INDIAN INSTITUTE OF TROPICAL METEOROLOGY
PASHAN, PUNE-411 008
Tender No. CE/IITM/works/12-13/06
e-TENDER NOTICE

Director, Indian Institute of Tropical Meteorology, Dr. Homi Bhabha Road, Pashan, Pune-411 008 (India) invites sealed tenders (Part-I – Technical Bid, Part-II – Commercial Bid) in separate sealed covers from contractors registered in the approved list of contractors of PWD/CPWD/MES/Railways/P&T/Experienced industrial contractors and any other government department in appropriate class for following work :

Name of the work: Renovation of 2 Blocks of Type-III (Qtr No. 21 to 24 & 25 to 28) at IITM Colony campus, Pune-411008.

Tender documents can be down loaded from e-procurement web site http://www.eprocure.gov.in or from Institute's web site http://www.tropmet.res.in and also can be obtained from the civil wing of the Institute. The tender documents fee Rs.1000=00 (Rs.One thousand only) in the form of DD only drawn in favour of Director IITM Pune

Date of issue of tender documents:	**19.06.2012**
Pre-Bid Meeting	**28.06.2012 at 1100 hrs**
Last date of receipt of Tender at IITM, Pune:	**10.07.2012 at 1230 hrs**
Opening of Tenders (Technical Bids only):	**10.07.2012 at 1500 hrs**

The Institute reserves the right to reject any or all tenders without assigning any reasons thereof.

Civil Engineer
anupam@tropmet.res.in

TENDER FOR

RENOVATION OF 2 BLOCKS OF TYPE-III (Qtr No. 21 to 24 & 25 to 28)
AT
INDIAN INSTITUTE OF TROPICAL METEOROLOGY, COLONY CAMPUS, DR. HOMI BHABHA ROAD,
PASHAN, PUNE-411008

PART- I

(TECHNICAL BID)

INDIAN INSTITUTE OF TROPICAL METEOROLOGY,
DR.HOMI BHABA ROAD, PASHAN, PUNE-411008

INDIAN INSTITUTE OF TROPICAL METEOROLOGY PUNE 411 008
TERMS & CONDITIONS
ENQUIRY NO: **CE/IITM/works/12-13/06**
Tender No. CE/IITM/works/12-13/06
Sealed item rate tenders are invited from the Contractors registered in the approved list of PWD, MES, CPWD, Railways and P&T in appropriate class for carrying out the following work at Indian Institute of Tropical Meteorology, Pune-8

Sr.No.	Name of Work	Tender Fee	EMD	Completion Period
1.	Renovation of 2 Blocks of Type-III (Qtr No. 21 to 24 & 25 to 28) at IITM Colony campus, Pune-8.	Rs 1000/- Non-Refundable	Rs. 1,20,000/-	6 months [including monsoon]

1) Contractors shall produce **banker's solvency certificate** for value of **Rs. Twenty lakhs** obtained not earlier than three months from last date.

2) On production of definite proof of valid contractor license / enlistment certificate with the PWD/CPWD/MES/Railways/P&T/Experienced industrial contractors and any other government department in appropriate class, issued by the respective enlistment authority of the concerned department for the amount not less than estimated value of the work.

3) Satisfactorily completed 3 similar works each costing **Rs. Twenty lakhs** or completed two similar works of each costing **Rs. Thirty lakhs** or completed one similar work costing Rs. **Sixty lakhs**, during the last three years.

4) Should not have incurred any loss in more than two year during the last five year ending 31st March 2012.

5) Technical evaluation committee of IITM will visit to Bidder's completed site & submit the report to IITM office, Pune. Based on IITM committee report bidders are subject to be qualified/disqualified.

6) The Tenderers are requested to give detailed sealed tender in their own forms in two Bids i.e.

Part – I Technical Bid

1) The contractor is required to submit proof of his latest valid **registration certificate** (**original**) with above bodies for the prescribed amount.
2) The contractor is required to submit proof of his latest Income **Tax clearance certificate.**
3) The contractor is required to submit a list of works in hand, and completed during the last 3 years.
4) Copy of Pre-Bid M.O.M. duly signed and stamped.
5) Bar chart/work completion schedule.
6) EMD.
7) Tender fee.

Part - II Commercial Bid

Both the sealed bids should be sent in another sealed envelope addressed to the Director, Indian Institute of Tropical Meteorology, Dr. Homi Bhabha Road, IITM Post, Pashan, Pune – 411 008, INDIA so as to reach on or before **10/07/2012 up to 12.30hrs.**

7) A sum of Rs. 1000/- (Non – Refundable) for the cost of tender documents DD drawn in favour of Director, IITM.

8) You have to submit two separate bids in two separate envelopes and you may keep both the bid envelopes in an envelope for sending to us.

9) One envelope will contain only the **TECHNICAL BID** of the indented equipment.

10) Another envelope will contain only the financial bid. **"The Contractor shall inspect the site and quote the rates inclusive of all taxes and duties etc."**

11) The main envelope, which will contain both the bids, should be super scribed with our tender enquiry No. **CE/IITM/works/12-13/ 06** due on **10/07/2012. (12.30hrs)**

12) The technical bids will be opened on **10/07/2012** at **1500 hrs** in the presence of tenderers who wish to be present & the financial bids of only those bidders will be opened whose technical bid is found suitable by us.

13) The Date and Time of opening for Part-II (Commercial Bid) will be intimated only to technically qualified Tenderers.

Last Date and Time for receipt of Tenders: **Up to 12.30 hrs. on 10/07/2012**
Date and Time of opening of Tenders: **At 15:00 hrs. on 10/07/2012**

(Part - I Technical Bid only)

14) This tender is not transferable.

15) Cost of the items should be mentioned clearly in the Commercial Offer (Part-II) only.

16) Tenders received through Fax / E-mail / Telegraphic / Telex will not be considered.

17) Tenders addressed to the Director, Indian Institute of Tropical Meteorology, Pune 411008 are to be submitted under two bids system. Super scribed with Tender No. **CE/IITM/works/12-13/06** for Renovation of 2 Blocks of Type-III (Qtr No. 21 to 24 & 25 to 28) at IITM Colony campus, Pune-8.

18) The tenders must be clearly written or typed without any cancellations / corrections or overwriting.

a) Tenders, which are submitted without following the Two-Bid Offer System, will summarily be rejected.

b) Unsigned Tenders will also be rejected.

c) Part and incomplete tenders are liable to be rejected.

19) The tenders will be received in the Institute till **10/07/2012** up to **12.30 hrs** and shall be opened on **10/07/2012** at **1500 hrs** (Technical Bids) in presence of the tenderers or their authorized agents who wish to be present.

20) IITM will not be responsible:

a) For delayed / late quotations submitted / sent by Post / Courier etc.

b) For submission / delivery of quotations at wrong places other than the Office of Director, IITM, Pune,

21) The tender / quotation / offer submitted by the firm should be valid for a minimum period of **One hundred twenty (120) days** from the date of opening the tender.

22) The Tenderer's conditions printed on the tender or otherwise sent along with the tender shall not be binding on IITM.

23) **Delivery Period**: As time is the essence of the contract, period of completion work (Six months including monsoon) mentioned in the work Order should be strictly adhered to.

24) The Tenderer is required to furnish the Permanent Account Number (PAN) and Service Tax no. if any allotted by the Income Tax Department. If registered with the National Small Industries Corporation, the registration number, purpose of registration and the validity period of registration' etc. should also be provided in Technical Bid.

25) A copy of latest Income Tax Clearance Certificate from Income Tax Department (INDIA) for in Technical Bid.

26) **PAYMENT**: a) No advance can be paid.

b) Payment will be made in RA bills of 20 lakhs each.

c) Performance security **5%** of order value in the form of BG/DD in favour of **Dircetor IITM**, drawn on Nationalized Bank which will be refunded on completion and handing over of the work at site.

d) 5% security deposit will be recovered & retained from each running bill which will be refunded after defect liability period of 12 months.

27)The prices quoted should be firm and irrevocable and not subject to any change whatsoever, even due to increase in cost of raw material components and fluctuation in the foreign exchange rates and excise duty.

28) IITM will not provide any accommodation/transportation for the Engineers/Representatives.

29) DEFECT LIABILITY PERIOD: Defect liability period of the work will be 12 months from the date of actual completion of work and taking over by the Institute.

30) No sub-contracting will be allowed for installation or maintaining system/ equipment/ instrument during or after warranty period.

31) Discount if any offered should be mentioned clearly in the commercial bid only.

32) a) The Earnest Money Deposit of **Rs.1,20,000=00 (Rs. One lakhs Twenty thousand only)** must be paid / sent along with your technical bid in the form of a Demand Draft, Banker's cheque or Bank Guarantee drawn on Nationalized Bank drawn in favour of **The Director, Indian Institute of Tropical Meteorology, Pune payable at Pune**, otherwise your technical & financial bids will not be considered at all.

b) The Earnest Money of the unsuccessful bidder whose technical bid has not been found suitable will be returned issue of LOI to successful biders.

c) Though EMD has to be submitted by Demand Draft or Bank Guarantee, we prefer to have Bank Guarantee for easy return to the bidders once a decision is taken by IITM. (Specimen of Bank Guarantee is enclosed at Annexure '1').

d) Tenders not accompanied with Demand Draft / Bank Guarantee towards "Earnest Money Deposit" will summarily be rejected.

33) If the work is not completed by scheduled time or if you leave work in half complete stage, the **liquidated damages** will be charged or deducted 1.0% per week and the maximum to 10% value of work order.

34) The rate for **Extra Item** shall be worked out in accordance with the following rules:

A.The rates for the extra items shall be derived from the rate of an appropriate item of similar class for which the rate already has been accepted, where same can be directly derived.

b) The contractor shall bind to carry out any extra items of work as per site requirement. The rate for extra items shall be derived from the rate already quoted. Where the items are not specified in the BOQ the rate shall be worked out at cost of material +labour cost+10% over heads,wastage,transportation & profit.

35) **Corrupt or Fraudulent Practices.**

A) IITM requires that the bidders/contractors under this tender observe the highest standards of ethics during the procurement and execution of such contracts. In pursuance of this policy, IITM:

i) Defines for the purposes of this provision, the terms set forth as follows:

a) "Corrupt practice" means the offering, giving, receiving or soliciting of anything of value to influence the action of the public official in the procurement process or in contract execution; and

b) "Fraudulent practice" means a misrepresentation of facts in order to influence a procurement process or a execution of a contract to the detriment of IITM, and includes collusive practice among bidders (prior to or after bid submission) designed to establish bid prices at artificial non-competitive levels and to deprive IITM of the benefits of the free and open competition;

ii) Will reject a proposal for award if it determines that the Bidder recommended for award has engaged in corrupt of fraudulent practices in competing for the contract in question;

B) IITM will declare a firm ineligible, either indefinitely or for a stated period of time, to be awarded a contract if it at any time determines that the firm has engaged in corrupt and fraudulent practices in competing for, or in executing, a contract.

36) Conditional Offers will not be considered.

37) All disputes are subject to exclusive jurisdiction of Competent Court and Forum in Pune, India only.

38) The Director, Indian Institute of Tropical Meteorology, Pune 411 008, India reserves the right to accept any tender in full or in part or to reject the lowest or any or all tenders without assigning any reason.

39) The Director, Indian Institute of Tropical Meteorology, Pune will be the final authority to decide the appropriate action and it will be binding on the Vendor.

For Director

Email: ***anupam@tropmet.res.in***

Summary of Forms
(To be filled in by the contracting firm)

1) i) Name of the Contractor : _____

ii) Postal Address : _____

_____

iii) Telephone No. : _____

iv) Fax No. : _____

v) Mobile No. : _____

vi) Email Address : _____

2) Please mention status

i) Proprietary firm …….. : Yes / No*

ii) Partnership firm …….. : Yes / No*

iii) Pvt. Ltd. Co. …….. : Yes / No*

iv) Public Ltd. Co. …….. : Yes / No*

v) Co. Op. Society) …….. : Yes / No*

(* - Strike out whichever is not applicable)

3) a) Registration Class of Contractor :

b) Validity of Registration :

c) Authority issuing the registration Certificate (Copy of registration Certificate to be enclosed as Annexure I)

4) i) Mention the names of Partners or Directors :1)----------

2) ----------

5) Annual turnover of the firm for last 3 years as Certified by the Chartered Accountant vide Form F. : 2009-2010 Rs. ……

2010-2011 Rs. ……

Minimum required turnover per year 2011-2012 Rs. ……

Shall be more than **Rs. 60 lakhs** for any one of the year.

6) a) Whether the contractor is having valid VAT & Service Tax Registrations : Yes/No

b) If so whether the certified copy of Such registration is enclosed (As Annexure II) : Yes/No

7) a) Whether the contractor is having plant, machinery and equipments as per requirement of project : Yes/No

b) If yes, whether information in form “A” with documentary evidence is furnished. : Yes/No

8) Whether the information in respect of trained and qualified staff is furnished in form B with documentary evidence. : Yes/No

9) a) Whether the contractor has executed a single work of similar nature having cost of work **Rs. 60 lakhs** (**Rs. Sixty lakhs only)**. : Yes/No

b) If Yes, whether the information of such work in form "C" is furnished. : Yes/No

c) Whether the certificates from concerned authorities in 'E' form are enclosed (Work value should be more than the amount as mentioned under Sr. No. 9) : Yes/No

10) Whether the list of works in hand is enclosed in form "D" : Yes/No

11) Whether the amount of balance Works vide col. No.5 of Form "D" : Yes/No is mentioned.

Quote the amount of balance work. : Rs._____

12) State…..

a) In how many cases the notice under penalty / Liquidated damages clauses of the tender was issued to the applicant during last 3 years. : Nos/Nil

b) In how many cases the work was rescind during last three years. : Nos/Nil

c) If the work is rescind, the reasons for the same shall be mentioned : _____ with documentary proof. _____

d) In how many cases compensation was recovered for slow progress : _____

13) Whether financial information in form "F" is furnished duly signed by Chartered Accountant : Yes/No

14) Quote the bid capacity calculated as Per formula prescribed for the Purpose. (Shall not be less than the cost put to tender) : Rs._____ lakhs

15) Quote the Net worth to long term Liabilities : _____ (shall not be less than 20%)

16) Quote the Net profit to capital investment : _____ (should not be less than 5%)

17) Whether the list of machinery owned by the tenderer which will be used for the work is enclosed in form “A” : Yes/No

18) Whether the list of technical personnel of the tender likely to be deployed for each project is enclosed in form “B” : Yes/No

19) Whether the details of works of similar or allied type and magnitude carried out by tendered is enclosed in form “C” : Yes/No

20) Whether the details of other works tendered for and in hand on the date of submission of this application is enclosed in Form “D” : Yes/No

21) Whether the details of certificate in respect of completion of work by tenderer enclosed in form “E” : Yes/No

22) Whether the details of financial statement enclosed in form “F”: Yes/No

The information given above and in the enclosed forms, annexure is true to the best of my knowledge and belief and I am fully responsible for its correctness.

Signature of Contractor

Date: _____

The Director,
IITM

FORM - A

LIST OF MACHINERY OWNED BY THE TENDERER WHICH WILL BE USED FOR THIS WORK.

NAME OF TENDERER: _____

Sr. No.	Name of Machineries and Equipments required for execution of work	No. of Machineries, equipments required for the work.	No. of Machineries, equipments owned by Tenderer	No. of Machineries equipments separable for this work
(1)	(2)	(3)	(4)	(5)

Sufficient proof in support of the machinery owned by tenderer as mentioned under **Sr. No. ____ to ____** be produced. Tenderer should produce documentary evidence like statement of fixed assets attached with balance sheet, RTO registration etc, for having owned the machinery as on date not earlier than 6 months of the date of submitting the pre-qualification form. The Xerox copy of the documents shall be readable and attested by Gazetted officer. If the tenderer does own the said machinery he shall not be pre-qualified.

If the information found false and misleading, he shall not be pre qualified.

Note: The rent agreement for hiring the machinery shall not be accepted.

Tenderer **Director, IITM**

FORM-B

Sheet No.

LIST OF TECHNICAL PERSONNEL OF THE TENDERER LIKELY TO BE APPOINTED ON THIS WORK

NAME OF WORK :

Sr. No.	**Name of Persons**	**Designation / holding the post in the firm.**	**Status in the firm**	**Academic Qualification & experience**	**Remarks & any other points.**
1.	2.	3.	4.	5.	6.

NOTE :-

1) Continuation sheet shall be used if required.

2) The contractor should produce either a copy of form No. 24 of annual return of I. T. Authority for schedule of employees attached to the latest annual report or such other proof like extract of employment tax register, to the satisfaction of tender inviting authority.

Contractor **Director, IITM**

FORM-C

Sheet No.

DETAILS OF WORKS OF SIMILAR OR ALLIED TYPE AND MAGNITUDE CARRIED OUT BY TENDERER

NAME OF TENDERER. :

Sr.No.	*Name of work*	*Name of Organisation and place of work*	*Tender cost*	*Stipulated date of completion*	*Actual Date of completion*	*Principal features in brief.*
1.	*2.*	*3.*	*4.*	*5.*	*6.*	*7.*
		TOTAL				

NOTE :-

1) The contractor should have completed at least a single work of similar nature as mentioned under Sr. No. 9

(Only one or two works which contractor claimed to be the best and fulfil the norms and willing to produce the experience Certificate in form 'E' shall only be mentioned.)

Contractor **Director, IITM**

FORM-D

Sheet No.

DETAILS OF OTHER WORKS TENDERED FOR AND IN HAND ON THE DATE OF SUBMISSION OF THIS APPLICATION

NAME OF TENDERER. :

Sr. No	Name of work	Name of organization and place of work	Work in hand			Works tendered For			REMARKS
			Tendered cost	Cost of remaining work	Anticipated date of completion	Estimated cost.	Date when decision is Expected.	Stipulated period for completion.	
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
		TOTAL			TOTAL				

NOTE :- The continuation sheet may be used if required.

Contractor **Director,IITM**

FORM-E

CERTIFICATE IN RESPECT OF COMPLETION OF WORK BY CONTRACTOR.

1. Name of contractor. : _____

2. Name of work. : _____

3. Estimated cost put to tender. : Rs. _____

_____

4. Period stipulated in tender : for completion of work. _____

5. Date of work order. : _____

6. Actual Date of completion. : _____

7. If time over-run, the reasons : for the same. _____

8. Final cost of work completed. : _____

i) Has he started the work promptly after issue of work order? : YES / No

ii) Has he maintained the progress: of work as per agreement? : YES / No

iii) Quality of work : Excellent / Good / Satisfactory.

iv) Compensation / Penalty levied **if any, with reasons.** _____

_____

_____

9. **Any other information about the overall performance of the contractor, the authority may like to mention.** : _____

_____

_____

_____

Certified that the information given above is based on the facts and figures recorded in this office through various documents and is true to the best of my knowledge and belief.

Signature and seal of Officer issuing the Certificate.

Outward No. _____

Dated : _____

NOTE :- **1) For works costing Rs. 1.00 Crore and above certificate issued by the S. E. or duly countersigned by the SE/CE shall be accepted.**

Contractor

The Director,

IITM

FORM –F

FINANCIAL STATEMENT

1. Name of Contractor : In case of Joint Venture / Consortium, the name of the Consortium firm).

2. Summary of Assets & Liabilities : on the basis of the audited financial statement of the last three financial years. (Attach copies of the audited financial statements of the last three financial years)

		Year 2009-2010 (Rs. In Lakhs)	**Year 2010-2011 (Rs. In Lakhs)**	**Year 2011-2012 (Rs. In Lakhs)**
A)	Authorized capital			
B)	Issued capital			
C)	Paid up Capital /Partners / Proprietor Capital.			
D)	Reserves & Surplus.			
E)	Long term liabilities.			
F)	Current liabilities & Provisions.			
G)	**TOTAL (C + D + E + F)**			
H)	Net Tangible Fixed Assets.			
I)	Intangible Assets.			
J)	Long term investment			
K)	Current Assets, loans & Advances.			
L)	**TOTAL (H + I + J + K)**			
M)	Quick Assets i.e cash & equivalent, short term investment and current receivables.			
N)	Net profit after interest and depreciation.			

		Year 2009-2010 (Rs. In Lakhs)	Year 2010-2011 (Rs. In Lakhs)	Year 2011-2012 (Rs. In Lakhs)
P)	Turn over in terms of value of Civil / Electrical Engineering works executed during each Year as reflected in the Profit &Loss Account.			
3)	**RATIOS :**			
i)	Net worth to long term Liabilities (O:E)			
ii)	Current Ratio (K:F)			
iii)	Quick Ratio (M:F)			
iv)	% of net profit to capital invested i.e. (N x 100)/(C + D)			
4)	**Net Profit before Taxation**			
a)	Current Period.			
b)	During the last financial year.			
c)	During each of the Four previous Financial years.			
	Certified that the facts and figures given above have been verified from the audited balance sheet at the end of the respective year and the profit and loss accounts for the respective year, are true to the best of our knowledge and belief. Seal Signature of the Chartered Accountant.			

Contractor

The Director,
IITM

	Detail Calculations for all the Ratios should be submitted on separate Annexure.		
5.	Applicants financial arrangements (Mention amount in Rupees)	**:**	Rs.
a)	Own Resource	**:**	Rs.
b)	Bank Credit.	**:**	Rs.
c)	Others (Specify)	**:**	Rs.
6.	Certificate of financial soundness from bankers of applicants together with their full address.	**:**	
7.	Credit Facilities :	**:**	
a)	Name / Address of Nationalized Bank providing credit line.	**:**	
b)	Total Amount of credit line (Attach certificate from the bank)	**:**	
8.	Approximate value of works in hand.	**:**	
9.	Bid capacity i.e. (Ax N x2) – B where - (shall not be less than the cost put to tender)	**:**	
A	Maximum of the updated values of Civil & Plumbing works executed in one of the Preceding 3 years. The updating of the Value of work should be done at 10% per annum (compounded) by multiplying the Values with applicable factor i.e. 1.10, 1.21, Or 1.331 as the case may be.		
B	Value of existing commitment and works (on going or to be completed in the period stipulated for completion of the work in the present tender) i.e. from _____ to _____		
N	Number of years prescribed for completion of the work for which tenders are invited. = ____ Year.		

Contractor

The Director,
IITM

A. Special Conditions of Contract

1. LABOUR :

The Contractor shall, unless otherwise provided in the Contract, make his own arrangements for the engagement of all staff and labour, local or other, and for their payment, housing, feeding and transport.
The Contractor shall, if required by the Architect/Employer, deliver to the Architect/Employer a return in detail, in such form and at such intervals as the Architect/Employer may prescribe, showing the staff and the numbers of the several classes of labour from time to time employed by the Contractor on the Site and such other information as the Architect/Employer may require.

2. COMPLIANCE WITH LABOUR REGULATIONS :

During continuance of the contract, the Contractor and his sub contractors shall abide at all times by all existing labour enactments and rules made there under, regulations, notifications and bye laws of the State or Central Government or local authority and any other labour law (including rules), regulations, bye laws that may be passed or notification that may be issued under any labour law in future either by the State or
the Central Government or the local authority. Salient features of some of the major labour laws that are applicable to construction industry are given below. The Contractor shall keep the Employer indemnified in case any action is taken against the Employer by the competent authority on account of contravention of any of the provisions of any Act or rules made there under, regulations or notifications including amendments. If the Employer is caused to pay or reimburse, such amounts as may be necessary to cause or observe, or for non-observance of the provisions stipulated in the notifications/bye laws/Acts/Rules/regulations including amendments, if any, on the part of the Contractor, the Architect/Employer shall have the right to deduct any money due to the Contractor including his amount of performance security. The Architect/Employer shall also have right to recover from the Contractor any sum required or estimated to be required for making good the loss or damage suffered by the Employer.

The employees of the Contractor and the Sub-Contractor in no case shall be treated as the employees of the Employer at any point of time.

SALIENT FEATURES OF SOME MAJOR LABOUR LAWS APPLICABLE TO ESTABLISHMENTS ENGAGED IN BUILDING AND OTHER CONSTRUCTION WORK

(The law as current on the date of bid opening will apply)

a) Workmen Compensation Act 1923: The Act provides for compensation in case of injury by accident arising out of and during the course of employment.

b) Payment of Gratuity Act 1972: Gratuity is payable to an employee under the Act on satisfaction of certain conditions on separation if an employee has completed 5 years service or more or on death the rate of 15 days wages for every completed year of service. The Act is applicable to all establishments employing 10 or more employees.

c) Employees P.F. and Miscellaneous Provision Act 1952 *(since amended)*: The Act Provides for monthly contributions by the employer plus workers @ 10% or 8.33%.
The benefits payable under the Act are :
(i) Pension or family pension on retirement or death, as the case may be.
(ii) Deposit linked insurance on the death in harness of the worker.
(iii) payment of P.F. accumulation on retirement/death etc.

d) Maternity Benefit Act 1951: The Act provides for leave and some other benefits to
women employees in case of confinement or miscarriage etc.

e) Contract Labour (Regulation & Abolition) Act 1970: The Act provides for certain
welfare measures to be provided by the Contractor to contract labour and in case the
Contractor fails to provide, the same are required to be provided, by the Principal
Employer by Law. The Principal Employer is required to take Certificate of
Registration and the Contractor is required to take license from the designated
Officer. The Act is applicable to the establishments or Contractor of Principal
Employer if they employ 20 or more contract labour.

f) Minimum Wages Act 1948: The Employer is supposed to pay not less than the Minimum Wages fixed by appropriate Government as per provisions of the Act if the employment is a scheduled employment. Construction of Buildings, Roads, Runways are scheduled employments.

g) Payment of Wages Act 1936: It lays down as to by what date the wages are to be paid, when it will be paid and what deductions can be made from the wages of the workers.

h) Equal Remuneration Act 1979: The Act provides for payment of equal wages for work of equal nature to Male and Female workers and for not making discrimination against Female employees in the matters of transfers, training and promotions etc.

i) Payment of Bonus Act 1965: The Act is applicable to all establishments employing 20 or more employees. The Act provides for payments of annual bonus subject to a minimum of 8.33% of wages and maximum of 20% of wages to employees drawing Rs.3500/-per month or less. The bonus to be paid to employees getting Rs.2500/- per month or above upto Rs.3500/- per

month shall be worked out by taking wages as Rs.2500/-per month only. The Act does not apply to certain establishments. The newly set-up establishments are exempted for five years in certain circumstances. Some of the State Governments have reduced the employment size from 20 to 10 forthe purpose of applicability of this Act.

j) Industrial Disputes Act 1947: The Act lays down the machinery and procedure for resolution of Industrial disputes, in what situations a strike or lock-out becomes illegal and what are the requirements for laying off or retrenching the employees or closing down the establishment.

k) Industrial Employment (Standing Orders) Act 1946: It is applicable to all establishments employing 100 or more workmen (employment size reduced by some of the States and Central Government to 50). The Act provides for laying down rules governing the conditions of employment by the Employer on matters provided in the Act and get the same certified by the designated Authority.

l) Trade Unions Act 1926: The Act lays down the procedure for registration of trade unions of workmen and employers. The Trade Unions registered under the Act have been given certain immunities from interior and criminal liabilities.

m) Child Labour (Prohibition & Regulation) Act 1986: The Act prohibits employment of children below 14 years of age in certain occupations and processes and provides for regulation of employment of children in all other occupations and processes. Employment of Child Labour is prohibited in Building and Construction Industry.

n) Inter-State Migrant workmen‘s (Regulation of Employment & Conditions of Service)Act 1979: The Act is applicable to an establishment which employs 5 or more interstate migrant workmen through an intermediary (who has recruited workmen in one state for employment in the establishment situated in another state). The Inter-State migrant workmen, in an establishment to which this Act becomes applicable, are required to be provided certain facilities such as housing, medical aid, traveling expenses from home up to the establishment and back, etc.

o) The Building and Other Construction workers (Regulation of Employment and Conditions of Service) Act 1996 and the Cess Act of 1996: All the establishments who carry on any building or other construction work and employs 10 or more workers are covered under this Act. All such establishments are required to pay cess at the rate not exceeding 2% of the cost of construction as may be modified by the Government. The Employer of the establishment is required to provide safety measures at the Building or construction work and other welfare measures, such as Canteens, First-Aid facilities, Ambulance, Housing accommodations for workers near the work

place etc. The Employer to whom the Act applies has to obtain a registration certificate from the Registering Officer appointed by the Government.

p) Factories Act 1948: The Act lays down the procedure for approval at plans before setting up a factory, health and safety provisions, welfare provisions, working hours, annual earned leave and rendering information regarding accidents or dangerous occurrences to designated authorities. It is applicable to premises employing 10 persons or more with aid of power or 20 or more persons without the aid of power engaged in manufacturing process.

(i) ARBITRATION (GCC Clause 25.3)

If the decision of the Adjudicator as described in clause 25 is not acceptable , then the disputes can be referred to the Arbitrator.
The procedure for arbitration will be as follows :

25.3 (a) In case of Dispute or difference arising between the Employer and a domestic contractor relating to any matter arising out of or connected with this agreement, such disputes or difference shall be settled in accordance with the Arbitration and Conciliation Act, 1996. The arbitral tribunal shall consist of 3 arbitrators one each to be appointed by the Employer and the Contractor. The third Arbitrator shall be chosen by the two Arbitrators so appointed by the Parties and shall act as Presiding arbitrator. In case of failure of the two arbitrators appointed by the parties to reach upon a consensus within a period of 30 days from the appointment of the arbitrator appointed subsequently, the Presiding Arbitrator shall be appointed by the * Indian Council of Arbitration/President of the Institution of Engineers (India)/The International Centre for Alternative Dispute Resolution (India).

(b) If one of the parties fails to appoint its arbitrator in pursuance of sub-clause above within 30 days after receipt of the notice of the appointment of its arbitrator by the other party, then the * Indian Council of Arbitration/President of the Institution of Engineers (India) shall appoint the arbitrator. A certified copy of the order of the *Indian Council of Arbitration /President of the Institution of Engineers (India), making such an appointment shall be furnished to each of the parties.

(c) Arbitration proceedings shall be held at **Pune,** India, and the language of the arbitration proceedings and that of all documents and communications between the parties shall be English.

(d) The decision of the majority of arbitrators shall be final and binding upon both parties. The cost and expenses of Arbitration proceedings will be paid as determined by the arbitral tribunal. However, the expenses incurred by each party in connection with the preparation, presentation, etc. of its proceedings as also the fees and expenses paid to the arbitrator appointed by such party or on its behalf shall be borne by each party itself.

- Performance under the contract shall continue during the arbitration proceedings and payments due to the contractor by the owners shall not be withheld, unless they are the subject matter of the arbitration proceedings.

1. PROTECTION OF ENVIRONMENT:

Add the following as GCC Clause 16.2:

The contractor shall take all reasonable steps to protect the environment on and off the Site and to avoid damage or nuisance to persons or to property of the public or others resulting from pollution, noise or other causes arising as a consequence of his methods of operation.

During continuance of the contract, the contractor and his sub-contractors shall abide at all times by all existing enactments on environmental protection and rules made there under, regulations, notifications and bye-laws of the State or Central Government, or local authorities and any other law, bye-law, regulations that may be passed or notification that may be issued in this respect in future by the State or Central Government or the local authority.

Salient features of some of the major laws that are applicable are given below :
The Water (Prevention and Control of Pollution) Act, 1974, This provides for the prevention and control of water pollution and the maintaining and restoring of wholesomeness of water. 'Pollution' means such contamination of water or such alteration of the physical, chemical or biological properties of water or such discharge of any sewage or trade effluent or of any other liquid, gaseous or solid substance into water (whether directly or indirectly) as may, or is likely to, create a nuisance or render such water harmful or injurious to public health or safety, or to domestic, commercial, industrial, agricultural or other legitimate uses, or to the life and health of animals or plants or of aquatic organisms.

The Air (Prevention and Control of Pollution) Act, 1981, This provides for prevention, control and abatement of air pollution. 'Air Pollution' means the presence in the atmosphere of any 'air pollutant', which means any solid, liquid or gaseous substance (including noise) present in the atmosphere in such concentration as may be or tend to be injurious to human beings or other living creatures or plants or property or environment.

The Environment (Protection) Act, 1986, This provides for the protection and improvement of environment and for matters connected therewith, and the prevention of hazards to human beings, other living creatures, plants and property. 'Environment' includes water, air and land and the inter-relationship which exists among and between water, air and land, and human beings, other living creatures, plants, micro-organism and property.

The Public Liability Insurance Act, 1991, This provides for public liability insurance for the purpose of providing immediate relief to the persons affected by accident

occurring while handling hazardous substances and for matters connected herewith or incidental thereto. Hazardous substance means any substance or preparation which is defined as hazardous substance under the Environment (Protection) Act 1986, and exceeding such quantity as may be specified by notification by the Central Government.

6) Supply of materials:

a) The successful Bidder should make his own arrangement to obtain / import all materials required for the work.

b) The Work shall be carried out using high quality materials and products from good source and reputed manufacturer respectively. The tenderer / contractor shall furnish the details of sources and manufacturers of materials and products, which they intend to use in the Work if their tender is acceptable.

c) Quality assurance should be strictly adhered to. All materials are subject to inspection and approval of the Employer/Architect before use in the Work. All Work carried out and materials supplied shall conform to relevant latest Indian Standard Specification.

d) The Contractor shall furnish the Employer for approval adequate samples of all materials to be used in Work and to permit tests and examinations thereof. All materials used in the Work shall be strictly as per approved samples and
approved make.

e) All mock ups / finishes / quality shall be approved by Employer/Architect.

f) All materials which are rejected shall be forthwith removed from the site.

7) Water & Power:

- The rate quoted by the Contractor shall include expenditure for providing all the water required for the Interior construction work as well as that of Direct Sub Contractors and the Contractor shall make his own arrangements for the supply of good quality water, including obtaining Municipal connection for his labour as well as for construction purpose, and all charges for water shall be borne by him. If Municipal water is not available and should it become necessary for the Contractor to bring acceptable quality water from outside by tankers, the Employer shall not be liable to pay any charges in connection therewith including charges for periodic testing of the water of such sources for its suitability before use on works.

- The rate quoted in the tender shall also include electric consumption charges for power required for the Interior construction work as well as that of Sub-Contractor and the Contractor shall have to make his own arrangements to obtain power connections and maintain at his own expense an efficient service of electric light and power and shall pay for the electricity consumed. . The Employer, as well as

the Architect, shall give all possible assistance to the Contractor to obtain the requisite permission from the various Authorities, but the responsibility for obtaining the same shall be that of the Contractor. Any shortfall in quantum of electric power from local electric company‘s supply shall be made up by necessary captive generators at site which the Contractor shall install at site. All charges connected with installing, running and maintaining of the generators, including all statutory approvals shall be borne by the Contractor.

- The Contractor shall also be responsible to supply water and electricity to all other agencies directly engaged by him such as Direct Sub-contractors etc. free and without levying any charge.

- If no such facility is available at the site of work and if available and found inadequate, it shall be the responsibility of the Contractor to make his own arrangement for obtaining water and power at his cost. The Contractor‘s responsibility also cover supply of adequate quantity of water and power for testing and commissioning of all his Direct sub-Contractors‘ works.

e) All Municipal service charges or fees, for drainage and water connection for construction purposes shall be borne by the Contractor and if any, payable for permanent connections shall be initially paid by the Contractor and the Employer will reimburse the amount on production of official receipts.

f) Electric supply connection deposits, improvement or development charges for the permanent supply will be paid by the Employer to the Electric supply authority. It is the responsibility of the Contractor to apply in time and follow up with respective authorities to obtain all permanent service connections.

10) RECORD DRAWINGS

The Interior Contractor shall make accurate records of those parts of the Works which will become hidden by further progress, as may be directed by the Architect. Such records shall be checked and verified by the Architect while the work is open for inspection. Records shall be entered by the Interior Contractor on prints of drawings which will be made available to him for this purpose, amplified by him with supplementary dimensioned sketches and handed to the Architect as soon as practicable. All costs and expenses in connection therewith shall be borne by the Contractor.

11) Permission from Statutory Body :

Permission required to be obtained from local Government and connected bodies for establishing the site office and executing the work shall be Bidder‘s responsibility.

12) Insurance:

The Contractor shall be responsible for any injury to persons, animals or things and

for all structural damage to property which may arise from the operation or neglect of himself and or any nominated Direct Sub-Contractors, or Direct Sub-Contractors /Contractor's Employees and or third party whether such injury or damage arising from carelessness, accident or any other cause whatsoever, in any way connected with the execution of work.

The cover taken by the Contractor towards Third Party Liability shall be for a value of Rs. 5 Lakhs (Rupees Five Lakhs only) for a single event and there shall be no upper limit on the number of such events. The Bidders are expected to include all the charges towards taking all insurance cover, charges towards premia etc., in the quoted rates and no extras / claims shall be entertained on account of the Bidders' failure to comply with this requirement.

The Contractor shall take required insurance cover with an approved insurance company and deposit the policy with the Owner well before commencement of work

13) Joint Inspection

Employer's / Architect representatives' shall conduct a joint inspection with the Contractors' authorised representative at every stage of the work, immediately upon completion of such stage of works. The purpose of the joint inspection is to observe and record any deviations from the specified tolerances / levels, plumb or any quality defects or any such issues which require immediate attention / action from the Interior Contractor to make good or rectify such defects or observations jointly recorded. Such joint inspections can be held at any time as deemed fit and shall be binding on the Contractor to act upon and implement without any extra cost the directions arising out of such joint inspections. Failure / delay in holding such joint inspections shall not absolve the Interior Contractor from his responsibilities to rectify any defects which may be subsequently noticed at any time after the respective stages of work.

14) Photographs and Video Cassettes:

The Contractor shall take photos and video from the locations approved by the / Architect to show the progress of work at weekly intervals throughout the construction period and furnish photographs and video cassettes of required duration duly indicating therein the specified number of negative / prints affixed in albums. Each photograph shall be marked with the description of the photograph and location from which it was taken.

The ownership and copy right of all photographs and negatives shall be vested in the Employer and are not to be used without his permission under any circumstances. Negatives and prints shall be handed over to the Architect monthly.

15) Fire Protection during Construction

Provide and keep in working order adequate fire-fighting equipment for emergency use.

16) Schedule of Quantities and Technical Specifications

In case of conflict between item description in —Bill of Quantities‖ and —Technical specifications‖ the following priority shall govern:
Bill of Quantities & Preamble
Technical Specifications
IS Code
Equivalent BS Codes
Other codes

17) DOCUMENTATION:

The contractor shall submit the All guarantee certificates and documents applicable to any item before submission of Final Bill :

a) As – built drawings (05 sets of hard copy and soft copy in the form of CD) for all buildings and structures.

b) Guarantee for Anti-termite treatment work Any other Material and work inspection reports called for by Employer /Architects as found necessary.

Additional Special Conditions

1 CONTRACTOR to provide supervisor for each work group / area.
2 All Employees of the CONTRACTOR shall wear badge showing name, profession, date of training, work order no., work description, valid from _____ to _____ , name of the Contractor, name of supervisor.
3 Welding transformer, if any brought to the site, shall have a valid test certificate
4 CONTRACTOR should provide detailed plan of material handling during time of contract. Material - manual handling shall conform to State Regulations.
5 Pre-commissioning test report shall be provided for all electrical systems. Including cables, wire, motors, transformers, voltage stabilizers.
6 All rotating and moving parts with a nip must be guarded, such that even a little finger cannot come in contact with any moving part.
7 Section 32 of the Factory Act regarding ladders, platforms/stairs and scaffolding to be followed strictly. (For e.g. Ladders should have uniform step height of not over 300mm.All fixed ladders to have railings at a height of 910-1050mm. Ladders over 3m height to be roped.)
8 All portable ladders shall be of aluminum with rubber shoes and flat treads as per IS3696 part 2 (1991) except where these could come in contact with live electrical. In such situations, only carbon fiber or insulated ladders to be used. Wooden and Bamboo ladders are not to be used. Portable ladders to be stored in a place where it is easily accessible.
9 All platforms, walkways to have toe-boards of 100 to 150mm and hand rails at a height of 910mm to 1150mm. A spring return bar gate to be provided at every access to the ladder.

10 All scaffolds to be of metallic construction and conform to IS2750-1964. Safe access by means of stairway to be provided if the height is more than 4m. Working platform with handrails at a height of 910mm to 1150mm and toe boards of 100-150mm to be provided.

11 Methods statement to be produced for all high risk activities (including risk assessment of critical activities). Approximate PPE usage for all critical activities to be compiled with.

12 Lifting gears, tools and tackles and equipment like cranes shall conform to requirements of section 28 and 29 of the Factory Act.

13 Noise level at 1 Mtr. distance from the equipment should not exceed the level indicated elsewhere in the specification.

Any further clarification on Environment, Health and Safety guidelines can be sought from unit, Environment Health and Safety Manager and Employer‘s guidelines on EHS.

Signature of Tenderer

With Date and Seal

TECHNICAL SPECIFICATIONS

TECHNICAL SPECIFICATIONS

1- GENERAL

1.1 ***(A) – Work***

All works shall be carried out with due diligence and specification laid hereunder. In case any item not covered by this specification, either C.P.W.D. or any other specification as directed by the Engineer in charge shall be followed. As and where necessary this specification shall be supplemented by C.P.W.D. specification.

1.1 ***(B) – Material specification***

1.2

All material shall conform to the latest edition of the Indian standard specification with all amendments issued thereof. For material not covered By Indian standard specification, C.P.W.D. specification shall followed. For such material covered by neither of the two any other specifications as directed by the engineer in charge, and after obtaining his written approval shall be followed.

1.2 ***Sampling and testing***

All material used in the works shall be subjected to inspection and test. Samples of all material proposed to be used in the works shall be submitted to the Engineer in charge for approval, before they are bought to the site. These samples shall be submitted 15 days in advance than required for works. After the sample is approved, the material shall be arranged and bought to site within a fortnight. Sample submitted to the Engineer in charge or his representative for their retention is to be kept in labeled box and suitably stored.

1.3 ***Storage of material***

All material to be used in the works shall be stored on racks, supports, in bins, under cover etc., as required to prevent deterioration or damage from any cause whatsoever to the entire satisfaction of the Engineer in charge.

Cement shall be stored in such quantities as can be consumed within a short time after receipt from the manufacturers. It shall be stored in such a manner to permit easy access for proper inspection and in a suitable weatherproof store to protect it from dampness and to minimize deterioration. Use of cement shall be on principle of first come, first used.

2. ***MATERIALS***

2.1 **Water**

Clean fresh water only shall be used for mixing all concrete, grout and mortar. This shall be free from any deleterious matter in solution or in suspension and be obtained from an approved source. Generally portable water is found to be suitable for the above work.

2.2 ***Lime***

Lime shall be stone lime and conform to the specification Building Limes-IS: 712 (latest edition). Lime putty may be prepared from hydrated lime or quick lime. Hydrated lime shall be mixed with water to form putty for preparation of lime cement and sand mortar, lime, cement and sand in specified proportions shall be mixed further. Minimum quantity of water shall be added to achieve working consistency.

Surplus mortar droppings from masonry if received on surface free from dirt may be mixed with fresh mortar if permitted by the Engineer- in charge of site who may direct additions of additional cement without any extra payment.

2.6 ***Grading of Aggregate***

Coarse aggregate shall be as per IS: 383 (latest edition) consisting of hard, strong and durable pieces of crushed stone and shall be free from organic or clay coating and other impurities like disintegrated stone, soft flaky particles etc.

Aggregates other than confirming to the provision of specifications may be used if permitted by Engineer-in-charge.

Washing of aggregates by approved means shall be carried out, if directed by the Engineer-in-charge. Grading of coarse aggregates shall confirm to IS:383 (latest edition) and shall be such as to produce dense concrete of the specified proportions and strength and of consistency that will work readily into position without segregation.

(a) Grading of Coarse Aggregate shall be as under :

I.S. Series	Percentage passing By weight for nominal size of			
Mm	40 mm	20 mm	16 mm	12.5 mm
75	100	-	-	-
37.5	95-100	100	-	-
19	30-70	95-100	100	100
16	-	-		-
11.2	-	-	-	90-100
9.5	10-35	25-35	30-70	40-85
4.75	0-5	0-10	0-10	0-10
2.36	-	-	-	-

(b) Fine aggregate : On the basis of particle size fine aggregate is graded into four zone which is shown below :

IS Sieve	Percentage passing for grading			
MM	Zone-1	Zone-2	Zone-3	Zone-4
9.50	100	100	100	100
4.75	90-100	90-100	95-100	95-100
2.36	60-95	75-100	85-100	95-100
1.18	30-70	55-90	75-100	90-10
600 micron	15-34	35-59	60-79	80-100
300 micron	5-20	8-30	12-40	15-50
150 micron	0-10	0-10	0-10	0-15

Fine aggregate shall be coarse sand, fine sand stone dust or marble dust fly ash and surkhi and shushkhi Use of sand shall not be allowed unless otherwise specified.

(a) Grading of coarse sand shall fall within the limit of grading zone1, 2, 3, 4, of table above.

(b) Grading of fine sand shall fall within the limit of grading zone 4 of table above.

(c) Grading of stone dust shall fall within the limit of grading zone1,2,3, of table above.

(d) Grading of marble dust shall fall within the limit of grading zone 4 of table above.

2.7 ***Bricks***

Bricks for masonry work shall be well burnt, of uniform size, shape and color, free from cracks, flaws or nodules of free lime and should give ringing sound when struck with each other. Fractured surface shall show uniform texture free from grit, lumps, holes etc. Compressive strength, shall not be less than 75kg/cm^2. Water absorption after 24 hours immersion shall not exceed 15% by weight for common bricks and 12% for face bricks. Dimension tolerance shall have rectangular faces sharp, straight edges. Maximum permissible chip page for bricks shall be 6 mm at the edge and 10 mm for corner bricks shall and show no efflorescence after soaking in water and drying.

Each brick shall have the manufacturer's identification mark clearly marked on the frog. Representative sample shall be submitted and approved sample shall be retained by the Engineer in charge for future comparison and reference. The color and texture of brick shall be limited to the range of sample submitted. Any brick not found up to the satisfaction shall be removed immediately from site at the Contractor's own cost. Brick tiles shall conform to the same specification as brick but thickness shall be 5 cm (2") nominal.

2.8 ***Ashes (Cinder)***

These shall be obtained from furnaces of stream boilers using coal fuel only. It shall pass through IS sieve designation 3.35 mm with at least 50% of it passing through IS sieve 1.7 MM. Cinder obtained from brick kilns shall not be used. At site of work, the cinder shall be protected from dirt or any harmful material getting mixed.

Cinder required to be used for external work such as plastering and in foundation concrete where it is likely to be affected by dampness, shall not contain more than 0.5% of acid soluble sulfates. For cinders required to be used in internal work such as mortar for walls and base concrete for floors, the allowable percentage for unburnt carbon shall be up to 20% and that for acid sulfates as 1%.

2.11 ***Scaffolding***

Scaffolding shall consist of ballies necessary battens and planks of approved quality. All the scaffolding members before erection shall be checked for their strength and fitness. It shall be tied up properly and rigidly. Steel scaffolding, if available, may be used. Where scaffolding is necessary it shall be erected on double supports. Holes shall not be made in walls for supports. Planks

shall be fixed and tied together in case of finishing works such as plastering, painting and distempering no part of the scaffolding shall touch the structure. Where ladders are used, gunny bags shall be tied up at the end to protect any damage to work by sliding etc.

2.12 ***Timber***

Timber shall be of type as stated in schedule and the best kind available. Perfectly dry, well seasoned free from sapwood. And shall be straight free from knots, cracks, roots and other defects.

2.13 ***Wrought iron work***

All wrought iron work shall be of best kind and of the size and shape specified. The ironwork shall be free from burning blisters and cracks and shall be coated with shop coat of anticorrosive paint. No ironwork of inferior workmanship or quality shall be allowed to be used.

2.14 ***TOR Steel***

Steel shall comply with the Indian Standards Specifications IS:226 latest editions for construction work. The surface shall be free from rust. All steel shall be TATA's or other Indian manufacturer. Untested steel shall not be used unless otherwise specified.

A Cement

One of the type of cement given below as specified shall be used Portland cement latest edition 53 grade conforming to is 12269 latest editions. Rapid hardening Portland cement conforming to IS 8041 (latest edition) any other brand of specified shall conform to relevant Indian Standard specification (ISS).

2.15 ***Glass***

Sheet or plates of glass shall be of approved Indian make (Pllington or equivalent) of thickness as stated in the schedule of quantities and visually clear when viewed from any direction. It should be free from bubbles, waves and all other defects.

2.16 ***Steel Frames***

Steel frames shall be manufactured out of steel conforming to the relevant standard specifications and shall have oxidized fittings. The size & section

shall be as specified or shown on the drawings. They shall have all necessary accessories such as eyes, lugs and hinges etc. as per drawings and Engineer In charge's instructions. The welding of joints shall be full size and grinned neat.

2.17 ***Oil Paint and primers***

These shall be ready mixed Jonson & Nicholson, Shalimar Goodlac, Nerolac ,I.C.I or other approved brand and in sealed tins and shall be of the quality approved by the Engineer in charge & shall conform to the relevant I.S.S. (latest edition)

2.18 ***Distempers and primers***

These shall be either water bound or oil bond as specified in the schedule of quantities. These shall be in powder form of Jenson and Nicholson, Shalimar or other approved brand in sealed drums and package as directed by Engineer-In-charge. These shall be of approved brand such as Snowcem/Apex Exterior Paint or equivalent as directed by the Engineer in charge.

Specifications for Works

2.0 EARTHWORK IN EXCAVATION:

2.1.0 The excavation shall be done strictly according to the dimensions shown in the plans or as directed. If Contractors excavates beyond what is stipulated in the drawings or as directed at site, the additional quantity of earth work shall not be taken into account for payment. In case, the Contractor excavates trenches and foundations width less than minimum specified, actual measurement of excavated trench will be taken for payment. The excavation will be carried out in all sorts of soils up to a depth as shown in the drawings and will be disposed- off as directed by Engineer-in-Charge within the lead of 1000 Meters.

2.2.0 Rates shall be inclusive of refilling the trench, foundation etc., with excavated earth with in the lead of 1000 meters.

2.3.0 Payment shall be made on cubic meter basis of the permissible excavation done.

3.0 CENTERING SHUTTERING FOR R.C.C. WORKS:

3.1.0 Form-work shall be strong enough to withstand dead and live load and forces caused by ramming / vibration of concrete and other incidental loads, likely to be imposed upon it during and after casting of concrete. Shuttering shall either be of wooden plank 30 mm minimum thickness or steel plate with stiffened edges. The shuttering shall be supported at bottoms by props of vertical sal ballies properly cross braced together so as to make the form work rigid. The shuttering shall have a smooth and even surface and joints shall not permit leakage of cement grout. The timber planks shall be accurately sawn and planed on one side. The surface of shuttering that would come in contact with concrete shall be covered with a thin sheet of polythene paper rolls, after removing all rubbish such as chippings, shavings, saw dust etc. from the shuttering.

Alternatively application of raw linseed oil or soap solution to the surface of the shuttering may be allowed at the discretion of the Engineer-in-Charge / Site Engineer. Sufficient camber shall be provided to the shuttering so as to offset subsequent deflection after pouring of concrete on it.

3.2.0 A minimum camber of 4 mm per meter length of beam and $1/50^{th}$ of length of cantilever / projected member shall be provided as directed by the Engineer-in-Charge / Site Engineer. Minimum period that shall elapse after the concrete is laid, before removal of centering and shuttering shall be as per provisions of IS: 456. The completed form work shall be inspected and approved by the Engineer-in-Charge / Site Engineer before reinforcement bars are placed in position.

3.3.0 Payment shall be made for form work, centering shuttering etc. on Sqm basis. The length and breadth shall be measured in cms correct to two places of decimal and area shall be worked out in Sqm. No deductions from the shuttering due to openings / obstructions shall be made, if the area of such openings / obstructions does not exceed 0.10 Sqm. Nothing extra shall be paid for forming such openings. Rates quoted shall be inclusive of cost of form works, centering shuttering, labor, materials and removal of form work etc. complete as described above.

4.0 BRICK WORK:

4.1.0 Brick work will be with bricks of class specified in schedule of rates, laid in cement mortar of designed proportion as specified in item or drawings. Bricks shall be soaked in water thoroughly at the site of work for at least 6 hours before use. When the bricks are soaked they shall be removed from the tank sufficiently early so that at the time of laying they are skin dry. The bricks shall be placed in the tanks by hand, one by one, and not by throwing. The mortar shall be used before it shows any signs of setting or stiffening.

4.2.0 Unless otherwise specified, brick work shall be done in English bond with the frog upwards. No broken brick shall be used except at closures. Brick work shall conform to IS-2212. The courses shall be truly horizontal and the work strictly in plumb. The mortar joints should not exceed 10 mm in thickness except where extra thickness is required for the purpose of bringing the brick work to the required height or level or for making both faces even. The brick work shall not be raised by more than 14 single courses per day.

4.3.0 Masonry shall be kept constantly moist while under construction and for a period of at least 10 days after completion. Watering shall be continued twice a day for at least one month after completion.

4.4.0 Construction of walls shall, as far as possible, be carried out in regular and level course throughout their entire length and no portion of work shall be 0.90 meter lower than the other. All cross walls, buttresses, counterforts, steps etc. shall be built up, course by course, with the main walls carefully embedded into them. Where such bonding is not possible in the course of the work for any reason, necessary grooves or toothing shall be left in the brick work for subsequent bonding. No extra payment will be made for this.

4.5.0 Brick work in foundation and plinth shall be the portion of brick work between foundation level and plinth level. Provision of relevant clausesof Special Conditions of Contract shall be applicable for distinguishing work infoundation from that of superstructure.

4.6.0 Brick work in superstructure will mean all brick works above plinth level. Parapet shall be considered as part of the wall. In exposed brick work, specially selected brick shall be used for facing, ensuring that irregular and wrinkled bricks or bricks which have irregular edges and corners are not used. The surface shall be rubbed down with brushes if necessary and thoroughly washed. The joints in faces which are to be plastered or pointed should be raked out to a depth of 15 mm while the mortar is still green. The raked joints shall be brushed and well wetted, and shall be later refilled with mortar to give ruled finish.

4.7.0 The rate for brick work shall include supplying, erecting and dismantling the necessary scaffolding. Scaffolding shall be strong and stiff. Holes left in the brick work to take the put logs shall be properly bricked up before plastering or pointing is done. Put log holes shall not under any circumstances be allowed in pillars.

4.8.0 MEASUREMENT:

4.8.1 Payment will be made on cubic meter basis on the volume of work done calculated on actual measurement of length, height and thickness. Any extra work over the specified dimensions shall be ignored. No extra payment will be made for cutting bricks, if required, either for openings or for rounding or for insertion at the time of construction of small fixtures in wall such as angles, joists, distribution boards, small size pipes, etc. No deduction will made for volumes occupied by such fixtures. No deduction shall be made for openings up to 0.1 square meter, cement concrete blocks for holdfasts/ holding down bolts. In calculating area of opening, any separate lintel or sills shall be included with the size of opening but end portions of lintel shall be excluded.

4.9.0 RATE:

4.9.1 The contractor's rate shall include cost of all material supply, fixing and removal of scaffoldings, curing etc. and shall apply to all brick work in steps, string course, blocking course, brick work curved in plan and parapet over roof etc.

5.0 HALF-BRICK MASONRY:

5.1.0 Half - brick wall (115 mm) laid in stretcher bond including reinforced will be measured in square meter for payment. In reinforced wall, 2 no. of 6 mm dia M.S. bars shall be provided at every fourth course. Proper laps & end embedments (of not less than 200 mm) shall be provided. They shall be securely anchored at their end where the partitions end.

5.2.0 **MEASUREMENTS:** Thickness of walls in excess of thickness computed on the basis of nominal brick sizes, if any shall be ignored while measuring. No separate payment shall be made for steel reinforcement used in the brick masonry. Deduction for openings shall be as per IS: 1200. The area shall be calculated in square meters.

5.3.0 **RATE:** The rate includes the cost of all materials and labor involved in all the operations described including cost of reinforcement.

6.0 DAMP PROOF COURSE:

6.1.0 **Proportions**

One part of Portland cement, 2 parts of coarse sand, 4 parts graded stone 20mm down size mixed with water proofing compound CICO or approved water proofing compound @ 1 kg/bag of cement shall be used. The compound shall be mixed with the cement in the proportion specified by the manufacturer or as directed by the Engineer-in-charge.

6.2.0 **Mixing**

As per specification for cement concrete, compound will be first mixed dry with cement.

6.3.0 **Laying**

D.P.C. shall consist of 40mm thick or as specified cement concrete. The edges shall be finished smooth. Plank shuttering for edges must be used. The top surface shall be double checkered and cured by pounding for seven days. The item shall include formwork, finishing, leveling etc. all complete.

7.0CEMENT CONCRETE (PLAIN & REINFORCED)

7.1.0 **Mixing**

All proportions shall be by volume or by weight as directed by Engineer-in-charge. Mixing shall be done in mechanical mixer. The cement and aggregate shall be thoroughly mixed together and the required quantity of the water shall be added to mixer only when all the cement and aggregate constituting one batch are in the drum. The concrete shall be mixed till the mixture is of uniform color. Mixing in a drum shall be continued for at least 2 minute after adding water. When in special cases hand mixing is allowed by the Engineer-in-charge. Measured quantity of coarse sand shall be spread evenly on a pucca watertight platform. Required quantity of cement shall be dumped on the sand and distributed evenly and mixed intimately with spade till mixing is of even color throughout. Measured quantity of coarse aggregate shall be spread on top of cement and sand mixture and mixing done by shoveling and turning till the coarse aggregate gets evenly distributed in the cement sand mixture. ¾ quantity of water required should be added in a hollow made in the middle of the pile with spade. The whole mixture is turn over again and again and remaining quantity of water added gradually. Mixing shall be continued till the mixture is of uniform color and consistency. Only such quantity of concrete shall be mixed which can be consumed in half an hour. In case of hand mixing 10% extra cement shall be added. No extra payment for cement thus added shall be made to the contractor.

7.2.0 **Placing of Concrete**

Concrete shall be conveyed and placed in final position in such a manner as to prevent segregation and loss of any of the ingredients. The maximum height of drop and the method of placing concrete shall be approved by the Engineer-in-charge. The interval between adding water to dry ingredients and completion of placing of concrete shall not exceed 30 minutes and the concrete shall not be distributed once the setting of cement has commenced. The rate of placement of concrete shall be such that no cold joint is formed and fresh concrete is placed always against green concrete which is still plastic and workable.

7.3.0 **Protection**

Newly placed concrete shall be protected by approved means from frost, sun, dust, storms, rains and hot spells etc. Concrete placed below the ground shall be protected from falling earth. Ground having deleterious salts shall be kept free from contact with concrete at least for three days or otherwise directed thereafter.

Approved measure shall also be taken to protect immature concrete from damage by debris, excessive loading, vibration, abrasion, floating due to sub soil water and other influences that may impair the strength and durability of the concrete. This shall apply to all item of cement concrete such as foundations, sub grade, flooring, damp proofing and all other R.C.C. and P.C.C. items.

7.4.0 Following tests shall be done on concrete in field or lab,as the case may be.

a) Slump Test (Field Test)

The consistency of the mix shall be controlled by 'slump test' of the wet mix as per IS specification. The test shall be carried out at least twice aday, once at start of concreting and the other near the end of concreting. Quantity of water to be used for such mix shall be such that the concrete is of adequate workability for the placing condition of the concrete and can properly be compacted with the means specified. Generally quantity of water to be used for each mix of 50 kg cement shall not be more than 34 liters for 1:3:6 mix, 30 liters for 1:2:4 mix, 30 liters for 1:1/2:3 mix and 25 liters for 1:1:2 mix. In case of vibrated concrete the quantity of water may be reached to avoid segregation. The quantity of water shall be regulated by carrying out regular stump test at intervals as mentioned above. The slump and workability for different kinds of work shall be as under:

Slump and workability for different kinds of works

	Placing Conditions	Degree of Workability	Value of Workability
1.	Concreting of shallow sections with vibration	Very low	0.75 to 0.80 compaction of factor
2.	Concreting of lightly reinforced section with vibration	Low	Slump up to 22mm 10.5 seconds vee bee time or 0.80 to 0.85 compacting factor
3.	Concreting of lightly reinforced section without vibration or heavily reinforced section with vibration	Medium	25-75 mm slump for 20mm aggregate.
4.	Concrete of heavily reinforced section without vibration	High	75-125 mm slump for 20mm aggregate

b) Test of material and (lab test)

Upon the signing of the contract, the contractor shall provide and deliver to the engineer-in-charge, at his own expense samples of the sand and coarse aggregate he proposes to use. Such samples shall be in sufficient quantity to enable tests to be carried out on the individual materials and for the making and testing of concrete cubes if required by the engineer-in-charge. All expenses of testing shall be borne by the contractor.

Six preliminary test cubes 150 x 150 x 150 mm shall be made in the laboratory for prescribed mix three for testing at seven days and three at twenty eight days. The mean strength of set of three cubes shall not be less than the following:

Strength requirement of cement concrete (IS 456)

Grade of concrete	Compressive strength	
	After 7 Days	After 28 days
M (10) 1:3:6	07 N/mm^2	10 N/mm^2
M (15) 1:2:4	10 N/mm^2	15 N/mm^2
M (20) 1:1.5:3	13.5 N/mm^2	20 N/mm^2
M (25) 1:1:2	17 N/mm^2	25 N/mm^2

During the course of the work, test cubes shall be made from time to time as directed by the Engineer-in-charge from freshly mixed concrete taken from a batch prepared in the normal way for actual use in the works. The cubes shall be in sets of six numbers and tested in accordance with IS: 1999 (latest edition) and IS: 516 (latest edition).

Three cubes shall be tested at seven days and three at twenty-eight days. Test strength of each specimen should not vary +/- 15% of the average. The concrete shall be deemed to comply with the strength requirements if the above test results meet the 'Acceptance Criteria' as per IS: 456 (latest edition).

In the event of a set of cubes failing to meet these strengths the engineer-in-charge may direct that any concrete represented by the cube be subjected to in-situ tests at the cost of the contractor. Depending on the result of such tests the Engineer may direct that the concrete be demolished and reconstructed at the expense of the contractor.

Workability testing shall be carried out in accordance with IS: 1199-1959. The results shall lie within the range upon which the accepted mix design is based. Testing shall be carried out at such frequency so that required workability ic constantly achieved.

Prior to the commencement of concreting, the contractor shall submit for approval of the engineer-in-charge details of his proposed arrangements for carrying out tests. The results of all tests shall be communicated to the engineer-in-charge as soon as possible. If the engineer so desires he may require that his representatives shall be present at any test.

Contractor shall maintain records in a register issued by engineer-in-charge duly certifying the number of pages in the register of all test results of cubes of concrete indicating location where the quantity of concrete to which the cube is related has been used. In case of test result of core, location from where core has been cut with the result shall be mentioned. An extract of such entries in the register shall be submitted to the engineer-in-charge.

In addition, a cement consumption & reinforcement steel record shall be maintained in the prescribed form in a register issued by the engineer-in-charge, certifying number of pages in the register by him.

c) *Tensile strength of concrete (Lab. Test)*

I. Flexural tests of beams (usually third point loading) for values of modulus of rupture.
II. Diametrical splitting of cylinder for tensile splitting strength.
III. Direct tensile tests using special shaped specimens or special gripping devices for direct tensile strength.

d) ***Durability***

Concreting is to be done with care with low water/cement ratio, good compaction, careful curing, dry and graded aggregates, specified cement content so that concrete is almost impermeable and can resist weathering, chemical attack and abrasion.

7.5.0 ***Repairing and finishing of concrete***

All concrete surfaces either cast-in-situ or precast shall have even, clean finish, free from honeycombs, air bubbles, fins or blemishes. The joint marks due to form work in concrete work exposed to view shall be rubbed out with carborundum stone and defects patched up with a paste of 1 part and 1 part cement and cured. The finishing shall be done to the satisfaction of the engineer-in-charge. Concrete surfaces to be subsequently plastered or where brick work is to be done it shall be raked as soon as the form is stripped off so that proper bond can develop.

7.6.0 ***Curing and protection of concrete***

All fresh concrete shall be covered with a layer of hessian or similar absorbent material and kept constantly wet for a period of seven days or more from the date of placing of concrete as per directions of the engineer-in-charge. Curing may also be done by pounding. Steps shall be taken to protect immature concrete from damage by debris, excessive loading, vibration, abrasion, deleterious ground water, mixing with earth or foreign materials, floating etc. that may impair the strength durability of the concrete.

7.7.0 ***Reinforcement***

All bars TMT for steel shall be cold bent by machines or by approved means. Bends, hooks and shapes shall confirm strictly to the dimension shown on drawings and unless otherwise mentioned, the bending dimensions shall confirm to IS: 2502. All binding shall be done by 16/18 gauge annealed soft iron wire. To ensure adequate cover steel bars shall be kept on small concrete cube or any suitable material as directed by engineer-in-charge. Sufficient number of chairs and hangers shall be used to keep the enforcement in position. Placing of reinforcement shall be completed well in advance of concreting. Before concreting, the reinforcement shall be inspected and approved for accuracy of placing, binding and cleanliness, by the engineer-in-charge. No placing of concrete shall be done before approval of reinforcement. Before reinforcement is covered contractor shall ensure that it is measured, checked by the component authority & properly recorded.

8.0 VITRIFIED/ANTI-SKID CERAMIC GLAZED FLOOR TILES:

8.1.0 **MATERIALS:-**

8.1.1 Providing & fixing of colored 10mm thick vitrified floor tiles / 6mm thick Anti-skid ceramic glazed floor tiles of reputed make and manufacturer i. e. Somany, Kajaria, Johnson (thickness specified by the manufacturer may also be taken in to consideration). The tiles shall be flat, true to shape and free from blisters crazing, chips, welts, crawling or other imperfections detracting from their appearance.

8.1.2 Deviation in length of tiles (+/-) 0.1%

8.1.3 Deviation in thickness of tiles (+/-) 3%

8.1.4 Water absorption by tiles should not be more than 3% of its weights.

8.1.5 The Resistance of tiles should be strain proof.

8.1.6 Flexural strength of tiles should not be less than 39 N/mm^2.

8.2.0 **BASE PREPARATION**

8.2.1 Tacking on existing floor, riser, dadoes on / surface shall be done for proper bonding between tiles and floor with cement mortar of specified grade / adhesive solution.

8.2.2 Tacking scrap to be collected & disposed off outside station premises within a lead of 1 Km.

8.2.3 After tacking & dry-cleaning, proper washing of existing floor/surface to be done by neat water.

8.2.4 After washing proper cleaning of existing floor, riser, dedoson / surface shall be done by soft brush and all dust particles or any loose materials to be cleaned by wet cloth.

8.3.0 **LAYING / FIXING OF TILES**

8.3.1 After the base is cured and dried, 20 mm thick cement mortar 1:4 (1 cement: 4 coarse sand) for vitrified / anti-skid ceramic glazed floor tiles and / adhesive solution (As per recommendation of manufacturers) shall be laid on the surface and spread evenly with a trowel. Neat cement slurry of honey like consistency over cement mortar shall be spread over. The back of the tile previously cleaned and soaked in water shall be placed over the mortar and brought to proper level by striking gently with a wooden mallet.

8.3.2 The tiles shall be laid in the manner as specified above in required pattern with as thin a joint as possible. The joints shall be thoroughly cleaned and pointed with white cement slurry admixed with pigment of matching color as the tiles. The pointing can alternatively be carried out with an approved non-shrink grout of matching color as recommended by the manufacturer.

8.3.3 Since these are specially pre-sized tiles, and they have very low moisture absorption and thermal expansion, they can be laid free of joints, and it is not necessary to leave gaps between two tiles. For large areas, an expansion gap of 2-4 mm may be provided after every six meter of laying.

8.3.4 Cutting of tiles shall be done by cutting machine, as per requirement / size of floor. Fixing of tiles on skirting, door's Jam, corners etc shall be done according to site condition/requirement for which no extra cost shall be involved.

8.3.5 Joints between existing skirting & tiles shall be filled up with white cement. Edge of existing floor/ surface & top of the tiles at door portion shall also be filled up by same material maintaining angle of 45^0 or less so as to form a fillet.

8.3.6 Fifteen minutes after fixing the tiles, wipe with a damp sponge and clean / polish the tiles with a soft dry cloth.

8.3.7 The tiles should be Scrub and Scratch free and finally cleaning of the tiles shall be done by water or dilute soap solution followed by water / moist cloth or sponge.

8.4.0 **PRECAUTIONS**

8.4.1 Do not use neat cement while fixing / laying tiles. Only manufacturer's supplied adhesive (Mortar) to be used.

8.4.2 Wooden mallet / hammer to be used to keep the tiles in position and to remove air pocket between tiles & adhesive.

8.4.3 Minimum 95% of tiles shall be free from visible defects.

9.0 Granite/Marble/Kota stone Flooring

9.1.0 The slabs of Granite/marble. Kota stone as specified in the item. they shall be made of selected quality, hard, sound and dense, color, shape, homogeneous in texture, free from cracks, decay, weathering and fault, Granite should be of Bangalore good quality polished 18 mm thickness otherwise specified. Before starting the work, contractor shall get the sample of slabs approved; the color pigment should be used to match the shade of the marble/granite/Kota.

9.2.0 **Dressing**

Every stone shall be cut by hand/machine to the required size and shape and chisel dressed on all side /or cut by machine all the angles and edges of the slab shall be true, square and free from chipping and the surface shall be leveled smooth, the thickness of the slab shall be described in the item of work description.

9.3.0 **Laying**

9.3.1 The sub grade concrete or the R.C.C.slab on which the stone slabs are to be laid shall be cleaned wetted and mopped. The bedding for the slab shall be with cement mortar 53 grades of specified quality and ratio.

9.3.2 The average thickness og the bedding mortar under the slab shall be 18 mm or specified and the thickness at any place under the slab shall not be less than 12mm.when the mortar has hardened cement slurry of paste like consistency be spread at the rate of 4.4 kg of cement per square meter. The edges of the slab already paved shall be buttered with cement and admixture of pigment mating the shade of stone slab. The slab shall then place in position so as to get a matching joint and required level.

9.4.0 **Curing**

The flooring shall be cured for a minimum period of seven days.

9.5.0 **Grinding and Polishing.**

After the laid marble/kota flooring are cured and have dried, these shall be polished. Grinding should be done by granite finish polishing and grinding machine, the first grinding shall be done with granite grinding blocks six batti should be used to finish grinding in a smooth manner,

before the final granite finish block shall be used after that buffing block batti shall be used to give a smooth granite polish finish.

9.6.0 **Measurements**

Measurement shall be done in square meters of the flooring/slab counters/stair steps, length and breadth shall be measured between the finished faces of skirting door or wall plaster, the skirting shall be measured in square meters , as the case may be, correct to the centimeter and area calculated up to two place of decimal.

10.0 CERAMIC GLAZED TILES IN WALLS / SKIRTING / DADOS:

10.1.0 **MATERIALS:-**

10.1.1 Minimum 5mm thick Ceramic glazed tiles of approved color, brand and manufacturer i.e. Somani / Kajaria / Johnson or equivalent approved make shall be used with following details:

i) Deviation in length of tiles ± 0.6%

ii) Deviation in thickness of tiles ± 5%

iii) Water absorption by tiles should not be more than 0.5% of its weights.

iv) The abrasion resistance of tiles should not be less than 204 mm^2.

v) Flexural strength of tiles should not be less than 27N/mm^2.

10.2.0 **BASE PREPARATION:-**

10.2.1 Tacking on existing surfaces of floors, skirting, risers, dados shall be done for proper bonding between tiles and the surface with cement mortar of specified grade / adhesive solution.

10.2.2 Tacking scrap to be collected & disposed off outside station premises within a lead of 1 Km.

10.2.3 After tacking & dry-cleaning, proper washing of existing floor/surface to be done by neat water.

10.2.4 After washing proper cleaning of existing floor, riser, dados the surface shall be done by soft brush or cotton cloth and all dust particles or any loose materials to be cleaned by wet cloth.

10.3.0 **LAYING / FIXING OF TILES**

10.3.1 After preparation of the base, the tiles shall be fixed over a base of 12 mm thick cement mortar 1:3 (1 cement: 3 coarse sand). The back of the tiles previously cleaned and soaked in water shall be fixed over the mortar and brought to proper level by striking gently with a wooden mallet.

10.3.2 The tiles shall be laid in the manner as specified above in required pattern with as thin a joint as possible. The joints shall be thoroughly cleaned and pointed with white cement slurry mixed with pigment of matching color as of the tiles. The pointing can alternatively be carried out with an approved non-shrink grout of matching color as recommended by the manufacturer.

10.3.3 Since these are specially pre-sized tiles, and they have very low moisture, absorption and thermal expansion, they can be laid free of joints, and it is not necessary to leave gaps between two tiles. For large areas, an expansion gap of 2-4 mm may be provided after every six meter of lying.

10.3.4 Cutting of tiles shall be done by cutting machine, as per requirement / size of floor. Fixing of tiles on skirting, door's Jam, corners etc. shall be done according to site conditions / requirement for which no extra cost shall be involved.

10.3.5 Joints between existing skirting & tiles shall be filled up with white cement mixed with pigment to match the shade of the tiles. Edges of existing floor / surface & top of the tiles at door portion shall also be filled up by same material maintaining angle of 45^0 or less so as to form a fillet.

10.3.6 Fifteen minutes after fixing the tiles, wiping with a damp sponge and cleaning / polishing the tiles with a soft dry cloth will be done.

10.3.7 The tiles should be Scrub and Scratch free and finally cleaning of the tiles shall be done by water or dilute soap solution followed by water / moist cloth or sponge.

10.4 PRECAUTIONS

10.4.1 Use of cement mortar / adhesive for fixing / laying tiles shall be done only as per manufacturer's recommendations and as per the direction of EIC / Site Engineer. Nothing extra shall be paid to the contractor on this account.

10.4.2 Wooden mallet / hammer to be used to keep the tiles in position and to remove air pocket between tile & adhesive.

10.4.3 Minimum 95% of tiles shall be free from visible defects.

10.5.0 **Measurements:**

The length and breadth of the tiles fixed shall be measured in cm correct to two places of decimals and area shall be calculated in Sq.m. The rate shall be inclusive of cost of all the operations described above.

11.0 M.S Steel Railing

Steel shall comply with the Indian Standards Specifications IS: 226 (latest edition) for construction work. The surface shall be free from rust. All steel shall be TATA's or other Indian manufacturer. Untested steel shall not be used unless otherwise specified.

12.0 Stainless steel Railing

Providing and fixing staircase railing 90cm high from nosing of steps , made of following specifications:

a) 50mm dia. SS pipe handrail.
b) Providing and fixing in position SS railing at staircase made out of-304 grade 16 SWGSS handrail -

50mm dia. With Stainless Steel end cap and fixed into wall at end. Mid rail -12mm dia. X 3 rows 1st balustrade 75mm x 2 Nos. and other Balustrades75mm x 2 Nos. and other balustrade- 38mm Dia. x 5 steps per side with base plate of 5mm with Stainless Steel base cover and complete with all fittings as per design and diagram.

13.0 ANODISED ALUMINIUM DOORS / WINDOWS / VENTILATORS / PARTITIONS AND CARPENTRY WORK:

13.1.0. **General:**

13.1.1 Aluminum Doors / Windows / Ventilators / Partitions shall be fabricated (by mitering) with box type frame sections & of size as mentioned in the relevant item of schedule of rates or as shown in the drawing & shall be conforming to IS: 1948-1961. All sections shall be fabricated from extruded sections as manufactured by reputed concerns & as approved by Engineer-in-charge. The weight & thickness of walls of sections shall be as specified in relevant item of schedule of rate. Robust construction shall be achieved by interlocking & screwing outer frame corners.

13.1.2 **Finish:**

Aluminum doors will be anodized. & will be powder coated. The average thickness of anodized coating shall not be less than 15 microns as per IS-1868 and average thickness of powder coating shall not be less than 50 microns. A thick layer of clear transparent lacquer based on mathacrylates or cellulose butyrate shall be applied on aluminum door to protect the surface from waste cement during installation. Before handing over the building the lacquer coating shall be removed as directed by Engineer-in-charge.

13.1.3 **Hinges:**

Hinges shall be projecting type, made of Aluminum alloy conforming to relevant Indian Standards and welded to frames). Minimum two hinges shall be provided for each shutter, however, door shutter shall be provided with one additional hinge at the centre. The pins for hinge shall also be of aluminum alloy conforming to HR 30 of Indian Standard. Pins for hinges shall have an anodizing coating of 25 micron thickness and powder coating of 50 microns thickness.

13.1.4 **Fixing of panels/doors/windows/ ventilators:**

Fixing of frames with walls /other members shall be done in any of the following three manners;

Using 30 mm x no. 10 galvanized screws in case the frame is to be fitted to a wooden member.

ii) With slotted galvanized steel lugs fitted to the frame with galvanized nuts and screws embedded in cement concrete block (1:2:4) in case, the frame is to be fitted on a brick / stone masonry wall.

iii) With plug and galvanized screws (45 mm x 10 nos.). Position and number of fixing lugs and screws shall be as per IS: 1948: 1961 as far as practicable, Complete with all accessories including cleaning the Aluminum sections free from lacquer.

13.2.0 **ALUMINIUM FULLY GLAZED DOORS:**

13.2.1 Aluminum doors shall be manufactured from standard aluminum alloy extrudes sections and shall be all as per drawings. The aluminum alloy shall be as per IS-733, HE-O-WP. Hollow aluminum alloy sections shall conform to IS designation HV-O-WP of IS 1285. Aluminum doors will be made of 5.5 mm thick plate glass fitted and fixed with box 101.6 x 44.45 x 3.18 mm aluminum frame with snap beadings and glazing clips as per standard practice and exhibit drawings. Aluminum beading of approved size and make, gasket and felt will be used for holding the glass in position. One floor spring 12"x8" as per IS 7197 shall be provided with each panel at bottom unless otherwise specified and one pivot at top of each panel shall be provided. Proper locking arrangement as per drawings and direction of Engineer-in-Charge shall be provided.

13.2.2 **Fittings & Fixtures:**

All doors shall be provided with double action floor spring, suitable locking arrangement (open able either from outside or inside), bolting devices and handles. In case of double leaf shutters doors, the first closing shutter shall have a concealed aluminum bolt at top. All fixtures shall conform to relevant I.S. codes.

13.2.3 **Rate:**

Rate shall include cost of all materials and labor required for fixing the door excluding the cost of floor springs (which shall be paid separately) etc. complete with all accessories including cleaning the aluminum section free from lacquer.

13.3.0 **ALUMINIUM PARTLY GLAZED PARTITIONS:**

13.3.1 Aluminum sections, finish, glazing, workmanship etc. shall, in general, conform to the specifications covered under clause 16.1.0 and its sub-clauses except that floor-springs and locking arrangements which will not be required in case of glazed panels. These panels shall have to be fixed in wall openings (with provision for opening as per drawings, specifications and instructions of the Site Engineer / Engineer-in-charge.

13.3.2 **Rate:**

Rates shall include all materials and labor required for providing and fixing he panel in position complete.

13.4.0 **ALUMINIUM GLAZED WINDOW/ VENTILATORS (FEXED/ OPENABLE / TOP HUNG VENTILATORS):**

13.4.1 Frames for windows/ventilators shall be fabricated from anodized aluminum alloy section HE9-

WP confirming IS : 733 and HE9-WP conforming to IS-1285 true to dimensions as shown in construction drawings after making clearance for proper fittings in the wall opening as per IS:1948.

13.4.2 **Glazing:**

Glazing panels of not less than 4 mm thickness or as specified shall be used. Sizes of glass panels shall conform to table I of IS:1948, wherever practicable. Specifications and fixing glazing shall confirm to those of steel door, windows and ventilators.

13.4.3 **Fittings & Fixtures:**

All windows shall be provided with cast aluminum handles and peg stays conforming to A-5-M of IS: 617 with anodized finish of 15 micron thickness and powder coating of minimum 50 microns thickness. Ventilators shall be top hung and provided with peg stays. It (peg) shall be 300 mm long complete with peg & locking bracket. The locking bracket shall either fitted to the frame or to the ventilator.

13.4.4 **Rate:**

Rate quoted for glazed windows and ventilators shall be inclusive of glazing works and shall be as per relevant item given in the schedule of rates.

13.4.5 **Payment:**

Payment shall be made on square meter basis of the actual area of the frame fixed.

13.5.0 **CARPENTRY & JOINERY**

13.5.1 **Carpentry work:**

The timber to be used shall be well seasoned free from knots and other defects. All joints shall be true and tightly fitted to each other and of the type as specified for the particular work. The embedded portion of the timber shall be painted with two coats of hot bitumen. The surface of wood work to be painted shall be cleaned and sand papered so that the surface is quite smooth. Paint shall be applied over a priming coat of specified primer. All joints shall be neat and strong truly accurately fitted and coated with white lead being fitted.

13.5.2 **Flush Doors:**

These shall be of well seasoned soft wood battens of poplar etc with three layers of ply as specified these flush door shutter should be phenol bonded fire proof and water proof in all respect with teak wood lapping on all side, the thickness will be 40 mm as specified. Molded and mortised together in a workman like manner. Each panel of door shall be of such thickness as specified.

The measurement shall be in square meters from outside of frame both ways vertical and horizontal. Wooden molding shall not be paid separately. Measurements shall be measured nearest to one mm and area calculated to three places of decimal in square meter and shall include all fittings as described in the item of work.

13.5.3 **Almirah and boxes below work counters:**

These should be of seasoned board 18mm board of good quality termite proof and water proof of ISI mark Duro or equivalent and lapping on shutter should be of teak wood, with sunmica 1.0 mm thick pressed with fevicol/ or any other specified bonding material on the front surface or good quality veneer should be used as per the specified shade and quality.

Measurement shall be done in square meters.

13.6.0 **Rate:**

Rate quoted for glazed doors, almirahs and boxes shall be inclusive of all complete fitting works and shall be as per relevant item given in the schedule of rates.

13.7.0 **Payment:**

Payment shall be made on square meter basis of the actual area of the frame fixed.

14.0 Aluminum Composite Panel:-

14.1.0 Providing & Fixing of **4mm thick PVDF coated** Exterior Grade Aluminum Composite Panel Cladding consist of LDPE core laminated between two sheets of aluminum foils**.50** thickness of a same grade on both sides as per ASTM standard ensuring no Air Entrapment between PE core and Aluminum Coil in desired color as may be approved by the Architects as per Elevation Drawings and Plan Drawings.

14.1.1 The basic frame work shall be created by **38mm x 38mmx16 gauge thick** Extruded Aluminum Rectangular Tube in the vertical and horizontal plane of the cladding.

14.1.2 The Extruded Aluminum Rectangular Tube shall be provided with 50mm long Aluminum Extruded Angle (Brackets) of 25x25x4 mm thick (Or 38x25x4 mm thick-50x25x4 mm thick or as may be required at site at respective locations) at every 900mm internal on both sides of the Tube, fixed with 3 Nos. of Aluminum Rivets for each angle.

Fixing of the basic framework shall be done by drilling holes by an Electric Drill in the Masonry/Reinforced Cement Concrete, inserting 50mm long Nylon Sleeves of Fischer make and 10x25 or 50 or 75mm long stainless Steel CSK Wooden Screw (2 Nos. per Bracket). Wherever the basic frame work is required to be fixed on to Metal Structural Framework, the same shall be done by drilling holes and fixed with Stainless Steel self taping screws. ACP shall be sealed with

"Non-Staining" Silicon Weather Sealant of **Dow Corning 789 (USA).** TheAluminum Composite Panel Cladding shall be measured on out to out basis and paid for.

14.2.0 **Semi Unitized Glazing-**

Providing & fixing of Semi unitized structural glazing in DGU (Double glass unit) as per the Elevation drawing, fabricated out of Heavy Duty Aluminum Extruded profiles. All profiles shall be conforming to Alloy **63400 WP**. Frame made from **131mm x 67mm2.5mm Thick.** hollow extruded structural glazing Vertical section, horizontal section **81mm x 67mm X 2.5 mm** and sub frame section will be of **68mm X 28mm.X1.8mm** thick for glass with natural Anodized/power coating minimum **50 to 60 micron** and glass will be of **6mm toughened reflectasol +12mm air gap+6mm clear toughened glass Make Saint Gobain .** with fixed in grid pattern mechanically joined with cleats and screws, frame fix to the slab /beam with fastener and fixing over it unitized Aluminum glazed panel with spacer tape and structural glazing adhesive and duly fixing the glazed panel to the main frame and sealing joint with silicon sealant make **Dow Corning789** for waterproofing and **995** structural support. All Profile shall be Powder coated to required color .The Semi unitized structural glazing shall be designed for a Wind Pressure as per site condition. The Anchoring/ Bracing of the Semi unitized structural glazing at site with Heavy duty M.S. Brackets of approved design, Pure Polyester Powder Coated to 50 Microns Thickness in approved color M.S. Brackets of approved Design. PVC spacers shall be provided between the Aluminum Mullion member and Bracket. Aluminum shims of various thicknesses as may be required shall be provided behind the brackets to adjust the beam level variations possible at site, or Extended brackets duly designed shall be provided of required size as per site requirements. FISCHER makes fasteners and 10 x 75 mm. stainless Steel Bolt (or as may be required as per site condition) shall be used for Anchoring the Brackets to provide a minimum anchoring depth of 40mm in the concrete to withstand the dead load of the Semi unitized structural glazing as stresses due to wind pressure etc

14.3.0 **Technical Specifications:-**

A. Vertical Frame Section : 131mm X 67mmX2.5mm thick.

B. Horizontal Frame Section : 81mm X 67mmX2.5mm thick.

C. Glass Panel Section : 68mm X 28mm.X1.8mm thick.

D. Reflective Glass : 6mm toughened . Reflectasol+12mm air gap + 6mm clear toughened glass.

E. Powder Coating : 50/60 microns Color Powder Coating.

F. Tape : Norton Tape.

G. Bracket : 6mm thick MS Power Coated bracket.

H. Anchor Fastener : 12mmX100mm Fastener.

I. Structural Silicon : 995 St Silicon Dow corning.

J. Weather Sealant : 789 Weather Sealant Dow Corning.

15.0 <u>Structural glazing</u>

15.1.0 Design, fabrication and installation of structural glazing system in the form of fixed panels, using specially designed aluminum extruded sections, (weight 6 Kgs./sq. m.) mullions and transoms having 50 micron pure polyester powder coating of approved color and shade and make with mullions fixed on the RCC beams/columns through adequately designed brackets providing and fixing glass as specified including providing masking tape on the profiles for safety against external scratches on site complete with approved silicon sealant EPDM gasket etc. to make the curtain glazing air tight and water tight as per standard and as per architects drawings and specifications. Contractor to furnish shop drawings along with sequence of work and for approval of Architect.

15.2.0 Above items using insulated glass hermetically sealed with 6 mm outer hard coated toughened reflective glass and 5 mm clear float glass inside with 12 mm dry air cavity between two glass panes separated by a hollow aluminum spacer bar with twin lines of micro holes as approved filled with molecular desiccant of approved make sealant of approved make all complete.

16.0 <u>ARMSTRONG CEILING SYSTEM</u>

16.1.0 **Lay In Metal– Standard Perforated without fleece (BP4266M6A1WH)**

Providing & Fixing of Armstrong Lay In Standard Perforated without fleece (BP4266M6A1WH) metal ceiling System consisting of 600x600x0.50mm Lay in tiles with micro look edge. Tile should have 2.50mm dia. holes with 16% open area. Material of pre coated hot dipped galvanized steel with surface finish of baked polyester paint in 0.50 mm thickness in white color with RH 100 performance to inhibit panel sag. Formulated to withstand conditions with temperature up to 49 degree Celsius. Having CAC of 36 and fire resistance of Class A and Air quality ISO 3 (3). And having inherent Anti Microbial. Light reflectance 77% and scrub able soil resistant durability. To be laid on Armstrong make Superfine 15 mm steel angle systems with 15mm wide T - section flanges color white having rotary stitching on the Main Runner (BP754033), 1200mm (BP753032) & 600mm (BP752032) Cross Tees and Angle Molding (BPT1945HI). Luminaries should be independently hung from the Soffit. Web height of steel angle should be 38mm with load bearing capacity of 15.20 Kg/ SQM. Length of Main Runner should be 3600mm.

The Tile & Grid system used together should carry a 15 year warrantee. The T Sections have a Galvanizing of 120 grams per M2 & passed through 500 hrs of Salt test.

16.2.0 **INSTALLATION:** To comprise main runner spaced at 1200mm centers securely fixed to thestructural socket by approved hanger at 1200mm maximum centre. The last hanger at the endof each main runner should not be greater than 450mm from the adjacent wall.Flush fitting 1200mm long cross tees to be interlocked between main runners at 600mm centreto form 1200 x 600 mm module. Cut cross tees longer than 600mm require independentsupport. 600 x 600mm module to be formed by fitting 600mm long flush fitting cross teescentrally between the 1200 mm cross tees.Perimeter trim to be Armstrong wall angles or channel, secured to walls at 450 mm maximumcenters.

16.3.0 **ARMSTRONG SUSPENSION SYSTEM** accessories manufactured and supplied by Armstrong World Industries consisting of M6 Anchor Fasteners (BPGM6065) with Vertical Hangers (BPGM2626) made of Galvanized steel of size 26 x 26 x 25 x 1.2mm with a Galvanized Thickness of 80gsm, A pre Straightened Hanger wire (BP78916BD10) of dia – 2.68 mm of 1.83 m length., thickness of 80gsm and a tensile strength of 344-413 MPa, along with Adjustable hook clips (BPGM2010) of 0.8mm thick, galvanized spring steel for 2.68 mm with a minimum pull strength of 110 kg. The adjustable clip also consists of a 3.5 mm aquiline wire to be used with the main runner.

17.0.0 APP WATER PROOFING:

17.1.0 Water Proof treatment on roof shall be as specified in Schedule o f Rates and shall be carried out as per CPWD specifications 2009 volume-II Clause no. 25.13 and as per manufacturer's recommendations.

17.1.1 The surface to be treated shall have a minimum slope of 1 in 120 or as directed by the Site Engineer. Grading shall be carried out with PCC 1:2:4 with 10 mm down aggregate to 40 mm average thickness and finished smooth. Such grading shall be included in the item and nothing extra shall be paid on this account.

17.1.2 Junction between the roof and vertical face of parapet wall etc. shall be caused by running galta / triangular fillets 75x75 mm size in PCC 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size). At the drain mouths the fillets shall be suitably cut back and rounded off for easy application of water proofing treatment and easy flow of water. The provision of fillets shall not be included in the item of water proofing and shall be measured and paid for separately under the relevant item of schedule of rates.

17.1.3 For carrying over and tucking in the water proofing felts into parapet wall etc. a horizontal groove 65 mm deep and 75 mm wide section with its lower edge not less than 150 mm above the graded roof surface shall be left on the inner face of the same during construction, if possible. When such groove has not been left, the same shall be cut out neatly. The base and rear of the groove shall be finished smooth with cement mortar 1:4 (1cement: 4coarse sand). Such cutting of groove and its finishing smooth shall be deemed to be part of the water proofing

item and shall not be measured or paid separately. No deduction shall be made either, for making the groove when the later has already been left in masonry.

17.1.4 Tucking in of the water proofing felt will be required where parapet wall exceed 45 cm in height from graded surface. Where the height is 45 cm or less, no groove will be required as the water proofing treatment will be carried over the top of the parapet wall to its full thickness. Such treatment shall not be measured or paid for separately.

17.1.5 The graded surface of the roof and concrete fillets and face of walls etc. shall be thoroughly cleaned with wire brushes & all loose scale etc. removed. The cracked surface shall be cut to `V' Section, cleaned and filled up flush with cement mortar slurry 1:4 (1 cement : 4 coarse sand). Such cleaning of the surface or treating the crack shall not be paid for separately.

17.1.6 After grouting the crack, if any, with Cement grout, the same shall be cured for a minimum period of seven days. The roof surface will be made dry and thoroughly cleaned with wire brushes & all loose scale etc. removed. The APP (Atactic Polypropylene Polymer) modified prefabricated five layer 3mm thick water proofing membrane, black finished reinforced with non-woven polyester matt consisting of a coat of bitumen primer for bitumen membrane @ 0.40liter / Sqm by the same membrane manufactured of density at 25degree Celsius , 0.87 - 0.89 kg / liters and viscosity 70 - 160 cps. Over the primer coat, the layer of membrane shall be laid using butane torch and sealing all joints etc., and preparing the surface complete. The vital physical and chemical parameters of the membrane shall be as under : Joint strength in longitudinal and transverse direction at 23degree Celsius as 350/300 N/5cm. Tear strength in longitudinal and transverse direction as 60/80N. Softening point of membrane not less than 150°C. Cold flexibility shall be up to -2°C when tested in accordance with ASTM, D - 5147. The laying of membrane shall be got done through the authorized applicator of the manufacturer of membrane.

17.1.7 Payment will be made on square meter basis of the area of roof surface covered by the APP water proofing treatment. No extra measurement shall be made for laps, joints, anchoring in grooves, carrying over parapet etc.The rate will be inclusive of all the operations described above.

18.0.0 **G.I. PIPES & FITTINGS:**

18.1.0 All G.I. Pipes and fittings shall conform to IS: 1239 and shall be of medium grade (Class - B) for water supply services. All screwed tubes and sockets shall have pipe thread in accordance with the requirement specified in IS: 554.

18.2.0 All fittings shall be of malleable galvanized iron approved by the Engineer-in-Charge. Fittings in G.I. line shall include all couplings, elbows, tees, bends, union, nipples, reducers, rubber insertion etc. No extra payment shall be made for these fittings. Payment shall be made on running meter basis. All pipes shall be painted with two coats of anti corrosive bitumenestic paint with an under coat of red oxide primer.

18.3.0 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 shall be replaced at no extra cost. The pipes and fittings after laying shall be tested under a gradually applied test hydraulic pressure of 6 kg/sq.cm. The pipe and joints shall be capable of maintaining the above pressure for at least half an hour without any indication of fall of pressure. All expenses in carrying out the test shall be borne by the Contractor.

18.4.0 Measurement shall be made in running meter of the finished job as described above. Rate shall include the cost of materials and labor involved in all the operations describe above.

19.0.0 <u>EUROPEAN TYPE WATER CLOSET :</u>

19.1.0 Water closet of Hindustan ware /Perry ware or any other equivalent approved make, color , of vitreous china clay conforming to IS: 2556 ,Part VIII and as described in the Schedule of Rates. The closet shall be of one, piece construction and have integral flushing rim of suitable type. Each water closet shall have four holes with its pedestal for fixing to the floor. The water closet shall have an integral S or P trap outlet with at least 50 mm water-seal. The closet shall be provided with 10 liters low level PVC flushing cistern with all fittings, CP Brass Angle valve with CP Brass connection pipe, M.S. or C.I. brackets and 40 mm dia flush bend pipe. The closet shall be provided with approved color plastic seat and lid.

19.2.0 The water closet shall be fixed to the floor by means of 75 mm long 6.5 mm diameter counter sunk bolts and nuts embedded in the floor concrete. The cisterns shall be fixed on C.I. cantilever brackets which shall be firmly embedded in the wall in cement mortar 1:4 (1 cement: 4 fine sand). The cistern shall be connected to the closet by means of 40 mm diameter white porcelain enameled flush bend with rubber inlet connection.

19.3.0 Rate shall include cost of all materials, labor involved in all the operations specified above including fixing, cutting of wall and floor and making good the same.

20.0.0 <u>WASH BASINS</u> :

20.1.0 Wash basins of Hindustan ware /Perry ware or any other equivalent approved make and size specified in the relevant item of schedule of rates shall be provided and fixed with single 15 mm CP brass pillar tap with CI/MS brackets of approved brand i.e Kingston / Gem/ Techno/ Parko. Wash basin shall be of one piece construction including a combined over flow. This shall be fitted on C.I. or M.S. brackets (conforming to IS:775). The wall side shall be fixed well flushed with the plaster of wall and the joint, if any, shall be properly finished with mortar and painted white. The basin shall be provided with C.P. brass waste trap, C. P. brass chain, rubber stopper, CP brass bottle trap, CP brass angle valve, CP brass connection pipe and 32 mm dia. C.P. brass waste pipe. The basin shall be fixed at 800 mm above finished floor level or as directed by the Site Engineer.

20.2.0 Rate shall include cost of all materials and labor involved in all the operations mentioned above.

21.0.0 C.P. BRASS BIB COCKS/ STOCK COCKS/ OTHER CP FITTINGS

21.1.0 All the C.P. Brass bib cocks, concealed stock cocks, bottle traps and all other CP fittings shall be of Kingston / Gem/ Techno/ Parko or equivalent approved make.

22.0.0 URINALS:

22.1.0 Providing and fixing colored vitreous china flat back or wall corner type lipped type front Urinals basin of size 430 x 260 x 350 mm with automatic PVC flushing cistern of 5 ltr. Capacity of approved make i.e. Parryware / Hindware / Seabird / Orient with standard flush pipe and CP brass spreaders shall be conforming to IS:2556 Part-VI. Urinal basin shall be of one piece construction with integral flushing rim. These shall be mounted on walls.

The flushing inlet pipe connection piece shall be of CP brass 15 mm dia. with brass union and CP brass stop cock/Angle valve for cistern, 25 mm dia CP. distribution pipe and waste pipe shall be 750 mm long 32 mm dia. G.I. pipe with necessary brass union and CP. brass screws shall be used for fixing the urinals. Fixing shall ensure that no liquid is left over in the pan after flushing. Urinals shall be connected to automatic flushing cistern either individually or in groups. For a set of three urinals one automatic flushing cistern of 5 liter capacity shall be provided or as per specified in Schedule of Rates.

22.2.0 Rate shall include cost of all material and labor involved in all the operations mentioned above.

23.0.0 BEVELLED EDGE MIRROR:

23.1.0 The beveled edge mirrors shall be of best quality of `Hindustan Pilkington' or equivalent make approved by Engineer-in-Charge. The size of the mirrors shall be 600 x 450 mm and of thickness 6 mm. Mirrors shall be provided with a backing of asbestos sheet of 6 mm thickness and fixed to wooden cleat with 4 C.P. brass screws.

23.2.0 Payment shall be made on number of mirrors fixed.

24.0.0 TOILET PAPER HOLDER:

24.1.0 The toilet paper holder shall be of C.P. Brass of size 150 mm x 150 mm fixed with C.P. brass, screws over the wooden cleat. Chromium plating shall be of Grade B type conforming to IS: 1068 (latest edition). The payment shall be made on per number basis. The rate is inclusive of providing and fixing of toilet paper holder with screws, and making good the wall complete with all labor and material.

25.0.0 TOWEL RAIL:

25.1.0 The towel rail shall be of chromium plated and shall be of 20 mm dia. and up to 600 mm length. Aluminum brackets shall be fixed on both the sides. The rod shall be fixed with screws and wooden batten on the walls as directed. The mode of measurement shall be on number basis.

26.0.0 C.I. RAIN WATER PIPES AND FITTINGS :

26.1.0 Pipes and fittings shall be of approved manufacture. Pipe shall be true to shape, have smooth and cylindrical inner and outer surfaces and be as nearly as practicable, concentric. These shall be of sound and uniform casting, free from laps, pin holes or other imperfections and shall be neatly finished and carefully fitted with both inside and outside. The pipes shall be factory painted with a coat of tar both inside and outside (applicable for CI pipes).

26.1.1 Pipes shall be secured to wall at all joints with MS holder bats and clamps. The clamps shall be made from 1.6 mm thick MS flat 30 mm width, bent to the required shape so as to fit tight on the socket of the pipe. The clamps shall be fixed to the wall by clamping/embedding their hooks in steelworks/cement. Concrete blocks 10 x 10 x 10 cm of mix 1:2:4 (1 cement: 2 coarse sand: 4 stone aggregate 10 mm nominal size) for which the necessary holes shall be made in proper places. The annular space between spigot and socket of the pipe shall be filled with five turns of spun yarn soaked in cement slurry and then filled with cement mortar 1:2 (1 cement : 2 fine sand and finished flush).

26.1.2 A M.S. grating of size 150mm X 150mm X 8mm thick weighing minimum 100grams shall be provided and fixed at the inlet mouth of the rain water pipes.

26.1.3 Payment will be made on running meter basis inclusive of all material, jointing, fitting and fixing in position, including bends, shoes. M.S. grating, MS holder bat clamps and other specials etc. complete for all the operations described above.

27.0.0 OIL BOUND DISTEMPER:

27.1.0 **Materials:**

Oil bound washable distemper of approved shade, brand and manufacture shall be used. The primer shall be of the same manufacture as oil bound distemper. The distemper and primer shall be procured by the contractor in sealed tin in sufficient quantities at a time to suffice for a fortnight's work and the same shall be kept in the joint custody of the contractor and the Site Engineer. The empty tins shall not be removed from the site of work, till this item of work has been completed and passed by the Site Engineer.

27.2.0 **Preparation of Surface:**

The surface shall be thoroughly cleaned of dust, old white or color wash if any by washing and scrubbing and then be allowed to dry for at least 48 hours. It shall then be sand-prepared to remove any unevenness. Depressions if any, shall be made up with plaster of Paris putty.

27.3.0 **Application:**

The primer coat shall be applied first horizontally and then vertically immediately afterwards. The surface shall be finished as uniformly as possible leaving no brush marks. It shall be allowed to dry for at least 48 hours before oil bound distemper is applied. The surface thus prepared shall be lightly sand papered to make it smooth for receiving distemper, taking care not to rub out the primer coat. One coat of distemper properly diluted with thinner (as stipulated by manufacturer) shall be applied with brush in horizontal strokes followed immediately by vertical ones, which together constitute one coat. The subsequent coat shall be applied in the same way, so as to obtain an even shade. A time interval of at least 24 hours shall be allowed between consecutive coats to permit proper drying of the preceding coat.

27.4.0 Mode of measurements and payments shall be on the Sq.M. basis. Deductions of opening shall be done in accordance to IS 1200.

28.0.0 <u>SYNTHETIC ENAMEL PAINT:</u>

28.1.0 Ready mixed paints of approved brand and manufacture as received from the manufacturers without any mixture shall be used as per the manufacturer's instructions. If for any reason thinning is necessary, the brand of thinner recommended by Site Engineer shall be used. Primer shall be applied uniformly over the all surfaces.

28.2.0 Paints of approved brand and manufacturers as approved by Site Engineer shall be used. Paints manufactured by M/S. Johnson & Nicholson, Asian Paints, Berger Paints, Nerolac and Shalimar shall only be used.

28.3.0 The brushing operations are to be adjusted to the spreading capacity advised by the manufacturers of particular paint. All unevenness shall be rubbed down to smoothness with sand paper and the surface shall be well dusted. The doors in wood shall be filled up with filler made of a paste of whiting in, if required otherwise the French polish will get absorbed and good gloss will be difficult to obtain.

29.0.0 <u>PLASTIC EMULSION PAINT</u>

29.1.0 Preparation of Surface:

The surface shall be thoroughly cleaned of dust, old white or color wash if any by washing and scrubbing and then be allowed to dry for at least 48 hours. It shall then be sand-prepared to remove any unevenness. The surface before application of paint shall be flattened well to get the proper flat velvety finish after painting. Any depression / dents / holes shall be filled with thin acrylic wall putty/ cement putty and allowed to dry for 4 to 6 hours.

29.2.0 **Application:**

Plastic emulsion paints of Asian/Burger/Nerolac or other equivalent approved shade, brand & manufacture shall be used. The primer coat shall be applied first horizontally and then vertically immediately afterwards over the above prepared surface. The primer used shall be of the same make as the plastic emulsion paint. The surface shall be finished as uniformly as possible leaving no brush marks. It shall be allowed to dry for at least 6 to 8 hours. Again the surface shall be smoothened with emery paper and wipe cleaned followed by application of another coat of primer. This will again be allowed to dry for 6 to 8 hrs. The surface thus prepared shall be lightly sand papered to make it smooth for receiving 2 coats of premium emulsion paint, taking care not to rub out the primer coat. One coat of plastic emulsion paint properly diluted with water (as stipulated by manufacturer) shall be applied with brush in horizontal strokes followed immediately by vertical ones, which together constitute one coat. The subsequent coat shall be applied in the same way, so as to obtain an even shade. A time interval of at least 3 to 4 hours shall be allowed between consecutive coats to permit proper drying of the preceding coat.

29.3.0 Mode of measurements and payments shall be on the Sq. M. basis. Destructions of opening shall be done in accordance to IS 1200.

30.0.0 SPECIFCATIONS FOR BUILDING ELECTRIFICATION

30.1.0 GENERAL

a) This specification defines the minimum requirements of supplies, installation & testing of internal electrification system of various buildings at stations.

b) The works under this specification include supply of all the materials as per ISS or equivalent international standards, which shall be duly approved by Owner. Contractor should indicate in the offer conforming codes/ standards and makes of various materials to be supplied and installed.

c) Number of various fittings/ fixtures is to be marked out which are indicated in the bid. Before proceeding with any work, the Contractor shall carefully check and verify all dimensions, sizes, etc. and assume responsibility for the proper fitting of the materials and equipments in the buildings/structures.

d) The contractor shall employ supervisory and skilled personnel who are well conversant with the nature and standard of work required in electrification of buildings.

e) In all matters relating to the installation of electrical equipments, the Contractor shall be responsible for the quality and correctness of workmanship and for the quality and suitability of materials of his supply.

f) Inspection and acceptance of complete installation will be based upon compliance of the above regulations and requirements.

g) Contractor shall use modern methods and practices to secure a result that will present a high quality of workmanship and a neat and 'finished' appearance.

h) Temporary arrangement of power supply shall be done by the contractor without any additional cost, if main power supply is not arranged/available.

30.2.0 **STANDARDS:**

The work shall be carried out in the best workmanship manner in conformity with this specification and with the relevant specifications/ codes of practice of Indian Standard and International standards and shall also conform to the requirements of following:

i) Indian Electricity Acts and Rules with latest amendments.

ii) Tariff Advisory Committee; a statutory body under Insurance Act.

iii) Regulations laid down by the Electrical Inspectorate of respective states.

iv) Any other regulations laid down by the statutory authorities.

v) Requirement of OISD regulations.

30.3.0 INSTALLATION OF MAIN & SUB DISTRIBUTION BOARDS:

Main and sub distribution boards shall be suitably mounted recessed on the wall OR erected on the foundations as per instructions of site engineer / EIC at locations indicated in the drawings. Distribution boards shall be earthed at two points to ensure perfect earthling. 40 x 5 mm G.I. strip shall be employed to earth main distribution boards and 8 SWG G.I wire for earthling sub distribution boards.

30.4.0 SYSTEM OF WIRING:

All the wiring shall be of concealed type using conduits. Power wiring shall be kept separate and distinct from light & fan wiring. Separate wiring to be done for each light and power point as shown in the relevant drawing. Crossing of wiring must be avoided. The wiring must be done in such a way they are easily accessible for inspection and maintenance and Junction boxes should be provided at suitable intervals. Jointing of wiring wherever necessary, should be done by porcelain / epoxy resin connectors by providing additional junction boxes.

30.4.1 Point Wiring:

All the Point wiring for 05 Ampere Switch & Socket shall include circuit wiring with 2.5 sqmm stranded PVC insulated copper wire of approved make from Distribution board to Switch board and from one Switchboard to other on the same circuit. The Point wiring for 15 Ampere Switch & Socket shall be circuit wiring with 04 sqmm stranded PVC insulated copper wire of approved make from Distribution board. For Point Wiring of an Air conditioner/Motor duty point; circuit wiring shall be done with 04 sqmm stranded PVC insulated Copper Wire of approved make including earthling the third pin with 2.5 sqmm Copper earthling wire including 20-Ampere Motor duty MCB, 3 pin 32 Amp. Metal Clad Plug & Socket. Stranded PVC insulated Copper Wire of 2.5 sqmm shall be used for wring from Switch board to Light fittings/Ceiling Fan/Exhaust Fan etc. for both phase & neutral

All wiring shall be concealed in 25 mm nominal dia. PVC conduit recessed on Wall/Ceiling/False Ceiling including supply of M.S. Switch boxes, Junction Boxes, Pull boxes, Bushes, Screws, Check nuts, Bends and all other accessories required to complete the job successfully.

16 S.W.G. G.I wire shall run all along inside the conduit to facilitate pulling of copper wires. Contractor may take GI wire of higher diameter/gauge depending upon his requirement for smooth pulling of wires in concealed conduits.

All the controlling switches shall be on the live side of the line.

30.5.0 LAYING OF CONDUITS:

30.5.1 Making of Chase:

The chase shall be provided in the wall & ceiling at the time of building construction and shall be filled up neatly after fixing of conduits in cement mortar 1:3 (1 cement : 3 coarse sand).

30.5.2 **Fixing of Conduit in chase**:

The conduit pipes shall be fixed by means of staples or saddles not more than 60 m apart. In order to minimize condensation on swelling inside the conduit, all the outlets of conduits shall be adequately drained and ventilated, but in such a manner as to prevent the entry of insects etc.

30.5.3 **Bends in conduits:**

Use of standard bends shall be avoided as far as practicable and all curves maintained by bending the conduit pipe itself with a long radius, which will permit easy drawing of conductors.

30.5.4 Bunching of cables in conduits:

The number of insulated cables that may be drawn through a conduit shall be in accordance with IS: 732-1963.

30.5.5 **Conduit Joints**:

Conduits shall be joined by threaded joints where there are long runs of straight conduit, inspection boxes shall be provided at suitable intervals. For conduits fittings & accessories reference may be made to IS: 2667-1964 & IS: 3837-1966.

30.5.6 **Inspection Boxes:**

Suitable boxes shall be provided to permit periodical inspections and to facilities removal of wires if necessary. These shall be mounted flush with the wall. Suitable ventilating holes shall be provided in the inspection box covers.

30.5.7 **Earthling of conduits:**

Earthling of entire conduit shall be done by using 1 Sq.mm PVC insulated copper cable wires, which shall run all its length, outside the conduits. Conduits, in which cables have been installed, shall be effectively bonded and earthed. Cable arm ours shall be earthed at both ends.

The earthling of all equipment shall be carried out in accordance with the IS;3043-1966 (with latest amendments)

All the Nuts, Bolts & Washers to be used for termination in earthling system are to be of Brass.

Joints and tapping in the main earth loop shall be made in such a way that reliable and good electrical connections are permanently ensured. All joints on earthling strip shall be welded and suitably protected by giving two coats of bitumen and covering with insulation tape. The joints shall be lapped first with the overlapping length not less than width of the GI strip and it shall be welded all round the periphery of LAP joint. Tee connectors shall be used for tapping, earthling leads from the main earth loop wherever required.

31.0.0 LIGHTING FITTINGS:

Each lighting fitting shall be controlled by a switch and all the accessories required to complete the fitting shall be supplied & erected as per manufacturer's recommendation. Necessary Control gears, support structures, clamps, copper ballast, capacitor, lamp holders, lamps, starters, connector blocks, drop pipes, ceiling roses, hooks, nuts & bolts, fasteners, should be provided wherever required. The Flame proof light fitting shall confirm to IS 2148 & IS 2206 (latest edition)

31.0.0 EXHAUST FANS:

For fixing of an exhaust fan a circular hole shall be provided in the wall to suite 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 fed from the switchboard provided near the location of the fan. The location of exhaust fans shall be as indicated in the drawing. Louver shutters on outside wall for preventing entry of birds shall be provided. Wiring for Exhaust Fan is inclusive of providing 5 Ampere socket point near the exhaust fan and a 5-Ampere Switch under the exhaust fan at a height of 1.2 Meter from finished floor level. The work shall also include supply of accessories such as three pin Plug, three core flexible wire up to Exhaust Fan, termination etc.

32.0.0 SWITCH BOARDS/ OUTLETS:

The switch regulator box shall be made of metal on all side except on the front. In case of cast boxes, wall thickness shall be at least 3 mm and in case of welded M.S Sheet boxes the wall thickness shall not be less than 18 gauge for boxes up to a size of 20 cm x 30 cm and above this size 16 gauge M.S Boxes shall be used. A 3 mm thick phenolic laminated or Bakelite sheet or modular switches panel shall be fixed on the front with brass screws. Clear depth of boxes shall not be less than 60 mm and this shall be increased suitably to accommodate mounting of fan regulators in flush pattern. All switches, receptacles, fan regulators etc. on the switchboard shall be mounted in flush pattern.

33.0.0 SOCKET OUTLETS AND PLUGS:

Every socket outlet shall be controlled, by a switch which shall be located immediately adjacent thereto or combined therewith. The switches controlling the socket outlet shall be on the live side of the line. Socket outlet shall be fixed 23 cm above from the floor level or as directed by Engineer-In-Charge at locations shown in the drawing. Socket outlet with plug shall be of three pin type with the third terminal connected to the earth.

34.0.0 CEILING FANS, REGULATORS AND CLAMPS:

34.1.0 Ceiling fans including their suspension shall conform to IS: 3740 (1960)(revised 1966). All ceiling fans shall be wired to ceiling roses or to special connector boxes to which fan rod wires shall be connected and suspended from hooks or shackles with insulator between hook and suspension rod. Fan clamps shall be of suitable design according to the nature of construction of ceiling on which these clamps are to be fitted. In all cases all clamps shall be fabricated from tested new metal of suitable sizes. Fan clamps for reinforced concrete roof shall be buried with the casting and due care shall be taken that they shall serve the purpose.

34.2.0 Canopies on top and bottom of suspension rod shall effectively hide suspension and connections to fan motors respectively.

34.3.0 Unless otherwise specified all ceiling fans shall be hung not less than 2.75 m above the floor.

34.4.0 Electronic regulator of approved make is to be used for controlling the speed of the ceiling fan.

35. System Wiring:

35.0.0 Following tests shall be complied with in accordance with IS: 732-1963, clause 9.1

a) Insulation resistance test.

b) Earth continuity test.

c) Polarity test of switches.

36.0.0 Supply and Installation of Safety Equipments

36.1.0 The Contractor shall supply and install the following safety equipment. The equipments offered shall be of very good quality conforming to IS:2551-1963.

a) Vitreous Enamel caution boards for 440 Volts

b) Shock Treatment chart in a very neat frame with glass. The description on the chart shall be in English, Hindi and regional language.

APPENDIX-1

LIST OF APPROVED ELECTRICAL EQUIPMETS/ FITTINGS & FIXTURES

SL.N.	NAME OF FITTINGS/ FIXTURES/ EQUIPMENTS	MANUFACTURER'S NAME/BRAND AS REQUIRED
1.	650 V grade PVC insulated PVC sheathed Cu wires (for internal wiring)	Finolex.Kalinga/Havells/Bonton
2.	Indoor and Outdoor light fittings	Philips
3.	Tube-light fittings	Philips
4.	5A, 3 pin socket and modular switch	Anchor viola/Roma/Havells./
5.	15A, 3 pin socket and modular switch	-do-
6.	M.C.B	Modular
7.		Havells/standard copp.

27.0.0 **OTHER MATERIALS:**

27.1.0 All other materials not fully specified herein and which may be used in the works shall be of best quality approved by the Engineer-in-Charge and he shall have the right to determine whether all or any of the materials offered or delivered for use in the works are suitable for the intended purpose. Contractor shall produce the sample of materials to the Engineer-in-Charge and shall get it approved before procurement and execution of work.

WORKMANSHIP
&
QUALITY STANDARDS

LIST OF I.S. CODE FOR THE REFERENCE

Materials used shall confirm to appropriate standards specified by the Indian standards
institution/Bureau of Indian standards and unless other wise specified, these standards will
form a part of these specifications in particular.

AEPPL herein clarifies that the IS codes mentioned in the technical specifications & in the list given below are for reference only.

The following or latest standards should be referred to-

AGGREGATES

IS : 383-1970 Coarse and find aggregate from natural sources for concrete
IS : 515-1959 natural and manufactured aggregates for use in mass concrete
IS ; 1607-1960 Sand for plaster
IS : 2386 Methods of test for aggregate for concrete.
Part-I-1963 Particle size and shape.
Part-II-1963 Estimation of deleterious materials and organic impurities.
Part-III-1963 Specific gravity, density, voids, absorption and bulking.
Part-IV-1963 Mechanical properties.
Part-V-1963 Soundness.
Part-VI-1963 Measuring mortar making properties of fine aggregates.
Part-VII-1963 Alkali aggregate reactivity.
Part-VIII-1963 Pétrographiqueexaminateur.

CEMENT :

IS : 8112-1976 High strength ordinary Portland cement.

CONCRETE :

IS : 516-1959 Methods of tests for strength of concrete.
IS : 1199-1959 Methods of sampling and analysis of concrete.

REINFORCEMENT CONCRETE :

IS : 456-1978 Code of practice for plain and reinforcement concrete for general building Construction.
IS : 432 Mild steel and medium tensile steel bars and
IS : 1786-1985 High strength Deformed steel bars and wires for concrete reinforcement.

BRICK MASONRY

IS : 1077-1076 Common burnt clay building bricks.
IS : 2212-1962 Code for practice of brick work.

DOORS & WINDOWS

IS : 1003 Timber panelled and glazed shutters.
Part-I-1977 Doors shutters.
Part-II-1966 Windows and ventilators and shut.
IS: 1948-1961 Aluminium doors, windows and ventilators.
IS: 2191 Wooden flush door shutters (Cellular and hollow core type).
Part-I-1973 Plywood face panels.
IS: 2202 Part-I-1991 Wooden flush door BWP type (solid core).

FLOOR AND FLOOR FINISHING

IS : 777-1970 Glazed Earthenware tiles.
IS : 1443-1972 Code of practice for laying and finishing of cement concrete (Flooring
tiles)
IS : 3365-1956 Floor polishing machines.

WATER SUPPLY PIPES AND DRAINAGE

IS : 651-1971 Specification for salt glazed stoneware pipes and fittings.
IS : 778-1971 Gunmetal gate, globe and check valves for general purpose.
IS : 780-1969 Sluice valves for water work purpose.
IS : 781-1977 Cast copper alloy screw-down bib taps and stop valves for water service
IS : 172-1971 Code of basic requirements for water supply, drainage and sanitation.
IS : 1726- Cast iron manhole covers and frames.
Part-I-1974 General requirements.
Part-IV-1974 Specific requirements for MD circular type.
Part-V-1974 Specific requirements for MD rectangular type
Part-VI-1974 Specific requirements for LD rectangular type
Sec 1 : Single seal
Sec 2 : Double seal
Part-VII-1974 Specific requirements for LD square type
Sec 1 : Single seal
Sec 2 : Double seal
IS : 1742-1972 Code of practice for doubling drainage.
IS : 2065-1972 Code of practice for water supply in buildings.
IS : 2556- Vitreous sanitary appliances (Vitreous Chin)
Part-I-1974 General requirements.
Part-II-1973 Specific requirements of wash down water closets.
Part-III-1972 Specific requirements of squatting pans.
Part-IV-1974 Specific requirements of wash basins.
Part-VIII-XV Wash down water-closets, bibes foot rests, shower-rose, foot traps for squatting pans, integrated squatting pans. Universal
water closets.
IS : 2963-1964 Non-ferrous waste fittings for wash basins and sinks.

IS : 311-1965 Waste plug and its accessories for sinks and wash basins.
IS : 4127-1967 Code of practice for laying of glazed stoneware pipes.
IS : 5531 Specification of cast iron special for asbestos cement for water, gas and Sewage

STRUCTURAL STEEL:

IS: 2062-1992 Steel for general structural purpose.

MISCELLANEOUS :

IS : 1020-1963 Conversion tables for ordinary use.

APPROVED MAKES

LIST OF APPROVED MAKES/SUPPLIERS

AS PER BOQ

BLANK BOQ: ONLY FOR REFERENCE

Note:

(1) Bidders shall comply the BOQ and signed & stamped on each page. This will be part of technical bid.

Reference for BOQ of Renovation of type –III Staff quarters at Indian Institute of Tropical Meteorology (IITM), Pune.

Item no.	Description	Qty	Unit	Rate	Amount
	CIVIL WORK				
	(A) Dismentling Civil Work				
1	Removing/Taking down existing sand face External wall and cieling Cement plaster, exposing brick masonry, rakingout joints in the masonry including providing necessary scaffolding & disposing of the material beyond PMC limit all as directed by Engineer In charge etc complete.	975.000	Sq.m.		
2	Removing/Taking down existing neeru/sanala finish Internal wall and cieling Cement plaster, exposing brick masonry, racking joints in the masonry including providing necessary scaffolding & disposing of the material beyond PMC limit all as directed by Engineer In charge etc complete.	2000.000	Sq.m.		
3	Dismantling all R.C.C. Chajja's and lintel beams etc. at G.F.& F.F. including providing necessary scaffolding & disposing of the debris material beyond PMC limit all as directed by Engineer In charge.	50.000	Nos.		
4	Dismantling existing paving/plinth protection including disposing off the material beyond PMC limit all as directed by Engineer In charge etc complete.	26.000	Cu.m.		
5	Dismantling of old wash basins inculing fitting fixtures etc.& disposing off the debris material beyound PMC limit all as directed by Engineer In charge.	8.000	Nos.		
6	Removing Indian type W.C. pan including disconnecting the sanitary & water supply connection & removing & breaking flooring & bed concrete around pan removing the same carefully and disposing off debris material beyound PMC Limit all as directed by Engineer In charge.	8.000	Nos.		
7	Removing/Taking down Doors & Windows including shutters and disposing off debris				

	material beyond PMC Limit all as directed by Engineer In charge etc complete.				
	(a) Doors	75.000	Nos.		
	(b) Windows	72.000	Nos.		
8	Removing existing Indian patent stone flooring of any thickness without removing bed concrete/Mother slab & disposing off the debris material beyond PMC limit all as directed by Engineer In charge.	430.000	Sq.m		
9	Removing of kitchen otta,R.C.C Shelves and partitions for each quarter and disposing of the debris material beyond PMC limit all as directed by Engineer In charge etc complete.	1.000	Job		
10	Dismantling R.C.C. Grills for stair case & disposing off the debris material beyond PMC limit all as directed by Engineer In charge etc complete.	15.000	Sq.m		
11	Dismantling Brick work & disposing off the debris material beyond PMC limit as directed by Engineer In charge etc complete.	34.000	Cu.m		
12	Removing old plumbing fittings and disposing off the dismentelled material and debris out of the premises, all as directed by the Engineer In charge.				
	(a) Shower	16.000	Nos.		
	(b) Bibcock/stopcock Wheel valves etc.	32.000	Nos.		
13	Removing old G.I. Pipes 15mm to 40mm diameter concealed or open and disposing off all dismentelled material and debris out of the premises, all as directed by Engineer In charge.	330.000	RM		
14	Removing Cast Iron dowen take vent pipes and etc fittings and disposing off dismetelled material and debris out of the primises, all as directed by Engineer In charge.	95.000	RM		
15	Removing existing waterproofing over terace and toilet/bath at G.F and F.F quarters including scrapping & cleaning the area thoroughly & disposing off the dabris material beyond PMC limit all as directed by Engineer In charge.	340.000	Sq.m		
16	Dismantling existing water tank's top slab & side walls by providing required support of scaffolding to slab as directed by engineer in-charge & disposing of the damaged material beyond PMC limit as directed by Engineer In charge.	4.000	Nos.		
17	Dismantling R.C.C horizontal & vertical slab shelves partitions of existing cupboard in rooms for each quarter by providing required	8.000	Nos.		

	support of scaffolding and disposing off of the debris material beyond PMC limit all as directed by Engineer In charge.				
	TOTAL (A)				
	(B) New Civil Work				
18	Excavation in foundation in all types of soil including hard murum, sand, soft rock including shoring, pumping or bailing out water, back filling excavated material in the sides of trenches and / or spreading, leveling surplus earth as directed or disposing of the still surplus earth anywhere in owners boundary with 150 m. lead & depth upto 1.5 m. as directed by Engineer In charge.	11.000	Cu.m		
19	Providing & Constructing 2nd class Burnt Brick masonry 230 mm thick with conventional / I.S. type Brick, in Cement Mortat (1:6) including striking joints on unexposed faces & raking out joints on exposed face, providing scaffolding for construction, curing etc. complete.	30.000	Cu.m		
20	Providing & constructing 2nd class Burnt Brick masonry 100mm thick with conventio-nal / I.S. type brick in c.m. (1:4) including providing R.C.C. Bond at 0.9 m interval, striking out joints on unexpo-sed faces & raking out joints on exposed faces, providing scaffolding for construction, curing etc. complete	28.000	Sq.m.		
21	Providing & laying machine mixed plain cement concrete in grade M10 but having volumetric proportion (1:3:6) (Cement:sand:coarse aggreg-ates) of specified thickness mix & gradation & including formwork if required, laying, spreading vamming, curing, etc. for all types of foundations below footings, walls, rafts, etc.complete all as directed by Engineering-in-Charge.	33.000	Cu.m		
22	Providing & Casting in situ RCC M20 of trap/granite /quartzite/gneiss metal for Lintel as per design including formwork, laying, spreading, ramming, compaction, curing & roughening the surface if special finish is to be provided etc. complete.(Excluding steel)	12.000	Cu.m		
23	Providing & applying internal cement plaster 15 mm thick in a single coat in Cement Mortar (1:4) over chicken wire mesh with neeru finishing to concrete & brick surface in all	2000.000	Sq.m		

	position including all types of finishing such as cornice, molding, pattas, scaffolding & curing etc. complete as directed.				
24	Providing & applying external cement plaster 20 mm thick over chicken wire mesh in double coat. First coat in c.m. (1:4) & Finishing coat in c.m. (1:2) with sand face finish to concrete & brick surfaces in all positions including all types of finishing such as cornice, mold-ing, pattas, scaffolding & curing etc. complete as directed.	990.000	Sq.m		
25	Providing & laying Ceramic tiles of size 450 X450X9mm (make Nitco / Kajaria / Bell) in required position laid on a bed of C:M (1:4) including neat cement float, filling joints with white / coloured cement slurry, cleaning curing etc. complete	345.000	Sq.m		
26	Providing & fixing 450X100 X9mm (make Nitco / Kajaria / Bell) skirting in required position with cement mortor including joint filling with white/coloured cement slurry cleaning curing etc. complete	360.000	R.M.		
27	Providing & fixing 300X300 X7mm antiskid ceramic tiles for flooring in toilets/Bath (make Nitco / Kajaria / Bell) in required position on C.M. (1:4) including neat cement float, filling joints with white / coloured cement slurry, cleaning curing etc. complete.	23.000	Sq.m		
28	Providing & fixing ceramic tiles in dado of size 200mmX 300mmX7 mm in toilets of approved quality & brand (make Nitco/Kajaria/Bell) in required position with cement mortor including joint filling with white/coloured cement slurry cleaning curing etc. complete.	305.000	Sq.m		
29	Providing & laying 60mm thick precast concrete paving blocks including ramming the ground laying ¼" crush metal in required slope ramming the same & laying blocks over it in proper slope & level and cleaning etc. complete.	160.000	Sq.m		
30	Providing & constructing Kitchen platform of 25 mm to 30mm thick high polished Jet Black granite stone slab fixed in C:M. (1:3) granite facia patti including providng and fixing S.S. Sink with size 18" x 16" (make Tata / Nirali) as approved with grating including waste coupling, PVC Waste pipe, upto Nahani trap cutting the plaster wherever required for anchorage of stone slab making good the same as per model flat in required position with	27.000	RM		

	cement mortor including joint filling with white / coloured cement slurry cleaning curing etc. complete.				
31	Providing & laying 20-25mm thick ready made edge cutting and polished Kota stone flooring slabs with cement mortar 1:4 bedding and jointed with gray cement slurry mixed with pigment to match the shade of the slabs, including rubbing, cleaning curing as per model flat etc. complete.	32.000	Sq.m		
32	Providing & laying 20-25mm thick ready made cut and polished Kota stone riser and threads including chamfering etc in cement mortar 1:4 and jointed with gray cement slurry mixed with pigment to match the shade of the slabs, including rubbing, cleaning curing as per model flat etc. complete.	18.000	Sq.m		
33	Providing & fixing MS Grill of approved design as per model flat including 1 coat of primer and 2 coats of enamel paints etc. complete.	175.000	Sq.m		
34	Providing & fixing M.S. grilled panel door at entrance of staircase & at fr.fl staircase lobby with mosquito net including one primer & two coats of enamel paint as directed by engineer in-charge with all leads, lifts as per model flat etc. complete.	7.000	Sq.m		
35	Providing & laying integral cement based water proofing treatment including preparation of surface as required for treatment of roofs, balconies, terraces etc. consisting of following operations. a)Applying and grouting a slurry coat of neat cement using 3.15 Kg/sq.m. of cement admixed with proprietary water proofing compound conforming to IS:2645 over the RCC slab including cleaning the surface before treatment. b)Laying cement concrete using broken bricks / brick bats 25 mm to 100 mm size with 500% of cement mortar 1:5 (1 cement : 5 coarse sand) admixed with proprietary water proofing compound conforming to IS:2645 over 20 mm thick layer of cement mortar of mix 1:5 admixed with proprietary water proofing compound confirming to IS:2645 to required slope and treating similarly the adjoining walls upto 300 mm height including rounding of	337.000	Sq.m		

	junctions of walls and slabs. c)After two days of proper curing applying a second coat of cement slurry admixed with proprietar d)Finishing the surface with 20 mm thick joint less cement mortar of mix 1:4 (1 cement:4 coarse sand)admixed with proprietary waterproofing compound conforming to IS:2645 and finally finishing the surface with trowel led with neat cement slurry and making of 300 x 300 mm square e)The whole terrace so finished shall be flooded with water for a minimum period of two weeks for curing and for final test. All above operations to be done in order and as directed and specified by the Engineer In charge. With average thickness of 120 mm and minimum thickness at khurra as 65 mm.				
36	Providing & fixing colour glazed earthenware wash hand basin of size 18" x 12" with water pillar cock, brackets rubber plugs & stop cock & necessary pipe connections including PVC waste pipe upto the outside face of the wall etc complete. [Make:Parryware/Cera/Simplo]	8.000	Nos.		
37	Providing & applying Apex Paint with two and more coats over external sand faced plastered finish walls including preparation of surfaces etc complete. [Make: Snowcem / Ntcocem / Floora]	1500.000	Sq.m		
38	Providing & applying of 1st quality washable Oil Bond distemper (O.B.D) (ready made) applying standard quality cement primer and putty of approved manufacturer preparing surface by rubbing zero no. sand paper & applying standard quality paint of required shade and colour complete as directed manufacturers specification as per model flat etc. complete.[Make: Asian/Burger/Nerolec]	1500.000	Sq.m		
39	Providing & applying Synthetic Enamel Paint (Oil Paint) to ceillings, walls including applying standard quality primer and putty of approved manufacturer preparing surface by rubbing zero no. sand paper & applying standard quality paint of required shade and colour complete as directed manufacturers specification as per model flat etc. complete.[Make: Asian/Burger/Nerolec]	175.000	Sq.m		
40	Providing & fixing 40 mm thick ready made edge cut and both side polished kaddappa	32.000	Sq.m		

	stone slabs for shelves and cupboards fixed in cement including making grooves in the wall cleaning curing etc complete as per model flat.				
41	Providing window sills, jams & lintel bottom in 20mm thick granite patti in stepping manner with chamfered edge polishing on both side faces as per model flat & on a bed of C.M.(1:2) & applying adhesive for anchorage including cement float filling joints with slurry, curing polishing & cleaning curing etc complete.	115.000	Sq.m		
42	Providing and Fixing TMT steel reinforcement including cutting , bending, hooking, binding with steel wire, placing in position steel reinforcement for RCC lintel, chajja work at all level with chair, supports, cover etc. complete.	1010.000	KG		
43	Providing & fixing chicken wire mesh over external / internal walls to receive cement plaster in all position including nailing, scaffolding as directed by engineer in-charge with all leads, lifts etc. complete.	2970.000	Sq.m		
44	Providing & fixing in position Indian type virtuous China orrisa W.C. Pan, with P trap brick masonry around the pan including 10 litre flushing cistern of standard make flush pipe from tank to inlet connector as per model flat etc. complete.[Parryware/Cera/Simplo]	8.000	Nos.		
45	Raising of existing Chamber of approximate size 900 mmX600mm with brick masonry internal and external neat finish cement mortar plaster & IPS in the bottom with half round channel, hunches etc. & externally finished with rough cement plaster in c.m. (1:4) in single coat with R.C.C. Manhole cover with frame, refilling etc. complete.	4.000	Nos.		
46	Providing & fixing 150X100 mm S.W. gully trap in brick masonry chamber with 1:3:6 P.C.C. 100 mm thick, chamber finished externally with cement plaster (1:4) 230X300 with cover & frame etc. complete	8.000	Nos.		
47	Providing, fixing & jointing C.I.Soil pipes of heavy quality Indo Swedish or equivalent make with fitting such as plug or plain bends of sets, tees, cowls with cement joints & heavy clamps & making holes in walls & floors, testing to joints rectifying of leakage etc. complete.				
	a) 100mm dia C.I. waste pipe	31.000	RM		
	b) 75mm dia C.I. waste pipe	88.000	RM		

48	Providing, fixing & jointing 65mm dia PVC pipes with fitting such as plug or plain bends of sets, tees joints & heavy clamps & making holes in walls & floors, testing to joints rectifying of leakage etc. complete. [Suprem/Prince/Astron]	12.000	RM		
49	Providing & fixing 75 mm dia Nahani traps with C.P. grating on top as per model flat etc. complete.	24.000	Nos		
50	Providing, laying, jointing, fixing & testing G.I. 'C' class (make Swastik TT / Zenith/ Sidharath / equivalent) with G.I. tested fittings or laid under ground with necessary excavation, refilling & leveling & fitting heavy clamps & making holes in walls & floors, testing to joints rectifying of leakage etc. complete.				
	a) 40 mm dia	14.000	RM		
	b) 25 mm dia	62.000	RM		
	c) 15 mm dia	258.000	RM		
51	Providing & fixing various types of valve & cocks & other fittings as per model flat etc complete.				
	a) 15 mm dia C.P. Stop cock	24.000	Nos		
	b) 15 mm dia C.P. Pillar cock	8.000	Nos		
	c) 15 mm dia C.P. Shower	8.000	Nos		
	d) 15 mm dia C.P. Bib cock	8.000	Nos		
	e) 15 mm dia C.P. Long body bib cock	16.000	Nos		
	f) 15 mm dia C.P. Mixer cock	8.000	Nos		
	g) 15mm patti gate valve	12.000	Nos		
	h) 25mm patti gate valve	8.000	Nos		
	i) 40mm patti gate valve	4.000	Nos		
52	Providing & fixing in position anodized (as per I.S. 1868/1982 aluminium sliding black powder coated window of three track with all necessary sections fixtures & fastenings in nylon casing & self locking latch fitted in vertical section, shutters including 4 mm thick	60.000	Sq.m		

	plain glass and mosquito net with all required screws, nuts, fittings & fixture etc. complete as per model flat all as directed by Engineer-In-charge.				
53	Providing & fixing in position anodized (as per I.S. 1868/1982 aluminium louvered black powder coated window with all necessary sections fixtures & fastenings in nylon casing & self locking latch fitted in vertical section, shutters including mosquito net with aluminum frame and all required screws, nuts, fittings & fixture etc. complete as per model flat all as directed by Engineer-In-charge.	7.000	Sq.m		
54	Providing & fixing in position anodized aluminium black powder coated fixed window including all necessary section fixtures & fastening including 4 mm thick plain glass with provision for Exhaust fan complete as per model flat and all as directed by Engineering-in-charge.	3.000	Sq.m		
55	Providing and fixing 300 mm radius marble piece at corner in bath and kitchen including making groove in walls & fixing in cement mortar (1:2) and finishing with white cement as per model flat.	16.000	Nos		
56	Providing & Fixing flush Doors with T.W. frames (Frames size 125mm x 75mm) fixed with 6 no. of hold fast in walls, including primer coat with side hung solid core panel bonded block board flush door of 30 mm thick with teak lipping including three coats of enamel paint with three 100 mm hinges & all necessary C.P. fittings such as aldrop -1, tadipatti-1, tower bolt-1, Hinges-3, door stopper-1 & handles-2 to each door as per model flat etc complete.	63.000	Sq.m		
57	Providing & fixing latch of standard make of europa to main door with separate eye view, safety chain as per model flat etc complete.	8.000	Nos		
58	Providing & fixing Granite stone frame made in granite slab of 18mm thk. granite patti in stepping manner with chamfered edge polishing on both side faces as per model flat & on a bed of C.M.(1:2) & applying adhesive for anchorage including cement float filling joints with slurry, curing polishing & cleaning curing etc complete with PVC door (make Sintex) at toilet & bath block as directed by engineer in-charge with all leads, lifts as per model flat	16.000	Nos.		

	etc. complete.				
59	Providing & fixing in position openable 30mm thick wooden mosquito net shutters in main door opening & in balcony door opening as per detailed drawing & with all necessary sections, fixtures & fastenings & self closing hinges fitted in vertical section of shutter including accessories such as aldrop -1, tadipatti-1, tower bolt-1, Hinges-3, door stopper-1 & handles-2 to each door as per model flat etc complete.	22.000	Sq.m		
60	Providing & fixing Doors for cupboard with T.W. frame of size 75 mm x 50 mm with good quality 18mm ply wood shutter with TW lipping, externally finished with lamination & internally painted with white enamel including necessary C.P. fittings such as hinges-6, door closer magnet-2, C.P.cloth hinger rod-1, Handles-2 & lock-1 as per model flat etc. complete	41.000	Sq.m		
61	Providing & fitting PVC double layered water tanks with a capacity of 2000 ltr including necessary inlet/outlet, wash outlet, ball cock & over flows pipes, G.I. connections fitting etc completed as directed & as per model flat etc complete.	4.000	Nos		
62	Providing & fitting Stainless steel Curtain rods with end caps to doors & windows opening in position with all required screws, nuts, fittings & fixture etc. complete as per model flat all as directed by Engineer-In-charge.	82.000	RM		
63	Providing & fitting Mirror with Cabinet near Wash basin in position with all required screws, nuts, fittings & fixture etc. complete as per model flat all as directed by Engineer-In-charge.	8.000	Nos.		
64	Providing & fitting Wooden batten with J hooks for Cloth drying in position with all required screws, nuts, fittings & fixture etc. complete as per model flat all as directed by Engineer-In-charge.	8.000	Nos.		
65	Providing & fitting C.P. finish make Jaquar / Essco / Metro /Parryware Bathroom/toilet accessories & fittings in position with all required screws, nuts, fittings & fixture etc. complete as per model flat all as directed by				

	Engineer-In-charge.				
	a) Towel Rod	8.000	Nos.		
	b) Ring to hold towel	8.000	Nos.		
66					
	TOTAL (B)				
	(C) ELECTRIC WORK Concealled Electric Wirring Work				
1	Dismentalling the existing light, fans, plug points with VIR/PVC wire in casing capping, PVC or TW batten complete with fitting such as batten holder, ceilling rose, switches, and disposing off the dismentelled material and debris out of the premises, all as directed by the Engineer In charge.[Note: Electrical fitting such as Fan, Fan regulator and tube light and its fittiings will removed takenover by the Institute.]	2.00	Nos.		
2	Dismentalling Internal and External existing cables & mains of all types & sizes & refilling holes with cement mortor & finishing in an approved manner for Four Quarter i.e One Block as directed by engineer in-charge as per model flat etc. complete.	1.00	JOB		
3	Providing, laying, fitting & installation consealled electric wirring Light point with making groove in wall, PVC conduit pipe, 2X1.0 sq.mm. Finolex /Popycab / RPG make copper conductor multi strand FR wires with angle holder/ batten holder/ceilling rose & with Roma Anchor /Vinay /Harrison make switches including 1X1.0 sq.mm. Finolex /Popycab / RPG make copper conductor multi strand FR wire for earthing all along the length of point as directed by engineer in-charge with all leads, lifts as per model flat etc. complete.	103.00	Nos.		
4	Providing, laying, fitting & installation consealled electric wirring for 6 A plug & switch point make Roma Anchor /Vinay /Harrison 2X1.5 sq.mm. Finolex /Popycab / RPG make copper conductor multi strand FR wires including 1X1.0 sq.mm. Finolex /Popycab / RPG make copper conductor multi strand FR wire for earthing all along the length of point as directed by engineer in-charge with all leads, lifts as per model flat etc. complete.	179.00	Nos.		

5	Providing, laying, fitting & installation consealled electric wirring for 6/15 A plug & switch point make Roma Anchor /Vinay /Harrison with 2X2.5 sq.mm. Finolex /Popycab / RPG make copper conductor multi strand FR wires including 1X1.0 sq.mm. Finolex /Popycab / RPG make copper conductor multi strand FR wire for earthing all along the length of point as directed by engineer in-charge with all leads, lifts as per model flat etc. complete.	24.00	Nos.		
6	Providing, laying, fitting & installation consealled electric wirring for Two way Light/Fan point/Bell point make Roma Anchor /Vinay /Harrison with making groove in wall, PVC conduit pipe, 2X1.5 sq.mm. Finolex /Popycab / RPG make copper conductor multi strand FR wires with angle holder/ batten holder/ceilling rose including 1X1.0 sq.mm. Finolex /Popycab / RPG make copper conductor multi strand FR wire for earthing as directed by engineer in-charge with all leads, lifts as per model flat etc. complete.	57.00	Nos.		
7	Providing, fitting & installation consealled electric Tel point as directed by engineer in-charge with all leads, lifts as per model flat etc. complete.	16.00	Nos.		
8	Providing, Supplying & installing T V point as directed by engineer in-charge with all leads, lifts as per model flat etc. complete.	8.00	Nos.		
9	Providing,laying &fitting consealled electric wirring for circuit with making groove in wall, PVC conduit pipe, 2X2.5 sq.mm. Finolex /Popycab / RPG make copper conductor multi strand FR wires with connection at both ends including 1X1.0 sq.mm. Finolex /Popycab / RPG make copper conductor multi strand FR wire for earthing all along the length of point as directed by engineer in-charge with all leads, lifts as per model flat etc. complete.	683.00	R.M.		
10	Providing,laying &fitting consealled electric wirring for circuit with making groove in wall, PVC conduit pipe, 2X4.0 sq.mm. Finolex /Popycab / RPG make copper conductor multi strand FR wires with connection at both ends including 1X1.0 sq.mm. Finolex /Popycab / RPG make copper conductor multi strand FR wire for earthing all along the length of point as directed by engineer in-charge with all leads,	209.00	R.M.		

	lifts as per model flat etc. complete.				
11	Providing,laying &fitting consealled TV Cable with making groove in wall, PVC conduit pipe, Finolex /Popycab / RPG make with connection at both ends as directed by engineer in-charge with all leads, lifts as per model flat etc. complete.	120.00	R.M.		
12	Providing,laying &fitting consealled Tel Cable with making groove in wall, PVC conduit pipe, Finolex /Popycab / RPG make with connection at both ends as directed by engineer in-charge with all leads, lifts as per model flat etc. complete.	240.00	R.M.		
13	Providing, fitting & installation on wall MCB Distribution Board suitable for 12 MCB's as per requirement, fitted with bus bar, electric circuit breaker make MDS / INDOASIAN / as directed by engineer in-charge with all leads, lifts as per model flat etc. complete.	8.00	Nos.		
14	Providing, fitting & installation 32/40 A MCB Isolator double pole as per requirement, electric circuit breker make MDS / INDOASIAN / as directed by engineer in-charge with all leads, lifts as per model flat etc. complete.	24.00	Nos.		
15	Providing, fitting & installation 10/15/20/32/40 A MCB single pole as per requirement, electric circuit breker make MDS / INDOASIAN / as directed by engineer in-charge with all leads, lifts as per model flat etc. complete.	90.00	Nos.		
16	Supplying & fixing Ding dong bell Anchor make cat no. 8057 on teak work/ sunmica top board as directed by engineer in-charge with all leads, lifts as per model flat etc. complete..	8.00	Nos.		
17	Supplying & fixing ceilling fans Crompton /Bajaj / Usha make with 1200 mm sweep, double ball bearing type, white/ brown colour. Considering the height of the ceilling contractor will have to provide the fan rod of appropriate length made from MS conduit pipe as directed by engineer in-charge with all leads, lifts as per model flat etc. complete..	24.00	Nos.		
18	Supplying, fixing & connecting on wall over PVC block prewired single tube light fitting Wipro/ Philips/ Bajaj make with low loss choke, starter, condensor as directed by	36.00	Nos.		

	engineer in-charge with all leads, lifts as per model flat etc. complete.				
19	Providing, Supplying & installing Elect Exaust fan including wiring with socket ,Crompton /Bajaj / Usha make white/ black colour in Kitchen room as directed by engineer in-charge with all leads, lifts as per model flat etc. complete.	8.00	Nos.		
20	Providing & Fixing 18mm thk plywood board as Meter board in meter room with TW lipping, finished with white enamel painting as directed by engineer in-charge as per model flat etc. complete.	2.00	Nos.		
21	Fixing existing armed cable from electric pole to the meter room by providing sadals to fix cable in well manner as directed by engineer in-charge as per model flat etc. complete.	50.00	R.M.		
22	Providing, fitting & installing 32/63-400 Kikat switch in meter room as directed by engineer in-charge as per model flat etc. complete.	6.00	Nos.		
23	Providing, fitting & installing 100 A Bus bar in meter room as directed by engineer in-charge as per model flat etc. complete.	2.00	Nos.		
24	Providing & Earthing with G.I. earth plate of size 600x600x6mm with 25x3 mm GI strip as an earth conductor in 2 mtr deep & 1mtr wide pit with 3/4" G.I. pipe for watering refilling the pit with 30 kg charcoal & 30 kg salt including construction of cement concrete chamber with C.C. cover & funnel for watering as directed by engineer in-charge as per model flat etc. complete.	2.00	Nos.		
25	Supplying & fixing on wall or under ground GI earth strip of size 25 x 3 mm in 2 nos. earth conductor as directed by engineer in-charge as per model flat etc. complete.	10.00	R.M.		
26	Supplying & fixing on wall or under ground ISI mark GI pipe of class "C" of 32mm dia & also to lay earth strip of size 25 x 3 mm in 2 nos. earth conductor as directed by engineer in-charge as per model flat etc. complete.	6.00	R.M.		
	TOTAL-C				
	TOTAL (A+B+C)				

TENDER FOR RENOVATION
OF
RENOVATION OF 2 BLOCKS OF TYPE-III (Qtr No. 21 to 24 & 25 to 28)
AT
INDIAN INSTITUTE OF TROPICAL METEOROLOGY, COLONY CAMPUS, DR. HOMI BHABHA ROAD, PASHAN, PUNE-411008

PART - II

(COMMERCIAL BID)

INDIAN INSTITUTE OF TROPICAL METEOROLOGY,
DR.HOMI BHABA ROAD, PASHAN, PUNE-411008

BOQ of Renovation of type –III Staff quarters at Indian Institute of Tropical Meteorology (IITM), Pune.

Item no.	Description	Qty	Unit	Rate	Amount
	CIVIL WORK				
	(A) Dismentling Civil Work				
1	Removing/Taking down existing sand face External wall and cieling Cement plaster, exposing brick masonry, rakingout joints in the masonry including providing necessary scaffolding & disposing of the material beyond PMC limit all as directed by Engineer In charge etc complete.	975.000	Sq.m.		
2	Removing/Taking down existing neeru/sanala finish Internal wall and cieling Cement plaster, exposing brick masonry, racking joints in the masonry including providing necessary scaffolding & disposing of the material beyond PMC limit all as directed by Engineer In charge etc complete.	2000.000	Sq.m.		
3	Dismantling all R.C.C. Chajja's and lintel beams etc. at G.F.& F.F. including providing necessary scaffolding & disposing of the debris material beyond PMC limit all as directed by Engineer In charge.	50.000	Nos.		
4	Dismantling existing paving/plinth protection including disposing off the material beyond PMC limit all as directed by Engineer In charge etc complete.	26.000	Cu.m.		
5	Dismantling of old wash basins inculing fitting fixtures etc.& disposing off the debris material beyound PMC limit all as directed by Engineer In charge.	8.000	Nos.		
6	Removing Indian type W.C. pan including disconnecting the sanitary & water supply connection & removing & breaking flooring & bed concrete around pan removing the same carefully and disposing off debris material beyound PMC Limit all as directed by Engineer In charge.	8.000	Nos.		
7	Removing/Taking down Doors & Windows including shutters and disposing off debris material beyond PMC Limit all as directed by Engineer In charge etc complete.				
	(a) Doors	75.000	Nos.		
	(b) Windows	72.000	Nos.		

8	Removing existing Indian patent stone flooring of any thickness without removing bed concrete/Mother slab & disposing off the debris material beyond PMC limit all as directed by Engineer In charge.	430.000	Sq.m		
9	Removing of kitchen otta,R.C.C Shelves and partitions for each quarter and disposing of the debris material beyond PMC limit all as directed by Engineer In charge etc complete.	1.000	Job		
10	Dismantling R.C.C. Grills for stair case & disposing off the debris material beyond PMC limit all as directed by Engineer In charge etc complete.	15.000	Sq.m		
11	Dismantling Brick work & disposing off the debris material beyond PMC limit as directed by Engineer In charge etc complete.	34.000	Cu.m		
12	Removing old plumbing fittings and disposing off the dismentelled material and debris out of the premises, all as directed by the Engineer In charge.				
	(a) Shower	16.000	Nos.		
	(b) Bibcock/stopcock Wheel valves etc.	32.000	Nos.		
13	Removing old G.I. Pipes 15mm to 40mm diameter concealed or open and disposing off all dismentelled material and debris out of the premises, all as directed by Engineer In charge.	330.000	RM		
14	Removing Cast Iron dowen take vent pipes and etc fittings and disposing off dismetelled material and debris out of the primises, all as directed by Engineer In charge.	95.000	RM		
15	Removing existing waterproofing over terace and toilet/bath at G.F and F.F quarters including scrapping & cleaning the area thoroughly & disposing off the dabris material beyond PMC limit all as directed by Engineer In charge.	340.000	Sq.m		
16	Dismantling existing water tank's top slab & side walls by providing required support of scaffolding to slab as directed by engineer in-charge & disposing of the damaged material beyond PMC limit as directed by Engineer In charge.	4.000	Nos.		
17	Dismantling R.C.C horizontal & vertical slab shelves partitions of existing cupboard in rooms for each quarter by providing required support of scaffolding and disposing off of the debris material beyond PMC limit all as directed by Engineer In charge.	8.000	Nos.		
	TOTAL (A)				

	(B) New Civil Work				
18	Excavation in foundation in all types of soil including hard murum, sand, soft rock including shoring, pumping or bailing out water, back filling excavated material in the sides of trenches and / or spreading, leveling surplus earth as directed or disposing of the still surplus earth anywhere in owners boundary with 150 m. lead & depth upto 1.5 m. as directed by Engineer In charge.	11.000	Cu.m		
19	Providing & Constructing 2nd class Burnt Brick masonry 230 mm thick with conventional / I.S. type Brick, in Cement Mortat (1:6) including striking joints on unexposed faces & raking out joints on exposed face, providing scaffolding for construction, curing etc. complete.	30.000	Cu.m		
20	Providing & constructing 2nd class Burnt Brick masonry 100mm thick with conventio-nal / I.S. type brick in c.m. (1:4) including providing R.C.C. Bond at 0.9 m interval, striking out joints on unexpo-sed faces & raking out joints on exposed faces, providing scaffolding for construction, curing etc. complete	28.000	Sq.m.		
21	Providing & laying machine mixed plain cement concrete in grade M10 but having volumetric proportion (1:3:6) (Cement:sand:coarse aggreg-ates) of specified thickness mix & gradation & including formwork if required, laying, spreading vamming, curing, etc. for all types of foundations below footings, walls, rafts, etc.complete all as directed by Engineering-in-Charge.	33.000	Cu.m		
22	Providing & Casting in situ RCC M20 of trap/granite /quartzite/gneiss metal for Lintel as per design including formwork, laying, spreading, ramming, compaction, curing & roughening the surface if special finish is to be provided etc. complete.(Excluding steel)	12.000	Cu.m		
23	Providing & applying internal cement plaster 15 mm thick in a single coat in Cement Mortar (1:4) over chicken wire mesh with neeru finishing to concrete & brick surface in all position including all types of finishing such as cornice, molding, pattas, scaffolding & curing etc. complete as directed.	2000.000	Sq.m		

24	Providing & applying external cement plaster 20 mm thick over chicken wire mesh in double coat. First coat in c.m. (1:4) & Finishing coat in c.m. (1:2) with sand face finish to concrete & brick surfaces in all positions including all types of finishing such as cornice, mold-ing, pattas, scaffolding & curing etc. complete as directed.	990.000	Sq.m		
25	Providing & laying Ceramic tiles of size 450 X450X9mm (make Nitco / Kajaria / Bell) in required position laid on a bed of C:M (1:4) including neat cement float, filling joints with white / coloured cement slurry, cleaning curing etc. complete	345.000	Sq.m		
26	Providing & fixing 450X100 X9mm (make Nitco / Kajaria / Bell) skirting in required position with cement mortor including joint filling with white/coloured cement slurry cleaning curing etc. complete	360.000	R.M.		
27	Providing & fixing 300X300 X7mm antiskid ceramic tiles for flooring in toilets/Bath (make Nitco / Kajaria / Bell) in required position on C.M. (1:4) including neat cement float, filling joints with white / coloured cement slurry, cleaning curing etc. complete.	23.000	Sq.m		
28	Providing & fixing ceramic tiles in dado of size 200mmX 300mmX7 mm in toilets of approved quality & brand (make Nitco/Kajaria/Bell) in required position with cement mortor including joint filling with white/coloured cement slurry cleaning curing etc. complete.	305.000	Sq.m		
29	Providing & laying 60mm thick precast concrete paving blocks including ramming the ground laying ¼" crush metal in required slope ramming the same & laying blocks over it in proper slope & level and cleaning etc. complete.	160.000	Sq.m		
30	Providing & constructing Kitchen platform of 25 mm to 30mm thick high polished Jet Black granite stone slab fixed in C:M. (1:3) granite facia patti including providng and fixing S.S. Sink with size 18" x 16" (make Tata / Nirali) as approved with grating including waste coupling, PVC Waste pipe, upto Nahani trap cutting the plaster wherever required for anchorage of stone slab making good the same as per model flat in required position with cement mortor including joint filling with white / coloured cement slurry cleaning curing etc. complete.	27.000	RM		

31	Providing & laying 20-25mm thick ready made edge cutting and polished Kota stone flooring slabs with cement mortar 1:4 bedding and jointed with gray cement slurry mixed with pigment to match the shade of the slabs, including rubbing, cleaning curing as per model flat etc. complete.	32.000	Sq.m		
32	Providing & laying 20-25mm thick ready made cut and polished Kota stone riser and threads including chamfering etc in cement mortar 1:4 and jointed with gray cement slurry mixed with pigment to match the shade of the slabs, including rubbing, cleaning curing as per model flat etc. complete.	18.000	Sq.m		
33	Providing & fixing MS Grill of approved design as per model flat including 1 coat of primer and 2 coats of enamel paints etc. complete.	175.000	Sq.m		
34	Providing & fixing M.S. grilled panel door at entrance of staircase & at fr.fl staircase lobby with mosquito net including one primer & two coats of enamel paint as directed by engineer in-charge with all leads, lifts as per model flat etc. complete.	7.000	Sq.m		
35	Providing & laying integral cement based water proofing treatment including preparation of surface as required for treatment of roofs, balconies, terraces etc. consisting of following operations. a)Applying and grouting a slurry coat of neat cement using 3.15 Kg/sq.m. of cement admixed with proprietary water proofing compound conforming to IS:2645 over the RCC slab including cleaning the surface before treatment. b)Laying cement concrete using broken bricks / brick bats 25 mm to 100 mm size with 500% of cement mortar 1:5 (1 cement : 5 coarse sand) admixed with proprietary water proofing compound conforming to IS:2645 over 20 mm thick layer of cement mortar of mix 1:5 admixed with proprietary water proofing compound confirming to IS:2645 to required slope and treating similarly the adjoining walls upto 300 mm height including rounding of junctions of walls and slabs. c)After two days of proper curing applying a second coat of cement slurry admixed with proprietar d)Finishing the surface with 20 mm thick joint	337.000	Sq.m		

	less cement mortar of mix 1:4 (1 cement:4 coarse sand)admixed with proprietary waterproofing compound conforming to IS:2645 and finally finishing the surface with trowel led with neat cement slurry and making of 300 x 300 mm square e)The whole terrace so finished shall be flooded with water for a minimum period of two weeks for curing and for final test. All above operations to be done in order and as directed and specified by the Engineer In charge. With average thickness of 120 mm and minimum thickness at khurra as 65 mm.				
36	Providing & fixing colour glazed earthenware wash hand basin of size 18" x 12" with water pillar cock, brackets rubber plugs & stop cock & necessary pipe connections including PVC waste pipe upto the outside face of the wall etc complete. [Make:Parryware/Cera/Simplo]	8.000	Nos.		
37	Providing & applying Apex Paint with two and more coats over external sand faced plastered finish walls including preparation of surfaces etc complete. [Make: Snowcem / Ntcocem / Floora]	1500.000	Sq.m		
38	Providing & applying of 1st quality washable Oil Bond distemper (O.B.D) (ready made) applying standard quality cement primer and putty of approved manufacturer preparing surface by rubbing zero no. sand paper & applying standard quality paint of required shade and colour complete as directed manufacturers specification as per model flat etc. complete.[Make: Asian/Burger/Nerolec]	1500.000	Sq.m		
39	Providing & applying Synthetic Enamel Paint (Oil Paint) to ceillings, walls including applying standard quality primer and putty of approved manufacturer preparing surface by rubbing zero no. sand paper & applying standard quality paint of required shade and colour complete as directed manufacturers specification as per model flat etc. complete.[Make: Asian/Burger/Nerolec]	175.000	Sq.m		
40	Providing & fixing 40 mm thick ready made edge cut and both side polished kaddappa stone slabs for shelves and cupboards fixed in cement including making grooves in the wall cleaning curing etc complete as per model flat.	32.000	Sq.m		

41	Providing window sills, jams & lintel bottom in 20mm thick granite patti in stepping manner with chamfered edge polishing on both side faces as per model flat & on a bed of C.M.(1:2) & applying adhesive for anchorage including cement float filling joints with slurry, curing polishing & cleaning curing etc complete.	115.000	Sq.m		
42	Providing and Fixing TMT steel reinforcement including cutting , bending, hooking, binding with steel wire, placing in position steel reinforcement for RCC lintel, chajja work at all level with chair, supports, cover etc. complete.	1010.000	KG		
43	Providing & fixing chicken wire mesh over external / internal walls to receive cement plaster in all position including nailing, scaffolding as directed by engineer in-charge with all leads, lifts etc. complete.	2970.000	Sq.m		
44	Providing & fixing in position Indian type virtuous China orrisa W.C. Pan, with P trap brick masonry around the pan including 10 litre flushing cistern of standard make flush pipe from tank to inlet connector as per model flat etc. complete.[Parryware/Cera/Simplo]	8.000	Nos.		
45	Raising of existing Chamber of approximate size 900 mmX600mm with brick masonry internal and external neat finish cement mortar plaster & IPS in the bottom with half round channel, hunches etc. & externally finished with rough cement plaster in c.m. (1:4) in single coat with R.C.C. Manhole cover with frame, refilling etc. complete.	4.000	Nos.		
46	Providing & fixing 150X100 mm S.W. gully trap in brick masonry chamber with 1:3:6 P.C.C. 100 mm thick, chamber finished externally with cement plaster (1:4) 230X300 with cover & frame etc. complete	8.000	Nos.		
47	Providing, fixing & jointing C.I.Soil pipes of heavy quality Indo Swedish or equivalent make with fitting such as plug or plain bends of sets, tees, cowls with cement joints & heavy clamps & making holes in walls & floors, testing to joints rectifying of leakage etc. complete.				
	a) 100mm dia C.I. waste pipe	31.000	RM		
	b) 75mm dia C.I. waste pipe	88.000	RM		
48	Providing, fixing & jointing 65mm dia PVC pipes with fitting such as plug or plain bends of sets, tees joints & heavy clamps & making	12.000	RM		

	holes in walls & floors, testing to joints rectifying of leakage etc. complete. [Suprem/Prince/Astron]				
49	Providing & fixing 75 mm dia Nahani traps with C.P. grating on top as per model flat etc. complete.	24.000	Nos		
50	Providing, laying, jointing, fixing & testing G.I. 'C' class (make Swastik TT / Zenith/ Sidharath / equivalent) with G.I. tested fittings or laid under ground with necessary excavation, refilling & leveling & fitting heavy clamps & making holes in walls & floors, testing to joints rectifying of leakage etc. complete.				
	a) 40 mm dia	14.000	RM		
	b) 25 mm dia	62.000	RM		
	c) 15 mm dia	258.000	RM		
51	Providing & fixing various types of valve & cocks & other fittings as per model flat etc complete.				
	a) 15 mm dia C.P. Stop cock	24.000	Nos		
	b) 15 mm dia C.P. Pillar cock	8.000	Nos		
	c) 15 mm dia C.P. Shower	8.000	Nos		
	d) 15 mm dia C.P. Bib cock	8.000	Nos		
	e) 15 mm dia C.P. Long body bib cock	16.000	Nos		
	f) 15 mm dia C.P. Mixer cock	8.000	Nos		
	g) 15mm patti gate valve	12.000	Nos		
	h) 25mm patti gate valve	8.000	Nos		
	i) 40mm patti gate valve	4.000	Nos		
52	Providing & fixing in position anodized (as per I.S. 1868/1982 aluminium sliding black powder coated window of three track with all necessary sections fixtures & fastenings in nylon casing & self locking latch fitted in vertical section, shutters including 4 mm thick plain glass and mosquito net with all required screws, nuts, fittings & fixture etc. complete as per model flat all as directed by Engineer-In-	60.000	Sq.m		

	charge.				
53	Providing & fixing in position anodized (as per I.S. 1868/1982 aluminium louvered black powder coated window with all necessary sections fixtures & fastenings in nylon casing & self locking latch fitted in vertical section, shutters including mosquito net with aluminum frame and all required screws, nuts, fittings & fixture etc. complete as per model flat all as directed by Engineer-In-charge.	7.000	Sq.m		
54	Providing & fixing in position anodized aluminium black powder coated fixed window including all necessary section fixtures & fastening including 4 mm thick plain glass with provision for Exhaust fan complete as per model flat and all as directed by Engineering-in-charge.	3.000	Sq.m		
55	Providing and fixing 300 mm radius marble piece at corner in bath and kitchen including making groove in walls & fixing in cement mortar (1:2) and finishing with white cement as per model flat.	16.000	Nos		
56	Providing & Fixing flush Doors with T.W. frames (Frames size 125mm x 75mm) fixed with 6 no. of hold fast in walls, including primer coat with side hung solid core panel bonded block board flush door of 30 mm thick with teak lipping including three coats of enamel paint with three 100 mm hinges & all necessary C.P. fittings such as aldrop -1, tadipatti-1, tower bolt-1, Hinges-3, door stopper-1 & handles-2 to each door as per model flat etc complete.	63.000	Sq.m		
57	Providing & fixing latch of standard make of europa to main door with separate eye view, safety chain as per model flat etc complete.	8.000	Nos		
58	Providing & fixing Granite stone frame made in granite slab of 18mm thk. granite patti in stepping manner with chamfered edge polishing on both side faces as per model flat & on a bed of C.M.(1:2) & applying adhesive for anchorage including cement float filling joints with slurry, curing polishing & cleaning curing etc complete with PVC door (make Sintex) at toilet & bath block as directed by engineer in-charge with all leads, lifts as per model flat	16.000	Nos.		

	etc. complete.				
59	Providing & fixing in position openable 30mm thick wooden mosquito net shutters in main door opening & in balcony door opening as per detailed drawing & with all necessary sections, fixtures & fastenings & self closing hinges fitted in vertical section of shutter including accessories such as aldrop -1, tadipatti-1, tower bolt-1, Hinges-3, door stopper-1 & handles-2 to each door as per model flat etc complete.	22.000	Sq.m		
60	Providing & fixing Doors for cupboard with T.W. frame of size 75 mm x 50 mm with good quality 18mm ply wood shutter with TW lipping, externally finished with lamination & internally painted with white enamel including necessary C.P. fittings such as hinges-6, door closer magnet-2, C.P.cloth hinger rod-1, Handles-2 & lock-1 as per model flat etc. complete	41.000	Sq.m		
61	Providing & fitting PVC double layered water tanks with a capacity of 2000 ltr including necessary inlet/outlet, wash outlet, ball cock & over flows pipes, G.I. connections fitting etc completed as directed & as per model flat etc complete.	4.000	Nos		
62	Providing & fitting Stainless steel Curtain rods with end caps to doors & windows opening in position with all required screws, nuts, fittings & fixture etc. complete as per model flat all as directed by Engineer-In-charge.	82.000	RM		
63	Providing & fitting Mirror with Cabinet near Wash basin in position with all required screws, nuts, fittings & fixture etc. complete as per model flat all as directed by Engineer-In-charge.	8.000	Nos.		
64	Providing & fitting Wooden batten with J hooks for Cloth drying in position with all required screws, nuts, fittings & fixture etc. complete as per model flat all as directed by Engineer-In-charge.	8.000	Nos.		
65	Providing & fitting C.P. finish make Jaquar / Essco / Metro /Parryware Bathroom/toilet accessories & fittings in position with all required screws, nuts, fittings & fixture etc. complete as per model flat all as directed by				

	Engineer-In-charge.				
	a) Towel Rod	8.000	Nos.		
	b) Ring to hold towel	8.000	Nos.		
66					
	TOTAL (B)				
	(C) ELECTRIC WORK Concealled Electric Wirring Work				
1	Dismentalling the existing light, fans, plug points with VIR/PVC wire in casing capping, PVC or TW batten complete with fitting such as batten holder, ceilling rose, switches, and disposing off the dismentelled material and debris out of the premises, all as directed by the Engineer In charge.[Note: Electrical fitting such as Fan, Fan regulator and tube light and its fittiings will removed takenover by the Institute.]	2.00	Nos.		
2	Dismentalling Internal and External existing cables & mains of all types & sizes & refilling holes with cement mortor & finishing in an approved manner for Four Quarter i.e One Block as directed by engineer in-charge as per model flat etc. complete.	1.00	JOB		
3	Providing, laying, fitting & installation consealled electric wirring Light point with making groove in wall, PVC conduit pipe, 2X1.0 sq.mm. Finolex /Popycab / RPG make copper conductor multi strand FR wires with angle holder/ batten holder/ceilling rose & with Roma Anchor /Vinay /Harrison make switches including 1X1.0 sq.mm. Finolex /Popycab / RPG make copper conductor multi strand FR wire for earthing all along the length of point as directed by engineer in-charge with all leads, lifts as per model flat etc. complete.	103.00	Nos.		
4	Providing, laying, fitting & installation consealled electric wirring for 6 A plug & switch point make Roma Anchor /Vinay /Harrison 2X1.5 sq.mm. Finolex /Popycab / RPG make copper conductor multi strand FR wires including 1X1.0 sq.mm. Finolex /Popycab / RPG make copper conductor multi strand FR wire for earthing all along the length of point as directed by engineer in-charge with all leads, lifts as per model flat etc. complete.	179.00	Nos.		

5	Providing, laying, fitting & installation consealled electric wirring for 6/15 A plug & switch point make Roma Anchor /Vinay /Harrison with 2X2.5 sq.mm. Finolex /Popycab / RPG make copper conductor multi strand FR wires including 1X1.0 sq.mm. Finolex /Popycab / RPG make copper conductor multi strand FR wire for earthing all along the length of point as directed by engineer in-charge with all leads, lifts as per model flat etc. complete.	24.00	Nos.		
6	Providing, laying, fitting & installation consealled electric wirring for Two way Light/Fan point/Bell point make Roma Anchor /Vinay /Harrison with making groove in wall, PVC conduit pipe, 2X1.5 sq.mm. Finolex /Popycab / RPG make copper conductor multi strand FR wires with angle holder/ batten holder/ceilling rose including 1X1.0 sq.mm. Finolex /Popycab / RPG make copper conductor multi strand FR wire for earthing as directed by engineer in-charge with all leads, lifts as per model flat etc. complete.	57.00	Nos.		
7	Providing, fitting & installation consealled electric Tel point as directed by engineer in-charge with all leads, lifts as per model flat etc. complete.	16.00	Nos.		
8	Providing, Supplying & installing T V point as directed by engineer in-charge with all leads, lifts as per model flat etc. complete.	8.00	Nos.		
9	Providing,laying &fitting consealled electric wirring for circuit with making groove in wall, PVC conduit pipe, 2X2.5 sq.mm. Finolex /Popycab / RPG make copper conductor multi strand FR wires with connection at both ends including 1X1.0 sq.mm. Finolex /Popycab / RPG make copper conductor multi strand FR wire for earthing all along the length of point as directed by engineer in-charge with all leads, lifts as per model flat etc. complete.	683.00	R.M.		
10	Providing,laying &fitting consealled electric wirring for circuit with making groove in wall, PVC conduit pipe, 2X4.0 sq.mm. Finolex /Popycab / RPG make copper conductor multi strand FR wires with connection at both ends including 1X1.0 sq.mm. Finolex /Popycab / RPG make copper conductor multi strand FR wire for earthing all along the length of point as directed by engineer in-charge with all leads,	209.00	R.M.		

	lifts as per model flat etc. complete.				
11	Providing,laying &fitting consealled TV Cable with making groove in wall, PVC conduit pipe, Finolex /Popycab / RPG make with connection at both ends as directed by engineer in-charge with all leads, lifts as per model flat etc. complete.	120.00	R.M.		
12	Providing,laying &fitting consealled Tel Cable with making groove in wall, PVC conduit pipe, Finolex /Popycab / RPG make with connection at both ends as directed by engineer in-charge with all leads, lifts as per model flat etc. complete.	240.00	R.M.		
13	Providing, fitting & installation on wall MCB Distribution Board suitable for 12 MCB's as per requirement, fitted with bus bar, electric circuit breaker make MDS / INDOASIAN / as directed by engineer in-charge with all leads, lifts as per model flat etc. complete.	8.00	Nos.		
14	Providing, fitting & installation 32/40 A MCB Isolator double pole as per requirement, electric circuit breker make MDS / INDOASIAN / as directed by engineer in-charge with all leads, lifts as per model flat etc. complete.	24.00	Nos.		
15	Providing, fitting & installation 10/15/20/32/40 A MCB single pole as per requirement, electric circuit breker make MDS / INDOASIAN / as directed by engineer in-charge with all leads, lifts as per model flat etc. complete.	90.00	Nos.		
16	Supplying & fixing Ding dong bell Anchor make cat no. 8057 on teak work/ sunmica top board as directed by engineer in-charge with all leads, lifts as per model flat etc. complete..	8.00	Nos.		
17	Supplying & fixing ceilling fans Crompton /Bajaj / Usha make with 1200 mm sweep, double ball bearing type, white/ brown colour. Considering the height of the ceilling contractor will have to provide the fan rod of appropriate length made from MS conduit pipe as directed by engineer in-charge with all leads, lifts as per model flat etc. complete..	24.00	Nos.		
18	Supplying, fixing & connecting on wall over PVC block prewired single tube light fitting Wipro/ Philips/ Bajaj make with low loss choke, starter, condensor as directed by	36.00	Nos.		

	engineer in-charge with all leads, lifts as per model flat etc. complete.				
19	Providing, Supplying & installing Elect Exaust fan including wiring with socket ,Crompton /Bajaj / Usha make white/ black colour in Kitchen room as directed by engineer in-charge with all leads, lifts as per model flat etc. complete.	8.00	Nos.		
20	Providing & Fixing 18mm thk plywood board as Meter board in meter room with TW lipping, finished with white enamel painting as directed by engineer in-charge as per model flat etc. complete.	2.00	Nos.		
21	Fixing existing armed cable from electric pole to the meter room by providing sadals to fix cable in well manner as directed by engineer in-charge as per model flat etc. complete.	50.00	R.M.		
22	Providing, fitting & installing 32/63-400 Kikat switch in meter room as directed by engineer in-charge as per model flat etc. complete.	6.00	Nos.		
23	Providing, fitting & installing 100 A Bus bar in meter room as directed by engineer in-charge as per model flat etc. complete.	2.00	Nos.		
24	Providing & Earthing with G.I. earth plate of size 600x600x6mm with 25x3 mm GI strip as an earth conductor in 2 mtr deep & 1mtr wide pit with 3/4" G.I. pipe for watering refilling the pit with 30 kg charcoal & 30 kg salt including construction of cement concrete chamber with C.C. cover & funnel for watering as directed by engineer in-charge as per model flat etc. complete.	2.00	Nos.		
25	Supplying & fixing on wall or under ground GI earth strip of size 25 x 3 mm in 2 nos. earth conductor as directed by engineer in-charge as per model flat etc. complete.	10.00	R.M.		
26	Supplying & fixing on wall or under ground ISI mark GI pipe of class "C" of 32mm dia & also to lay earth strip of size 25 x 3 mm in 2 nos. earth conductor as directed by engineer in-charge as per model flat etc. complete.	6.00	R.M.		
	TOTAL-C				
	TOTAL (A+B+C)				