 (II) shall be followed except that the thickness of plastering shall be 20 mm. in C. M. 1 : 4.

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item No. 17.59 (I) shall be followed.

2.2. The rate shall be for a unit of one sq. metre.

17.61 (III) 20 mm. thick cement plaster in single coat on rough side of single or half brick wall for interior plastering upto floor two level, finished even a smooth in C. M, 1 : 6 (1 cement: 6 sand).

1.0. Materials & Workmanship : 1.1. The relevant specifications of item No. 17.59 (III) shall be followed except that thickness of plaster shall be 20 mm. in C. M. 1 : 6.

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item No. 17.59 (I) shall be followed.

2.2. The rate shall be for a unit of one sq. metre.

17.69. Extra over item 58 to 64 for finishing with a floating coat of net cement slurry.

1.0. Materials & Workmanship :

1.1. The relevant specifications of item No. 17.58 and 17.61 shall be followed for materials and workmanship except that this work is only of providing smooth cement finish with foloating coat of neat cement slurry.

1.2. The coat of cement and fine sand mortar of proportion 1:1 (1.5. rnm. thick about) shall be applied to the plastered surface with a trowel to provide uniform texture while the base coast is still plastic.

1.3. In any continuous face of wall the finishing treatment should be carried out continuously and day to day break made to coincide with architectural breaks in order to avoid unsightly junctions.

1.4. Curing : All the plaster work shall be kept damp continuously for a period of 7 days.

2.0. Mode of measurements & payment:

2.1. The payment shall be made for a unit of 1.0 sq. mt. of work done over and above the finishing of work of base coat.

2.2. The-relevant specifications of item of base coat shall be followed for measurements and payment.

2.3. The rate shall be for a unit of one sq. metre.

17.70. Extra over items 17.58 to 17.61 for providing and mixing water proofing materials in cement mortar in proportion recommended by the manufacturers.

1.0 Materials & Workmanship :1.1. The relevant specification of item No. 17 58 to 17.61 shall be followed except that

the water proofing materials of approved make shall be added to the cement at the rate specified or as directed by the Engineer-in-charge. The proportion of water proofing materials to be mixed with 50 kg. bags shall be as recommended by the manufactures of the water proofing material.

2.0. Mode of measurements & payment:

2.1. The payment shall be made extra for this work over and above the plaster work.

2.2. The rate shall be for a unit of 1- Kg. of water proofing materials used in 1 bag weighing 50 Kg. cement used extra over the rate of plastering work.

17.91. Extra over item No. 17.59 to 17.61 for plastering on ceiling and soffits of stair upto floor two level instead of plastering on walls.

1.0 Materials & Workmanship :

1.1. The relevant specifications of item No. 17.59 (I) shall be followed except that this work is for ceiling soffits of stairs, upto two floor level instead of plaster on walls.

1.2. The smooth concrete surface shall be suitably roughened to provide necessary bond before plastering.'

2.0. Mode of measurements & payment:

2.1. The payment shall be made for a unit of one sq. metre of work done, extra over and above the payment plaster work on wall surfaces.

2.2. The rate shall be for a unit of one sq. metre.

17.94 (I) Extra over item No. 1 to 69, 71 to 87 and 90 for interior plastering above floor two level for every additional story height (i). Single coat plaster.

1.0. Materials & Workmanship :

1.1. The relevant specifications of item No. 17.59 (I) shall be followed except that the whole work is lo be carried out above floor two level.

2.0. Mode of measurements & payment:

2.1. The mode of measurements and payment shall be same as item No. 17.59 (1).

2.2. The extra payment shall be made over and above the floor two level rate for every additional floor height.

2.3. The rate shall be for a unit of one sq. metre.

17.94 (II) Extra over item 1 to 69, 71 to 87 and 90 for interior plastering above floor two level for every additional story height. Two coat plaster.

1.0. Materials & Workmanship :

1.1. The relevant specifications of item No. 17.94 (I) shall be followed except that extra payment for work shall be for a two coat plaster.

2.0. Mode of measurements & payment :

2.1. The relevant specifications of item No. 17.94 (I) shall be followed.

22. The rate shall-be for a .unit of one sq. metre.

17.94 (III) Extra over item 1 to 69,71 to 87 and 90 for interior plastering above floor two level for every additional story height Floating coat of neat cement.

1.0. Materials & Workmanship :

1.1. The relevant specifications of item No. 17.94 (I) shall be followed except that the extra payment shall be made for work of floating coat of neat cement slurry.

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item No. 17.59 (I) shall be followed.

2.2. The rate shall be for a unit of one sq. metre.

17.95. 20 mm. thick sand face cement plaster on walls upto height of 10 mm. and above ground level consisting of 12 mm. thick backing coating of C. M. 1: 3 (1 cement: 3 sand) and 8 mm. thick finishing coat in C. M. 1: 1 (1 cement: 1 sand) etc. complete.

1.0. Materials :

1.1. Water shall conform to M-12. Cement mortar shall conform to M-11.

2.0. Workmanship:

2.1. The work shall be carried out in the coats: The backing coat (base coat) shall be 12 mm. thick in C. M. 1:3. The relevant specifications of item No. 17.58 (I) shall be followed except that the thickness of back coat shall be 12 mm. average. Before the first coat hardens its surface shall be beaten up by edges of wooden tappers and close dents shall be made on the surface.

The subsequent coat shall be applied after this coat has been allowed to set for 3 to 5 days depending upon the weather conditions. The surface shall not be allowed to dry during this period.

2.2. The second coat shall be completed to 8 mm. thickness in C. M. 1:1 as described above, including raising sand facing by bushing. The sample of sand face shall be got approved before the work is started. The whole work shall be carried out uniformly as per sample approved.

2.3. Curing : The curing shall be started overnight after finishing of plaster. The plaster shall be kept wet for a period of 7 days. During this period, it shall be protected from all damages.

3.0. Mode of measurements & payment:

3.1. The relevant specifications of item No. 17.58 (I) shall be followed except that the sand face plaster on outside upto m. above ground level shall be measured under this item.

3.2. The rate shall be for a unit of one sq. metre.

17.116 (A) Pointing on brick work with cement mortar 1 : 3 (1 cement: 3 coarse sand) flush pointing.

1.0. Materials : 1. Water shall conform to M-12. Cement mortar shall conform toM-11.

2.0. Workmanship: 2.1. The flush pointing work shall be carried out with cement mortar of proportion 1:3(1 part of cement and 3 parts of coarse sand) by volume.

2.2. Preparation of surface : 2.2.1. The joints shall be raked to such a depth that the average of new mortar measured from either the sunk surface of finished pointing or from the edge of the brick shall be average 10 mm.

2.3. Application of Mortar & Finishing : 2.3.1. The mortar shall be pressed into the raked out joints with a pointing trowel according to the type of pointing specified in item. The mortar shall not spread over the corner edges or surface of the masonry. The pointing shall then be finished with the pointed tools.

2.4. Curing : 2.4.1. The pointing shall be kept wet for 7 days. During this period, it shall be suitably protected from all damages.

3.0. Mode of measurements & payment:

3.1. No deductions shall be made for end of joints, beams and posts etc. and openings not exceeding 0.5 sq. mt. each and no addition shall be made for reveals, jambs, soffits, sill etc. of these openings.

3.2. Deductions for openings exceeding 0.5 sq. mt. but not exceeding 3 sq. mt. each shall be paid as follows and no addition shall be made for reveals jambs, soffits-sills etc: of these openings.

(i) When both faces of walls are pointed with same type of pointing, deduction shall be made for one face only.

(ii) When two faces of walls are pointed with different type of pointing or if one face is plastered and the other is pointed, deduction shall be made in the plaster or pointing on the side of frame for door, windows etc. on which the width of reveals is less than that on the other side but no deduction shall be made from plaster or pointing on the other side.

(iii) When only one face is treatged and the other face is not treated, full deduction shall be made, if the width of the reveals on the treated side is less than on the untreated side, but if the width of the reveal is more, then no deduction shall be made nor any addition shall be made for reveals jambs soffits, sills etc.

3.3. In case of openings of area above 3 sq. mt. each deduction shall be made for opening but jambs, sills and soffits, shall be measured.

3.4. The rate shall be for a unit of one sq. metre.

17.116 (B) Pointing on brick work with cement mortar 1 : 3 (1 cement: 3 coarse sand) Ruled pointing.

1.0. Materials & Workmanship :

1.1. The relevant specifications of item No. 17.116 (A) shall be followed except that the pointing to be done ruled pointing asunder:

1.2. The joints shall be initially formed for flush pointing and then while the mortar is still green a groove of specified shape shall be formed by running forming toool straight along the centre line of joints till a smooth and hard surface is obtained. The vertical joints shall also be finished in a similar way. The pointing lines shall be uniform in width and truly horizontal and parallel in case of floor and ceiling.

2.0. Mode of measurements & payment:

2.1. The mode of measurements and payment shall be the same as per item No.17.ll6(A).

2.2. The rate shall be for a unit of one sq. metre.

17.117 (A) Painting on brick work with cement mortar 1 : 4 (1 cement: 4 sand) Flush pointing.

1.0. **Materials & Workmanship :** 1.1. The relevant specifications of item No. 17.116 (A) shall be followed except that the pointing work shall be carried out C. M. 1 : 4.

2.0. The relevant specifications of item No. 17.116 (A) shall be followed.

2.1. The rate shall be for a unit of one sq. metre.

17.117 (B) Pointing on brick work with cement mortar 1:4(1 cement: 4 sand): Ruled pointing.

1.0. **Materials & Workmanship :** 1.1. The relevant specifications of item No. 17.116 (B) shall be followed except that the proportion of C. M. 1 : 4 shall used for ruled pointing.

2.0. Mode of measurements & payment:

2.1 The relevant specifications of item No. 17.117 (A) shall be followed.

2.2. The rate shall be for a unit of one sq. metre.

17.140 (A) Pointing on coursed stone masonry with cement mortar 1 : 3 (1 cement: 3 sand) flush pointing.

1.0. Materials & Workmanship : 1.1. The relevant specifications of item No. 17.116 (A) shall be followed except that the pointing shall be done on coursed stone masonry with C. M. 1:3 and the mortar shall be simply struck off with a trowel and the work left showing the natural irregularities in line and the surface of the stones themselves.

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item No. 17.116 (A) shall be followed.

2.2. The rate shall be for a unit of one sq. metre.

17.140 (B) Pointing on course masonry with cement mortar 1:3(1 cement :3 sand) Ruled pointing.

1.0. Materials & Workmanship : 1.1. The relevant specifications of item No. 17.140(A)and 17.116 (B) shall be followed.

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item No. 17.116 (A) shall be followed.

2.2. The rate shall be for a unit of one sq. metre.

17.144. (A) Pointing on uncoursed stone masonry with cement mortar 1:3(1 cement: 3 sand) Flush pointing.

1.0. Materials & Workmanship : 1.1. The relevant specifications of item No. 17.116 (A) shall be followed except that the flush pointing shall be done on uncoursed rubble masonry work in C. M. 1: 3 and the mortar shall be simply struck off with a trowel and the work left showing the natural irregularities in line and the surface of the stone themselves.

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item No. 17.116 (A) shall be followed.

2.2. The rate shall be for a unit of one sq. metre.

17.144 (B) Pointing on uncoursed stone masonry with cement mortar 1:3(1 cement: 3 sand) : Ruled pointing.

1.0. Materials & Workmanship : 1.1.The relevant specifications of item No. 17.116,(A)and 17.144 (A) shall be followed except that the ruled pointing work shall be carried out on uncoursed rubble masonry work in C. M. 1 : 3.

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item No. 17.116 (A) shall be followed.

2.2 The rate shall be for a unit of one sq. metre.

17.0.0.1. Providing cement vata (10 cms. x 10 cms.) size quarter round in cement mortar 1: 1 including near cement finishing, watering etc. complete.

1.0. Materials : 1.1. Water shall conform to M-1.2 Cement mortar shall conform to M-11.

2.0. Workmanship : 2.1. The work of cement vata of 10 cms. x 10 cms. size shall be carried out at junctions of parapets and terraces as directed. The vata shall be finished in quarter round shape. The work shall be carried out in the best workmanlike manner. The inter portion of rain water pipe shall be rounded off properly during constructing the vata. The work shall be cured for 7 days.

2.0. Mode of measurements & payment:

2.1. The work shall be measured for finished item in running metre.

2.2. The rate shall be for a unit of one running metre.

SECTION-18

DETAILED SPECIFICATIONS FOR WHITE WASHING & DISTEMPERING
AS PER "SCHEDULE OF RATES"

18.11. White washing with lime on undedorated wall surfaces (two coats) to give an even shade including throughly brooming surface to remove all dirt, dust, mortar drops and other foreign matter.

1.0. Materials:

1.1. The clcarcolle shall be made from glue and boiling water by Mixing I kg. mixture shall be suitably tinted where required use under coloured distemper if directed. Glue shall conform to I.S. 852-1969 (Specifications for animal glue). 1.2 Lime used shall be freshly burnt class 'C' Lime (fat lime) and white in colour conforming to I.S. 712-1973/ Water shall conform to M-l Best quality of gum shall be used in the preparation of white wash. Ultramarine blue or Indigo: This shall conform to I.S. 55-1970 for points, and shall be used for preparation of white wash. Pigments : Mineral colours, not affected by lime shall be used in preparing colour wash.

2.0. Workmanship : 2.1. Preparation of white wash solution :

Surface already white or colour. The fat lime shall be slaked at site and shall be mixed and stirred with about five litres of water for 1 kg. of unslaked lime to make a thin cream. This shall be allowed to stand for a period of 24 hours and then shall be screened through a clean coarse cloth, 4 Kg. of gum dissolved in hot water shall be added to each cubic metre of lime cream. Small quantity of ultramarine blut (Upto 3 gms. per kg. of lime) shall also be added to the last two coats of white wash solution and the whole solution shall be stirred throughly before use.

2.1. Preparation of surface:

2.2.1. The surface shall be throughly cleaned of all dust, dirt, mortar croppings and other foreign matter before .white wash is to be applied.

2.2.2. The surface spoiled by smoke soot shall be scraped with steel wire brushes or steel scrapers or shall be rubbed with over-burnt surkhi or brick bats. The surface shall be then broomed to remove all dust, dirt and shall be washed with clean water.

2.1.3. Oil or grease spots shall be removed by suitable chemical and smooth surface shall be rubbed with wire brushes.

2.2.4. All unsound portion of the surface plaster shall be removed to full depth of plaster in rectangular patches and plastered again after raking the masonry joints properly. Such portion shall be wetted and allowed to dry. They shall then be given one cat of white wash.

2.2.5. All unnecessary nails shall be removed, the holes cracks patches etc. shall be made good with materials similar in imposition to the surface to be prepared.

2.3. Scaffolding : Wherever scaffolding is necessary it shall be erected in such a way that as far as possible on part of scaffolding shall rest against the surface to be white or colour washed. A properly secured strong and well tied suspended platform (Zoola) may be used for white washing. Where ladders arc used, pieces of old gunny bag shall be teid at top and and bottom to prevent scratches to the floors and walls. For white washing of ceilings proper stage scaffolding shall be erected where necessary.

2.4. Application of white wash:

2.4.1 On the surface prepared the white wash shall be applied with 'Moon' brush. The first stoke of the brush shall be from top downwards another, from bottom upwards over the first stroke and similary one stoke from the right another from the left, over the first stroke brush before it dries. This will from one coat. Each coat shall be allowed to dry before next coat applied. Number of coats as specified in item shall be applied. It shall present smooth and uniform finish free from brush marks and it should not come off easily when rubbed with finger.

2.4.2. Splashing and dropping if any on the doors and windows, ventilators etc. shall be removed and the surface cleaned.

2.4.3. Priming and Alkali resistant treatments, scraping of surface washing etc. surface spoiled by smoke soot removed of oil and great spots treatment for infection with effloresence moulds moss, funji, algae and letchen and patch repairs to plaster

wherever done shall not be paid extra.

3.0. **Mode of measurements & payment :**

3.1. All the work shall be measured in the decimal system as under :

(a) Dimensions shall be measured to the nearest 0.01 M.

(b) Area in individual items shall be worked out to the nearest 0.01 Sq. M.

All the work shall be measured in sq. mt. Deductions for jambs, soffits, sills etc. for opening not exceeding 0.5 sq. mt. each in area for ends of joints, posts, beams, girders, steps etc. not exceeding 0.5 sq. mt. each in area and for opening exceeding 0.3 sq. mt. and not exceeding 3.0 sq. mt. each in area deductions and additions shall be made as under :

3.2. No deductions shall be made for ends of joints beams, posts etc. and openings not exceeding 0.5. sq. mt. each. No addition shall be made for reveals, jambs, soffits, sills etc. of these openings nor for finish arounds ends of joints, beams, posts etc.

3.3. Deductions for openings exceeding 0.5 sq. mt. but not exceeding 3 sq. mt. each shall be made as follows and no addition shall be made for reveals, jambs, soffits etc. of these openings:

(a) When both the faces or walls are provided with finish, deduction shall be made for one face only.

(b) When each fasce of wall is provided with different finish deduction shall be made for that side of frame for door, windows etc. on which width of reveals is less than that of the other side, where width of reveals on both faces of wall are equal, deduction of 50% of area of opening on each face shall be made from total area of finish.

(c) When only one face of wall is treated and the other face is not treated, full deduction shall be made if the width of reveal on the treated side is less than that on the untreated side, but if the width of the reveal is equal or more than on the untreated side neither deductions nor additions be made for reveals, jambs, soffits, sills etc.

3.4. In case of area of opening exceeding 3 sq. mt. each, deduction shall be made for openings but jambs, soffits, shall be measured.

3.5. No deduction shall be made for attachment such as casing, conducts, pipe, electric wiring and the like.

3.6. Corrugated surfaces shall be measured flat as fixed and not girth. The quantities so measured shall be increased by the following percentage and the resultant shall be included with the general areas.

(a) Corrugated steel sheets 14%

(b) Corrugated A. C. Sheets20%

(c) semi corrugated A. C. Sheets 10%

(d) Nainital pattern roof (Plain sheeting with rolls) 10%

(e) Nainital pattern roof (with corrugated sheets) 25%

3.7. Cornices and other wall features, when they are not picked out in a different finish/colour shall be girthed and included in the general area

3.8. The rate shall include the cost of all materials, labour, scaffolding, protective measures etc. involved in all the operations described above.

3.9. The rate shall be for a unit of one sq. metre.

18.12. White washing with lime on decorated wall surface-(One coat) to give an even shade including throughly brooming the surface to remove dirt, dust mortar drops and loose scales of lime wash and other foreign matter.

1.0. Materials & Workmanship : 1.1. -The relevant specifications of item No. 18.11 shall be followed except that the white washing work shall be carried out on decorated wall surface in single coat.

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item No. 18.11 shall be followed.

2.2. The rate shall be for a unit of one sq. metre.

18.13. Extra over item 18.11 and 18.12 for every subsequent coat of white washing with lime on wall surfaces.

1.0. Materials & Workmanship: 1.1. The relevant specifications of item No. 18.11 shall be followed except that this work is for extra coat over and above two coats on wall surface.

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item No. 18.11 shall be followed except that the payment of subsequent coat shall be made extra over and above the item No. 18.11 for every subsequent coat applied.

2.2. The rate skill be for a unit of one sq. mt.

18.14. Extra over item 18.11 for while washing with the lime on ceiling and/or sloping roof.

1.0. Materials & Workmanship: 1.1. The relevant specifications of item No. 18.11 above shall be followed except that this work is for ceiling and/or sloping roof.

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item No. 18.11 shall be followed except that extra payment for white washing on ceiling and/or slopping roof shall be made and above the payment of item No. 18.11.

2.2. The rate shall be for a unit of one sq. metre.

18.15. Extra over 18.12 for white washing with lime on ceilings and sloping roofs.

1.0. Material & Workmanship : 1.1 The relevant specifications of item No. 18.12 shall be followed except that the white washing work shall be carried out on decorated ceilings and/or sloping roofs.

2.0. Mode of measurements & payment:

2.1. The relevant specifications pf item No. 18.12 shall be followed except that the extra payment for while washing on ceiling and/or sloping roof shall be made over and above the payment of item No. 18.12.

2.2. The rate shall be for a unit of one sq. metre.

18.16. Extra over the item No. 18.13 for every subsequent coat of white washing with lime on ceiling and/or sloping roofs.

1.0. Materials & Workmanship : 1.1. The relevant specifications of item No. 18.11 and 18.13 shall be followed except that this work is for extra coat over and above two coats of ceiling and/or sloping roofs.

2.0 Mode of measurement & Payment:

2.1. Relevant specifications of item No. 18.11 and 18.13 shall be followed except that the extra payment for white washing shall be made for sloping roof or/and ceiling for every subsequent coat applied over and above item 18.13.

2.2. The rate shall be for a unit of one sq. metre.

18.17. Colour washing with lime on undecorated wall surfaces (Two coats) over and including priming coat of white washing to give even shade including thoroughly brooming the surface to remove all dirt, dust, mortar drops and other foreign matter. The relevant specifications for the materials and workmanship of item No. 18.11 shall be followed except that it shall be for colour wash.

1.0. Materials:

1.1. Clear-Colle : This shall be made from glue and boiling water by mixing 1 Kg. of glue to every 15 litres of water. The mixding shall be suitable tinted to match with colour of washing as directed. Glue shall conform to I.S. 852-1969.

1.2. Lime : Lime used shall be freshly burnt class 'C' lime (Fat lime) and white in colour conforming to I.S. 712-1973.

1.3. Water : Water shall conform to M-l.

1.4. Gum : Best quality of gun shall be used in the preparation of white or colour wash. The colour pigment of required tint and shade shall be mixed in lime cream. The mineral colour not affected by lime shall be used in preparing the colour wash.

2.0. Workmanship : 2.1. Sufficient quantity of colour wash enough for the complete job shall be prepared in one operation to avoid any difference in shade. The basic white wash solution shall be prepared in accordance with item 18.11. Mineral colours not affected by lime shall be added to the white wash solution. No colour wash shall be done until a sample of the colour has been approved. It shall be noted that small samples of colour appeals lighter in shade then when the same shades are applied precisely to large surface. The colour shall be of event tint, over the whole surface. If it is patchy or otherwise badly applied, it shall be rejected. Preparation of the folour wash with pigment shall be as under :

(a) With Yellow and Red Ochre: Solid Lumps if any in the powder shall be crushed to powder and solution in water prepared and then added to white wash sieving it through a coarse cloth, mixed evenly and thoroughly to white wash in small quantities till the required shade is obtained.

(b) With Blue Vitriol: Fresh crystals of hydrous copper sulphate (i.e. blue vitriol) shall be ground to fine powder and dissolved in small quantity of water. Sufficient quantity of solution enough to produce the colour wash of required shade shall be strained through a clean cloth, the filtrate being mixed evenly and throughly to the white wash.

(c) Colour wash from other colouring pigment shall be prepared in accordance with the instructions of the manufacturer.

2.2. Preparation of Surface : The surface shall be prepared by removing mortar toppings and foreign matter and thoroughly clean with wire or fibre brush or any suitable means as greeted by the Engineer-charge. All loose pieces and scales shall be scrapped off notes holes filled with mortar.

2.2.1. For scaffolding and application of colour wash, relevant specification of item No. 18.11 above shall be followed. The colour wash shall be applied as under:

The colour wash shall be applied in accordance with the procedure given in item No. 18.11. Application of white wash for colour washing on undecorated surface after the surface has been prepared. The first primary coat shall be of white wash and subsequent (minimum two) shall be colour wash and the entire surface shall represent a smooth and uniform finish. To start with, patch of 0.1 sq.mt. on preared surface shaft be colour washed with first coat of white wash and subsequent coat of colour wash solution in full numbers of coats as described in the item and the shade so obtained shall be examined before the entire work of colour washing is taken up in hand. It shall be noted that small areas of colour wash win appear lighter in shade then when the same shade is applied to the large surface.

2.2.2. For colour washing on decorated surfaces, after the surface has been prepared, a coat of white wash shall be applied for the patches and repairs. Then one coat or more of colour wash shall be applied over the entire surface, such that the colour of washed surface shall present a. uniform colour shade. No primary coat is needed for a decorated surface bearing colour of same shade on surface requiring change of colour after the surface has been prepared as described above. Two coats of white wash shall be applied before application of specified number (minimum two) of coals of colour wash of the new shade.

2.3. Protective measure: The surface of doors, windows, floors, articles of furniture etc, and such other parts of the building not to be white washed shall be protected from being splashed upon. Such surfaces shall be cleaned of white wash splashed if any.

3.0. Mode of measurements & payment:

3.1. The relevant specification of item No.18.11 shall be followed.

3.2. The rate shall be for it unit of one sq. metre.

18.18. Colour washing, with lime on decorated wall surfaces (one coat) to give an even shade including throughly brooming the surface remove all dirt dust, mortar drops and loose scales of, lime wash and other foreign matter.

1.0. Materials & Workmanship: The relevant specifications of item No. 18.17 shall be followed dexcept that the colour washing shall be carried but on decorated wall surfaces in one coat.

2.0. Mode of measurements payment:

2.1. The relevant specification of item No.18.17 shall be followed.

2.1. The rate shall be for it unit of one sq. metre.

18.19. Extra over item No. 18.17 and 18.18 for every subsequent coat of colour wash with lime on wall surface.

1.0. Materials & Workmanship : 1.1. The relevant specifications of item No. 18.17 shall be followed except that this work is for extra cost of colour wash overhand above two coals on wall surface.

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item No; 1JL17 shall be followed except that the extra payment for every subsequent coat of while wash shall be made over and above the rate of item 18.17 and 18.18.

2.2. The rate shall be for a unit of one sq. metre.

18.20. Extra ever item 18.17 for colour washing on ceilings and/or sloping roofs.

1.0. Materials & Workmanship : The relevant specifications of item No.18.17 shall be followed except that this work is for colour washing on ceiling and/or sloping roofs.

2.2. The rate shall be for a unit of one sq. metre.

18.29. Cement washing with Portland cement slurry en undecorated wall surfaces, (one coat) to give a smooth finish including thoroughly brooming the surface to remove all dirt dust, mortar drops and other foreign matter.

1.0. Materials: 1. Water shall conform to M-1. Portland cement shall conform to M-3.

2.0. Materials & Workmanship : 2.1. The relevant specifications of item No. 18.11for preparation of surface, scaffolding, application of wash etc. shall be followed except that the cement wash shall be applied instead of white wash. Cement shall be mixed to

water to form slurry to the consistency of good ready mix oil paint. The slurry shall be applied with brushes to form a smooth bodies opaque surface.

3.0. Mode of measurements & payment:

3.1. The relevant specifications of item No. 18.11 shall be followed.

3.2. The rate shall be for a unit of one sq. metre.

18.30. Extra over item No. 18.29 for every subsequent coat of cement washing with portland cement slurry.

1.0. Materials & Workmanship : 1.1. The relevant specifications of item No. 18.29 shall be followed except that the work of cement slurry wash shall be provided for every, subsequent coats above item No. 18.29 to be applied.

2.0. Mode of measurements payment:

The relevant specifications of item No. l8.29. shall be followed except that the extra rate shall be paid for every subsequent coat applied over and above the rate of item No.18.29.

2.1. The rate shall be for a unit of one sq. metre.

18.33. Removing dry or oil bound distemper by washing and scraping and sand papering the wall surface smooth including necessary repairs to scratches complete.

1.0. Materials & Workmanship : 1.1. All loose pieces and scales shall be removed by sand papering and surface shall be cleared of all greaseay, dust, dirt, etc. on decorated wall surface. Where heavy scaling has taken place, the entire surface shall, be scrapped by means of steel scrappers so as to remove all accumulated distemper, leaving clean surfaces. Necessary repairs to the scratches shall be made as directed.

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item No. 18.11 shall be followed.

2.2. The rate shall be for a unit of one sq. metre.

18.34. Extra over item No. 18.33 for removing dry oil bound distemper on ceiling and sloping roofs!

1.0. Workmanship: 1.1. The relevant specifications of item No. 18.33 shall be followed except that removing dry oil bound distemper from sipping roof, ceiling is to be carried out.

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item No. 18.33 shall be followed except that the payment shall be made for removing dry/oil bound distemper from ceiling/sloping roof over and above the rate-of item No. 18.33.

2.2. The rate shall be for a unit of one sq. metre.

18.38. Distempering with dry (water bound) Distemper of approved brand and manufacture (two coats) and of required shade on undecorated wall surfaces to give an even shade, over and including a priming coat of white washing, after throughly brooming the surface free from mortar droppings and other foreign matter.

1.0. Materials: 1.1. The dry distemper and primer shall be of approved brand and manufacture. The dry distemper shall be of required colour and shade and the same shall conform to I.S. 427-1965. Whiting shall conform to I. S. 63-1964.

2.0. Workmanship:

2.1. Scaffolding: Where scaffolding is required it shall be erected in such a way mat as far as possible no part of scaffolding shall rest against the surface to be distempered. A properly secured strong and well tied suspended platform (Jools) may be used for distempering. Where ladders are used, pieces of old gunny bags shall be lied at top and bottom to prevent scratches to the walls and floors. For distempering to ceiling, proper stage scaffolding shall be erected where necessary.

2.2. Preparation of Surface : 2.2.1 The undecorated surface to be distempered shall be throughly brushed free from dust, dirt, grease, mortar, droppings and other foreign matter and sand papered smooth. New plaster surface shall be allowed to dry at least 2 months, before application of distemper.

2.2.2. Alt unnecessary nails shall be removed. Pitting hi plaster shall be made good with plaster of paris mixed with distemper of the colour to be used. The surface shall then be rubbed down again with a/me grades and paper and made smooth. The surf ace affected by moulds, moss, fungi, algee lichem, efflorescence etc. shall be treated in accordance with I.S.: 2395 (Part-I)-1966 before applying distemper. Any unevenness shall be made good by applying putty made of plaster of paris mixed with water on entire surface including filling up the undulations & then papering the same after it is dry.

2..3. Priming coat:

23.1. A priming coat of whiting shall be applied as per item No. 18.11. over the prepared surface in case of new work on undecorated surface; No coat of white washing with lime shall be used as a priming coat for distemper.

2.3.2. Application of plaster shall be done as under:

The primer shall be applied with a brush on the clean dry and smooth surface. Horizontal strokes shall be given first and vertical strokes shall be applied immediately afterwards. This entire operation will constitute one coat. The surface shall be finished as uniformly as possible leaving no brush marks. It shall be allowed to dry for atleast 48 hours before oil bound distemper or paint is applied.

2.3.3. Distemper is not recommended to be applied within six months of the completion of wall plaster.

2.4. Proportion of Distemper : The distemper shall be diluted with water or any other prescribed thinner in a manner recommended by the manufactures only. Sufficient quantity of distemper required-for one day's work shall be prepared.

2.5. Application of Distemper coat:

2.5.1. For undecorated surfaces, after the primer coat is dried for at least 48 hours, the surfaces shall be lightly sand papered to make them smooth for receiving the distemper, taking care not to rub cut the priming cort, All loose particles shall be dusted off after rubbing. Minimum two coats of distemper shall be applied with brushes in horizontal strokes followed immediately by vertical strokes which together shall constitute one coat. The subsequent coats shall be applied after time interval of at least 24 hours between consecutive coats to permit proper drying, of the preceding coat. The finished surfaces shall be even and uniform without patches, brush marks; distemper drops etc.

2.5.2. Sufficient quantity or distemper shall be mixed to finish one room at a time. The application of a coat in each room shall be finished in one operation and no work shall be started in any room which cannot be completed on the same day.

2.5.3. 15 cm. double bristled distemper brush shall be used. After the days work, brushes shall be thoroughly washed in hot water with a soap solution and hang down to dry. Old brushes which are dirty and caked with distemper shall not be used on the work.

2.6. Protective Measure: 2.6.1. The surfaces of door, windows, floors, articles of furniture etc. and such other parts of the building as are not to be distempered shall be protected from being aplashed upon. Such surfaces shall be cleaned of distemper aplashes if any.

3.0. Mode of measurements & payment:

3.1. Priming coat of distemper, Primer scraping of surface spoiled by smoke soot, removal of oil and greast spots, treatment for infection of effloresces, mouldmoss, fungi, algee and litoben and patch repairs to plaster shall be included in this item for which nothing extra shall be paid.

3.2. All the work shall be measured net in the decimal system as in places subject to the following limits unless otherwise stated hereinafter.

(a) Dimension shall be measured to the nearest 0.01 m.

(b) Area in individual items shall be worked out the nearest 0.01 sq. m. all work shall be measured in sq. metre. No deductions shall be made for ends of joints beams, posts etc. and openings not exceeding 0.5 sq. m. each and no addition shall be made for reveals jambs, soffits, sills etc. of these openings nor finish alround the ends of joints, beams, posts etc.

3.3. Deductions of openings exceeding 0-5 sq. m. but not exceeding 3 sq. m. each shall be made as follows and no addition shall be made for reveals, jambs, soffits sills etc. of these openings:

(a) When both the faces of wall is provided with the same finish deductions shall be made for one face only.

(b) When each face of wall is provided with different finish, deduction shall be made for that of frame for doors, windows etc. on which width of reveal is less than that of the other side but no deductions shall be made on the other side. Where the width of reveals on the both the faces of wall are equal, deduction of 50% of area of opening on each face shall be made from area of finish.

(c) When only one face of wall is treated and the other face is not treated, full deductions shall be made if the width of the reveal on treated side is less than that on untreated side but if the width of the reveals is equal or more than that of untreated side neither deductions nor additions to be made for reveals; jambs, soffits, sills etc.

3.4. In case of area exceeding 3 sq. m. each, openings of deduction shall be made for openings, bat jambs, sills and soffits

shall be measured.

3.5. No deductions shall be made for attachments such as casing, conduits, pipes, electric wiring and the like.

3.6. Item includes removing nails, making good holes, cracks, patches with materials similar in composition to the distemper.

3.7.The rate includes cost of all materials, labour, scaffolding, protective measures etc. involved in all the operations described above. This shall also include conveyance, delivery, handling, unloading storing etc.

3.8. The rate shall be for a unit of one sq. metre.

18.39. Distempering with dry (water bound) distemper of approved brand and manufacture (one coat) and of required shade on decorative wall surface to give an even shade after thoroughly brushing the surface clean of all grease dirt, loose pieces of scales including preparing the surfaces and even sand papered smooth.

1.0. Materials & Workmanship : 1.1. The relevant specifications of item No. 18.38 shall be followed except that the dry distemper shall be applied on decorative wall surface in one coat.

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item No. 18.38 shall be followed.

2.2. The rate shall be for a unit of one sq. metre.

18.40. Extra over item 38 & 39 for every subsequent coat of distemper with dry distemper of approved brand and manufacture.

1.0. Material & Workmanship : The relevant specifications of item No. 18.38 shall be followed same except that the extra work for applying subsequent coat of dry distemper is to be carried our over arid above the work of item No. 18.38 and 18.39.

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item No. 18.38 shall be followed except that extra rate shall be paid for every subsequent coat applied over and above the rate item No. 18.38 and 18.39.

2.2. The rate shall be for a unit of one sq. metre.

18.41. Extra over item 38 for distempering with dry distemper on ceiling and sloping roofs.

1.0. Materials & Workmanship : The relevant specifications of item No. 18.38 shall be followed except that the dry distempering shall carried out on ceiling and sloping roofs on undecorated surface.

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item No. 18.38 shall be followed except that extra rate shall be paid for carrying out work on ceiling/sloping roof on undecorated surface over and above of item 18.38.

2.2. The rate shall be for a unit of one sq. metre.

18.42. Extra over item 18.40 for distempering with dry distemper on ceiling/sloping roofs.

1.0. Materials & Workmanship : 1.1. The relevant specifications of item No. 18.39 shall be followed except that the work shall be carried out on ceiling/sloping roofs on decorated surfaces.

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item No. 18.39 shall be followed except that the extra rate shall be paid for the distempering work carried out by dry distemper on ceiling/sloping roofs with decorated surface over and above the rate of item No. 18.39.

2.2. The rate shall be for a unit of one sq. metre.

18.44. Distempering (two coats) with oil bound distemper of approved brand and manufacture and of required shade on undecorated wall surfaces to give an even shade, over and including a priming coat with distemper primer of approved brand and manufacture after throughly brushing the surface free from mortar dropping and other foreign matter also including preparing the surface even and sand papered smooth.

1.0. Materials : 1.1. Oil bound washable distemper and primer shall be of approved brand and manufacture.

The distemper shall be required colour and shade and the same shall conform to I.S. 428-1969.

2.0. Workmanship: 2.1. Scaffolding: Where scaffolding is required, it shall be erected in such a way that as far as possible no part of scaffolding shall rest against the surface to be distempered. A properly secured strong and well tied suspended platform (Joola) may be used for distempering. Where ladders are used, pieces of old gunny bags shall be tied at top and cottom to prevent scratches to the walls and floors. For distempering to ceiling, proper stage scaffolding shall be erected where necessary.

2.2. Preparation of surface :

2.2.1. The undecorated surface to be distempered shall be throughly brushed off from dust, dirt, grease, mortar dropping and other foreign matter and sand papered smooth. New plaster surface shall be allowed to dry for atleast 2 months before applications of distemper.

2.2.2. All unecessary nails shall be removed. Pitting in plaster shall be made good with plaster of paris mixed with dry distemper of colour to be used. The surface shall then be rubbed down again with a fine grade sand paper and made smooth. A coat of distemper shall be applied over the patches. The surface shall be allowed to dry thoroughly before the regular coat of distemper is allowed. The surface affected by moulds, moss, fungi algae lichens, efflorescence etc. shall be treated in accordance with I.S. 2395 (Part-I) 1966. Before applying distempering, any unevenness shall be made good by applying putty made of plaster of paris mixed with water on entire surface including filling up the undulation and then sand papering the same after it is dry.

2.3. Priming coat:

2.3.1. A priming coat or distemper prime of approved manufacture and shade shall be applied over the papered surface in case of new work on undecorated surface. If the distemper primaring is done alter the wall surface dries completely, the distemper primer shall be applied.

2.3.2. Application of Primer shall be done as under:

The primer shall be applied with a brush on the clean dry and smooth surface. Horizontal strokes shall foe given first and vertical strokes shall be applied immediately afterwards. This entire operation will constitute one coat. The surface shall be finished as uniformly as possible leaving no brush marks. It shall be allowed to dry for atleast 48 hours before oil bound distemper or Paint is applied.

2.3.3. Oil bound distemper is not recommended to be applied within six months of the completion of wall plaster.

2.4. Preparation of oil bound distemper : 2.4.1. The distemper shall be diluted with water or any other prescribed thinner in a manner recommended by the manufacture only. Sufficient quantity of distemper required for a day's work shall be prepared.

2.5. Application of Distemper coat:

2.5.1. For undecorated surfaces, after the primer coat is dried for atleast 48 hours, the surface shall be lightly sand papered to make it smooth for receiving the distemper, taking care not to rub out the priming coat. All loose particles shall be dusted off after rubbing. Minimum two coats of distemper shall be applied with brushes in horizontal strokes followed immediately by vertical strokes which together shall constitute one coat. The subsequent coats shall be applied after a time interval of atleast 24 hours between consecutive coats to permit proper drying of the proceeding coat. The finished surface shall be even and uniform without patches, brush marks, distemper drops etc.

2.5.2. Sufficient quantity of distemper shall be mixed to finish one room at a time. The application of a coat in each room shall be finished in one operation and no work shall be started in any room which cannot be completed on the same day.

2.5.3. 15 cm. double bristled distemper brush shall be used. After day's work brushes shall be thoroughly washed in hot water soap solution and hung down to dry. Old brushes which are dirty and caked! with distemper shall not be used on the work.

2.6. Protective measurements : The surfaces of doors, windows, floors, articles of furniture etc. and such other parts of the buildings as are not to be distempered shall be protected from being splashed upon. Such surfaces shall be cleaned opt distemper splashes if any.

3.0. Mode of measurements & payment:

3.1. Priming coat of distemper primer, scraping of surface spoiled by stunk soots removal of oil and grease spots, treatment for infection of effloresces mould moss, fungi, algae and litchen and patch repairs to plaster shall be included in this item for which nothing extra shall be paid.

3.2. All the work shall be measured net in the decimal system as in place subject to the following limits unless otherwise stated hereinafter:

(a) Dimensions shall be measured to the nearest 0.01 m.

(b) Area in individual items shall be worked out to the nearest 0.01 sq. m. All work shall be measured in sq. metre. No deductions shall be made for ends of joints, beams, posts etc., and openings, not exceeding 0.5 sq. m. each and no addition shall be made for reveals, jambs, soffits, sills etc. of these openings nor for finish alround ends of joints, beams, posts etc.

3.3 . Deductions of opening exceeding 0.5 sq. m. but not exceedings 3 m. in each shall be made as follows and net addition shall be made for reveals, jambs, soffits etc. of these openings:

(a) When both the faces of walls are provided with same finish deductions shall be made or one face only.

(b) When each face of wall is provided with different finish, deduction shall be made for that side of frame for doors, windows etc. on which width of reveal is less than that of the other side but no deduction shall be made on the other side. Where the width of reveals on the both the faces of wall are equal, deduction of 50% of area of opening of each face shall be made from area of finish.

(c) When only one face of wall is treated and the other face is not treated, full deduction shall be made if the width of the reveal on treated side is less than that on untreated sides but if the width of the reveal is equal or more than that on untreated side neither deductions not addition to be made for reveals, jambs, soffits, sills etc.

3.4. In case opening of area exceeding 3 sq. m. each, deduction shall be made for openings but jambs, sills and soffits shall be measured.

3.5. No deductions shall be made for attachments such as casings, conduits, pipes, electric wiring and the like.

3.6. Item includes removing nails, making good holes, cracks, patches with material similar in composition of distemper.

3.7. The rate includes cost of all materials, labours, scaffolding, protective measures etc. involved in all the operations described above. This shall also include conveyance, delivery, handing, unloading, storing work etc.

3.8. The rate shall be for a unit of one sq. metre.

18.45. Distempering (two coats) with oil bound washable distemper of approved brand and manufacture and of shade required on undecorated wall surfaces to give an even shade, over and including a priming coat with alkali resistance primer of approved brand and manufacture after thoroughly brushing the surface free from mortar droppings, and other foreign matter and also including preparing the surface even and sand-papered smooth.

1.0. Materials & Workmanship: 1.1. The relevant specifications of item No. 18.44 shall be followed except that the primer of alkali resistance primer of approved brand and manufacture shall be used instead of distemper primer.

2.0. Mode of measurements & payment:

2.1. The mode of measurements and payment shall be the same as for item No. 18.44 above.

2.2. The rate shall be for a unit of one sq. metre.

18.46 Distempering (one coat) with oil bound washable distemper of approved brand of required shade on decorated wall surfaces to given an even shade after thoroughly brushing the surfaces clean of all grease, dirt, loose pieces of scales and also including distempering with oil bound washable distemper of preparing the surface even and smooth.

1.0. Materials & Workmanship : The relevant specifications of item No. 18.44 shall be followed except that distempering with oil bound washable distemper shall be carried out on decorated wall surfaces in one coat.

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item No. 18.44shall be followed.

2.2. The rate shall be for a unit of one sq. metre.

18.47. Extra over items 18.44 to 18.46 for every subsequent coat of distempering with oil bound washable distemper of approved brand and manufacture.

1.0. Materials & Workmanship: 1.1. The relevant specifications of item No. 18.44 shall be followed except that this work is for providing extra coat of oil bound distempering over and above two coats of distempering.

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item No. 18.44shall be followed except that the extra rate shall be paid over and above the rate for every subsequent coats over two coats of item 18.44 and 18.46.

2.2. The rate shall be for a unit of one sq. metre.

18.48. Extra over item 18.44, 18.45 for distempering with oil bound washable distemper on ceiling and sloping roots.

1.0. Materials & Workmanship: The relevant specifications of item No. 18.44 shall be followed except that the distempering shall be carried out on ceiling/sloping roofs.

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item No. 18.44shall be followed except that the extra rate shall be paid for earning out

distempering work on ceiling/sloping roofs over and above the rate of item No. 18.44 and 18.45.

2.2. The rate shall be for a unit of one sq. metre.

18.49. Extra over item 18.46, 18.47, for every subsequent cost of distempering on ceiling and sloping roofs.

1.0. Materials & Workmanship : 1.1,The relevant specifications of item No. 18.44 shall be followed except that the distempering work shall be carried out for subsequent coals over item No. 18.46 and 18.47.

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item No. 18.46 shall be followed except that the extra rate shall be paid for every subsequent coal of distemper applied over and above the rate of item No. 18.46 and 18.47.

2.2. The rate shall be for a unit of one sq. metre.

18.51. Finishing wall with water proofing cement paint on an undecorated wall surfaces (two coals) to give an approved brand and manufacture and of required shape even shade after thoroughly brushing the surface to remove all dirt and remains of loose powered materials.

1.0. Materials : 1.1. The water shall conform to M-l. Cement water proofing shall conform to l.S. 5410-1969.

2.0. Workmanship :

2.1. Scaffolding: The relevant specifications of item No. 18.11 shall be followed.

2.2. Preparation of surface: The relevant specifications of item No. 18.11 shall he followed except that the word white wash colour wash shall be substituted with water proofing cement paint. The surface shall be thoroughly wetted with clean water before cement water proofing paint is applied.

2.3. Preparation of paint: Portland cement shall be prepared by adding paint powder to water and stirring to obtain a thick paste, which shall then be diluted to a brushable consistency. Generally, equal volumes of paint powder and water make a satisfactory paint. In all cases, the manufacture's instructions shall be followed. The paint shall be mixed in such quantities as can used up within an hour of mixing as otherwise the mixture will set and thickness, affecting flowing and finish. The libs of cement paint drums shall be kept tightly when not in use.

2.4. Application of Paint:

2.4.1. No painting shall be done when the paint is likely to be exposed to a temperature of below 7°C within 48 hours after application.

2.4.2. When weather conditions are such as to cause damage the work shall be carried out in the shadow as far as possible.
This helps the proper hardening of the paint film by keeping the surface moist for a longer period.

2.4.3. To maintain the uniform mixture and to prevent segregation, the paint shall be stirred frequently in the bucket.

2.4.4. For undercoated surfaces, the surfaces shall be treated with minimum two coats of water proof cement paint. Not less than 24 hours shall be allowed between two coats. Next coat shall not be started untill the proceeding coat has become sufficiently hard to resist marking by the brush being used. In hot dry weather, the proceeding coat shall be allowed between two coats. Next coat shall not be started untill the proceeding coal has become sufficiently hard to resist marking by the brush being used. In hot dry weather, the proceeding coat shall be slightly moistened before applying the subsequent coat.

2.4.5. The finished surface shall be even and uniform in shade, without patches, brush masks, paint drops etc.

2.4.6 The cement paint shall be applied with a brush with reletively short stiff hog or fibre bristles. The paint .shall be brushed in uniform thickness .and shall be free from excessive heavy brush marks. Ths lamps shall be well brushed out.

2.4.7. Water proof cement paint shall not be applied on surfaces already treated with white wash colour wash, distemper dry or oil bound varnishes, paint etc. It shall not be applied on gypsum, wood and metal surfaces.

2.5. Curing : Painted surfaces shall be sprinkled with water two or three times a day. This shall be done between coats and for atleast two days following the final coat. The curing shall be started as soon as the paint has hardened so as not to be damaged by me sprinkling of water say about 12 hours after the application.

2.6. Protection measures shall be taken as per item No. 18.11 para 2.6.

3.0. Mode of measurements & payment:

3.1.The relevant specifications of item No. 18.11 shall be followed.

3.2. The rate shall be for a unit of one sq. metre.

18.53. Extra over item 18.51 for every subsequent coat of water proofing cement point of approved brand and manufacture.

1.0. Materials & Workmanship : 1.1. The relevant specifications of item No. 18.51 shall be followed except that the work is for applying subsequent coat of cement water proofing paint.

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item No. 18.51 shall be followed except that the extra rate shall be paid for applying every subsequent coat of cement water proofing paint over and above the rate of item No. 18.51.

2.2. The rate shall be for a unit of one sq. metre.

18.54. Extra over item 18.51 for finishing with cement paid on ceiling/sloping roofs.

1.0. Materials & Workmanship: 1.1. The relevant specifications of item No. 18.51 shall be followed except that the cement water proofing paint shall applied on ceiling and sloping roofs.

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item No. 18.51 shall be followed except that the extra shall be paid for applying cement water proofing paint on ceiling and sloping roofs, over and above the rate of item No. 18.51.

2.2. The rate shall be for a unit of one sq. metre.

18.56. Extra over item 18.53 for every subsequent coat of finishing with cement paint on ceiling and sloping roofs.

1.0. Materials & Workmanship : 1.1. The relevant specifications of item No. 18.51 shall be followed except that the work shall be carried out for subsequent coat on ceiling and sloping roofs.

2.0. Mode of measurements & payment: 2.1. The relevant specifications of item No. 18.53 shall be followed except that extra rate shall be paid for every subsequent coat applied with cement water proofing paint over and above the rate of item No. 18.53.

18.57. Wall painting (two coats) with plastic emulsion paint of approved brand and manufacture on undecorated wall surfaces to give an even shade including thoroughly brushing the surface free from mortar dropping and other foreign matter and sand paper smooth.

1.0. Materials : Water shall be conform to M-l. The plastic emulsion shall conform to I.S. 5411-1969 (part-I).

2.0. Workmanship:

2.1. Scaffolding : The relevant specifications of item No. 18.11 para 2.1. shall be followed.

2.2. Preparation of surface : The relevant specifications of item No. 18.44 para 2.2. shall be followed.

2.3. Preparation of Mix : This shall be done as per manufacturers instructions. The thinning of emulsion is to be done with water and not with turpentine. The quantity of thinner to be added shall be as per manufacturer instructions.

2.4. Applications:

2.4.1. Before pouring into small containers for use, the paint shall be stirred thoroughly in its container. When applying also, the paint shall be continuously stirred in the smaller container, so that its consistency is kept uniform.

2.4.2. The paint shall be laid on evenly and smoothly by meant of crossing and laying off the crossing and laying off consist of covering the area over with paint, brushing the surface hard for the first lime over and then brushing alternately in opposite direction two or three times and then finally brushing lightly in a direction at right angles to the same. In this process, no brush marks shall be left after the laying off is finished. No hair marks from the brush or clogging of paint puddles in the corners of panels, angles of mouldings, etc. shall be left on the work. The full process of crossing and laying off will constitute one coat.

2.4.3. The paint shall be applied with brush or rollers. For undecorated surfaces, the surface shall be treated with minimum two coats of cement water proofing paint. The second or subsequent coat shall not be started until the preceeding coat has become sufficiently hard to resist marking by brush being used.

2.4.4. The surface on finishing shall present a flat velvety smooth finish. It shall be even and uniform in shade without patches, brush marks, paint drops etc.

2.5. Precautions:

(a) Old brushes if they are to be used with emulsion paints, shall be completely dried of turpentine oil paint by washing in warm soap wafer.

Brushes shall be quickly washed in water immediately after use and kept immersed in water during break periods to prevent the paint from hardening on the brush.

(b) In the preparation of wall for plastic emulsion painting, no oil base putties shall be used in filling cracks, holes etc.

(c) Splashes on floors etc. shall bi cleaned out without delay as they will be difficult to remove after hardening.

(d) Washing of surfaces treated with emulsion paint shall not be done within 3 to 4 weeks of application.

2.6. Protective measures: **2.6.1.** The relevant specifications of item No. 18.17. para 2.3. shall be followed:

3.0. Mode of measurements & payment:

3.1. The relevant specifications of item No. 18.11 shall be followed.

3.2. The ,ate shall be for a unit of one sq. metre.

18.59 Extra over item No. 18.57 for every subsequent coat of wall painting with plastic emulsion paint of approved brand. **1.0. Materials & Workmanship**: 1.1. The relevant specifications of item No. 18.57 shall be followed except that the painting work shall be for subsequent coat of platstic emulsion paint.

2.0. Mode of measurements & payment: **2.1.** The relevant specifications of item No. 18.57 shall be followed except that the extra shall be paid for every subsequent coat of plastic emulsion paint applied over and above the rate of item No. 18.57. 2.2. The rate shall be for a unit of one sq. metre.

18.60 Extra over item 18.57 for painting with plastic emulsion paint of approved brand on ceiling and slopping roofs.

1.0. Materials & Workmanship : 1.1. The relevant specifications of item No. 18.57 shall be followed except that the painting shall be done on ceiling and sloping roofs.

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item No. 18.57 shall be followed except that the extra payment shall be made for applying plastic emulsion paint on ceiling and sloping roofs over and above the rate of item No. 18.57.

2.2. The rate shall be for a unit of one sq. metre.

18.62. Extra over item 18.59 for paint on ceiling and sloping roofs.

1.0. Materials & Workmanship : **1.1.** The relevant specifications of item No. 18.5.7 shall be followed except that the work for subsequent coat of plastic emulsion paint will be carried out on ceiling and sloping.

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item No. 18.57 shall be followed except that the extra rate shall be paid for carrying out painting on sloping roofs and ceiling with plastic emulsion paint over and above the rate of item No.18.59.

2.2. The rate shall be for a unit of one sq. metre.

SECTION-19

DETAILED SPECIFICATIONS OF ITEMS - PAINTINGS & POLISHING

AS PER "SCHEDULE OF RATES"

19.11. Painting one coat (excluding priming coat) on previously painted steel and other rnetal surface with enamel paint, brushing to given and even shade including cleaning the surface of all dirt, dust and other foreign matter.

1.0. Materials & Workmanship : 1.1. The relevant specifications of item No. 19.7 shall be followed except that painting shall be carried out in one coat with enamel paint on previously painted steel and metal surface.

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item No. 19.7 shall be followed.

2.2. The rate shall be for a unit of one sq. metre.

19.12. Applying priming coat over new steel and other metal surfaces after and including preparing the surface by thoroughly cleaning oil, grease, dirt and other foreign matter and secured with brushes, fine steel, wood scrapes and sand paper, with ready mixed priming paint, brushing red lead.

1.0 Materials:

1.1. The ready mixed primer, brushing red lead shall conform to I, G. 102-1962.

1.2. The thinner (linsed oil) shall conform to I.S. 75-1973. If for any reson, thinning is necessary in case of ready mix paint, the brand of thinner recommended by manufacturer shall be used.

2.0. Workmanship:

2.1. Preparation of surfaces : The surfaces 10 be painted shall be cleaned of all rust, scale, dirt and other foreign matter sticking to it with wire brushes, steel wool, scrapers, sand paper etc. This surface shall then be wiped finally with mineral turpentine which shall also removed grease and perspiration of hand marks. The surface shall then be allowed to dry.

2.2. Application of primer : 2.2.1. After the preparation of the surface, the priming coat shall be applied immediately. The brushying operations are to be adjusted to the spreading capacity advised by the manufacturer of the particular primer. The paint shall be applied evenly and smoothly by means of crossing and laying off. The crossing and laying off consists of covering the area over with paint, brushing alternately in opposite directions, two or three times and then finally brushing lightly in a direction at right angles to the same. In this process, no brush marks shall be left after the laying off is finished. The full process of crossing arid laying off will constitute one coat.

2.2.2. During painting, every time after the priming coat has been worked out of the brush bristles or after the brush has been unloaded of the bristles of the brush shall be opened up by striking the brush against portion of the unpainted surface with the end of the bristles, held at right angles to the surface, so that bristles thereafter will collect the correct amount of paint when dipped again into a paint container. The primery coat shall be allowed to dry completely before painting is started.

2.2.3. No hair marks from the brush or clogging at paint puddles in the corner or panels angles of mouldings etc. shall be left on the work.

2.2.4. Special care shall be taken while painting over bolls, nuts, rivets overlaps etc.

2.2.5. The container when not in use shall be kept close and free from air so that paint does not thickne and also shall be kept guarded from dust.

3.0. Mode of measurements & payment:

3.1. The new steel and other metal surface shall be measured under this item.

3.2. All the work shall be measured net in the decimal system as executed subject to the following limits unless otherwise stated hereinafter:

(a) Dimensions shall be measured to the nearest 0.01 metre.

(b) Areas shall be worked out to the nearest 0.01 Sq. metre.

3.3. No deductions shall be made for openings not exceeding 0.5 sq. mt. each and no addition shall be made for painting to headings, mouldings, edges, jambs, soffits, etc. of such opening.

3.4. In case of fabricated structural steel and iron work, priming coat of paint shall be included with fabrication. In case of trusses if measured in sq. m. compound girders, stanchions, lattices, girder and similar work, actual area shall be measured in sq. M. and no extra shall be paid for painting on bolts, heads, nuts, washers etc. No addition shall be made to the weight calculated for the purpose of measurements of steel and iron works for paint applied on shop or at site.

3.5. The different surfaces shall be grouped into one general item, areas of uneven surface being converted into equivalent plain areas in accordances with the table given as per Annexure II for payment.

3.6. The rate shall be for a unit of one sq. metre.

19.7. Painting two coats (excluding priming coat) on new steel and other metal surfaces with enamel paint, brushing, interior to give an even shade including cleaning the surface of all dirt, dust and other foreign matter.

1.0. Materials : The enamel paint shall conform to M-44 B.

2.0 Workmanship : 2.1. General:

2.1.1. The materials required for work of painting work shall be obtained directly from approved manufacturers or approved dealer and brought to the site in maker's drums, kege etc. with seal unbroken.

2 1.2. All materials not in actual use, shall be kept properly protected, lids of containers shall be kept closed and surface of paint in open or partially open containers covered with a thin layer of turpentine to prevent formation of skin. The materials which have become stale or flat due to improper and long storage shall not be used. The paint shall be stirred thoroughly in its container before pouring into small containers. While applying also the paint shall be continuously stirred in smaller container. No left over paint shall be put back into stock tins. When not in use, the containers shall be kept properly closed.

2.1.3. If for any seasons, thinning is necessary, the brand of thinner recommended by the manufacturer shall be used.

2.1.4. The surface to be painted shall be thoroughly cleaned am.' dusted. All rust, dirt and grease shall be thoroughly removed

before painting is started. No painting on exterior or other exposed parts of the work shall be carried out in wet, damp or otherwise unfavourable weather and all the surfaces shall be thoroughly dry before painting work is started.

2.2. Application:

2.2.1. Brushing operations arc to be adjusted to the spreading capacity advised by the manufacture of particular paint. The paint shall be applied evenly and smoothly by means of crossing and laying off. The crossing and laying off consists of covering the area over with paint, brushing the surface hard for the first lime over and then brushing alternately in opposite directions two or three times and then finally brushing lightly in direction at right angles to the same. In this process, no brush marks shall be left after the laying off is finished. The full process of crossing and laying off will constitute one coat.

2.2.2. Each coat shall be allowed to dry completely and lightly rubbed with very fine grade of sand paper and loose particles brushed off before next coat is applied. Each coat shall vary slightly in shade and shall be got approved from Engineer-in-charge before next coat is started.

2.2.3. Each coat except the last cost shall be lightly rubbed down with sand paper of fine pumice stone and cleaned of dust before the next coat is applied. No hair marks from the brush or clogging of paint puddles in the corners of panels angles of mouldings etc. shall be left on the work.

2.2.4. Special care shall be taken while painting over bolts, nuts, rivets, overlaps etc.

Approved best quality brushes shall be used.

3.0. Mode of measurements & payment:

3.1. The relevant specifications of item No. 19.12 shall be followed for mode of measurements and payment. The rate is excluding priming coat.

3.2. The rate shall be for a unit of one sq. metre.

19.15. Extra over item No. 19.7 and 19.11 for every subsequent coat of paint.

1.0. Materials & Workmanship : 1.1. The relevant specifications of item No. 19.7 shall be followed except that the work of painting shall be carried out for subsequent coat. .

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item No. 19.7 shall be followed except that the extra rate shall be paid for every subsequent coat of paints applied over and above the rate of item No. 19.7 and 19.11.

2.2. The rate shall be for a unit of one sq. metre.

19.19. Painting two coats (excluding priming coat) on new steel and other metal surface with synthetic enamel paint, brushing to give an even shade including cleaning the surface of all dirt, dust and other foreign matter.

1.0. Materials : Synthetic enamel paint shall conform to I. S. 1932-1964.

2.0. Workmanship : 2.1. The relevant specifications of item No. 19.7 shall be followed except that the painting shall be carried out with synthetic enamel paint.

3.0. Mode of measurements & payment:

3.1. The relevant specifications of item No. 19.7. shall be followed.

3.2. The rate shall be for a unit of one sq. metre.

19.21. Painting one coat (excluding priming coat) on previously painted steel and other metal surfaces with synthetic enamel paint brushing to give an even shade including cleaning the surface of all dirt, dust and other foreign matter.

1.0. Materials & Workmanship : 1.1. The relevant specifications of item No. 19.19. shall be followed except that the painting shall be carried out on previously painted steel and other metal surfaces using synthetic enamel paint in one coat.

2 0. Mode of measurements & payment:

2.1 The relevant specifications of item No. 19.19 shall be followed.

2.2. The rate shall be for a unit of one sq. metre.

19.23. Extra over item No. 19.19 and 19.21 for every subsequent coat of paint.

1.0. Materials & Workmanship: 1.1. The relevant specifications of item No. 19.19. shall be followed except that the work shall be carried out for subsequent coat of paint.

2.0. Mode of measurements & payment: 2.1. The relevant specifications of item No. 19.19 shall be followed except that the extra rate shall be paid for applying subsequent coat of oil paint over and-above the item No. 19.19.and 19.21.

19.50 (B) Painting two coats (excluding priming coat) on external surfaces of new rain water, soil, waste and vent pipes and fittings with ready mixed bituminous paint brushing, biack anticorrosive to give an even shade including cleaning of all dirt, dust and other foreign matter (75 mm. dia).

1.0. Materials : 1.l. Ready mixed bituminous paint shall conform to I.S. 158 : 1968.

2.0. Workmanship :

2.1. The relevant specifications of item No. 19.7 shall be followed except that the painting work of external surfaces of 75 mm. dia. rain water pipe, soil, waste and vent pipe and fitting with ready mixed bituminous paint shall be carried out.

3.0. Mode of measurements & payment:

3.1. The rate is excluding the cost of priming coat but including painting of all fittings coming in line.

3.2. The rate shall be for a unit of one running metre.

19.50 (C) Painting two coals (excluding priming coat) on external surfaces of rain water, soil waste and vent pipe and fittings with ready mixed bituminous paint brushing, black anticorrosive to give an even shade including cleaning off all dirt dust and other foreign matter: 100 mm. dia.

1.0. Materials & Workmanship : 1.1. The relevant specifications of item No. 19.50 (B) shall be followed except that the pipes to be painted on is 100 mm. dia. metre.

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item No. 19.50 (B) shall be followed. The rate is excluding the cost of priming coat but including cost of painting all fitting coming in line.

2.2. The rate shall be for a running metre.

19.59 (B) Applying priming coat over new wood and based surfaces after and including preparing the surface by thoroughly cleaning of dirt grease, dust and oilier foreign matter, sand papering and knotting: Ready mixed paint, brushing wood primer pink.

1.0.Materials : 1.1. The ready mixed paint, brushing, wood primer pink shall conform to I. S. 3536-1966.

2.0. Workmanship : 2.1. Preparation of Surfaces :

2.2.l. All wood work shall be dry and free from any foreign matter incidental to building operations. Nails shall be punched well below the surface to provide a firm key for stopping. Mouldings shall be carefully smoothened with abrasive paper and projecting fibres shall be removed. Flat portion shall be smoothened off with abrasive paper used across the grain prior to staining and with the grain prior to staining or if the wood is to be left in its natural colour, wood work which is to be stained may be smoothened to scraping instead of by glass papering if so required.

2.2.2.. Any knots, resinous or stricaks or blueish sap wood that are not large enough to justify cutting out shall be treated with two coats of pure shellac knotting applied thinly and extended about 25 mm. beyond the actual area requiring treatment.

2.2. Application of primer : 2.2.1. The relevant specifications of item No. 19.12 (A) shall be followed for application of primer.

3.0. Mode of measurements & payment: 3.1. The relevant specifications of item No. 19.32 shall be followed except that work done on wood and wood based surfaces shall be paid under this item. : J.2. The rate shall be for a unit of one sq. metre.

19.59. (C) Applying priming coal over new wood and wood based surface after and including preparing the surface by thoroughly cleaning oil, grease, dirt and other foreign matter sand papering and knotting; Ready mixed paint brushing priming, or enamel.

1.0. Materials : 1.1. The Ready mixed paint for brushing priming for enamels wood shall conform to I. S. 106-1962.

2.0. Workmanship : 2.1. The relevant specifications of item No. 19.59 (B) shall be followed except that ready mixed paint rushing priming for enamel shall be used instead of ready mixed paint brushing wood primer pink.

3.0. Mode of measurements & payment:

3.1. The relevant specifications of item No. 19.12 shall be followed.

3.2. The rate shall be for a unit of one sq. metre.

19.62. (B) Extra over item 19.59(B) for every subsequent coal o' priming coat. Ready mix paint brushing wood primer pink.

1.0. Materials & Workmanship : 1.1. The relevant specifications of item No. 19.59 (B) shall be followed except that the

painting work shall be carried out with ready mix paint, brushing wood primer pink for subsequent coat.

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item No. 19.59 (B) shall be followed except .hat the extra rate shall be paid for every subsequent coat applied with Ready mix paint; brushing wood primer pink over and above the rate of item No. 19.59 (B).

19.62 (C) Extra over item No. 19.59(C) for every subsequent coat of priming coat ready mix paint brushing priming for enamel.

1.0. Materials & Workmanship : 1.1. The relevant specifications of item No. 19.59 (C) shall be followed except that the painting work shall be carried out with ready mix paint brushing priming for enamel.

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item No. 19.59 (C) shall be followed except that the extra shall be paid for every subsequent coats of priming coat with ready mixed paint, brushing priming for enamel.

2.2. The rate shall be for a unit of one sq. metre.

19.71. Painting two coats (excluding priming coat) on new wood and wood based surfaces with enamel paint interior to give an even shade including cleaning the surface off all dirt, dust and other foreign matter sand papering and slopping.

1.0. Materials : 1.1. The enamel paint shall conform to I. S. 133-1975.

2.0. Workmanship:

2.1. The relevant specifications of item No. 19.7 shall be followed for general and applications of paint, except that the enamel paint shall be used for painting on new wood/wood based surfaces.

2.2. In painting doors and windows the putty, round the glass panes also be painted but care shall be taken to see that no paint, stain etc. are left on the glass. Top of shutters and surfaces in similar hidden locations shall not be left out in painting.

3.0. Mode of measurements & payment:

3.1. The relevant specifications of item No. 19.12 shall be followed, for mode of measurements and payments. The rate excludes cost of priming coat.

3.2. The rate shall be for a unit of one sq. metre.

19.73. Painting one coal (excluding priming coal) on previously painted wood and wood based surfaces with enamel paint to give even shade including cleaning of all dirt, dust and other foreign mailer.

1.0. Materials & Workmanship: 1.1. The relevant specifications of item No. 19.71 shall be followed except that the painting work shall be carried out on previously painted wood and wood based surfaces with enamel paint to give even shade in one coat with paint.

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item No. 19.71 shall be followed.

2.2.The rate shall be for a unit of one sq. metre.

19.75. Extra over item 19.71 and 19.73 for every subsequent coat of paint.

1.0. Materials & Workmanship : 1.1. The relevant specifications of item No. 19.71 shall be followed except that painting work shall be for subsequent coal with paint.

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item No. 19.71 shall be followed except that the extra rate shall be paid for every subsequent coat applied over and above the item No. 19.71 and 19.73.

2.2. The rate shall be for a unit of one sq. metre.

19.77. Painting two coats (excluding priming coat) on new wood and wood based surfaces with of ready mixed paint brushing, oil gloss, semi-gloss, to give an even shade including cleaning all dust, dirt and other foreign mailer sand papering and stopping.

1.0. Materials : The ready mixed paint shall conform to M- 44. The ready mixed paint brushing gloss, semi-gloss shall conform lo I. S. 129-1962 and I. S. 117-1964.

2.0. Workmanship: 2.1. The relevant specifications of item No. 19.71 shall be followed for general and application of paint except that ready mixed paint brushing, oil gloss and semi-gloss shall be used of approved colour and shade instead of enamel paint.

3.0. Mode of measurements & payment:

3.1. The relevant specifications of item No. 19.12 shall be followed for measurements and payment. The rate excludes cost of priming coat.

3.2. The rate shall be for a unit of one sq. metre.

19.84. Varnishing two coats (excluding priming coat) on new wood and wood based surfaces undercoating with flatting varnish and finishing coat varnish to give an even surface of alldisri, dust and sand papering so as to produce a smooth dry surface.

1.0. Materials : The varnish shall conformt o I. S. 338-1962.

2.0. Mode of measurements & payment:

2.1.1. The surface to be varnished shall be prepared to produce a smooth, dry neat surface. The previous coat of paint or stair, if any shall be allowed to dry and rubbed down slightly wipped off and allowed to dry.

2.1.2.The operation of varnishing calls for careful attention to cleanliness. All dust and dirt shall be removed from the surface to be varnished and also from the neighborhood. If surfaces are dampened to avoid raising of dust, they shall be allowed to dry thoroughly before varnishing is commenced. Damp atmosphere and draughts shall be avoided. For exterior work a normal dry day should be chosen. Explosure to extreme of heat or cold, or to a damp atmosphere v/ill spoil the work.

2.1.3. In handing and applying varnish care should be taken to avoid forming forth or air bubbles. Brushes and containers shall be kept scrupulously clean.

2.2. Application :

2.2.1. The varnish shall be applied liberally with a brush and spread evenly over a portion of the surface with a short light strokes to avoid for frothing. It shall be allowed to flow out while (he next section is being laid-in. Excess varnish then be scrapped out of the brush and the first section be crossed recrossed and then laid off lightly. Two much or too little varnish left on the surface will mar the appearance of the finish. The varnish once it has begun to set, shall not be retouched. If a mistake is made, the varnish shall be removed and the work started afresh.

2.2.2. In case of two coats of varnish work, the first shall be hard drying, under coating or flatting varnish, this shall be allowed o dry hard and then be flatting down before applying the finishing coat. If two coats are applied, sufficient time shall be allowed between two coals.

2.2.3. When flat varnish is used for finishing a preparatory coat of hard drying under coating of Halting varnish shall be first applied and shall be allowed to harden thoroughly. It shall then be lightly rubbed down before the flat varnish is applied, section of the work such as panels, shall be cut in clearly, so as to avoid any overlapping during applications, as this is likely impart some measure, of gloss to partially dried area, worked up in lapping. On larger area the flat varnish shall be applied. rapidly and the edges of each patch applied shall not be allowed to set but shall be followed up whilst in free working conditions.

3.0. Mode of measurements & payment:

3.1. The relevant specifications of item No. 19.71 shall be followed.

3.2. The rate shall be for a unit of one sq. metre.

19.86. Extra over Her.: item 19.84 for every subsequent coal of varnish.

1.0. Materials & Workmanship : 1.1. The relevant specifications of item No. 19.84 shall be followed except that the work hall be for a subsequent coat of varnishing.

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item No. 19.84 shall be followed except that the extra rate shall be paid for every subsequent coat of varnishing done over and above the rate of item No. 19.84. 2.2. The rate shall be for a unit of one sq. metre.

19.87. Polishing with french polish on new wood and wood based surface to give an even surface including cleaning the surface of all dirt, dust and sand papered smooth and including a coal of wood filler.

1.0. Material:

1.1. The French polish of required tint and shade shall be prepared with the below *me*ntioned ingredients and other necessary materials : (i) Denatured spirit of approved quality (ii) Chadras, (iii) Sheilac (iv) Pigment. The french polish so prepared shall conform to I.S. 348-1968.

2.0. Workmanship : 2.1. Preparation of Surface :

2.1.1. All unevenness shall be rubbed down to smoothness with the paper and the surface shall be well dusted. The pores in the wood shall be filled up with a filler made of paste of whiting in water or methylated spirit (with a suitable pigment like burnt sienna or umber if required): Otherwise the French polish will get absorbed and a good gloss will be difficult to obtain.

2.2. Application : 2.2.1. A pad of woolen cloth covered by a fine cloth shall be used to apply the polish. The pad shall be moistened with polish and rubbed hard on the surface in a series of over laping circles applying the polish sparingly but uniformly over the entire area to give an even surface. A trace of linseed oil on the face of the pad may be added which shall faciliate this operation. The surface shall be allowed to dry and the remaining coats applied in the same way. To finish off the pad shall be covered with a fresh piece of clean fine cloth, slightly damped with methylated spirit and rubbed lightly and quickly with circular motions. The finished surface shall present a uniform texture and high gloss.

3.0. Mode of measurements & payment:

3.1. The relevant specifications of item No. 19.12 shall be followed for mode of measurements and payment.

3.2. The rate includes cost of wood filler etc. complete.

3*3.* The rate shall be for a unit of one sq. metre

19.88. Polishing with french polish on previously polished wood and wood based surface to give an even surface including cleaning the surface of all dirt, dust and sand papered smooth including a coat of wood filler.

1.0. Materials & Workmanship: 1.1. The relevant specifications of item No. 19.87 shall be followed except that the french polish will be applied on previously polished wood and wood based surface.

2.0. Mode of measurements & payments:

2.1. The relevant specifications of item No. 19.87 shall be followed.

2.2. The rate shall be for a unit of one sq. metre.

19.91. Applying wax polish on new wood work and wood based surfaces with bee's wax polish in proportion 2:1.5:1 .05:05 (2 Bess Wax, 1.5 linseed oil: 1 Turpentine oil: 0.5 Varnish by weight) to give an even surface including cleaning the surface of all dirt, dust and sand papered smooth.

1.0. Materials : Bee's Wax shall conform to LS.: 1504-1968 Linseed oil shall conform to I. S. 75-1967. Turpentine shall conform to I.S$_V$83-1950. Varnish shall conform to I.S. 337-1952.

2.0. Workmanship : 2.1. Preparation of bees wax :

2.1.1. In case of bees wax it shall be prepared locally with following specifications :

2.1.2. Pure bees wax free paraffin or stearine adulterants shall be used. The polish shall be prepared from mixture of bees wax, linseed oil, turpentine and varnish in proportion 2 : 1.5 : 1 : 0.5 by weight. The bees wax and boiled linseed oil shall be heated over a slow fire. When the wax is completely dissolved the mixture shall be cooled till it is just warn and turpentine and varnish added to it in the required-proportions and entire mixture shall be well stirred.

2.0. Preparation of surfaces:

2.2.1. The surface to be waxed shal1 be prepared to produce a smooth dry, neat surface. Previous coat of paint or stain of any shall be allowed to dry and be rubbed down lightly wiped off and all allowed to dry. All dust and dirt shall be removed from the surface to be waxed, and also from the neighborhood. Damp atmosphere and draughts shall be avoided. For waxing, normal dry day shall be chosen.

2.3. Application:

2.3.1. The polish shall be appplied evenly with clean soft pad of cotton cloth in such a way that the surface is completely and fully covered. The surface shall then be rubbed continuously for half an hour. After well rubbing in one coat of wax polish the work shall be covered with dust proof sheet. (Cloth for preventing dust falling on the work.) Subsequent coat shall be applied after the surface is quite dry and shall be rubbed off with soft fiannel until the surface has assumed a uniform gloss and in dry showing no sign of stickness.

2.3.2. The final polish depends largely on the amount of rubbing which shall be continuous and with uniform pressure with Sequent changes in the direction.

3.0. Mode of measurements & payment:

3.1. The relevant specifications of item No. 19.12 shall be followed.

3.2. The rate shall be for a unit at one sq. metre.

19.92. Applying wax polish on previous wax polished wood and wood based surfaces with boss, wax polish in proportion of 1 : 1.5 : 1: 0.5 (2 Bees wax 1.5 linseed oil: 1 Turpentine: 0.5 Varnish by weight) to give an even surface including cleaning the surface of all dirt, dust and sand papered smooth.

1.0. Materials & Workmanship : 1.1. The relevant specifications of item No. 19.91 shall be followed except that the wax polishing shall be carried out on previously was polished wood and wood based surfaces with bess wax polish.

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item Ne.19.91 shall be followed.

2.2. The rate shall be for a unit of one sq. metre.

19.98 coal tarring two coats on new wood and wood based surfaces using 0.15 and 0.12 litres of coal tar per sq.m. in the first and second coat respectively to give an even shade including cleaning of all dirt, dust and other foreign matter:

1.0. Materials : The coal tar shall conform to I. S. 290-1961.

2.0. Workmanship : 2.1. 200 Cms, of unslaked lime shall be added to every litre of coal tar and heated till it begins to boil. It shall be taken off the fire and kerosene oil added to it slowly at the rate of 1 part kerosene oil and 6 parts or more parts of coal tar by volume and stirred thoroughly. The addition of lime is for preventing the tar from runnings.

2.2. Preparation of surface : 2.2.1. The surface to be painted shall be allowed to dry sufficiently. Any existing fungus of mould growth shall be completely removed. All major crackes or defects in the plaster shall be cut out and made good. Before primer is applied holes and undulations shall be filled up with plaster of paris and rubbed smooth.

2.3. Application of paint: 2.3.1. The coal tar shall be applied as per relevant specifications of applying mixed paint item No.19.7 except coal tarring is used instead of enamel paint.

3.0. Mode of measurements & payment:

3.1. The relevant specifications of item No.19.12 shall be followed.

3.2 The rate shall be for a unit of one sq. metre.

19.119. (I) Writing letter of figures on any surface with black Japan paint (stops, comas, hyphens and the like not be measured and paid for separately): block (Letters/figures).

1.0. Materials : 1.1. Ready mixed the black Japan paint shall conform to I. S. 341-1952.

2.0. Workmanship : 2.1. The loiters and figures shall be to the heights and widths as per approved drawings or as directed.
These shall be stenciled or drawn in pencil and got approved before painting. They shall be of uniform size and finished neatly. The edges shall be straight or in pleasant smooth curves.

3.0. Mode of measurements &. payment:

3.1. Letters, figures and similar items etc. stops, commas, hyphens and the like shall be deemed to be included in the item.

3.2. The rate per cm. height of letter shall hold good irrespective of width of the letters of figures or the thickness of the lettering.

3.3. The rate shall be for a unit of per letter per cm. height.

19.119 (II) Writing letter of figures on any surface with black japan paint stops, commas, hyphens and the like not be measured and paid for separations: Indian Letters/figures.

1.0. Materials & Workmanship: The relevant specifications of item No. 19.119 (I) shall be followed except the writing of letters shall be Indian letters/figures.

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item No. 19.119(1) shall be followed.

2.2. The rate shall be for a unit of per letter per cm. height.

19.126 (I) Painting lines, dashes, arrows, letters etc. on roads, air fields, and like in two coats with road marking paint, brushing including the surface of all dirt, dust and other foreign matter: Over 10 cms in width.

1.0. Materials : 1.1. The road marking paint shall conform to I. S. 164-1951.

2.0. Workmanship : 2.1. The relevant specifications of item No. 19.119 (I) shall be followed except that the painting lines, dashes arrows and letters on roads, air fields and like thall be carried out with road marking paint in two coats : over 10 cms. in width.

2.0. Mode of measurements & payment :

2.1. The relevant specifications of item No. 19.119(I) shall be followed.

2.2. The rate shall be for a unit of one sq. metre.

19.126. (II) Painting lines, clashes, arrows, letters etc. on roads, fields and like in two coats with road making paint brushing including cleaning the surface of all dirt, dust and other foreign matter: upto 10 cms. in width.

1.0. Materials & Workmanship: 1.1. The relevant specifications of item No. 12.126 (I) shall be followed, except that painting work shall be upto 10 cms. width.

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item No. 19.119 (I) shall be followed.

2.2. The rate shall be for a unit of one running metre.

19.127 (A) Painting lines, dashes, arrows, letters etc. on roads, airfields and like in one coat with road marking paint, brushing including cleaning the surface of all dirt, dust and other foreign matter : over 10 cms. in width.

1.0. Materials & Workmanship: The relevant specifications of item No. 19.126 (1) shall be followed except that the painting shall be done in one coat over 10 cms. in width.

2.0 Mode of measurements & payment:

2.1. The relevant specifications of item No. 19.126 (I) shall be followed.

2.2. The rate shall be for a unit of one sq. metre.

19.127 (B) Painting lines, dashes, arrows, letters etc. on roads air fields and like in one coat with road making paint, brushing including cleaning the surface of all dirt, dust and other foreign matter: upto 10 cms. in width.

1.0. Materials & Workmanship : 1.1. The relevant specifications of item No. 19.126 (I) shall be followed except that the painting shall be done in one coat upon 10 cms. in width.

2.0 Mode of measurements & payment:

2.1. The relevant specifications of item No. 19.126 (I) shall be followed.

2.2. The rate shall be for a unit of one running metre.

SECTION-20

DETAILED SPECIFICATIONS FOR DEMOLITION & DISMANTALING AS PER "SCHEDULE OF RATES"

20.1. (I) Demolition and disposal of unserviceable materials with all leads and lifts : Lime Concrete.

1.0. Workmanship:

1.1. The demolition shall consist of demolition of one or more parts of the building as specified or shown in the drawings. Demolition implies taking up or down or breaking up. This shall consist of demolishing whole or part of work including all relevant item as specified or shown in the drawings.

1.2. The demolition shall always be planned before hand and shall be done in reverse order of the one in which the structure was constructed. This scheme shall be got approved from the Engineer- in-charge before starting the work. This however will not absolve the Contractor from the responsibility of proper and safe demolition.

1.3. Necessary dropping, shoring and under pinning shall be provided for the safety of the adjoining work or property, which is to be left intact, before dismentaling and demolishing is taken up and the work shall be carried out in such a way that no damages is caused to the adjoining property.

1.4. Wherever required, temporary enclosures or partitions shall also be provider. Necessary precautions shall be taken to keep the dust nuisance down as and where necessary.

1.5. Dismantaling shall be commenced in a systematic manner. All materials which are likely to be damaged by dropping from a height or demolishing roof, masonry etc. shall be carefully dismantled first. The dismantled articles shall be properly stacked as directed.

1.6. AH materials obtained from demolition shall be the property o. Government unless otherwise specified and shall be kept in safe custody untill handed over to the Engineer-in-charge.

1.7. Any serviceable materials, obtained during dismantling or demolition shall be separated out and stacked properly as directed, with all lead and lift. All unserviceable materials, rubbish etc. shall be slacked as directed by the Engineer-in- charge.

1.8. On completion of work, the site shall be cleared of all debris rubbish and cleaned as directed.

2.0. Mode of measurements & payment:

2.1. Measurements of all work except hidden work shall be taken before demolition or dismantaling and no allowance for increase in bulk shall be allowed. The demolition of lime concrete shall be measured under this item. Specification for deduction for voids, openings etc. shall be on same basis as that employed for construction of work.

2.2. All work shall be measured in decimal system as fixed in its place subject to the following limits, unless otherwise slated hereinafter: (a) Dimensions shall be measured to the nearest 0.01 mt. (b) Area shall be worked out to the nearest 0.01 sq. ml. (c) Cubical connection shall be worked out to the nearest 0.01 Cu. m.

2.3. The rate shall include cost of all labour involved and tools used in demolishing and dismantling including scaffolding. The rate shall also include the charges far separating out and stacking the serviceable materials properly and disposing the unserviceable materials with all lead and lift. The rate also includes for temporary storing for the safety of the portion not required to be pulled down or of adjoining property and providing temporary enclosures or partitions where considered necessary.

2.4. The rate shall be for a unit of one cubic metre..

20.1. (ii) Demolition and disposal of unserviceable materials with all leads and lifts. Unreinforced cement concrete.

1.0. Workmanship: The relevant specifications of item 10.1 (i) shall be followed except that the unrcinforced cement concrete work is to be demolished instead of lime concrete.

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item No.20.1 (I) shall be followed.

2.2. The rate shall be for a unit of one cubic metre.

20.3. Demolition including slacking of serviceable materials and disposal or unserviceable materials with all leads and lifts R.C.C. work.

1.0. Workmanship: 1.1. The relevant specifications of item No. 20.1 (I) shall be followed except that demolition of R.C.C. work is to be done.

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item No. 20.1. (I) shall be followed except that the demolition of reinforced concrete structure. The unserviceable materials shall be disposed of at all leads and lifts. The rate excludes scraping straightening of reinforcement but includes cutting of reinforcement.

2.2. The rate shall be for a unit of one cubic metre.

20.11. (I) Demolition of brick work arid stone masonry including stacking of serviceable materials and disposal of underviceable materials with all leads and lifts: in lime mortar.

1.0. Workmanship : 1.1. The relevant specifications of item No. 20.1 (I) shall be followed except that demolition of brick or stone masonry in lime mortar is to be done.

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item No. 20.1 (I) shall be followed except that the wall and independent piers of columns of brick or stone masonry shall be measured in cubic metres. All copings, corbles, cornices and othe projections shall be included with the wall measurements.

2.2. In measuring thickness plastered walls, the thickness of plaster shall be included. The unserviceable materials shall be disposed off with all lead and lift Ashlar face stones dressed stone etc. if required to be taken down intact shall be dismantled and measured separately in cubic metres.

2.3. The rate is exclusive of cleaning of bricks or stones. Honey comb works or hollow block walling shall be measured as solid.

2.4. The rate shall be for a unit of one cubic metre.

20.11 (II) Demolition of brick work and stone masonry including stacking of serviceable materials and disposal of unserviceable materials with all leads and lifts: in cement mortar.

1.0. Workmanship : The relevant specifications of item No. 20.1 (I) shall be followed except demolition of brick or stone masonry in cement mortar is to be done:

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item No. 20.11 (II) shall be followed. The unserviceable materials shall be stacked as directed by Engineer-in-charge with all leads and lifts.

20.22. Demolition in terrace including stacking of serviceable materials and disposal of unserviceable materials with all lead and lift: Brick tiles covering.

1.0. Materials: 1.1. The relevant specifications of item No. 20.1 (I) shall be followed except that the demolition of terrace brick tiles is to be done. .

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item No. 20.1 (I) shall be followed pt that the brick tiles covering of terrace shall be measured in sq. mt. The unserviceable materials shall be stocked as directed at all leads and lifts.

2.2. The rate shall be for a unit of one sq. metre.

20.23. Dismantling tiled or stone floors laid in mortar including stacking of serviceable materials and disposal of unserviceable materials with all lead and lifts.

1.0. Workmanship: 1.1. The relevant specifications of item No. 20.1 (I) shall be followed except the dismantling of tiled or stone floors laid on mortar shall be done. Dismantling implies carefully taking up or down or these are fixed by nail, screws, bolts etc. these shall be taken out with proper tools. .

2.0. Mode of measurements & payment:

2.1. The supporting materials such as joints, beams if any etc. shall be measured separately, the relevant specification of item No.20.1 (I) shall be followed. The rate shall include stacking the unserviceable materials as directed will lead and lift.

2.2. The rate shall be for a unit of one sq. metre.

20.25. Dismantling of wooden floors, inc hid ing stacking of serviceable materials and disposal of unserviceable materials with all lead and lifts.

1.0. Materials : 1.1. The relevant specifications of item No. 20.1 (I) shall be followed except that wooden floors shall be dismantled.

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item No. 20.1 (I) shall be followed. The supporting members such as joints, beams etc. shall be measured separately. The rate includes disposal of unserviceable materials as directed with all lead and lift.

2.2. The rate shall be for a unit of one sq. metre.

20.27 (I) Dismantling of sheet roofing including ridges, hips, valleys, gutters etc. stacking of serviceable materials and disposal of unserviceable materials with all leads and lifts G.I. sheet roofing.

1.0. Materials: 1.1. The relevant specifications of item No. 20.1 (i) shall be followed except that G. I. sheet roofing shall be dismantled instead of concrete work.

2.0. Mode of measurements & payment:

2.1. The area of G. I. sheet roofing shall be measured in sq. metre. Ridge, hips and valley shall be girthed and included with roof area. Corrugated and semi-corrugated surfaces shall be measured flat and not girthed.

2.2. Supporting member such as rafters, purlins, beams, joints, trusses etc. shall be measured separately.

2.3. The rate shall be include disposal of unserviceable materials with all leads and lifts and stacking the serviceable materials as directed.

2.4. The rate shall be for a unit of one sq. metre.

20.27 (II) Dismantling of sheet roofing including ridges, hips, valleys, gutters etc. stacking or serviceable materials and disposal of unserviceable materials with all leads and lifts: A. C. Sheet roofing.

1.0. Workmanship: 1. The relevant specifications of item No. 20.1 (I) shall be followed except the dismantling work of A.C. sheet roofing is to be done.

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item No. 20.27 (i) shall be followed except that the A.C. sheets roofing shall be

measured in this item.

2.2. The rate shall be for a unit of one sq. metre.

20.28. Dismantling Mangalore or country tile roofing with battens, boarding etc. including stacking of serviceable materials and disposal of unserviceable materials with all lead & lifts.

1.0. Workmanship: The relevant specifications of item No. 20.1 (I) shall be followed that the country tile roof of Mangalore roof shall be dismantled.

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item No. 20.1 (I) shall be followed.

2.2. The supporting members shall be measured under separate item.

2.3. The rate includes labour required for disposal of unserviceable item with all leads and lifts.

2.4. The rate shall be for a unit of one sq. metre.

20.30. Dismantling cement asbestos/hard board in ceiling or partition walls, wooden trellis work including frames, stacking of the serviceable materials and disposal of unserviceable materials with all leads and lifts.

1.0. Workmanship: 1.1. The relevant specifications of item 20.1 (I) shall be followed except that the cement asbestos hard board in ceiling or partition walls, wooden trellis, work etc.

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item No. 20.1 (I) shall be followed. The serviceable materials shall be stacked as and where directed and the unserviceable materials shall be disposed off with all leads and lifts.

2.2. The rate shall be for a unit of one sq. metre.

20.35. Dismantling wood work, wrought frame and fixed in frames, trusses including stacking the materials with all lead and lift.

1.0. Workmanship: 1.1. The relevant specifications of item No. 20.1 (I) shall be followed except that the wood work, wrought framed, and fixed in frames, trusses, etc. shall be dismantled.

2.0. Mode of measurements & payment:

2.1. The relevant specification of item No. 20.1 (I) shall be followed.

2.2. The materials shall be stacked as and where directed with all lead and lifts,

2.3. The rate shall be for a unit of one cubic metre.

20.39. Dismantling expanded metal or I. R. C. fabric with necessary battens and headings including frame work and stacking the serviceable materials with all lead and lift.

1.0. Workmanship : The relevant specifications of item 20.1 (I) shall be followed except that the dismentling of expanded metal or I. R. C. fabric shall be done. .

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item No. 10.1 (I) shall be followed.

2.2. The rate shall be for a unit of one sq. metre.

20.43. Dismentaling steel work including dismembering and stacking the materials with all lead and lifts.

1.0. Materials : 1.1. The relevant specifications of item.No..20.1 (i) shall be followed except that the dismantling of steel work shall be carried out.

2.0. Mode of measurements *&* payment:

2.1. The relevant specifications of item No. 20.1 (I) shall be followed.

2.2. The weight of the member shall be computed from standard tables unless the actual weight can be readily determined.

2.3. Riveted works where rivets are required to be cut, the same shall be carried out under this item and nothing extra shall be paid.

2.4. In farmed steel gate, the weight of any covering materials or filling such as iron sheets and expanded metal shall be added to the weight of the main articles if such covering is not ordered to be taken out separately.

2.5. The rate includes stacking the materials as and where directed with all leads and lifts.

2.6. The rate shall be for a unit of one kg.

20.49. (I) Dismentling doors, windows, ventilators etc. (wood or steel) shutters including chowkhats Architraves, hold fasts and other attachments etc. complete and stacking them within ail lead & lifts, Not exceeding 3 sq. m. in area.

1.0. Workmanship: 1.1. The relevant specifications of item No. 20.1 (I) shall be followed except that the doors, windows, ventilators etc. (wood or steel) shutters including chowkhats, architraves, holdfasts and other attachments etc. are to be dismentled.

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item No. 20.1 (I) shall be followed.

2.2. The doors, windows, ventilators etc. not exceeding 3 sq. ml. in area (each) including shutters and chowkhats, Architrave, holdfasts and other attachment to grames etc. will be dismantled and measured under this item.

2.3. The rate includes stacking serviceable materials as and where directed with all leads and lifts.

2.4. The rate shall be for a unit of one number.

20.49. (ii) Dismantling doors, windows, ventilators etc. (wood or steel) shutters including chowkhats, Architraves, hold fasts and other attachments etc. complete and stacking them within all leads and lifts exceeding 3 sq. metres in area.

1.0. Workmanship : 1.1. The relevant specifications of item No,20.49 (I) shall be followed except that the area of doors, windows, ventilators, exceeding 3 sq. metres are to be dismantled under this item.

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item No. 20.49 (I) above shall be followed.

2.2. The rate shall be for a unit of one number.

20.51. Dismantling barbed wire fencing including making rolls and also including dismantling fencing posts including all earth work, concrete in the base and making good the disturbed ground, stacking useful materials as directed and disposing all the unserviceable materials with all leads and lifts.

1.0. Workmanship : 1.1. The relevant specifications of item No. 20.1 (I) shall ho followed except that the dismantling of barbed wire fencing shall be carried out.

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item No. 20.1 (i) shall be followed.

2.2. The rate includes making rolls of dismantled wires and including dismantling fencing posts, concrete work, in case and making good the disturbed ground etc. complete.

2.3. The serviceable materials shall be stacked as and where directed and the unserviceable materials shall be disposed with all leads and lifts.

2.4. The rate shall be for a unit of one running metre.

20.56. Dismantling C.P. Pipes, G. S. W. Pipes and A. C. rain water pipes with fitting and clamps including stacking the materials with all lead and lift (for any dia. of pipe.)

1.0. Workmanship: 1.1. The relevant specifications of item No. 20.23 shall be followed except that the dismentaling work of pipe lines of C.I., G.S.W. & A.C. Pipes with fitting shall be carried out.

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item No. 20.1 (I) shall be followed.

2.2. Water pipe lines, including rain water pipes; with clamps and specials, sewer pipe lines, (Salt glazed ware or concrete) etc. shall be measured in running metre inclusive of joints (The measurements shall be taken along the centre line of pipe and fittings.)

2.3. The rate shall be for a unit of one running metre.

20.001. Dismantling sanitary fittings like wash basin. W. C. Pan Indian & European Type Hushing tank, etc. including stacking the materials with all lead lifts.

1.0. Workmanship : 1.1. The relevant specifications of item No. 20.23 shall be followed except that the dismantaling work of sanitary fittings such as wash basin, W. C: Pan (all type of pans), flushing tanks etc. shall be carried out.

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item No. 20.1 (I) shell be followed.

2.2. The-rate shall be for a unit of one number.

20.002. Scraping oil paint from steel and other metal surface and making the surface even (with hand scraping), .1.0 workmanship the oil haint from steel and other metal surface shall be scraped thoroughly withhand scraper followed by wire brushing (first with coarse and then with fine brushes) and finally sand papering with coarse and paper (No. 3) steel wood (No. 2) or emery paper (No. 3) or with emery clothes. This shall then be wipped finally with mineral terpentine to remove grease and prospiration of hand marks etc. and allowed to dry. The surface shall be made even and smooth.

2.0. Mode of measurements & payment:

2.1. The work shall be measured in actual area of work done.

2.2. The rate shall be for a unit of one sq. metre.

SECTION-21

DETAILED SPECIFICATIONS FOR REPAIRS TO BUILDINGS AS PER "SCHEDULE OF RATES"

21.8 Providing and fixing M. S. Fan clamps of shape and size as specified in existing R. C. C. slab including culling chase and making good.

1.0. Materials: 1.1. M.S. Bar shall conform to M-18.

2.0. Workmanship:

2.1. The shape and size of fan clamp shall be as directed.

2.2. For fixing M. S. fan clamp in existing R. C. C. slab a chase of size 150mmx75n«n. shall be cut from the ceiling so as to expose reinforcement and upto 25 mm. clear round the reinforcement bar. This shall be done without any damage to adjoining portion of ceiling. The two arms of the ends of the clamp shall be passed through the space over reinforcement bar from the bottom 0f the slab. Then the two arms shall be bent down about 15 mm. by means of crow bar. The clamp shall be held in position and the chase in the ceiling filled with cement concrete 1 : 2 : 4(1 cement, 2 coarses and: 4 graded stone aggregate 20 mm. nominal size), The ceiling shall be then finished to match the existing surface and properly cured.

3.0. Mode of measurements & payment:

3.1. The rate includes cost of all materials and labour required for satisfactory completion of this item as described above.

3.2. The rate shall be for a unit one number.

21.23. Cutting out cracks of roof terrace to V. Section. Cleaning out, welting, grouting with cement and sand slurry 1: 3 (1 cement 3 sand).

1.0. Materials: (i) Water shall conform to M-I, (2) Cement shall conform to M-3. (3) Sand M-6.

2.0. Workmanship : 2.1. The cracks shall be cleaned out and trimmed to V. shaped cuts atleast 6 mm. wide on top. The cracks shall be cleaned off end then cracks shall be thoroughly flcoded with water, allowed to a soak in cracks, and then grouted with cement and sand slurry in proportion 1:3. The required cracks shall be cured atleast 7 days.

3.0. Mode of measurements & payment:

3.1. The rate shall include cost of all materials and labour required for satisfactory completion of item as described above.

3.2. The rate shall be for a unit of "one running metre.

21.24. Cutting out cracks of roof terrace to V-Section cleaning out, and filling solidly with a hot mixtures of bitumen and clean dry sand (1: 1 by weight).

1.0. Materials: (i) Bitumen shall be 85/25 penitration. (20 Sand shall conform to M-6.

2.0. Workmanship:

2.1. The relevant specifications of item No. 21.23 shall be followed for opening cracks and cleaning.

2.2. The cracks shall be absolutely dried and cleaned and Tilled solidly with a hot mixtures of 85/25 penitrating and sand in ratio of 1:1 by weight The filter shall be well filled in cracks with the edges of trowel and left flush with surface of roof. Repaired cracks shall cause no ridges across the direction of the slope of roof.

3.0. Mode of measurements & payment:

3.1. The relevant specifications of item No. 21.23 shall be followed.

3.2. The rate shall be for a unit of one running metre.

SECTION -22

DETAILED SPECIFICATIONS FOR MIS. BUILDING ITEMS AS PER "SCHEDULE OF RATES"

22.20. Providing and fixing 1.20 metre high fencing with 2 metre long M.S. angle posts 40 mm. x 40 mm. x 6 mm. and oil painting 3 coats fixed at 2.5 M. C/C with five horizontal lines, and two diagonals of galvanised steel barbed wire weighing 9.38 kg. per 100 metre (Min.) strained and fixed to posts with G. I. staples including fixing the post in ground with 0.5 M. x 0.5 M. x 0.5 M. M block in C. C. 1:5: 10(1 cement, 5 sand, 10 graded brick aggregate 40 mm. nominal size) etc. complete. 1.0. Materials: (1) Water shall conform to M-l. (2) Cement shall conform to M-3 (3) Sand shall conform to M -6. (4) Bricks bats aggregate shall conform to M-14. (5) Oil paint shall conform to M-44 (6) Barbed wire shall conform to M-78.

2.0. Workmanship:

2.1. The pits of the size 0.5 M. x 0.5 M. x 0.5 M. shall first be excavated, true to line and level to receive the post at 2.5 M. C/C. The relevant specifications of item 4.00.1 shall be followed for excavation work.

2.2.The pits shall be filled with a layer of 0.15 M. thick with lean concrete 1: 5 : 10 (1 cement: 5 sand: 10 graded brick bat aggregates 40 mm. nominal size). The M. S. angle 40 mm. x 40 mm. x 6 mm. shall be then placed over the concrete in true to line and plumb. The remaining portion of block shall be filled in with lean concrete 1: 5 :10 and rammed properly so as to form total 0.5 M. x 0.5 M. x 0.5 M. concrete block. The concrete shall be cured for 7 days to allow it to set.

2.3. The barbed wire shall be stretched and fixed in 5 horizontal rows and two diagonals. The bottom row shall be 140 mm. above ground and the rest at 125 mm. centre to centre. The diagonal shall be stretched between adjacent posts from top wire of one post to the bottom wire of 2nd post. The wires shall be fixed to posts by means of staples. 2.4. The M. S. Angle posts shall be painted with 3 coats of oil paint of approved tint and shade.

3.0. Mode of measurements & payment:

3.1. The work shall be measured for the finished work from centre to centre of the posts.

3.2. The rate shall include the cost of all labour and materials involved in the operations described above.

3.3. The rate shall be for a unit of one running metre.

22.00.1 Constn. of B. B. Masonry Paniara 23 cm x 75 cm. wall including fixing precast R.R.C. marble Mosaic (Terrazo) slab of 75 mm. thickness on top and smooth finishing to walls in cement plaster in C.M. 1 : 3 curing etc. complete including drainage out waste water arrangements.

1.0. Materials : (1) Water shall conform to M -1. (2) Cement shall conform to M-3- Sand shall conform to M-6 (4) Burnt bricks shall conform to M-15 (5) Precast marble mosaic terrazo paniara of 75 mm. thickness shall be of best quality. The width of paniara shall be as directed.

2.0. Workmanship:

2.1. The brick masonry shall be constructed for paniara for the size as directed in C. M. 1 : 6. The thickness of wall shall be 23 cms. thick and height shall be 74 cms. The relevant specifications of B. B. masonry at item 6.13 (b) shall be followed for B. B. masonry work.

2.2. The B. B. masonry work shall be covered with precast marble terrazo paniara a top, of width and length as specified or as directed. The terrazo masaic paniara shall be 75 mm. thickness.

2.3. The whole masonry work shall be finished smooth with C.m. 1: 3. on both sides. The relevant specification of item No. 17.59 (I) shall be followed.

2.4. The drainage outlet and water arrangement shall be made as directed.

3.0. Mode of measurements & payment:

3.1. The work shall be measured for the finished work.

3.2. The rate shall include the cost of all labour and materials involved in the operations described above.

3.3. The rate shall be for a unit of One Running Metre.

22.00.2. Constructing a Chowkadi with C. C. over 12 cm. thick B. B. masonry in front and dwarf wall 1 M. high and 23 cms. thick cement plaster to masonry in C. M. (1:3) and cement concrete flooring in 1 :2:4, with 5 cm. dia. A. C. Drain pipe etc. complete.

1.0. Materials : 1.1. Water shall conform to M-l. Cement shall comfort to M-3. Sand shall conform to M-6. Burnt bricks shall conform to M-15. Stone aggregate 20 mm. nominal size shall conform to M-12.a. and A. C. Drin pipe of 5 cms. dia. shall conform to M-74.

2.0. Workmanship:

2.1. The chowkadi shall be constructed of Specified size and as directed. The slab shall be cast on B. B. masonry wall 12 cms. thick and dwarf wall 1 M. high, and 23 cms. thick shall be constructed in proportion of C. M. 1:3. The relevant specification of item 6.3 (I) shall be followed for masonry partition work and 5.4.1. (c) shall be followed for reinforced concrete work.

2.2.The whole masonry work shall be finished with cement mortar 1 : 6 and finished smooth. The relevant specifications of item No. 17.59 (I) shall be followed for plastering work.

2.3. The A.C. pipe of 5 cms. dia. shall be fixed as drainage pipe. The bottom shall be finished with C.C. 1:2:4 finished with cement slurry.

3.0. Mode of measurements &, payment:

3.1. The work shall be measured for finished work.

3.2. The rate includes cost of all materials labour etc. required for carrying out satisfactory completion of work.

3.3. The rate shall be for a unit of one sq. metre.

22.00.3 (I) Constructing cooking platform 60 cm. width and 70 cm. height resting on B. B. Masonry wall 23 cms. thick in C. M. 1:6 with fixing of precast 1:2:4 R.C.C. 0.08 M thick slab with marble mosaic chips set in C. M. (Terrazo) with plastering on exposed faces to wall in cm. 1:4 etc. complete.

1.0. Materials : Water shall conform to M-l. Cement shall conform to M-3. Sand shall conform to M-6. Burnt brick shall conform to M-l5. Marble Mosaic chips shall conform toM-46. Stone aggregate 20 mm. nominal size shall conform toM-12 and M. S. Bars shall conform to M-18.

2.0. Workmanship:

2.1. The cooking platform of size as directed shall be constructed in 60 cms. width and 70 Cms. height. The brick masonry wall in C. M. 1:6 shall be constructed in 23 cms. thickness upto full depth. The relevant specifications of item 6.13 (B) shall be followed for masonry work.

2.2. The R. C. C. slab of 8 cms. thickness and of adequate design and size shall be precast and the same shall be put up on the B. B. masonry work.

2.3.The top and exposed sides of the C.C. slab shall be finished with marble mosaic terrazao 8 mm. thick with required colour pigment. The work of terrazo shall be carried out as per relevant specification of item 14.4 (E).

2.4. The whole masonry work shall be finished with cement mortar in C. M. 1 : 4. The relevant specifications of item 17.59 (II) shall be followed.

3.0. Mode of measurements & payment:

3.1. The work of cooking platform shall be measured for finished work.

3.2. The rate includes cost of all labour and materials, etc. required for satisfactory completion of this item as described above.

3.3. The rate shall be for a unit of one Running metre.

22.00.3 (II) Constructing cooking platform of 60 cm. width and 70 cms. height resting on B. B. masonry walls 23 cm. Thick in C. M. 1 : 1 with fixing black kada pastone surface laid on precast R.C.C. slab 1 : 2 : 4 with plastering on exposed faces to wall in C. M. 1 :4 etc. complete.

1.0. Materials & Workmanship : l.l. The relevant specifications of item No. 22.00.3. (I) shall be followed except that the cooking platform shall be constructed by providing black kads pastone of 25 mm. to 20 mm. thickness on precast R.C.C. 1: 2*:* 4 slab 8 cms. thick. The black stone shall be provided in single piece upto 1.8 M. in length and specified width. All the exposed edges of stone shall be machine cut.

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item 22.00.3 (I) shall be followed.

2.2. The rate includes providing machine, cut edges on exposed face of kada pastone.

2.3. The rate shall be for a unit of one running metre.

12.00.4. Providing and fixing Rajula stone 75 mm. thick 50 cm x 45 cms, size including fixing in cement mortar as directed.

1.0. Materials : Water shall conform to M-l. Cement mortar shall conform to M-l1. Rajula stone of specified size shall be of best quality and free from any defects. The stone shall not be less than 75 mm. in thickness.

2.0. Workmanship .2.1. The Rajula stone of size 60 x 45 cms. size shall be fixed as and where directed in cement mortar in 1:3. All the edges of the stone shall be fixed with cement mortar in C.M. 1:3 and sloped at 45E and finished smooth. The work shall be cured for 7 days after fixing.

3.0. Mode of measurements & payment:

3.1. The work shall be measured for finished work.

3.2. The rate includes cost of all labour and materials required for satisfactory completion of this item.

3.3. The rate shall be for a unit of one sq. metre.

22.00.5. Providing and laying Bilimora type brick facing in C. M. 1 : 1 laid over bedding of cement mortar 1 : 3 (13 mm. thickness) including cleaning, watering scaffolding etc. complete.

1.0. Materials: 1.1. Water shall conform to M-l. Cement mortar of specified proportion shall conform to to M-l1. Bilimora type bricks shall be best quality and make as approved. The bricks shall be approved before collecting the same on site.

2.0. Workmanship:

2.1. The surface on which the Bilimora type bricks is to be provided shall be cleaned of all dust, dirt, etc. and finished with CM 1 : 3 in 13 mm. thickness. The relevant specifications of item 17.59 (I) shall be followed except that the thickness of finishing shall be 13 mm. The top surface shall be roughened by wire brushes to give proper grip to the tiles to be fixed.

2.2. The Bilimora type bricks shall be fixed with CM 1 : I. The tiles shall be properly wetted before fixing. The horizontal and vertical joints snail be maintained in true line and level by providing 12 mm. or 20 mm. sq. bars as directed. The tiles shall be tamped by trowel so that there shall not be any hollows left behind the tiles.

2.3. The tiles shall be cut to the required size on ends or at top bottom of beams in best workman like manner.

2.4. The whole work shall be cured for. 7 days.

3.0. Mode of measurements & payment:

3.1. The work shall be measured as per relevant specification of item No. 17.58 (I).

3.2. The rate includes cost of all materials, wastage etc., occuring due to cutting of tiles and ends, top and bootom of beams etc. including base cost.

3.3 The rate shall be for a unit of one sq. metre.

22.00.6. Providing and fixing teak wood rail of 60 mm. x 20 mm. size and 60 cms. length incl. 3 coats of oil paint to wood work with set of 3 pegs.

1.0. Materials : Teak wood battens of specified size conform to M-29. Oil paint shall conform to M-44. Wall pegs of aluminium 3 Nos. of approved quality and make shall be provided.

2.0. Workmanship : 2.1. The teak wood battens of size 60 mm. x 20 mm. and 50 cms. long shall be planed on all sides. The anodised aluminium wall pegs of approved make shall be fixed on wooden batten prepared with screws as directed. The wall pegs unit shall be fixed on wall with wooden gutties and screws as directed. The wooden battens shall be painted with 3 coats of ready mix paint of approved colour and shade.

3.0. Mode of measurements & payment:

3.1. The work shall be measured of finished work.

3.2. The rate shall be for a unit of one number.

22.00.7. Treating the bottom and sides (upto a height of 300 mm.) of the excavations for the masonry foundation and basement with chemical emulsion at the rate of 5 litres per sq. metre of the surface area.

1.0. Materials: The chemicals used for the soil treatment shall be only one of the following with concentration shown against each in aqueous emulsion.

Chemicals	**Concentration**
1 Aldrin	0.50% (by weight)
2 Heptachlor	0.50% (“ “)
3 Chlordane	1.00% (“ “)

2.0. Workmanship:

2.1. The chemicals barrier shall be complete and continuous under whole of the structure to be protected.

2.2. The bottom and the sides of foundations upto a height of 30 cms. from the bottom of excavation made for masonry foundation and for basement column pits shall be treated with the chemical emulsion at the rate 5 litres/sq. metre of the surface area.

2.3. The chemical treatment shall be carried out when the surface is quite dry. Chemical treatment shall not be carried out when it is raining or when the soil is wet with rain or sub soil water.

2.4. Once formed, treated soil barriers shall be not distrubed. If by chance, treated soil barriers are distrubed, immediate steps shall be taken to restore the continuity and compactness of the barrier system. .

2.5. The treatment against termite infection shall remain full effective for a period not less than 10 years from date of issue of the final certificate of completion of work. If at any time during this period, any defects in treatment are revealed or any evidence of infection in any part of the building or structure is noticed, the contractor shall be rectify the concerned defects within 15 days on receipt of notice from Engineer-in-charge. On contractor's failure to do so, the Engineer-in-charge may get the same rectified through any other agency at contractor's risk and cost, and decision of Engineer-in-charge as to the cost payable by the contractor for the same shall be final and binding to the contractor.

2.6. A guarantee bond on appropriately stamped paper shall be given by the contractor to the department in the manner and form prescribed below:

FORM OF GUARANTEE BOND

"I/We..... (Contractor) hereby guarantee that work will remain uneftected and will not be in any way damaged by termite or any other germs of similar types, for a period of 10 years after completion of the work of anti-termite as per the terms and conditions of the contract and contractor hereby indemnifies and agrees to save harmless the Government of Gujarat from any loss and or damage that might be caused on account of termite and or oilier similar type of germs and hereby Guarantees to make good any loss or damages suffered by the Government of Gujarat and further guarantee to redo the effective work without claiming any extra cost."

2.7. This guarantee shall remain force for the period of 10 years from the completion of the work under the contract and it shall remain binding to the contactor for period of 10 years.

2.8. The deposit at the rate of 50% of the cost of this item from the running and final bills shall be recovered and retained for the first one year after completion of, the work and 10% shall be retained for the balance of guarantee period and shall be refunded only after the completion of the guarantee period.

3.0. Mode of measurements & payment:

3.1. The length and breadth shall be measured correct to a Cm. as per the dimensions of sanctioned plans. No deduction shall be made norextra paid for any opening for pipes etc. upto 0.1 Sq. ml. The rate shall include the cost of all labour and materials required for the operation involved for satisfactory completion of this item. The sides of the trenches 30 cms. each side and bottom shall be measured under this item.

3.2. The rate shall be for a unit of one sq. metre.

22.00.8. Treating the backfill immediately in contact with foundation structure with chemical emulsion at the rate 7.5 litres per sq.mt. of vertical surface of the sub-structure for each side (In case of R.C.C. columns, beams and R.C.C. basement walls, treating the sides of 50 cms. from ground level with chemical emulsion at the rate of 7.5 Litres/sq.metre).

1.0. Materials : 1.1. The specifications of the item 22.00.7 shall be followed.

2.0. Workmanship:

2.1. After masonry foundations and retaining wall of basement come up, the backfill immediately in contact with foundation shall be treated with the chemical emulsion at the rate of 7.5 litres per sq. m. of the vertical surface of the sub-structrure for each side. The filling of earth is usually carried out in layers and the treatment shall be directed towards the concrete or masonry surfaces of the columns and walls so that the earth in contact with these surfaces is well treated with chemical.

2.2. In case of R.C.C. framed structure with columns and plinth beams, and R.C.C. basements the treatment shall start at the depth of 50 cms. below ground level from this depth back-fill around the columns, beams and R.C.C. basement walls shall be treated at 7.5 lit/sq. m. of vertical surface. The relevant specifications shall be followed same as item 22.00.7.

3.0. Mode of measurements & payment:

3.1. The area of sub-structure in contact with backfill to be measured. The length and breadth shall be measured correct to a

Cm. as per dimension of sanction plans for the surfaces in contact with backfill.

3.2. No deduction shall be made nor extra paid for any opening for pipes etc. upto 0.1 sq. m.

3.3. The rate includes cost of all labour, materials required for satisfactory completion of this item.

3.4. The rate shall be for a unit of one sq. metre.

20.00.9. Treating the top surface of the plinth filling with chemical emulsion at the rate of 5 litres per sq. metre before the sand bed or subgrade is laid.

1.0. Materials: 1.1. The relevant specifications of item 22.00.7 shall be followed.

2.0. Workmanship : 2.1. The relevant specifications of item 22.00.7 shall be followed except that the top surface of the consolidated earth within the walls shall be treated with the chemical emulsion at the rate of 5 litres/sq. metre of the surface before the and bed or sub-grade is laid. If the filled earth has been well rammed and the surface docs not allow the emulsion to seep through, holes upto 50 to 75 mm. deep at 150 mm. centres both ways may be made with 12 mm. dia. M. S. rod on the surface to faciliate absorption of the emulsion.

3.0. Mode of measurements & payment:

3.1. The length and breadth shall be measured clean for the actually treated.

3.2. No deduction shall be made nor extra paid for ;s.ny opening for pipes etc. uplo 0.1 sq. m.

3.3. The rate shall be for a unit of one sq. metre.

22.00.10. Treating the junctions of walls and floor area with chemical emulsion at the rale of 7.5 liters/sq. mt. by making holes at junction of walls, and columns, with the floor before laying sub-grade to a depth of 15 cms. by making holes.

1.0. Materials : 1.1. The relevant specifications of item 22.00.7 shall be followed.

2.0. Workmanship : 2.1. The relevant specifications of item 22.00.7 shall be followed except that the junction of wall, and columns with the floor shall be treated with the chemical emulsion at the rate 7.5 litres/sq. metre. Special care shall be taken to establish countinuity of the vertical chemical barrier on inner wall surfaces from the ground level upto the level of filled earth surface. To achieve this, a small channel 3 x 3 cm. shall be made at the junctions of the wall and columns with floor (before laying the sub-grade) and rod holes made in the channels upto the ground level 15 cms. apart and the rod moved backward and forward to breakup the earth and chemical emulsion poured along the channel at the rate of 7.5 litres per sq. m. of the vertical walls or columns surfaces of sub-structurers so as to soak the soil right lo the bottom. The soil should be tamped back into place after this operation.

3.0. Mode of measurements & payment:

3.1. The relevant specifications of item 22.00.7 shall be followed.

3.2. The vertical area of sub-structure in contact with filled up earth above ground level lo top of filled up earth shall be measured for payment.

3.3. The rate shall be for a unit of one sq. metre.

20.00.11. Treating the earth along the external perimeter of the building by making holes 15 cms. apart upto a depth of 30 cms. with chemical emulsion at the rate of 7.5 litres per sq.metre along the wall.

1.0. Materials : 1.1. The relevant specifications of item 22.00.7 shall be followed.

2.0. Workmanship : 2.1. The relevant specifications of item 22.00.7 shall be followed except that the external perimeter of the building shall be treated with chemical emulsions. After building is complete, the earth along the external permieter of the building should be treated at intervals of l5 cms. and to a depth of 30 ems. The rods shall be moved backward and forward parelled to the wall to breakup the earth and chemical emulsion poured along the wall at the rate of 7.5 litres per sq. metre of vertical surfaces. After the treatment the earth shall be lamped back into place, the earth out side of the building should be graded on completion of building. This treatment shall be carried out on the completion of such grading. In event of filling being more than 30 cms. the external permieter and treatment shall be extended to the full depth of filling upto ground level so as to ensure continuity of the chemical barrier.

3.0. Mode of measurements & payment:

3.1. The relevant specifications of item No. 22.00.7 shall be followed.

3.2. The vertical surface area of sub-structure 30 cms. in depth from finished ground level in external perifary only shall be measured and paid under this item. The depth of wall treated under back filled shall not be included in this item.

3.3. The rate shall be for a unit of one sq. metre.

22.00.12. Providing treatment along outside of founuation'using chemical emulsion at 7.5 litres per sq. m. of vertical surface (for each side) of sub-structure.

1.0. Materials : 1.1. The chemical used for the soil treatment shall be any one of the following with concentration shown against each in aqueous emulsion.

Chemicals	**Concentration**
l. Aldrin	0.50% (by weight)
2. Heptachlor	0.50% (" ")
3. Chlordane	1.00% '(" ")

2.0. Workmanship : 2.1. The surface of consolidated earth around the existing shall be treated with chemical emulsion at the rate 7.5. litres/sq. m. of vertical surface of sub structure. The minimum height 10 sub-structure shall be considered 60 cms. for treatment. If the earth along the perimeter does not allow emulsion to seep through, holes upto 300 mm. depth at 150 mm. centres both way be made by 12 mm. dia. mild steel rod on the surface on facilitate saturation of the soil with chemical emulsion.

2.2. The chemical barrier shall be complete and continuous under hole of the structure to be protected.

2.3. The chemical treatment shall be carried out when the surface is quite dry. Chemical treatment shall not be carried out when it is raining or when the soil is wet with rain or sub soil water.

3.0. Mode of measurements & payment:

3.1 The length shall be measured along the perifary of the sub- structure. The depth shall be taken 0.60 M.

3.2. No deduction shall be made nor extra paid for any opening for pipes etc. upto 0.1 sq. m.

3.3. The rate includes cost of all labour and material required for the operations involved for satisfactory completion of this item.

3.4. The rate shall be for a unit of one sq. metre.

22.00.13. Providing treatment along external wall primeter below concrete or masonry appron using chemical at 5 Lt./per linear including drilling and plugging etc.

1.0. Materials: 1.1. The relevant specifications of item No. 22.0.12 shall be followed.

2.0. Workmanship : 2.1. The relevant specifications of item No. 22.0.12 shall be followed except that the treatment shall be Carried out along external will perimeter below concrete or masonry appron, using chemical at rate *5* lit./running metre.

3.0. Mode of measurements & payment:

3.1. The relevant specifications of item No. 22.0.12 shall be followed.

3.2. The rate includes drilling and plugging holes in appron etc. complete.

3.3. The rate shall be for a unit of one running metre.

22.00.14. Treatment of soil below existing floor using chemical at 1 litre per hole at 300 mm. including drilling plugging holes etc.

1.0. Materials: 1.1. The relevant specifications of item No. 22.0.12 shall be followed.

2.0. Workmanship:

2.1. The relevant specifications of item Na 22.00.9 shall Be followed except that the termite control treatment shall be carried out in soil below existing floors.

2.2. The holes of 12 mm. dia. rod shall be drilled in floor upto 150 mm. depth at 300 mm. apart both ways. The chemicals shall be then injected with pressure at the rate 1 litres/hole of surface area.

3.0. Mode of measurements & payment:

3.1. The relevant specifications of item 22.00.9 shall be followed.

3.2. The rate shall be includes cost of drilling holes and plugging.

3.3. The rate shall be for a unit of one sq. metre.

22.00.15. Treatment of voids is masonry using chemical at 1 Lit./holc at 300 mm. apart including drilling holes plugging. 1.0. Materials: The relevant specifications of item 22.0.12 shall be followed.

2.0. Workmanship : 2.1. The walls effected by termite shall be cleaned off all live for my bidding inside and holes or voids in masonry wall surface shall be treated by chemical emulsion al rate 1 Lit. hole. The holes in cracks in surface of wall shall

wall shall be drilled at 300 mm. apart.

3.0. Mode of measurements & payment:

3.1. The rate shall be for a unit of one Number of voids treated.

22.00.16. Treatment to wood work by chemical emulsion in oil or kerosene based including 6 mm. dia. down ward slanted holes 150 mm. C/C and plugging the same with cement mortar.

1.0. Materials: 1.1. The relevant specifications of item No. 22.00.7 shall be followed.

2.0. Workmanship:

2.1. The wood work effected by Anus shall be cleaned of all live formly hiding inside. The whole wood surface shall be then treated with oil or kerosene based chemical emulsion. The holes of 6 mm dia. shall be drilled slanted downwards at 150 mm. centres to centres and chemical emulsion shall be poured into holes by means of funnels specifically prepared for the same and allowed to seep. After funds become empty, another dose of chemical shall be poured in them. This process shall be done repeatedly till the whole wood work fully be comesaturated with chemical.

2.2. The holes drilled in wood work shall be filled in with party and other similar materials as directed and the whole wooden surface shall be made good as before.

3.0. Mode of measurements & payment:

3.1. The work shall be measured for the finished work in sq. metre including frame.

3.2. The out to out of frame shall be measured as width and from top flooring to top of frame shall be as height. This area includes for treating frame and shutters both.

3.3. The rate includes cost of all labours and materials, required for satisfactory completion of this item.

3.4. The rate includes drilling holes plugging the same after treatment completed and making good as before.

3.5. The rate shall be for a unit of one sq. metre.

SECTION -23

DETAILED SPECIFICATIONS FOR WATER SUPPLY, PLUMBING AND SANITARY FITTINGS AS PER "SCHEDULE OF RATES"

23.2. Providing and fixing to wall, ceiling and floor galvanised mild steel tube (Medium grade) of the following nominal bore, tube fittings and clamps including making good the wall ceiling and floor (A) 15 mm. dia. (8) 20 mm dia. (C) 25 mm. dia. (D) 342 mm. (E) 40 mm. (F) 50 mm.

1.0. Materials: Galvanised mild steel lubes of specified dia. nominal bore shall conform to I. S. 1239-1968. The galvanised fittings, clamps, etc. required for specified dia. bore pipes shall be of best quality and make as approved by the Engineer-in-charge.

2.0. Workmanship : 2.1. Cutting, Laying and Jointing:

2.1.1. When the tubes arc to be cut or retheraded the end shall be carefully filed out so that no obstruction to bore in offered. The ends of the tubes shall then be threaded conforming to the requirements of I. S. 554-1955 with pipe dies and taps carefully in such a manner as will not result in slackness of joints when the two pieces arc screwed together.

2.1.2. The taps and dies shall be used only for straightening screw threads which have become bent or damaged and dies shall not be used for turning of the threads so as to make them slacks as the latter procedure may not result in a watertight joints. The screw threads for tube and fittings shall be protected from edge unit they are fitted.

2.1.3. In jointing the tubes, the inside of the socket and the screwed end of the tubes shall be oiled and smeared with white or red lead and wapping around with a few turns of fine spun yarn round the screwed end of the tube. The end shall then be tightly screwed in the socket, tees, etc. with a pipe wrench. Care shall be taken that all pipes and fittings are properly jointed so as to make the joints completely water tight and pipes are kept at all times free from dust, and din during fixing. Burr joints shall be removed after screwing. After laying, the open ends of the pipes shall be temporarily plugged to prevent acess of water, soil, or any other foreign matter.

2.1.4. Any threads exposed after jointing shall be painted or in the case of underground piping thickly coated with approved anti corrosive paint to prevent corrsion.

2.2. Fixing of the tabe fitting to wall ceiling and Poors :

2.2.1. In case of fixing of tubes and fillings to the walls or ceiling, these shall run on the surface of the wall or ceiling (not in chase) unless otherwise specified. The fixing shall be done by means of standard pattern, holder clamps keepings the pipes about 15 mm. clear of the wall. When it is found necessary to conceal the pipes and when specified so, chasing may be adopted or pipe fixed in duets or resesses etc. provided that there is sufficient space to work on the pipe with usual tools. The pipe shall not ordinarily be buried in walls or solid floors, where unavoidable, pipes may be buried for short distances provided that adequate protection is given against damage and where so required joints are not buried. Where required M.S. tube sleave shall be fixed at a place a pipe is passing through a wall or floor for expansion and contraction and other movements. In case the pipe is embeded in walls or floors, it should be painted with anti-corrosive bitumastic paint of approved quality. The pipe should not come in contact with lime mortar or lime concrete as the pipe is affected by lime. Under the floors, the pipe shall be laid in layer of sand filling.

2.2.2. All pipes and fittings shall be fixed trully vertical and horizontal unless unavoidable. The pipes shall be fixed to walls with standard pattern clamps of required size and shape, one end of which shall be properly plugged or cemented into walls with cement mortar 1 : 3 (1 cement: 3 coarse sand) and the other tightened round the pipes to hold it securely. These clamps shall be spaced at regular intervals in straight length at 2 M C/C interval in horizontal run and 2.5 M. interval in vertical run. For pipe of 15 mm dia. upto 25 mm. dia. the holes in the walls and floors shall be made by drilling with chisel or jumper and not by dismantling the brick work or concrete. However for bigger diameter pipes, the holes shall be carefully made of the smallest required size. After fixing the pipe the holes shall be made good with cement mortar 1:3(1 cement: 3 coarse sand) and properly finished to match the adjacent surface.

2.3. Testing of joints :

2.3.1. After laying and jointing, the pipes and fittings shall be inspected under working conditions of pressure and flow. Any joint found leaking shall be redone, and all leaking pipes removed and replaced without extra cost.

2.3.2. The pipes and fillings as they are laid shall be tested to hydraulic pressure of 6 Kg./sq. cm. The pipe shall be slowly and carefully charged with water allowing all air lo escape and avoiding all shock and water hammer. The draw off takes and stopcock shall then be closed and specified hydraulic pressure shall be applied gradually. The pressure gauge must be accurate. The pipes and fillings shall be tested in sections as the work of laying proceeds keeping the joints exposed for inspection during the testing.

3.0. Mode of measurements & payment:

3.1. The description of each item shall unless otherwise stated, be held to include where necessary, conveyance, and delivery, handling, unloading, storing fabrication, hoisting, all labour for finishing to required shape and size; testing, fitting in position, straight, culling and waste, return of packing etc.

3.2. The length shall be measured on running metre basis of finished work. The length shall be taken along the centre line of the pipe and fittings. The pipes fixed lo walls, ceiling, floors etc. shall be measured and paid under this item.

3.3. All the work shall be measured in decimal system as fixed in its place, subject to tolerance given below unless otherwise stated:

(i) Dimension shall be measured to the nearest 0.01 metre,

(ii) Area shall be worked out to the nearest 0.01 sq. metre.

3.4. All measurements of culling shall unless otherwise stated be held to include the consequent waste.

3.5. In case of filling of unequal bore, the largest bore shall be measured for the test.

3.6. Testing of pipe lines filling sand joints include for providing all plant and appliances necessary for obtaining access to the work to be tested and carrying out the tests.

3.7. The rate includes galvanised steel tubing with screwed socket joints, together with all fittings (such as bends, sockets, springs, elbows, tees, crosses, short pieces, clamps and plugs unions etc.) and fixing complete with clamping wall-hooks, wooden plugs etc. and also cutting, screwing and waste and for making forged (or hand mad) bends on piping as required. Connector shall be inserted, where required or directed. The rate also includes cutting through walls, floors etc. and their making good and painting exposed threads with anti-corrosive paint as above and testing. Whore lubes arc lo be fixed to wall, ceiling and flooring, the rate shall not include painting of pipes, providing sleeves and sand Oiling under floor for which separate payment shall be made.

3.8. The rate shall be for a unit of one Running metre.

23.4. Providing and laying in trenches galvanised mild steel tubes (Medium grade) of the following nominal bore and tube

fittings (earth work in trenches to be measured and paid for separately : (A) 15 mm. dia. (B) 20 mm. (C) 25 mm. (D) 40 mm. (E) 60 mm. (F) 80 mm.

1.0. Materials : 1.1. Galvanised mild steel tube of specified dia. nominal bore and fitting shall conform to I.S. 1239-1968.

2.0. Workmanship:

2.1. The relevant specifications of item 23.2 (A) shall be followed for cutting, laying and jointing testing of joints except that the fixing of tube shall be done in trenches.

2.2. The width and depth of the trenches for different diametres of the tubes shall be as unclsr : For 15 to 80 mm. dia. tube width of trenches-shall be 30 cms. and depth of trenches 60 cms.

2.3. At joints, the trench width shall be widened where necessary. The work of excavation and refilling shall be done true to line and gradient in accordance with general specifications of earth work in trenches.

2.4. The pipes shall be painted with two coast of anti-corrosive bitumasic paint of approved quality. The pipe shall be laid on a layer of 75 mm. sand filled upto 150 mm. above the pipe so specified. The remaining portion of trench shall be then filled with excavated earth. The surplus earth shall be disposed of as directed.

2.5. When the excavation is done in rock, the bottom shall be cut deep enough to permit the pipe to be laid and cushion of sand 75 mm. In case of bigger diameter of tube where the pressure is very high, thrust bock of cement concrete 1:2:4(1 cement: 2 coarse sand : 4 graded stone aggregate of 20 mm. nominal size) shall be constructed on all bends to transmit the hydraulic thrust without imparing the ground and spreading it over a sufficient area if so specified.

3.0. Mode of measurements & payment:

3.1. The relevant specifications of item No. 23.2. (A) shall be followed. The authorised quantities shall be measured.

3.2. For purpose of calculating cubic content cross section shall normally be taken at suitable intervals i.e. at manhole or wall chamber intervals except in abnormal cases like sudden change in strata or undulating ground etc. when they may be taken at closer intervals as approved by the Engineer-in-charge whose decision shall be final conclusive and binding.

3.3. Authorised width:

(a) Upto one metre depth, the width of the trenches for the purpose of measurement of excavation shall be arrived at by adding 40 cms. to the external diameter of the tube (not the socket) where a pipe is laid on concrete bed/cushioning layer. The authorised width shall be the external diameter of tube plus 40 cms. or the width of. the concrete bed cushionning layer whichever is more.

(b) For depths exceeding one metre an allowance of 5 cms. per metre of depth for each side of the trench shall be added to the authorised width (i.e. external diameter of pipe of plus 40 cms.) This allowance shall apply to the entire depth of the trench. The authorised width in such cases shall therefore be, equal to the depth of trench, plus external diameter or tube plus 40 cms.

(c) When more than one tube is laid, the diameter shall be reckoned as the horizontal distance for outside to outside of the outermost pipes.

(d) Where sheeting etc., has been provided the authorised width of the tenchers at bottom shall be increased to accommodate for sheeting etc. so that the clear width available between faces of sheeting is as per provisions of (a), (b) & (c) above.

(c) If the side of the trench are not vertical, the toes of the side slopes shall end at the top of pipe and vertical sided trench of authorised width as per (a), (b), (c) and (d) above shall be excavated from these down to the bed of trenches.

3.4. Where the tubes are laid in trenches, the work of excavation and refilling shall be paid for separately. The rate also docs not include painting of pipes and sand filling all round lubes for which separate payment shall be made. The length shall be measured on running metre basis.

3.5. The rate shall be for a unit of one running metre.

23.6. Making connection of galvanised M. S. distribution branch with galvanised mils steel main 50 mm. to 80 mm. Nominal bore by providing and fixing tee including cutting and threading the pipes etc. complete.

1.0. Materials: The fittings required of specified dia. of pipe shall conform to I.S. 1237-1968

2.0. Workmanship: 2.1 A pit of suitable dimensions shall be dug at the point where the connection is to be-made with the main and earth removed upto 150 mm. below the main. The flow of water in water main shall be also be disconnected by closing the sluice or wheel

valves on the mains. The main shall first be cut, Water if any, collected in the pit shall he bailed out, ends of the pipe threaded.
2.2. The connections of distribution pipe shall be made *by* fixing malleable galvanised mild steel tee of the required size and fittings such as jam nut, socket, connecting piece etc.
2.3. The testing of the joints shall be done as per relevant specifications of item No. 23.2. (A).

3.0. Mode of measurements & payment:
3.1. The rate includes cost of all labour, materials, tolls and plant required for satisfactory completion of this item.
3.2. The rate shall be for a unit of one number.
23.8. Providing and fixing to wall ceil rap and floor 6 Kgs/Sq. Cm. working pressure- polythene pipes of the following outside diameter low density complete with special flange compression type fittings wall clips etc. including making good the wall/ceiling and floor, (A) 20 mm. dia (8) 25 mm dia. (C) 32 mm. dia. (D) 40 mm. dia. (E) 50 mm; dia.
1.0. Materials: 1.1. The low density polythene pipe of specified diameter with 6 Kg./Sq.Cm. working pressure shall conform to I.S. 3076-1968. The specials and fitting required shall be of best quality.
2.0. Workmanship:
2.1. The P. V. C. Pipes of specified diameter shall be fixed as directed. Due to thermal expansion of rigid P. V. C. Pipes, due allowance shall be made particularly in over gound pipe lines for any change in length of pipe line which may occur during, installation or when pipe line is in service.
2.2.. Above ground installation of rigid P.V.C. pipe should be undertaken after preparations arc observed for their protection against direct sun rays and mechanical damage.
2.3. The rigid P.V.C. pipe lines should not be kept exposed above ground when if passes through public places, railway lines, road side and footpaths.
2.4. P.V.C. pipes shall be supported at the following intervals:
20 mm dia. 500 mm. 32 mm. dia.900 mm.
25 mm. dia. 750 mm.
2.5. Closer support spacings shall be provided if recommended by the manufacture.
2.6. The guide lines indicated by the manufacturer regarding, handling, transportation, storing laying and jointing of pipes shall be kept in view during execution.
2.7. P.V.C. pipes shall be fixed on wall with wooden plugs and suitable plastic clamps.
2.8. Jointing the pipes :
2.8.1 The pipes and sockets shall be accurately cut. The ends of the pipes and fittings should be absolutely free from dirt and dust. The outside surface of the pipes and the inside of the fillings shall then be roughened with emery paper, and then solvent cement joint. Since solvent cement is aggressive to P.V.C., care must be taken to avoid applying excessive cement to the inside of pipe sockets as any surplus cement cannot be wiped off after jointing. Empty solvent cement tins, brushes rags, or paper unpregnated with cement should not be buried in the trenches. They should be gathered, not left scattered about, as they can prove to be a hazard to animals, which may chew them.
2.8.2. If manufacture recommends its own methods of jointing, the same shall be adopted after necessary approval from the Engineer- in-charge.
2.9. Laying pipes in Trenches :
2.9.1. The pipe shall be laid over uniform relatively soft fine grained soil found to be free of presence of hard objects such as large flints, rockey projections, large tree roots etc. The width of the trenches shall be minimum width required for working.
2.9.2. The pipes laid underground shall not be less than one metre from the ground level. The pipe shall be positioned in the trenches so as to avoid any induced stresses due to deflection. Any deviation required shall be obtained by using proper type of rubber ring joints.
3.0. Mode of measurements & payment:
3.1. The relevant specifications of item 23.2. (A) shall be followed except that the P. V. C. pipes of specified dia. shall be paid under this item.
3.2. The unit rate shall be for a unit of one running metre.

23.111. (A)(I) Providing and fixing water closet seating pan (Indian type W.C. Pan) size 580 mm. (Earth work, bed concrete, foot-rests and trap to be measured and p; id for separately). Vitreous china. Long pattern white colour.

1.0. Materials: 1.1. Water closet squatting pan (Indian type W.C. Pan) shall conform to M-62. Cement mortar shall conform to M-11.

2.0. Workmanship : 2.1. The pan shall be sunk into the floor and embedded in a cushion of average 15 cm. cement 1:5: 10 (1 cement: 5 fine sand : 10 graded stone aggregate or brick aggregate 40 mm. nominal size) or as specified. This concrete shall be left 115 mm. below the lop level of the pan so as to allow for flooring and its bed concrete. The floor should be suitably sloped so that the waste water is drained into the pan. The pan shall be provided with 100 mm. 'P' or 'S' trap as specified in the item No. 23.113 with approximately 50 mm. seal. The joints between the pan and the trap shall be made leak-proof with cement mortar 1 : 1 (1 cement: 1 fine sand).

3.0. Mode of measurements & payment:

3.1. The rate shall include the cost of all materials and labours involved in the operations described under workmanship.

3.2. The rate shall be for a unit of one number.

3.3. The 'P' or 'S' stap shall be paid separately.

23.79. Providing and fixing cast iron spigot and sockets soil waste water and ventilating pipes of the following normal size (B) 75 mm. dia. (C) 100 mm. dia.

1.0. Materials 1.1. The specified dia. C.I. Spigot and socket soil or waste pipe shall conform M-68.

2.0. Workmanship:

2.1. The fixing of C. I. spigot and sockets soil waste and ventilating pipe shall be carried .out as per relevant specifications of item 15.93 (B) except the C. I. spigot and socket shall be fixed. The joints shall be fixed with cement mortar 1:2(1 cement : 2 sand) and spun yarn. The pipes without cars shall be fixed tow all with M.S. clamps. The pipes with cars shall be secured with 40 mm. before steel or iron barrel distance pieces or bobils and strout galvanised iron nails 10 cms. long driven itno hand wool plugs fixed in walls. Access doors to fittings shall be provided with 3 mm. rubber insertion packings and secured without screws to make air and water tight.

2.2. All soil pipes shall be carried up above the roof and shall have a wire ballon guard or a cowl.

2.3. The ventilating pipe or shaft shall be carried out to a height of atleast one metre above the outer covering of the roof of the building or in the case of windows in a gable wall or a dormar windows, it shall be carried upto the ridge of the roof or atleast two metres abov2 the top of the windows. In case of flat roof to which access for use is provided, it shall be carried out upto a height of atleast one metre above the parapet or two metres measured vertically from the top of any windows in opening which may exist upto a horizontal distance of five metres from the vent pipe into such building and in no case shall be carried out to a height less than three metres.

2.4. Where ventilating pipe are carried in pipe shafts, the shafts shall be of a minimum *size* of one metre. If the shafts roof also used to give light and air to rooms, the ventilating pipes must be carried out to a horizontal distance at roof level not less than five metre from the site of the shaft.

2.5. The sand cast iron pipes above parapet shall be fixed with M. S. clamps and stays. The clamp shall be made from 1.5 mm. thick M. S. fiat or 3 mm. width band to the required shape and size to fit tightly on the sockets when tightened with screw blots. It shall be formed of two semi circular pieces with flanged ends on both sides; with holes to fit in the screw bolts and nut 40 mm. dia. M. S. Bars. One end of the stay shall be bent to from a hook to be fixed with clamps by means of bolts and the other end shall be bent for embedding in wall in cement concrete block of size 200 mm. x 100 mm. x 100 mm. in 1 : 2: 4 mix. The concrete shall be finished to match the surrounding surfaces.

2.6. The connection between the main pipe and branch pipes shall be made by using branches and bends with access doors for cleaning.

2.7. The waste from lavatories, kitchens basins, sinks, baths and other floor traps shall be separately connected to respective stacks of upper floors. The waste stack of lavatories shall be connected directly to main hole while the waste slack of other shall be separately discharged over gullcy trap.

3.0. Mode of measurement:, & payment:

3.1. The length of pipe shall be measured included all fillings along its length in running metres correct to a centimetre. No allowance shall be made for the portion of pipe length entered the sockets of the adjacent pipe or fittings.

3.2. The rate includes all labour, and materials, tools and plant etc. required for satisfactory completion of this item.

33. The rate shall be for a unit of one running metre.

23.87. Providing and fixing cast iron (spun) Nahni trap of the following nominal diameter of self cleaning design with C. I. Screwed down or hinged grating including cost of culling and making good the walls and floors: 100 mm. inlet and 50 mm. outlet.

1.0. Materials: 1.1. The cast iron (spun) Nahni trap shall be conform to M-69. The C. I. hinged of screwed down cover shall be of best quality.

2.0. Workmanship:

2.1. The Nahni trap with 100 mm. dia. inlet and 50 mm. dia. outlet shall be fixed as per drawing or as directed.

2.2. The Nahni trap shall be jointed with C. I. Pipe, 75 mm. dia. with lead joints. The lend joints shall be done in conformation with I.S. 782-1976.

3.0. Mode of measurements & payment:

3.1. The rate includes cost of all labour, materials, tools and plants etc. required for satisfactory completion of this item including lead jointing and testing.

3.2. The rate shall be for a unit of one number.

23.112. (A)(I) Providing and fixing wash down water closet (European type W.C. Pan) with integral 'P' or 'S' trap including joining the trap with soil pipe in C.M. 1: 1 (1 cement: 1 fine sand) (seat and cover to be measured and paid for separately) : Vitreous china pattern : In white colour.

1.0. Materials : Wash down water closet (European type W.C. Pan) shall shall conform to M-60. Cement mortar shall conform to M-11.

2.0. Workmanship: Closet shall be fixed to the floor by means of 75 mm. long 6.5 mm. diameter conter sunk bolts and nuts embedded in the floor concrete using rubber or fibre washers so as not to allow any lateral displacement. The joint between the trap of W. C. and soil pipe shall be made with C.M. 1:1(1 cement: 1 fine sand).

3.0. Mode of measurements & payment:

3.1. The rate shall include the cost of all labour for fixing pans and seat and cover, inlet, connections etc. complete including testing the same.

3.2. The payment of seat and cover shall be made separately. 3.3.

The rate shall be for a unit of one number.

23.113. (A) Providing and fixing 100mm. size 'P' or 'S' trap for water closet squatting pan including jointing the trap with the pan and soil pipe in cement mortar 1:1(1 cement: 1 fine sand) Vitreous china.

1.0. Materials : The 100 mm. size 'P' or 'S' trap for water closet shall conform to M.62 Cement mortar shall conform to M.ll

2.0 Materials : Workmanship 'P' or 'S' trap shall be fixed with pan and cast iron pipe with C. M. 1 : 1. The pan shall be provided with a 100 mm. 'P' or 'S' trap as specified in the item with an approximately 50 mm. seal. The joint between the pan and the trap shalUxj made I'xik-proof with cement 1: 1 (1 cement: 1 fine sand).

3.0. Mode of measurements & payment:

3.1. The rate shall be. include the cost of all materials and labour involved in the operations described under workmanship including testing.

3.2. The rate shall be for a unit of one number.

23.114. Providing and fixing in C.M. 1 : 3 (1 cement: 3 coarse sand) a pair of white vitreous china 250 mm. x 130mm. x 30 mm. foot rest for long pattern squatting pan water closet.

1.0. Materials: 1.1. The pair of white vitreous china foot-rests shall conform to M-62. Cement mortar shall conform to M-l 1.

2.0. Workmanship: 2.1. After laying the floor, the floor, shall be suitably sloped so that the waste water is drained into the pan. A pair of foot-rests of size 250 mm x 130 mm. x 30 mm. of white vitreous china shall be set in cement mortar 1: 3 (1 cement: 3 coarse sand). The foot-rests shall be fixed at a distance of 175 mm. from the inner edge of the back side of the pan and shall be fixed at convenient angle.

3.0. Mode of measurements & payment:

3.1. The rate shall include the cost of all materials and labours involved in all the operations described under workmanship.

3.2. The rate shall be for a unit of one pair.

23.115. (A)(I) Providing and fixing 1215 litres low level flushing cistern with a pair of C. I. or mild steel brackets complete with fittings such as lead valveless syphon, 15 mm. nominal size brass ball valve with polythene float, C. P. brass ball handle, unions and coupling for connections with inlet, outlet and overflow pipes, 40 mm. dia. porcelain enamelled flush including cutting holes in walls and making good ihc same and connecting the flush bend with cistern and closet, (overflow pipe to be measured and paid for separately): Vitreous China. In white colour.

1.0. Materials : 1.1. The low level vitreous china (Enamel) flushing tank shall conform lo M-65, except that the flushing cistern shall be 12.5 litres low level type as mentioned in the item.

2.0. Workmanship:

2.1. The low level cistern shall be fixed firmly on two C.I. or mild steel brackets which shall be firmly embedded in the wall in C. M. 1 : (1 cement: 4 fine sand).

2.2. The height of the bottom of the cistern from the top of the pan shall be 30 cms. The low level flushing cistern shall be connected to .the closet by means of 40 mm. dia. white porcelain enamelled flush bend using Indian rubber adaptus joint. The flush pipe shall be securely connected to the cistern outlet by means of coupling nut made of any non-corrosive materials non-ferrous metal or galvanised steel. The flush pipe from the cistern shall be connected lo the closet by means of cement or red-lead.

3.0. Mode of measurements & payment:

3.1. The rate shall include the cost of all materials, fitting and labour involved in all the operations described under workmanship including testing.

3.2. The rate shall be for a unit of one number.

23.116. Providing and fixing 12.5 litres high level C. I. flushing cistern with a pair C. I. or mild steel brackets, complete with fittings such as syphonic arrangement, 15 mm. nominal size brass ball valve with polythene flat, lever G. I. China (60 cms.) and pull unions and couplings for connections with inlet outlet and overflow pipes etc. including cutting holes in walls and making good the si me. (overflow pipe lo be measured and paid for separately).

1.0. Materials : 1.1 The high level C. I. flushing cistern shall conform to M-66, except that (he flushing cistern shall be of 32.5 litres high level C. I. flushing cistern as mentioned in the item.

2.0. Workmanship 2.l. The cistern shall be fixed on two C. I. or mild steel brackets which shall be firmly embedded in the wall in cement mortal l : 4 (1 cement, 4 fine sand).

2.2. The height of the bottom of the cistern from the top of the pan shall be two melres.

2.3. The W.C. Pan shall be connected lo the cistern by galvanised steel flushed pipes of 32 mm. nominal internal diameter. The flush pipe shall be fixed to wall by using clamps. The flush pipe from the cistern shall be connected to the closet by means of cement or red-lead. .The flush pipe shall be securely connected to the cistern outlet by means of coupling out made of any corrosive material non-ferrous metal or galvanised steel.

2.4. The china and the pull union shall be fixed to the protruding lever arm of the flushing cistern.

2.5. The whole installation shall be tested for leak-proof joints and satisfactory functioning.

3.0. Mode of measurements & payment:

3.1. The rate shall be include the cost of all materials, fillings and labour involved in all operations, described under workmanship including testing.

3.2. The rate shall be for a unit of one number.

23.117. Providing and fixing in position with clamps etc. 32 mm. nominal internal dia. galvanised steel lube flush pipe for nigh level flushing cistern including connecting the flush pipe with cistern and closet and making good the walls and floors.

1.0. Materials : 1.1. The 32 mm. nominal internal dia. galvanised steel tube flush pipe shall conform to M-56.

2.0. Workmanship :

2.1 The W.C. pan shall be connected to the cistern by galvanised steel flush pipe of 32 mm. nominal internal diameter. The Ripe shall be fixed to wall by using clamps.

2.2. the flush pipe from the cistern shall be connected to the closet by means of cement or red-lead.

2.3. The flush pipe shall be securely connected to the cistern outlet by means of coupling nut made of any non-corrosive materials, non-ferrous metal or galvanised steel.

3.0. Mode of measurements & payment:

3.1. The rate shall be include the cest of all materials, fittings and labour involved in all the operations .described under workmanship including testing.

3.2. The rate shall be for a unit of one running metre.

23.120. Providing and fixing G. I. inlet connection for flush pipe with W. C. Pan.

1.0. Materials: 1.1. The G. I. inlet connection for flush pipe shall conform to M-56.

2.0. Workmanship : 2.1. The flush pipe from the cistern shall be connected to the closet by means of cement or read-lead.

3.0. Mode of measurements & payment:

3.1. The rate shall include the cost of all materials, fittings and labour involved in all the operations described under workmanship including testing.

3.2. The rate shall be for a unit of one number,

23.127. Providing and fixing wash basin with single hole for pillar top white C.I. or M.S. brackets painted white intruding cutting holes, and making good the same but excluding fittings, vetreous china flat back wash basin 550 mm. x 400 mm. in white colour.

1.0. Materials: 1.1. The white glazed earthenware wash basin shall be 550 cm. x 400 mm. of 1st quality and make as approved by the Engineer-in-charge. The wash basin shall conform to M-59.

2.0. Workmanship :

2.1. The wash basin shall be fixed on the wall as and where directed. The wash basin shall be supported on a pair of M.S. or C.I. brackets fixed in C.M. 1 : 3 (1 cement: 3 sand). The bracket shall conform to I. S.: 775-1962. The wall plaster on the rear shall be cut to rest the top edge of the wash basin. After fixing the basin, plaster shall be made good and surface finished to match with the existing one.

2.2. The bracket shall be painted white with ready-mixed paint.

2.3.The C.I. brass trap and union shall be connected to 32 mm. dia. waste pipe which shall be suitably bent towards the wall and which shall discharge into an open drain leading to a gully trap or direct into the gully-trap on the ground floor and shall be connected to a waste pipe through a floor trap-on the upper floors. C.P. brass trap and union may not be provided where the surface drain or a floor trap is placed directly under the basin and the waste is discharged into vertically.

2.4. The height of the front edge of the wash basin from the floor level shall be 80 cms.

2.5. The necessary inlet, outlet connections and fittings such as pillar cocks. C.P. dress waste trap waste pipe, stop cock, chain wish rubber plug etc. shall be fixed.

2.6. The payment of fittings shall be made separately under separate item.

3.0. Mode of measurements & payment:

3.1. The rate includes cost of all labour, materials; tools and plant etc. required for satisfactory completion of this item as specified in workmanship.

3.2. The rate shall be for a unit of one number.

23.130 (C) Providing and fixing kitchen sink with C.I. or M.S. Brackets painted white including cutting holes in walls and waking good the same but excluding fittings, Vitreous china Sink 600 mm. x 450 mm. x 150 mm. size.

1.0. Materials : 1.1. While glazed vitreous china sink 600 mm. x 450 mm. x 150 mm. size shall conform to M-63.

2.0. Workmanship :

2.1. The kitchen sink shall be supported on a pair of M. S. or C. I. brackets fixded in cement mortar 1:3 (1 cement: 3 coarse sand). The M.S. or C.I. brackets shall conform to I.S. 775-1972. The wall plaster on the rear shall be cut to rest over the top edge of the sink. After fixing the sink plaster shall be made good and the surface finished to match with the existing one.

2.2. The C.P. brass trap and union shall be connected to 40 mm. dia. nominal bore galvanised miled steel waste pipe which shall be suitably bent towards the wall and which shall discharge into an open drain leading to a gully-trap or direct into the

gully- trap on the ground floor and shall be connected to a waste pipe through a floor trap on the upper floors. C.P. brass trap and union may not be provided where surface drain or a floor trap is placed directly under the sink and the waste is discharged to it vertically.

2.3. The height to front edge of the wash basin from the floor level shall be 80 cms.

3.0. Mode of measurements & payment:

3.1. The rate includes cost of all labour, materials tools and plant and other equipment required for satisfactory completion of this item as described in workmanship.

3.2. The rate shall be for a unit of one number.

23.135 (A) Providing and fixing 32 mm dia. C.P. brass waste for wash basin or sink.

1.0. Materials: 1.1. The C.P. brass waste trap and unions shall be of 12 mm. dia. and of best quality and make as approved by the Engineer-in-charge.

2.0. Workmanship:

2.1. C. P. brass waste trap and union shall be connected to 32 mm. dia. waste pipe which shall be suitably bent woards the wall and which shall discharge into drain through a floor trap. The C. P. brass waste trap shall be provided for wash basin or sink as the case may be.

3.0. Mode of measurements & payment:

3.1. The rate includes all labours and providing C. P. brass waste trap and union including waste coupling of 32 mm. dia. The rate excludes the cost of waste pipe of 32 mm. dia.

3.2. The rate shall be for a unit of one number.

23.135 (B) Providing and fixing 40 mm. dia. C. P. Brass waste for wash basin of sink.

1.0. Materials & Workmanship : 1.1. The relevant specifications of item 23.135 (A) shall be followed except that the diameter of C. P. brass waste is 40 mm. dia.

2.0. Mode of measurements & payment: 2.1. The rate shall be for a unit of one number.

23.136. (A) Providing and fixing 32 mm. dia. M. I. Fisher union shall be of best quality and make as approved by the Engineer-in-charge.

1.0. Materials : 1.1. The 32 mm. dia. M. I. Fisher union shall be of best quality and make as approved by the Engineer-in-charge.

2.0. Workmanship: 2.1. The 32 mm. dia. M. I. Fisher union shall be fixed to wash basin or sink in best workman like manner.

3.0. Mode of measurements & payment: 3.1.The rate includes all labours and materials, tools & Plants etc. required for satisfactory completion of the item.

23.136 (B) Providing and fixing 40 mm. dia. M. I. fisher union for wash basin or sink.

1.0. Materials & Workmanship : 1.1. The relevant specifications of item No. 23.136 (A) shall be followed except the diametre of M. I. Fisher union shall be 40 mm. dia.

2.0. Mode of measurements & payment: The rate shall be for a unit of one number.

23.139. Providing and fixing 100 mm. dia. sand cast iron grating for gulley floor or Nahni trap.

1.0. Materials: 1.1. The 100 mm. dia. sand cast iron gratings for gulley floor or Nahni trap shall be of best quality and make as approved.

2.0. Workmanship: 2.1. The cast- iron grating shall be provided to gully trap floor or Nahni trap as the case may be in best workman like manner.

3.0. Mode of measurements & payment:

3.1. The rate includes cost of all labour, materials tools, and plants, etc. required for satisfactory completion of this item.

3.2. The rate shall be for unit of one number.

23.141. (A) Providing and fixing 100 mm. dia. C. P. brass shower rose with 15 mm. or 20 mm. inlet. 1.0. Materials: 1.1.100 mm. dia. C. P. brass shower rose shall conform to LS.: 2556-1972 part XI and of best quality and make as approved by the Engineer-in-charge. The inlet of shower rose shall be 15 mm. dia. or 20 mm. dia. as directed. 2.0. Workmanship :2.1. The C.P. brass shower rose shall be fixed us directed 15 mm. dia. or 20 mm. dia. G.I. inlet pipe as

the case may be.

3.0. Mode of measurements & payment:

3.1. The rate includes all labour and materials, tools and plant etc. required for satisfactory completion of this item.

3.2. The rate shall be for a unit of one number.

23.143. Providing and fixing 600 mm. x 450 mm. bevelled edge mirror of superior glass mounted on 6 mm. thick A. C. Sheet or plywood sheet and fixed to wooden plugs with C. P. brass screws and washers.

1.0. Materials:

1.1. The 600 x 450 mm. size mirror shall be of superior glass with edge rounded off or bevelled as specified. It shall be free from flaws specks, or bubbles and its thickness shall not be less than 6 mm. The glass for the mirror shall be uniformly silver plated at the back and shall be free from silvering defects. Silvering shall have a protective uniform covering of red-lead paint. The 6 mm. thick plywood shall conform to M-37.

1.2. The 6 mm. thick A. *C.* Sheets shall conform to M-24.

2.0. Workmanship : 2.1. The mirror of 500 mm.x450mm. size mounted on A.C. sheet orplywood6mm. thick with. C.P. brass clips shall be fixed as directed, by fixing wooden plugs in wall and C. P. brass screws and washers. The work shall be carried out in best workman like manner.

3.0. Mode of measurements & payment: 3.1. The rate includes cost of all labour and materials, tools and plant etc. required for satisfactory completion of this item. The rate shall be for a unit of one number.

23.144 (B) Providing and fixing 600 x 20 mm. C. P. brass towel rail complete with C. P. brass brackets fixed to wooden plugs with and C. P. brass screws.

1.0. Materials : 1.1. The C. P. brass towel rail shall be 600 x 20 mm. of best quality as approved by the Engineer-in- charge. The brackets shall be of C. P. brass. The rail shall conform to I.S. 1068-1958.

2.0. Workmanship : 2.1. The brackets of the towel rail shall be fixed by means of C.P. brass to screws wooden plugs finnly embedded in the wall with C.M. 1 : 3 (1 cement: 3 coarse sand). The towel rail shall be fixed as and where directed.

3.0. Mode of measurements & payment:

3.1. The rate includes cost of all labour and materials, tools and plant etc. required for satisfactory completion of this item.

3.2. The rate shall be for a unit of one number.

23.145. Providing and fixing 600 mm. x 120 mm. glass shelf with C.P. brackets and guard rail complete, fixed to wooden plugs with C.P. brass screws.

1.0. Materials : 1.1. The glass shelf of 600 mm. x 120 mm. size shall be of 5 mm. thick plate glass. The edge of the glass shall be grounded. The C.P. over brass guard rail shall be of best quality and make.

2.0. Workmanship : 2.1. The C. P. brass brackets of the glass shelf shall be fixed with C.P. brass screws to wooden plug firmly embedded in the wall C. M. 1: 3 (1 cement: 3 coarse sand). The C. P. guard rail shall be fixed to glass shelf as directed.

3.0. Mode of measurements & payment:

3.1. The rate includes all labour and materials, tools and plant etc. required for satisfactory completion of this item.

3.2. The rate shall be for a unit of one number.

23.146 (A) Providing and fixing C. P. brass toilet paper holder.

1.0. Materials : 1.1. The C.P. brass toilet paper holder shall be of best quality and make. The chromium plating shall be of grade 'B' type conforming to I.S. 1068-2958.

2.0. Workmanship : 2.1. The toilet paper holder shall be fixed in position by means of screws and wooden pluges embedded in wall with cement mortar 1 : 3 (1 cement: 3 coarse sand).

3.0. Mode of measurements & payment:

3.1. The rate includes best of all labour and materials, tools and plant etc. required for satisfactory completion, of the item.

3.2. The rate shall be for a unit of one number.

23.92. (A)(I) Providing and fixing brass screw down bib taps of following size: Polished bright 14 mm. dia.

1.0. Materials: 1.1. 15 mm. dia. brass screw down with bright polished finish shall conform to I.S. 781-1977. The bib coak shall be best Indian make and quality.

2.0. Workmanship : 2.1. The screw down bib cock 15 mm. dia. as specified above shall be fixed as directed. The threaded portion shall be smeared with white or red lead and around with a few turns of fine spun yarn round the screwed end of the pipe. The bib cock shall be than screwed and fixed to water tight position.

3.0. Mode of measurements & payment:

3.1. The rate includes cost of all labour, materials, tools and plant etc. required for satisfactory completion of this item.

3.2. The rate shall be for a unit of one number.

23.92(A)(II) Providing and fixing brass screw down bib taps of following size: Polished bright: 20 mm. dia.

1.0. Materials & Workmanship : 1.1. The relevant specifications of item 23.92 (A)(I) shall be. followed except that the bib taps of 20 mm. dia. shall be fixed.

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item 23.92 (A)(I) shall be followed.

2.2. The rale shall be for a unit of one number.

23.92 (B)(I) 1.0. Materials & Workmanship : Providing and fixing Chromium plated brass screw down bib laps of the following size: 15 mm. dia.

1.0. Materials & Workmanship : 1.1. The relevant specifications of item No. 23.92 (A)(I) shall be followed except that brass chromium plated screw down bid tap of 15 mm. dia. shall be fixed.

2.0. Mode of measurements & payment 22.1. The rate shall be for a unit of number.

23.92 (B)(II): Providing and fixing chromium plated brass screw down bib laps of the following size: 15 mm. dia.

1.0. Materials & Workmanship : 1.1. The relevant specifications of item No. 23.92 (A)(i) shall be followed except that the brass chromium placed screw down bib lap shall be fixed.

2.0. Mode of measurements & payment: 2.1. The rate shall be for a unit of one number.

23.92 (C)(I) Providing and fixing gun metal screw down bib taps of the following size : 15 mm. dia.

1.0. Materials & Workmanship : 1.1. The relevant specifications of item No. 23.92 (A)(i) shall be followed except that the 20 mm. dia. gun screw down bib tap shall be fixed.

2.0. Mode of measurements & payment: 2.1. The rate shall be for a unit of one number.

23.92 (C)(II) Providing and fixing gun metal screw down bib taps following size *:* 20 mm. dia.

1.0. Materials & Workmanship: 1.1. The relevant specifications of item No. 23.92 (A)(I) shall be followed except that the 20 mm. dia. gun screw down bib tap shall be fixed.

2.0. Mode of measurements & payment: 2.1. The rate shall be for a unit of one number.

23.95 (A) Providing and fixing billcr tap capsicn head screw down high pressure with screw shank and back nuts : (A) 15 mm. dia. (B) 20 mm. dia.

1.0. Materials: 1.1. The capsten head pillar tap of specified dia. of C.P. over brass shall be of best quality and shall conform to I.S.: 1795-1961. The pillar taps shall be of tested quality.

2.0. Workmanship: The capstan head pillar tap of specified dia. shall be fixed as directed with required washwer of selected leather or rubber asbestos composition or of plastic as directed. The cock shall fixed with pipe line with white zink end spun yarn to make joint water light. The work shall be carried out in best workman like manner.

3.0. Mode of measurements & payment:

3.1. The rate includes cost of all labour, materials lolls and plant etc. required for satisfaction completion of this item.

3.2. The rate shall be for a unit of one number.

23.96(A) Providing and fixing brass screw down stop cock (A) 15 mm. diy. (B) 20 mm. dia. (C) 25 mm. dia.

1.0. Materials : 1.1. The brass screw down slorJ cock of specified dia. shall conform to I.S.: 781-1977. The stop cock shall be tested quality.

2.0. Workmanship : 2.1. The stop cock shall be fixed in position by means of Jam nut and stocket. The stop cock shall be fixed near the inlet of the water metre or as directed. The joints shall be done with white zinc and spun yarn. The joint shall be tested for leak proofing.

3.0. Mode of measurements & payment:

3.1. The rate includes cost of all labours, materials, tools and plant etc. required for satisfactory completion of this item.

3.2. The rate shall be for a unit of one number.

23.99. Providing and fixing gun metal check or non-return valve (A) 15 mm. dia. (B) 20 mm. dia. (C) 25 mm. dia. (D) 32 mm. dia. (E) 40 mm. dia.

1.0. Materials: 1.1. The gun metal check or non return full way wheel valve of specified dia. shall conform to I.S. 778-1964. The non return valve shall be of tested quality.

2.0. Workmanship : 2.1. The gun metal check or non return valve" shall be fully cleared of all foreign matter before fixing. The fixing of valve shall be done by means of bolts nuts and 3 mm. rubber insertions with flanges of spigot and socketed tail pieces, drilled to the same specification as in case of socket and spigot and with flanges in case of flanged pipes. The jointing shall be done leak proof.

3.0. Mode of measurements & payment:

3.1. The rate includes all labours, materials, tools and plant etc. required for satisfactory completion of this item.

3.2. The rate shall be for a unit of one number.

23.00.1. Providing and fixing chromium plated brass half turn flush cock of approved quality incl. fixing in pipe line etc. complete (I) 20 mm. dia. (II) 25 mm. dia. (III) 32 mm. dia.

1.0. Materials: 1.1. Chromium plated brass half turn flush cock shall conform to M-67.

2.0. Workmanship : The half turn flush cock of specified diameter shall be fixed as directed. The flush cock shall be fixed in G.I. pipe line with necessary fillings. The joints shall be made leak proof by using spun yarn and white zink. The fixing work shall be carried out as per relevant specifications of item No. 23.2 (4).

3.0. Mode of measurements & payment:

3.1. The rate includes cost of all materials and labour required for satisfactory completion of this item including fittings.

3.2. The rate shall be for a unit of one number.

23.004. Providing and fixing chromium plated bottle trap with necessary coupling of approved quality for wash basin.

1.0. Materials : The chromium plated bottle trap shall be of approved make and of best quality. The bottle trap shall be provided with coupling.

2.0. Workmanship: The bottle trap shall be fixed on hand wash basin with wooden gullies and screws as directed. The work shall be carried out in best workman like manner.

3.0. Mode of measurements & payment:

3.1. The rate includes cost of all materials and labour involved for satisfactory completion of this item.

3.2. The rate shall be for a unit of one number.

23.122. (A) Providing and fixing urinal of approved quality including connecting the urinal with waste pipe, trap etc. complete : white earthen ware flat back or corner type size 430 mm. x 260 mm. x 350 mm.

1.0. Materials: 1.1. The white earthenware flat pack or comer type urinal of size 430 mm. 260 mm. x 350 mm. shall conform to M-64.

2.0. Workmanship: 2.1. The urinals shall be fixed in position by using wooden plugs and screws and shall be at a height 65 cms. from the floor level to the top of the lip or urinal, unless otherwise directed. The wooden plugs shall be 50 mm. x 50 mm. at base lappering to 38 mm. x 38 mm. at top and 50 mm. in length shall be fixed in wall in cement mortar 1: 3 (1 cement : 3 coarse sand). The urinal shall be connected to 32 mm, dia. galvanised mild steel waste pipe which shall discharge in the channel or-floor trap. The connection between the urinal and flush or waste pipe shall be made by means of putty or whit elead mixed with chopped hemp.

3.0. Mode of measurements & payment:

3.1. The rate includes cost of all labours, materials, tools and plants etc. required for satisfactory completion of this item.

3.2. The rate shall be for a unit of one number.

22.124. (A) Providing and fixing urinal of approved quality deluding connection with trap and with integral longitudinal flush pipe squatting plate pattern white earthenware 550mm x 300 mm.

1.0 Materials : 1.1. The squatting plate plattern, white glazed earthenware urinal of 550 mm. x 300 mm. shall conform to I.S. 771-1063. It shall be of best Indian Make.

2.0. Workmanship:

2.1. The squatting plate urinal shall be fixed as directed.

2.2. The lop edge of the squatting plate shall be flush with the finished floor level adjacent to it. It shall be embedded on a layer of 25 mm. thick cement mortar 1:8(1 cement: 8 fine sand) laid over a bed of burnt brick bl cement a: 5 : 10 (1 cement : 5 fine sand. 10 graded brick aggregate 20 mm. nominal size). There shall be 100 mm. dia. glazed earthenware of vitreous china channels as specified with stop and outlet pieces suitably fixed in floor in Cement mortar 1:3(1 cement: 3 coarse sand) and joint finished with white cement. The earthenware vitreous china shall discharge into 65 mm. C.P. brass outlet grating. The trap and fitting shall be fixed as directed.

3.0. Mode of measurements & payment:

3.1. The rate includes cost of all materials, tools and plants and labour required for satisfactory completion of this item.

3.2. The rate shall be for a unit of one number.

23.134. Providing and fixing rubber plug for sink or wash basin.

1.0 Materials: 1.1. The rubber plut for sink or wash hand basin shall be best quality and make as approved by the Engineer-in-charge.

2.0. Workmanship :2.1. The rubber plug with chain shall be fixed in wash basin or sink as directed.

3.0. Mode of measurements & payment: 3.1. The rate shall for a unit of one number.

23.00.5 (A) Providing and fixing ball cock of approved quality as directed (Copper metal) : (1) 25 mm. dia. (II) 50 mm. dia.

1.0 Materials: The ball cock of specified diameter shall conform to M-75.

2.0. Workmanship: The ball cock of specified diameter shall be fixed as directed. The fixing of ball cock shall be carried out as per relevant specifications of item No. 23(A) for joints etc.

3.0. Mode of measurements & payment:

3.1. The rate includes cost of all materials and labour involved for carrying out satisfactory work.

3.2. The rate shall be for a unit of one number.

23.00.5(B) Providing and fixing ball cock of approved quality as directed: (Abonite (I) 25 mm. dia. (II) 50 mm. dia.)

1.0 Materials & Workmanship : The relevant specifications of item No. 23.00.5(I) shall be followed except that the bail cock of specified dia. of Abonite shall be fixed.

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item No. 23.00.5.(A) shall be followed.

2.2. The rate shall be for a unit of one number.

22.00.6. Providing and fixing C.I. Manhole cover 0.60 CM x 0.45 CM size having weight not less than 35 Kg.

1.0 Materials: C.I. Manhole cover of 0.60 x 0.45 Cms. size shall be of best quality. The weight of C.I. cover and frame shall not be less than 35 Kg. The C.I. manhole cover shall be of light duty and conform relevant I.S.

2.0. Workmanship : 2.1. C.I. Manhole cover shall be fixed as per relevant specifications of item No. 24.44 except that the C.I. cover shall be fixed as and where directed.

3.0. Mode of measurements & payment:

3.1. The rate includes cost of all labour and materials required for satisfactory completion of this item.

3.2. The rate shall be for a unit of one number.

23.00.7. Providing and fixing G.I. rain water spout of 50 mm. dia. and 20 cms. length.

1.0 Materials: G.I. M.S. pipe of 50 mm. dia. shall conform to M-56.

2.0. Workmanship: 2.1. The G.I. pipe of 30 cms. fixed as rain water pipe as directed. The pipe shall be fixed about 1/4 dia. below the floor level so as to make approach of water easy. The inlet of pipe shall be rounded off for easy entry of fain water pipe. The pipe shall be fixed in C.M. 1:3.

3.0. Mode of measurements & payment:

3.1. The rate includes of all labour and materials required for satisfactory completion of this item.

3.2. The rate shall be for a unit of one number.

23.8. Providing and fixing to wall ceiling and floor polythine pipe of specified diameter will 6 Kg. F/Sq. cm. working pressure outside diameter, low density completion with special flange compression type fittings wall clips, etc., incl. making good the wall ceiling and floor. (A) 20 mm. dia. (B) 25 mm. dia. (C) 32 mm. dia. (D) 40 mm. dia. (F) 50 mm. dia.

1.0. Materials : 1.1. The low density polythene pipe of specified diameter with 6 Kg./F. Sq. Cm. working pressure shall conform to I.S. 3076-1968. The specials and fillings required shall be of best quality.

2.0. Workmanship:

2.1. The P.V.C. Pipes of specified diameter shall be fixed as directed. Due to thermal expansion of rigit P.V.C. Pipes, due allowance shall be made particularly in over ground pipe lines for any change in length of pipe line which may occur during installation or when pipe line is in service.

2.2. Above ground installation of rigid P.V.C. pipe should be undertaken after precautions are observed for their protection against dirt sun rays and mechanical damage.

2.3. The rigid P.V.C. pipe lines should not be kept exposed above ground when it passes through public place, railway lines, roads, road side and footpaths.

2.4. P.V.C. pipes shall be supported at the followings intervals :

20 mm. dia.	500 mm.
25 mm. dia.	750 mm.
32mm. dia.	900mm.

2.5. Closet support spacings shall be provided, if recommended by the manufacturer.

2.6. The guide line indicated by the manufacturer regarding handling, transportation, storing, laying and jointing of pipes shall be kept in view during execution.

2.7. P.V.CV. pipes shall be fixed on wall with wooden plugs and suitable clamps.

2.8. Jointing the pipes :

2.8.1. The pipes and sockets shall be accurately cut. The ends of the pipes and filling should be absolutely free from dirt and dust The outside surface of the pipes and the inside of the fillings shall then be roughened with emery paper, and then solvent cement shall be applied to the matching surface and pushed home and joint. Since solvent cement is aggreswive to P.V.C. care must be taken to avoid applying excessive cement to the inside of pipe sockets as any surplus cement cannot be wiped off after jointing. Empty solvent cement tins, brushes, rags, of paper unpregneted with cement should not be buried in the trenches. They should be gathered, not left scatcrred about, as they can prove to be a hazard to animals which may chew them.

2.8.2. If any manufacturer recommends its own methods of jointing the same shall be adopted after necessary approval from the Engineer-in-charge.

2.9. Laying pipes in trenches :

2.9.1. The pipes shall be laid over uniform relatively soft fine grained soil found to be free of presence of hard objects such as large flints, rocky projections, large tree roots etc. The width of the trenches shall be minimum width required for working.

2.9.2. The pipes laid underground shall not be less than one metre from the ground level. The pipe shall be positioned in the trenches so as to avoid any induced stresses due lo reflection. Any deviation required shall be obtained by using proper type of rubber ring joints.

3.0. Mode of measurements & payment:

3.1. The relevant specifications of item No. 23.2 (A) shall be followed except that the P.V.C. pipes of specified dia. shall be paid under this item.

3.2. The rate shall be for a unit of one running metre.

SECTION – 24

DETAILED SPECIFICATIONS FOR DRAINAGE & SEWERAGE

24.1.(A) Providing and laying (Two level or slopes) and jointing with stiff mixture of cement mortar in proportion 1 : 1 salt glazed stone-ware pipes, following nominal internal diametres including testing of pipes and joints complete: 100 mm. dia.

1.0 Materials : (1) Water shall conform to M-l, (2) Cement mortar of proportion 1: 1 shall conform toM-11. (3) 100mm. dia. glazed stoneware pipe shall conform to M-71.

2.0. Workmanship: 2.1. The trenches for stoneware pipe drains shall be carried out as per relevant specifications of item No. 23.4(A) except that the work is for stoneware pipes of 100 mm. dia.

2.2. Laying: 2.2.1. The pipes shall be laid accurately and perfectly true to line, levels and gradients. Great care shall be taken to prevent sand etc., from entering the pipes. The pipes between two manholes shall be laid truly in a straight line without vertical or horizontal undulation. All junctions and changes in direction and diameter shall be made inside manholes by means of curved tapered channels formed in cement concrete finished smooth and benched on both sides. The body of the pipe shall rest for its entire length, on an even level bed grips being made or left on the bed to receive the sockets of the pipes.

2.3. Jointing:

2.3.1. Tarred gaskin or yam socked in neat cement slurry first be placed around the spigot of each pipe and the spigot shall then be placed well home into the socket of the pipe previously laid. The pipe shall then be adjusted and fixed in the correct position and gaskin cculked home so as to fill not more thanl/4th of the total dept or (13 mm. in depth) of the socket.

2.3.2. The remainder of the socket shall be filled with stiff mixture of cement mortar in porportion of one part of cement and one part of sharp sand. When the socket is filled, a fillet, shall be formed round the joints trowel, forming an angle of 45144 with the barrel of the pipe.

2.3.3. The mortar shall be mixed as necessary for immediate use.

2.3.4. After the joint is made, any extraneous materials shall be removed from the inside of the joints with a suitable scraper of 'badger'. The newly made joint shall be protected, until set, from the sun, dry winds, rain or *host,* sacking or other suitable materials which shall be used for the purpose.

23.5. The mortar shall be cured to 10 days.

2.4. Testing of Joints: The pipe line shall be tested as directed.

2.4.1. If any leakage is visible, the defective part of the work shall be made good at no extra cost.

2.4.2. A slight amount of sweating which is uniform may be overlooked, but excessive sweating from a particular pipe or joints shall be watched for and taken as indicating a defect to be made good.

3.0. Mode of measurements & payment:

3.1. Pounding or bottaning of the trenches bed to fit the lower part of the pipe and 'Grips' left to take socket, collars etc. are included in the rate of laying the pipes.

3.2. The measurements shall be net without any allowance for cutting and waste. The length of bends, junctions and other connections shall be included inthe total length of the drain pipes. Nothing extra shall be paid for the same. The rate includes necessary excavation refilling trenches etc. complete.

33. The rate shall be for a unit of one running metre.

24.1.(B) Providing and laying and jointing salt glazed stoneware pipes with the lime concrete 1 : 2 :4 (1 lime: 2 fine sand: 4 graded brick aggregate 40 mm. nominal size) bedding with necessary form work and curing etc. complete: ISO mm. dia.

1.0 Materials & Workmanship: The relevant specifications of item 24.1 .(A) shall be followed except that the diametre of pipe shall be 150 mm. dia.

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item 24.1.(A) shall be followed.

2.2. The rate shall be for a unit of one running metre.

24.2.(A) Providing and laying cement concrete 1:5: 10(1 cement: 5 fine sand.: 10 graded stone: aggregate 40 mm. nominal size) bedding for stoneware pipe of following internal diameter with necessary formwork and curring complete : 100 mm. dia. 300 mm, width (12 mm. average bed thickness).

1.0 Materials : (I) Water shall conform to M-l. (2) Cement shall conform to M-3. (3) Sand shall conform to M-6. (4) Stone aggregate 4C mm. nominal size shall conform to M-12.

2.0. Workmanship : 2. l. The relevant specifications of item 5.3.4. shall be followed except that the concrete work shall be carried out in trenches as bedding for stoneware pipes. The width of concrete work shall be 300 mm. and average thickness of bedding shall be 112 mm. The concrete shall be brought up atleast to the invert level of the pipe to form a cradle and to avoid line contact between the pipe and the bed.

3.0. Mode of measurements & payment:

3.1. The rate includes cost of all labour and materials required for satisfactory completion of this item.

3.2. The rate includes cost of necessary formwork required if any.

33. The rate shall be for a unit of one running metre.

24.2. (B) Providing and laying cement concrete 1:5:10(1 cement: 5 fine sand: 10 graded stone aggregate 40 mm. nominal size) bedding for stoneware pipe of following internal diametres with necessary form work and curing complete : 150 mm. dia. 450 mm. width (166 mm. average bed thickness)

1.0 Materials & Workmanship : 1.1. The relevant specifications of item 24.2.(A) shall be followed except that the cement concrete work shall be carried out for bedding for stoneware pipe of 150 mm. dia. The average thickness of bedding shall be 166 mm. and width shall be 450 mm.

2.0 Mode of measurements & payment:

2.1. The relevant specifications of item 24.2.(A) shall be followed.

2.2. The rate shall be for a unit of one running metre.

24.19.(I) Providing and fixing S. W. gully trap with G. I. grating, brick masonry chamber and watertight C.I. cover with frame of 300 mm. x 300 mm. size (Inside) with standard weight :(A) square mount traps 100 mm. x 100 mm. size P. type.

1.0 Materials : (I) Water shall conform to M-l. (2) Cement mortar of proportion 1: 5 shall conform to to M-l 1. (3) Burnt brick shall conform to M-15. (4) The S.W. Gulley trap of 100 mm. x 10-0 mm. size shall conform to M-70.

2.0. Workmanship : 2.1. Excavation for gulley trap shall be done true to dimensions and levels as indicated on plans or as directed. The excavation vork shall generally be done as per relevant specification of item 4.0.0. of earth work.

2.2. Fixing : 2.2.1. The gulley trap shall be fixed over cement concrete 1: 5 : 10 (1 cement: 5 sand : 10 graded brick bats aggregate 40 mm. nominal size) foundation 650 mm. square and 100 mm. thick. The depth of top of concrete below the ground level shall be 675 mm. The jointing of gulley outlet to the branch drain shall be done similar to jointing of S. W. pipe as described in item No. 24.1.(A).

2.3. Brick masonry chamber: After fixing and testing gulley and branch drain, a brick masonry 300 x 300 mm. inside with bricks in C.M. 1 : 5 (1 cement: 5 sand) shall be built With a 100 mm. brick work round the gully trap from the top of bed concrete upto ground level. The space between the chamber walls and the trap shall be filled with cement concrete 1:5:10. The upper portion of the chamber i.e. above the top level of the trap shall be plastered inside with cement mortar 1 : 3 (1 cement: 3 sand) finished with floating coat of neat cement. The corners and bottom of the chamber shall be rounded of so as to slope towards the grating.

2.4. C.I. cover with frame 300 mm. x 300 mm. (inside) size shall than be fixed on the lop of the brick masonry with C.C. 1:2:4 (1 cement: 2 coarse sand: 4 graded stone aggregate 20 mm. nominal size) 40 mm. thick and rendered smooth. The finished top of the cover shall be left about 40 mm. above the adjoining ground level so as to exclude the surface water from entering the gully trap.

3.0. Mode of measurements & payment:

3.1. The rate includes cost of all labour, materials, tools and plant etc. required for satisfactory completion of this item as described above.

3.2. The rate shall be for a unit of one number basis.

24.22. Providing and laying (to level or slopes and jointing reinforced concrete light duty non-pressure pipes I.S. class N.P. 2 of the following internal diametres with collars and butt-ends prepared for collar joints incl. testing of joints etc. complete (B) 150 mm. (C) 250 mm. (D) 300 mm. (AE) 450 mm. (F) SCO mm. (G) 600 mm. (H) 900 mm. (K) 1000 mm. (M) 1200 mm. **1.0 Materials :** 1.1.The reinforced concrete light duly non -pressure pipes of specified diameter shall conform to I.S.

458-1971.

2.0. Workmanship : 2.1. The relevant specifications of item No. 24.1.(A) shall be followed for work of trenches except that the excavation in trenches shall be for reinforced concrete pipes of specified diameter.

2.2. Laying:

2.2.1. The pipes shall be lowered into the trenches carefully. Mechanical appliances may be used. Where necessary pipe shall be laid in straight lines or with easy curves and true to line and gradient as specified. The laying of pipe shall proceed upgrade of a slope. In the pipe with loose collars, the collars shall be slipped on before the next pipe is laid.

2.2.2. In case where the foundation conditions are unusual such as the proximity of troes or holes, under existing or proposed around in 150 mm. thick cement concrete 1:5:10(1 cement: 5 fine sand : 10 graded stone aggregate 40 mm. nominal size) or compacted sand or gravel.

2.2.3. In case where the natural foundation is inadequate the pipe shall be laid either in concrete cradle, supported on proper foundation or on any other suitably designed structure. If concrete bedding is used, the depth of concrete below bottom of the pipe shall be atleast ¼ th of the internal diametre of the pipe subject to a minimum of 100 mm. and maximum 300 mm. The concrete shall be extended upto the sides of the pipe atleast a distance of ¼ th of the outsided diameter for pipes 300 mm. and over in diameter.

2.2.4. The pipes shall be laid in the concrete bedding before the concrete has set. Pipe!/laid in trenched in earth shall be bedded evenly and firmly and as far as upto the naunches of the pipe as to safely transmit the load expected from the back fill through the pipe to the bed. This shall be done cither bye xcavaling the bottom of the trenches to fit the curve of the pipe or by compacting the earth under round curve of the pipe to form an even bed. Necessary provision shall be made for joints wherever required.

2.3. Jointing: 2.3.1. The joints shall be done by slipping the collar over and clear of the end of the pipe. The recess of the end of the pipe shall be filled with jute threading dipped in hot bitumen. The new pipe shall then be brought forwarded until the bitumen ring in recess of first pipe is set into the recess of the second pipe. This process shall be repeatred for two or three pipes shich shall then be jacked up so as to thoroughly compress the bitumen. The quantity of jute and bitumen shall be just enough to fill the recess when pressed hard by jacking, care being taken that no offset of the jute braiding shall be visible either outside or inside of pipe. The collar shall then be set up over the joints covering equally both the pipe and leaving an even caulking space all round Cement and sand mortar 1 : 1½ shall then be well punched or pressed home with a caulking tool within this caulking space. Care shall be taken that the underside of the joints is properly filled with mortar.

2.4. Curing:

2.4.1. Every joint shall be kept wet for about 10 days for maturing, the section oft he pipe line laid and jointed shall be covered immediately to protect from weather effects. Minimum bore of 100 mm. is considered adequate. 2 A2. The joints shall be left exposed for observation.

2.5. Testing of joints : 2.5.1. The testing of joints shall be done as per relevant specifications of item No. 24.1.(A) except that the testing of reinforced concrete pipes shall be done.

3.0. Mode of measurements & payment:

3.1. The relevant specifications of item No. 24.1.(A) shall bge followed except that the rate includes for laying (to level or slope in trenches etc. measured separately) making the joints as indicate and testing to stand the water test.

3.2. The measurements shall be net without any allowance for cutting and waste. The length of bends, junctions and other connections (measured along the centre line) shall be including in the total length of the pipes, the connections being numbered afterwards and paid for extra over pipes.

3.3. The size of bends, junctions etc. shall suit the size of pipe. The bore (internal diameter of pipe) shall be the criterion for payment.

3.4. Nothing extra shall be paid separately for the use of mechanical appliances, Where necessary, as described above.

3.5. The rate shall be for a unit of one running metre.

24.27. Constg. Manhole with R.C.C. top slab in 1 : 2 : 4 mix (1 cement: 2 coarse sand : 4 graded stone aggregate 20 mm. nominal size) foundation concrete i : 3 : 6 (1 cement: 3 coarse sand: 6 brick bats 40 to 50 mm. size) inside plastering 15 mm. thick with CM. 1 : 5 (1 cement: 5 coarse sand) finished with floating coat of neat cement and making channels in C. C. 1 : 2 : 4 (1 cement: 2 coarse sand : 4 stone :aggregate 20 nm. nominal size) finished smooth complete incl. curing and

testing (I) inside size 900 mm. x 120 mm. and 1.5 mm. deep including C. I. cover with frame size 560 mm. diameter, total weight of cover and frame to be not less than' 18 Kgs. (Wt. of cover 64 Kg. and Wt. o'f frame 64 Kg.) (A) with 230 mm. thick walls of masonry using brick shaving crushing strength not less than 35 Kg./sq.cm. in C.M. 1:5(1 cement: 5 coarse sand).

i. A type depth 0.90 metre for 150 mm. sewer, ii. B type depth 150 metre for 150 sewer

iii. C type depth 2.25 metre for 150 mm. sewer iv. D type depth 315 metre for 150 sewer

1.0 Materials : Water shall conform to M-l. Cement shall confirm to M-6. Burnt bricks shall conform to M-15. Prick bats of 40 to 50 mm. size shall conform to M-14. Stone coarse aggregate of 20 mm. nominal size shall conform to M-l2. Grit shall conform to M-8. Cement mortar of specified proportion shall conform to M-11. The cast iron manhole cover of 560 mm. dia. with frame shall conform to I.S. 1726-1966.

2.0. Workmanship : 2.1. The manholes of different types and sizes as specified shall be constructed in sewer line at such places and to such levels and dimension as shown in drawings or as directed.

2.2. Bed Concrete:

2.2.1. The manhole shall be built on a hed of cement concrete 1:3:6(1 cement: 3 coarse sand: 6 brick bats) (40 to 20 mm. nominal size) to the thickness of the bed concrete shall be 15 crns. for manhole upto 1 M. depth and 20 cms. for manholes over metre and upto 2 metres, depth and 30 cms. for manholes of greater depth.

2.2.2. Projection of bed concrete beyond the masonry wall shall be 15 cms.

2.3. Walls : 2.3.1. The walls or manhole shall be carried out with burnt bricks using bricks, having crushing strength not less than 35 Kg./Cm 2 in C.M. 1: 5 (1 cement: 5 coarse sand. The thickness of brick masonry wall shall be 230 mm. The jointing face of such brick shall be well buttered with cement mortar before laying so as to ensure full joints.

2.4 Plaster: 2.4.1. The inside of walls shall be plastered 15 mm. thick with C:M. 1:5 (1 cement: 5 coarse sand) and finished with floating coat of neat cement. All angles shall be rounded to 7.50 cms. radius and all rendered internal surfaces shall hard impervious finish obtained by using a steel trowel. The external joints of masonry shall be finished smooth.

2.4 Channels & Benching:

2.5.1. Channels shall be semicircular in the bottom half and of diameter equal to the sewer. Above the horizontal diameter, the sides shall be extended vertically to the same level as the crown of the outgoing pipe and the top edge shall be suitably bonded off. The branch channels shall also be similarly constructed with respect to the benching but at their junction with the main channel and appropriate fall suitably rounded off in the direction of flow in the main channel shall be given.

2.5.2. The channel and benching shall bee done C.C. 1 : 2 :4 (1 cement: 2 coarse sand: 4 graded stone aggregate 20 mm. nominal size) rising at a slop in line from edges of channel. The channels of the bottom of the chamber shall be plastered with C.M. 1:2 (1 cement: 2 coarse sand) and steel trowelled smooth.

2.6. Cover slab: 2.6.1. The cover slab of R.C.C. 1:2:4 (1 cement: 2 coarse sand: 4 graded stone aggregate 20 mm. nominal size) 15 cms. thick reinforced with 10 mm. brass at 15 cms. C/C bothways, surface and edges finished fair. Full bearing equal to the width of wall shall be given to the slab on all sides. The frame of manhole cover shall be embedded firmly in R.C.C.
Slab so that the top of the frame remains flush with the top of R.C.C. slab.

2.7. Testing:

2.7.1. Manhole shall be tested by filling with water to a depth not exceeding 1.2. M. as directed.

2.7.2. After completion of work, manhole covers shall be sealed by. means of thick grease.

3.0. Mode of measurements & payment:

3.1. The depth of manhole shall be distance between the top of the manhole cover and the invert level of the main drain. The rate includes all labours, materials, tools and plant etc. required for satisfactory completion of this item as directed above.

3.2. The rate shall be for a unit of one number.

24.28.(I) Extra rte for costing B. B. masonry for every additional depth of 0.1 M. or part there of over item 24.27(I) for depth from 0.90 M to 1.5 M.

1.0 Materials & Workmanship : The relevant specifications of item No. 24.27(I) shall be followed for excavation except that the depth of manhole shall be done OJ M. or part thereof more than 0.90 metre upto 1.5. M. the extra payment shall be made for additional depth of 0.1 M. or part thereof manhole done over and above the depth 0.90 metre.

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item 24.27 0) shall be followed except that the extra rate shall be paid for every addition depth of 0.1 M. and part thereof shall be paid over and above the rate of item No. 24.27(1).

2.2. The rate shall be for a unit of one number.

24.28.(II) Extra rate for constg. B. B. masonry for every additional depth of 0.1 M. and part thereof-over item 24.27(1) for depth from 1.5 M. to2.25 M.

1.0. Materials & Workmanship : 1.1. The relevant specifications of item 24.27(1) shall be followed except that the depth of manhole shall be done 0.1 M. or part thereof mote than 1.5 M. upto 2.25 M. The extra payment shall be made for additional depth of 0.1 M. or part thereof manhole done over and above the depth 1.50 M. upto 2.25 M.

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item 24.27(II) shall be followed except that the extra rate shall be paid for 0.1 M. or part there of additional depth of manhole provided over and abqye item 24.27(I).

2.2. The rate shall be for a unit of one number.

24.28.(III) Extra rate for constg. B. B. masonry for every additional depth of 0.1 M. or part thereof over item 24.27(I) for depth from 2.25 to 3.15 M.

1.0. Materials & Workmanship : 1.1. The relevant specifications of item 24.27(1) shall be followed except that the depth of manhole shall be done 0.1 M. or part thereof more than 2.25 M. upto 3.15 M. Extra payment shall be made for additional depth of 0.1 or part thereof manhole done over and above depth 2.25 M. upto 3.15 M.

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item 24.27(I) shall be followed except that the extra rate shall be paid for every addition 0.1 M. or part thereof depth provided over and above item 24.27(I).

2.2. The rate shall be for a unit of one number.

24.28(IV) Extra rate of constg. B. B. masonry for every additional depth of 0.1 M. or part thereof over item 24.27(I) for depth above 3.15 M.

1.0. Materials & Workmanship:

1.1. The relevant specifications of item 24.27(I) shall be followed except that the depth of manhole shall be done 0.1 M. or part thereof more than 3.15 M. above.

1.2. Extra payment shall be made for additional depth of manhole 0.1 M. or part thereof done above 3.15 M. and above depth.

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item 24.27(I) shall be followed except that extra rate shall be paid for every additional 0.1 M. or part thereof depth provided for above item 24.27(I).

2.2. The rate shall be for a unit of one number.

24.13. Providing and fixing C. I. steps of size 500 x 150 mm. x 22.5 m. and painting with two coats of anti-corrosive paint etc. complete.

1.0 Materials: 1.1. The C. I. steps of size 500 x 150 x 22.5 mm. size shall conform I.S. 5455-1969. Paint shall conform to M-44.

2.0. Workmanship : The C. I. steps of size 500 x 150 x 22.5 ;nm. size shall be fixed in manhole as and where directed. The steps shall be staggered in vertical runs 380 mm. apart horizontally. The top step shall be 450 mm. below the manhole cover and lowest not more than 300 mm. above the benching. The steps shall be embedded in well of manhole with C.C. 1: 3: upto 200 m. depth and the surface finished with cement plaster 15 mm. thick in C.M. 1:5. The steps shall be painted with two coats of anti-corrosive paint.

3.0. Mode of measurements & payment:

3.1. The rate includes all labours, materials, tools and plants etc. required for satisfactory completion of this item.

3.2. The rate shall be for a unit of one number.

24.30. Providing and erecting at the site of work steel ventilating column of 150 mm. internal dia. and 12.20 M. high from G. L. to bottom of top grill incl. C.I. grill and base plate, bolts and nuts etc. and excavation in foundation of size 120 x 120 x

165 cms. and filling the pit with 1st layer of cement concrete 1 : 3 :6 mix(1 cement: 3 coarse sand : 6 graded stone aggregate 20 mm, nominal size) of size 120 x 120 x 90 cm. and remaining pit with B.B.C.C. 1:3:6 mix (1 cement: 3 coarse sand 6 brick bats, 40 to 50 mm. size) and providing Filled in cement concrete 1:2:4 mix (1 cement: 2 coarse sand: 4 graded stone aggregate 20 mm. nominal size) at G.L. and 3 coats of silver paint etc. Complete.

1.0 Materials:

1.1. The steel ventilating column internal dia. 150mm. 12.20m, high shall be of standarp make and best quality as approved. Stone aggregate of 20 mm. nominal size shall conform to M-12. Brick-bats 40 to 50 mm. nominal size-shall conform to M-14. Cement shall conform to M-3. Water shall conform to M-l. Silver (Aluminium) paint shall conform to I.S. 2339-1963.

2.0. Workmanship:

2.1. The vent shaft shall be provided at the strung point of main sewer arid at such points where the flow of sewerage is disturbed i.e. at falls, syphons etc. As far as possible, the location shall be t such a place where it receive sun rays for the maximum period of the day.

2.2. A pit of 120 x 120 x 165 cms. size shall be dug. The cement concrete of 1 : 3 : 6 (1 cement: 3 coarse sand : 6 graded stone aggregate 20 mm. nominal size) shall be first laid in the pit to form 90 cms. thick concrete foundation which shall be allowed to set for 24 hours. The vent shaft shall then be erected at the centre of the pit truly in plumb by means of such as shear legs, pullies, tackles and rope etc.

2.3. The connection with sewer manhole shall be made using 150 mm. diameter cement concrete pipe. After the connection is completed the pit shall be filled with cement concrete 1:3 :6 (1 cement: 3 coarse sand: 6 brick bats 40 to 50 mm. nominal size) round the vent shaft upto ground level except top 150mm. which shall be filled with C.C.I : 2:4(1 cement: 2 coarse sand: 4 graded stone aggregate 20 mm. nominal size) and rendered smooth. The junction of vent shaft with cement concrete shall be grouted with cement mortar l : 1 (1 cement: 1 sand). The concrete work shall be cured for 7 days.

2.4. The steel shaft shall be painted with silver paint (aluminium paint) 3 coarse. The relevant specifications of item of painting shall be followed for painting.

3.0 Mode of measurements & payment:

3.1. The rate shall include the cost of all labours and materials tools and plant etc. required for satisfactory completion of this item as directed above.

3.2. The rate shall be for a unit of one number.

24..00.1.(A) Providing and laying lime concrete 1:2: 4(1 :o,e {iltu : 2 fine sand : 4 graded brick aggregates 40 mm. nominal size) bedding for stoneware pipes of following internal diametres with necessary form work and curing complete 100 mm. dia. (112 mm. average bed thickness)

1.0. Materials: Water shall conform to M-l. Lime mortar shall conform to M-10.Brick aggregate40 mm. nominal size shall conform to M-14.

3.0. Workmanship : The relevant specifications of item No. 5.1. 8. shall be followed except that the proportion of mix shall be 1 : 2 : 4 (1 Lime putty : 2 fine sand : 4 graded brick bats aggregate 40 mm. nominal size) and the concrete work shall be done in trenches for beddings of stoneware pipes of 100 mm. dia. The width of concrete shall be 300 mm. and the thickness of bedding shall be 112 mm. average.

3.0. Mode of measurements & payment:

Mode of measurements & payment:

3.1. The relevant specifications of item 24.2.(A) shall be followed.

3.2. The rate shall be for .a unit of one running metre.

24.00.1.(B) Providing and laying lime concrete 1:2:4 (1 Lime putty: 2 fine sand: 4 graded brick aggregates 40 mm. nominal size) bedding for stoneware pipes of fallowings internal diameter with necessary form work and curing complete 150 mm. dia. (166mm. average bed thickness).

10. Materials & Workmanship: The relevant specifications of item No.24.00.1 (A) shall be followed except that the concrete bedding shall be carried out for 150 mm. dia. stoneware pipe. The width of concrete bedding shall be 450 mm. and the average thickness shall be 166 mm.

2.0. Mode of measurements & payment:

2.1. The relevant specifications of itemTMo. 24.2.(A) shall be followed.

2.2. The rate shall be for a unit of one running metre.

24.17.(I) Extra over item 24.1. for providing salt glazed stoneware fittings : Bends of required degree (Any Radious) of following internal diametres: A-100 mm. dia.B-150mm.dia..

1.0. Materials & Workmanship : The relevant specifications of item No. 24.1.(A) shall be followed except that the salt glazed stoneware bends of any degree of specified diameter shall be provided.

2.0. Mode ef measurements & payment:

2.1. The relevant specifications of item No.24.1 .(A)shall be followed except that the extra payment shall be made for providing salt glazed stoneware bend of specified diameter of required degree of any radious over and above the rate of item No. 24.1.

2.2. The rate shall be for a unit of one number.

24.17.(II) Extra over item 24.1. for providing salt glazed stoneware fittings : Taper bend of required degree of following internal diameters : 100 mm. x 150 mm.

1.0. Materials & Workmanship : The relevant specifications of item No. 24.1.(A) shall be followed except that the salt glazed stoneware taper bend of required degree of 100 mm. x 150 mm. shall be fixed.

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item No. 24.1.(A) shall be followed except that the extra payment shall be made for providing salt glazed stoneware taper bend of required degree of 100 mm. x 150 mm. size over and above the rate of item No. 24.1.

2.2. The rate shall be for a unit of one number.

24.17.(III) Extra over item 24.1 for providing salt glazed stoneware fittings : Single junction of required angle of following internal diameter (A) 100 mm. dia. (B) 150 mm. dia.

1.0. Materials & Workmanship : The relevant specifications of item No.24.1.(A) shall be followed except that the salt glazed stoneware single junction of required angle of specified diameter shall be fixed.

2.0. Mode of measurements & payment: .

2.1. The relevant specifications of item 24.1 .(A) shall be followed except that the extra shall be paid for providing salt glazed stoneware single junction of required angle for specified diameters over and above the rate of item 24.1.

2.2. The rate shall be for a unit of one number.

24.18. Providing and laying jointing and pointing with stiff mixture of C.M. 1: 1 (1 cement: 1 fine sand) 150mm. internal diameter salt glazed stoneware half round channels.

1.0. Materials & Workmanship :

1.1. The relevant specifications of item 24.1. shall be followed except that the half round channel of 150 mm. internal diameters shall be fixed in cement mortar 1:1.

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item 24.1 .(A) shall be followed.

2.2. The rate shall be for a unit of one running metre.

24.35. Supplying and fixing C.I. cover 300 x 300 mm. without frame for gully trap (Standard pattern). The weight of cover not less than 4.53 kg.

1.0. Materials : The G.I. cover of 300 x 300 mm. size shall be standard pattern and approved make the weight of C.I. cover shall not be less than 4.53 Kg. without frame.

2.0. Workmanship: The C.I. cover 300 x 300 mm. size without frame shall be fixed on top of the brick masonry with cement concrete 1 : 2:4 (1 cement: 2 sand : 4 graded stone aggregate 20 mm. nominal size) 40 mm. thick and rendered smooth. The finished top of the cover shall be left about 40 mm. above the adjoining ground level so as to exclude the surface water from ring the gully trap.

3.0. Mode of measurements & payment:

3.1. The relevant specifications of item 24.19 shall be followed.

3.2. The rate shall be for a unit of one number.

24.410. Consig. brick masonry road gully chamber 500 mm. x 450 mm. 600 mm. incl. 500 mm. x 450 mm. G.I. horizontal gratings with frame complete.

1.0 Materials : Water shall conform to M-1. Cement shall conform to M-3. Sand shall conform to M-6. Brick shall conform M-15. C.I. Grating of 509 x 450 mm. size of standard make shall be approved quality. Stone aggregate 40 mm. nominal size shall conform to M-12. Coal tar shall conform to relevant M-5.

2.0. Workmanship:

2.1. The chamber shall be of size 500 mm. x 450 mm. internal clear dimensions between the masonry wall faces. The height of 500 mm. shall be measured from the top of the bed concrete to the top of the C. I. frame. The size of the grating indicates the clear internal dimensions of the C.I. frame of the gratings.

2.2. The excavation shall be done to true dimensions and levels.

2.3. The foundation concrete shall consist of 150 Cms. x 130 Cms. 15 Cms. thick C.C. 1: 5:10(1 cement: 5 sand: 10 graded stone aggregate 40 mm. nominal size).

2.4. The wall of the chamber shall be constructed in brick work with C.M. 1 5 and 23 Cms. thick as per relevant specifications of item 6.12(B).

2.5. The walls and the bed concrete of chamber shall be plastered inside with 12 mm. thick cement plaster 1: 3 (1 cement: 3 coarse sand) finished smooth.

2.6. The gully grating cover shall be hinged to frame to facilitate its opening for leaning and repairs. The frame of the gully gratings shall be fixed on the lop of masonry walls of the chamber in 15 cms. thick C.C. 1: 2: 4 (1 cement: 2 coarse sand : 4 graded stone aggregate 20 mm. nominal si/e) laid over the full thickness of walls.

2.7. The chamber shall have connection pipe, the length of which in metre between the road gully chamber and the manhole of the drin shall not be less than 1/40 times the nominal diameter of the pipe in MM i.e. for 150 mm. connection pipe, the length shall not be less than 3.75 metre. The invert of the pipe at the junction with the wall shall be flush with the top of the cement plaster on the bed concrete.

2.8. Painting: After the completion of the work the exposed surface of the grating and the frame shall be painted with a thick coat of coal tar.

3.0. Mode of measurements & payment:

3.1. The cost of connection pipes is not included in the item and shall be paid separately. However fixing connection pipes in the walls of gully chambers is included in the rate for gully chambers and nothing extra shall be paid for-this separately.

3.2. The rate includes all labours, and materials required for satisfactory completion of this item as described above.

3.3. The rate shall be for a unit of one sq. metre.

24.41. Constg. brick masonry road gully chamber 450 mm. x 450 mm. x 775 mm. with vertical grating complete.

1.0. Materials & Workmanship : The relevant specifications of item 24.40 shall be followed except the size of road gully chamber is 450 mm. x 450 mm. x 775 mm. with vertical grating complete.

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item 24.40 shall be followed.

2.2. The rate shall be for a unit of one number.

24.42. Constg. brick masonry road gully chamber 1100 mm. x 500 aim. x 775 mm. incl. 500 mm. x 450 mm. C. I. horizontal grating with frame and vertical grating complete.

1.0. Materials & Workmanship : The relevant specifications of item 24.40 shall be followed except that the size of road gully chamber shall be 1100 mm. x 500 mm. x 775 mm. incl. .500 mm. x 450 mm. C. I. horizontal grating with frame and vertical grating complete.

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item 24.40 shall be followed.

2.2. The rate shall be for a unit of one sq. metre.

24.44.(I) Constg. brick masonry hamber for underground C.I. inspection chamber and bends with brick having crushing strength not less than 35 Kg./CM2 in C.I. 1 : 5 C.M. cover with frame (light duly) 455 x 610 mm. internal dimensions, total weight of cover with frame to jc not less than 38 Kg. (Wt. of cover 23 Kg. and Wt. of frame 15 Kg.) R.C.C. top slab with C.C. 1:2:4 mix (1 cement :2coarsc sand: 4 graded aggregate 20mm. size) foundation concrete 1 :5:10 inside plaster 15 mm. thick with C.M. 1 : 3 finished smooth with a finishing coat of neat cement on walls and bed concrete etc. complete.
Inside dimensions 450 mm. x 610 mm. and 450 mm. deep for single pipe line.

1.0 Materials: Water shall conform to M-l. Cement shall conform to M-3. Coarse sand shall conform to M-5. Brick shall conform to M-15. stone aggregate shall conform to M-12. Brick bat shaft shall conform to M-14. M.S. bar shall conform to M-18.

2.0. Workmanship:

2.I.C.I. inspection chamber with provision of C.I. bends of specified size with bolts, nuts and left washers for underground drain shall be enclosed in masonry chamber which shall be constructed as under:

2.2. The excavation shall be done true to diamensions and levels shown on the plans or as directed.

2.3. Bed concrete shall be of 15 cms. thick C.C. 1:5: 10 (1 cement: 5 coarse sand : 10 graded brick bat aggregates). The projection c: bed concrete beyond the masonry walls shall be 7.5 cms.

2.4. Masonary walls and plaster work shall be carried out as per relevant specifications of item 24-40.

2.5. The cover slab shall be constructed as per relevant specifications of 24.27(1).

3.0. Mode of measurements & payment:

3.1. The earth work in excavation providing and laying C.I. inspection chamber and bends shall be measured and paid for separately.

3.2. The rate shall be for a unit of one number.

24.44.(II) Constg. brick masonry chamber for underground C.I. inspection chamber and bends with brick having crushing strength not less than 35 Kg./CM in C.M. 1.1:5 C.I. cover with frame (light duty) 455 x 610 mm. internal dimensions, total weight of cover with frame to be not less than 38 Kg. (Wt. of cover 23 Kg. and Wt. of frame 15 Kg.) R.C.C. top slab with C.C-1 : 2 : 4 mix (1 cement: 2 coarse sand : 4 graded stone aggregate 20 mm. size) foundation concrete 1 : 5 : 10 inside plaster 15 mm. thick with C.M. 1 : 3 finished smooth with a floating coat of neat cement on walls and bed concrete etc. complete. Inside dimensions 500 mm. 700 mm. and 450 mm. deep for pipe line with one or two inlets.

1.0. Materials & Workmanship : The relevant specifications of item 24.44.(I) shall be followed except that the inside dimension of brick masonry chamber shall be 500 mm. x 700 mm. and 450 mm. deep for pipe line with one or two inlets.

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item 24.44(I) shall be followed.

2.2. The rate shall be for a unit of one number.

24.44.(III) Constg. brick masonry chamber for underground C.I. inspection chamber and bends with brick having crushing strength not less than 35 Kg./CM^2 in C.I. 1 : *5* C.M. cover with frame (light duty) 455 x 610 mm. internal dimensions, total weight of cover with frame to be not less than 38 Kg. (Wt. of cover 23 Kg. and Wt. of frame 15 Kg.) R.C.C, top slab with 1 : 2:4 mix (1 cement: 2 Coarse sand : 4 graded stone aggregate 20 mm. size) foundation concrete 1 : 5 : 10 inside plaster 15 mm. thick with C.M. 1 : 3 finished smooth with a finishing coat of neat cement on walls and bed concrete etc. complete. Inside dimensions 600 mm. 850 mm. and 450 mm. deep for pipe line with three or rnoronlets.

1.0. Materials & Workmanship : The relevant specifications of item 24.44 (I) shall be folowed except that the inside dimension of brick masonry chamber shall be 600 mm. x 850 mms and 450 mm. deep for pipe lines with three or more inlets.

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item 24.44 (I) shall be followed.

2.2. The rate shall be for a unit of one number.

24.46. Extra over item 24.44 for every additional depth 0.1 M or part thereof beyond 450 mm. depth for brick masonry chamber, (i) For 455 mm. x 610 mm. size (ii) For 500 mm. x 700 mm. size. (iii) For 600 mm. x 850 mm. size.

1.0. Materials & Workmanship : The relevant specifications of item 24.44 (I),(ii),(III) shall be followed except that extra depth of 0.1 M. or part thereof shall be constructed over and above the depth of chambers of respective kerns.

2.1. The relevant specifications of item 24.4(1) shall be followed except that extra shall be paid for providing additional depth of 0.1 M. or part thereof over and above the item No. 24.44(I), 24.44(II), 24.44(III) as the case may be.

2.3. The rate shall be for a unit of one number.

2.0. Mode of measurements & payment:

24.00.2.(A) Providing soak pit of 2 cum. volume incl. excavating and filling brick bats with dry masonry work at top for 45 cms. height incl. covering the top with stone incl. providing Vatas in C.M. 1: 3 with finishing, curing etc. complete as directed.

1.0 Materials : Water conform to M-l. Cement mortar shall conform to M-l 1. Burnt Bricks shall conform to M-15. Rough stone slab 40 x 50 mm. thick shall conform to M-48. Brick bat shall conform to M-l4.

2.0. Workmanship:

2.1. The excavation for soak pit shall be carried out as per relevant specifications of item 4.00.1.(A) except that the size of soak pit shall be such that the clear volume shall remain 2 cum. The diameter and depth shall be as directed.

2.2. The perifary of the soak pit shall be provided with dry masonry with burnat bricks in 23 cm. thick. The masonry wall be done with best workman like manner in true line and plumb.

2.3. The soak pit shall be filled in with brick bats of burnt brick, 40 mm. nominal size in 45 cms. height. The work of filling brick-bats shall be done in such a way tht no dry masonry shall be damaged during filling of brick bats.

2.4. The top of the s6ak pit shall be covered with rough kotah stone slab 4p to 50 mm. thickness The length of the stone shall be in single piece in length.

2.5. The cement mortar 1: 3 shall be used to fill up the joints and preparing vata as directed.

2.6. The cement work shall be .cured for 4 days.

3.0. Mode of measurements & payment:

3.1. The rate includes coat of all labour and materials required for satisfactory completion of this item as described above.

3.2. The rate shall be for a unit of one number.

24.00.2.(B) Providing soak-pit of 5 cum. volume incl. excavating and filling brick-bats with dry masonry work at top for 45 cms. height incl. covering the top with stone incl. Providing Vatas in CM. 1 : 3 with finishing curring etc. complete as directed.

1.0. Materials & Workmanship : The relevant specifications of item 24.00.2(A) shall be followed except that the volume of soak pit shall fee 5 cum. clear.

2.0. Mode of measurements & payment:

2.1. The relevant specifications of item 24.00.2(A) shall be followed.

2.2. The fate shall be for a unit of one number.

EQUIVALENT PLAIN AREAS OF UNEVEN SURFACES

(Vide specifications for items relating to : Painting & Polishing)

Sr. No.	Description of work	How measured	Multyplying Factor
1.	Panelled or framed and braced or ledged and battened or ledged and braced joinery.	Measured flat (not girthed) including chowkat or frame, Edges, chocks, cleats, etc. shall be deemed to be included in the item.	1 .30 (For each side)
2.	Flush joinery.	Measured flat (not girthed) including chowkat or frame. Edges, chocks, cleats, etc. shall be deemed to be included in the item.	1.20 (For each side)

1	2	3	4
3.	Fully glared of gauzed joinery.	Measured flat (not girthed) including chowkat or frame. Edges, chocks, cleats, etc. shall be deemed to be included in the item.	0.80 (For cach side)
4.	Partly panelled and partly glazed or gauzed joinery.	Measured flat (not girthed) including chowkat or frame. Edges, chocks, cleats, etc. shall be deemed to be included in the item.	1. 00 (For each side)
5.	Fully venetioned or louvered joinery.	Measured flat (not girthed) including chowkat or frame. Edges; chocks, cleats, etc. shall be deemed to be included in the item.	1.80 (For each side)
6.	Weather boarding.	Measured flat (not girthed) supporting frame work shall not be measured separately.	1.20 (For each side)
7.	Wood single roofing.	Measured flat (not girthed).	1.10 (For each side)
8.	Boarding with cover fillets and match boarding.	Measured flat, (not girthed)	1.05 (For each side)
9.	Tile and State battening.	Measured flat, over all : No deduction shall be made for open space.	0.80 (For painting all over)
10.	Trellies (or Jafri) work one way or two way.	Measured flat, over all : No deduction shall be made for open spaces, supporting members shall not be measured separately.	1.00 (For painting all over)
11.	Guard bars, balustrades gates, gratings, grills, expanded metal and railings.	Measured flat, over all : No deduction shall be made for open spaces, supporting members shall not be measured separately.	1.00 (For painting all over)
12.	Gates and open palisade fencing including stand-ards.	Measured flat, over all : No deduction shall be made for open spaces, supporting members shall not be measured separately. (See Note).	1.00 (For painting all over)
13.	Curved or enriched work	Measured flat.	2.0 (For each side)
14.	Steel roller shutters.	Measured flat (size of opening) over all, jamb, guides bottom rails and locking' arrangement etc. shall be in-cluded in the item (top cover shall be measured separately)-.	1.10 (For each side)
15.	Plain sheet steel door and windows	Measured flat (not girthed) including frame.	1.10 (For each side)
16.	Measured flat (not gir-thed) including frame edges etc.		0.50 (For each side)
17.	Partly panneled and partly glazed or gauzed steel doors.	Measured flat (not girthed) including frame edges etc.	0.80 (For each side)
18.	Collapsible gate.	Measured flat (size of opening) : no separate measurement shall be taken for the top and bottom guide, rails, rollers, fittings etc.	1.50 (For painting all over)

Note: The height shall be taken from the bottom of the lowest rail if the palisades do not go below it (or from the lower end of palisades, if they protect below the lowest rail) upto the top of palisades, but not upto the top of standards if they are higher than the palisades.

CODE OF PRACTIC-13(B) SCHEDULE OF FIXTURES AND FASTENINGS FOR DOOR, WINDOWS, VELTILATORS, WARDROBES AND CUPBOARDS.

NOTATIONS

Da - Teak wood doors fully panelled or fully glazed or partly panelled and glazed.

Db - Bathroom and W.C. door with single shutter.

Dd -Doors battenned ledged and braced

De -Doors battenned framed and braced

Wa - Teak wood windows fully panelled or fully glazed or partly panelled and glazed.

Va:lud -Teak wood ventilators (independent)

S.W. -Steel windows

SV-Ind -Still ventilators (independent)

CB -Cupboard

S.1 -Single shutter

S.2 -Duble shutter

S.4 -Four shutter

B -Breadth of door Shutter

H -Height of window shutter

900 -900mm and below

900 -above 900mm

1200 -1200mm & below

1200 -above 1200mm

	Kitchen : CB:S.2	Kitchen : CB:S.4	Platform-CB:S.2	Countersunk Wood scres	Size of screws in mm.	and no of screws per unit of fixture of fastening		
				50	40	30	25	20
1.	-	-	-	-	-	2	-	-	-	-
2.	-	-	-	-	-	2	-	-	-	-
3.	8	8	6	8	4		-	-	-	-
4.	-	-	-	-	-	8	-	-	-	-
5.	-	-	-	-	-	-	8		-	-
6.	-	-	-	-	-	-	6		-	-
7.	-	4	4	8	-	-	-	6	-	-
8.	-	-	-	-	-		-	4	-	-
9.	-	-	-	-	-		-	-	-	-
10.	-	-	-	-	-	8	-	-	-	-
11.	-	-	-	-	-	7	-	-	-	-
12.	-	-	-	-	-	2	-	16	-	-
13.	-	-	-	-	-		-	8	-	-
14.	-	-	-	-	-		-	6	-	-
15.	-	-	-	-	-		-	6	-	-
16.	-	-	-	-	-		-	6	-	-
17.	2	2	2	4			-	-		6
18.	-	-	-	-	-	-	-	-	2/18	-
18A	-	-	-	-	-	-	-	-		-
19.	-	-	-	-	-	-	-	-	6/4	-
20.	-	-	-	-	-	-	-	-		-
21.	-	-	-	-	-	-	-	-		-
22.	-	-	-	-	-	-	-	-		-
23.	-	2					-	-	4	-
24.	-		2	2	4	2	-	-	4	-
25.	-	-	-	-	-	-	-	-	8	-
26.		-	-	-	-	-	-	-	6	2
27.	2	-	-	-	-	-	-	-	-	-
							Per 75 mm Length			
28.	-	1	1	2	-	-	-	-	-	-
29.	1	-	-	-	-	-	-	-	-	-
30.	-	-	-	-	-	-	-	-	-	-
31.	2	-	-	-	-	-	-	-	-	-

Sr. No	Particulars of fixtures & Fastenings	Size in mm								
1.	Hold Fast	300x40x3	6	6	6	6	6	6	6	6
2.	Hold Fasts	200x40x3	-	-	-	-	-	-	-	-
3.	Coach Screws (Hexagonal Head)	-	-	-	-	-	-	-	-	-
4.	Butt Hinges	125	-	-	-	3	-	-	-	6
5.	Butt Hinges	100	3	3	3	-	6	6	6	-
6.	Butt Hinges	75	-	-	-	-	-	-	-	-
7.	Butt Hinges	75-A	-	-	-	-	-	-	-	-
8.	Butt Hinges	50	-	-	-	-	-	-	-	-
9.	Non projecting type-Hinget (Box type)	22	-	-	-	-	-	-	-	-
10.	Tee & Strap Hinges	300	-	-	-	-	-	-	-	-
11.	Tee & Strap Hinges	200	-	-	-	-	-	-	-	-
12.	Sliding Door Bolts	250x16	1	1	1	1	1	1	1	1
13.	Tower Bolts (Barrel Type)	200x10	1	1	1	1	1	1	1	1
14.	Tower Bolts (Barrel Type)	150x10	-	-	-	-	-	-	-	-
15.	Tower Bolts (Barrel Type)	100x10	-	-	-	-	-	-	-	-
17.	Tower Bolts (Barrel Type)	50x6	-	-	-	-	-	-	-	-
18.	Door Latch	200x16x5	1	1	1	1	1	1	1	1
18A.	Hooks and Eye	20mm.	-	-	-	-	-	-	-	-
19.	Bathroom Latches	60x12	-	-	-	-	-	-	-	-
20.	Casement window fastner		-	-	-	-	-	-	-	-
21.	Casement Stays (Straight Peg Stay)		-	-	-	-	-	-	-	-
22.	Ventilator Catch/Lug.		-	-	-	-	-	-	-	-
23.	Handles	100	2	2	2	2	2	2	2	2
24.	Handles	75	-		-	-	-	-	-	-
25.	Door Stoppers	75	1	1	1	\	1	1	1	1
26.	Wooden Door Stop with Hinges		-	-	-	-	-	-	-	-
27.	Continuous Piano Hinges	30 width	-	-	-	-	-	-	-	-
28.	Hasps and Staples (Safety types)	115x40	-	-	-	-	-	-	-	-
29.	Hasps and Staples (Safety type)	90x40	-	-	-	-	-	-	-	-
30.	Cupboard Lock (6 Levers)	-	-	-	-	-	-	-	-	-
31.	Cupboard knob	--	-	-	-	-	-	-	-	-

Sr. No.	Db : S.1	Dc-S.1 : B 900	Dc-S.1 : B 900	Dd-S.1 : B 900	Dd-S.1 : B 900	De-S.1 : B 900	De-S.1 : B 900	Wa-S.1 : H 1200	Wa-B.1 : B 1200	Wa-S.2 : H 1200	Wa-S.2 : H 1200	Va:Ind.	S.W.	Sv-Ind	Wardrone : S.2
1.	6	6	6		6	6	6	4	6	4	6	-	-	-	-
2.	-	-	-	-	-	-	-	4	-	-	-	4	4	4	-
3.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8
4.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5.	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6.	-	-	-	-	-	-	-	2	3	4	6	2	-	-	-
7.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10.	-	-	3	-	3	-	3	-	-	-	-	-	-	-	-
11.	-	3		3				-	-	-	-	-	-	-	-
12.	-	1	1	1	1	1	1	-	-	-	-	-	-	-	-
13.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14.	-	1	1	1	1	1	1	-	-	-	-	-	-	-	-
15.	-	-	-	-	-	-	-	2	2	3	3	-	-	-	-
16.	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-
17.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
18.	-		1	1	1	1	1	1				1	1	1	
18A	-	-	-	-	-	-	-	1	1	2	2	1	1	2	1
19.	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21.	-	-	-	-	-	-	-	-	-	-	-	-	1	1	
22.	-	-	-	-	-	-	-	-	-	-	-	-		1	
23.	2	2	2	2	2	2	2	-	-	-	-	-	-	-	2
24.	-	-	-	-	-	-	-	-	1	1	2	2	1	-	-
25.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26.		1	1	1	1	1	1	-	-	-	-	-	-	-	-
27.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
28.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
29.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
30.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
31.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

NOTE: PLEASE READ CAREFULLY

(1) Where detailed specification of an item provides for specific size of any fixture fastening that's shall prevail over the provisions in this schedule.

(2) Fixtures and fastenings (except hold fasts which shall be of M.S. Plate only) shall be of brass, copper oxidised brass, chromium plated brass, Iron, copper oxidised iron, or chromium plated iron as specified in the item of work of detailed specifications.

(3) External door and door falling in staircase excepting the door in balcony shall have sliding door bolt of size 360 mm. x 18 mm. in place of 250mm. x 16 mm. as shown in this schedule.

(4) The length of tower bolt shown is for a door having shutter height upto 2100 mm. only. For door having shutter height more than 2100 rnm., the length of tower bolt is to be increased to the extent of increase door shutter height beyond 2100mm.

(5) 150 mm. x 150 mm. size glass vision panel shall be provided in the doors of Officer's chamber in addition to the scheduled provisions if so directed by the Engineer-in-charge.

(6) Diamond shape chromium plated brass peeping plate of approved quality shall be provied in one entrance door in residential building in addition to the scheduled provisions.

(7) Drawer in a wardrobe shall be provided with one furniture handle and 4ne drawer lock (4 levers) in addition to its scheduled provision.

(8) For door and window with steel frame, 75 mm. size screws, shaft be provided both in top and bottom frame for fixity as shown below:

(a) For width upto 1200mm..... ..... 2 Nos.

(b) For width above 1200 mm. and upto 1800 mm..... ..... 3 Nos.

(c) For every additional width of 500 mm. over and above 1800mm..... ..... 1Nos.

(9) When the mortice local (6 levers) and latch is specified to be provided to a door enter in the item of work itself or by a separate item, the requirement of providing sliding door bolt door latch and handles as per this schedule shall be dispensed with.

(10) For door/window with ventilator at top, fixtures and fastenings of door/window plus those of ventilator (excluding hold fasts) shall be used.

(11) Where the item of work or its specification provides for anodised aluminium fixtures, all the fixtures except hinges and screws will be of anodised aluminium and chromium plated iron hinges and screws will be of anodised aluminium and chromium plated iron hings and screws shall be used.

(12) For door, window, or cupboard frame abutting concrete section, instead of hold fasts as shown in the schedule, coach screws of size as mentioned below shall be used :

(a) Teak wood frame..... .... 00.125 mm

(b) Steel frame..... ..... 00.75 mm.

(13) The locking etc. in the door latch shall be so positioned that the door can be properly locked even if part of the latch, when fully, slided, remains in the frame or masonry.

(14) Showcase cupboards having single shutter shall be provided with ball catcher instead of tower bolt (barrel type) as per schedule.

(15) The size of the handle shown in the schedule indicates grip length.

(16) Door stopper shall be either floor door stopper or door catchas directed by the Engineer-in-charge.

(17) Piano hinges shall be for the fall height of the shutter.

(18) Shutters with piano arrangements shall be provided with two pivots 'of approved size instead of hinges as per the schedule.

(19) For butt hinges, only lengths are indicated in the schedule. The width of each flap being 5 mm. less than the thickness of the shutter to which they are to be fixed and the thickness of the flap shall be as specified inthe relevant I.S.S. for heavy medium or light as specified in the detailed specification of we item of work.

SCHEDULE FOR TESTING OF MATIRIALS (BUILDING)

For ensuring quality control and workmanship, various tests prescribed below corresponding to the material concerned shall be taken as periodic intervals as stipulated below.

The Material shall be got tested at GERI or Govt. recognised Laboratory or filed Laboratory of GERI for which 1% of the estimated amount to tender shaft be recovered from the contractor from the R. A. Bill and Final bill as the testing charges shall be paid by the Govt. to the Laboratory. However if the charges increase over 1% no excess recovery shall be made from the contractor as per resolution of B & C department dated 10th May 1985, vide TNC/1085(4) S.

Item No. as per Sch. "B"	Brief Description of material to be tested.	Prescription of test which shall be carried out	Frequency @ which test shall be carried .out (As per GERI Q.C. Vol. I, 2002)	Qnty. of materials	Total No. of test to be carried out
1	2	3	4	5	6
	Coarse Aggregate (Metal, gravel etc.)	Gradation test impact value, flakiness index, water absorption, stripping value.	1/150 M^3 for concrete or as per specification.		
	Fine aggregate (Sand)	Gradation fineness modulus, specific gravity, water absorption, silt content.	1/150 or concrete or as per requirement of relevant specification		
	Bricks	Dimension and tolerance, water absorption, compressive strength; efftorencence	1 test per 50,000 Brides 5 bricks from (Sample) 5 Woks from (Sample) *5* bricks from (Sample)		
	C.C. Tiles	Water absorption. Transverse strength abrasion size tolerances.	1/2000 tiles (18 tiles for Sample)		
	Cement concrete	Compressive strength (I.S. 516-1959).	**Qnty. Of C.C. M3** — **No. of Test** 1 – 5 — 1 test 6 – 15 — 2 test 16 – 30 — 3 test 31 – 51 — 4 test 51 & above — 4 + 1 For each Addnl. $50M^3$ or part thereof		
	Cement	Consistency, setting time, compressive strength, fineness, Chemical analysis Soundness	Upto 50 T — 1 test 50 – 100 T — 2 test 100 – 200 T — 3 test 200 – 300 T — 4 test 300 – 500 T — 5 test 500 – 800 T — 6 test 800 – 1300 T — 7 test and 8 test for larger consignment		
	Steel	Tensile strength, yield stress, Elongation	1/40 tonnes / per category		
	Teak Wood	Anatomy test, density tests moisture content test.	1 test		

SIGN OF CONTRACTOR **EXECUTIVE ENGINEER**

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

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

issued to M/s. _____

_____

Divisional Accountant / D.A.O.

Executive Engineer.

Instructions to Tenderers

1. Tenders, sealed and marked on the outside for

   win 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 General Conditions of Contract for Electrical Works. and the general specification for electrical works in Government building.

5. Plans may be seen, in the office of the 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 reckoned for the date of acceptance of tender, namely.

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

3. I/We further agree to make good at my/our own expense all defect in the installation which appear within twelve months from the date bringing the installation into beneficial use when such defects are due to defective workmanship 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 incumbent 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 Date 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 reckoned for the date of acceptance of tender, namely,

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

3, I/We further agree to make good at my/our own expense all defect in the installation which appear within twelve months from the date bringing the installation into beneficial use when such defects are due to defective workmanship 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 AtithiIVishram Gruha and in the Circle as Superintending Engineer in addition for Panchayat Works-no working nor having posting as Chairman of P. W. Committee or as incumbent 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 Date 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 grantee by the authorities in which case, the! application for the extension' in time limit have t6 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-f79).
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 initialed by the tenderer.
   (iv) Any eresure 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 occurring in one is as binding as though occurring in all, they are intended to be mutually explanatory and complementary and to describe and provide for a complete work.
11. In the event of any discrepancy the several documents forming contract or in anyone 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 fulfill 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 il H:3 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 for the work shall remain open for a period (90/1.20*) days from the stipulated date of receiving of the tenders for this work and that the tenderer shall not be allowed to withdraw or modify the offer on his own after handing over the tender to postal authorities for despatch. If any tenderer withdraws or makes any modifications or additions in the terms and conditions of his tender not acceptable to the Government (Public Works Department).then the Government shall without prejudice to any right remedy. be at liberty to forfeit in full the said earnest money absolutely.
15. The contractor shall employ only such labourers who shall produce a valid certificate of having been vaccinated against small pox within la 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 unto 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 receipts or deposit at call receipts 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 preferred 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 Engineer_____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 As.

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 guarantee for any charge in constitution of the tenderer or of the Bank.

Date **Signature & Seal of Guarantor**_____

Bank Address_____

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

* Strike out whichever is not applicable.

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 overwriting 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. Wherever secured advance has been granted the contractor should provide necessary sign board indicating the fact of hypothecation of the materials to the Govt. and exhibited the same publically prominently. (Govt. in P.W.D. Resol. No. PWD-2675-IB-905-66-C. dtd. 30-1 1-77).
24. The contractor should give a written undertaking while applying for the grant of secured advance in case of the agreement indenture bond already prescribed to the effect that he has not taken or caused to be taken nor shall be taken or caused to be taken any advance on the same materials on which secured advance is applied for from any other person/firm, corporation, limited company or any financing institution like Bank etc. by hypothecating or pledging the materials (Govt. in P.W.D. Resolution No. PWD-2675 B/905/66-C, dtd. 30-11-77).
25. Secured advance will be paid after producing equivalent amount of Bank Guarantee of Schedule Bank (R&BD G.R.No. P.W.M.-1 090/U-0-13(5)-C, dated 4-10-1997)
26. Any error in quantity or amount in Schedule 'B' showing items of works to be carried out shall be adjusted in accordance with the following rules :
    (a) In the event of a discrepancy between description in words and figures quoted by a tenderer in the rates column, the description in words shall prevail.
    (b) In the event of an error occurring in the amount column of the Schedule 'B' showing item of works, as a result of wrong multiplication of the unit rate and quantity the unit rate shall be regarded as firm and multiplication shall be amended on the basis of the rate.
    (c) All errors in totaling 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.
27. Battens shall be teakwood for acceptable quality and shall be varnished before fixing in position.
28. Wooden-cup board should be polished on both the sides.
29. Whenever Government materials are issued, the contractor shall be responsible for the safe custody and proper use of the materials.
30. Loose electric fitting connection should be done at the time of handing over possession of building to the concerned civil or administrative department and accordingly after taking over possession of these connection concerned Civil!
    Administrative department is responsible for fittings.
31. (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.
31. (ii) The tenders received (by registered post after the time of date specified in the tender notice) shall not be received by the concerned office from the postman, for which date and time may be recorded on the cover of the tender "5 to when tender was refused by the Divisional. Accountant or the Divisional Head or any other person in charge.

રુા.૧ કરોડથી વધુ રકમના વર્કસ કોન્ટ્રાકટ સંબંધે રકમની ચુકવણી વખતે ચુકવવાપાત્ર થતી રકમમાંથી નીચે મુજબ ૧ થી ૩ ની રકમ બાદ કર્યા પછી રહેતી સિલક ઉપર ૨ ટકાની રકમની કપાત કરવામાં આવશે. (૧) આંતર રાજય વાણિજય અને વેપાર દરમ્યાનના વેચાણ થયેલ માલની કિંમત (૨) વર્કસ કોન્ટ્રાકટ ની રકમમાં સંડોવાયેલ મજુરીની રકમ (૩) આંતર-રાજય વાણિજય અને વેપાર દરમ્યાનની ખરીદી અથવા રાજય બહારથી આયાત કરેલ માલની ખરીદીની કિંમત પરંતુ (૬) મુજબ રાજય સરકારે રાખેલ વર્કસ કોન્ટ્રેકટ પરત્વે રાજય સરકારે ચુકવવાની થતી રકમના પ્રસંગે તા.૧-૪-૨૦૦૨ પછી ચુકવણી કરવાની થતી રકમ પરત્વે કલમ ૫૭-ખ ની ટી.ડી.એસ. ની જોગવાઇ લાગુ પડશે નહી.

ઉપરોકત બાદ કરવાની રકમ નકકી કરવાના હેતુથી સેલ્સ ટેકસના નમુના ૫૭ક ના નિયત કરેલ ફોર્મમાં લેખિત નિવેદન કોન્ટ્રાકટરે રજુ કરવાનું રહેશે. (વેચાણવેરા કમિશનરશ્રી ગુજરાત રાજયની તારીખ ૨૨-૪-૦૨ તથા ૨૦-૮-૦૨ નો જાહેર પરિપત્ર ક્રમાંક ગુજકા/૧૦-ક/૫૪૯/ક-૫૭-ખ /વેલીડેશન એકટ/૨૦૦૨-૦૩ જા.૧૧૭૭/૦૨)

Signature of contractor/s

Executive Engineer

Division

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 Drawing tile 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 "York 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 "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:

The person/persons whose tender is accepted (hereinafter called the "Contractor" which expression shall, unless excluded by, or repugnant to the context include his Legal heirs, executors, administrators and assignees shall (a) Deposit with the Executive Engineer a sum sufficient to make up the full security deposit specified in the tender in cash or Government securities (as mentioned in para 208 of Gujarat Public Works Department Manual Vol. 1) duly transferred in the name of the Executive Engineer or fixed deposit receipts or Term Deposits of Narmada Project in the name of the Executive Engineer within a period of 10 days from the date of receipt of the Notification of acceptance of his tender. or (b) (i) deposit fifty percentage of the total security deposits as specified in the tender form with the Executive Engineer in form of small saving schemes or securities of Sardar Sarovar Narmada Nigam or F.D. Rs. of scheduled bank. However, the Contractor can deposit twenty five percentage of total security deposit in the form of Govt. security (as mentioned in para 208 of Gujarat Public Works Department Manual Vol. 1) or Term Deposit of Narmada Project duly transferred in the name of the Executive Engineer, or fixed deposit receipts in the name of the

Executive Engineer within a period of ten days from the date of receipt of notification of acceptance of his tender. If the security deposit is not paid within the above specified time, no work order will be issued, till the issue about delay is finally decided by the competent authority. (b) (ii) The Government shall be deemed to have been authorised to deduct the balance of fifty percentage of the security deposit as specified in the. tender form from the amounts that become payable to the contractor for the work done under the contract from time to time, such deduction shall pot exceed ten percentage of the amount so payable and the whole amount paid in cash or by way of deduction shall be held by Government by way of security deposit. For the works whose estimated amount is more than rupees fifteen lacs, the Contractor shall have to give the performance bond supported by F. D. R or Unconditional, So that same can be encashed without giving any reason by the Executive Engineer Non Transferable and Irrevocable Bank Guarantee of any schedule bank equivalent to five percentage of the estimated amount put to tender alongwith the initial security deposits. 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. The security deposit, when paid as above shall at the cost of the depositor, be converted into interest bearing Government securities in the name of Executive Engineer provided that the depositor has expressly desired this in writing. This is subject to the condition that twenty five percentage of the total security deposit must be held in the form of small saving Schemes or Term Deposits of Narmada Project. If the full amount of the security deposit to be paid as above within the period specified above, is not paid the tender/contract already accepted shall be considered as cancelled and legal steps shall be taken against the contractor for
recovery of the amounts.

Fifty 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; including the royalty charge if " No Due-Certificate" is not produced by the contractor 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 expiry of the Defect Liability period as per clause-33 after deducting therefrom the amount of expenses, if any. due to Government under this contract.

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

……...

NOW 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 01 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 ail 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 30% the contractor will be paid for the quantity in excess of 30% at the rate entered in the S.O.R. of the year during which the excess in quantity is first executed and for the materials consumed in excess quantity the rate for the materials to be charged would be the basic rate taken into. account for fixing the rate for the S. O. R. above instead of the rate stipulated in schedule-A.

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 5' 111 commence work or incur any expenditure in regard thereof before the rates shall have been determined as lastly herein before mentioned, then in such cases he shall only be entitled to be paid in respect of the work carried out or expenditure incurred by him prior to the date of the determination of the -rate as aforesaid according to such rate or rates as shall be fixed by the Engineer-in-charge, In the event of the dispute, the decision of the Superintending Engineer of the Circle shall be final.

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

The time limit for the completion of the work shall be extended in the proportion that the increase in the cost occasioned by alternations bears to the cost of the original contract work and the certificate of the Engineer-in-charge as to such proportion shall 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 arid conclusive. The contractor shall at his own expenses provide all material Iabour, 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, pr 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 occasioned but 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 al)d 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 6n 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 maybe 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 bi 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 ~aid 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 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. Maintenance:

The Contractor shall make good at his own' expense all defects due to faulty design material, or workmanship on the part of the contractor which may during a period of 6 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 further 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 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 representative, 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 12 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.

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 certificate 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 !he 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 {)'1 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-incharge, 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 its 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 & 8 D. G. R. No. TNC - 1096 – 1B - 143 - (16) 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 fulfillment 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 shat! 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 accordance with the condition.

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

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

If in any test under this clause the plant tested shall fail to satisfy the contract conditions the Governor of Gujarat shall as from the date stipulated by the contract for completion nevertheless have the right of using such plant until the same shall satisfy such conditions and such use shall be at the contractor's risk. In the event of the question whether the works have been completed in accordance with the 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 stipulated for completion the engineer may give notice in writing to the contractor setting for the particular of the defects of particulars in respect of which the works in his opinion fail to comply with the contract conditions and requiring the contractor to make good. after or replace the same within such time to be specified in the notice as the engineer may consider reasonable and the contractor shall make good, after or replace the same as required by such notice and so as to make itemploy 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 ,} 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) of 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 enforcement 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 preceding 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 conditions 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 compensation 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 contractor under sub section (2) of the said section such compensation shall be recovered in 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 knowledge 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 against 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 after making due inquiries and shall not be entitled to any payment or compensation on account of any loss that he (contractor) may have to incur of the 'action as aforesaid. Before the action as aforesaid is enforced notice in writing to the contractor shall be issued by the Executive Engineer or the officer of the equal rank to pay the wages as per minimum Wages Act in face 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.

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 description :

(i) The wiring shall be carried out as per Schedule "power" wiring must be in screwed conduit and shall be kept separate and distinct from lighting wiring. All wiring must be done on the distribution system with main and branch distribution boards at convenient centers and without isolated fuses. All conductors shall be run as far as possible along the walls and ceiling as to be easily accessible and capable of being thoroughly inspected. The balancing of circuits will be arranged 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, Elect. Dn. and these Wiring plans shall be "Drawings" within the meaning of the term as used in the General Conditions of contract.

5. Conductors:

All conductors unless otherwise specified shall not be less than 1.5 Sq. mm for point wiring and 2.5 Sq. mm for

mains Conductors for power and lighting circuits shall be of adequate size to carry the designed circuit load without exceeding the permissible thermal limits for the installation, and such sizes will be stipulated in specifications and or drawings.

6. Cables:

6.1 All cables shall conform to relevant Indian Standards.

6.2 Conductors of all cable except the flexible cable shall be of aluminium. The smallest aluminium conductors for 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 minimum cross 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 single phase Appliances for phase, neutral & earth connections.

7. Fall of Potential:

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

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

than that of the fuse which protects the circuit or sub circuit respectively for current higher than the full load current.

8. Ratings of lamps and fans socket 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 the 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 the three wire D.C. or a poly phase A.C. System, the neutral pole of which is connected to earth either direct or through added resistance, the working pressure shall be deemed to be that which is maintained between the 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 divided by the number if outlet or when PVC insulated cables are used for wiring 12.5 megohms divided by number 10f outlets

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

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

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

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

9.2.2 Polarity Test :

9.2.2.1 In a two wire installation a test shall be made to verify that all switches in every circuit have been fitted in the same conductor through' out & such conductor shall be labeled 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 labeled 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 of 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 if any point in the earth continuity conductor in the completed installation shall not exceed one ohm.

9.2.3.1 Earth Electrode Resistance Test :

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

9.3 On completion of an electric installation (addition and alteration) a certificate shall be furnished by the contractor countersigned by the certified Supervisor under whose direction supervision the installation was carried out. This certificate shall be in the prescribed form as given in Appendix-'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 Switch gears, 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 phospher bronze or if steel shall be copper or Nickel plated and that handle shall be so fastened that they do not tend to unscrew or become loose.

11.3 All main switches shall be either of metal clad enclosed pattern or of any insulated enclosed pattern which shall be fixed at close proximity to the point of entry of supply.

11.4 Switch boards shall not be erected above gas. stoves', or sinks or within 2.5 m of any washing unit in the washing rooms of laundries or in the bath rooms, lavatories. toilets or kitchens.

11.5 Switch boards, if unavoidably fixed in places likely to be exposed to weather. to drip or to abnormal moist temperature the outlet casing shall be weather proof and shall be provided with glands or bushing of adopted to receive screwed conduit according to the manner in which cables are run, PVC and double flanged bushes shall be fitted in the holes of the switches for entry and exit of wires.

11.6 A switch board not be installed so that its bottom is within 1.25 m above the floor unless the front of the switch board is completely enclosed by a door or the switch board is located in a position to which only authorised persons have access.

11.7 Switch boards shall be recessed in the wall if so specified in the schedule of work or in the special specification. The front shall be fitted with hinged 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 inadvertently personal contact with live parts is unlikely during the manipulation of switchgears, changing of fuses or like operations.

11.9 No holes other than the holes by means of-which the panel is fixed shall be drilled closer than 1.3 cms. from any edge of the panel.

11.10 The various live parts, unless they are effectively screened by substantial barriers of non-hydroscopic, no-inflammable insulating material, shall be so spaced that space shall not be maintained between such parts and earth.

11.11 The arrangement of gear shall be such that they shall be readily accessible and their connections to all instruments and apparatus shall also be traceable.

11.12 In every case in which switches and fuses are fitted on the same pole, these fuses shall be so arranged that the
fuses are not alive when their respective switches are in the off position.

11.13 No fuses other than fuses in instrument circuit shall be fixed on the back of or behind a switch board pannel or frame.

11.14 All the metal switchgears and switch boards ~hall 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 switchgear The neutral shall also be distinctly marked. In this connection Rule 32(2) of the Indian Electricity Rules, 1966 (See Appendix- 'A') shall also be referred.

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

12.3 On the main switchgear, where the conductor of a two wire system or an 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(1)of Indian Electricity Rules, 1956 (see appendix. 'N) 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:

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

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

13.2 Fixed type Metal Boards:

These shall consist of an angle or channel of iron frame fixed on the wall or on floor and supported on the wall at the top if necessary. There shall be a clear distance of one metre in front of the 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 is gall apply.

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

13.3 Teakwood Boards:

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

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

13.5 Recessing of Boards:

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

13.6 Arrangement of Apparatus:

a) Equipment which is on the front of a switch board shall be so arranged that inadvertently personal contact with live parts is unlikely during the manipulation of switches, changing of fuses or like operation.

b) No apparatus shall project beyond any edge of panel .No fuse body shall be mounted within 2.5 cm. of any edge of the panel and no hole other than holes by means of which the panel is fixed shall be drilled closer than 1.3 cms from any edge of the panel.

c) The various live parts, unless they are effectively screened by substantial barriers of non-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 snall also be easily traceable.

e) In every case in which switches and fuses are fitted on the same pole, these fuses shall be so arranged that the fuses are not alive when their respective switches are in the 'OFF' position.

f) No fuses other than fuses instrument circuit shall be fixed on the back of or behind a switchboard 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.

13.7.A 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 installations requiring the use of group control of switching operation, circuits, for socket outlets may be kept separate from fans and lights. Normally fans and lights may be wired on a common circuit, however, if need is felt separate circuits may be provided for the two. The 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 center 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 explodes 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 Triple 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 unnecessary crossing.

13.10.3 Cables shall be connected to a terminal only by soldered or welded or crimped lugs using suitable sleeve, lugs or ferrules unless the terminal is of such a form that it is possible t6 securely clamp them without the cutting away of cable strands.

13.10.4 All bare conductor shall be rigidly fixed in such a manner that a clearance of at least 2.5 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 switch board 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 socket 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 centers however one outlet per circuit may be preferred. The circuit shall be designed based on the loading of the circuit where not specified the load shall be taken as 1 KW per outlet, Where the load is more than 1 KW it should be controlled by a isolator switch or miniature circuit breaker.

15.0 Passing Through Walls and Floors:

15.1 Where conductors pass through walls one of the following methods shall be employed. Care shall be taken to see that wires pass very freely through protective pipe or box and that the wires pass through in a straight line without any twist or cross in wires, on other ends of such holes.

(a) 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 *18 : 2509 1963 specification for Rigid Non-Metallic 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 *18 1653-1964) to a height not less than t.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 approved hardwood- not less than 5 cm long 2.5 cm. square on the inner end and 2 cm. square on the outer end. They shall be cemented into walls to width 7.5 mm of the surface, the remaining being finished according to the nature of the surface with plaster or lime punning.

16.1 Where owing to irregular crossing or other reasons the plugging of the walls or ceiling with wood plugs 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 fiber 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) Caring not more than 15 amperes may be of tumbler type which shall be 'CN' 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. Fittings 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 lamp holders and all those for use flexible pendants shall be provided with cord grips. All lamp holders shall be provided with shade carriers. Where center contact edison screw lamp holders are used, the outer or screw contacts shall be connected to the middle wire, the natural, 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 lamp holders shall not be used where exposed to whether. In verandahs and similar exposed situations where pendants are used, they shall be of fixed rod type.

21.0 Lamps:

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

22.0 Fans, Regulators and Clamps:

22.1.0 Ceiling fans :

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

(a) All ceiling fans shall be wired to ceiling roses or to special connector boxes, to which fans rod wires shall be connected and suspended from hooks or shackles with insulators between hooks and suspension rods. There shall be no joint in the suspension rod, but if joints be avoidable then such joints shall be screwed to special couplers of 5 em minimum length and both ends of pipes shall touch together within couplers, and shall in addition be secured by means of split pins; alternatively, the two pipes may be welded.

(b) Fans clamps shall be of suitable design according to the nature of construction of ceiling on which these clamps are fitted. In all cases fan clamps shall be fabricated from tested new metal of suitable sizes and they shall be as close fitting as possible. Fan clamps for reinforced concrete roots shall be buried with the casting and due care shall be taken that they shall serve the purpose. Fan clamps for wood beams shall be of suitable flat iron fixed on two sides of the beam and according to the size and section of the beam one or two mild steel bolts passing through the beam shall. hold both flat irons together. Fan clamps for steel joint shall be fabricated from test~ 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 Interchangeability :

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

25.0 Conduit Wiring System:

25.1.1 **Type and size of conduit** - All conduit pipes shall b~ conforming to *IS : 1653-1964, furnished with galvanised or stove enameled 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 stance straight runs of conduit, inspection type couplers at reasonable intervals shall be provided or running threads with couplers and jam-puts (in the latter case the bare threaded portion shall be treated with anti- corrosive preservative) shall be provided. Thread on conduit pipes in all cases shall be between 11 mm to 27 mm long sufficient to accommodate pipes to full threaded portion of couplers or accessories. Cut ends of conduit pipes shall have no sharp edges nor any or buries left to avoid damage to the insulation of conductors while puling them through such pipes;

TABLE-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 I (311.06*) (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 AI. 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 meter but on either side of couplers or bends or similar fittings, saddles shall be fixed at a distance of 30 cm. from the center 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 inspection boxes whichever is more suitable. Conduit fitting shall be avoided as far as possible. On conduit system exposed to weather, where necessary, solid type fitting shall be used. Radius of such bends in conduit pipes shall be not less than 7.5 cm. No length of conduit shall have more than the equivalent of four quarter bends from outlet, the bends at the outlets not being counted.

25.1.8 **Outlets** - All outlets for fitting switches etc., shall be boxes, of suitable metal or any other approved outlet boxes for other surface mounting or flush mounting 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 continuity between each wire and conduit. Gas or water pipe~ shall not be used as earth medium. If conduit pipes are liable to mechanical damage, they shall be adequitably protected.

25.2 **Recessed Conduit wiring system with Rigid Steel conduits** - Recessed conduit wiring system shall comply with all the requirements for surface conduit wiring system specified in 6.5.1.1 to 6.5.1.1 0 and in addition, conform to the requirements specified in 6.5.2.1 to 6.5.2.4.

25.2.1 **Making of chase** - The chase in the wall snail 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 *6G* 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 outlets shall. be of cast iron mild steel boxes with a cover of approved insulating material or shall be a box made of a suitable insulating material. The switches and

other outlets shall be mounted on such boxes as would be approved. The metal box shall be efficiently earthed with conduit by an approved means of earth attachment.

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

25.25 When crossing through expansion joints in buildings, the conduit sections across the joint may be through flexible conduits of the same size as the rigid conduit.

25.3 Conduit Wiring System with Rigid Non-Metallic Conduits:

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

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

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

TABLE-III MAXIMUM PERMISSIBLE NUMBER OF 250 VOLTS GRADE SINGLE- CORE CABLE THAT MAY BE DRAWN INTO RIGID NON-METALLIC CONDUITS

Size of cable		Size of conduit (mm)					
Nominal Crossectional area mm^2	No. Diameter in mm of wires	16	20	25	32 (No. of cable Max)	40	50
1.0	1/1.12*	5	7	13	20	-	-
1.5	1/1.40	4	6	10	14	-	-
2.5	1/1.80 3/1.06*	3	5	10	14	-	-
4	1/1.24 7/0.85*	2	3	6	10	14	-
6	1/2..80 7/1.06*	-	2	5	8	11	-
10	1/3.55+ 7/1.40*-	-	-	4	7	9	-
16	7/1.70	-	-	2	4	5	15
25	7/2.24	-	-	-	2	2	6
35	7/2.50	-	-	-	-	2	5
50	7/3.00+ 19/1.80	-	-	-	-	2	3

* For Cu. Conductors only.

+For Al. Conductors only.

25.3.3 **Conduit joints** - shall be joined by means of screwed or plain couplers depending on wheather the conduits are screwed or plain. Where there are long runs of straight conduit. Inspection type couplers shall be provided at intervals. For conduit fittings and accessories reference may be made to IS : 3419-1965.

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

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

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

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

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

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

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

26.0 GENERAL :

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

26.1 Attachment to walls and ceiling :

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

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

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

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

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

26.4.0 Protection of wiring from Mechanical Damage:

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

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

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

26.6.0 Passing>through walls: When conductors pass through walls, anyone of the following methods shall be employed. Care should be taken to see that wires pass very freely through protective pipe or box and that wires pass

through in a straight line without any twist or cross in wires on either ends of such holes.

(a) A box of teak wood or approved hard wood extending through the hole thickness of the wall shall be buried in the wall and casings or conductors and casing or conductors shall be carried so as to allow 1 .3 cm air space on the three sides of the casing or conductor.

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

26.6.1 Where a wall tube passes outside a building so as to be exposed to weather, the outer end shall be mounted and turned downwards and properly bushed on the open en<!. The conduit shall be neatly arranged so that the cables enter them without bending.

26.7.0 **Buried cables**: The TRS or PVC sheathed cable shall not normally be buried directly in plaster. Where so specified in the special specification they may be taken in teak wood channeling of ample capacity or conduit pipe buried in the wall.

26.8.0 **Stripping of outer covering**. While cutting and stripping of the outer covering of the cable care shall be taken that the sharp edge of the cutting instrument does not touch the inner insulation of the conductors. The protective outer covering of the cables shall be stripped off near connecting terminal and this protective covering shall be maintained up to the close proximity of connecting terminals as far as practicable. Care shall be taken to avoid hammering on link clips with any metal instrument after the cables are laid. Where junction boxes are provided they shall be made moisture proof with a plastic compound.

27.0 PAINTING WORK IN GENERAL:

27.1 **Paints**: paints, oils varnishes, etc, of approved make in original to the satisfaction of the Engineer-in-charge shall only be used.

27.2 Preparation of surface: The surface shall be thoroughly cleaned and dusted before painting is started. The proposed surface shall be inspected by Engineer-in-charge or his authorised agent and shall have received the approval before painting is commenced.

27.3 Application : Paint shall be applied with brush. The paint shall be spread as smooth & even as possible. Particular care shall be paid to rewets, nuts, bolts and cover lapping. Before drawing cut, it shall be continuously stirred in the smaller containers with a smooth stick while it is being applied.

Each coat shall be allowed to dry out sufficiently before a subsequent coat is applied.

27.4 Scope: Painting on old surface in indoor situations will not include primer coat except where specially mentioned in the schedule of work or special specification. However, where rust has formed on iron and steel surfaces the spots will be painted with one anti-rust primer coat.

27.5 Precautions : All furniture fixtures. glazing floors, etc, shall be protected by covering. All stains, smears, oplashings, dropping of every kind shall be removed. While painting of wiring etc. it shall be ensured that painting of wall ceiling etc. is not spoiled in any way.

27.6 Painting of conduit and accessories: After installation surface of conduit pipes, fittings switch and regulator boxes, etc. shall be painted with two coats of approved enamel paint or aluminium paint as required to match the finish of surrounding wall, trusser, etc.

28. link clip:

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

APPENDIX - 'A'

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

Clause No.	Subject
3.	Authorisation :
29.	Construction, installation, protection, operation and maintenance of electric supply lines and apparatues.
31.	Cut-out on consumer's premises.
32.	Identification of earthed and earthed neutral conductors and position of switches and cutous therein.
33.	Earthed terminal on consumer's premises.
34.	Handling of electric supply lines and appartus.
41.	Distinction of circuits of different voltages.
42.	Accidental charge.
43.	Provisions applicable to protective equipment.
44.	Instructions for restoration of persons suffering from electric shock.
45.	Precautions to be adopted by consumers, owners, electrical contractors, Electrical workmen and suppliers.
46.	Periodical inspection and testing of consumer's installation.
48.	precautions against leakage before connection.
50.	Supply to consumers.
51.	Provisions applicable to medium, high voltage installations. Point of commencement of supply.
58.	Point of commencement of supply.
59.	Precautions against failure of supply; Notice of failures.
61.	Connection with earth, (low and Medium Voltage system.
64.	Use of energy at high and extra-high voltage system.
67.	Connection with earth. (High & Extra-high voltage system.
68.	General conditions as to transformation and control of energy.
All clauses under Chapter VIII on Overhead Lines.	
137.	Mode of entry.
138.	Penalty for breaking seal.
139.	Penalty for breach of rule-45.
140.	Penalty for breach of rule-82.
141.	Penalty for breach of rules.

APPENDIX-'B'

From of Completion Certificate

I/We certify that the installation detailed below has been installed by me/us and tested and that to the best of my/our knowledge and belief, it complies with Indian Electricity Rules, 1956, as well as the C.P.W.D. General Specification for Electrical Works, 1972.

Electrical Installation at Voltage and system of supply

(1) Particulars of works :

(a) Internal Electrical Installation — No. Total Load of wiring. — Type of system

(i) Light point

(ii) Fan point

(iii) Plug point

(a) 3 pin 5 Amp.

(b) 3 pin 15 Amp. Others :

(b) Others :

Description

(a) Motars : (i) HP/KW

(ii)

@X1 = (iii)

(c) Other Plants:

(d) If the work involves installation of over head line/or under ground cable:

(a) (i) Type & Description of overhead line.

(ii) Total length & No.-of spans.

(iii) No. of street light & its description

(b) (i) Total length of under ground cable & its size.

(ii) No. of joint.

End joint:

Tee join:

St through jont.:

2) Earthing:

(i) Description of earthing elecrode :

(ii) No. of earth eletrodes :

(iii) Size of main earth lead:

3) Test Results:

(a) Insulation Resistance:

(i) Insulation resistance of the whole system of conductors to earth. Megohms

(ii) Insulation resistance between the phase conductors and neutral. Megohms

Between phase R and neutral Megohoms

Between phase Y and neutral Megohoms

Between phase B and neutral Megohoms

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

Between phase R & phase Y Megohoms

Between phase Y & phase B Megohoms

Between phase B & phase R Megohoms

(b) Polarity Test:

Polarity of non linked single pole branch switches.

(c) Earth continuity Test:

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

d) Earth Electrod Resistance:

Resistance of each electrode.

i) ohms

ii) ohms

iii) ohms

iv) ohms

e) Lighting Protective System :

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

ohms

Signature of Supervisor Signature of Contractor

Name & Address Name & Address

SPECIFICATIONS

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

1) Indian Electricity Act, 1910 with its amendments.

2) Indian Electricity Rules, 1956 and its amendments.

3) Indian Electricity supply Act, 1948.

4) Regulation for Electrical Equipment in building by I.E.F. Landon.

5) The Factory Act. 1948 and its amendments.

6) I.S.-732-1982 Part-I, II & III code of practice for Electrical wiring and fittings in buildings for low and medium voltages.

7) I.S. 4064-1967 H.D. Air break switches and fuses for Voltages not exceeding 1100 volts.

8) I.S. 3043 - Earthing code of practice for

9) I.S. - 1554 Part-I - 1970 PVC insulated (Heavy duty) Electrical Cables for working voltages upto and including 110 volts.

10) I.S. : 694 - 1964 Part- II - PVC insulated cable with Alluminium conduits (revised) for voltages upto 110 volts.

11) I.S: : 5908-1970 - Electrical installations in buildings. method of measurements of.

12) I.S.: 4237-1967 - General requirement for switchgear and control gear for voltage not exceeding 1000 volts.

13) IS: 1653-1964 - Rigid steel conduits for electrical wiring (revised)

14) IS : 2509-1973 - Rigid steel conduits for electrical installation. (First revision).

15) IS: 1258-1967 - Beyonet lampholders (First revision).

16) IS: 418-1957 - Tungston-Filament General service electric lamps (Third revision).

17) IS: 374-1966 - Fans and Regulators. ceiling type, electric (second revision).

18) IS : 2667-1964 - Fittings. for rigid steel conduits for electrical wiring.

19) IS: 3419-1976 - Fitting for rigid non-metallic conduits (First revision).

20) National Electric Code, 1986.

ANNEXURE I.

Abstract of the Wiring Rules of the Institution of

Electrical Engineer

(referred to in the specification)

DEFINITIONS (See Clause 2 of the Specification)

Systems :

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

1) **Earthed**: Effectually connected t9 the general mass of the earth. Solidly earthed means earthed without the intervention of a fuse, switch, circuit -breaker, resistor reactor or solenoid.

2) **Uninsulated Conductor**: A conductor without provision, by the interposition of a dielectric or otherwise, for its insulation from earth.

3) **Bare**: Not covered with insulating material.

4) **Dielectric** : any material which offers high resistance to the passage of an electric current.

5) **Bunch Conductor**: When more than one conductor is contained within a single duct or groove or when they are run enclosed and not spaced apart from each other. .

6) **Points**: In wiring as per IS : 5908-1970-Method of measurements of electrical installation in buildings

7) **Switch board**: An assemblage pf switchgear with or without instruments, but the term does not apply to a group of local switches in a final sub-circuit where each switch has its own insulating base.

Note: In the electricity (Factories Act) special regulations,. 1908 and 1944 the term "Switchborad" includes "Distribution board" .

8) **Single pole switch**: A switch suitable for closing and or opening a circuit on one phase or pole only.

9) **Linked switches**: A switch the blades of which are so linked mechanically as to make or break all poles simultaneously or in a definite sequence.

10) **Fuse Switch**: A switch the moving part of which carries one or more fuses.

11) **Three Wire System:.**

a) **Outer Conductor**: Those between which there is the greatest difference of potential. This use of the word outer must not be confused with the use of the work when applied to the external conductor of a concentric main.

b) **Neutral Conductors**: The term includes the natural conductor of a 3 phase 4 wire system, the conductor of a single phase or d.c. installation which is earthed by the supply undertaking (or .otherwise at the source of the supply) and the middle wire or common return conductor of a 3 wire d.c. or single phase a.c. system.

12) **Semi enclosed machine**: One in which the ventilating openings in the frame are covered with

a) Grids expanded metal or wire gauge, with openings of less than 1/4 inch so as t6 obstruct free ventilation.
b) Wire gauge, in which the openings are less than 1/41 inch but not Jess than 3/32 inch (diameter or width) :
c) Screens with smaller openings than the above.

13) **Totally - enclosed Machine**:

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

14) **Pipe Ventilated Machine**: An enclosed machine in which the frame is so. arranged that the ventilating air may be conveyed to. it through a pipe attached to. the frame, the ventilation Opening maintained by the fanning action producted by the machine - itself.

15) **Farced draught machine**: An enclosed machine in which the ventilating air supply is maintained by an independent fan external to. the machine itself.

16) **Protected Machine**: One having end shield bearings and in which there is free access to. the interior without opening doors removing cavers.

SWITCHES. AND CIRCUIT BREAKERS

(See clause II of Specifications)

17) **Switches and Circuit Breakers.:**

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

(a) Overt heading must not take place at the paint of contact or elsewhere, when the full current flows continuously.

(b) They must be so. constructed or arranged that the contracts cannot accidentally close when left open.

(c) The basis must be of incombustible, non-conducting and moisture proof material.

(d) Circuit breaker as must be so. arranged and placed that no combustible material is endangered by their action.

(e) Unless placed in an engine roam or in a compartment especially arranged for the purpose, they must their live parts covered. The covers must be of incombustible material and must be either non-conducting or of rigid metal and clear of all internal mechanism. For mare than 6 amperes, at pressures exceeding 125 Valts metal' cavers must be lined with insulating material.

(f) In positions where they are liable to. injury or come into. contract with goads, they must be further protected by an open fronted box or other suitable guard.

(g) Handles must be insulated and so arranged that the hand cannot touch live metal, or be injured through and adjacent fuse blowing.

(h) Switches having a handle projecting through an open slat in the cover, must not be used.

Signature of Contractor/s Executive Engineer

SECTION F-1A

GENERAL REQUIREMENTS

1.1 Scope of works :

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

(a) Conduit a wiring system far fans, lighting paints bells, clacks sockets, etc. including fixing of lighting fixtures and fans etc. and miscellaneous paints.

(b) Conduit and wiring system' far exhaust fans, power sockets.

(c) Panel boards, distribution boards. switch fuse units.

(d) Complete power and lighting cable systems. Grounding system.

(e) Grounding system.

(f) Conduits system.

(g) Street lighting system.

(h) Other miscellaneous electrical work.

1.2 Completeness of Contract:

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

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

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

1.3 Guarantee :

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

1.4 Interchangeability:

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

1.5 Tools:

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

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

SECTION F-2A

Specifications for Electrical Installation in Buildings

1. GENERAL:

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

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

1.3 APPLICABLE RULES AND REGULATIONS:

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

1.4 DEFINITIONS:

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

1.5 DRAWINGS:

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

1.6 MATERIALS:

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

1.7 WORKMANSHIP:

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

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

1.8 CO-OPERATIVE WITH CIVIL AND OTHER WORKS CONTRACTORS:

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

1.9 TESTING:

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

1.10 . COMPLETION CERTIFICATE AND MAINTENANCE GUARANTEE:

1.10. 1 After the completion of the installation and testing, the contractor should furnish a certificate in the proforma In Appendix-III, at the time of taking over the installation by the Department. The installation shall be guaranted for period of 12 months from the date of taking over by the Department. During the period of guarantee all defects in material or in workmanship shall be rectified or replaced free of cost to the Department.

1.11 TENDERER'S ABILITY:

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

1.12 RATES:

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

1.13 STORAGE SPACE:

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

1.14 DEPARTURE FROM SPECIFICATIONS:

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

1.15 EXTRA ITEMS:

Rates for extra items shall generally be derived from the rates already available in the schedule. Where it is not possible, the rates shall be mutually agreed upon and the contractor shall furnish a detailed analysis of the rates claimed by him.

2. TECHNICAL SPECIFICATION:

2.1 Supply System:

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

2.2 Wiring for Lights and Fans:

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

2.2.2 Point wiring:

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

Conductors:

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

Loading:

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

Incandescent Lampts	1 *00* watts
Ceilling fans	60 watts
5-A Socket Outlets (lighting)	100 watts
4. ft. fluorescent tube.	50 watts
5 ft. fluorescent tubes.	100 watts

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

Local Control Switches (General) :

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

Switches (Two way) :

(a) Two way switches shall be piano type single pole, (double throw, 250V, suitable. for flush mounting and of 5A capacity as per the drawings. All switches shall be recessed in an embedded metal box.

(b) Each box shall have suitable outlet for fixing conducts directly.

(c) Each box shall have Perspex cover painted inside with the wall colour, if required.

(d) Each switch shall be suitable for the position in a corridor stairway wiring.

Switch Boxes (General):

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

Ceiling Rose:

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

Fittings:

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

Flexible wiring:

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

Ceiling Fans:

All ceiling fans shall be wired to ceiling rose and suspended from a hook shackle or clamp and insulated from the same. All joints in the suspension road shall be screwed and secured. by means of split pins. The fan clamps supplied by the Contractor shall be suitable for the ceiling or proof member as the case may be. For concrete roofs,

fan hooks shall be buried in concrete during construction in an approved manner and securely bound to the reinforcement.

Conduits and Earthing:

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

2.3.1 Point wiring:

Point wiring for power shall be as defined under section 2.2.2 and shall include the switches and sockets.

2.3.2 Loading:

All distribution board for power wiring shall be not less than 15A per way. Loading per way shall not exceed' normally 100 watts. The following loads may be assumed if exact figures are not known.

3-Pin 15A Outlets	1,000	Watts
3-Pin 5A Outlets	100	Watts

2.3.3 Wiring for Motors:

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

2.3.3.2 All wiring shall be carried in H.G. conduit as specified in I.S. specification for gauge for different sizes of conduits.

When the motor is resiliently mounted flexible conduit with approved adopters shall be used for the last few feet. Where cables are used sufficient loop shall be left.

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

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

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

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

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

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

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

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

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

2.4 Conduit Wiring:

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

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

2.4.3 Protection of conduit against rust:

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

2.4.3.A Protection against insects and damp:

In order to minimise cocensation or sweating inside the conduit, system shall be properly drained any ventilated in

such a manner as to prevent the entry of insects.

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

2.5 SPECIFICATION FOR POWER CONTROL AND TELEPHONE CABLES :

1. SCOPE:

i. The specifications cover the supply and installation of meduim voltage power and control cables either in ground or trench depending on the conditions at site including accessories for the same. The work in general, consists of supplying, laying, jointing terminating and connecting all. 1.1. KV APLSTS PVC power and control cables.

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

II. SPECIFICATION:

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

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

iii. Installation of all equipment shall also conform to the applicable. Codes and practice as per the IS and shall be executed to comply with the lates Indian Electricity rules as regards the safely. earthing of equipments and other essential provisions specified therein.

iv. Only approved make of cable shall be used. ICC and CCI will be preferred.

v. The cables shall generally be laid as per is Code of practice.

III. GENERAL RULES CABLE LAYING:

i. Installation shall be carried out in a neat. workmen like manner by skilled experienced and competent workmen in accordance with the standard practices.

ii. Cables shall be laid preferably in one piece length to avoid joins. If straight joints are found necessary. these can be introduced with prior approval of the Engineer-in-charge. The cost of the straight joint however. shall not be borne by the Department. But in no case joint shall be within the conduit G.I. pipe and duct.

iii. Proper care should be exercised in handling the cable to avoid formation of kind etc. and should it become necessary a cable be bent to a radius not less than 20 times the overall diameter of the cable.

iv. Method of installation, routing of cable etc. shall in every case be subject to the Department's approval and the contractor shall modify and or certify at no extra cost to the Department any portions of the installation which do not meet with the Department's approval. All damages to the civil and other works on this account shall be made good by the contractor at no extra cost to the Department.

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

v. Where cables pass through hume pipes. contractor shall fix hard wood bushed round the cables at the ends of hume pipes. Where the cables pass through the floors or chambers and in such other situations as the Engineer shall require. the contractor shall seal cable holes in a manner approved by Engineer-in- charge. Where cable pass through roads nallahs, etc. cables must be protected by Class 'A' Hume pipe of diameter not less than 6" (15cms.)

vi. The cable route shall be the shortest and these shall be minimum interference with built up areas, lawns etc.

vii. Care shall be exercised for providing suitable props for supporting other service lines on earth at the time of excavation. Where cutting of a lawn become inevitable it should be with the approval of the Engineer-in-charge.

viii. Excavation of the trenches shall be executed with vertical sides and the trenches shall be kept as straight as possible. The exact location of each trench shall be served by the Engineer- in-charge. On the site when the contract is in a position to commence each portion of the work.

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

ix. After the cables are laid. the trench shall. be filed in layers, the earth in each layer being well rammed by spraying water and consolidated and sufficient allowance made for settlement. The extra earth over the trench should be removed from the place of trench to a place as decided by the Engineer- in-charge at site.

x. Ends of cables shall be properly sealed to prevent entry of moisture prior to installation.

xi. Where it is as specified as 1/2 core cables the 1/2 core shall be a neutral conductor having reduced section.

xii. For all multicore cables each core and tails shall be brought out, marked and or coloured in on approved manner.

xiii. Cables termination shall be done with suitable compression brass qlands in the case of PVC cables and cast iron triturating boxes in the case of APLSTS cables. The armour should be connected to the, right main earth in building with duplicate earth wires as per the relevant lS/BS specification.

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

2.6 DISTRIBUTION BOARDS AND PANELS:

General Requirements:

2.62 All distribution panels shall comply with I.E.E. Rules 60- 61. A clear distance of 0.91 b metre in front of the switch board shall be kept. Where bare connections or attachments are provided 8t the back of the 'Switch board the space behind the panel shall be either less than 0.299 metre or more than 0.762 main width there shall be a passage way from the furtherest outstanding part of any attachment or conductor. If the space behind the switch board exceeds 0.70 main width there shall be a passage way from either end of the switch board clear to height of 1.928 m width 0299,m. All wiring connection shall be made neatly and securely.

2.6.2 For corciots carrying more than 10 Amps. tinned cable sockets shall be used. All connections shall be so made as to form their own diagram Circuit shall be clearly numbered to correspond t 1 wiring diagram Names of the distribution boards shall be painted as directed by the Engineer-in-charge. All the switch fuse units and isolators D.Bs. shall be complete with earthing studs lugs neutral bar link, H.R.C. fuses and of approved make.

2.6.3 Skeleton type panels shall have a rigid form work adequately braced and supported. The switch and distribution boards shall be neatly arranged in the frame. The details of the frame work and the arrangement of switches shall be got approved by the Engineer-in-charge before the panel is fabricated:

2.6.4 All cubical type panels shall have rigid supporting frames adequately braced over which sheet metal shall be nearly secured. All switches, distribution boards e-c. shall be neatly arranged en the panels and all connections made from the back of switches. The panels shall be rendered dust and vermin-proof. The interior of the panels shall not be accessible to unauthorised persons.

2.6.5 The recess type boards shall be embeded in wall in a cupboard with a metal hinged door with locking arrangement. In all recessed conduit work all distribution boards shall be recessed. Whet e recessing is not possible, free standing panel may be provided as approved by the Engineer-in-charge.

2.6.6 All individual components i.e. switch fuse units D.Bs. etc. shall be connected by earth continuity wire of appropriate size with the main earth bus of the panel D.H. etc. The panel switches or ').Bs. shall be earthed by the less than 2 distinctive paths to earth. Earthing of metallic parts of exposed metal shall not be effected through any structural metal work which houses the installation. Where metallic parts are not required to be earthed and are liable to become alive should the installation of the contractor become defective such metallic parts shall be separated by durable non-conducting material from any structural work.

(a) Power panels shall be 3 phase, 4 Wire, 400.230 volts for the distribution of 3 phase .01' single phase power loads. Lighting panels shall be 3 phase 4 wire 400/230 volts for single phase lighting load distribution on all 3 phase.

(b) All panels shall be done or protected front type with no mechanical or electrical defects. (c) . Bus bars shall be of electrolytic copper or aluminium as specified and the properly tinned sizes as indicated on applicable drawings as required.

(d) AU knock outs for branch circuits, conduit entries shall be drilled in und filled as required. For lighting panels the top and bottom cover plates shall be removable type.

(e) Main disconnect device for all panel boards shall be of switches of disconnect type and of the size as indicated shall be mounted directly below the panel or through a short thread conduit of required size.

(f) The main disconnect for all panel boards shall have an entry suitable for PVC armoured cable from bottom.

(g) All panel boards shall be provided with an earthing terminal and lug for connection to the grounding system.

(h) Temperature rise of all electrical parts shall not be more than 3000 with full load amseres at room temperature. Buses shall be securely supported so that ordinary vibrations will not cause any of the parts to become loose.

(i) All barriers and supports of current carrying parts shall be of moisture resistant insulating material and shall not be adversely affected by arcing.

(j) The locations of panels shown in the drawings are only tentative. Panels nay be located at a place approved by the Engineer-in-charge.

(k) All civil works connected with fixing such as grouting chasing and making good shall be the tenderer's responsibility.

(m) Wires adequate capacity with proper size of lugs shall be used for inter connections.

(n) Panel should be self supported on angle channel iron frame work. It should be preferably of bolted construction in case of transportation and flexibility. The frames shall be of the required size for the mounting of the equipment on it. It shall be bolted or grouted rigidly alter leveling and alignment.

(o) The cupboard and D.B. should be of such size so to be accommodated in the excising room as per I.S. rules and I.S. codes of practice for installations of medium voltage switch gear.

(p) Fabrication drawing showing the detailed dimensions and panels and its components indicating the frame work. earthing positioning of switches. D.Bs. cable boxes. adopter chambers etc. shall be furnished to the Engineer-in-charge for his approval. All material to be got approved by the Engineer-in-charge. Panel should be guaranteed for satisfactory operations for a period of one year after handing over.

(q) The panel should be painted with anticorrosive paint suitable for humid and salty atmosphere on two coats of primer.

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

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

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

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

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

The Combination Fuse-switch unit should comply with IS 4064 BS 861 and BBS 2510 wherever applicable. It should be suitable to accommodate High Rupturing Capacity Cartridge Fuse links complying with IS 2208 or BS 88 and having a certified rupturing capacity of not less than 35 MVA at 440 volts (AC5 duly). The switch gear (panes. D. Bs. etc.) shall be installed generally as per IS-Part- I 3072 and las specified and shown in drawings.

All fuse switch units shall be provided with non-deteriorating HRC fuse links complying with IS 2208-1962 and having rupturing capacity of 35 MVA at 415 volts. or as specified.

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

A meters sector switches and LMH metre shall be provided where specifically mentioned. Small wiring for the inter-.connecting shall be colour coded and provided with numbered fuses for easy identification of circuits.

(a) The distribution boards should be totally enclosed metal clad complying with B. S. 214. The M. S. sheet steel enclosures for recessed D. Bs. shall be of not less than 14 guage.
(b) The D. B. shall be with hinded door and the locking arrangements as approved by the Engineer-in-charge.
(c) All the components shall be enclosed in the enclosure. The mounting of D. B. shall be got approved by the Engineer-in-charge before carrying out the installation.
(d) The D. Bs. shall have proper size cut outs for conduits entry or cable entry as required and these shall be made on site.
(e) Adequate spacing shall be provided inside the D. Bs. for easy removal of the fuses and carry out the inter connection:
(f) A set of insulating barriers have to be provided between in coming breakers switches and fuses.

Switch fuse Units:

(a) All the D.P. T.P. and TP.N. switch fuse units shall be totally enclosed iron clad quick make, quick dreak type to best Indian make conforming to the I.S. or B.S. 3185 specifications. All the switch fuse units shall have mechanical interlock with a door, so that the door cannot be opened when the swithches are in 'ON' position. The switches should be of double break solation type to ensure safely.
(b) Each TP. & TP.N. switch fuse unit shall be earthed with two distinct earch connections.
(c) Suitable insulator shall be provided. between phase.
(d) There shall be suitable neturallink in the fuse box.
(e) All T. P. & T.P.N. switch fuse units shall be rated for 500 volts and D. P. (required for single phase supply) and S.P.N. switches for 250 volts.
(f) The H.R.C. catridge fuse shall conform to H.S. 88 (1952).

The O.C.Bs. ACB shall be suitable for 400/440 volts 3 phase 50 cycle supply capable of interrupting a fault MVA of not less than 31. The circuit breaker shall conform to the BSS-936-1940 BSS 3659 with such tripping arrangement as may as required under special specifications for the building. Efficient and foolproof mechanical interlocking shall be provided for the safe operation and maintenance. The rate shall be inclusive of the first filling of oil.

2.7 Instrumentation :

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

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

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

2.8 FIXING OF LIGHTING FIXTURES:

1. Location of fixtures their manner of fixing mounting height etc. are indicated in relevant drawing. Actual location and levels shall however be arrived at site in co-ordination with other service etc and prior approval of the Engineer-in-charge regarding the actual location. Manner of fixing shall be obtained before the work is taken up in hand.

2. In all cases the contractor shall provide necessary interconnection wiring earthing painting etc. all necessary for complete installation. The contractor shall also test and commission the fixtures during completion of the work.

3. . General arrangement of fixtures layout is indicated in drawings. Care snail be taken to see that all light fixtures are in a row in a room or particular area, are in absolute line and plump and are symmetrically disposed with respect to finished surfaces of walls columns beams etc. .

4. The inter-connections wiring from the light outlet point up to the fixture shall be carried out by means of flexible copper wire of 'section not less than 1.5 mm^2.

5. All fixtures suspended by means of conduits shall be done with all and socket joints or as per approved design.

2.9 Telephone System:

1. Empty conducting shall be done, recessed or exposed to surface along with pull boxes, junction boxes and telephone outlet boxes, in areas and location' as indicated in the relevant drawing as per materials and methods as described in regard to conducting under section "Wiring in Conduits" except the G.I. pull wires of guage not. less than 20 SWG shall be kept pulled through conduits in all sections so that in future telephone wires can be pulled easily.

2. Location shown on the drawing are approximate and final location shall be decided in the field by the Engineer-in-charge.

SECTION G

SPECIFICATION FOR EARTHING.

1. Installation of Earthing Plates :

All installation of earthing shall conform to Indian Electricity Rules, 18.3043 latest edition and IEE. The copper earth plates should be tinned before installation. The earth plates of copper 60 cm x 60 cm x 3.515 ~m thick size as mentioned in the schedule be -in separate pits at least 150 cms to 300 cms. away from the building at a depth necessary to reach moist earth surface but with a minimum depth of 2.5 mtr from the finished ground level upto the top vertical dodge of earth electrode. The earth plate shall be throughly cleaned to remove all dirt from the surface and be tinned property for electrical contact with the main ground. Each earth pit should be provided with 38 mm. dia G,I. pipe 2.5 Mts. long or more depending upto the depth of pit, put over the vertical edge of earth plate'(with top end of pipe provided with a closed to couyler). Alternative layers of salt and coke shall be provided surrounding the plate. The pits shall be filled when the plates are in position and with the approval of Engineer-in-charge.

To facilitate watering the pit, a concrete compartment sh(~uld be made with funnel with mesh and cover plate as per rules provided in ISI regulation.lhe masonary endousures shall be25 8m x 25 cm x 25 cm (deep) with C.I.lid of 23 cm x 30 cms size. After installation, the earthing resistance of each earth plate should be measured by resistance m'eggar in the presence of Engineer-in- charge, three days after the completion of earthing work, and the value should conform to regulations.

Signature of Contractor/s Executive Engineer

Division.

-- List of Approved Products --

As per Separate Booklet Attached

LIST OF APPROVED ELECTRICAL PRODUCTS (FOR THE YEAR 2006-2007)

LIST OF THE APPROVED PRODUCTS

CHAPTER-I

WIRING

1.1 SHOCKPROOF ACCESSORIES

(A) Concealed I Surface type.

Any 'I S I ' marked switcher, and accessories approved .by the Engineer in charge of work

(C) Mini Modular Type

1 ANCHOR

2 VINAY

3 ELLE

Modular Type

A. CATEGORY-I

1 ANCHOR

2.SG

3 ELLEYS

B. CATEGORY -II

1 MK

2 TOYOMA

3LK

4 NORTH WEST

1.2 RIGID PVC PIPES I OVAL PIPES & FITTINGS.

FIA Approved & ISI marked (Emossed)

1.VRAJ

2. NIHIR

3. PRECISION

4 SHRINATH

1.3 OVAL I CASING & GAPING & PVC TRUNKING

1. PRECISION PLASTIC

2 CENTUR

3 MK

4 SHREENATH

5 TOYOMA

6 L.M

CHAPTER-II

LAMPS & FITTINGS

2.1 FILAMENT LAMPS IFLOURESCENTTUBES

(A) CAT. I

ANYISI MARKED

(B) CATEGORY -II

I SURYA

2 BAJAJ

3 PUSKAR

4 OS RAM

(C) CATEGORY-III

1 PHILIPS

2 CROMPTON

2.2 MERCURY VAPOUR LAMPS

(A) CAT -I

ANY ISI MARKED

(B) CATEGORY -II

1 SURYA .

2. BAJAJ

3. OSRAM

4. MYSORE

5. MYNA

(C) CATEGORY -III

1. PHILIPS

2 CROMPTON

2.3 SODIUM VAPOUR LAMPS

(A) .CATEGORY -I

ANYISIMARKED

(B) CATEGORY -II

1 PUSKAR

2 OSRAM

3 BAJAJ

4. SURYA

5 MYNA

(C) CATEGORY -III

1. PHILIPS

2. CROMPTON

2.4 COMPACT FLOURESCENT LAMPS

(A) CATEGORY -I

ANY OTHER THAN FOLLOWING MAKE (B) CATEGORY -II

1. ANCHOR

2. OSRAM

3. SHAH

4. ORPAT

5. INDOASIAN

6. JOY LIGHTING

7. DECON

8 .ARCO

9. SAMAY

10 MYNA

(C) CATEGORY-III

1. PHILIPS

2. CROMPTON

2.5 METAL HALIDE LAMPS

(A) CATEGORY -I

ANY ISI MARKED

(B) CATEGORY -II

1. PUSKAR

2. SURYA

3. OS RAM

4.BAJAJ

5. MYNA

(C) CATEGORY -III

1. PHILIPS

2. CROMPTON

2.6 ENERGY SAVING FLOURESCENT TUBE FITTINGS (Box Type Industrial Type/ Mirror Optic / Mirror Light / Street Light)

(A) CATEGORY -I

ANY OTHER THEN FOLLOWING MAKE (B) CATEGORY -II

1. DECON
2. SHAH
3. HAVELLS
4. ASIAN
5. SHAKTI
6. MYNA

(C) CATEGORY -III

1. PHILIPS
2. CROMPTON

2.7 FLOURESCENT TUBE FITTINGS [ELECTRONICS BALLAST] (Box Type / Industrial Type / Mirror Optic / Mirror Light / Street Light)

(A) CATEGORY -I .

ANY OTHER THEN FOLLOWING MAKE (B) CATEGORY .11

1. SURYA
2. ARCO
3. ANCHOR
4. SHAKTI
5. DECON
6. HAVELLS
7. SHAH
8. FIXOLITE
9. MYNA
10 JOYLIGHTING
11 PRESTOLITE

(C) CATEGORY ~III

1. PHILIPS
2. CROMPTON

2.8 MERCURY VAPOUR LAMP FITTINGS (POST TOP LANTERN / STREET LIGHTS) (A) CATEGORY-I

ANY OTHER THEN FOLLOWING MAKE' (B) CATEGORY-II

1. SURYA
2. ARCO
3. SHAKTI
4. DECON
5. HAVELLS
6. BAJAJ
7 FIXOLITE
8. MYNA
9. JOYLIGHTING
10 PRESTOLITE

(C) CATEGORY -III

1. PHILIPS
2. CROMPTON

2.9 . SODIUM VAPOUR LAMP FITTINGS (POST TOP LANTERN/STREET LIGHTS) .

(A) CATEGORY -I

1. KUMAR
2. GLOLUX
3. G-LITE
4. ARYA

(B) CATEGORY -II

1. SURYA
2. ARCO
3. SHAKTI
4. BAJAJ
5. CANARA
6. FIXOLITE
7. MYNA
8. JOYLIGHTING
9 HAVELL.:S .
10 PR~STOLITE

(C) CATEGORY-III

1. PHILIPS
2. CROMPTON

2.10 FLOOD LIGHTS WITH BC/ESIIMV/SV/MH/LAMPS (POSTTOP LANTERN IS TREET LIGHTS)

(A) CATEGORY-I' .

1 .ARCO
2. GLOLUX
3. G-LITE .
4. TWINKLE
5. KUMAR
6 ARYA

(B) CATEGORY -II

1. SURYA
2. FIXOLITE
3. DECON
4. SHAKTI
5. BAJAJ
6. JOYLIGH,JNG
7 HAVELLS
8. PRESTOLITE

(C) CATEGORY -III

1. PHILIPS
2. CROMPTON

2.11 TABLE FANS

(A) CATEGORY -II

1. DECON
2. BAJAJ

(B) CATEGORY- III,

1. PHILIPS
2. CROMPTON

2.12 ELECTRONIC BALLAST

(A) CATEGORY-I

1. KUMAR'
2. MARVEST
3. KELTRON
4. JOYIIGHTING
5. ARYA

2.12 (B) CATEGORY -II 1. ANCHOR
2. SHAH
3 ASIAN
4. OSRAM
5. OPAL
6. HAVELLS
7. ACON
(C) CATEGORY -III 1. PHILIPS
2. CROMPTON

CHAPTER-III

3.1 SWITCHGEARS & DISTRIBUTION BOARDS
CAST IRON CLAD SWITCHES WITH REWIREBLE FUSE
(A) CATEGORY -I
ANY OTHER THEN FOLLOWING MAKE
(B) CATEGORY -II
1.NEW
2.MODI
3. SUPER
4. PEW
(C) CATEGORY -III
1. KEW
2. STENLY

3.2 METAL CLAD SWITCHES WITH REWIREBLE FUSE,- 100 A)
(A) CATEGORY.
1. SIGMA
(B) CATEGORY-II
1. MODI
2. HPL
3. SUPER
4. TRISUL
5. KEW
6. STANDARD
(C) CATEGORY-III 1. HAVELLS
2 .L&T .
3. CROMPTON

3.3 METAL CLAD SWITCHES WITH HRC FUSE
(A) CATEGORY -II
1. STANDARD
2. SUPER
3 CROMPTON
4.KEW
5. HPL
(B) CATEGORY -III
1. L & T
2. SIEMENS
3.C&S
4.GE
5. HAVELLS

3.4 MOULDED CASE CIRCUIT BRAKERS (A)
CATEGORY -II
1. HAVELLS
2. CROMPTON
3. STANDARD
(B) CATEGORY -III
1.L&T
2.C&S
3.G.E.
4. SIEMENS
5. BCH

3.5 AIR CIRCUIT BREAKERS
(A) CATEGORY -III
1.G.E.
2. SIEMENS
3. L&T
4, CROMPTON
5. C&S

3.6 CHANGE OVER SWITCHES
(A) CATEGORY-I
1.MODI
2. SIGMA
(B) CATEGORY -II
1. STANDARD
2. HAVELLS
3. SUPER
4. KEW
5. C&S
6. HPL
(C) CATEGORY -III
1. L& T
2. CROMPTON
3. G.E.
4. SIEMENS

3.7 MCB & MCB DISTRIBUTION BOX
(A) CATEGORY-I
1. SIGMA
2. BALKAM
3.S.G.

3.7 (B} CATEGORY -II 1.HAVELLS
2. STANDARD 3.HPL
4. KEW
5. INDO-ASIAN
6. AECO-MEFA
7. SUPER
8. ANCHOR
9. RkCON-CLI~SAL
(C) CATEGORY -III 1. L&T
2. MDS
3. G.E.

3.8 4. CG SNEIDER
ELCB & RCCB
(A) CATEGORY - I
1. S.G.
2. SIGMA
(B) CATEGO~Y -II
1. STANDARD
2. ANCHOR
3. SUPE"R
4. INDO-ASIAN
5. AECO-MEFA 6.HPL
7. ELECON-CLIPSAL
(C) CATEGORY -III
1.L & T
2. MDS
3. HAVELLS
4.G.E
5. C.G. SNEIDER

3.9 TIME SWITCHES
1. L& T
2.MDS
3. INDO-ASIAN 4.C&S

3.10 ENERGY METER
1. HPL
2. L& T
3.G.E.
4.C&S
5. ANCHOR
6. HAVELLS
7. INDO-ASIAN

CHAPTER-IV

CABLES & WIRES

4.1 ALLUMINIUM & COPPER XLPE CABLES (ALL Type)

4.2 1.UPTO 35 Sa.MM ANY ISI MARKED
ALLUMINIUM & COPPER XLPE CABLES (ALL type)
ABOVE 35 SQ.MM & UP TO 185 SQ.MM
1.CAPCAB
2. DICABX
3. FINOLEX
4. R R CABLE
5. POPULAR
6. POLYCAB
7. AVOCAB
8.HMT
9 LOOKMAN
10 POWERCAB

4.2 ALLUMINIUM & COPPER XLPE CABLES (ALL, Type)
ABOVE 185 SQ.MM
1. DICABS
2. AVOCAB
3. POL'I'CAB
4.CCI
5. INCAB
6.HMT
7. R R CABLE

CHAPTER-V

FANS

5.1 CEILING FANS &TABLE FANS
1. LAZER
2. ANCHOR
3. POWERPACK
4. CROMPTON
5. BAJAJ
6. ORIENT
7. ALMONDARD
8. KHAITAN
9. INOVA
10 CINNI
11 USHA
12 GEC
13 REMI
14 ORIENTS
15 Kedia

5.2 EXHAUST FANS, BRACKET FANS & PEDESTAL FANS

A) CATEGORY-I 1. LAZER
2. POWERPACK 3. ANSU
4.EPC
5. NOVA 6.REMI
7. KHAITAN
8. ORIENT
9 USHA

(B) CATEGORY -II 1.CROMPTON
2. GEC.
3. BAJAJ 4.ALMONARD

CHAPTER-VIII

8.1 AIR CONDITIONERS, WATER COOLERS & WATER HEATERS
SERVO CONTROLLED VOLTAGE STABILIZER & ELECTRONICS POWER CONDITIONERS 1. SUVIK
2. KELTRON
3. KEPREJ
4. GELCO
5. RIDER
6. TOCONSI

8.2 ON LINE UPS
1. SUVIK
2. KELTRON
3. KEPREJ

8.3 WATER HEATERS
A. CATEGORY-I
1. LAZER
2. POWERPACK
3. BAJ.AJ
4. USHA
B. CATEGORY -II
1. SPHEREHOT
2 RECOLD
3. VENUS

CHAPTER-IX

MOTOR PUMPS

9.1 MOTOR PUMP STARTERS & STARTER ACCESSORIES .
A.CATEGORY-II
1. CROMPTON
2. JYOTI
3. HAVELLS
4. ANCHOR
5. PECO
B. CATEGORY -III
1 L&T
2. SIEMENS
3. BHARITA CUTTLER HAMMER
4. ALSTHOM
5. C & S

9.2 PANNELACCESSORIES
1. STANDARD
2. L & T
3. MEW
4. KAYCG
5. ANCHOR
6. UNIVERSAL
7. IMP

9.3 SINGLE PHASE MONO BLOCK PUMPS (A) CATEGORY -II
1. LUBI
2 PRIME
3. TULLU
4. HARSHA
5. AUE
6. SAGA
(B) CATEGORY III
1. CROMPTON
2. KIRLOSKAR
3. SIEMENTS

9.4 OPEN WELL TYPE HORIZONTAL MONO BLOCK PUMPS
(A) CATEGORY -I
1. TOPLAND
2. PRIME
3. SABAR
(B) CATEGORY -II
1. UNEEL
2. LUBI
3. KIRLOSKAR
4. CROMPTON'
5. PRIMA

9.5 STARTER PANELS
1. L & T
2. SUECO
3. SAMUDRA
4. SUN
5. LUBI
6. BCH

9.6 SUBMERSIBLE PUMPS
(A) CATEGORY -I
1. TOPLAND
2. AROMA
3. JASCO
4. SABAR
5. PRIMA
(B) CATEGORY -II
1. CROMPTON
2. CALAMA
3. AMRUT
(C) CATEGORY-III
1. KSB
2. UNEEL
3. KIRLOSKAR
4. LUBI.

CHAPTER-X

SUBSTATION EQUIPMENTS

10.1 (A) CATEGORY -II
1. VOLTAMP
2. SKP
3. YULE
(B) CATEGORY -III
1. ALSTOM
2. CROMPTON
3. KIRLOSKAR
4. L&T

Garden Bench

Shopping Cart

NOTIFICATIONS

HomeFurniture and FurnishingsAccommodation furnitureOutdoor furnitureGarden Bench (Q3 Category)

KRISHTHA Cast Iron Polish Garden Bench, Capacity 3 Seater

KRISHTHA[R]

(GARDEN BENCH RAC)

₹ 8,000.00 30% OFF

Trends | Purchase History

Product Details

Price For :	1 pieces
MRP/Unit:	₹ 11,500.00
Offer Price/Unit:	**₹ 8,000.00**
Availability:	799 In Stock
Min. Qty. Per Consignee: EDIT CONSIGNEE	2
Product id:	5116877-32104497785
Country Of Origin:	India

Ask GeMmy

Product Compare | Product History 4

Local Content (MII):	100%

*Please Note: Local Content value is as declared by reseller since OEM is not registered on GeM

Seller Details

Sold by:	**Resellers**

OEM verified Reseller

Catalogue not verified by OEM

Seller Excellence	**4.0 - 4.49**

ADD TO CART

REPORT THIS PRODUCT

Specifications

Seating Capacity	3 Seater
Stand/Legs Design	Decorative
Finsh	Polish
Back Rest	With
Arm Rest	With
Warranty	1 year
Weight Bearing Capacity	149 kilogram

Material

Side Frame Material	Cast Iron
Seat Material	Mild Steel Pipe 14 Gauge
Back Rest Material	Mild Steel Pipe 14 Gauge

Technical Parameters

Bench Type	Integrated Seat and Back
Seating Capacity	3 Seater
Stand/Legs Design	Decorative
Finsh	Polish
Back Rest	With
Arm Rest	With
Colour of Seat and Back	As per buyer's Choice

Dimensions

Total Height	770 millimeter
Seat Height	410 millimeter
Width	458 millimeter
Total Area Required	1550 millimeter

Generic

Warranty	1 year
acity	149 kilogram

Test Reports

Test reports to be furnished to buyer on demand	Yes
Availability of Test Report from Central Govt/NABL/ILAC accredited lab to prove conformity to specification	No

Site operated and maintained by Managed Service Provider

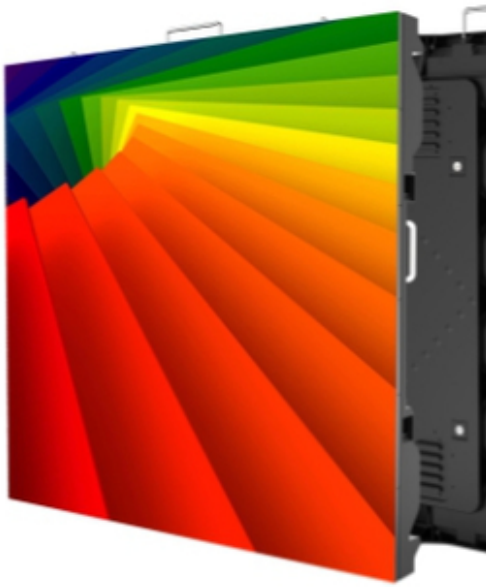
LED Display System

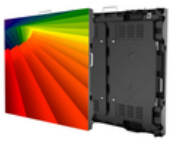
Shopping Cart

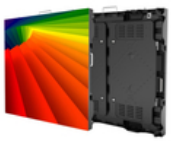
NOTIFICATIONS

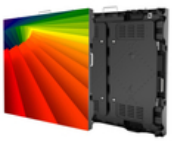
HomePrinting and Photographic and Audio and Visual Equipment and Supplies

Audio and visual presentation and composing equipmentProjectors and SuppliesLED Display System (Q2 Category)









ADDSOFT 5000 Nits Brightness, Outdoor Mild Steel Led Display System

ADDSOFT^{R}

(ADDWALL-OUT-P10)

₹760,000.00 11% OFF

Trends | Purchase History

Product Details

Price For :	1 pieces
MRP/Unit:	₹ 850,000.00
Offer Price/Unit:	**₹ 760,000.00**
Availability:	10 In Stock
Min. Qty. Per Consignee: EDIT CONSIGNEE	1
Product id:	5116877-52279191596

Country Of Origin:	India
Local Content (MII):	61%
Certification:	

Seller Details

Sold by:	**OEM**
OEM verified catalogue	
Seller Excellence	**4.0 - 4.49**

ADD TO CART

REPORT THIS PRODUCT

Specifications

Type of LED Display System	Outdoor
Material of the Cabinet	Mild Steel
Aspect Ratio	16:9
Maximum Pixel Pitch (mm)	10
Length of LED Display System (cm)	211 - 220
Height of LED Display System (cm)	181 - 190
Brightness -Calibrated Minimum (Nits)	5000
Life of Light Source (Hours)	100000
IP Rating (Front)	IP65
IP Rating (Rear)	IP54
Duty Cycle	24x7
Wireless Connectivity	Yes
If Yes, Type of Wi-fi Connectivity	802.11b/g/n

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Price on other marketplaces

Construction and Performance

Type of LED Display System	Outdoor
Material of the Cabinet	Mild Steel
Aspect Ratio	16:9
LED Configuration	RGB 3 in 1 SMD
Maximum Pixel Pitch (mm)	10
Length of LED Display System (cm)	211 - 220
Height of LED Display System (cm)	181 - 190
Maximum Depth of LED Display System (cm)	15
Pixel Density Minimum (Per Square Metre)	10000
Horizontal Resolution (Pixel)	480
Vertical Resolution (Pixel)(in mm)	320
Horizontal Viewing Angle (degree)	140
Vertical Viewing Angle (degree)	140
Optimal Viewing Distance (meter)	>/=10
Refresh Rate (Hz)	1920
Response Time (milliseconds)	5
Frame Frequency (Hz)	50 - 60
Brightness -Calibrated Minimum (Nits)	5000
Contrast Ratio	5000:1
Uniformity of Brightness across the Screen	90

Gray Scale Processing (Bit)	16
Life of Light Source (Hours)	100000
Dimming Capability	256 levels
Fanless Design	Yes
Availability of Data Power Redundancy	No
Mean Time Between Failure (MTBF)(Hours)	>10000
IP Rating (Front)	IP65
IP Rating (Rear)	IP54
Maintenance	Rear
Duty Cycle	24x7
Availability of Smart PDU	No
LED Make	EPI STAR
Power Input (Volt)	230 Vac +/- 10%, 50-60 Hz
Maximum Power Consumption (Per Square Meter)	600
Mounting Arrangement	Pole
Availability of Receiver Card	Yes
Earth Leakage Current	<3mA

Ports and Connectivity

Number of DVI-I Port	0
Number of DVI-D Input Port	0
Number of VGA Port	0
Number of HDMI Port	1
Number of DP Port	0
Number of USB Port	1
Number of Gigabit Ethernet Port	1
Wireless Connectivity	Yes
If Yes, Type of Wi-fi Connectivity	802.11b/g/n

Certifications

BIS Registration under CRS of Meity for LED Wall including LED Controller	Yes
BIS Registration Number and its validity	R-52000060
ROHS Compliance	Yes
Certifications Available	CE,FCC
ISO Certifications	Yes

Generic

Total Weight of Wall with complete structure and frame (kg)	180
Standard Accessories to be supplied	Power cable from nearest power point
ACP Sheet at top of the structure having depth 450mm to avoid bird drops at Screen	Yes
Mounting structure (Mild Steel) with protectomastic primer 100 micron with ACP cladding	Yes
Minimum Operating Temperature (degree)	-10
Maximum Operating Temperature (degree)	40
Minimum Operating Humidity (%RH)	5
Maximum Operating Humidity (%RH)	90
Installation and Commissioning is included in Scope of Supply	Yes
On Site OEM Warranty (Years)	1

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computer kiosk

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NOTIFICATIONS

HomeInformation Technology Broadcasting and TelecommunicationsComputer Equipment and AccessoriesComputers

Computer Kiosk (Q3 Category)

GLOBUS Intel Color LED touch Screen Type Of Information Kiosk Intel Core i5 Computer Kiosk

GLOBUS^{R}

(GIL 55VSDW with Signage Software)

₹382,720.00 11% OFF

Trends | Purchase History

Product Details

Price For :	1 pieces
MRP/Unit:	~~₹ 429,000.00~~
Offer Price/Unit:	**₹ 382,720.00**
Availability:	10 In Stock
Min. Qty. Per Consignee: EDIT CONSIGNEE	2
Product id:	5116877-58635569297

Country Of Origin:	India
Local Content (MII):	30%

Seller Details

Sold by:	**Resellers**
OEM verified Reseller	
OEM verified catalogue	
Seller Excellence	**4.5 - 5.0**

ADD TO CART

REPORT THIS PRODUCT

Specifications

Type Of Information Kiosk	Processor Based
Type Of Enclosure	Mild Steel
Processor Make	Intel
Processor Configuration	Intel Core i5
Processor Speed (GHz)	2
Operating System (Pre-loaded)	Window 10
Memory (GB)	8
Storage/HDD (GB)	999
Display Size (inches)	55

VIEW MORE

Generic

Type Of Information Kiosk	Processor Based
Type Of Enclosure	Mild Steel
Thickness of Enclosure (mm)	1.2
Chassis	Screwless
Mounting	Floor mount

Configuration

Processor Make	Intel
Processor Configuration	Intel Core i5
Processor Speed (GHz)	2
Operating System (Pre-loaded)	Window 10
Memory (GB)	8
Storage/HDD (GB)	999

Display

Display Size (inches)	55
Display Type	Color LED touch Screen
Touch Type	Infra Red
Antiglare & Overlay Tempered vandal resistant glass thickness (mm)	4
Screen Resolution (pixels)	1920 x 1080
Brightness (Nits)	350

Ports

USB Port 2,0	4
USB 3 or Higher	2
VGA Port	Yes
LAN Port	Yes
Audio In and Out	Na

Options

Standard Keyboard with USB Interface	Not Available
Thermal Printer with 80 mm paper width and with Auto Cutter	Not included

Certification

BIS Registration under CRS of Meity for Data Processing Unit	NA
BIS Registration Number for Data Processing Unit	NA
BIS Registration for Thermal Printer	NA
BIS Registration Number for Thermal Printer	NA
Safety Certification (For CPU and Display)	NA

Miscellaneous

Speakers	NA
Weight (Kg)	98 kilogram
Optical Disk Drive	NA
Overall Dimensions (cm x cm x cm)	185 x 7.93 x 1.62
Maximum Power Consumption(In Watt)	240 Watt
Operating Temperature Range(In Degree C)	40
Operating Humidity(In %)	80
On Site OEM Warranty (Year)	1

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LED Display System

Shopping Cart

NOTIFICATIONS

HomePrinting and Photographic and Audio and Visual Equipment and Supplies

Audio and visual presentation and composing equipmentProjectors and SuppliesLED Display System (Q2 Category)

HINLED DISPLAY SYSTEMS 5000 Nits Brightness, Outdoor Mild Stee Led Display System

HINLED DISPLAY SYSTEMS[R]

(Hinled 43)

₹88,000.00 **23% OFF**

Trends | Purchase History

Product Details

Price For :	1 pieces
MRP/Unit:	₹ 115,000.00
Offer Price/Unit:	**₹ 88,000.00**
Availability:	13 In Stock
Min. Qty. Per Consignee: EDIT CONSIGNEE	1
Product id:	5116877-31732495918

Country Of Origin:	India
Local Content (MII):	55%
Certification:	

Seller Details

Sold by:	**OEM**
OEM verified catalogue	
Seller Excellence	**4.0 - 4.49**

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Specifications

Type of LED Display System	Outdoor
Material of the Cabinet	Mild Steel
Aspect Ratio	16:9
Maximum Pixel Pitch (mm)	10
Length of LED Display System (cm)	61 - 70
Height of LED Display System (cm)	181 - 190
Brightness -Calibrated Minimum (Nits)	5000
Life of Light Source (Hours)	50000
IP Rating (Front)	IP65

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Price on other marketplaces

Construction and Performance

Type of LED Display System	Outdoor
Material of the Cabinet	Mild Steel
Aspect Ratio	16:9
LED Configuration	RGB 3 in 1 SMD
Maximum Pixel Pitch (mm)	10
Length of LED Display System (cm)	61 - 70
Height of LED Display System (cm)	181 - 190
Maximum Depth of LED Display System (cm)	15
Pixel Density Minimum (Per Square Metre)	10000
Horizontal Resolution (Pixel)	61
Vertical Resolution (Pixel)(in mm)	182
Horizontal Viewing Angle (degree)	140
Vertical Viewing Angle (degree)	140
Optimal Viewing Distance (meter)	>/=2
Refresh Rate (Hz)	1920
Response Time (milliseconds)	10
Frame Frequency (Hz)	50 - 60
Brightness -Calibrated Minimum (Nits)	5000
Contrast Ratio	5000:1
Uniformity of Brightness across the Screen	99

Gray Scale Processing (Bit)	16
Life of Light Source (Hours)	50000
Dimming Capability	256 levels
Fanless Design	Yes
Availability of Data Power Redundancy	No
Mean Time Between Failure (MTBF)(Hours)	>10000
IP Rating (Front)	IP65
IP Rating (Rear)	IP54
Maintenance	Rear
Duty Cycle	16x7
Availability of Smart PDU	No
LED Make	HINLED
Power Input (Volt)	230 Vac +/- 10%, 50-60 Hz
Maximum Power Consumption (Per Square Meter)	600
Mounting Arrangement	Pole
Availability of Receiver Card	Yes
Earth Leakage Current	<3mA

Ports and Connectivity

Number of DVI-I Port	0
Number of DVI-D Input Port	0
Number of VGA Port	0
Number of HDMI Port	0
Number of DP Port	0
Number of USB Port	1
Number of Gigabit Ethernet Port	0
Wireless Connectivity	Yes
If Yes, Type of Wi-fi Connectivity	802.11b/g/n

Certifications

BIS Registration under CRS of Meity for LED Wall including LED Controller	Yes
BIS Registration Number and its validity	R-97000612
ROHS Compliance	Yes
Certifications Available	CE
ISO Certifications	Yes

Generic

Total Weight of Wall with complete structure and frame (kg)	80
Standard Accessories to be supplied	Power cable from nearest power point
ACP Sheet at top of the structure having depth 450mm to avoid bird drops at Screen	No
Mounting structure (Mild Steel) with protectomastic primer 100 micron with ACP cladding	No
Minimum Operating Temperature (degree)	-10
Maximum Operating Temperature (degree)	40
Minimum Operating Humidity (%RH)	20
Maximum Operating Humidity (%RH)	85
Installation and Commissioning is included in Scope of Supply	Yes
On Site OEM Warranty (Years)	1

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MUNICIPAL CORPORATION

BHAVNAGAR

VENDOR LIST

(A)LIST OF APPROVED VENDORS FOR CIVIL WORKS

Sr. No.	ITEMS	Approved Brands / Quality
1	CEMENT PPC 53 Grade & SULPHATE RESISTANT CEMENT,S.R.C.	Ambuja, Hathi, Ultra Tech, Sanghi, Siddhi, Hi-bond
2	BRICKS	MBM, Arjun, PBM, 555, Kisan, ABM, TRD, Paresh, Dhara, B.R.C., Kiran, BMB, Kirit, Sonal
3	Steel TMT, CRS	TISCO, SAIL, VIZAG, Kamdhenu, NATIONAL, Electrotherm, JSW, Welspun steel, Pollad Steel, DIAMOUND TMT, M. G. Steel, Friends Steel, Crown next TMT, Briskon TMT
4	VITRIFIED TILES	Asian, Kajaria, Jonson, Varmora, Simpolo, OASIS
5	CERAMIC TILES	Asian, Kajaria, Johnson, Varmora, Simpolo, OASIS
6	GLAZED TILES	Asian, Kajaria, Johnson, Varmora, Simpolo
7	ACRYLIC PAINT	ICI, Asian, Nerolac, Burger
8	OIL BOUND DISTEMPER	ICI, Asian, Nerolac, Burger
9	EXTERIOR WEATHER PROOF EMULSION PAINT	ICI, Asian, Nerolac, Burger
10	Oil Paint	ICI, Asian, Nerolac, Burger
11	SANITARY WARE	Cera, Hindware, Parryware
12	CAST IRON PIPES AND FITTINGS.	NECO, Swayarhoo, Bengal, Oriental Castings, Electro steel Castings
13	P.V.C. PIPES AND FITTING (UPVC/CPVC)	Finolex, Supreme, Jain, Kisan, Astral, Dutron, Prince
14	CHROMIUM PLATED WATER SUPPLY FITTINGS	Jaquar, Ess Ess, Plumber ,ESSCO, Crown, Metro, Prince
15	GALVANIZED PIPE	Tata, Essco, Jaquar, Ess Ess, Plumber
16	GALVANIZED FITTINGS	'R' Brand, 'RV' Brand, Kranti
17	C.I. MANHOLE COVER	Manish, Sil, NECO
18	PLUMBING FIXTURES	Jaguar, Plumber, Essco
19	PVC WATER TANK (100% VIRGIN PVC)	SIntex, Aqua
20	ALUMINIUM SHEETS AND ACCESSORIES	Nalco, Jindal, Hindalco, Banko

Sr. No.	ITEMS	Approved Brands / Quality
21	ALUMINIUM EXTRUDED DOOR/ WINDOW SECTION	Jindal, Hindalco, Banko, Ajin India, Aldowin, Alumilite
22	ALUMINIUM HARDWARE	Rajdoot, Belu, Diamond, Glider, Ajin India, Aldowin, Alumilite
23	WATER PROOFING MATERIALS	Zycosil, Dr. Fixit,Kerakoll, Pidilite, Roff
24	DOOR CLOSER	Efficient Gadget, Everite, Hardwin, Aldowin, Ozone
25	DOOR FITTINGS	Godrej, Efficient Gadgets (E.G.) Dunex, Doorset, Suzu, Coral
26	HINGES	Suzu, Yama, E.P.P.W.
27	SCREW AND BOLTS	Nettle Folds, GKW, Stud
28	BOLTS & FASTENERS	Hilti, Fisher
29	LIFT	Top, Express, Omega,OTIS, Schander, TRIO, Aegis Elevator, Mitsubishi, Aditya, Siemens slider
30	ROOFING MATERIAL – Galvalume sheets	TATA, Essar, Jindal
31	Slag Cement	SANGHI CEMENT Sanghipuram
32	CPVC PIPES FOR AUTOMATIC SPRINKLER FIRE EXTINGUISHING SYSTEM	ASTRAL POLY TECHNIK LIMITED પાર્કિંગ એરિયા, બેઈઝમેન્ટ એરિયા જેવા વિસ્તારો સિવાય માત્ર કન્સીલ્ડ પાઈપીંગ માટે આ કંપનીના CPVC pipe નો ઉપયોગ fire sprinkler piping માટે કરવાની મંજુરી આપવામાં આવે છે.
33	AAC Blocks	NXTBLOC
34	Jointing Mortar	NXTFIX Block
35	Ready Mix Plaster	NXTPLAST
36	Block joining Masonry Mortar	Unifix
37	Tile adhesive	Unifix
38	RCC bench	Sardar Pre cast
39	Rubber mould garden curbin	Sardar Pre cast

Sr. No.	ITEMS	Approved Brands / Quality
40	Rubber mould Paver block	Sardar Pre cast
41	Fencing Pole	Sardar Pre cast
42	RCC Masonry block	Sardar Pre cast
43	Pre cast wall	Sardar Pre cast

(B) LIST OF APPROVED VENDORS FOR MECHANICAL & ELECTRICAL WORKS

Sr. No.	Description	Name of Manufacturer
1	HSCF Pump	Crompton Greaves Ltd
		Kirloskar Brothers Limited (KBL)
		JASCO
		Mather & Platt Pumps Ltd.
		Jyoti Ltd.
2	Electric Motor	Lubi Industries LLP
		Bharat Bijlee Ltd.
		Jyoti Ltd.
		JSL Industries Ltd.
		Jeumont Electrical India Pvt. Ltd.
		LHP
3	Electrical Panel	Crompton Greaves Ltd
		Bhagyashree Power Control
		Dynamic Control System
		Elembica Services
		JSL Industries Ltd.
		Nutral Power Tech
4	Kinetic Air Valve	Kirloskar Brothers Limited (KBL)
		FOURESS Engineering (India) Limited.
		Durga Valves Pvt.Ltd
		Orbinox
		શ્રી કિષ્ના ઈન્ડસ્ટ્રીઝ
5	Expansion Bellows	Precise Engineers
6	Dewatering (Drain) Pump(Submersible/ Horizontal)	KSB Pumps
		Kirloskar Brothers Limited (KBL)
		JASCO
		Crompton Greaves Ltd
		La Gajjar Machinery Pvt Ltd.
		Pullen Pumps Industries Pvt. Ltd.
		MBH
7	Sluice Valves and Sluice Gate	Kirlosker Brothers Limited (KBL)
		DURGA Valves Pvt.Ltd
		L & T Valves
		Jupiter
		SACHDEVA
8	UPVC Pipe	Supreme Industries Ltd.,Mumbai
		Dutron Polymers Ltd
		Parixit Industries Ltd., A'bad
		Jain Irrigation Systems Ltd., Jalgaon
9	HDPE Pipe	Parixit Industries Ltd., A'bad
		Jain Irrigation Systems Ltd., Jalgaon
		Dutron Polymers Ltd
		Jindal
		Essar Steel
10	C.I. Pipe	Electro Steel, Kejriwal, Oriental Castings, BIC, Jindal, Lanco Industries Ltd.,Chennai, Kesins
13	EOT Crane	Grip Engineering Pvt. Ltd., JAPS Project, Brady & Morris Engineering Co. Ltd., Techno Industries

Sr. No.	Description	Name of Manufacturer
14	Cable & Wires	KEI Industries Ltd.
		Polycab Wires Pvt. Ltd.
		Aerolex Cables Pvt. Ltd.
		Allwin Industries
		Finolex Cables
		L&T Cables
		ULTRA CAB (India) Limited
15	Transformer	Atlanta Electricals Pvt. Ltd.
		Powerlite Electricals
		Voltamp Transformers Ltd.
		SKP Transformers
		Arya Electronics
16	Components for MCC :	
	Switch	L&T, Siemens
	HRC Fuse	L&T, Siemens
	Timer	L&T, Siemens
	Relay	L&T, Siemens
	Push Button Stations	L&T, Siemens
	Indicating Lamp	L&T, Siemens
	Cable Jointing Kit	CCI, M. Seal
	MCB/DB's	MDS, Siemens, Indokupp
17	Capacitors	L&T, Crompton, Khatau Note: Capacitors shall be oil fill type
18	KWH Meter	Simco, Jaipur, GEC
19	Light Fittings: (Indoor & Outdoor Luminaries)	Philips, Crompton, Bajaj, NESSA Illumination
20	Exhaust Fans	Crompton, Bajaj,
21	Ceiling Fans	Crompton, Bajaj, Havells
22	Air Blowers	Everest Ltd.
		Swan Pneumatics (P) Ltd
23	Alum Dosing Pumps	Asia LMI
		VK Pumps
		Swelore
24	Pressure Gauges	General Instruments
		Bells Control
		H. Guru Marketing
25	Level Gauge / Indicator	R K Dutt
		Levecon
		S. B. Electromec
26	Clarifier Equipment	Enviro Control Associates
		Voltas Ltd
		Hindustan Dorr-Oliver
		Geomiller/Triveni
27	Chlorination System	Industrial Device (I) Pvt. Ltd
		Metito
		Chloroequip
		Pennwalt
28	Gear Box	Greaves
		Radicon
		Elecon
		Shanti

Sr. No.	Description	Name of Manufacturer
29	Level Switches	Level-Tech
		Revathi Electronics
		Levec
30	Refrigerator	LG, Samsung, Kelvinator
31	PVC Pipes for Fluid	Finolex, Jain Irrigation
32	PVC Conduits for Electricals	Precision, Shakti
33	Butterfly Valve	KIRLOSKAR Brothers Limited(KBL), DURGA valves Pvt Ltd, L & T valves, R&D MULTIPLE, Jupiter, શ્રી કૃષ્ણા ઈન્ડસ્ટ્રીઝ IVC, IVI, Audco, R & D multiple, Jupiter, Cair, Orbit Engineers
34	Check Valve (Dual Plate check Valve)	KIRLOSKAR Brothers Limited(KBL), DURGA valves Pvt Ltd, Orbinox, R&D MULTIPLE, Orbit Engineers
35	Metallic Expansion Bellow	Beloflex(B.D. Engineers), Stanfab Engineering Pvt. Ltd., D. Wren Engineering Pvt. Ltd., Sur Industries,
36	Centrifugal / Centrifugal Non Clog Pumps	Beacon Weir, KSB, Mather & Platt (Wilo), Worthington, WPIL, Xylem pumps , Grundfos Pumps Pvt. Ltd., MBH, JASCO
37	Submersible non Clog Pumps / Submersible Centrifugal Pumps	Kirlosker, KSB, ABS, ITT- Flyght, Xylem pumps, Grundfos Pumps Pvt. Ltd. , MBH, JASCO, AQUA, Jyoti, PULLEN PUMPS, Alpha, Het Pump
38	Screw Pump	Roto, Netzsch, Tushaco, Seepex
39	Metering / Dosing Pumps	Swellore, V.K. Pumps, Shapotools
40	Non Return Valves (Single / multi door) / Dual Plate Check Valves	Kirlosker, IVC, IVI, R & D multiple, Durga, Jupiter, Cair, Orbit Engineers
41	Knife Gate valves	Jash, Fouess, Vass (Dezurick), Vag, Orbinox, Orbit Engineers
42	Sluice gates / open Chanel Gates	Jash Engineering, IVC, R & D Multiple, Jupiter
43	Mechanical Fine Screens – Step (Mat) Type / Drum Type	Jash, Huber, Johnson, Savi, Italy, Apollo Screens
44	Mechanical Course bar Screen	Jash, Huber, Johnson, HDO, Triveni, Savi, Italy
45	Manual Bar Screen	Jash, Japs, HDO, Triveni, Auric
46	Grit mechanism	EIMCO – KCP, Hindustan Dorr – Oliver, Jash-Shivpad, Triveni, Voltas
47	Diffused Aeration System	EDI, OTT, Rehau
48	Air Blower	Kay, Swam, Everest, Usha Compressors, Gardner Denver
49	Agitator / mixer	Remi, Schurtek, Fibre & Fibre, Milton Roy
50	Gear Boxes	Greaves, Elecon, CPEC, PEPL, Bonfiglioli
51	Centrifuge	Humboldt, Alpha Laval, Hiller

Sr. No.	Description	Name of Manufacturer
52	HDPE Pipes	Astral, Dutron, Duraline, Narmada, RIL (PIL), Penwalt, Anjney, jain irrigation, Sangir
53	Air Compressor	Ingersoll – Rand, khosla, Kirlosker, CPE, Alpha
54	Bearing For All Equipments	SKF, FAG, Tata
55	Fasteners	Precision, Durakhanawala, Echjay, Tata, Sundaram
56	Mechanical Seals	Eagle Seals (Sealol), Durametallic, Burgman
57	Electric Actuator	Auma ,Rotork, Emerson, Pentair
58	(1) CATEGORY III Indoor LED fittings, LED Panel light, LED down light, outdoor LED ligh (street light, LED flood light, LED Post top lantern, LED bollard) (2) Solar LED Light	NESSA ILLUMINATION TECHNOLOGIES PVT.LTD., Litsun, Nextray
59	STREET LIGHT POLES	AMBICA POLES (for octogonal poles,swage poles,street loght poles, high mast poles,decorative poles, conical poles, JETCOTECH Engineering LLP
60	Resilient Seated Slice Valve	Cair
61	Air Vale	Cair, Orbit Engineers
62	Flow Control valve	Cair
63	Altitude Control valve	Cair, Orbit Engineers
64	Pressure reducing valve	Orbit Engineers
65	Pressure relief valve	Orbit Engineers
66	Ball valve	Orbit Engineers
67	Mast pole	JETCOTECH Engineering LLP
68	Earthing material	JETCOTECH Engineering LLP
69	Hot dip galvanizing	JETCOTECH Engineering LLP
70	LED Highbay	Litsun

(C) LIST OF APPROVED VENDOR FOR INSTRUMENTATION SYSTEM

SR NO	DESCRIPTION	Name Of Manufacturer
1	Electromagnetic Flow Meter	E+H, Siemens, Abb, Fuji, Yokogawa, Krohne-Marshall, AAROHI Embedded System Pvt Ltd., Emerson, SBEM
2	Pressure Gauges	Wika, H.Guru, General Instruments Consortium Manometer (India) P. Ltd. , Baumer, Waaree
3	Pressure Switch	Danfoss , Indfoss , Switzer
4	Process Analyzers (pH, DO, Free / Residual Chlorine , BOD / COD)	E+H , Emerson , Hach , Chemitech , Polymetron, Wtw (Forbes Marshall),Yokogawa
5	Ultrasonic transmitter level / diff. level / flow	E+H, Siemens – Milltronics, Krohne, Vega
6	Hydraulic level transmitter	E+H,Siemens, ABB, Forbes- Marshall, Emerson, SBEM
7	Displacer/Float Switches	Levcon, Nivo, Toshbro, Pune Techtrol , SBEM
8	PP Float / Buoyancy switch	Pepprl + Fuchs, Baumer, Waaree, E+H , Pune Techtrol , SBEM
9	Float & Board Type Level Gauge	Levcon, Nivo, Toshbro, Pune Techtrol, SBEM
10	Electromagnetic Flow Meter	E+H, Siemens, ABB, Fuji, Yokogawa, Krohne-Marshall
11	Field Transmitter (P, DP,F, L , T)	ABB, Fuji, Yokogawa, Honeywell, Emerson
12	Pressure Gauges	Wika, H.Guru, General Instruments Consortium Manometer (India) P. Ltd., Baumer, Waaree
13	Panel Mounted Process Indicator & Flow Integrator	Masibus, Nishko, Nivam, Selectron, Radix, Yokogawa, ABB
14	Pressure Switch	Danfoss, Indfoss, Switzer
15	Programmable Logic Controllers	Rockwell (Allen Bradeley), Siemens, Schneider, Fuji, ABB, GE Fanuc
16	Control Panel Enclosure	Rittal, Enklotek, Bartakke, BCH, Eldon
17	Alarm Annunciator	Aplab Ltd., Minilec , IIC
18	Solenoid valves	Asco, Rotex, Schrader
19	Tube Fitting	Excel Hydropneumatic, Multimetal, Placka

20	Instrument Valves , Manifolds	Aptek, Anmol (Superlok), Excel Hydropneumatic, General
21	Fitting	Instrument Consortium , Multimetal, Technomatic, Placka
22	Pneum , Brass Fitting	Swagelok, Multimetal Industries, SMC, Festo
23	Control Panel Accessories / Components	
a.	Miniature Relay	Wago, Omron,Phoenix, Rockwell
b.	Indication Pilot Lamps (LED Type)	Teknic, Schneider, Siemens
c.	Push Button / Selector Switch (with NO/NC Elements)	Teknic, Schneider, Siemens
d.	DC Power Supplies (DIN Rail mounted)	Phoenix, Omron, Schneider, Rockwell
e.	Terminals	Elmex, Phoenix, Wago, Connectwell
f.	Panel Wires	Finolex , Havell's , R R Kabel
g.	Panel Illumination	Philips , Crompton , GE
24	Instrument Cables (Power , Signal , Control)	Associated Cables, Associated Flexible and Wires P.Ltd., Brooks Cables, Thermo Cables, Udey Pyro
25	Cable Glands	Ex- protecta, Braco, Sudhir, Comet, Connectwell
26	Junction Box	Ex- protecta, CEAG, Sudhir, Baliga, FCG
27	Cable Tray	M.M.Engineering, Globe, Jacinth, Equi. Reputed, JETCOTECH Engineering LLP
28	Computer System	HP-Compaq, Dell, IBM, Sony, Samsung
29	UPS	Hirel-Hitachi, Emerson, APC
30	1. PLC (Programmable Logic Controller) 2. SCADA (Supervisory Control and Data acquisition) 3. VFD (Variable Frequency Drive Up to 500 KW) 4. ACB (Air Circuit Breaker up to	MITSUBISHI ELECTRIC INDIA PRIVATE LIMITED, Emerald House, EL-3, J Block, M.I.D.C., Bhosari, Pune 411026

	6000A) 5. MCCB (Moulded Case Circuit Breaker up to – 1600 A) 6. MCB (Miniature Circuit Breaker up to – 63 A) 7. ELCB (Earth Leakage Moulded Case Circuit Breaker up to 1600 A) 8. Contractor up to – 800 A & OLR (Over load Relay) up to 630 A 9. Multi Functional Meters 10. MPCB (Motor Protection Circuit Breaker up to 32 A)	

(D) LIST OF APPROVED VENDORS FOR MATERIALS RELATED TO WATER SUPPLY AND SEWERAGE NETWORK

SR. NO.	ITEMS	NAME OF AGENCIES
1	A C Pressure pipe MAZZA process	Lotus, Kirti
2	A C Pressure pipe MEGHNANI process	Lotus, Kirti, Hindustan
3	Sluice Valve	Durga, kartar, Kirloskar, Jupiter, SACHDEVA (C.I. & D.I.), શ્રી કિષ્ના ઈન્ડસ્ટ્રીઝ, Cair, Orbit Engineers
4	DI Pipe	Electrotherm (I) Ltd.,Ahmedabad, Lanco Industries Ltd.,Chennai, Electrsteel, Jindal Saw Ltd.,Ahmedabad, Kesins, Welspun
5	R.C.C. PIPE (COLLAR JOINT & SOCKET SPIGOT JOINT) CLASS NP3 & NP4, & R.C.C. COLLARS	VIPUL SPUN PIPES (SIHOR & LATHIDAD,BOTAD), KATARIYA & CO. (DHASSA), OMKARESHVAR PIPES (NAVAGAAM), OMKAR PIPES (LATHIDAD, BOTAD), MARUTI PIPES (BAGODARA ,AHMEDABAD), KALATHIYA PIPES(BAGODARA ,AHMEDABAD), R. S. PIPES (BODELI), UMA HUME PIPES (KALOL, GANDHINAGAR), SIDHDHIVINAYAK (KARDEJ ,BHAVNAGAR)
6	R.C.C. MACHINEOLE FRAME & COVER, INLET FRAME COVER 10T.(600*450 MM.) , 20T.,35T., & 50T.	SONI CEMENT PRODUCT , VIPUL SPUN PIPES, KATARIYA & CO., OMKARESHVAR PIPES, OMKAR PIPES, MARUTI PIPES, KALATHIYA PIPES , R. S. PIPES, UMA HUME PIPES, SIDHDHIVINAYAK , S.K. Corporation, Laxmi Price Industries, S.J.Corporation, Sardar pre cast
7	Stone ware PipeManufacturer having BIS Certificate for ISI marking	Krishna Pipe, j.K. Pipe, Taya ceramic, Burn & co., perfect Potteries, Navroji Vakil, Kashmira
8	D.I. & C.I. FITTINGS	RG BRAND, ESSEM Engineering Industries, Bikaners Engineers works
9	CID Joints	ESSEM Engineering Industries
10	Valves & Graded Castings	ESSEM Engineering Industries
11	Pipe Fittings	ESSEM Engineering Industries, Bikaners Engineers works
12	CI/DI/MS graded castings	Bikaners Engineers works
13	Scaper machine hole	Sardar Pre cast

Kiosk Advertisement

Figure 4.2 Reference Image of Kiosk Advertisement

Kiosk advertising offers high visibility in prime locations, providing a cost-effective way to reach a diverse audience. These strategically placed kiosks ensure 24/7 exposure and can display versatile formats, including digital and interactive media, enhancing engagement and relevance. By integrating aesthetically into the urban landscape, kiosks foster local trust and connection while delivering immediate impact for time-sensitive promotions. Their durability and regular maintenance ensure lasting, high-quality brand presence, making kiosk advertising a powerful tool for boosting visibility and engagement.

Decorative Lighting

Decorative road lighting significantly enhances cleanliness by illuminating streets, making it easier to spot and clean litter, debris, and spills. Improved visibility deters littering and vandalism, promoting a sense of civic pride and responsibility. Well-lit roads also facilitate nighttime cleaning operations, ensuring thorough and efficient maintenance. Additionally, the aesthetic appeal of decorative lighting encourages community engagement and respect for public spaces, contributing to overall urban cleanliness and hygiene.

Figure 4.3 Reference Image for Decorative lighting

Fountains on the Junction

Fountains provide a multitude of benefits beyond their aesthetic appeal, serving as focal points that enhance the ambiance of public spaces. Their soothing sounds and visual allure create a calming effect, promoting relaxation and stress relief for passersby. Fountains also act as natural humidifiers, especially in arid climates, improving air quality by releasing tiny water droplets that cleanse and hydrate the surrounding environment. Additionally, they serve as gathering spots, fostering social interaction and community cohesion. From a practical standpoint, fountains help cool urban areas during hot weather, contributing to a more comfortable and enjoyable outdoor experience for residents and visitors alike.

Figure 4.4 Reference Image for Fountains

pedestrian footpath paintings and paver block design

Painting on the footpath can significantly enhance the overall beauty and aesthetic appeal of the road. In addition to improving the visual aspect, we have the wonderful opportunity to create vibrant and joyful paintings specifically designed for the children

we can create design from the paver blocks as well using different kind of colors, shape and size .

Figure 4.5 Reference image for the path way

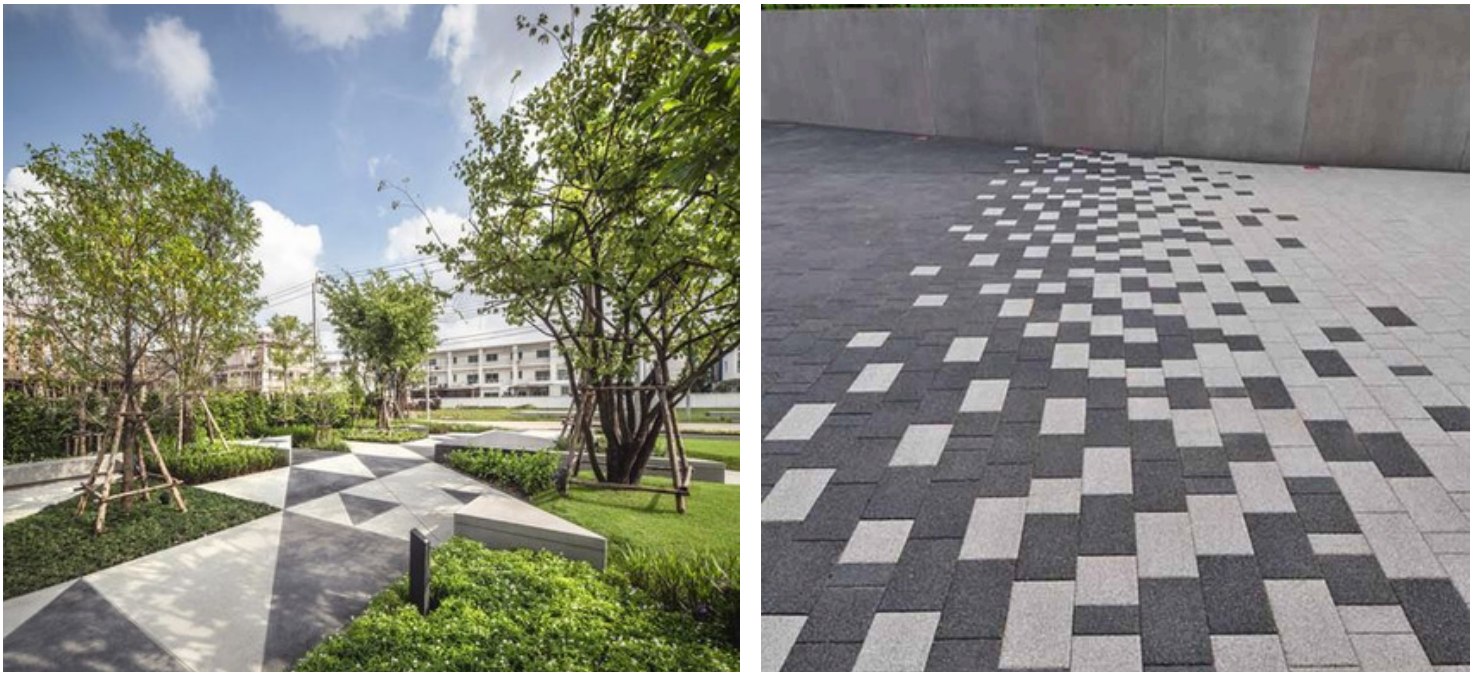

Figure 4.6 Reference image for the path way

KIOSK

In addition, placing an information kiosk in a strategic location along Furniture Lane would serve an important purpose by offering advertisements, as well as providing valuable information related to the city. This dual approach could enhance the vibrancy of the area and ensure that visitors have easy access to both promotional content and essential city updates.

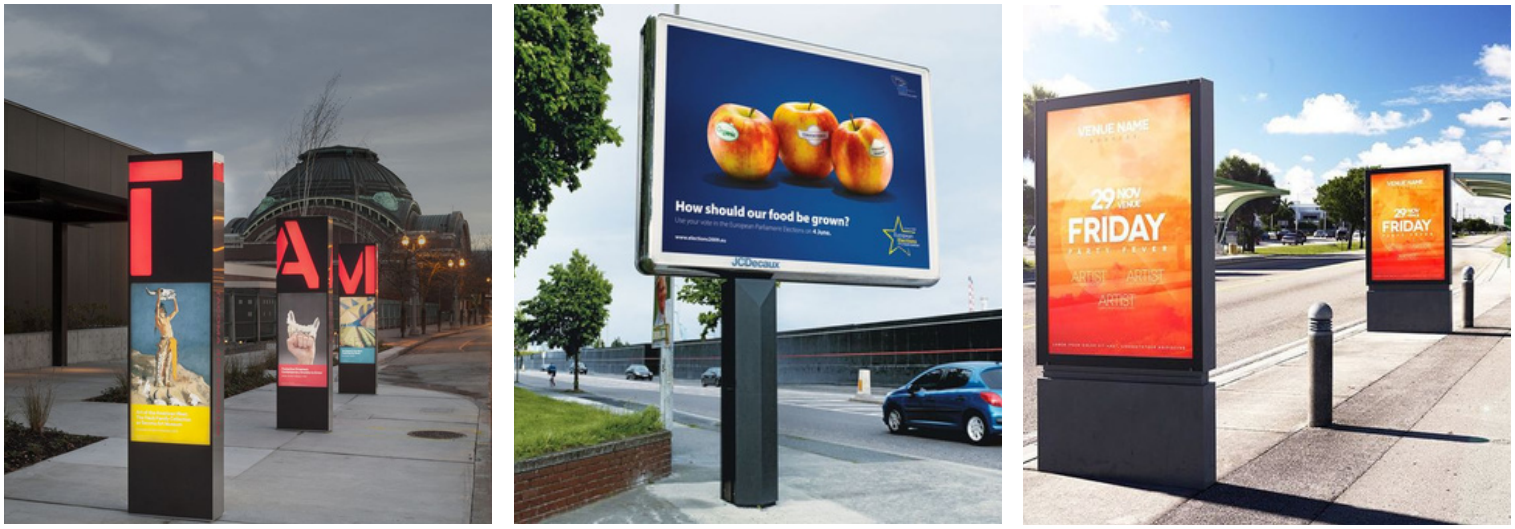

Figure 4.9 Reference images for the kiosk

Litterbins

Litter bins ought to be strategically positioned at consistent and regular intervals along the path to ensure that the footpath remains clean and well-maintained for everyone who uses it. By doing so, we can help facilitate proper waste disposal and encourage individuals to keep the area tidy.

Figure 4.11 Reference images for the twin litterbins

Use of Sustainable Materials and Design Elements

The sustainable materials and design elements are used to provide aesthetic and environmentally sound feature to enhance the beauty of Iconic Road.

Sculpture

Sculptures made from discarded waste materials or scrap items have the potential to significantly enhance the visual appeal of road junctions. In addition to beautifying these often-overlooked spaces, they serve to effectively promote and underscore the important principles of reduction, reuse, and recycling. By transforming waste into art, these sculptures not only capture attention but also inspire a greater awareness about sustainable practices in our everyday lives. The presence of such innovative creations encourages the community to reflect on the value of materials.

Figure 4.12 waste to art artefacts

Figure 4.13 Street furniture and waste to art benches

Figure 4.14: Pavements on footpath

Conceptual Representation of Road

The conceptual Representation visuals of the Iconic Road components is prepared for better understanding.