12)

SECTION - I

NOTICE INVITING TENDER

Sealed tender are invited in duplicate on behalf of The Zonal Manager, Zonal Office, Bhagalpur for the following work :-

1)	Name of work	Construction of RSETI Building Bhagalpur
2)	Location of work	Nathnagar, Distt- Bhagalpur, Bihar
3)	Estimated cost	Rs. 1.32 CR (Rupees –One crore Thirty Two Lacs only)
4)	Time of completion of the work	09 (Nine) Calendar months from the date of acceptance of tender
5)	Earnest Money	Rs. 132000.00 (Rupees One lacs Thirty Two Thousand Only) in the shape of Bank Draft / Pay Order / Bank Guarantee / Banker's Cheque drawn in favour of UCO Bank and payable at Bhagalpur. Tender without Earnest Money in proper form will be rejected.
6)	Cost of tender document	Rs. 5000.00 (Rupees Five thousand only) in the form of Bank Draft in the name of UCO Bank, Zonal Office, Bhagalpur (Non-refundable) per set of tender document (original & duplicate) payable at Bhagalpur. Both original & duplicate documents are to be submitted.
7)	Availability of tender documents	Tender documents will be available from UCO Bank's website www.ucobank.co.in
8)	Pre-bid meeting – Venue, Date & Time	Pre-bid meeting to be held at UCO Bank, Zonal Office, Bhagalpur on 09.03.2018 at 04.00 PM. In case any contractor does not attend the pre-bid meeting, the decision of the pre-bid meeting will be binding to the firm.
9)	Time & Date of submission of tender	Up to 05.00 PM on 17.03.2018.
10)	Place of submission	At the Office of The Zonal Manager, UCO Bank, Zonal Office, Bhagalpur.
11)	Procedure for submission of tender	Tenders in duplicate will have to be submitted in two parts viz. Part-I & Part-II separately sealed and super scribed with the name of the work as described in detail under para 6 of Section – II (General Rules & Instructions for the Guidance of Tenderers).
12)	Tender to be addressed to	Zonal Manager, UCO Bank, Zonal Office, -- Bhagalpur.
13)	Time & Date of Opening of Tender	**I. Part-I on 19.03.2018 at 04.00 PM.** **II. Part-II – Time and date will be notified after opening of Part-II.**

14)	Place for Opening of Tender	Office of the Zonal Manager, UCO Bank, Zonal Office, --Bhagalpur.
15)	Inspection of drawings other than enclosed ones and clarifications, if any	At the Office of –Zonal Office, Bhagalpur during working hours on all working days up to 05.00 PM
15A)	**Last Date of Submission of Tender**	Up to 05.00 Hrs on 17.03.2018.
16)	Validity of tenders	For (4) Calendar Months from the stipulated last date of submission of tender.
17)	Delay in submission	Delay in submission arising out of postal or any other irregularities will not be considered. The Bank in any case will not be responsible for any damage in transit in case of postal delivery.

18) Supplier /Service Provider to confirm that the GST amount charges in invoice is declared in its returns and payment of taxes is also made.

The Supplier / Service Provider agrees to comply with all applicable GST laws , under applicable in India from time to time and to ensure accurate transaction details as required by GST laws , are timely uploaded in GSTIN. In case there is any mismatch between the details so uploaded in GSTIN by suppliers / Service Provider and details available with UCO Bank then payment to Supplier / Service Provider to the extent of GST relating to the invoices under mismatch may be retained from due payment till such time the accurate tax amount is finally reflected in the GSTIN to UCO Bank's Account and is finally available to UCO Bank in terms of GST laws and that the credit of GST so taken by UCO Bank is not required to be reversed at a later date along with applicable interest.

UCO Bank has the right to recover monetary loss including interest and pen suffered by it due to any non-compliance of tax-laws by the supplier / service provi Any loss of input credit to UCO Bank for the fault of supplier shall be recovered by U Bank by way of adjustment in the consideration payable.

Supplementary invoices / Debit Note / Credit Note for price revisions to enable UCO Bank to claim tax benefit on the same shall be issued by you for a particular year before September of the succeeding financial year.

19. The Bank does not bind itself to accept the lowest tender and reserves to itself the right to reject any or all others tenders received without assigning any reason/s thereof. The notification of award of contract will be made to the successful tenderer in writing by the Bank.

Yours faithfully,

For UCO Bank,
Zonal Office, Bhagalpur

SECTION – II

General Instruction for Guidance of Tenderers in respect to Part-I of Tender document

1. Applications should be submitted in Bank's prescribed format only (as per Annexure-I). Application in any other form will not be considered.

2. Applicants should have at least seven year's experiences in execution of similar works i. e., construction of Office / Residential Buildings, Training College with Hostel, Hotels, Shopping Malls etc in Banks / Govt./Public Sector / reputed private sector organizations.

3. A) **Project cost above Rs. 5.00 Crore**
   a. Three similar completed works costing not less than the amount equal to 40% of the estimated cost within seven years ending last day of the month previous to the one in which applications are invited in execution of similar works,

   or,

   b. Two similar completed works costing not less than the amount equal to 50% of the estimated cost within seven years ending last day of the month previous to the one in which applications are invited in execution of similar works,

   or,

   c. One similar completed work costing not less than the amount equal to 80% of the estimated cost within seven years ending last day of the month previous to the one in which applications are invited in execution of similar works.

   B) **Project cost below Rs. 5.00 Crore**

   Tenderers should have successfully executed at least two similar works of at least up to 75% of the estimated cost during last seven years ending last day of the month previous to the one in which applications are invited in execution of similar works.

4. Average financial turnover during the last three years, ending 31st March of the previous financial year, should be at least 30% of the estimated cost.

5. The Tenderers should have their Office / Establishment in Bihar.
6. The Bank reserves the right to visit the establishment / workshop of Tenderers before finalization of tender.
7. The Bank reserves the right to accept or reject any application without assigning any reason and **WITHOUT COST OR COMPENSATION THEREFOR.**
8. Additional sheet of papers may be used for submitting the applications, wherever space in the format is found inadequate.
9. Bank reserves the right to call for report from the existing clients of the applicant if required.

Following documents / papers are to be submitted :

- The list of similar work executed in last three years in Bank's / Govt. Departments / Public Sector Organizations / Reputed private Sector Organizations along with Completion Certificates & Work Order mentioning therein the details of work value & date of completion. (**as per Annexure – II & III**).
- Copies of PAN card, GST Registration Certificate, Trade Licence and any other registration certificates/licences, as may be necessary, as per Rules of local Statutory Authorities.
- Audited Account and Balance Sheet for last three years.
- Name and Address of Bankers with solvency certificate.
- Key personnel permanently employed (**as per Annexure – IV**).
- Work force & workshop facilities (**as per Annexure – V & VI**).

10. <u>Rejection Criterion</u>

Tender will be summarily rejected on account of followings:-

1. Tenderers not submitting the cost of tender document along with Part – 1 tender as stipulated in NIT,
2. Tenderers not submitting the Earnest Money along with Part-1 tender as stipulated in NIT,
3. Tenderers not submitting the Part – 1 & Part – 2 tender in separate sealed cover duly super scribed as mentioned in NIT,
4. Non-fulfilment of any criterion as specified under this Section – II.

Signature of Bank Official with seal

SECTION – III
GENERAL RULES AND INSTRUCTION FOR THE GIUDANCE OF TENDERER

1. Tenders are hereby invited on behalf of UCO Bank, Zonal Office, Bhagalpur for General Building, Sanitary & Plumbing and Area Development work for construction of Bank's RSETI Building at Bhagalpur. Estimated cost of the work is Rs. 132 Lakh.

2. Tender documents consisting of the following may be downloaded from UCO Bank's website www.ucobank.co.in

   i. Notice Inviting Tender,
   ii. General Instructions for Guidance of Tenderers in respect to Part – I of Tender Document,
   iii. General Rules and Instructions for the guidance of Tenderer,
   iv. Form of Tender,
   v. Articles of Agreement,
   vi. General Conditions of Contract with Appendices,
   vii. Special Conditions,
   viii. Safety Code,
   ix. Model Rules for the protection of health and sanitary arrangements of Workers,
   x. Technical Specifications and mode of Measurements,
   xi. Schedule of Quantities,
   xii. Drawings, Construction Schedule.

3. It is proposed to hold a pre-bid meeting with the intending tenderers on 09.03.2018 at 4.00 PM. at the Office of the Zonal Manager, UCO Bank, Zonal Office, Bhagalpur to clarify any point that the intending tenderers may have regarding the drawings, technical specifications, schedule of quantities and clauses of conditions of contract. Based on the pre-bid meeting, the Bank may modify some terms & conditions, a set of which will be published in UCO Bank's website www.ucobank.co.in This will also form a part of the contract document. The object of pre-bid meeting is to obtain a substantially responsive bid from the tenderers conforming to all the terms, conditions and specifications of the tender document inclusive of modified conditions/s furnished without any material deviation or reservation affecting the competitiveness of other tenders submitting substantially responsive bid. Conditional tenders are liable for rejection.

4. The site of work is available.
5. Tenders only in downloaded printed form should be placed in a sealed cover and address to the Zonal Manager, UCO Bank, Zonal Office, Bhagalpur. The name of the project shall be super scribed on the envelop and the same shall be received at the Office of the Zonal Manager, UCO Bank, Zonal Office, Bhagalpur up to 05.00 PM hrs on 17.03.2018
6. The sealed cover, as mentioned in para 5 above, shall contain two separate sealed covers marked Part – I and Part – II containing the documents as under :-

   Part – I : Covering Letter, Earnest Money of Rs. 1.32 Lacs (Rupees One lacs Thirty Two Thousand Only), Cost of Tender Booklet of Rs. 5000.00 (Rupees Five thousand Only) and others as per Annexure I to Annexure – VI.

   Part – II : Bill of Quantities, duly priced and Drawings. No conditions shall be stipulated in the Part – II. Conditional Rebate, if any, given in Part – II shall be treated as unconditional.

7. Part – I will be opened on 19.03.2018 at 04.00 hrs. The tenderers may depute their authorized representative to be present at the time of opening. The date and time of opening of Part – II will be intimated to the tenderers after opening of Part – I. In order to expedite the process, the representatives deputed by the tenderers at the time of tender opening should be authorized to take the decision on behalf of the tenderers. Part – II of tenders will not be opened and will be treated as cancelled in case submissions in Part – I are found to be not in order.

8. The time allowed for carrying out the work will be 09(Nine) months either from the fourteenth day after the date of written orders to commence work or day on which the contractor is instructed to take possession of site, whichever is later.

9. The tenderers should quote in figures as well as in words the rates and amount tendered by them. The language for filling tender documents shall be in English. The amount of each item should be worked out and requisite total given.

All corrections shall be attested by the initials of the tenderes with the seal of the firm. In case any discrepancy / difference is found on checking between rates quoted by the Contractor in words and figures or in the amount worked out by him, the following procedure shall be followed :-

a) When there is difference between the rates in figure and in words, the rate which corresponds to the amount worked out by the Contractor, shall be taken as correct.
b) When the amount of any item is not worked out by the Contractor or it does not correspond with the rate written either in figures of in words, then the rate quoted by the Contractor in words shall be taken as correct.
c) When the rate quoted by the Contractor in figures and in words tally but the amount is not worked out correctly, rate quoted by the Contractor shall be taken as correct and not the amount.
d) Amendments as mentioned above shall be based on tender marked "original" only.

10. Tenderer has to ensure that the rates of terms of similar nature or analogous in specifications are consistent throughout the tender.

    In case inconsistent rates are observed for terms of same description in the different sections of the schedule of quantities, the lowest of such rates shall be considered as the rate applicable for all such items.

11. All rates shall be quoted on the proper form of the tender alone.

    Special care should be taken to write the rates in figures as well as in words and the amount in figures only, in such a way that interpolation is not possible. The total amount should be written both in figures and in words. In case of figures, the words Rs. Should be written before the figures of rupees and words "P" after the decimal figures e. G. Rs. 2.15P and in case of words, the words "Rupees" should precede and the word Paise should be written at the end. Unless the rate is in whole rupees and followed by the words "only" it should be invariably up to two decimal places. While quoting the rate in schedule of quantities, the word "only" should be written clearly following the amount and it should not be written in the next line.

12. The contractor, whose tender is accepted, will be required to furnish by way of security deposit for the due fulfilment of his contract, such sum as detailed in clause No. 17 of the General Conditions of Contract. The Earnest Money Deposit of the Contractor whose tender is accepted is liable to be forfeited in full at the discretion of the Employer in case he does not remit the Initial Security Deposit (ISD) within the stipulated period and / or does not start the work by the stipulated date mentioned in the tender of award / work order.

13. The acceptance of a tender will rest with the UCO Bank, Zonal Office, - Bhagalpur who does not bind itself to accept the lowest or any tender and reserves to itself the authority to reject any or all the tenders received without assigning any reason whatsoever. All tenders in which any of the prescribed conditions are not fulfilled are incomplete in any respect are liable to be rejected. The Employer reserves the right to accept the tender in full or in part and the tenderer shall have no claim for revision of rates or other conditions if his tender is accepted in parts.

14. Canvassing in connection with tenders is strictly prohibited and tenders submitted by the Contractors who resort to canvassing will be liable to rejection.

15. An item rate tender containing percentage below / above will be summarily rejected.

16. On acceptance of the tender, the name of the accredited representatives of the Contractor who would be responsible taking instructions from the Employer / Consultant shall be communicated to the Employer / Consultant.

17. GST on materials or on finished work in respect of this contract whether in vogue or likely to be imposed in future, shall be payable by the Contractor and the Employer will not entertain any claim whatsoever in this respect at any time. GST regarding Service will be payable by Bank as per applicable rate.

18. The Contractor shall give a list of his relatives working with the Employer along with their designations and address.
    i)

    ii)

iii)

19. No Employee of the Employer is allowed to work as a contractor for a period of two years of his retirement from Employer's service, without the previous permission of the Employer. The contract is liable to be cancelled if either the Contractor or any of his employees is found at any time to be such a person who had not obtained the permission of the Employer as aforesaid before submission of the tender or engagement in the Contractor's service.

20. The tender for the work shall remain open for acceptance for a period of 4 (Four) calendar months from the stipulated last date for submission of tenders. If any tenderer withdraws his tender before the said period, or make any modification in the terms and conditions of the tender which are not acceptable to the Employer, then the Employer without prejudice to any other right or remedy shall be at liberty to forfeit the Earnest Money paid along with the tender.

21. The tender for the work shall not be witnessed by a Contractor or Contractors who himself / themselves has / have tendered or who may and had / have tendered for the same work. Failure to observe this condition would render tenders of the Contractors tendering as well as witnessing the tender liable to summarily rejection.

22. It will be obligatory on the part of the tenderer to tender and sign the tender documents for all the component parts and **THE WORK ORDER WILL BE ISSUED / AWARDED TO THE SELECTED BIDDER ONLY AFTER RECEIPT OF SIGNED TENDER DOCUMENTS AND ACCEPTANCE OF OUR LETTER OF INTENT BY THE SELECTED BIDDER FOR EXECUTING TEH ARTICLES OF AGREEMENT AVAILABLE WITH THE BANK THEREAFTER.**

23. The tenderer, apart from being a competent Contractor, must associate himself with agencies of the appropriate class who are eligible to tender for (i) Ante Termite Treatment, (ii) Waterproofing work and (iii) Sanitary & Water Supply Installation work etc.

Signature of Bank Official with Seal

SECTION – IV

FORM OF TENDER

The Zonal Manager, **Date .....**
UCO Bank,
Zonal Office , Bhagalpur.

Dear Sir(s),

Re : General Building, Sanitary & Plumbing and Area Development work for construction of RSETI Building at Bhagalpur.

1. I / we refer to the tender notice issued by UCO Bank, Zonal Office, Bhagalpur in connection with the captioned work that the work for which tender is submitted falls within the scope and ambit of our business.

2. I / we do hereby offer to perform, provide, execute, complete and maintain the work in conformity with drawings, conditions of contract, specifications, schedule of quantities etc. at the respective rates quoted in the schedule of quantities.

3. I / We have satisfied myself / ourselves as to the site conditions, examined the drawings and all aspects of the tender conditions. Subject to above, I / We do hereby agree, should this tender be accepted in whole or in part, to :

   a: Abide by and fulfil all the terms and provisions of the said conditions annexed hereto :

   b: Complete the work within 09 (Nine)calendar months, as stipulated by working in two or three shifts, if considered necessary by the Consultants, at no extra cost the Employer.

4. I/ We have deposited Earnest Money of Rs. 1.32 Lacs (Rupees One Lacs Thirty Two Thousand Only) in the form of Demand Draft / Pay Order / Banker's Cheque which, I / We note, will not bear any interest and is subject to forfeiture solely at Bank's discretion if :

   a. Not abide by and fulfil all the terms and provisions of the said conditions annexed hereto.
   b. Not completed the work within 09 (Nine) calendar months, as stipulated by working in two or three shifts, if considered necessary by the Consultants, at no extra cost to the Employer.

5. I / We have deposited Earnest Money of Rs. 1.32 Lacs (Rupees One Lacs Thirty Two Thousand Only) in the form of Demand Draft / Pay Order / Banker's Cheque which, I / We note, will not bear any interest and is subject to forfeiture solely at Bank's discretion if :

   i. The work is not commenced by me / us either within 14 (Fourteen) days from the date of issue of formal work order or the day on which I / We will be instructed to take possession of the site, whichever is later Or,
   ii. The offer is withdrawn within the validity period of acceptance Or,
   iii. The Initial Security Deposit (ISD) is not deposited within 14 (fourteen) days from the date of acceptance of tender Or,
   iv. The agreement of the contract is not executed within 15 days from award of contract.

6. I / We understand that you are not bound to accept the lowest or any tender you receive **and for that the accepting authority is not bound to assign any reason for the same.**

7. The acceptance of this tender shall constitute a binding contract and any failure as mentioned in item 4. above shall constitute a breach of contract by us and the tender accepting authority shall be entitled to have the work executed at our risk and cost and to claim extra cost / expenditure incurred by them from us.

8. Our Bankers are :

   1.
   2.
   3.

9. Name of partners / directors of our firm :

   i)

   ii)

   iii)

Yours faithfully,

For ----------

Signature ----------

Name

……

Designation

……

Name of Partner / Director of the Firm authorized to sign or name of person having power of attorney to sign the contract. (Certified true copy of power of attorney should be attached)

Signature and address of witnesses:

a. Signature ……
   Name:
   ……
   Address ……

b. Signature ……
   Name:
   ……
   Address ……

SECTION - V

GENERAL CONDITIONS OF CONTRACT

Except where provided for in the description of the individual items in the schedule of quantities and in the specifications and conditions laid down hereinafter and in the Drawings, the work shall be carried out as per standard specifications and under the direction of the Employer/Consultant.

1: INTERPRETATION

In construing these conditions the specifications, the schedule of quantities, tender and Agreement, the following words shall have *the* meaning herein assigned to them except where the subject context otherwise requires :

i: **Employer** : The term Employer shall denote "**UCO Bank**, a body corporate, constituted under the Banking Companies (Acquisition & Transfer of Undertakings) Act, 1970 as amended from time to time having its Head Office at No.10, BTM Sarani, Kolkata-700001 and a Zonal Office amongst other places at Bhagalpur or *any* of its employees / representative authorized on their *behalf*

ii: **Consultant** : The term Consultant shall mean ***MIs.*** Attik Architects, IBS building , Sitala Sthan Road, Tilkamanjhi, Bhagalpur or in the event of their ceasing to be the Consultant for the purpose of this contract such other persons as *the* Employer shall *nominate* for the purpose.

iii: **Contractor:** The term contractor shall mean the individual or firm or company whether incorporated or not, undertaking the work and shall include legal representative(s) of such individual or persons composing such firm or company or successors of such firm or company as the case may be and *permitted* assigns of such individual or firm or company.

iv: **Site**: The site shall mean the site where the work are to be executed as shown within the boundary in red borders on the site plan including any building and erections thereon allotted by the Employer for the Contractor's use.

v: **Site Engineer/Project Management Consultant (PMC)** : The Site Engineer shall be appointed by the Employer. The Employer may also appoint Project Management Consultant (PMC).

vi: **Drawing** : The work is to be carried out in accordance with drawings, specifications, the schedule of quantities and any further drawings

which may be supplied or any *other* instruction, which may be given *by* the Employer/Consultant during the execution of the work.

All drawings relating to work given to the Contractor together with a copy of schedule of quantities are to be kept at site and the Employer/Consultant shall be given access to such drawings or schedule of quantities whenever necessary.

In case any detailed drawings are necessary the contractor shall prepare such detailed drawings and/or dimensional sketches therefore and have it confirmed by the Employer/ Consultant prior to taking up such work.

The contractor shall ask in writing for all clarifications on matters occurring anywhere in drawings, specifications and schedule of quantities or to additional instructions at least 20 days ahead from the time when it is required for implementation so that the Employer / Consultant may be able to give decision thereon.

vii: **"The Work"** shall mean the work to be executed or done under this contract.

viii: **"Act of Insolvency"** shall mean any act as such as defined by the Presidency Towns Insolvency Act or in Provincial Insolvency Act *or* any amending statutes.

ix: **"The Schedule of Quantities"** shall mean the schedule of quantities as specified and forming part of this contract.

x: **"Priced Schedule of Quantities"** shall mean the schedule of quantities duly priced with the accepted quoted rates of the Contractor.

2: SCOPE

The work consists of General Building, Sanitary & Plumbing and Area development in connection with construction of RSETI Building at Bhagalpur, UCO Bank in accordance with the drawings and "Schedule of items and quantities". It includes furnishing all materials, labour, tools and equipment and management necessary for and incidental to the construction and completion of the work. All work, during its progress and soon completion, shall conform to the lines, elevations and grades as shown on the drawings furnished by the Employer/ Consultant. Should any detail, essential for efficient completion of the work be omitted from the drawings and specifications it shall be the responsibility of the Contractor to inform the Employer/Consultant and to furnish and install such detail with Employers / Consultant's concurrence, so that

upon completion of the proposed work the same will be acceptable and ready for use.

Employer/Consultant may in their absolute discretion issue further drawings and/or written instructions, details, directions and explanations, which are, here after collectively referred to as 'The Employer's / Consultant's instructions in regard to :

a. The variation or modification of the design, quality or quantity of work or the addition or omission or substitution of any work.

b: Any discrepancy in the drawings or between the schedule of quantities and/or drawings and/or specification.

c: The removal from the site of any defective material brought thereon by the Contractor and the substitution of any other material thereof.

d) The demolition removal and or execution for any work executed by the contractors.

e) The dismissal from the work of any persons employed thereupon.

f) The opening up for inspection of any work covered up.

g) The rectification and making good of any defects under clauses hereinafter mentioned and those arising during the Defect Liability Period.

The Contractor shall forthwith *comply with* and duly execute any work comprised in such Employers *I* Consultant's instructions, provided always that verbal instructions, directions and explanations given to the Contractor or his representative upon the work by the Employer / Consultant shall if involving a variation be confirmed in writing to the Contractor within seven days. No work, for which rates are not specifically mentioned in the priced schedule of quantities, shall be taken up without written permission of the Employer / Consultant. Rates of items not mentioned in the priced schedule of quantities shall be fixed by the Employer in consultation with the Consultant as provided in Clause "variation".

The contractor shall set up at his own cost a field laboratory with necessary equipments for day to day testing of materials like grading of coarse and fine aggregates, silt content and bulkage of sand etc.

Regarding all factory made products for which ISI marked products are available, products bearing ISI marking shall be used in the work.

3 DETAILED DRAWINGS AND INSTRUCTIONS

The Employer through its Consultant shall furnish with reasonable promptness additional instructions by means of drawings or otherwise necessary for the proper execution of *the* work. All such drawings and *instructions* shall be consistent with the Contract Documents, true developments thereof, and reasonably inferable therefore.

The work shall be executed in conformity therewith and the Contractor shall not work without proper drawings and instructions.

4. COPIES FURNISHED

The Contractor on signing of the agreement shall be furnished by the Employer through its Consultant free of charge with a copy of the priced schedule of quantities rates, two copies of each of the said drawings and one copy of specifications and two copies of all further drawings issued during the progress of the work. Any further copies of such drawings required by the Contractor shall be supplied on payment of the charges thereof by *the* contractor.

5. OWNERSHIP OF DRAWING

All drawings, specifications and copies thereof furnished by the Consultant are the property of the Employer. They are not to be used on other work and with the exception or the signed contract set, are to be returned to the Employer on request at the completion of the work

6. FAILURE BY CONTRACTORS TO COMPLY WITH EMPLOYER'S / CONSULTANTS INSTRUCTION

If the contractor after receipt of written notice from the Employer or the Consultant requiring compliance of any instruction within ten days fails to comply with such further drawings, Employer's/Consultant's instructions, the Employer through the Consultant or other person, may *employ* other person to execute any such work whatsoever that may be necessary to give effect here and pay all cost incurred in connection therewith and same shall be recoverable from the contractor by the Employer on the certificate of the Consultant as a debt or shall have right to deduct same from all moneys due or to become due to the contractor.

7. TENDERER SHALL VISIT THE SITE

Intending tenderer shall visit the site and make himself thoroughly acquainted with the local site condition, nature and requirements of the work, facilities of

transport condition, effective labour and materials, access and storage for materials and removal of rubbish. The tenderer shall provide in their tender for cost of carriage, freight and other charges including all taxes etc. as also for any special difficulties and including police restriction for transport etc for proper execution of work as indicated in the drawings. The successful tenderer will not be entitled to any claim of compensation for difficulties faced or losses incurred on account of any site condition which existed before *the* commencement of the work or which in *the* opinion of the *Employer* / Consultant might be deemed to have reasonably been inferred to be so existing before commencement of work.

8. TENDERS

The entire set of tender paper Issued to the tenderer should be submitted fully priced and also signed on the last page together with initials on every page. Initial/signature will *indicate* the acceptance of the tender papers by the tenderer :

The schedule of quantities shall be filled in as follows :

i: The "Rate" column to be legibly filled in ink in both English figures and English words.

ii: Amount column to be filled in for each item and the amount for each subhead as detailed in the "Schedule of Quantities".

iii: All corrections / overwriting are to be initialed with the seal of the Firm.

iv: The "Rate Column" for alternative items if any shall be filled up.

v: The "Amount" for alternative items if any of which the quantities are not mentioned shall not be filled up.

vi: In case of way errors / omissions in the quoted rates, the rates given in the tender marked original shall be taken as correct rates.

No modifications, writings or corrections can be made in the tender papers by the tenderer.

The Employer reserves the right to reject the lowest or any tender and also to discharge *any* or all of the tenders for each *section* or to split up and distribute *any item* of work to any specialist firm or firms, without assigning any reason.

The tenderers should note that the tender is strictly on the item rate basis and their attention is drawn to the fact that the rates for each and every item

should be correct, workable and self-supporting. If called upon by the Employer / Consultant detailed analysis of any or all the rates shall be submitted. The Employer / Consultant shall not be bound to recognize the Contractor's analysis.

The work will be paid for as "measured work" on the basis of actual work done and not as "lump sum" contract.

All items of work described in the schedule of quantities are to be deemed and paid as complete work in all respects and details including preparatory and finishing work involved, directly, related to and reasonably detectable from the drawings, specifications and schedule of quantities and no further extra charges will be allowed in this connection. In the case of lump sum charges In the tender in respect of any item of work, the payment of such item of work will be made for the actual work done on the basis of lump sum charges as will be assessed to be payable by the Employer / Consultant.

The Employer has power to add to, omit from any work as shown in drawings or described in specifications or included in schedule of quantities and intimate the same in writing but no addition, omission or variation shall be made by the Contractor without authorization from the Employer. Such variation done by the Employer shall not vitiate the contract.

9. AGREEMENT

The successful Contractor shall sign the agreement as per draft agreement annexed within 15 days from the date of issue of Letter of Intent and he shall pay for all stamps and *legal* expenses, incidental thereto. However, the written acceptance of the tender by the Employer / Consultant on behalf of Employer will constitute a binding contract between the Employer and the person so tendering whether such formal agreement is or is not subsequently executed.

THE SELECTED BIDDER IS REQUIRED TO EXECUTE THE ARTICLES OF AGREEMENT BEFORE AWARDING/ISSUANCE OF THE WORK ORDER TO HIM AND THE SAID DRAFT AFRTICLES OF AGREEMENT WILL BE AVAILABLE FROM THE OFFICE OF THE EMPLOYER.

10. ROYALTIES & PATENTS

The contractor shall pay all royalties and license fees. He shall defend all suits or claims for infringement of any patent rights and shall save the Employer harmless from loss on account thereof.

11. PERMITS AND LICENCES

Permits and licenses for release of materials which are under government control will be arranged by the contractor. The Employer will render necessary assistance, sign any forms or applications that may be necessary.

The Employer/Consultant shall be indemnified against all Government or legal actions arising out of theft or misuse of Government controlled materials in the custody of the contractor.

12. GOVERNMENT AND LOCAL RULES

The Contractor shall conform to the provisions of all local Bylaws and Acts relating to the work and to the Regulations etc. of the Government and Local Authorities and of *any* company *with* whose system *the* structure is proposed to be connected. The Contractor shall give all notices required by the said Act, Rules, Regulations and Bylaws etc and pay all fees payable to such authority/authorities for execution of the work involved. The cost, *if* any, *shall* be deemed to *have* been included in his quoted rates, taking into account all liabilities for licenses, fees for footpath encroachment and restorations etc. and shall indemnify the Employer against such liabilities and shall defend all actions arising from such claims or liabilities.

13. TAXES AND DUTIES

The tenderness must include in their tender prices quoted for GST on material If applicable. No extra claim on this account will in any case be entertained. However, GST for service as applicable will be payable by the Bank.

14. PROVISIONAL SUMS (P.S.)

All provisional sum described in the schedule of quantities as P.S. shall be exclusively allotted to the purchase of materials & not for any handling & fixing to be done by the contractor. Such costs of handling & fixing *with* profit (or transportation charges, if required) shall be separately included in the contract price as described in the schedule of quantities. The disposal of the amounts covered under this head will be absolutely at the discretion of the Employer. Contractor is to make payments for these materials to the suppliers on certificate or order issued by the Employer / Consultant & realizes them through his bills from the Employer.

15. QUANTITY OF WORK TO BE EXECUTED

The Quantities shown in the Schedule of Quantities are intended to cover the entire new structure indicated *in* the drawings but *the* Employer reserves *the* right to execute only a part or the whole or any excess thereof without assigning any reason therefore. If at any time after the commencement of the work, the Employer / Consultant shall for any reason whatsoever not require the whole work thereof as specified *in the* tender to be carried out, the Consultant / Employer shall give notice in writing of the fact to the contractor who shall have no claim to any payment or compensation whatsoever on account of any profit or advantage which he might have derived from the execution of the work in full, but which he did not derive in consequence of the full amount of the work not having been carried out; neither shall he have any claim for compensation by reason of any alterations having been made in the original specification, drawing, designs and instructions which shall involve any curtailment of the work as originally contemplated.

16. OTHER AGENCY OR PERSONS ENGAGED BY THE EMPLOYER

The Employer reserves the right to execute any part of the work included in this contract or any work which is not included in this contract by other Agency or persons and the Contractor shall allow all reasonable facilities and use of his scaffolding for the execution of such work. The General building Contractor shall extend all co-operation in this regard.

17. EARNEST MONEY, SECURITY DEPOSIT & RETENTION MONEY

The tenderer will have to deposit an amount of Rs. 1.32 Lacs (Rupees One Lacs Thirty Two Thousand Only) in the form of Demand Bank Draft/Pay Order/Banker's Cheque drawn in favour of UCO Bank and payable at Bhagalpur at the time of submission of tender as Earnest Money. The Employer is not liable to pay any interest on the Earnest Money. The Earnest Money of the unsuccessful tenderers will be refunded without any interest soon after the decision to award the work is taken or after the expiry of the validity period of the tender.

The successful tenderer to whom the *contract* is awarded *will* have to deposit as "Initial Security Deposit" (ISD) a further sum to make up 2% (Two Percent) of the value of the accepted tender including the Earnest Money. ISD may be submitted in the form of Bank Draft/Pay Order/Banker's Cheque or Bank Guarantee (as per Annexure-XII herein below). The Bank Guarantee shall be from any nationalized Bank other than UCO Bank. The initial Security Deposit will have to be made within 14 days from the date of acceptance of tender, failing which the Employer at his discretion may revoke the Letter of

Acceptance and forfeit the Earnest Money deposit furnished along with the tender.

Apart from the initial security deposit made as above, Retention Money shall be deducted from progressive running bills @ 8% of the gross value of each running bill until security deposit, i.e. the Initial Security Deposit plus the Retention Money equal to:

(a) 10% on the first Rupees one Lac of the cost of work;

(b) 7.5% on *the* next Rupees one Lac of *the* cost of work;

(c) 5% on the next amount up to Rs. 2 Crores of the cost of work.

(d) 2% for the amount in excess of 2 Crores of the cost of work subject to ceiling on the total security of Rs. 25,00,000/-.

However, the retention money will not be deducted from progressive running bills till the amount of Initial Security Deposit including the earnest money is covered.

Also, the Retention Money will not be deducted from the contractor's running bills if Bank Guarantee from a Nationalized Bank other than UCO Bank covering the retention money *calculated* as above, is submitted by the contractor.

After realization of *the* total Retention Money by deduction from the bills of the contractor as specified above, 50% of the total Retention Amount will be refunded to the contractor on completion of work subject to the following :-

1) Issue of the Virtual Competition Certificate by the Consultants / Bank.
2) Contractors removal of his material, equipment, labour force, temporary, sheds/stores etc. from the site excepting for small presence required if any, for the defect liability period and approved by the Bank.

The balance 50% will be released to the Contractor within a reasonable period after the end of "Defect Liability Period" provided he has satisfactorily carried out all the work, submitted all documents including all as built drawings etc. contractually called tor and attended to all defects in accordance with the conditions of the contract. No interest is allowed on Retention Money and Earnest Money Deposit.

Further, if some dues to the Employer from the Contractor(s) have still to be recovered, the Employer reserves the right to withhold payment of so much of the Retention Money as in his opinion, represents the cost of the

same.

18. PERFORMANCE SECURITY:

Within 30 days of receipt of the letter of award the successful tenderer shall furnish to the UCO Bank Performance Security (as per Annexure-XIII herein below) for an amount of 7% *(seven* percent) of the contract price in the shape of Demand Draft or Pay Order or Bank Guarantee from a Nationalized (other than UCO Bank) or Foreign Bank acceptable to the employer.

After due performance or completion of the work in all respects the Performance Security will be returned to the Contractor without any interest. Failure of the successful tenderer to furnish the Performance Security shall constitute sufficient grounds for the annulment of the award and forfeiture of Initial Security Deposit. In this event the employer *may* make the award to other tenderer according to the position prevailing at the appropriate time.

10% of the job value pertaining to waterproofing & anti-termite works will be kept in FD a/c for 4 (Four) years after the end of Defect Liability Period for which the contractor is to execute guarantee bond for waterproofing treatment work (as per Annexure-X herein below) and guarantee bond for anti-termite treatment (as per Annexure-IX herein below) which shall be refunded after 4 years from the end of Defect Liability Period & will carry interest **AT PREVAILING RATE** provided he has satisfactorily carried out all the work and attended to all defects in accordance with the conditions of the contract.

No interest is allowed on retention money for defect liability period of one year.

19. CONTRACTOR TO PROVIDE EVERYTHING NECESSARY

The Contractor shall provide everything necessary for the proper execution of the work according to the intent and meaning of the drawings, schedule / of quantities and specifications taken together whether the same may or may *not* be particularly shown or described therein provided that the same can reasonably be inferred there from and if the Contractor finds any discrepancies therein he shall immediately and in writing refer *the* same to the *Employer* / Consultant whose *decision* shall be final and binding. The contractor shall provide himself for fresh and tested water for carrying out the work at his own cost. The Employer Shall on no account be responsible for the expenses incurred by the Contractor for hired ground or

fresh water obtained from elsewhere.

The rates quoted against individual items will be inclusive of everything necessary to complete the said items of work within the contemplation of the contract, and beyond the unit price no extra payment will be allowed for incidental or contingent work, labour and or materials inclusive of all taxes and duties whatsoever except for specific items, if any stipulated in the tender documents.

The Contractor shall supply, fix and maintain at his awn cost, for the execution of any work, all tools, tackles, machineries and equipments and all the necessary centering, scaffolding, staging, planking, timbering, strutting, shoring, pumping, fencing, boarding, watching and lighting by night as well as by day required not only for the proper execution and protection of the said work but also for the protection of the public and safety of any adjacent roads, streets, walls, houses, buildings, all other erections, matters and things and the Contractor shall take down and remove any or all such centering, scaffolding, planking, timbering, strutting, shoring, etc, as occasion requires or when ordered so to do, and shall fully reinstate and make good all matters and things disturbed during the execution of work to the satisfaction of the Employer / Consultant.

The Contractor shall also provide such temporary road on site as may be necessary for the proper performance of the contract and for his own convenience but not otherwise. Upon completion, such road shall be broken up *and* leveled where so required by the drawings unless the Employer shall otherwise direct.

The Contractor shall at all times give access to workers employed by the Employer or any men employed on the buildings and to provide such parties with proper sufficient and if required, special scaffolding, hoists and ladders and provide them with water and lighting and leave or make any holes, grooves etc. in any work, where directed by the Employer as may be required to enable such workmen to lay or fix pipes, electrical *and* telephone *conduit,* special fittings, *etc. The* quoted rates of the tenderers shall accordingly include all these above mentioned contingent work.

20. TIME OF COMPLETION, EXTENSION OF TIME AND PROGRESS CHART

a) Time of Completion:

The entire work is to be completed in all respects within the stipulated period of 09 (Nine) calendar months. The work shall be deemed to be commenced within 14 (fourteen) days from the date of issue of formal work order or the date on which the Contractor is instructed to take possession of the site, whichever is later. Time is the essence of the contract and shall be strictly

adhered to by the Contractor.

The work shall not be considered as complete until the Employer/Consultant have certified in writing that this has been completed and the Defects Liability Period shall commence from the date of such certificate.

b) Extension of Time:

If in the opinion of the Employer / Consultant the work be delayed (a) by reason of any exceptionally inclement weather or (b) by reason of instructions from the Employer / Consultant in consequence of proceedings taken or threatened by or disputes, with adjoining or neighbors or owners or (c) by the work, or delay of other contractors or tradesmen engaged or nominated by the Employer / Consultant and not referred to in the specification or (d) by reason of authorized extra and additions or (e) by reason of any combination of workmen or strike or lockout affecting any of the building trades or (f) from other causes which the Employer / Consultant may consider are beyond the control of the Contractor, the Employer / Consultant before the completion of the time allowed for the contract shall make fair and reasonable extension of time for completion in respect therefore. In the event at the Employer failing to give possession of the site upon the day specified above the time of *completion* shall be extended suitably.

In case of such strikes or lock-outs, as are referred to above, *the* Contractor shall immediately give the Employer / Consultant written notice thereof. Nevertheless, the Contractor shall use his best endeavors to prevent delay, and shall do that may be reasonably required, to *the* satisfaction of *the* Employer / Consultant to proceed with *the* work and on his doing so that it will be ground of consideration by the Employer / Consultant for an extension of time as above provided. The decision of the Employer as to *the* period to be allowed for *an extension at time*
for completion hereunder (which decision shall be final and binding on the Contractor) shall be promulgated at the conclusion of such strike or lock-out and the Employer shall then in the *event* of extension being granted, determine and declare the final completion date. The provision in Clause 20 with respect to payment of liquidated damages shall in such case, be read and construed as if the extended date fixed by the Employer were substituted for and the damage shall be deducted accordingly.

Hindrance Register *in* the approved format as per Annexure – XIII, Table – XII, shall be maintained and proper record of hindrances arisen and solved with the dates to be recorded in the register by the Employer's Site Engineer / Consultant's Site Engineer and Contractor's authorized representative so that extension of time to be granted can be derived from the register and

recommended by the Consultant and approved by the Employer's Competent Authority.

c) Progress of Work/ Work Program :

During the period of construction the Contractor shall maintain proportionate progress on the basis of the Programmed Chart submitted by the Contractor immediately before commencement of work and agreed to *by* the Employer / Consultant. Contractor should also include planning for procurement for scarce material well in advance and reflect the same in the Programme Chart so that there is no delay in completion of the project.

21. LIQUIDATED DAMAGES (LD)

Should the work be not completed to the satisfaction of the Employer / Consultant within the stipulated period, the contractor shall be bound to pay to the employer a sum calculated as under by way of liquidated damage and not as penalty during which the work remains un-commenced or unfinished after the expiry of the completion date :-

a)	For contracts having time for completion 9 months and less	1.00% of the estimated amount shown in the tender per week subject to a ceiling of 10% of the accepted contracted sum.
b)	For contracts having time for completion exceeding 9 months but not exceeding 2 years (24 months)	0.50% of the estimated amount shown in the tender per week subject to a ceiling of 7.5% of the accepted contracted sum but not exceeding the total S. D. of the contract.
c)	For contracts having time for completion in excess of 2 years	0.25% of the estimated amount shown in the tender per week subject to a ceiling of 5% of the accepted contracted sum but not exceeding the total S. D. of the contract.

22. ACTION WHEN WHOLE OF SECURITY DEPOSIT IS FORFEITED

In any case in which under any clause or clauses of this contract, the contractor shall have rendered himself liable to pay liquidated damages amounting to the whole of his Security Deposit (whether paid in one sum or deducted by Installments) the Employer / Consultant shall have power to adopt any of the following courses as they may deem) best suited to the interest of the Employer:

a) To rescind the contract (of which rescission notice in writing to the contractor under hand of the Employer shall be conclusive evidence), and in which case the Security Deposit of the contractor shall stand forfeited and be absolutely at the disposal of the Employer.

b) To employ labour by the Employer and to supply materials to carry out the work, or any part of the work, debiting the contractor with the cost of the labour and price of material (of the amount of *which* cost and price of a certificate of the Consultant shall be final and conclusive against the contractor) and crediting him with the value of the work done, in all respects in the same manner and at the same rates as if it had been carried out by the contractor under the terms of this contract and the certificate of the Employer as to the value of the work done, shall be final and conclusive against the contractor.

c) To measure up the work of the contractor, and to take such part thereof as shall be unexecuted, out of his hands, and to *give* it to another contractor to complete in which case any expenses which may be incurred in excess of the sum which would have been paid to the original contractor, if the whole work had been executed by him (of the amount of which excess the certificates *in* writing of *the* Consultant shall be final and conclusive) shall be borne and paid by the original contractor and may be deducted from any money due to him by the Employer under the contract or otherwise, or from his security Deposit or the proceeds of sale thereof, or a sufficient part thereof.

In the *event* of any of the *above* courses being adopted by the Employer / Consultant the contractor shall have no claim to compensation for any loss sustained by him by reasons of his having purchased or procured any materials or entered into any engagements or make any advances on account *of,* or with a view to the execution of the work or the performance of the contract. And in case the contract shall be rescinded under the provision aforesaid, the contractor shall not be entitled to recover or be paid any sum for any work thereto for *actually* performed under this contract unless and until the Employer / Consultant will have certified in writing the performance

of such work and the value payable in respect thereof, and he shall only be entitled to be paid the value so certified.

23. TOOLS, STORAGE OF MATIERIALS, PROTECTIVE WORKS AND SITE OFFICE REQUIREMENTS

The Contractor shall provide, fix up and maintain in an approved position proper office accommodation of the contractor representative and staff which shall be open at all reasonable hours to receive instruction notices or communications and clear away on completion of the work and make good all work disturbed.

All drawings maintained on the site are to be carefully mounted on boards of appropriate size. They are to be protected from ravages of termites, ants, and other insects.

The Contractor shall provide at his own cost all artificial light required for the work and to enable other contractors and sub-contractors to complete the work within the specified time.

The Contractor shall provide a suitable temporary hut for the watchman and clear away the same when no longer required and to provide all necessary attendance, lights etc, required.

The Contractor shall arrange for temporary latrines tor the use of workers and field staff and keep the same in a clean and sanitary condition to the satisfaction of the Public Health Authorities and shall cause such latrines and soil to be cleared away whenever necessary and shall make good all the work disturbed by these conveniences.

Every precaution shall be taken by the contractor to prevent the breeding of mosquitoes on the work during the *construction* and all receptacles, cisterns, water tanks etc used for storage of water must be suitably protected against bleeding of mosquitoes. The Contractor shall indemnify the Employer against any breach of rules in respect of *anti -malarial* measures. The Contractor *shall* not fix or place any placards or advertisement of any description or permit the same to be fixed or placed in or upon any boarding gantry, building structure other than those approved by the Employer.

Protective Measures

The Contractor from the time of being placed in possession of the site must make suitable arrangements for watching, lighting and protecting the work, the site and surrounding property by day, by night, on Sundays and other holidays.

The Contractor shall indemnify *the* Employer against any possible damage to the building, roads, or member of the public in course of execution of the work.

The Contractor shall provide necessary temporary enclosures, gates, entrances etc. for the protection of the work and materials and for altering and adopting the same as may be required and removing on completion of the work and making good all work disturbed.

Storage of materials

The Contractor shall provide and maintain proper sheds for the proper storage and adequate protection of the materials etc and other work that may be executed on the site including the tools and materials of sub-contractors and remove same on completion. Sheds for storage' of cement are to have pucca floor raised above the ground. Cement godown shall be constructed for storing about six weeks requirements of cement stored as per norms with a stack or 10 bags each, two feet opening all around with two feet passage between each stack. Structure shall be waterproof from all the sides and top. Cement should be stored one ft. above the ground level and the floor of the godown shall consist of wooden planks resting on base prepared of dry bricks.

So also reinforcement bars are to be stored above the ground level to prevent the same from getting rusted.

Tools

All tools, equipments and instruments as instructed by the Employer / Consultant and considered necessary for the work shall be provided by the Contractor for the due *performance* of this contract.

All measuring tapes shall be of steel and suitable scaffolding and ladders that may be required for taking measurement shall be supplied by the Contractor.

The mistries and the supervisors on the work shall carry with them always a one meter or two meter steel tape and a measuring tape of 30 meters, a spirit level, a plumb bob and a square and shall check the work to see that the work is being done according to the drawing and *specifications.*

The *Site* Engineer will use any or all measuring instruments or tools belonging to the contractors as he chooses for checking the work executed or being executed on the contract.

The Contractor should cover in his rates for making provisions for all reasonable facilities for the use of his erected scaffolding, and/or tools and plant etc by sub-contractors for their work or for work to be carried out *by* other agencies employed by the Employer / Consultant.

24. NOTICE AND PATENTS OF APPROPRIATE AUTHORITY AND OWNERS

The Contractor shall conform to the provisions of any Act of the Legislature relating to the work and to the Regulations and Bylaws of any authorities, and/or any water, lighting and other companies, and/or authorities with whose systems the structures were proposed to have connection and shall before making any variations from the drawings or specification that may be associated to so conform, give the Employer / Consultant written *notices* specifying the variations proposed to be made and the reasons for making them and apply for instruction thereon. The Employer / Consultant on receipt of such intimation, shall give a decision within a reasonable time.

The Contractor/s shall arrange to give all notices required for by the said Acts, Regulations or Bylaws to be given to any authority and to pay such authority or to any public office all fees that may be properly chargeable in respect of the work and lodge the receipts with the Employer.

The Contractor shall Indemnify the Employer against all claims In respect of patent rights, royalties damages to buildings, roads or member of public in course of execution of work and shall defend all actions arising from such claims and shall keep the Employer saved harmless and indemnified in all respects from such actions, costs and expenses.

25. CLEARING SITE AND SETTING OUT WORKS

The site shown on the plan shall be cleared of all obstructions, trees, bushes, shrubs, loose stone, and rubbish materials of *all* kinds. All holes or hollows whether originally existing or produced by removal of loose stone or materials shall be carefully filled with earth well rammed and leveled off as directed at his own cost.

The Contractor shall set out the work and shall be responsible of the true and perfect setting out of the work and for the correctness of the positions, levels, dimensions and alignment of all parts thereof. If at any time, *any* error *shall* appear during *the* progress of any part of the work, the Contractor shall at his own expenses rectify such error, if called upon to the satisfaction of the Employer / Consultant. The Contractor shall further set out the work to *the* alternative positions *at* the site until one is finally approved and the rates quoted in his tender should include for this and no extra on this account will

be entertained.

26. DATUM

The 'datum' will be furnished by the Consultant / Employer in conformity with regulations of appropriate Authority. The *contractor* shall make arrangements for preserving the above datum till completion of the work. All levels shown in the drawings are to be strictly adhered to.

27. BENCHES

The Contractor is to construct and maintain proper benches of all the main walls, in order that the lines and levels may be accurately checked at all times.

These benches will consist of timber posts of adequate length and minimum diameter 75mm to be driven in the ground at suitable distance as directed encased with brick work. *The* wire nails *will* be driven on the top of wooden post on the center line at columns, walls, inside and outside faces of foundation trenches. Center line of walls, columns etc may be clearly indicated so that checking may be done at any time, if it is so required.

28. CONTRACTOR IMMEDIATELY TO REMOVE ALL OFFENSIVE MATTERS

All soil, filth or other matters of any offensive nature taken out of any trench, sewer, drain, cesspool or other place shall not be deposited on the surface but shall be at once carted away by the Contractor to a safe place as per rules of the appropriate authorities / instruction of the Employer / Consultant.

The Contractor shall keep the foundations and work free from water and shall provide and maintain at his own expenses, electrically or other power driven pumps and other plant to the satisfaction of the Employer for the purpose, until the building is handed over to the Employer. The Contractor shall arrange for the disposal of the water so accumulated to *the satisfaction of* the employer and *the* local authority and no claims will be entertained afterwards if he does not include in his rates for the purpose.

29. ACCESS

Any authorized representative of the Employer / Consultant shall at all reasonable times have free access to the wonk and/or to the workshops, factories other places where materials are being prepared or constructed *for* the work and at any place where the materials are lying or from where they are being obtained, and the Contractor shall give every facility to the

Employer or their representatives necessary for *inspection and examination* and test of *the materials and* workmanship. Except *the* representatives of the Employer and Consultant no person shall be allowed at any time without the written permission of the Employer.

30. MATERIALS, WORKMANSHIP, SAMPLES, TESTING OF MATERIALS

All the work specified and provided for in the specifications or which may be required to be done in order to perform and complete any part thereof shall be executed in the best *and* most workman like manner with materials of the approved quality of the respective kinds in accordance with the particulars contained in and implied by the specifications and as represented by the drawings or according to such other additional particulars, and instructions as *may* from time to time be given by the Employer / Consultant during the execution of the work and to his entire satisfaction.

A list of Mandatory Tests is annexed as per Annexure – XIV, which is only indicative and not exhaustive. The contractor will have to carry out the tests at his own cost in any approved testing laboratory to prove that the materials under test conform to the specifications stipulated in relevant I. S. Code / Tender. The necessary charges for preparation of mould (in case of concrete cube), transporting, testing etc shall have to be borne by the contractor. Any other tests, special or routine, on any material or workmanship, if advised to be done by the Employer/ Consultant for any reason *whatsoever,* shall be carried out by the Contractor for which no additional payment will be made.

A list of materials of approved make and brand is annexed in the **"Technical Specifications".** Materials are to be used from the annexed approved materials list. Out of the approved brands one with ISI mark shall be given preference over the others In case of non-availability of materials of specified makes, alternative products of equivalent quality may be used with prior permission from the Employer / Consultant.

All the materials (except where otherwise described) stores and equipment required for the full performance of the work under the contract must be provided through normal channels *and* must include charges for all duties, sales tax, octroi and other *charges* legally payable and must be the best of their kind available and the contractors must be entirely responsible for the proper and efficient carrying out the work. The work must be done in the best workman *like* manner. Samples of *all materials are* to be used must be submitted to the Employer / Consultant when so directed by the Employer / Consultant and written approval from Employer / Consultant must be obtained prior *to* placement of order.

During the inclement weather the Contractor shall suspend concreting and plastering for such time as *the* Employer / Consultant may direct and shall

protect from injury all work during its course of execution. Any damage (during construction) to any part of the work for any reasons due to rain, storm or neglect of Contractor shall be rectified by the Contractor in an approved manner at no extra cost.

Should the work be suspended by reason of rain, strike, lock-outs *or any* other cause, the Contractor shall take all precautions necessary for the protection of work and at his own expenses shall make good any damage arising from any of these causes.

The Contractor shall cover up and protect from damage from any cause, all new work and supply all temporary doors, protection to windows, and all other requisite protection for the execution of the work whether by himself or special tradesmen or sub-Contractor and any damage caused must be made good by the Contractor at his own expenses.

31. REMOVAL OF IMPROPER WORK

The Employer / Consultant shall during the progress of the work have power to order in *writing* from *time* to time the removal from the work *within* such reasonable *time* or times as may be specified in the order of any materials which in the opinion of the Employer / Consultant are not in accordance with specifications or instructions, the substitutions or proper re-execution of any work executed with materials or workmanships not in accordance with the drawings and specifications or instructions. In case the Contractor refuses to complete with the order, the Employer / Consultant *shall* have the power to employ and pay other agencies to carry out the work and all expenses consequent thereon or incidental thereto as certified by the Employer/Consultant shall be borne by the Contractor or may be deducted from any money due to or that may become due to the Contractor. No certificate which may be given by the Consultant shall relieve the Contractor from his liability in respect of unsound work or bad materials.

32. S1TE ENGINEER/PROJECT MANAGEMENT CONSULTANTS (PMC)

The term "Site Engineer / Project Management Consultants (PMC)" shall mean the person/firm appointed and paid by the Employer to superintendent the work. The Contractor shall afford the Site Engineer / PMC every facility and assistance for examining the work and for checking and measuring work and Materials. The Site Engineer/PMC shall have no power to revoke, alter, enlarge or relax *any* requirements of the contract or to sanction *any* day work, additions, alterations, deviations or omission or any extra work whatever, except in so far as such authority may be specially conferred by a written order of the Employer.

The Site Engineer/PMC shall have power to give notice to the contractor or to his foreman, of non approval of any work or materials and such work shall be suspended or the use of such materials shall be discontinued until the decision of the Employer / Consultant Is obtained. The work will from time to time be examined by the Consultant, Engineer of the Employer and the Site Engineer/PMC. But such examination shall not in way exonerate the contractor from the obligations to remedy any defects which may be found to exist at any stage or the work or after the same is complete. Subject to the limitation of this clause the Contractor shall take instruction only from the Employer / Consultant.

33. OFFICE ACCOMMODATION FOR THE SITE ENGINEER / PMC

The Contractor shall provide, erect and maintain at his cost a separate simple watertight office accommodation for the Site Engineer/PMC in case it is not already available at site. This accommodation shall be well lighted and ventilated and provided with windows, door with a lock. The Site Engineer's /PMC's office shall be a minimum of 14 Sqm. (150 Sqft.) and the Contractor shall provide a desk, chairs, drawers for keeping drawings, a cupboard *having* proper lock, telephone connection and a tack board for displaying drawings, lights and fans. Charges for the telephone bill, electricity bill, etc. shall be borne by the contractor. The accommodation shall be demolished when directed.

34. CONTRACTOR'S EMPLOYEES

The Contractor shall employ technically qualified and competent supervisors for the work who shall be available (by turn) throughout *the* working hours lo receive and comply with instruction of the Employer/Consultant. The Contractor shall engage at least one experienced Engineer as Site- in – Charge for execution of the work. The Contractor shall employ in connection with the work persons having the appropriate skill or ability to perform their job efficiently.

The Contractor shall employ local laborers on the work as far as possible.

No labourer *below* the age of sixteen years and who is not an Indian National shall be employed on the work.

Any labourer supplied by the Contractor to be engaged on the work on day-work basis either wholly or partly under the direct order or control of the Employer or his representative shall be *deemed* to be a person employed by *the* Contractor.

The Contractor shall comply with the provisions of all labour legislation including the requirements of :-

a) The Payment of Wages Act
b) Employer's Liability Act
c) Workmen's compensation Act
d) Contract Labour (Regulation and Abolition) Act, 1970 and Central Rules 1971
e) *Apprentices* Act 1961
f) Any other Act or enactment relating thereto and rules framed there under from time to time.

The Contractor shall keep the Employer saved harmless against claims of any of the workmen and all costs and expenses as may be incurred by the Employer in connection with any claim that may be made by any workmen.

The contractor shall comply at his cost with the order or requirement of any Health Officer of the State or any local authority or of the Employer regarding the maintenance of proper environmental sanitation of the area where the contractor's labourers are housed or accommodated for the prevention of small pox, cholera, plague, typhoid, malaria and other contagious diseases. The Contractor shall provide, maintain and keep in good sanitary condition adequate sanitary accommodation and provide facilities for pure drinking water at all times for the use of men & women engaged on the work and shall remove and clear *away* the same on completion of the work. Adequate precautions shall be taken by the contractor to prevent nuisance of any kind *of work* or the lands adjoining the same.

The Contractor shall arrange to provide, first aid treatment to the labourers engaged on the work. He shall within 24 hours of the occurrence of any accident at or about the site or in connection with execution of the work, report such accident to the Consultant / Employer and also to the competent authority where such report is required by law.

35. DISMISSAL OF WORKMEN

The Contractor shall on the request of the Employer / Consultant immediately dismiss from work any person employed thereon by him, who may in the opinion of the Employer / Consultant be unsuitable or incompetent or who may misconduct himself. Such discharge shall not be the basis of any claim for compensation or damages against the Employer / Consultant or any of their officer or employee.

36. ASSIGNMENT

The whole of the work Included In the contract shall be executed by the Contractor and the Contractor shall *not* directly *or* indirectly transfer, assign or underlet the contract or any part, share or interest therein nor, shall take a

new partner, without written consent of the Employer and no subletting shall relieve the Contractor from the full and entire responsibility of *the* contract or from *active* superintendence of the work during their progress.

37. NOMINATED SUB-CONTRACTOR

All specialists, Merchants, Tradesmen and others executing any work or supplying and fixing any goods for which prime cost prices or provisional sums are included in the Schedule of Quantities/Rates and/or specifications and who may be nominated or selected by the Employer are hereby declared to be sub-contractors employed by the contractor and are herein referred to as nominated sub-contractors.

No nominated sub-contractor shall be employed on or in connection with the work against whom the contractor shall make reasonable objection or save where the Employer and contractor shall otherwise agree who will not enter into a contract provided:

a) That the nominated sub-contractor shall indemnify the contractor against the same obligations in respect of the sub contract as the contractor is under in respect of this contract.

b) That the nominated Sub-contractor shall indemnify the contractor against claims in respect of any negligence by the sub-contractor, his servants or agents or any misuse by him or them of any scaffolding or other plants the property of the contractor or under any Workman's compensation Act in force.

c) Payment shall be made to the nominated sub-contractor by the contractor within fourteen days of his receipt of the Consultant's certificate provided that before any certificate is issued the contractor shall upon request furnish to the Consultant proof that all nominated sub-contractor's accounts included in previous certification have been duly discharged, in default whereof the Employer may pay the same upon a certificate of the Consultant and deduct the amount thereof from any sums due to the contractor. The exercise of this power shall not create privity of contract between the Employer and the sub-contractor.

38. DAMAGE TO PERSONS AND PROPERTY, INSURANCE, ETC

The Contractor shall be responsible for all injury to the work or workmen to persons, animals or things and for all damages to the structural and/or decorative part of property which may arise from the operations or neglect of himself or of any sub-Contractor or of any of his or a sub-Contractors

employees, whether such injury *or* damage *arise* from carelessness, accident or *any* other cause whatsoever in any way connected with the carrying out of this contract. The clause shall be held to include inter-alia, any damage to buildings whether immediately adjacent or otherwise and any damage to roads, streets, foot-paths or pathways as well as damage caused to the buildings and the work forming the subject of this contract by rain, wind or other inclemency of the weather. The Contractor shall indemnify and hold harmless the Employer in respect of all and any expenses arising from any such injury or damages to persons or property as aforesaid and also in respect of any claim made in respect of injury or damage under any acts of compensation or damage consequent upon such claim.

The Contractor shall reinstate all damage of every sort mentioned in this clause, so as to deliver the whole of the contract work complete and perfect in every respect and so as to make good or otherwise satisfy all claims for damages to the property or third parties.

The contractor shall effect the insurance necessary and indemnify the employer entirely from all responsibility in this respect. The insurance must be placed with a company approved by the Employer and must be effected jointly in the name of the contractor and the Employer and the policy lodged with the latter. The scope of insurance is to include damage or loss to the contract itself till this is made over in a complete state. The Contractor shall also be responsible for anything which may be excluded from damage to any property arising out of incidents, negligence or defective carrying out of the contract. The Employer shall be at liberty and is hereby empowered to deduct the amount of *any* damages, compensations, costs, charges and expenses arising or accruing from or in respect of any such claim or damages from any sums due or to become due to the contractor.

39. INSURANCES

Unless otherwise instructed the Contractor shall insure the work and keep them Insured until handing over of the work against loss or damage by fire and / or earthquake, flood or damages from whatever cause by an "All Risk Insurance Policy" for the full value of the contract. The contractor shall also take insurance for third party liability. The limit of coverage for third party liability shall be 1% of the accepted contract sum at any time of the contract period. The insurance is to be at his own cost and must be placed with a company approved by the Employer, in the joint names of the Employer and the Contractor of such amount and for any further sum if called upon to do so by the Employer, the premium of such further sum being allowed to the Contractor as an authorized *extra.*
Moreover, the contractor will be required to obtain "Workmans Compensation Insurance" from an approved insurance company at his own cost.

Insurance is compulsory and the Contractor shall *effect* Insurance before undertaking construction work and deposit the policy and receipt for premiums paid with the Employer within 21 (twenty one) days from the date of issue of work order unless otherwise instructed. In default of the Contractor insuring as provided above, the Employer on his behalf may so insure and may deduct the premiums paid from any money due, or which may become due to the contractor. The Contractor shall as soon as the claim under the policy is settled or the work reinstated by the Insurance Company should they elect to do so, proceed with due diligence with the completion of work in the same manner as though the fire / earthquake / flood has not occurred and in all respects under the conditions of the contract. The Contractor in case of rebuilding or reinstatement after fire/earthquake/flood shall be entitled to extension of time for completion as the Employer may deem fit.

40. ACCOUNTS RECEIPTS AND VOUCHERS

The Contractor shall, upon the request of the Employer / Consultant furnish them with all the invoices, accounts, receipts and other vouchers that they may require In connection with the work under this contract.

If the Contractor shall use materials less than what he is required under the contract, the value of the difference in the quantity of the materials he was required to use and that he actually used shall be deducted from his dues. The decision of the Employer shall be final and *binding* on the Contractor as to the amount of materials the Contractor is required to use for any work under this contract.

41. MEASUREMENT OF WORK

The contractor will record the measurements in the approved printed measurement books available in the Consultant's office on payment, and submit measurements verification and endorsement of Project Management Consultant/Site Engineer and site representative of the Consultant, if any. The contractor should submit the bill to the Consultant with such endorsement.

The Consultant shall upon receipt of the bill intimate to the contractor that he requires the work to be measured, and the contractor shall forthwith attend or send a Qualified Agent to assist the Consultant or the Consultant's representation / Employer's Representatives In taking such measurements and calculations and to furnish all particulars or to give all assistance required by either of them.

Should the contractor not attend or neglect or omit to send such Agent then the measurement taken by the Consultant or a representative approved by him shall be taken to be the correct measurement of the work.

The contractor or his Agents may at the time of measurement take such notes and measurements as he may require. All authorized extra work, omissions and all variations made without the Consultant's knowledge, if subsequently sanctioned by him in writing, with the approval of the Employer shall be included in such measurements. The final measurement should be done within three months from the date of completion of work jointly by the Consultant and/or his representative. If the contractor fails to comply, the measurements taken by the Consultant will be final.

42. METHOD OF MEASURENENT

Unless otherwise mentioned elsewhere in the tender document, measurements will be on the net quantities of work produced in accordance with up to date rules laid down by the Indian Standard Institution. In the event of any dispute with regard to the measurement of the work executed, the decision of the Consultant / Employer shall be final and binding on the contractor.

43. ACTION WHERE NO SPECIFICATION

In the case of any class of work for which there is no such specification in Technical Specification, such work shall be carried out in accordance with the I.S specification, and in the event of there being no I.S. specification, then in such case the work shall be carried out in all respects in accordance with the instructions and requirements of the Consultant / Employer.

44. CONTRACTOR NOT TO DEPOSIT MATERIALS IN A MANNER THAT MAY CAUSE INCONVENIENCE TO THE PUBLIC

The contractors shall not deposit materials on any site which will cause inconvenience to the public. The Employer / Consultant may require the contractor to remove any materials, which are considered by him to be a danger or inconvenience to the public or cause them to be removed at the contractor's cost.

45. PAYMENTS

a) All bills shall be prepared by the Contractor in the form prescribed by the Employer / Consultant as per **format marked Annexure – VIII.** Normally one interim bill shall be prepared each month subject to minimum value for interim certificate as stated in **APPENDIX.** The bills in proper forms must be duly accompanied by detailed measurements recorded in the approved measurement book available from the consultants office, on payment, duly endorsed by the *Site* Engineer/PMC/Consultant representative as defined in Clause 42 above in support of quantities of *work done and must*

show deductions for all previous payments, retention money, etc. Advance / adhoc payment for work actually executed will not be normally made. However adhoc payment may be made at *the* discretion of Consultant/Employer in case of exigency.

The Consultant / Employer shall issue a certificate after due scrutiny of the Contractor's bill stating the amount due to the Contractor from the Employer and the Contractor shall be entitled to payment thereof, by the Employer within the period of honoring certificates mentioned in the **APPENDIX**.

The amount stated in an interim certificate shall be the total value of work properly executed and secured advances not exceeding 75% of invoiced assessed value of material brought to site for permanent incorporation into the work up to the date of the bill provided that secured advance is payable against them as per *tender* condition less the amount to be retained by the Employer as retention money vide **Clause 17** of these conditions and less installments previously paid under these conditions. The materials against which secured advance will be considered are cement, steel & stone chips/gravels; manufactured items of steel / cement, bricks, door frames & shutters, window frames & shutters, flooring materials, paints, G.I. & C.I. pipes & fittings, sanitary fixtures & fittings etc.

The materials to be considered for secured advance shall only Include the value of the said material and goods as and from such time as they are reasonably, properly and not prematurely brought to or placed adjacent to the work and then only if *adequately* protected against weather or *other* casualties, provided also materials are considered acceptable by the Site Engineer/PMC/Consultant. An indemnity bond on stamp paper is to be submitted by the contractor in the **annexed format** (as per Annexure-XIV herein below) whenever Secured Advance against materials are prayed for.

If the Employer has supplied any materials or goods to the Contractor, the cost of any such materials or goods will be progressively deducted from the amount due to the Contractor in accordance with the quantities consumed in the work.

All the interim payments shall be regarded as payments by way of advance against the final payment only and not as payments for work actually done and completed, and shall not preclude the requiring of bad, unsound, and imperfect or unskilled work to be removed and taken away and reconstructed, or re-erected or be considered as an admission of the due performance of the contract, or any part thereof in any respect or the accruing of any claim, nor shall, it conclude determine or affect in anyway the powers of the Employer under these conditions or any of them as to the final settlement and adjustment of the accounts or otherwise or in any other way vary or affect the contract. The final bill shall be submitted by the

Contractor to the Consultant within three months of the date fixed for completion of the work or of the date of certificate of completion furnished by the Consultant and payment shall be made by the Employer within three months from the date of receipt of the final bill duly verified & certified by the Consultant.

The Employer / Consultant reserves the right to withhold in part or full payment of bills in case of non-compliance/violation of *any* terms and conditions stipulated in *the* agreement. The contractor shall neither suspend the work nor claim for extension of time for non-payment / withholding of payment on this account and no interest is also payable on the payment withheld/due.

b) FINAL PAYMENT

The final bill shall be accompanied by a certificate of completion from the Consultants. Payments of final bill shall be made after deduction of Retention Money as specified in Clause 17 of these *conditions,* which sum shall be refunded in *the* manner stated in Clause 17. The acceptance of payment of the final bill by the Contractor would indicate that *he* will have no further claim in respect of the work executed.

46. VARIATION / DEVIATION

The Contractor may when authorized and shall, when directed in writing by the Consultant / Employer add and / or omit, or vary the work shown in the drawings or described in the *specifications* or included in the priced schedule of quantities. The Contractor on his own accord shall make no addition, omission or variation without such authorization or direction. A verbal authorization or direction by the Consultant / *Employer shall* when confirmed by the Contractor in writing within 3 days shall be deemed to have been given in writing.

The price of all such additional/non-tendered items will be worked out on the basis of rates quoted for similar items in the contract wherever existing or on engineering rate analysis based on prevalent fair price of labour, materials at site of work including wastage and other components as required plus 15% towards contractor's profit, supervision, overhead etc. Works Contract Sales Tax, if applicable will be considered over and above 15%. The tendered rates *shall* hold good for any increase or decrease in tender quantities.

No claim for an extra shall be allowed unless it shall have been executed by the authorization of Employer / Consultant. No variation i. e. additions, omissions or substitutions shall vitiate the contract.

47. SUBSTITUTION

Should the Contractor desire to substitute any materials and workmanship, he/they must obtain the approval of the Employer / Consultant In writing for any such substitution well *in* advance. For materials designated in this specification indefinitely by such term as "Equal" or "Other approved" etc. specific approval of the Employer / Consultant has to be obtained in writing prior to execution.

48. PREPARATION OF BUILDING WORKS FOR OCCUPATION AND USE ON COMPLETION

The whole of the work will be thoroughly inspected by the Contractor and deficiencies and defects put right. On completion of such inspection, he shall inform the Consultant that he has completed the work and it is ready for inspection.

On completion, the Contractor shall clean all windows & doors including cleaning and oiling, if necessary, of all hardware, inside & outside, all floors, staircases and every part of the building. He will leave the entire building neat and clean and ready for immediate occupation and to the satisfaction of the Employer / Consultant.

Contractor shall obtain necessary completion *I* occupation certificate from municipal authorities. Employer as well as Consultants may assist if required.

49. CLEARING SITE ON COMPLETION

On completion of the work the contractor shall clear away and remove from the site all constructional plant, surplus materials, rubbish and temporary work of every kind and leave the whole of the site and the work clean and in a workman like condition to the satisfaction of the Employer /consultant.

5O. DEFECTS AFTER COMPLETION

The Contractor shall make good at his own cost and to the satisfaction of the Employer / Consultant all defects, shrinkage, settlements or other faults which may appear within 12 months after completion of the work and considered as the "Defect Liability Period". In default the Employer may employ, and pay other persons to amend and make good such damages, losses and expenses consequent thereon or incidental thereto shall be made good and borne by the contractor and such damages, loss and expenses shall be recoverable from him by the Employer or may be deducted by the Employer,

in lieu of such amending and making good by the Contractor, deduct from any money due to the Contractor a sum equivalent to the cost of amending such work and in the event of the amount retained being insufficient recover that balance from the Contractor from the amount retained under clause No 17 together with any expenses the Employer may have incurred in connection therewith.

51. CONCEALED WORK

The Contractor shall give due notice to the Employer / Consultant whenever any work is to be buried in the earth, concrete or in the bodies of walls or otherwise becoming inaccessible later on in order that the work may be inspected and correct dimensions taken before such burial, in default whereof the same shall, at the option of the Employer / Consultant be either opened up for measurement at the Contractor's expense or no payment be made for such materials. Should any dispute or difference arise after the execution of any work as to measurements etc or other matters which cannot be conveniently tested or checked, the notes of the Employer / Consultant be accepted as correct and binding on the Contractor.

52. PRICE VARIATION

The rates quoted shall be firm for first six months the tenure of the contract (including extension of time, if any, granted) and will *not* be subject to any fluctuation due to increase in cost of materials, , sales tax, octroi, etc.

Thereafter, price variation adjustment clause as per specimen Price variation adjustment clause as given in Section VI clause 2 of these tender documents, will be applicable.

53. IDLE LABOUR

Whatever the reasons may be, no claim for idle labour, additional establishment cost of hire and labour charges of tools and plants would be entertained under any circumstances.

54. SUSPENSION

If the contractor except on account of any legal restraint upon the Employer preventing the continuance of the work or in the opinion of the Employer shall neglect or fail to proceed with due diligence in the performance of his part of *the* contract or if he shall more than once make default the Employer shall have the power to give notice in writing to the Contractor requiring the work be proceeded within a reasonable manner and with reasonable despatch, such notices purport to be a notice under this Clause.

After such notice shall have been given, the Contractor shall not be at liberty to remove from the site of the work or from any ground contiguous thereto, any plant or materials to subsist from the date of such notice being given until the notice shall have been complied with. If the Contractor shall fail for 7 (seven) days after such notice has been given to proceed with the work as therein prescribed, the Employer may proceed as provided in this Clause 55 (Termination of Contract by the Employer).

55. TERMINATION OF CONTRACT BY EMPLOYER

The Employer shall have the right to terminate the contract at any time at its own convenience by serving a prior written notice of 30 days to the contractor without assigning any reason and without cost or compensation therefore.
However, the Employer may also terminate the contract in any of the following cases upon prior notice of 30 days to the contractor:

(a) If the Contractor being a company go into liquidation whether voluntary or compulsory or being a firm shall be dissolved or being an individual shall be adjudicated insolvent or
(b) shall make an assignment or a composition for the benefit of the greater part, in number of amount of his creditors or
(c) shall enter into a Deed or arrangement with his creditors, or
(d) if the Official Assignee in insolvency, or the *Receiver* of the Contractor *in* insolvency, shall repudiate the contract, or
(e) if a *Receiver* of the Contractor's firm appointed by the Court shall be unable, within fourteen days after notice to him requiring him to do so to show to the reasonable satisfaction of the Employer that he is able to carry out and fulfill the contract and if so required by the Employer to give reasonable security therefore, or
(f) if the Contractor shall suffer execution to be issued, or shall suffer any payment under this contract to be attached by or on behalf of the creditors of Contractors, or
(g) shall assign, charge or encumber this contract or any payments due or which may become due to the Contractor, there under, or
(h) shall neglect or fail to observe and perform all or any of the acts matters of things by this contract, to be observed and performed by the Contractor within three clear days after the notice shall have been given to the Contractor in manner hereinafter mentioned requiring the Contractor to observe or perform the same or
(i) shall use improper materials or workmanship In carrying on the work, or

(j) shall in the opinion of the Employer not exercise such due diligence and make such due progress as would enable the work to be completed within due time agreed upon, and shall fail to proceed to the satisfaction of the Employer after three clear days notice requiring the Contractor so to do shall have been given to the Contractor as hereinafter mentioned, or

(k) Shall abandon the contract, then and in any of the said cases.

56. EFFECTS OF TERMINATION:

Further, on termination of the agreement as aforesaid, the Employer or his agent, or servants, may enter upon and take possession of the work and also materials lying upon premises or the adjoining lands or roads if any advance payment has been made by the Bank against those materials-and completing the work by employing any other contractors or other persons or person to complete the work, and the Contractor shall not in any way interrupt or do any act, matter or thing to prevent or hinder such other contractors Employer may give notice in writing to the Contractor to remove his surplus materials, plants, machinery, tools, scaffolding etc and should the Contractor fail to do so *within* a period *of* 14 *days* after receipt by him the Employer *may* sell the same by Public Auction and shall give credit to the Contractor for the amount so realized after adjusting dues from the contractor if any.

Any expenses or losses incurred by the Employer in getting the work carried out by other contractors shall be adjusted against the amount payable to the Contractor by way of selling his tools and plants or due on account of work carried out by the Contractor prior to engaging other contract or against the Security Deposit.

The Employer at its sole discretion shall invoke the Performance Guarantee, Security Deposit and the Indemnity furnished for performance of contract in the event of breach of terms and conditions of the contract by the Contractor, without prejudice to its rights and conditions available under the Law for the time being in force.

57. ARBITRATION

The Contractor and the Employer shall endeavor their best to amicably settle all disputes arising out of or in connection with the Contract in the following manner:

a. The Party raising a dispute shall address to the other Party a notice requesting an amicable settlement of the dispute within seven (7) days of

receipt of the notice.

b. The matter will be referred for negotiation between Employer and the Contractor. The matter shall then be resolved between them and the agreed course of action documented within a further period of 15 days.

c. In case any dispute between the Parties, does not settle by negotiation in the manner as mentioned above, all disputes or differences of any kind whatsoever which shall at any time arise between the parties hereto touching or concerning the work or the execution or maintenance thereof of this contract shall be referred to and the same may be resolved exclusively by arbitration by a Sole Arbitrator to be selected by the employer and approved by the contractor and such dispute may be submitted by either party for arbitration within 20 days of the failure of negotiations. Arbitration shall be held at **THE ZONAL OFFICE OF THE UCO BANK AT BHAGALPUR** and conducted in accordance with the provisions of Arbitration and Conciliation Act, 1996 or any statutory modification or re-enactment thereof.

d. The "Arbitration Notice" should accurately set out the disputes between the parties, the intention of the aggrieved party to refer such disputes to arbitration as provided herein and the Arbitrator is to be appointed within 45 days from receipt of the notice. All notices by one party to the other in connection with the arbitration shall be in writing.

e. The arbitrator shall hold the sittings at the **ZONAL OFFICE OF THE UCO BANK AT BHAGALPUR.** The arbitration proceedings shall be conducted in English language. The arbitration award shall be final, conclusive and binding upon the Parties and judgment may be entered thereon, upon the application of either party to a court of competent jurisdiction. Each Party shall bear the cost of preparing and presenting its case, and the cost of arbitration, including fees and expenses of the arbitrators, shall be shared equally by the Parties unless the award otherwise provides.

f. The contractor shall not be entitled to suspend the work or the completion of the work, pending resolution of any dispute between the Parties and shall continue with the work in accordance with the provisions of the Contract/Agreement notwithstanding the existence of any dispute between the Parties or the subsistence of any arbitration or other proceedings.

g. It is also a term of the contract that if Contractor(s) do/does not make any demand for arbitration in respect of any claim (s) within 90 days of receiving intimation from Employer/Consultant that the bill after due verification is passed for payment of a lesser amount, or he has accepted the payment as per clause 45 whichever is earlier or otherwise, the Contractor's right under this agreement to refer to arbitration shall be deemed to have been forfeited and Employer/Consultant shall be relieved and discharged of their liability under this agreement in respect of such

claims. Further, it is agreed that for the purpose of this clause, such notice is deemed to have been received by the Contractor(s) within 2 days of posting of the letter by Employer / Consultant or when delivered by hand immediately after receipt thereof by the Contractor/(s), whichever is earlier. Further, a letter signed by the officials of Employer / Consultant that the letter so posted to the *Contractor(s)* shall be conclusive.

h. For the purpose of appointing the sole Arbitrator referred to above the **ZONAL HEAD UCO BANK ZONAL OFFICE BHAGALPUR AS** Appointing Authority will send within thirty days of receipt by him of the written notice as aforesaid to the Contractor, a panel of three names of persons who shall be presently unconnected with *the* organization for which *the* work is executed from the following categories of Arbitrators.

i) Retired High Court *I* Supreme Court Judges, who have experience in handling Arbitration cases.

ii) Members of the Council of Arbitration.

iii) Fellow of the Institution of Indian Institute of Architects.

iv) Eminent retired Chief Engineers from State/Central PWD/Public Sector Undertakings of good reputations and integrity.

(i) The contractor shall on receipt by him names as aforesaid select any one of the persons named to be appointed as a sole Arbitrator and communicate his name to the Appointing Authority within thirty days *of* receipt by him of the names. *The* Appointing Authority shall thereupon without any delay appoint the said person as the sole Arbitrator. If the Contractor fails to communicate such selection as provided above within the period specified, *the Appointing Authority* shall make the selection and appoint the selected person as the Sole Arbitrator.

(j) If the Appointing Authority fails to send to the Contractor, the panel of three names as aforesaid within the period specified, the Contractor shall send to the Appointing Authority a *Panel* of three names of persons out of the above mentioned four categories of Arbitrators who shall all be unconnected with either party. The appointing Authority shall on receipt by him of the names as aforesaid select anyone of the person named and appoint him as the sole Arbitrator. *If* the Appointing Authority fails to select the person and appoint him as the sole Arbitrator within 30 days of receipt by him of the panel and inform the Contractor accordingly, the Contractor shall be entitled to appoint one of the persons from the panel as the sole Arbitrator and communicate his name to the Appointing Authority.

(k) If the Arbitrator so appointed is unable or unwilling to act or resign his

appointment or vacates his office due to any reason whatsoever another sole Arbitrator shall be appointed as aforesaid.

(l) The work under the Contract shall, however, continue during the arbitrations proceedings and no payment due or payable to the Contractor shall be withheld on account of such proceedings.

(m) The Arbitrator shall be deemed to have entered on the reference on the date he issues notice to both the parties fixing the date of the first hearing.

(n) The Arbitrator may from time to time, with the consent of the parties, extend the time for making and publishing the award.

(o) The Arbitrator shall give a separate award in respect of each dispute or difference referred to him. The Arbitrator shall decide each dispute in accordance with the terms of the contract. The venue of arbitration shall be such place as may be fixed by the Arbitrator in his sole discretion.

(p) In all cases, where the amount of claim in dispute is Rs. *50,000/-* (Rupees Fifty thousand) and above, the Arbitrator shall give reasons for the award.

(q) The fees, if any, of the Arbitrator shall, if required to be paid before the award is made and published, be paid half and half by each of the parties. The cost of the reference and of the award including the fees if any, of the Arbitrator who may direct to and by whom and In what manner, such costs or any part thereof shall be paid and may fix or settle the amount of costs to be so paid.

(r) The award of the Arbitrator shall be final and binding on both the parties AND THE PARTIES AGREE TO BE BOUND THEREBY AND TO ACT ACCORDINGLY.

(s) Subject to aforesaid the provisions of the Arbitration and Conciliation Act, 1996 or any statutory modification or re-enactment thereof and the rules made there under, and for the time being in force, shall apply to the Arbitration proceeding under this clause.

58. JURISDICTION

All the dispute(s) / difference(s) arising out of the said agreement shall be subject to the jurisdiction of Courts of Law at BHAGALPUR only and shall be governed by the Laws in force in India.

59. Excepted Matters:

If the disputes or differences pertain to the under noted matters (called excepted matters), the decision in writing of the officer of UCO Bank designated in and signing the contract documents shall be final, conclusive and binding on the parties. No arbitration shall arise in such matters except either by mutual agreement or under the directions of a competent Court:

i) Instruction
i) Transactions with local authorities
iii) Proof of quality of materials
iv) Assigning or under letting of the contract
v) Certificate as to the causes of delay on the part of the contractor and justifying extension of time.
vi) Rectification of defects pointed out during the defects liability period.
vii) Notice to the contractor to the effect that he is not proceeding with due diligence.
viii) Certificate that the contractor has abandoned the contract.
ix) Notice of determination of the contract by the Employer.

60. SECURITY ARRANGEMENTS

Proper arrangements shall be made to keep all records under lock and key. It shall be ensured that the contractor provides for adequate fences, Watch and Ward and security of basic materials such as cement and steel etc.

Movement of material, stores and plant, especially of those which the Bank has got financial interest or those which influence progress of work, shall be strictly controlled. Checks shall be exercised at gate (entrance and exit shall be preferably through one gate only).

When the work is completed and handed over to the user, the responsibility of proper security arrangements shall rest with the users.

61. WORKING HOURS

Site office working hours shall normally be fixed as may be prevailing in the locality.

Normally no construction work of important structural nature shall be carried out on Sundays, Holidays and during nights. In exceptional circumstances, however, the work may be carried out with prior approval of the Site Engineer who shall depute supervising staff to be present on the occasion.

62. BOND

The Contractor should execute an Indemnity Bond in the proforma provided (as per Annexure-XIV herein below) to keep the Bank harmless and indemnified against any extra costs, damages and/or bear extra burden and also for their acts of omission and commission or misdeeds.

APPENDIX

1	Name of Work	General Building, Sanitary & Plumbing and Area Development work for construction of RSETI Building for UCO Bank at Bhagalpur
2	Location	NATHNAGAR, BLOCK-NATHNAGAR, BHAGALPUR.
3	Scope of work	As in Clause 2 of Section: V and as further detailed in Tender Notice, Instruction to Tenderer.
4	Defect Liability Period (Cl. 50)	12 (Twelve) Months.
5	Date of Commencement (Cl. 20)	14th day from the date of issue of work order or the date on which the contractor is instructed to take possession of site, whichever is later.
6	Date / Time of Completion (Cl. 20)	09(NINE) Calendar Months.
7	Liquidated Damages (Cl. 21)	As per Clause 21, Page ---, under the Head "General Conditions of Contract" (Section – V)
8a	Earnest Money (Cl. 17)	Rs. 1.32 LACS (Rupees One lacs Thirty Two Thousand Only).
8b	Initial Security Deposit (Cl. 17)	2% of the accepted contract sum including EMD.
8c	Retention Percentage (Cl.	As mentioned in Clause No. 17.

	17)	
9	Installment after completion certificate (Cl. 17)	50% of the total retention amount.
10	Period of Honoring Certificate (Cl. 45)	3 weeks from the date of receipt of Certificate from the Consultant.
11	Minimum value of work for interim certificate (Cl. 44)	Rs. 30 Lacs(Rupees Thirty Lacs).

NOTE : Clauses (CL) refer to General Conditions of Contract.

SECTION -VI

SPECIAL CONDITIONS WITH PROFORMA OF TEST RESULTS

1: TECHNICAL EXAMINATIONS

The proposed work covered under this tender during its progress subject to inspection by the Chief Technical Examiner / Technical Examiner, Central Vigilance Commission, Govt. of India or by an Officer of the Vigilance Cell of the Employer. The Contractor will be required to extend all assistance and facilities for such inspections

2: GENERAL PRICE VARIATION ADJUSTMENT (PVA) CLAUSES FOR ALL MATERJALS (Including Cement & Steel) AND LABOUR

In partial modification of the provisions made elsewhere in this contract regarding rate quoted in the tender being not subject to any variations, price adjustment to the value of work payable to the contractor at tendered rates shall be made towards variation in the prices of materials and labour supplied by the *contractor* in the *manner* specified herein under.

If, after the written order to commence the work and during the operative period of this contract including any authorized extensions of the original stipulated completion period –

a) there be any variation in the consumer price index -general index - for industrial workers (Base 1982 = 100) (source- data published from time to time in Indian Labour Journal by the Labour Bureau, Government of India), or

b) there be any variation in the All India Wholesale Price index for all commodities (Base 1981-82 = 100) (as published from time to time in the RBI bulletin based on the data issued by the Office of the Economic Adviser to the Government of India).

Price Variation Adjustment (PVA) towards (1) labour component and (2) material component shall be calculated in accordance with the formulae A and B below, subject to stipulations hereinafter mentioned.

Formula (A) for labour

$$VL = 0.87\ P \times K1 \left(\frac{CI - CO}{100} \times \frac{\quad}{CO}\right) \ldots.$$

Formula (B) for materials

$$VM = I\ 0.87 \times P \times K2 \left(\frac{I}{100} - (Y)\right)\left[\times \frac{(11 - IO)}{IO}\right.$$

Where -

VL = Amount of Price Variation Adjustment - increase or decrease in rupees due to Labour Component.

VM = Amount of Price Variation Adjustment - increase or decrease in rupees on account of materials component.

P = Cost of work done during the period under consideration (bill period) excluding Advances on materials and/or adjustments *thereof ;*

Y = Cost of any materials supplied/arranged by the employer at fixed price during the period under consideration (bill period)

K1=percentage of labour component calculate is indicated note (1) below

K2= percentage of materials component as indicated in Note (2) below

CO = Consumer Price Index - General Index Number for industrial workers (Base 1982=100) at (a) above, ruling on the last date for receipt of tenders and as applicable to the centre, nearest to the place of work for which the index is published

CI = Average of above mentioned Consumer Price Index Number during *the period under consideration* (bill period).

IO = All India Wholesale Price Index Number to all commodities referred to at (b) above, ruling on the last date for receipt of tenders and as applicable to the centre, nearest to the place of work for which the index is published.

I1 - Average of above mentioned monthly all India Wholesale Price Index Number during the period under consideration (bill period)

Bill period mentioned above signifies the period of actual execution and not date of measurement or preparation of bill.

Note ~ (1) : K1 shall be taken as under :-

COMPONENT OF WORK	**K1**
a) Civil work including ancillary work and external work and R C. C. / tanks, septic tank and other external work, if any, of sanitary and plumbing work.	30
b) Sanitary and plumbing work including fittings and fixtures (internal work only)	20
c)Electrical installations work Including fittings and fixtures (external and internal work)	20

Note : (2) K2 shall he taken as under :	**K2**	
a)Civil work Including ancillary work as under Note (1) (a) above	70	detailed
b) Sanitary and plumbing work including fixtures as detailed under Note (I) *(b)* above	80	fittings and
c) Electrical installations work including fittings and fixtures as detailed under Note (1) (c) above on	80	

STIPULATION :

i) P.V.A clause is operative either way i. e. if the variation in above referred
Price Indices are not the plus side, PVA shall be payable to the contractor and if they are on the negative side PVA shall be recoverable from the contractor, for the respective bill period of occurrence of fluctuations.

ii) The rates quoted by the contractor shall be treated as firm for the value of work required to be done in the first 6 months of the contract. The value of work required to be done during the first 6 months of the contract period shall be taken as 80% of the value of work to be done on pro-rata basis in 6 months as compared to the total stipulated completion period. No PVA is admissible on the value of work required to be done in the first 6 months as work out above, even if this value of work is actually done in a period longer than 6 months. However, in case of any delay in the first 6 months due to the genuine reason which are not attributable to the contractor and which are beyond his control, such period of delay will be deducted from 6 months, and the value of work to be done will be 80% of the pro -rata value of work to be done in such reduced period on pro-rata basis.

iii) (a) For work where the original stipulated period of completion is not more than 6 months, no PVA whatsoever is permissible under this clause. However, if the period of completion is delayed beyond 6 months on account of genuine reasons which are not attributable to the contractor and which are beyond his control, PVA will be admissible on the value of work done only in excess of value of work required to be done on a pro-rata basis in the first 6 months minus the period of such genuine delay.

a)For purposes of admissibility of PVA all the cumulative period of extension granted for the reason which are solely attributable to the contractor is exclude from the total extended period of the contract and PVA shall not be admissible on the value of work done during such period of extensions, which are granted for keeping the contract current, but only due to reasons for which the contractor was solely responsible. Periods of extensions granted on account of genuine reason which are not attributable in the period for which PVA is admissible.

b)Notwithstanding anything to the country mentioned in any other clause / clauses of the contract, extensions of the contract period shall be granted by the Consultant only with prior approval of the Employer. Extensions granted by the Consultant without Employer's prior approval shall not bind the Employer for the payment of PVA for work done in the concerned period of extension.

iv) a) Where the total cost of work done beyond the value of work required to be done in the first 6 months (vide note (ii)and (iii)above) does not exceed Rs. 50 lakhs the total amount of PVA worked out on the basis of provisions of foregoing stipulations will be limited to an upper ceiling of 10% of such value of work done in excess of value of work required to be done in the
first 6 months, minus the cost of any materials arranged by the Employer at fixed prices i.e. (P - Y) (these term as per definitions given under Formulae A and B above).

(b) Where the total value of work done beyond the value of work required to be done in the first 6 months exceeds Rs. 50 lakhs the PVA on the first Rs.50 lakhs will be calculated as provided for In the foregoing para and for the balance value of work done for which PVA is admissible subject to foregoing conditions, the PVA will not have the upper ceiling of 10% but it will be worked out at a lower rate i.e. at 80% of the amount worked out as per the formulae A and B referred to earlier.

v: In working out the amount of PVA as per all the foregoing stipulations, value of such extra items or such portions of extra items, the rates of which are derived from the prevailing market rates of materials and labour will not be included In the value of work done. Value of only such extra items or such portions of extra items, rates of which are derived entirely from tendered rates will be Included in the value of work on which PVA is calculated.

vi: For Claiming the payment for PYA the contractor shall keep such books of accounts and other documents, vouchers receipts, etc. as may be required by the *Employer* / Consultant, for verification of the increased

claims or reductions, to be made as the case may be and he shall also allow inspection of books, documents by the Site Engineer and Employer's Engineer and/or other duly authorized representatives of the Employer/Consultant and furnish such information as may be required or called for to enable verification of the claim within a week of such request.

vii: The Contractor is required to submit to the Employer, through the Consultant his claims for PVA separately for each running bill for the individual bill period for the work paid to him by the Employer. He will also be required to submit detailed calculations in support of the claims.

Viii: No claim will be entertained from the Contractor for interest or any other grounds for non-payment or for any delay in payment of PVA due to late publication or non-availability of the necessary price Indices or due to delay in preparation of the running or final bills.

ix: In view of adjustments for variations in prices of materials and labour which
have been *covered* in this clause no other adjustments for any reasons whatsoever like statutory measures, taxes, levies, etc, will be allowed.

x: In all cases of disputes under this clause, the decision of the Officer of UCO Bank designation of the Employer who shall give a reasonable hearing to the Contractor in person (not through Agents / Advocates) shall be final and binding.

3. GUARANTEE

Whenever the tender provides for submission of a specific guarantee to keep any specialized work efficient and trouble free for a specific period and shall be submitted from the specialized agency along with a counter guarantee by the main Contractor engaged for the work. The specialized agency and the main contractor shall furnish the guarantee as mentioned above on non-judicial stamp papers off appropriate values. If the Contractor is required to submit guarantee/ guarantees for any item/items for a period of more man 12 months, the guarantee / guarantees in case of those items shall remain valid even after expiry of the defect liability period of 12 months as stipulated in the contract.

10% of the job value pertaining to waterproofing & anti-termite works will be kept in an FD a/c after the end of defects liability period for a period of 4 years & will be refunded thereafter to the contractor with accrued interest AT PREVAILING RATE provided he has satisfactorily carried out all the work and

attended to all defects in accordance with the conditions of the contract. No interest is allowed on retention money for defect liability period of one year.

4. POSSESSION PRIOR TO COMPLETION

The Employer shall have the right to take possession of or use any completed or partially completed part of the work. Such possession or use shall not be an acceptance of any work not competed in accordance with the contract agreement.

5. INCOME TAX/SALES TAX ON WORKS CONTRACT / OTHER TAXES

Statutory deductions on account of Income Tax/Sales Tax on works contract and other taxes legally payable by the contractor shall be made from all interim and final payments as per extant statute. However, GST will be payable by Bank as per applicable rate.

6. TREASURE TROVE ETC.

Any treasure trove, coil or object of antiquity which may be found on the site of construction shall be *the* property of the Employer and shall be handed over to him.

7. LAND FOR CONTRACTORS' ESTABLISMENT

For the purpose of construction of Contractors store yard, godowns, site office, etc. the Contractor may utilize with the permission of the Employer *I* Consultant, portion of the land belonging to the Employer if available at such location as would not interfere with the execution of the work. The Contractor shall for this purpose submit to the Employer *I* Consultant for his approval a plan or plans of the proposed layouts for the site facilities. The Employer /Consultant reserves the right to modify the contractors' proposal as he *may* deem fit

8. WATER

The rates quoted by the Contractor shall include all expenditure for providing all the water for the full contract period required for the work, including that for the work people and all staff on the site, He shall make his own arrangement for the supply of approved quality water suitable for use in the work and the work people. If municipal/urban water supply is available, the contractor shall make arrangements to obtain the same. All expenses including running charges shall be borne by the contractor. If municipal water is not available or inadequate, he shall make other arrangements like sinking tube wells or making bore wells or transport from outside by tanker or any other suitable means entirely at his cost and no separate payment for

the same will be made. He shall arrange for testing water at an approved laboratory at his own cost and shall provide all tubes, tanks, fittings and temporary plumbing work required tor the work and on completion of work shall remove all temporary appliances and make good any work disturbed for making such arrangements to the satisfaction of *the* Employer/Consultant for which no extra payment will be made.

9. Power

The contractor shall at his own cost arrange for necessary power required for construction and lighting for the entire period of contract. If, however, separable power available in the premises, the Contractor shall make his own arrangement to obtain necessary connections, maintain an efficient service of electric lights and power and shall pay for all the requisite charges for the same.

The Employer, as well as the Consultant shall give all the recommendations necessary to obtain power and water connections from the concerned authorities, but the responsibility for obtaining the same shall rest with the Contractor.

The contractor shall pay all fees and charges for obtaining power from the concerned authorities and include the same in his tendered rates and hold the Employer free from all such costs

If any other Contractor, appointed by the Employer, is required to use water and power, he shall be allowed to use the same and make temporary connections from the supply arranged by the main Contractor at rates and terms that may be mutually agreed upon by both, failing which, at rates, terms and conditions that may be decided by the Employer/consultant.

10. FIRST -AID FACILITIES

The Contractor shall at his own expense arrange to ensure availability of medical attendance promptly when necessary. He shall provide properly equipped first aid station, in -charge of qualified persons at suitable location within easy reach of the workmen and staff. The Contractor shall also provide for transport of serious cases to the nearest Hospital. The Contractor shall be responsible for availability which may be excluded from the insurance policies referred in Clause 38 of General Conditions of Contract and also for all other damages to any person, animal or property arising out or incidental to the negligence or defective carrying out of this contract. He shall also indemnify the Employer in respect of any cost, charges or expenses arising out or any claims or proceedings and also in respect of any award of compensations and damages arising there from.

The Employer shall with the concurrence of the Consultant be entitled to deduct the amount of any damage, compensation, cost charges and expenses arising from or occurring from, or in respect *of,* any such claims or damages from any or all sums due or become due to the Contractor without prejudice to the Employer's other rights in respect thereof.

11. FIRE FIGHTING ARRANGEMENTS

The contractor shall at his own expenses provide at suitable, prominent, and easily accessible places requisite number of fire extinguishers and buckets some filled with sand and some with water.

12. REPORTS AND RETURNS

Contractor shall maintain at site daily records of progress with regard to the work carried out, labour engaged and construction equipment deployed. These daily records shall be made available / accessible to the Employer's Site Engineer / Consultant as and when required by him.

Enlarged progress photographs are also submitted by the Contractors with each running account bill at no extra cost to the employer

13. SITE BOOK

For the purpose of quick communication, the Contractor shall maintain and preserve at site, a book with machine numbered pages In triplicate. Any instruction/advice given and recorded in the site order book by the Consultant/Employer shall be considered as a notice served on the Contractor.

14. Quality Control

For execution, control and monitoring of work and as well as for performing routine field tests the Contractor shall have to establish and maintain a field laboratory and the costs are to be covered within the rate quoted by him and no separate charges for the same will be paid. The field laboratory shall remain operative for the full tenure or the contract and must have at least the following equiprnents:-

a) Compression testing machine of minimum capacity of 150 tons
b) A set of standard sieves (for Coarse and fine aggregates)
c) Measuring Cylinders
d) Slump Cone
e) Adequate number of standard moulds

(15cm cubes)

f)Weighing balance

g) Slide caliper and screw gauge

h) Arrangement for design mix.

i) Weigh batch in sufficient Nos.

Any other apparatus if deemed necessary and called for by the Employer/Consultants shall also be provided by the Contractor at his own expense.

Materials should be tested in the field laboratory in presence of Consultant's/Employer's representative(s). In addition to that, the contractors shall get the materials tested in local Govt. Engineering College/Polytechnic/approved laboratory at his / their own cost and the results should be preserved carefully and attached with the respective running bills.

15: Completion Drawings and Photographs:

The Contractor, while reporting on completion of their work, shall furnish along with to the Consultant :- i) "as done" completion drawing of services *viz. sanitary/plumbing, electrical* work *etc.* on ammonia prints, ii: Inventory of all fittings fixed by him in the work, & iii) Enlarged completed photographs of the work.

16: Discrepancies and Adjustment of Errors:

The several documents forming the contract are to be taken as mutually explanatory of one another; detailed drawings being followed in preference to small scale drawings and figured dimensions in preference to scaled dimensions.

In the case of discrepancy between schedule of quantities, the specifications / and / or the Drawings, the following order of preference shall be observed:-

a: Description in the schedule of items and Quantities;

b: Technical specifications

c: Drawings;

If there are varying or conflicting provisions made in any one document forming part of the Contract, the accepting authority of the employer shall be the deciding authority with regard to the intention of the document.

Any error in description, quantity or rate In Schedule of quantities or any omission there from shall not vitiate the Contract or release the Contractor from the execution of the whole or any *part* of the work comprised therein according to drawings and specifications or from any of his obligations under the contract.

17: Tests/Results/Site Registers etc.

The contractor will be required to maintain the following registers at site of work and should produce the same for inspection of the Employer/Consultant whenever desired by them:-

Typical proforma of registers are enclosed (refer Table below)

Table I	Proforma of Cement Register
Table II	Proforma of Steel Register
Table III	Proforma of Water proofing material / paint / pesticide / lead Register
Table IV	Proforma of CI Rain Water Pipe Register
Table V	Proforma of HCI Pipe Register
Table VI	Proforma of Bulkage Test of Sand Register
Table VII	Proforma of Slump Test Register
Table VIII	Proforma of Silt Test Register
Table IX	Proforma of Brick Test Register
Table X	Proforma of Sieve Analysis of Coarse Aggregate Register
Table XI	Proforma of Sieve Analysis of Fine Aggregate Register
Table XII	Proforma of Concrete Cube Test Register
Table XIII	Proforma of G. I. Pipe Register
Table XIV	Proforma of Hindrance Register
Table XV	Proforma of Register of abnormally high / low Rated Item.

SECTION - VII

SAFETY CODE

1. The contractor should maintain all first aid appliances including adequate supply of sterilized dressing and cotton wool in a readily accessible place.

2. In case of any injured person if it is needed hospitalization even after proper first aid treatment then the injured person should be admitted to the nearest hospital without loss of time.

SCAFFOLDS

i. Suitable scaffolds shall be provided for workmen for all work that cannot safely be done from the ground, or from solid construction except in the case of short duration work which can be done safely from ladders. When a ladder is used, it shall be of rigid construction made either of good quality wood or steel. The steps shall have a minimum width of 450 mm and a maximum rise of 300 mm. Suitable hand holds or good quality wood or steel shall be provided and the ladder shall be given an inclination not steeper than 1/4 to 1 (1/4 horizontal and 1 vertical).

II. Scaffolding or staging more than 4 meter above the ground floor swung or suspended from an overhead support or erected with stationery support shall have a guard rail properly bolted, braced or otherwise secured, at least 1 meter above the floor or platform of such scaffolding or staging and extending along the entire length of the outside and ends thereof with only such openings as may be necessary for the delivery of materials. Such scaffolding or staging shall be so fastened as to prevent it tram swaying from the building or structure.

III. Working platforms, gangways and stairway shall be so constructed that they do not sag unduly or unequally and if the height of the platform, gangway or stairway is more than 4 meter above ground level or floor level, they shall be closely boarded and shall have adequate width and be suitably fenced as described in (ii) above.

IV. Every opening in the floor of a building or in a working platform shall be provided with suitable means to prevent the fall of persons or materials by providing suitable *fencing* or railing whose minimum height shall be 1 Mt.
Wherever there are open exceptions in ground, they shall be fenced off by suitable railing and danger signals installed at night so as to prevent persons slipping into the excavations.

V. Safe means of access shall be provided to all working places. Every ladder shall be securely fixed. No portable single ladder shall be over 9 m in length w*hile* the *width* between side rails in rung ladder shall in no case be less Man 290mm for ladder up to and including 3m *in*

length. For longer Ladders this width shall be increased at least 20mm for each additional meter of length.

VI. A sketch of the ladders and scaffolds proposed to be used shall be prepared and approval of the Engineer obtained prior to construction.

OTHER SAFETY MEASURES

VII: All personal of the Contractor working within this plant site shall be provided with safety helmets. All welders shall wear welding goggles while doing welding work and all in metal workers shall be provided with safety gloves. Persons employed on metal cutting and grinding shall wear safety glasses.

VIII: Adequate precautions shall be taken to prevent danger from electrical equipment. No materials on any of the sites of work shall be so stacked or placed as to cause danger or inconvenience to any person or the public All safety rules shall be observed while working on live electrical system or/installation as stipulated in I.E. rules.

EXCAVATION AND TRENCHING

IX: All trenches, 1.2M or more In depth, shall at all times be supplied with at least one ladder for each 30M in length or fraction thereof. The ladder shall be extended free bottoms of the trench to at least 1 m above the surface of the ground. Sides of trenches which are 1.5M or more in depth shall be stepped back to give suitable slope or securely held by timber bracing, so as to avoid the danger of sides collapsing. The excavated material shall not be placed within 1.5m of the edges of the trench or half of the depth of the trench whichever is more. Cutting shall be done from top to bottom. Under no circumstances undermining or undercutting shall be done.

X: The Contractor shall take all measures on the site of the work to protect the public from accidents and shall be bound to bear the expenses of defense of every unit, action or other proceedings at law that may be brought by any persons for injury sustained owing to *neglect* of *the* above precautions and to pay any such persons or which may with the consent of the Contractor, be paid to compromise any claim by any such person.

DEMOLITION

XI: Before any demolition work is commenced and also during the process of the work :-

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

b: No electric cable or apparatus which is liable to be a source of

danger over a cable or apparatus used by the operator shall remain electrically charged;

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

PERSONAL SAFETY EQUIPMENTS

XII: All necessary safety equipment as considered adequate by the Engineer should be kept available for the use of the person employed on the site and maintained in a condition suitable for immediate use, and the Contractor should take adequate steps to ensure proper use of equipment by those concerned :

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

b Those engaged in white washing and mixing or stacking of cement bags or any material which is injurious to the eyes shall be provided with protective goggles.

c: Those in welding work shall be provided with welder's protective eyesight lids.

d. Stone breakers shall be proved with protective goggles and protective clothing and sealed at sufficiently safe intervals.

e. When workers are *employed* in sewers and manholes, which are in use, suitable railing and provided with warning signals or boards to prevent accident to the public;

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

i: No paint containing lead or lead products shat be used except in the form of paste or readymade paint.

ii: Suitable face masks should be supplied for use by the workers when paint is applied in the form of spray or a surface having lead paint dry rubbed and scrapped.

Iii: Overalls shall be supplied by the Contractor to the workman and adequate facilities shall be provided to enable the working painters to wash during cessation of work.

XIII: When the work is done near any public place where there is risk of drowning all necessary equipments should be provided and kept

ready for use and all necessary steps taken for prompt rescue of any person in danger and adequate provision should be made for prompt first aid treatment of all injuries likely to be sustained during the course of the work.

XIV: **HOISTING MACHINES**

1) Use of hoisting machines and tackle including their attachments anchorage and supports shall conform to the following standards or conditions.

a: These shall be of good mechanical constructions sound material and adequate strength and *tree from* patent defect and shall be kept in repair and in good working order.

b. Every rope used in hoisting or lowering materials or as means *of* suspension shall be of durable quality and adequate strength and free from paten defects.

2) Every crane driver or hoisting appliance operator shall be properly qualified. No person under the age of 21 years shall be in charge of any hoisting machine including any scaffolding winch or give signals to operator.

3) In case of every hoisting machine all of every chain ring hook, shackle shovel and pulley block used in hoisting or as means of suspension the safe working load shall be ascertained by adequate means. Every hoisting machine and all gear referred to above shall be plainly marked with the safe working load. In case of hoisting machine having a variable safe working load, each safe working load and the conditions under which it is *applicable* shall be *clearly* indicated. No park of any machine or any gear referred to above in this paragraph shall be loaded beyond the safe working load except for the purpose of testing.

4) In case of departmental machines, the safe working load shall be notified by the Engineer. As regards Contractor's machines, the Contractor shall notify the safe working load of the machine to the Engineer whenever he brings any machinery *to* site of work and get it verified by the Engineer concerned.

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

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

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

XVIII: To ensure effective enforcement (the rules and regulations relating to safety) precautions the arrangements made by the Contractor shall be open to inspection by the Labour Office, Engineers of the Department or their representatives.

XIX: Notwithstanding the above clause from (I) to (VXIII), there is nothing in those to exempt the Contractor from the operations of any other Act or Rule in force in the Republic of India.

SECTION - VIII

MODEL RULES FOR THE PROTECTION OF HEALTH AND SANITARY ARRANGEMENTS FOR WORKERS

1. APPLICATION

These rules shall apply to all buildings and construction work relating to Construction of RSETI Building at BANKA of UCO Bank and the Contractor shall bear all cost for making the necessary provisions.

2. DEFINITION

(a) 'Work Place' means a place at which, at an average, 50 workers are employed in connection with construction work.

(b) 'Large work place' means a place at which average 500 or more workers are employed in connection with construction work

3. FIRST AID

(a) At every work place, there shall be maintained in readily accessible place first aid appliance including an adequate supply of sterilized dressings and sterilized cotton wool. The appliance shall be kept in good order and in large work place, they shall be placed under the charge of a responsible person who will be readily available during working hours.

(c) Where large work places are remote from regular hospitals, an indoor ward shall be provided with one bed for every 250 employees

(d) Where. large work places are situated in cities, towns in their suburbs and no beds are considered necessary owing to *the* proximity of city or town hospitals, suitable transport shall be provided to facilitate removal of urgent cases to the hospitals. At other work places, some conveyance facilities, such as a car, shall be kept readily available to take injured person or persons suddenly taken ill to the nearest hospital.

4. DRINKING WATER

a) In every work place there shall be provided and maintained at suitable places easily accessible to labour sufficient supply of cold water fit for drinking.

"

b) Where drinking water is obtained from an intermittent public wale supply, each work place shall be provided with storage where such drinking water shall be stored. .

(c) Every water supply *or* storage shall be at a distance of not less than

15m from any latrine, drain or other source of pollution. Where water has to be drawn from an existing well which is within the proximity of latrine, drain or any other source of pollution, the well shall be properly chlorinated before water is drawn from it for drinking. All such wells shall be entirely closed in and be provided with a trap door which shall be dust and water proof.

(d) A reliable pump shall be fitted to each covered well, the trap door shall be kept locked and opened only for cleaning or inspection which shall be done at least once a month.

5. WASHING AND BATHING PLACES

(a) Adequate washing and bathing places shall be provided, separately for men and women.

(b) Such places shall be kept in clean and drained condition.

6. SCALE OF ACCOMMODATION IN LATRINES AND URINALS

There shall be provided with the precincts of every work place, latrines and urinals in an accessible place and the accommodation, separately for each of them shall not be less than the following scale.

	No. of seats
a) Where the number of persons does not exceed 50	- 2
b) Where the number of persons exceeds 50, but does not exceed 100	-3
c) For every additional 1 00	3 per 100

In particular cases the Engineer shall have the powers to vary the scale where necessary.

7. LATRINES AND URINALS FOR WOMEN

If women and employed, separate latrines and urinals screened from those for men and marked *in* the vernacular *in* conspicuous letters 'For Women Only' shall be provided on the scale laid in Rule 6. Those for men shall be similar1y marked 'For Men Only'. A poster showing the figure of a man or a woman shall also be exhibited at the entrance of latrines for the respective sex. There shall be adequate supply of water close to the urinals and latrines.

8. LATRINES AND URINALS

All latrines shall be provided with septic tanks or leach pits in case of small units. All the latrines shall be kept in good sanitary condition.

9 CONSTRUICTION OF LATRINES

The Inside walls shall be constructed of masonry *or* some suitable heat resisting non-absorbent materials and shall be cement washable inside and outside at least once a year. The dates of cement washing shall be noted in a register maintained for this purpose and kept available for inspection. Latrines will not be of a standard lower than bore hole system and should have thatched roofs.

10. DISPOSAL OF EXCRETA

Unless otherwise arranged for by the local sanitary authority, arrangements tor proper disposal of excreta shall be made by septic tank or leach pit duly approved by the Engineer and in conformity with the requirements of local public health authorities.

11 PROVISIONS OF SHELTER DURING REST

At every work place there shall be provided free of cost, two suitable sheds, one for meals and the other for rest separately for men and women for the use of labour. The height of the shelter shall not be less than 3.5 M from the floor level to the lowest part of the roof. The sheds should be roofed with at *least* thatch and mud flooring and will be provided with a dwarf wall around not less than 750 mm. Sheds should be kept clean and the space should be on the basis of at least 0.50 square meter per head.

12. CRECHES

a) At every work place, at which 50 or more women workers are ordinarily employed, there shall be provided two huts for the use of children under the age of 6 years, belonging to such women, one hut shall be used for infants' games and play and the other as their bed room. The huts shall not be constructed on a lower standard than the following :-

I: thatched roofs

ill: mud floors and walls

Iii: planks spread over the mud floor and covered with matting.

The huts shall be provided with suitable and sufficient openings for light and ventilation. There shall be adequate provisions of sweepers to keep the place clean. There shall be two dais in attendance. Sanitary utensils shall be provided to the satisfaction of the Health Officer of the area concerned. The use of the hut shall be restricted to children, their attendants and mothers of the children.

b)Where the number of women workers is more than 25 but less than 50,
the Contractor shall provide at least one hut and one dai to look after

the children or women working.

c) The size of crèches or crèches shall vary according to the number of workers

d) The crèche or crèches shall be properly maintained and necessary equipment like toys, etc. shall be provided

13 CANTEEN

A cooked food canteen on a moderate scale shall be provided for the benefit of workers wherever *it is considered* expedient.

SECTION- IX

TECHNICAL SPECIFICATIONS FOR MATERIALS AND CIVIL WORK

INDEX

SECTION - A : MATERIALS

1. Materials shall be of approved quality. A list of materials of approved brand and manufacture is indicated in the list of materials of Approved Brand manufacture. The list is given to ensure the standard of quality and performance.

2. Contractors shall obtain approval of representative of Employer/Consultant on sample of all materials before placing order and the approved sample shall be carefully preserved in an appropriate manner at the site office for verification by the representative of Employer/Consultant.

3. For standard bought out items, the sizes manufactured by the firms listed shall prevail in case of discrepancy with the sizes mentioned in the schedule without any financial adjustment.

4. Materials shall be tested at site/any approved Testing Laboratory. The Laboratory Test Certificate in original shall be submitted to the representative of Employer/Consultant. Test results are also to be recorded at site registers appropriately.

5. Wherever work as per manufacturer's specification is indicated, it will be obligatory on the part of the contractor to submit manufacturers specification to Consultant/Employer. The Quoted rates shall be deemed to include for the complete work specified by the manufacturer even though not specifically mentioned in *the* schedule of items. Moreover, the quoted rates shall be deemed to include for the complete work specified by the manufacturer even though not specifically mentioned in the schedule of items.

6. It shall be obligatory for the contractor to furnish certificates, if demanded by the representative of Employer/Consultant, from manufacturer or the material supplier, stating that the work has been carried out by using their material.

7. All materials supplied by the representative of Employer/Consultant/any other specialist firm shall he properly stored and the Contractor shall be responsible for its safe custody until they are required on the works and till the completion of work.

8. All equipment and facilities for carrying out field tests on materials shall be provided by the Contractor without any extra cost.

9. Unless otherwise shown on the Drawings or mentioned in *the* "Schedule of Quantities" or anywhere in the contract, the quality of materials, workmanship, dimensions etc shall be as specified hereunder.

9.1 **Material for filling**

Shall be selected material as specified for filling and shall be free from building rubbish or organic decomposed material. They shall be

obtained either from excavation or brought from outside, as specified, in the schedule of items.

9.2 Cement

Cement unless otherwise specified of grade 43, conforming to IS. *455/IS* and grade 53 conforming to IS: 12269 shall be used. The use of cement other than ordinary Portland cement/Blast furnace slag cement will not be allowed unless specifically advised by representative of Employer/Consultant. Cement shall be stored in dry weatherproof go- down/shed built by the contractor at his own cost in order to prevent deterioration by dampness or intrusion of foreign matter. Not more than 10 bags should be kept in one stack and it shall be stored in such a manner as to permit easy access for proper inspection. It shall be stored in such a way as to allow the removal and use of cement in chronological order of receipt i. e., first received being first used. Cement deteriorated and/or clodded shall not be used on work but shall be removed at once from the site at Contractors cost.

Daily record of cement received and consumed shall be maintained by the Contractor in the cement register at site and submitted to representative of Employer/Consultant if called for. Theoretical consumption of cement for different materials brought at site by the Contractor shall also be submitted with proper documents with every bill for verification The consumption of cement for different items of work shall be as given in the tender and in its absence as per C. P. W. D. schedule. Consumption of cement in the corresponding items of work under the contract shall be computed on the basis of the quantities shown in the table subject to a variation of plus/minus three percent. The weight of 1 cum. of cement shall be taken as 1440 kg. Cement stored for more than three months shall be got tested before using it in work.

9.3 Lime

Lime shall be made from approved Lime Stone or Kankar and properly burnt and shall be of appropriate class for specific work given in IS: 712-1984. It shall be free from excess of unburnt kankar or lime stone ashes or other extraneous materials and shall be stored to prevent damage by rain, moisture or air slaking. Lime Shall be used within 14 days from the date of stacking and damaged lime shall not be used but shall be removed from *the* site of work forthwith at contractors cost.

9.4 Fine Aggregate

Shall be from natural source, chemically inert, clean, sharp, hard, durable and well graded and free from deleterious materials not exceeding the permissible limit as per IS : 383-1970. The Silt Content shall be within 8%. If it is in excess, washing shall be done in an

approved manner to bring it within allowable limit. The fine aggregate for concrete shall be graded and the Fineness Modulus shall be between 2.60 to 3.20. The Fineness Modulus of fine aggregate shall be between1.80 to 2.60 for plaster & masonry work.

The fine aggregate shall be stacked carefully on a clean and dry surface so that it will mixed up with deleterious foreign materials. If such a Surface is not available, thick floor or a thin layer of lean concrete shall be prepared. The percentage of Materials shall be within the permissible limits as specified in IS 383-1970.

9.5 COURSE AGGREGATE

It shall consist of crushed or broken stone 95% which shall be retained on 4.75 Mm IS test Sieve. It shall be obtained from crushing Granite, Trap, Basalt or Similar approved stones. Coarse aggregate shall be chemically inert when Mixed with cement and shall be roughly cubical in shape and free from soft friable, thin, laminated or Flaky pieces. Maximum percentage of deleterious materials shall not exceed those specified in IS 383-1970. The coarse aggregate used in the work shall conform to the grading as limits specified in IS: 383-1970. It shall be washed if so desired by the Employer *I* Architects. Aggregates shall be Stored on platforms or otherwise so as to avoid inclusion of foreign materials. It shall be thoroughly wetted before *being* charged into tile hopper of the
concrete mixer.

9.6 Reinforcement

High Strength Deformed Bars

Unless specified otherwise, high strength deformed bars shall conform to IS: 1786-1985 of grade Fe 415 and obtained from approved manufacturer.

Where mild steel bars are *specified* they shall conform to IS - 432 Part-I and shall be obtained from approved manufacturer.

Contractor shall get steel reinforcement tested at his cost as and when required and directed by the Employer/Architects/Consultants.

9.7 Bricks

The bricks shall be locally available kiln burnt bricks of generally regular and uniform size, shape and colour, uniformly well burnt throughout but not over burnt. They shall be free from cracks or other flaws.

They shall show a fine grained, uniform, homogeneous and dense texture on fracture and be free from lumps of lime, laminations, cracks, air-holes, soluble salts causing efflorescence or other defects which *may* in *any* way impair their strength, durability, appearance, usefulness for the purpose intended.

The size of brick shall be nominally 250 mm x 125 mm x 75 mm or 230 mm x 115 mm x 65 mm with a tolerance on dimension of ± 8%.

After Immersion in water, absorption by weight shall not exceed 20 percent of the dry weight of the brick when tested according to I. S. 1077-1970. The bricks shall have minimum average compressive strengths as specified nomenclature of the items. The compressive strength of any individual bricks on testing shall not fall below the average compressive strength by more than 20 (twenty percent). The rating of efflorescence of bricks shall not be more than 'Moderate'.

The Bricks to be used for the work shall be approved by the representative of Employer/ Consultant beforehand.

9.8 Water

Water for mixing Cement/Lime mortar of concrete shall not be salty or brackish and shall be clean, reasonably clear and free from injurious quantities of deleterious materials. It shall not contain any sugar or excess of oils, acid and injurious alkali, salts, organic matter which will either weaken the mortar or concrete or cause efflorescence or attack the steel in reinforced cement concrete. Water shall be obtained from source approved by the representative of Employer/Consultant. Potable water is generally considered satisfactory for mixing and curing concrete, mortar, masonry etc. Water shall be tested once before undertaking the construction work in an approved testing laboratory to establish *its suitability.* All charges connected therewith shall be borne by the Contractor. The pH value of water shall generally be not less than 6.

The permissible values of NaOH, H2 $S0_4$ and other organic and inorganic solids should be as per IS:456 and tile tests should be in accordance with IS : 3025.

9.9 Timber

Timber for carpentry/joinery works of all description shall be as specified as in schedule and seasoned, naturally or artificially as indicated therein. These shall be free from knot, shakes, fissures, flaws, sub-cracks and other defects to a reasonable extent. Representative of Employer/Consultant's decisions in this regard is final and binding. The moisture content for timber normally should not exceed the following limits :-

I) Timber for frames 14%

II) Timber for planking/ shutters etc. 12%

Tolerance up to maximum 5% on above is permissible.

In measuring cross-sectional dimensions of timber for the frames/shutters

styles, rails or panel members, tolerance up to 1.5 mm shall be allowed for each planed surface.

9.10 Steel Windows, Doors & Ventilators

Steel windows and doors shall be fabricated out of approved steel sections. They shall be obtained from approved manufacturers. Unless otherwise stated the Indian Standard Specifications applicable for steel doors, Windows and ventilations shall be IS:1038. Wherever rolled steel sections are used the section should however conform to I.S. 226 and I.S. 1977 latest addition, and steel should be of weldable quality.

9.11 Ceramic Tiles

White or colored ceramic glazed/unglazed tiles shall be obtained from approved manufacturer and shall be flat and true to shape. They shall be free from cracks. *crazing,* spots, chipped edges *and* corners. The glazing and colour *shall* be of *uniform* shade. Tolerance in dimension shall be ± 1.0 mm in sizes and ± 0..5 mm in thickness The rear face shall be grooved and recessed in parts to provide the necessary key for mortar. They shall *generally* conform to I.S. 777.

9.12 Kota/Cudappah Stone

Slabs shall be of selected quality, hard, sound, dense and homogenous in texture, free from cracks, decay, weathering and flaws. They shall be hand/machine cut to the specified thickness and of approved quality and size shall be uniform in colour with straight edges. The tolerance in thickness shall be ± 2 mm. Before starting the work, the contractor shall get the samples approved from Employer/Consultant.

9.13 Marble Slabs

Marble shall conform to the following characteristics :-

Moisture absorption after 24 hours immersion

: Max. 0.4% by weight tested as per I.S.1124.

Hardness : Min. 3 on Mhos scaler

Specific Gravity : Min. 2.5 tested as per I.S. 1122.

The thickness shall be as specified with a tolerance +/- 2 mm.

9 .14 Glazing

Glass used for glazing shall be sheet glass/float glass as specified, clear or obscured as directed by the Employer/Consultant of approved quality free from flaws, specks *bubbles.*

9.15 C. I. Rain Water Pipes

All C. I. pipes and fittings shall be of approved manufacturer free from cracks, chipped edges *or corners* and other damages. The pipes shall be IS stamped and shall conform I.S. 3989.

9.16 Collapsible Gates

These shall be of approved manufacturer and fabricated from MS sections consisting of vertical double channels each 18 x 9 x 3 mm at 100 mm *c/s* braced with flat iron diagonals 18 x 5 mm and top and bottom rails of either T's or E's with minimum web of 40 x 12 mm and flange *40* x 6 mm. The roller wheels shall be of grey iron castings and rivets shall be snap headed and not less than 6 mm dia.

The gates shall be provided with necessary bolts and nuts, loading arrangements, stoppers, handles etc. even if not specified.

9. 17 Rolling *Shutter*

Rolling shutter shall be of approved manufacturer as described in the schedule of quantities and fabricated from M.S. laths in single pieces, machine rolled and straightened with an effective bridge depth and shall be interlocked together throughout their entire length and joined at the end with end locks. These shall be mounted on specially designed pipe shaft. *The* springs shall be preferably coiled type manufactured from high tensile spring steel wire or strip of adequate strength to balance shutter at all positions. The spring pipe shaft shall be supported on MS brackets and covered with MS sections as that of lath. The guide channels shall be of MS deep channel pressed/rolled sections. The gap between legs should be just sufficient to allow free movement of shutter without making any rattling sound. The guide channels shall be provided with minimum three fixing cleats or supports with as pacing not exceeding 750 mm for *fixing* to *walls/columns* etc. with bolts/screws.

9.18 Marble Mosaic Tiles

Tiles shall conform to IS:1237-1959. They shall be of sizes as specified with tolerances of *(+/-)* 1 mm in length and breadth. The tolerance on thickness shall be 0, +3 mm & + 5 mm for 20 mm, 25 mm & 30 mm. tiles respectively. The tiles shall be manufactured with hydraulic pressure of not less than 140 kg/sq.cm.

9.19 Paints

Dry distemper, oil bound distemper, cement primer, oil paint, enamel paint, flat oil paint, plastic emulsion paint, anti-corrosive primer, red lead, yellow zinc chromate, water-proof cement paint shall be from an approved manufacturer as listed. Ready mixed paints received from the manufacturer without any admixture shall be used, except for addition of thinner, if recommended by the manufacturer.

9.20 Cement Admixtures

Cement admixtures are to be obtained from approved manufacturer with the explicit approval of the representative of Employer/Consultant. The use of admixture containing Calcium Chloride, Fluorides, Nitrates and Sulphates is prohibited The representative of Employer/Consultant's decision as regards use of admixtures is final and binding.

9.21 Hardware Fittings

The Hardware Fittings, Ferrous or Non-ferrous shall be obtained from approved manufacturer and IS stamped if available. The MS / Iron fitting are to be oxidized and Aluminum fittings anodized in natural colour mat satin finish, even though not specified in the schedule of quantities. The sample for fittings shall be submitted to the Employer/Architects for their approval.

9.22 Mortars

Cement mortar shall be of proportions specified for each type of work in the schedule. It shall be composed *at* cement *and sand. The* ingredients shall be accurately gauged by measure and shall be well and evenly mixed together, care being taken not to add more water than is required. No mortar that has begun to set shall be used.

If hand mixing is done in lieu of mechanical mixture, then it shall be done on pucca water-proof platform. The gauged materials shall be put on the platform and mixed dry. *Water* will then be added and the whole mixed again until it is homogeneous and of uniform colour. The contractor shall use 10% extra cement for hand mixing for which no extra payment will be made.

9.23 Aluminum doors & windows

Shall be obtained from approved manufacturer. All sections used shall be 'INDAL'. Thickness of anodic coating to aluminum members shall not be less than 15 micron.

9.24 Polysulphide Sealant

Polysulphide sealant if specified in the schedule of quantities should be obtained from approved manufacturers.

10,0 Codes

Wherever reference to codes is made, they shall mean the latest version of the particular IS Code under reference.

LIST OF MATERIALS 0F APPROVED BRAND AND / OR MANUFACTURE

CEMENT *Grade* 43 & 53 OP or Slag cement of ACC MODI/L&T/CENTURY/LAFARGE/AMBUJA/BIRLA.

WHITE CEMENT *JK & BIRLA.*

STEEL *TISCO, SAIL, RINL or any ISI approved manufacturer or Reroller authorised by TISCO/SAIL.*

CERAMIC TILES

I) UNGLAZED *SPARTEX, KAJARIA PLUS, NITCO, Regency.*

1I) GLAZED *First Quality of .*
i) *H & R Johnson*
II) Somani
iii) Cera
iv) *Decora*

WATERPROOFING COMPOUND : ROFFE, PIDILITE, SIKA QUALCRETE, CICO OF APPROVOVDE GRADE.

RED OXIDE ZINC CHROMATE : Shalimar, Asian Paints, Jenson and Nicholson.

WATERPROOF CIMENT PAINT : SNOECEM PLUS OR SIMILAR APPROVATE BRAND.

GLAZING : Modifloat and Asahifloat.

SHEET GLASS : Indo Ashal, Tribeni & Shreevallabh
2.

SYNTHETIC ENAMEL PAINT : DULUX (ICI), LUXOL (BERGER)

ACRYLIC DISTEMPER : ICI, BERGER, JOHNSON &NICHOLKSON, ASIAN

ACRYLIC DITEMPER : ICI, BERGER, JOHNSON &NICHOLKSON, ASIAN

FLUSH DOOR : GREEN PLY, CENT URI, SYLVAN OR EQUIVALENT

HARDWERE FITTINGS

I) FERROUS : MOWJEE AND EARL BIHARI OR EQUIVALANT

ii) NON-FERROUS : EARL BIHARI, METACO & ARGENT OR EQUIVALENT ISI STAMPED PRODUCT

COLLAPSIBLE GA TE : & ROLLING SHUTTER ANY ISI APPROVED MANUFACTURER.

ALUMINIUM DOOR : ANY ISI APPROVED MANUFACTURER

WATERPROOFING TREATMENT : SIKA / PEDILITE / CHOKSHI OR EQUIVALANT

TILE FIXING ADHESIVE : ROFFE & PIDILITE

HDPE PIPES : EVEREST GIPS OR EQUIVALENT

MS CONDUITS : NIC, BEC OR EQUIVALENT ISI MARKED

RIGID PVC CONDUIT : BEC, PLAZA AKG KALINGA

SECTION - B

EARTHWORK

1.0 GENERAL

The excavation will generally refer to open excavation of foundation area wet or dry in all sorts of soils at any depth, unless otherwise specified except hard rocks for which separate provisions are made.

2.0 EXAMINE THE SITE

The contractor shall visit and ascertain the nature of the ground to be excavated and the work to be done and shall accept all responsibility for the cost of the work involved.

3.0 SETTING OUT

The contractor shall clear the entire site by cutting/uprooting jungles, bushes, grass, vegetation growth and trees and generally level the site and set out the centre line of the Building or other involved works and get the same approved frorn representative of Employer/Consultant. It shall be the responsibility of the contractor to install substantial reference marks; bench marks etc. and maintain them as long as required by the representative of *Employer/Consultant.* The contractor shall assume full responsibility for proper setting out, alignment, elevation and dimension of each and all part of the works.

4. 0 GROUND LEVEL AND SITE LEVEL

Before starting the excavation the existing ground level of the entire plot shall be taken by the contractor in consultation with the representative of Employer/Consultant and a proper record of these levels kept, which shall be jointly signed *by* the contractor and the representative of Employer/Consultant.

5.0 EXCAVATION AND PREPARATION OF FOUNDATION FOR CONCRETE OTHER THAN HARD ROCK

Excavation shall include removal of all material of whatever nature including moored, soft rock, boulders, old foundations, concrete, asphalt or paved surfaces etc. at all depths and whether wet or dry necessary for the construction of foundation and sub-structure including mass excavation for underground reservoir, chess pits, septic tanks etc. where applicable, exactly

in accordance with lines, levels, grades and curves shown in the drawings or as directed by the representative of Employer/Consultant. The bottoms of excavation shall be leveled both longitudinally and transversely or as directed by the representative of Employer/Consultant. Should *the* contractors excavate to a greater depth or width than shown on the drawings or as directed by the representative of Employer/Consultant, he shall at his own expenses fill the extra depth or *width* in cement concrete in proportion as directed by the representative of Employer/Consultant but in no case with concrete of thin linear than 1:5:10 cement concrete.

The contractor shall report to the representative of Employer/Consultant when they are ready to receive concrete. No concrete shall be placed in foundations until the contractor has obtained representative of Employer/Consultant approval. In case excavation is done through different strata of soil and if the same is payable as per provision in the Schedule of Quantities the contractor shall set the dimensions or the strata decided by the representative of Employer/Consultant for payment. If no specific provisions is made in the schedule of quantities, it will be presumed that excavation shall be in all types of strata except hard rock and the contractor's rate shall cover for the same, which are treated as a single entity.

After the excavation is passed by the representative of Employment/consultant and before having the concrete, the contractor shall get the depth and dimensions of excavations, levels, nature of strata as applicable as per schedule of quantities and measurements recorded from the representative of Employer and Consultant.

5.1 Shoring

The sides of the excavations, if required, should be protected by shoring in such a *way* as is necessary to secure them from falling in, and the shoring shall be maintained in position as long as necessary. The Contractor shall be responsible for the proper design of the shoring to hold the sides of the excavation in position and ensure safety of persons and properties etc. The shoring shall be removed as directed after the items for which it is required are completed. No extra payment will be made for shoring.

5.2 Protection

If instructed by the representative of Employer/Consultant all foundation pits, and similar excavations shall be strongly fenced and marked with red lights at night to avoid accidents. Adequate protective *measures* shall be taken to see that the excavation does not affect or damage adjoining structures. All measures required for the safety of the excavations, the people working in and near the foundation trenches and people in vicinity shall be taken by the contractor at his own cost.
The contractor will be entirely responsible for any injury or damage to property caused by his negligence of accident due to his constructional operations.

5.3 Stacking of Excavated Materials

All materials excavated will remain the property of the employer. The excavated materials at the first instance shall be sorted as directed by representative of Employer/Consultant and stacked appropriately by the sides of trenches as directed by the representative of Employer/Consultant before they are disposed off and leveled within the site at locations directed by the representative of Employer/Consultant. Materials suitable and useful for back filling, plinth filling or leveling of the plot or other use shall be stacked in convenient places in such a way so as not to obstruct free movement of men, animals and vehicles or encroach on the area required for constructional purposes. The cost on account of sorting out useful materials/disposal within the site and removal or spoils etc outside in conformity with Local Municipal Rules will not be additionally paid for.

5.4 Back Filling / Plinth Filling

All shoring and form work shall be removed after their necessity ceases and trash of any sorts shall be cleaned out from the excavation. All space between foundation masonry or *concrete* and the sides of excavation shall be refilled to *the original* surface with approved excavated materials in layers 15 cm in thickness watered and rammed with iron and wooden rammers weighing 7-8 kg. with a base of 20 cm square or 20 cm diameter. The filling shall be done after concrete or masonry is fully set and done in such a way as not to cause undue thrust on any part of the structure. Where suitable excavated materials are to be used for refilling, it shall be brought from the space where it is temporarily stacked and used in refilling. When sand filling is done, it shall be consolidated by flooding with water. No excavation of foundations shall be filled in or covered up until all measurements at excavations, masonry concrete and other works below ground level jointly recorded. Black cotton soil shall not be used for back filling or in plinth filling.

5.5) Dewatering

Rate for excavation shall include bailing or pumping out water which may accumulate in the excavation during the progress of work either from seepage, springs, rain or any other cause and *diverting* surface flow if any by bends or other means. Pumping out water shall be done in such approved manner as to preclude the possibility of any damage to the foundation trench, concrete or masonry or any adjacent structure. When water is set in foundation trenches or in tank excavations, pumping out water shall be from auxiliary pit of adequate size dug slightly outside the excavation. The depth of auxiliary pit shall be more than the working foundation trench levels. The auxiliary pit shall be refilled with approved excavated materials after the dewatering is over.

The excavation shall be kept from water:

During inspection and measurement.

When concrete and/or masonry wall are in progress and till they come above the natural water level, and

Till the representative of' Employer/Consultant consider that the concrete mortar is sufficiently set.

5.6) Surplus Excavation Materials

All materials and spoils certified as surplus and not useful, shall be removed by the Contractor from the site in an approved manner at locations to be arranged by him in conformity with local regulations. The quantity to be disposed of shall be got pre-approved by Employer / Consultant.

The item of removal of surplus excavated materials shall only be undertaken by the Contractor only when specific instruction in this regard has been obtained from the representative of Employer/Consultant. The rate or the item will be mutually decided when such removal is advised.

6.0 Method of Measurement

6.1 Excavation

Excavation shall be measured in cum. As per drawing, the length and width being governed by the maximum dimensions of soling/bed concrete/structure concrete as in drawing and depth considered as the difference between average foundation level in a pit and average of pre-construction level there at. No extra measurements will be allowed for excavation for formwork, shoring, and working spaces or cut stability. No extra will be entertained for cost of dewatering and keeping trenches dry, protective shoring, if any needed. No Increase in bulk after cutting will be entertained. No deduction will be made for volume of pile heads, tree trunks or other masonry structures nor any extra on account of above is payable.

6.2 Filling

Plinth filling shall be measured as net consolidated volume in cum as per drawing.

SECTION - C

1.0 PLAIN AND REINFORCED CEMENT CONCRETE

All concrete work shall be carried out by the contractor under the supervision of a concrete foreman sufficiently experienced in this type of work.

Ingredients to be used in concrete and Reinforced concrete work :

Ingredients to be used in concrete should conform to the specifications as indicated under "Technical Specifications for Materials" given earlier.
As regards admixture, this shall be used with prior approval of representative of Employer/Consultant.

1.1 **Mix Proportion.**

The mix proportions shall be selected to ensure that the workability of the fresh concrete is suitable for the conditions of handling and placing so that after compaction it surrounds all reinforcements *and* completely fills the form work.

The determinations of the proportions of cement, aggregates and water to attain the required strength & workability shall be made as follows :

a) By designing the concrete mix such concrete shall be called "Design Mix Concrete" and *will* be permitted for use when complete quality control is ensured through use of weigh-batches, equipped field laboratory, approved transportation method and skilled technician.

b) By adopting nominal concrete mix, such concrete shall called "Nominal Mix Concrete". *The minimum cement content for nominal mix concrete shall be as under :*

Grade of Concrete	C**ement/cum. of concrete (in kg)**
M 20	400
M 15	317
1:3:6	235
1:4:8	180

1. 2 **Design Mix Concrete:**

The mix shall be designed to produce the grade of concrete having the required workability and a characteristic strength not less than values given in table Ä". The procedure given in Indian standard should be preferred for the

design but other Standard methods may also be followed. As long as quality of material does not change a mix design done earlier may be considered adequate for later work.

When mix is designed, the records shall be maintained in the format annexed.

TABLE A-GRADES OF CONCRETE

GRADE OF CONCRETE	SPECIFIED CHARACTERISTIC COMPRESSIVE STRENGTH	
	AT 7 DAYS N/SQ.MM	AT 28 DAYS N/SQ.MM
M10	7.0	10
M15	10.0	15
M20	13.5	20
M25	17.0	25
M30	20.0	30
M35	23.5	35
M40	27.0	40

1.3 Nominal Mix CONCRETE

Nominal mix concrete may be used for concrete of grades M5, M7. 5, M10, M15 and M20. The proportion of materials for nominal mix concrete shall be in accordance with Table "B". However strength requirement is to be pre-established before resorting to mass work The proportions of fine to coarse aggregates should be adjusted from upper limit to lower limit progressively as the grading of the fine aggregate becomes finer and the maximum size of coarse aggregate becomes larger. Graded coarse aggregates shall be used.

The cement content In the mix specified 'B' for any nominal mix to be proportionately increased if the quantity of water in a mix has to be increased to overcome *the* difficulties of placement and compaction, so that the *water* cement ratio is specified is not changed. In the case of vibrated concrete, the limit specified may be suitably reduced to avoid segregation.

The quantity of water used in reinforced concrete work should be the quantity of water used in reinforced concrete work should be sufficient but not more than sufficient to produce dense concrete of adequate workability for its purpose which property grip all the reinforcement. Workability of concrete should be controlled by maintaining a water content that is found to give a concrete which is sufficiently wet to be placed and compacted without difficulty with the means available.

TABLE B - PROPORTIONS FOR NOMINAL MIX CONCRETE

GRADE OF CONCRETE	TOTAL QUANTITY OF DRY AGGREGATE BY MASS PER 50 KGS OF CEMENT TO BE TAKEN AS THE SUM OF THE INDIVIDUAL MASSES OF FINE AND COURSES AGGREGATE (MAXIMUM)	PROPORTION OF FINE AGGREGATE TO COURSE AGGREGATE	QUANTITY OF WATER PER 50 KGS OF CEMENT (MAXIMUM)
	KG	BY MASS	LITRE
M5 M7.5 M10 M15 M25	800 625 480 350 250	GENERALLY 1:2 BUT SUBJECTED TO AN UPPER LIMIT OF 1:1 ½ AND A LOWER LIMIT OF 1:2 ½	60 45 34 32 30

2.0 PRODUCTION AND CONTROL OF CONCERTE

In proportioning Concrete the quantity of both Cement, Coarse/Fine Aggregate and water should be determined by weight in case of design mix or volume in case on nominal mix. Where weight of cement is determined on the basis of mass of cement per bag, a reasonable number *of bags* should be weighed periodically to check the net mass. Where the cement is weighed on the site and not in bags it should be weighed separately from the aggregates. Water should be either measured by volume in calibrated tanks or weighed. Any solid admixture that may be added may be measured by mass, liquid and paste admixture may be measured by volume or by mass. Batching plant when used should conform to IS: 4925. All measuring equipments should be maintained in a clean serviceable condition and their accuracy periodically checked.

Except where it can be shown to the satisfaction of the representative of Employer/Consultant that supply of properly graded aggregate of uniform quality can be maintained over the period of work, the grading of aggregate should be controlled by obtaining the coarse aggregate in different sizes and blending them in night proportions, as required, the different sizes being stacked in separate Stock-piles. The grading of coarse *and* fine aggregate should be checked as frequently as possible to ensure that the specified grading is being maintained. No change In proportions of substitutions In materials shall be made without additional tests to show that the quality and strength of concrete are satisfactory.

2.1 Mixing

Concrete shall be mixed in a standard mechanical mixer. The mixing shall be continued until there is a uniform distribution of the materials and the mass is uniform in colour and consistency. If there is segregation after unloading from the mixer the concrete should be remixed. The mixing time may be *1-1/2* to 2 minutes generally. In exceptional circumstances such as mechanical breakdown of mixer, work in remote areas or when the quantity of concrete work *is* very small, hand mixing may be permitted subject to adding 10% extra cement for which no extra payment will be made to the contractor. When hand mixing is permitted it shall be carried out on a water tight platform and concrete is uniform in colour and consistency.

Workability of concrete should be controlled by direct measurement of water content and it should be checked at frequent intervals. For Nominal Mix workability measured by slump test may have values given in table "C".

TABLE 'C'

Sl. No.	**Type of work**	**When vibrated**	**When not vibrated**
1.	Mass concrete in RCC foundation footings, retaining walls and pavement	2.5 cm (1")	5 cm (2")
2.	Beams, slabs, columns With sample reinforcement	2.5 cms to 5 cms (1" to 2")	5 cms to 10 cms (2" to 4")
3.	Thin sections with congested reinforcement	5 cms to 10 cms (2"to 4")	10 cms to 15 cms (4"to 6")

Note: Should conditions governing slump and workability change pointing to advisability of an increased slump, this shall only be done by decreasing the amount of aggregate and not by increasing the amount of water.

2.2 Transportation

The method of transportation shall be got pre-approved from Consultant/Employer. Concrete shall be transported from the mixer to the formwork as rapidly as possible by methods, which will prevent the segregation or loss of any of the ingredients and maintaining the required workability. In no case, more than 30 minutes shall elapse between mixing and consolidation in its position.

During hot and cold weather, concrete shaft be transported by deep containers. Other suitable methods to reduce the loss of water by evaporation in hot weather and heat loss in cold weather may also be adopted.

For buildings with height more than 18.0 Meter, transportation of concrete by suitable and pre-approved mechanical devices is essential.

2.3 Placing

The concrete shall be deposited as neatly as practicable in its final position to avoid rehandling. The concrete shall be placed and compacted before setting commences and should not be subsequently disturbed. Methods of placing should be such as to preclude segregation. Care should be taken to avoid displacement of reinforcement or movement of form work. Concrete shall not be dropped into position from a height greater than 2.0 m

2.4 Compaction

Concrete should be thoroughly compacted and fully worked around the reinforcement, embedded fixtures and into corners of the formwork. Mechanical vibrators should generally be used. Over-vibration or vibration of very wet mixes is harmful and should be avoided. Under-vibration is also harmful.

Whenever vibration is to be applied externally the design of form work and the disposition of vibrators should receive special consideration to ensure efficient compaction and to avoid surface blemishes.

Beams and columns shall be vibrated using immersion vibrators. Thin sections like walls of water tanks, chajjas, and aprons etc. should be vibrated preferably using surface vibrators. It is better to vibrate in smaller intervals for short period of time, rather than at wider intervals for longer periods of time. The vibrator shall be used only to aid compaction and not to push concrete laterally in the forms.

3.0 CONSTRUCTION JOINTS

Concreting shall be carried out continuously up to construction joints, the position and arrangement of which should be indicated by the designer.

The locations of construction *joints* shall *preferably* be kept parallel *to* the

principal reinforcements. Where it is unavoidable, and is at right angles to the principal reinforcement, it shall be kept at approx. 1/3rd to 1/4th of the span. All joints shall be *vertically* formed with proper wooden stop boards.

When work is to be resumed on a surface, which has hardened, such surface shall be roughened. It shall then be swept clean and thoroughly wetted. For vertical joints neat cement slurry shall be applied on the surface before it is dry. For horizontal joints the surface shall be *covered with* a layer of *mortar* about 10 to 15 mm thick composed of cement and sand in the same ratio as the cement and sand in concrete mix. This layer of cement slurry or mortar shall be freshly mixed and applied immediately before placing of concrete.

Where concrete has not fully hardened, all laitance shall be removed by scrubbing the wet surface with wire or bristle brushes, care being taken to *avoid* dislodgement of particles of aggregate. The surface shall be thoroughly wetted and all free water removed. The surface shall then be coated with neat cement slurry. On this surface, a layer of concrete not exceeding 150 mm in thickness shall first be well rammed against old work, particular attention being paid to close pots. Work therefore shall proceed in the normal way.

2.

4.0 CURING

Unless otherwise specified all exposed surfaces of concrete shall be kept continuously in a damp or wet condition by ponding or by covering with a layer or sacking canvas or similar materials and kept constantly well at least 7 days from the date of placing of concrete. Mere sprinkling of water on vertical surfaces shall not be allowed. The rate of RCC/plain concrete work shall include cost of curing.

Approved curing compounds may be used at no additional cost to the owner in lieu of moist curing with the permission of the representative of Employer/Consultant. Such compounds shall be applied to *all* exposed surfaces of the concrete as soon as possible after the concrete has set.

5.0 FACIUTIES FOR PREPARATION AND TESTING OF CONCRETE AT SITE

In order to exercise the required degree of constant control over the concrete materials and its preparation the contractor is expected to set up and maintain at his own expense a Testing Laboratory at Site equipped with at least *the* following equipments :-

i) *Compression* Testing machine of capacity 80t/100t;

ii) A set of standard sieves;

iii) Measuring cylinders, adequate number of cube and *cylinder*

moulds and slumps cones:

iv) Weighing balance,

v) Vicat apparatus;

vi) Curing tanks for Cubes.

5.1 Sampling, Testing and Acceptance of Concrete

Samples from fresh concrete shall be taken and cubes shall be made, cured and tested at 28 days in accordance with IS 516.

Tests shall be conducted for compressive strength on 15 cm x 15 cm x 15 cm Cubes of Concrete. Companion Specimens shall be cast from a single batch of concrete and shall be of the same age at the time of testing. In order to get a relatively quicker idea of the quality of concrete, additional tests of compressive strength tests at 7 days shall be carried out in addition to 28 days compressive strength tests. In all cases, 28 days compressive strength specified in Table 'A' shall alone be the criterion for acceptance or rejection of the concrete.

5.2 Frequency of Sampling

The frequency of sampling shall be as indicated in the list of mandatory tests. Works test cubes shall represent quality of concrete incorporated in the work and taken out in sets of 6 cubes. The concrete for preparation of one set of 6 cubes shall be taken from one batch of mixed concrete discharged from mixer. The cubes shall be moulded in accordance with IS Code of practice. Out of 6 cubes, 3 cubes shall be tested at an age of 7 days. In case of testing in an approved laboratory the contractor shall arrange to transport the cubes from site to the laboratory and forward the test results to the representative of Employer/Consultant. The contractor shall bear all expenses in connection with the preparation of test cubes, cost of concrete, labour and transportation charges to the approved laboratory etc. including laboratory testing charges and his rate for concrete item shall be quoted accordingly.

The Specimens shall be tested as per IS : 516. The samples may be tested at site laboratory generally but should be tested in any other Government Test House or approved laboratory whenever asked for by the representative of Employer/Consultant for which no additional payment shall be made.

The work's concrete cubes shall be deemed to comply with the strength requirements if, the individual variation is not more than +/- 15% of the average test strength of three specimens. For mix design, however, acceptance criterion will be decided based on "Standard Deviation" as per IS : 456.

5.3 Concreting under special condition

The specifications and references given in IS: 456 for concrete in extreme weather condition should be adhered to.

6. 0 DEFECTIVE OR POOR CONCRETE : PROCEOURE FOR DEALING WITH

Concrete, which does not meet the strength requirement, shall be dealt with as under at the discretion of the representative of Employer/Consultant:

I) The structural adequacy *of* the parts affected shall be investigated and any consequential action as needed shall be taken. Costs of any such consequential action or any tests to be advised by the representative of Employer/Consultant are to be borne by the Contractor.

ii) If it is advised by the representative of Employer/ Engineer to retain the concrete having strength less than that specified payment shall be made at a reduced rate pro-rata to the strength obtained if not covered by Cl. (iii) below.

iii) If the deficiency In the opinion of the representative of Employer/Consultant is such as to necessitate removal of the concrete from the structure, then on being so directed by the representative of Employer/Consultant the Contractor at his own expense shall remove the portion of the concrete certified as deficient, and replace by concrete of specified strength at no additional cost.

A register shall be maintained at site by the Contractor with the following details entered and initialed by the Contractor and the representative of Employer/Consultant.

2.

2._

i) Reference to specific structural members receiving the batch of concrete from which the cubes were cast.

Ii) Identification mark on cubes;

iii) Mix of concrete:

iv) Date and Time of casting,

v) Crushing strength as obtained at the end of 28 days and days for each set.

vi) Laboratory in which tested and certificates reference.

Concrete of each grade shall be assessed separately and shall be assessed daily for compliance. Concrete is liable to be rejected if it is porous or honey-combed, its placing has been interrupted without providing a proper construction joint, the reinforcement has been displaced beyond acceptable standard or construction tolerances have not been met. However the hardened concrete may be accepted after caring out suitable remedial measures to the satisfaction of the representative of Employer/Consultant.

7.0 FORM WORK

The form work shall conform to the shape, lines and dimensions as shown on the plans and be so constructed as to remain sufficiently rigid during the placing and compacting of the concrete and shall be sufficiently water light to prevent loss of cement slurry from the concrete.

The allowable tolerances to formwork shall be as under:

I)	Deviation from specified dimensions of cross-section of columns & beams	+/- 3 mm
il)	Plumb	1 in 1000 of height
lii)	Levels	± 3 mm before any deflection has taken place.
iv)	General setting out	+/- 3 mm up to 4 meters and ± 5 mm beyond 4 meters.

Craft paper or polythene sheets shall be used by the Contractor to ensure water tightness without additional costs to the Employer. Form work or centering shall be constructed of steel or timber or shuttering ply and adequately designed to support the impact load of full load of weight concrete and labourers without detection and retain its form during laying *and* setting *of concrete*. Timber used shall be properly seasoned so as to prevent wrapping when wetted. A camber in all directions of 6 mm for every 5 meter span in all slab and beam centering shall be provided to allow for unavoidable sagging due to compression or other causes.

All props either timber *or* steal, shall be straight and of full height and no joints shall be allowed. Where timber props like bullies are used, they shall have a minimum diameter of 100 mm and shall be straight and adequately strong. Props shall be braced with wooden battens and where *additional* staging *is* necessary extra care *shall* be taken to use bigger diameter props with bracing at 4 or 5 levels at no extra cost. All prop shall be supported on sole plates and double wedges. At the time of removing props, wedges shall be gently eased off and not knocked out.

All rubbish, chippings, shavings and saw dust shall be removed from the

interior of the forms and shall be cleaned and thoroughly wetted or treated, if considered necessary, with any approved material before concrete is poured at contractor's own cost. Care shall be taken that for such approved material is kept out of contact with the requirement.

Form work shall be removed when the concrete has reached a strength of at least twice the stress to *which* the concrete may be subjected at the *time* of removal of formwork.

This shall be stripped without shock or vibration and shall be eased off carefully in order to allow the structure to take up its load gradually. Forms shall not be disturbed until concrete has adequately hardened to take up the superimposed load.

In normal circumstances (generally where temperatures are above 20 degree Centigrade and where ordinary Portland cement is used) forms shall be struck after expiry of the following periods unless otherwise directed at site by the representative of Employer/Consultant:

Location	**Striking time in days**
a) Vertical sides of walls, stabs, beams and columns	2
b) Bottoms of slabs upto 4 .5 m span	7
c) Bottom of slabs above 4.5 m span & bottom of beams upto 6 m span	14
d) Bottom of beams over 6 m span	21

8.0 REINFORCEMENT CLEANING, BENDING, PLACING ETC.

8.1 Cleaning of Reinforcement

Before steel reinforcement is placed In position, the surface of the reinforcement shall be cleaned of rust, dust, grease and any other objectionable substances.

8.2 Bar Bending schedule of reinforcement

On receipt of structural drawing, contractor shall prepare bar bending schedule of reinforcement and shall get it approved by the representative of Employer/Consultant.

8.3 Cutting in Reinforcement

Before steel reinforcement bars are cut, the contractor shall study the length of bars required as per drawings and shall carry out to suit the sizes required as per drawings.

8.4 Placing and Security

Reinforcement bars shall be accurately placed and secured in position and firmly supported or wedged by precast concrete blocks of suitable thickness, at sufficiently close intervals so that they will not sag between the supports or get displaced during the placing of concrete or any other operation of the works. It is most important to maintain reinforcement in its correct position without displacement and to maintain the correct specified cover. The contractor shall be responsible for all costs for rectification required in case the bars are displaced out of their correct positions.

8.5 Binding Wire

The reinforcements shall be accurately tied wherever they cross each other or whenever required for with 20 gauge black soft annealed steel wire. The cost of materials and labour required for binding the reinforcement shall be included in the contractors quoted rate for reinforcement.

8.6 WELDING

Welding in lieu of splices may be carried out only after authorization in writing by the representative of Employer/Consultant. Welding shall be carried out as per relevant IS Code of Practice. However, no extra payment shall be allowed for the same.

8.7 Bend etc.

Bends, cranks, etc. in steel reinforcement shall be carefully formed, care being taken to keep bends out of winding. Otherwise all rods shall be truly straight. For any bend minimum radius of eight times diameter of the bar shall be used unless otherwise specified In the drawing. However, in respect of standard hooks the radius of bends shall be two times the diameter of bar. Heating of reinforcement bars to facilitate bending *will not* be permitted. The bars shall be always be bent cold. In case of mild steel reinforcement bars of larger sizes where cold bending is not possible they may be bend by heating with written permission of the representative of Employer/Consultant. Bars when bent shall not be heated beyond cherry *red color and* after bending, shall be allowed to cool slowly without quenching. The bars damaged or weakened in any way in bending shall not be used on the work. High strength deformed bars shall in no case be heated to facilitate bending.

8.8 Inspection of Reinforcement

No concreting shall be commenced until the representative of Employer/Consultant have inspected the reinforcement in position and until

their approval have been obtained. The contractor for inspection of reinforcement shall give a notice of at least 72 hours to the representative of Employer/Consultant. If in the opinion of the representative of Employer/Consultant any material is not in accordance with the specification or the reinforcement is incorrectly spaced, bent or otherwise defective, the contractor shall immediately remove such materials from the site and replace with new and rectify any other defects in accordance with the instruction of the representative of Employer/Consultant to their entire satisfaction at his own cost.

8.9 Cover for Reinforcement

Cover shall be measured from the outer surface of main reinforcement. Cover shall be as follows :

a) At each end of a reinforcing bar, 25 mm or twice the diameter of such rod or bar, whichever is greater,

b) For longitudinal reinforcing bar in beam 25 mm or the diameter of such rod or bar, whichever is greater,

c: For tensile, compressive, shear or in other reinforcement in slab 15 mm or the diameter of such reinforcement whichever is greater,

d) For reinforcement in any other member such as a lintel, chajja, canopy or pardi, 15 mm or the diameters of such reinforcements, whichever is greater,

e) For main reinforcement in isolated footing (side and bottom) clear cover shall be 50mm,

f) For column bars clear cover shall be 40 mm, unless otherwise specified in drawings,

g) For bars In slabs of strip footings and mat foundations clear cover shall be 50 mm. Slab bars shall be placed *over* beam bars, in the case of beam and slab type foundations.

h) For any other types covers is specified in I.S. 456 shall be provided.

8 .1 0 High Strength deformed Bars/Steel

High strength deformed bars manufactured by approved manufacturer conform to Fe 415 Gr. IS 1786-1985 shall be used in *work.*

9. 0 PRE-CAST CONCRETE

a) All thin pre-cast RCC members shall be cast using ply board base and timbered side shuttering s. Casting on floor over sand bed is not permitted.

Reinforcement cage to proper size as per design or instruction shall be placed after pouring concrete for the cover portion , duly leveled.

The top surfaces shall be finished smooth with additional cement in simultaneous operation.

Deshuttering shall be done carefully and rendering with cement mortar shall be immediately carried out.

Pre-cast members shall be fixed in positron only after 15 days curing.

10.0 METHOD OF MEASUREMENTS

10.1 Concrete

a) Actual net volume of work as actually executed and accepted based on the drawing and authorized variation if any shall be measured in Cum unless stated otherwise. No deduction for reinforcements shall be made.

b) Precast concrete work shall be measured in the same way as specified in the foregoing paragraph

10.2 Form Work and Centering

a) Actual net area of form work in contact with concrete shall be measured in Sq m unless stated otherwise, small charmers or fillet (Each not exceeding 10 sq cm. in cross section) and voids not exceeding 200 sq cm each on the exposed surface shall be ignored as if those are non-existent.

b) No separate payment shall be made for form work In case of precast units.

c) The work and payment thereof includes striping off after completion of the work.

10.3 Reinforcement

a) Actually net measurements by weight of reinforcement as actually used in the *permanent* works and accepted shall be paid *for.* Authorized extra for laps, hooks, steel chairs, spacer bars for keeping reinforcements in position shall be measured and paid for. The weight of binding wire or any fixture, shall be excluded from the measurement. The weight of bars shall be as per IS Code taken up to three decimal places. No extra for wastage, unnecessary overlaps or rolling margin shall be paid for.

b) Bar neither shown in drawings nor Instructed by the representative of Employer/Consultant but required *or* constructional facilities shall not be measured.

11.0 TYPICAL FORMAT FOR RECORDING MIX DESIGN RESULTS

Concrete mix of design for M _____. (Grade of MIX) proposed to be used in

(Designations and levels of structural member)

Weight in kgms. of

Cement	Coarse Aggregate	Fine Aggregate	*Aggregate /Cement Ratio*	*Water/Cement ratio*
1	2	3	4	5

Compacting factor 1199	Result of preliminary tests cube Strength at 7 days/ 28 days	Gradation of		fineness module for	
		Coarse Aggregate (C.A.)	Fine Agree gate (F.A.)	Coarse Aggre gate (C.A)	Fine aggre gate (F.A.)
6	7	8	9	10	11

Specific gravity of displacement	current	Absolute Volume	Density of cube by water Method

Coarse Aggregate	Fine			
12	13	14	15	16

Signature of the Testing Laboratory

Signature of the Contactor

SECTION -D

BRICK MASONRY

1.0 BRICK WORK

1.1 General

All brick work shall be carried out as shown on the drawings with setbacks, projections, curvatures, cuttings, footings etc. No additional cost for use of cut backs shall be allowed. Wherever the *proportion* of cement mortar has not been specifically mentioned, cement mortar in the proportion of 1:6 shall be used. Flat brick arches shall be provided wherever required without any extra cost. Brick work shall be kept wet while in progress, till mortar has properly set. Minimum curing period for work shall be 10 (ten) days. On holidays or when work is stopped, top of all unfinished masonry shall be kept wet. Should the mortar become dry, white or powdery, for want of curing, work shall be pulled down and rebuilt at the contractor's expense. All external brick work shall be done from outside by erecting rigid external scaffolds only.

2.0 BRICK MASONRY

2.1 Soaking

All bricks shall be immersed in water for twenty-four hours before being put into work so that they will be saturated and will not absorb water from the mortar.

2.2 Bats

No bats or cut bricks shall be used in the work unless absolutely necessary around irregular openings or for adjusting the dimensions of different course and for closures, in which case, full bricks shall be laid at corners, the bats being placed on the middle of the courses .

2.3 Laying

Unless otherwise specified, the brick work shall be laid In English bond. The brick shall be *laid in* cement mortar to line, level and thoroughly bedded in mortar and all joints shall be properly flushed and packed with mortar and no hollows left anywhere. Brick shall be handled carefully so as not to damage their edges. They should not also be thrown from any height to the ground *but* should be put down gently. *All courses shall* be laid truly horizontal and all vertical joints made truly vertical. Vertical joints on the course and the next below should not come over one another and shall not normally be nearer than quarter of a brick length. Fixtures, lugs, frames etc, if any, shall be built in at places shown in the plans while laying the course only and not later by removal of bricks already laid unless

instructed by the representative of Employer/Consultant.

Care shall kill be taken during construction to see that edges of bricks are not damaged.

The vertically of the walls and horizontally if the courses shall be checked very often with plumb bob and spirit level respectively.

2.4 Joints

Joints shall preferably not exceed 1 0 mm (about 3/8") in thickness,

2,5 Uniform raising

Brick work shall be carried up regularly. In all cases where the nature of work will admit, not leaving any part 60 cm lower than another. But where building at different levels necessary, the bricks shall be stopped so as to give later a uniform level and effective bond. Horizontal courses should be to line and level, and face plumb as shown on the plan. The rate of laying masonry may be up to a height of 80 cm (about 32 inch) per day if cement mortar is used, and 45 cm (about 18 inch) if lime mortar is used.

2.6 Scaffolding

The scaffolding must be strong and rigid stiffened with necessary cross bearers and always decked and beard on the sills with close boarding's/ceilings to prevent injury to persons or damage of materials. The contractor shall have to allow other tradesmen engaged by the employer to make use of the scaffoldings at no addition cost. Rates for brickwork is include all necessary costs and removal on *completion* of suitable scaffolding *needed for the work.* The contractor has to erect scaffolding arrangement for the same including licensing licensing fees etc. shall be borne by the contractor and the employer is kept free from any liability on this account.

3:0 HALF BRICK WORK AND 75/65 MM THICK BRICK WORK

The mortar mix for half-brick and *75/65* mm brick work shall be as specified in the schedule of quantities. Half brick thick and brick on edges *walls* shall be provided wire netting reinforcements. For half brick thick wall and brick on edge wall wire netting shall be provided at every third course and at alternate course respectively with wire netting 40 mm mesh made of 20 SWG soft G. l. iron wire, turned around the specified courses for continuity.

4.0 BRICK FLAT SOLING

For soling the bricks shall be picked slightly over burnt of approved brand, sound, hard, durable, dense, clean, *free* from soft spots, cracks, decay and other defects. Brick Bats shall not be used. All the fillings shall be watered and compacted to at maximum consolidation.

All necessary timings or flitting for laying of the soling In line and required grade shall be done. The sub-grade shall be marked by stacks and strings tor required depth for laying of soling. The cushioning as well as filling at joints shall be done with local sand.

The bricks shall be laid on flat (unless otherwise specified) touching each other. Brick shall be laid in parallel rows breaking bond or in herring bond pattern as directed by the representative of Employer/Consultant and firmly embedded true to line and filled with local sand.

5.0 MEASUREMENTS

The measurements shall be made Nett as per drawing or actual, whichever Is less. No deduction shall be made for ends of dissimilar materials up to 500 sq.crn in section.

SECTION-E

Plastering

1.0 SCAFFOLDING

Scaffolding for carrying out plastering work shall preferably be double scaffolding having two sets of vertical supports so that the scaffolding is independent of the walls.

1.1 Preparation of surface

All putlog holes in brickwork and junction between concrete and brickwork shall be properly filled in advance. Joints in brickwork shall be raked about 5 mm deep and concrete surface hacked to provide the grip to the plaster. Projecting burns of mortar formed due to gaps at joints in shuttering shall be removed.

The surface shall be scrubbed clean with wire brush/coir brush to remove dirt, dust etc. and the surface thoroughly washed with clean water to remove efflorescence, grease and oil etc. and shall be kept thoroughly wet prior to application of plaster.

1.2 Ordinary Cement Plaster

The preparation of surface shall be as stated above. The thickness and proportion of plaster shall be as specified *In* the schedule of Items.

The mortar shall be applied evenly with force on the surface to be plastered. The mortar surface shall be finished at once by being rubbed over with a trowel till the cement appears on the surface. All corners, angles and junctions shall be truly vertical and horizontal as the case may be and neatly finished. Rounding of corners and junctions where required shall be done without extra charges. Plastering in narrow grooves or making designed grooves on plastered surfaces are not separately payable. The *mortar* shall adhere to the surface intimately *when* set and there should be no hollow sound when struck

The completed plastered surface shall be cured for a minimum period of 10 days.

2.0 NEERU FINISH

'Neeru' shall be made of pure fat lime conforming to appropriate class mentioned in IS: 712.

The lime shall be slaked with fresh water and thereafter shifted and reduced to a thick paste by grinding in a mill.

'Neeru' thus prepared shall be kept moist until use and shall be utilized within 15 days after preparation.

A thin layer of 'Neeru' shall then be applied on the plastered surface while it is still green. 'Neeru' shall be rubbed into the surface by trowelling until an even and smooth finish is obtained. Any leveling work etc shall be carried out at the plastering stage itself and not while putting 'Neeru' finish.

The surface shall be kept moist for seven days following which a coat of white wash may be applied, if specified.

3.0 PLASTER OF PARIS

Surface of walls/ceiling where specified shall be treated with plaster of Paris calcium sulphate Hemihydrates materials. It shall have a fineness such that residue after sieving of dry materials for 5 minutes through IS. Sieve designation 3.75 mm. will not exceed 1% by weight & initial setting time shall not be less than 13 minutes. The particular brand of this special plaster and its composition must be previously approved by the Consultant/Employer.

The paste of material made with water shall be applied by means of English Trowel.

The entire surface must be very smooth on completion and unevenness must be removed. Special trained and skilled artisans with previous experience of this *work* will have to be employed for the purpose of achieving high grade finish. Before application of plaster of paris, the surface to be treated shall be thoroughly cleaned, brushed and patching must be scraped properly and all holes, cracks and patches shall made good with approved materials.

3.0 METHOD OF MEASURMENT

Measurement shall be in sq. mt as per drawing or actual whichever is less. Half the area of opening shall be deducted *for* each face of wall plaster and jambs and soffits will not be separately paid for. Deduction for ends of dissimilar materials if less than 0:5 sq. mt. will not be made.

SECT!ON - F

FLOOR FINISHING

1.0 TERRAZZO (MARBLE CHIPS) FLOORING LAID IN SITU

1.1 General

The thickness of the under layer shall be measured with a permissible tolerance of +/- 3 mm. The thickness of the top layer after polishing shall be measured with a tolerance of +/- 1.5 mm.

1 .2 Under Layer:

Cement concrete of specified mix shall be used. The panels shall be of sizes as directed by representative of Employer/Consultant and generally not exceeding 2 sq. mt. in *area* and 2 Mt in length for inside situations. In exposed situations the length of any side of the panel shall preferably be not more than 1.25 Meters or as directed. Cement slurry @ 2.00 kg. per sq. mt. shall be applied before laying of under layer over the cement concrete / R C. C. surface which will not be separately paid for.

1 3 Strip Fixing

Glass strips or aluminum strips as given in the schedule shall be fixed with their top at proper level.

1.4 Top laver

Mortar: The mix for terrazzo topping shall consist of cement with or without pigment, marble powder, marble aggregate (marble chips) and water. The cement and marble powder shall be mixed in the proportion of 3 parts of cement to one part marble powder by weight. For every part of cement marble powder mix, the proportion of aggregate by volume shall be as follows

Size of Aggregate	Proportions of Aggregates to binder mix
For predominantly grade 00,0 and 1	1.50 parts
For predominantly grade 2 and 2	1.25 parts
For predominantly grade 4 and 5	1.25 parts

Grade No.	Size of Aggregate in (MM)	Minimum thickness of top layer in(MM)
00	1-2	6
0	2-4	9
1	4-7	9
2	7-10	12

Where aggregate of size larger than 10 mm are used the minimum thickness of topping shall not be less than 1.5 times the maximum size of the chips. Where large size chips such as 20 mm or 25 mm are used they shall be used only with a flat shape and bedded on the flat face so as to keep the maximum thickness of wearing layer. Before starting the work, the Contractor shall get the sample of marble chips approved by the representative of Employer/Consultant. The cement to be used shall be ordinary grey cement, white cement, colored cement or cement with admixture of coloring matter of approved quality in the ratio specified in the description of the Item or in the ratio to get the required shade as ordered by the representative of Employer/Consultant. Coloring matter where specified, shall be mixed dry thoroughly with the cement and marble powder and then chips added and mixed as specified above. The full quantity of dry mixture of mortar required for a room shall be prepared in a lot in order to ensure a uniform colour. This mixture shall be stored in a dry place and well covered and protected from moisture. The dry mortar shall be mixed with water in the usual way as and when required. The mixed mortar shall be homogeneous and stiff and contain just sufficient water to make it workable.

The terrazzo topping shall be laid while the under layer is still plastic but has hardened sufficiently to prevent cement from rising to the surface. This is normally achieved between 18 to 24 hours after the under *layer* has been *laid. A* cement slurry preferably of the same color as the topping shall be brushed on the surface immediately before laying is commenced. It shall be laid to a uniform thickness slightly more than that specified in order to get *the* specified finished thickness after rubbing. The surface of the top layer shall be toweled over, pressed and brought true to required level by a straight edge and steel floats in such a manner that the maximum amount or marble chips come up and *are* spread uniformly over the surface.

1.5 Polishing, Curing and Finishing

Polishing shall be done by machine. About 36 hours after laying the top layer, the surface shall be watered and ground evenly with machine fitted with special rapid cutting grit blocks (carborundum stone) of coarse grade (No 60) till the marble chips are evenly exposed and the floor is smooth. After the first grinding, the surface shall be thoroughly washed to remove all grinding mud and covered with o grout of cement or/and coloring matter in same

mix and proportion as the topping in order to fill any pin holes that appear. The surface shall be allowed to cure for 5 to 7 days and then ground with machine fitted with fine grit blocks (No.120). The surface is cleaned and repaired as before and allowed to cure again tor 3 to 50 days. Finally the third grinding shall be done with machine fitted with fines grade grit blocks (No.320) to get even and smooth surface without pin holes. The finished surface should show the marble chips evenly exposed.

Where use of machine for polishing is not feasible or possible, rubbing and polishing shall be done by hand, in the same manner as specified for machine polishing except that carborundum stone of coarse grade (No 60) shall be used for the 1st rubbing, stone of medium grade (No. 80) for second rubbing and stone of fine grade (No 120) for final rubbing and polishing.

After the final polish either by machine or by hand, oxalic acid shall be dusted over the surface @ 33 gm per square meter sprinkled with water and rubbed hard with a namdah block (Pad of woolen rags). The following day, the floor shall be wiped with a moist rag and dried with a soft cloth and finished clean.

Curing shall be done by suitable means such as laying moist, sawdust or ponding water. The finished floor shall not sound hollow when lapped with a wooden mallet.

1.6 Precautions :

Flooring in lavatories and bathrooms shall be laid after fixing of squatting pans and floor traps. Traps shall be plugged, while laying *the floors* and opened after the floors are cured and cleaned. Any damage done to W.C.'s squatting pans and floor traps during the execution of work shall be made good by the Contractor.

During cold weather, concreting shall not be done when the temperature falls below 4 degree centigrade. The concrete placed shall be protected against frost by suitable coverings. Concrete damaged by frost shall be removed and work redone. During hot weather, precautions shall be taken to see that the temperature of wet concrete does not exceed 38 degree centigrade. No concreting shall be laid within half an hour of the closing time of the day unless permitted by the representative of Employer/Consultant.

The floor shall be protected from any damage during the execution of work.

2.0 TERRAZZO (MARBLE CHIPS) SKIRTING-IN-SITU

2.1 Thickness:

The thickness of the bottom and top coats shall be as specified. The total thickness of skirting specified is of the total thickness of plaster as measured

from the unplastered face of the masonry. Average thickness of the under coat shall not be less than 6 mm and minimum thickness *over* any portion of the surface shall not be less than 4 mm. A tolerance of 1.5 mm is applicable over the finished specified lop coat.

3.0 GLAZED / UNGLAZED CERAMIC TILE FLOORING:

3.1 Preparation of Surface and Laying

Sub-grade concrete or the RCC slab on which the tiles are to be laid shall be cleaned, wetted and mopped. The bedding *tor* the tile shall be either with cement mortar 1:3 (1 cement: 3 coarse sand) or approved cement based ready to use mortar on cement plastered (1:3) surface as specified. The average trickiness of the bedding for cement mortar shall be 10 mm while the thickness under portion of the tiles shall not be less than 5 mm.

Mortar shall be spread, tamped and corrected to proper levels and allowed to harden sufficiently to offer a rigid cushion for the tiles to be set and to enable the mason to place wooden plank across and squat on it.

Over this mortar bedding neat grey cement slurry of honey like consistency shall be spread @ 3.3 Kg of cement per square meter over such an area as would accommodate about twenty tiles. Tiles shall be soaked in water washed clean and shall be fixed in this grout one after another, each tiles gently being tapped with a wooden mallet till it is properly bedded and in level with the adjoining tiles. The joints shall be kept as thin as possible and in straight lines or to suit the required pattern.

The surface of the flooring during laying shall be frequently checked with a straight edge about 2 m long so as to obtain a true surface with the required slope.

Where full sizes tiles cannot be fixed these shall be cut to the required sizes and their edged rubbed smooth to ensure straight and true joints.

Tiles, which are fixed in the floor adjoining the wall, shall enter not less than 10 mm under plaster, skirting or dado.

After tiles have been laid surplus cement grout shall be cleaned off.

3.2 Pointing and Finishing :

The grey cement grouts in joins shall be cleaned of with wire brush or trowel to a depth of 2 mm to 3 mm and all dust and loose mortar removed. Joints shall then be flush pointed with white cement added with pigment if required to match the colour of tiles. The floor shall then be kept wet for 7 days. After curing, the surface shall be washed and finished clean. The finished floor shall not sound hollow when tapped with a wooden.

4.0 CERAMIC TILES IN SKIRTING AND DADO

4.1 Laying

Tiles shall be laid either on 12 mm thick plaster of cement mortar 1:3 (1 cement : 3 coarse sand) or *mix* as specified shall be applied and allowed to harden. The plaster shall be roughened with wire brushes or by scratching diagonally closed intervals. The plaster thickness shall be reduced, as directed only for a leveling course, when ready to use approved cement based mortar is used.

The tiles should be soaked in water, washed clean and a coat of cement slurry or ready to use cement based mortar as the case may be applied liberally at the back of tiles and set in the bedding mortar. Approved epoxy adhesives, if specified in the bill of quantities shall be used in lieu of cement blurry as per manufacturer. The tiles shall be tamped and corrected to proper plane and lines. The tiles shall be set in the required pattern and butt jointed. The joints shall be as fine as possible. Top of skirting of dado shall be truly horizontally except where otherwise Indicated. Full size tiles cannot be fixed, these shall be cut (sawn) to the required size and their edges rubbed smooth.

4.2 Curing and Finishing:

The joints shall be cleaned off the grey cement grout with wire brush or trowel to a depth of 2 mm to 3 mm and all dust and loose mortar removed. Joints shall then be flush pointed with white cement added with pigments if required to match the color of tiles. The surface shall then be kept wet for 7 days.

After curing, the surface shall be washed and finished clean. The finished work shall not sound hollow when tapped with a wooden matter.

5.0 KOTA / CUDOAPAH STONE FLOORING

5.1 Dressing:

Every slab shall be cut to the required size and shape and fine chisel dressed on the sides to the full depth so that a straight edge laid along the side of the stone shall be full contact with it. The sides (edges) shall be table rubbed with coarse sand or machine rubbed before paving. All angles and edges of the tiles shall be true, square and free *from* chippings and the surface shall be true and plane.

5.2 Preparation of Surface and Laving :

The sub-grade concrete or the RCC slab on which the slabs are to be laid

shall be cleaned, wetted and mopped. The bedding for the slabs shall be with cement mortar 1:4 (1 cement : 4 coarse sand) or with lime mortar (1 lime putty: 1 surkhi : 1 coarse sand) as given in the description of the item except that the edges of the slabs to be jointed shall be buttered with grey cement, with admixture of pigment to match the shade of the slab.

5 3 Polishing and Finishing:

The day after the slabs are laid all joints shall be cleaned of the grey cement grout with a wire brush or trowel to a depth of 5 mm and all dust and loose mortar removed and cleaned. Joints shall then be grouted with grey or white cement mixed with or without pigment to match the shade of the stone slabs. The flooring, thus laid, shall be ground evenly with machine as spooned In Para 3.2, except that (a) first polishing with coarse grade carborundum stone shall not be done, (b) cement slurry with or without pigment shall not be applied on the surface before polishing.

6.0 KOTA / CUDDAPAH STONE IN SKIRTING, DADO, RISERS, STEPS ETC.

6.1 Preparation of Surface:

Shall be as specified In case of Glazed tiles and Dado.

6.2 Laying:

The stone slab for risers of steps and skirting/dado shall be set in grey or white cement admixed with or without pigment to match the shade of the stone as specified in the description of the item, with the line of *the* slab at such a distance from *the* wall so that the average width of the gap shall be 20 mm and at no place the width shall be less than 15 mm. If necessary, fixed in the wall at suitable intervals. The skirting/dado or riser face shall be checked for plane and plumb and corrected. The joints shall thus be left to harden then the rear of the skirting or risers slab shall be paced with cement mortar 1:3 (1 cement: 3 coarse sand) or other mix as specified in the description of the item. The fixing hooks shall be removed after the mortar filling the gap has acquired sufficient strength.

6.3 Curing, Polishing and Finishing:

It shall be as specified in Para 5.3 as applicable, except that cement slurry with or without pigment shall not be applied on the surface and polishing shall be done only with hand. The face and top skirting shall be polished.

7.0 ARTIFICIAL STONE FLOORING

Selection of materials, method of mixing placing and compacting shall generally conform to the specifications under plain and reinforced cement

concrete described earlier. A stiff mix consistent with workability shall be used.

7.1 Preparation of surface:

Before the operation for laying topping is started the surface of base concrete shall be thoroughly cleaned of all dirt, loose particles, caked mortar, droppings and laitance, if any by scrubbing with coir or steel wire brush. Where the concrete has hardened so much that roughening of surface by wire brush is not possible, the surface shall he roughened by chipping or hacking at close intervals. The surface shall then be cleaned with water and kept for 12 hours and surplus water shall be removed by moping before the topping is laid.

7.2 STRIP FIXING

Where mentioned glass strips or Aluminum stripe as given in the schedule shall be fixed with their top at proper level.

7.3 LAYING

The screed strips shall be fixed over the base concrete dividing it into panels. The panels shall be uniform size and no dimension of a panel shall exceed 2 mt and the area of a panel shall not be more than 2 sq. cm. Before placing the concrete for topping, neat cement slurry shall be thoroughly brushed into the prepared surface of the base concrete just ahead of the finish. Concrete of specified proportion and thickness shall be laid in alternate panels to required level and shape and thoroughly tamped.

7.4 Finishing the surface

After the concrete has been fully compacted it shall be finished by toweling or floating with mixed cement rendering. Finishing operations shall start shortly after the *compaction* of concrete and the surface shall be toweled three times at intervals so as to produce a uniform and hard surface. The satisfactory resistance of floor to wear depends largely upon the care with which trowelling is carried out. The time interval allowed between successive troweling is very important. *Immediately* after placing cement rendering, only just sufficient trowelling shall be done to give a level surface. Excessive trowelling in the earlier stages shall be avoided as this tends to bring a layer rich in cement to the surface. Some time, after the first trowellinq the duration depending upon the temperature, atmospheric condition and the rate of set of cement used, the surface shall be re-trowelled to close any pores in the surface and to bring the surface and to scrap off the excess water in concrete. No dry cement shall be used directly on the surface to absorb moisture or to stiffen the mix. The final trowelling shall be done well before the concrete has become too hard but at such a time that considerable pressure is required to make any impression on the surface. If directed by the representative of Employer/Consultant, approved mineral pigment shall be added to the rendering to give desired color and shape, to the flooring at no extra cost. The finished floor shall not sound hollow when tamped with a wooden mallet.

8.0 CHEQUERED TILES:

The tiles of approved color shall be of normal size as 20 x 20 cm, 25 x 25 cm and 30 x 30 cm or of standards sizes with equal sides. The size of tiles to be used shall be as shown in drawings or as required by the representative of Employer/Consultant. The centre to centre distance of chequers shall not be less than 2.5 cm and not more than 5 cm.

The grooves in the chequers shall be uniform and straight. The depth of the grooves shall not be less than 3 mm.

The chequered tiles shall be cement tiles, or terrazzo tiles as specified in the description of the item. The thickness of the upper layer measured from the top of the chequers shall not be less than 6 mm.

The tiles shall be given the first grinding with machine before delivery to site. The tiles shall be manufactured under hydraulic pressure of not less than 140 kg per square centimeter and shall be given the first grinding with machine before delivery to site.

All exposed joints shall be pointed using mortars/water proof adhesives, as specified with admixture of pigment, duly approved by representative of Employer/Consultant to match the shade of marble.

Green work shall be protected from rains/adverse weather conditions by suitably *covering* the same. The work shall be kept constantly moist for a period of 7 days.

The entire work shall be cleaned by acid polishing on completion of work.

The proportion at cement to aggregate in the backing of the tiles shall not be leaner than 1:3 by weight. Similarly, the proportion of cement to marble chips aggregate in the wearing layer of the tiles and the proportion of pigment to be used therein shall not exceed 10 per cent of weight of cement used in mix.

8.1 Laying and Curing

Laying and curing shall be as specified for terrazzo tiles.

9.0 CRAZY MARBLE FLOORING

Crazy marble flooring shall be laid on cement concrete sub-grade. The surface of the sub-grade shall be hacked roughened with steel wire brushes, washed clean & scared with a floating coat of cement slurry @ 2 Kg/Sq Cm to provide bond between sub-grade and flooring.

The under layer of specified thickness and mix shall then be laid over it.

After spreading cement slurry mix @ 2 Kg/Sq. Mt. over the under layer marble stone picks of approved size shape and color free from strains, crack decay etc. shall be laid piece by piece in the manner advised in such a way that the top surfaces of all stone pieces are true to the required level. After fixing of stone pieces, the gap is filled up with *the* mix of binder Marble chips (4:7) by volume, the binder being a mix of cement (with or without pigment) : marble dust (3:1) by weight. The filled surface shall be toweled, pressed so as to bring it to the level of stone pieces. Polishing, curing and finishing shall be done as done for in-situ terrazzo flooring and specified elsewhere.

10) METHOD OF MEASUREMENTS

Flooring work shall be measured net as per drawing or actual, whichever is less. Measurements for flooring shall be upto the wall (before plaster) and that for skirting shall be from above the floor finish.

Nett laid area shall be measured in square meters correct to two decimal places.

11.0 TERRAZO TILE/MOSAIC TILE FLOORING

11.1 TERRAZO TILES

Terrazzo tile shall be of best quality of approved manufacturer and generally conform to IS : 1237 latest publication.

The specific sizes of tiles to be used shall be as shown in the drawings or as approved.

11.1.2 TOLERANCE

Tolerance on length and breadth shall be plus or minus one millimeter; tolerance on thickness shall be plus 5 mm. The range of dimensions in any one delivery of tiles shall not exceed 1 mm on length and breadth and 3 mm on thickness.

11.1.3

The tiles shall be manufactured under hydraulic pressure of not less than 140 kg. per Square Centimeter and shall be given the first grinding with machine before delivery to site.

11 1.4

The proportion of cement to aggregate in the backing of the tiles shall not be leaner than 1:3 by weight. Similarly the proportion of cement to marble chips aggregate in the wearing *layer* of the tiles and the proportion of pigment to be used therein shall not exceed 10 per cent of weight of cement used in mix.

11.1.5

The finished thickness of the upper layers shall not be less than 5 mm for size of Marble chips from the smallest up to 6 mm *and* also, not less than 5 mm for size of Marble chips ranging from the smallest up to 12 mm and not less than 6 mm for sizes of marble chips varying from the smallest up to 20 mm.

11.1.6 LAYING

Sub grade concrete or the R.C.C slab on which the tiles are to be laid shall be cleaned, wetted and mopped.
The average thickness of the bedding mortar shall be 20 mm and the thickness at any place shall not be less than 10 mm.

11.1.7

The surface of the flooring during laying shall be frequently checked with a straight edge at least 2 meter long, so as to obtain a true surface With the required slope.

11.1.8

Where full sizes tiles cannot be fixed, these shall be cut (sawn) to the required size and their edges rubbed smooth to ensure a straight and true joint.

11.1.9

Tiles which are fixed in the floor adjoining the wall shall enter not less than 12 mm under the plaster, skirting *or* dado. The junction between wall plaster and tile work shall be finished neatly and without waviness.

11.1.10

After the tiles have been laid, surplus cement grout that may have come out of the joint shall be cleaned off.

11 2 <u>Curing, Polishing and Finishing:</u>

11.2.1

The day after the tiles are laid all joints shall be cleaned of the grey cement grout with a wire brush or trowel to a depth of 5 mm and all dust and loose mortar removed and cleaned. Joints shall than be grouted with grey or white cement mixed with or without pigment to match the shade of the topping of the wearing layer of the tiles. The same cement slurry shall be applied to the entire surface of the tiles in a thin coat with a view to protect the surface from abrasive damage and fill the pinholes that may exists on the surface.

11.2.2

The floor shall than be kept wet for a minimum period of 7 days. The surface Shall thereafter be grounded evenly with machine fitted with coarse grade grit Blocks (No 60). Water shall be used profusely during grinding. After grinding the surface shall be thoroughly *washed* to remove all grinding mud, cleaned and mopped. It shall It than be covered with a thin coat of grey or white cement, fixed with or without pigment to match the color of the topping of the wearing surface in order to fill any pin hole that appear. The surface shall be again cured. The second grinding shall then be carried out with machine fitted with fine grade grit blocks (No. 120).

11 2:3

The final grinding with machine fitted with the finest grade grit blocks (No. 320) shall be carried out the day after the second grinding described in the preceding Para or before handing over the floor, as ordered.

For hand polishing the following carborundum stones, shall be used:

1st grinding--coarse grade stone (No. 60).

Second grinding--medium grade (No. 80).

Final grinding-fine grade (No 120).

In all other respects, the process shall be similar as for machine polishing.

11. 2.4

After the final polish, oxalic acid shall be dusted over the surface at the rate of 33 gm per square meter sprinkled with water and rubbed hard with a 'namdah' block (pad of woolen rags). The following day the floor shall be wiped with a moist rag and dried with a soft cloth and finished clean.

11.2.5

If any tile is disturbed or damaged, it shall be refitted or replaced, properly jointed and polished. The finished floor shall not sound hollow when tapped with a wooden mallet.

11 .2.6 <u>Measurements:</u>

Terrazzo tile flooring shall be measured as laid in square meter correct to two places of decimal. For length and breadth dimensions correct to a cm before laying skirting, dado or wall plaster shall be taken. No deduction shall be made nor extra paid for any opening in the floor of area up to 0.1 square meter (10 cm2). Nothing extra shall be paid for use of cut tiles nor for laying the floor.

11.2.7. Terrazzo tile flooring laid in floor borders and similar band shall be

measured under the Item of terrazzo tile flooring. No extra shall be paid in respect of similar bands formed of half sizes or multiples of half size standard tiles or other uncut tiles .

Skirting & dado paved with tiles shall be measured as follows:

The thickness of the skirting shall be as stated in the schedule of quantity. Length shall be measured along the finished face of riser, skirting or dado correct to a cm. Height shall be measured from the finished level of tread or floor to the top (the underside at tread in the case of steps). This shall be measured correct to 3 mm in case of riser skirting and dado. The area shall be calculated in square meter, correct to two places or decimal.

11.2.8. Rate

The rate shall include the cost of all materials and labor involved in all the operations described above.

12.0 MARBLE STONE FLOORING

12.1 Marble:

Marble shall be hard, sound dense and homogeneous in texture with crystalline texture. *It* shall be uniform in color and free from stains, crack, decay and weathering.

12.1.1. Dressing of Slabs:

Every stone shall be cut to the required size and shape, fine chisel dressed on all sides to the full depth so that a straight edge laid along the side of the stone shall be fully *in* contact with it. The top surface shall also be fine chisel dressed to remove all waviness. The sides and top surface of slabs shall be machined rubbed or table rubbed with coarse sand before paving. All angles and edges of the marble slabs shall be true, square and free from chippings and the surface shall be true and plain.

The thickness of the slabs shall be 20, 30 or 40 mm as specified in the description of the item. Tolerance of ± 2 mm shall be allowed for the thickness. In respect of length and breadth of slabs *a* tolerance of 5 mm shall be allowed.

12.1.2 Laying:

12.1.3 Sub-grade concrete or the RC.C. slab on which the slabs age to be laid shall be cleaned, wetted and mopped. The bedding of the slabs shall be with cement mortar 1:4 (1 cement : 4 coarse sand) or as given in the description of the Item.

12.1 .4 The average thickness of the bedding mortar under the slab shall be 20 mm and the thickness at any place *under* the slab not be less than 12 mm.

12.1.5 The slab shall be laid in the following manner :-

Mortar of the specified mix shall be spread under tile area of each slab, roughly to the average thickness specified in the item. The slab shall be washed clean before laying. It shall be laid on top, pressed tapped with wooden mallet and brought it to level with the adjoining slabs. It shall be lifted and laid aside. The top surface of the mortar shall then be corrected by adding fresh mortar at hollows. The mortar is allowed to harden a bit and cement slurry of honey like consistency shall be spread over the same at the rate of 4.4 kg. of cement per sq. mt. The edges of the slab already paved shall be buttered with grey or white cement with or without admixture of pigment to match the shade of the marble slabs as given in the description of the item. The slab to be paved shall then be lowered gently back in position and tapped with wooden mallet till it is property bedded in level with and close to the adjoining slab with as fine a joint as possible. Subsequent slabs shall be laid in the same manner. After each slab has been laid, surplus cement on the surface of the slabs shall be cleaned off. The flooring shall be cured for a minimum period of seven days. The surface of the flooring as laid shall be true to levels and slopes as instructed.

12.1.6 The slabs shall be matched as shown in drawings or as instructed by the Consultant Employer.

12.1.7 Slabs which are fixed in the floor adjoining the wall shall enter not less than 12 mm under the plaster skirting or dado. The junction between wall plaster and floor shall be finished neatly and without waviness.

12.1.8 <u>Polishing and Finishing ;</u>

Slight unevenness at the meeting edges of slabs shall then be removed by the chiseling finished in the same manner as specified in 11.2 of Terrazo Mosaic flooring except that cement slurry with or without pigments shall not be applied on the surface before each polishing.

12.1.9 <u>Measurements</u>

Marble stone flooring with different kind of marble shall be measured separately and in square meter correct to two places of decimal. Length and breadth shall be measured between the finished faces of skirting, dado or wall plaster as the case may be, correct to a cm. No deduction shall be made nor extras paid for any opening in the floor of area up to 0.05 sq m (5 dm2). No extra shall be paid for laying the floor at different levels. Steps and

treads of stairs paved with marble stone slabs shall also be measured under the item of "Marble stone flooring". The width of treads in all cases shall be measured from the outer line to the finished face of riser.

12.1.10 Rate:

The rate shall include the cost of all materials and labor involved in all the operation described above.

12.2 Marbles stone in Risers of steps, Dado and Skirting

12.2.1 Marble stone slabs and dressing of slabs shall be as specified in 12.1.1 except that the thickness of slabs shall be as specified in the schedule quantities. A tolerance of +/- 2 mm shall be allowed unless otherwise specified in the description of the item.

12.2.2 Preparation of Surface :

The joints shall be racked out to a depth of at least 15 mm in masonry walls, while the masonry is being laid. In case of concrete walls, the surfaces shall be hauked and roughened with *wire* brushes. The surface *shall* be cleaned thoroughly, washed with water and kept wet before skirting risers of steps, dado and skirting is commenced. Where necessary, the wall surface shall be cut uniformity to the requisite depth so that the face shall have the projection from the finished *face of wall as shown in drawings or as required by the Employer/Consultant.*

12.2. 3. LAYING:

The risers of steps, dado and skirting shall be set in grey or white cement admixed with or without pigment to match the shade of the stone, *specified* in the description of the item with the line of the slab at such a distance from the wall that the average width of the gap shall be 12 mm and at no place the width shall be less than 10 mm. If necessary, the slabs shall be held in position by temporary M. S. hooks fixed Into the wall at suitable intervals. The skirting *or* riser face shall be checked for plane and plumb and connected. The Joints shall thus be left to harden then the rate of the skirting or riser face shall be packed with cement mortar 1 3 (1 cement: 3 coarse sand) *of* other *mix* as specified in the description of *the* item. *The* fixing hooks shall be removed after the mortar filling the gap has acquired sufficient strength.

The Joints shall be as fine as possible. The top line of skirting and risers shall be truly horizontal and Joints truly vertical, except where otherwise indicated.

The risers, dado and skirting slab shall be matched as shown in drawings or as instructed by the Consultant/Employer.

12.2. 4. Curing, Polishing And Finishing:

It shall be as specified in 11.2 of terrazzo mosaic flooring as far as applicable except that cement slurry with or without pigment shall not be applied on the surface and polishing shall be done only with hand. The face and top shall be polished.

12.2.5 Measurements

Lengths shall be measured along the finished face of riser or skirting, correct to a cm. Height shall be measured from *the* finished level of tread or floor, to the top (the underside of tread, in the case of steps) correct to 1 mm. The area shall be calculated in square meter correct to two places of decimal.

12.2..6 Rate:

The rate shall include the cost of all materials and labour involved in all the operations described above.

13.0 MARBLE *I* DHOLPUR STONE *I* GRANITE SLAB IN SURFACE VENEERING WORK IN WALL LINING

13 1 Marble work shall be paid by under veneer work.

13.1.1 Dressing:

Dressing shall be same as specified in 12.1.1 except that the back shall not be dressed, but left rough cut, in order to ensure a good grip with the hearting or backing. The dressed slabs shall be of the thickness as specified with a tolerance of ± 2 mm. The tolerance in wall lining when a straight edge of 3 mt length is placed should not exceed more than 2mm.

13.1.2. Laying And Fixing :

The slab shall be sufficiently wetted before laying to prevent absorption of water from mortar. Sub-grade concrete or the RCC slab on which the slabs are to be laid shall be cleaned, wetted and mopped. The bedding tor the stabs shall be as specified in the schedule of quantities. Care shall be taken to match the grains of veneer work as directed by the Consultant/Employer. For purpose of matching, the grains the marble slabs shall be selected judiciously having uniform pattern of veins/streaks. Preferably, the slabs shall be those got out of the same block from the quarry. The area to be veneered shall be reproduced on the ground and the marble slabs laid in position and arranged in the manner to give the desired matching of grains. Any adjustment needed for achieving the best results shall be then carried out by replacing or interchanging the particular slabs. Special care shall be taken to achieve the continuity of grains between the two slabs one above

the other along the horizontal joints. This shall then be got approved from me Consultant/Employer and each marble slab numbered properly and the same number shall be marked on a separate drawing as well as on the surface to be actually veneered, so as to ensure the fixing of the particulars slab on the correct location.

In case of marble slabs, granite slabs, dholpur stone adjoining pieces shall be secured to each other by means of 75 mm long 6 mm dia brass pins. The slabs shall also be secured to the backing masonry or concrete surface by means of 25 mm x 6 mm size brass cramps of suitable length. Pins cramps shall be got approved before use. They shall be fixed using cement mortar.

For the facing of the columns also the same procedure as mentioned above shall be followed.

13.1,3 Joints:

All joints shall be full of mortar. Special case shall be taken to see that groundings for veneer work are full of mortar. If any hollow groundings are detected by tapping the face stones, these shall be taken out and re-laid. The thickness of the face joints shall be uniform, straight and as fine as possible not more than 1.5 mm and in the face Joint the top 6 mm depth shall be filled with mortar specified for the pointing.

13.1.4 Mortar;

The mortar used for jointing shall be as specified in the bill of quantities.

13.1.5 Curing: - The work shall be kept constantly moist on all faces for period of at least 7 days.

13.1.6 Finishing :- After the marble work is cured, it shall be rubbed with carborandum stone of different grades, No 60, 120 and 320 In succession, so as to give a plane true and highly smooth surface. It shall then be cleaned *with* a solution of oxalic acid washed and finished clean.

13.1.7: Protection :- Green work shall be protected from rain by suitable coverings. The work shall also be suitably protected from damage during construction.

13.1.8: Scaffolding :- Double scaffolding having two sets of vertical supports shall be provided, where necessary. The supports shall be sound and strong, tied together by horizontal pieces, over which the scaffolding planks shall be fixed.

13.1 9 Tolerances:

13.1.10 Slabs:

(a)Length + 2 percent

(b) width

(c) Thickness ± 3 percent

13.1.11 Measurements:
The length and breadth shall be measured correct to a cm. The area shall be calculated in square meter nearest to two places of decimal.

13.1.12 Rate:
The rate includes the cost of material and labor required for all the operations described above, except for the cost of providing and fixing brass pins etc. which shall he paid for separately, as stipulated in the item of work.

14.0 CEMENT CONCRETE FLOORING WITH METALLIC HARDENER TOPPING

14.1 The thickness of cement concrete flooring and metallic hardener topping shall be as specified in schedule of quantities.

14.1.1 Metallic Hardening Compound:

The Meramec hardening compound shall be approved quality consisting of uniformly graded iron particles, free from non-ferrous metal particles, oil, grease, sand, soluble alkaline compounds.

14.1.2 Sub-Grade :

Shall be as specified in 7.0 Artificial stone flooring.

14.1.3 Under layer :

Cement concrete flooring of specified thickness and mix shall be laid as under layer. The top surface shall be roughened with brushes while the concrete is still green and the forms shall be kept projecting up 12 mm over the concrete surface, to receive the metal hardening compound topping.

14.1.4 Topping:

The topping shall consist of 12 mm thick layer mix of 1:2(1 cement and two stone aggregate 6 mm normal size) by volume specified with which Metallic hardener compound as mixed in the ratio of 1:4(1 metallic concrete hardener and 4 cement) used by weight. Concrete hardener shall be mixed thoroughly with cement on a clean dry pucca platform. The dry mixture shall be mixed with stone aggregate 6 mm nominal size or as otherwise specified in the ratio of 1:2(1 cement and 2 stone aggregate) by volume and well turned over. Just enough water shall then be added to this dry mix as required for floor concrete.

The mixture so obtained shall be laid in 12 mm thickness, on cement floor

within 2 to 4 hours of its laying. The topping shall be laid true to provide an uniform and even surface. It shall be firmly pressed in to the bottom concrete so as to have good bond with it. After the initial set has started, the surface shall be finished smooth and true to slope with steel floats.

The men engaged on finishing operation shall be provided with raised wooden platform to sit on, so as to prevent damage to new work.

14.1.5 Curing :

The curing shall be done for a minimum period of 10 days. Curing shall not be commenced until the top layer has hardened. Covering with empty cement gunnies shall be avoided as the color is likely to be bleached with the remoments of cement matter from the bags.

14.1.6 Measurements:

Length and breadth shall be measured correct to 3 cm and its area as laid shall be calculated in sq. m correct to two places of decimal length and breadth shall be measured before laying skirting dado or wall plaster. No deduction shall be made nor extra paid for any opening in the floor of area up to 0.10 sq m.

The flooring done with strips (in one operation) and without strips (in alternate panels) shall be measured together.

14.1.7 Rate

The rate shall include the cost of all materials and labor involved in all operations described above including application of cement slurry on RCC slab or on sub- grade including roughening and cleaning the surface etc.

SECTION - G

EXTERNAL AND INTERNAL PAINTING WORKS

1.0 WHITE WASING WITH LIME

1.1 Scaffolding

Wherever scaffolding is necessary, it shall be erected on double supports tied together by horizontal pieces, over which scaffolding planks shall be fixed. No bullies, bamboos or planks shall rest on or touch the surface which is being white washed.

For all exposed brick work or tile work, double scaffolding having two sets of vertical supports shall be provided. The supports shall be sound and strong, tied together with horizontal pieces over which scaffolding planks shall be fixed.

Note In case of special type of brick work, scaffolding shall be got approved from representative of Employer/Consultant in advance.

Where ladders are used, pieces of old gunny bags shall be tied on their tops to avoid damage or scratches to walls.

For while washing the ceiling, proper stage scaffolding shall be created.

1.2 Preparation of surface

Before new work is white washed the surface shall be thoroughly brushed free from mortar droppings and foreign matter.

In the case of old work, all loose pieces and scale shall be scrapped off and holes In plaster as well as patches of less than 50 sq.cm. area shall be filled up with mortar of the same mix where so specifically ordered by the representative of Employer /Consultant, the entire surface of old white wash shall be thoroughly removed by scrapping and this shall be paid for separately.

1 .3 Preparation of Lime Wash

The wash shall be prepared from good quality fresh stone white lime. The lime shall be thoroughly slaked on the spot, mixed and stirred with sufficient water to make a thin cream. This shall be allowed to stand for a period of 24 hours and then shall be screened through a clean coarse cloth. 40 gm of gum dissolved in hot water, shall be added to each 10 cubic decimeter of the

cream. The approximate quantity of water to be added in making the cream will be 5 liters of water to one kg of lime.

If not directed otherwise, Indigo (Neel) upto 3 gm per kg of lime dissolved in water shall be added and wash stirred well. Water shall than be added at the rate of about 5 liters per kg of lime to produce a milky solution. In case of lime wash on the surface finished with lime punning no indigo should be used unless otherwise directed by the representative of Employer/Consultant.

1.4 Application

The white wash shall be applied with moonj brushes to the specified number of coats. The operation for each coat shall consist of a stroke of the brush given from the top downwards, another from the bottom upwards over the first strike, and similarly stroke horizontally from the right and another from the left before it dries.

Each coat shall be allowed to dry before the next one is applied. Further each coat shall be inspected and approved by the representative of Employer/Consultant before the subsequent coat is applied. No portion of the surface shall be left out initially to be patched up later on. For new work, three or more coats shall be applied till the surfaces presents a smooth and uniform finish through which the plaster does not show. The finished dry *surface* shall not show signs of cracking and reeling nor shall *it* come *off* readily on the band when rubbed.

For old work, after the surface has been prepared as described in Para 1.2, a coat of white wash shall be applied over the patches and repairs. Then a single coat or two or more coats of white wash as stipulated in the description of the item shall be applied over the entire surface. The white washed surface should present a uniform finish through which the plaster patches do not appear. The washing on ceiling should be done prior to that on walls.

1.5 Protective Measures

Doors, Windows, floors, articles of furniture etc. and such other parts of the building not to be white washed shall be protected from being splashed upon. Splashing and droppings if any shall be removed by the contractor at his own cost and the surfaces cleaned. Damages if any to furniture or fittings and fixtures shall be recoverable from the contractor

2.0 CEMENT PAINT

2.1 Preparation of Surface

For new work, the surface shall be thoroughly cleaned of all mortar dropping, dirt, dust, algae, grease and other foreign matter by brushing and washing. The surface shall be thoroughly wetted with clean water before the cement paint is applied.

In the case of old work, all loose pieces and scales shall be removed and the surface shall be cleaned of all dirt, dust, algae, oil etc by brushing and washing. Pitting in plaster shall be made good and a coat of water proof cement paint shall be applied over patches after wetting them thoroughly.

2.2 Preparation of Mix

Cement paint shall be mixed in such quantities as can be used up within an hour of its mixing as otherwise the mixture will set and thicken, affecting flow and finish.

Cement paint shall be mixed with water in two stages. The first stage comprises of 2 parts of cement paint and one part of water stirred thoroughly and allowed to stand for 5 minutes. Care shall be taken to add the cement paint gradually to the water and not vice versa. The second stage shall comprise of adding further one part of water to the mix and stirring thoroughly to obtain a liquid of workable and uniform consistency. In all cases the manufacturer's instructions shall be given preference over the above specification, in case of variation between the two exists.

The lids of cement paint drums shall be kept tightly closed when not in use, as by exposure to atmosphere the cement paint rapidly becomes air set due to its hygroscopic qualities.

2.3 Application

The solution shall be applied on the clean and tested surface with brushes or spraying machine. The solution shall be kept well stirred *during* the period of application. It shall be applied on the surface which is on the shady side of the building so that the direct heat of the sun on the surface is avoided. The method of application of cement paint shall be as per manufacturer's specification. The completed surface shall be watered after the day's work.

The second coat shall be applied alter the first coat has been set for at least 24 hours. Before application of the second or subsequent coats, the surface of the previous coat shall not be wetted. For new work, the surface shall be treated with three or more coats of water proof cement paint as found necessary to get a uniform shade.

For old work, the treatment shall be with one or more coats as found necessary to get a uniform shade.

a)

b)

2.4 Precaution

Waterproof cement based paint shall not be applied on surfaces already treated with white wash, color wash, distemper dry or oil bound, varnishes, paints, etc. It shall not be applied on gypsum, wood and metal surfaces.
The specifications in respect of scaffolding, protective measures, measurements and rate shall not be as described under white washing with lime.

3.0 PAINTING

Approved paints, oils or varnishes shall be brought to the site of work by the contractor in their original containers in sealed condition. The material shall be brought in at a time in adequate quantities to suffice for the whole work or at least a fortnight's work. The empties shall not be removed from the site of work, till the relevant item of work has been completed and permission obtained from the representative of Employer/Consultant.

3.1 Commencing Work

Painting shall not be started until the representative of Employer/Consultant has inspected the items of work to be painted, satisfied themselves about then proper quality and given their approval to commence the painting work. Painting of external surface should not be done in adverse weather condition like hail, storm and dust storm. Painting, except the priming coat shall generally be taken in hand after practically finishing all other builders work. The rooms should be thoroughly swept out and the entire building cleaned up at least one day in advance of the paint work being started.

3.2 Preparation of Surface

The surface shall be thoroughly cleaned and dusted. All rust, dirt, scales, smoke and grease shall be thoroughly removed before painting is started. The prepared surface shall receive the approval of the representative of Employer/Consultant after inspection, before painting is commenced.

3.3 Application

Before pouring into smaller containers for use, the paint shall be stirred thoroughly in the containers. When applying also, the paint shall be continuously stirred in smaller containers so that its consistency is kept uniform.

If for any reason, thinning is necessary in case of ready mixed paint, the brand of thinner recommended by the manufacturer or as instructed by the representative of Employer/Consultant shall be used.

The painting shall be laid on evenly and smoothly by means of crossing and laying off, the latter in the direction of the grain of wood. The crossing and laying off consists of covering the area over with paint, brushing the surface hard for the first time over and then brushing alternately in opposite direction, two or three times and then finally brushing lightly in a direction at right angles to the same. In this process, no brush marks shall be left after the laying off is finished. The full process of crossing and laying off will constitute one coat. Where so stipulated, the painting shall be done by spraying. Spray machine used may be (a) high pressure (small air aperture) type, or *(b)* a low pressure (large air gap) type, depending on the nature and location of work

to be carried out. Skilled and experienced workmen shall be employed for this class of work. Paints used shall be brought to the requisite consistency by adding a suitable thinner.

Spraying should be done only when dry condition prevails. Each coat shall be allowed to dry out thoroughly and rubbed smooth before the next coat is applied. This should be facilitated by through ventilation. Each coat except the last coat shall be lightly rubbed down with sand paper or fine pumice stone and cleaned off before the next coat is laid

No left over paint shall be put back into the stock tins. When not in use, the containers shall be kept properly closed.

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No hair marks from the brush or clogging of paint puddles in the corner of panels, angles of mouldings etc. shall be left on the work.

In painting doors and windows, the putty round the glass panes must also be painted; but care must be taken to see that no paint stains etc. are left on the glass. Top of shutters and surfaces in similar hidden locations shall not be left out in plaint.

In painting steel work, special care shall be taken while painting over bolts, nuts, rivets, overlaps etc. The additional specifications for primer and other coats of paints shall be as according to the detailed specifications under the ,respective headings.

3.4 Brushes and containers

After work, the brushes shall be completely cleaned of paint by rinsing with linseed oil or with turpentine. A brush in which paint has dried up is ruined and shall on no account be used for painting work. The container, when not in use, shall be kept dosed and tree from air so that paint does not thicken and also shall be kept safe from dust. When the paint has been used, the containers shall be washed with turpentine and wiped dry with soft clean cloth, so that *they* are clean, and can be used again.

4.0 PRIMING COAT ON WOOD, IRON OR PLASTERED SURFACE

4.1 Preparation of Surface

i) Wooden Surface

The wood work to be painted shall be dry and free from moisture.

The surface shall be thoroughly cleaned. All unevenness shall be rubbed down smooth with sand paper and shall be well ducted. Knots, if any, shall be covered with preparation of red lead made by grinding red lead in water and mixing with strong glue sized and used hot. Appropriate filler materials with same shade as paint shall be used where specified.

The surface treated for knotting shall be dry before painting is applied. After the priming coat is applied, the holes and indentations on the surface shall be stopped with glazier's putty or wood putty. The primer shall be prepared on site or shall be of approved brand and manufacture as specified in the item. Paint shall be anti corrosive bitumastic paint, aluminum paint or other types of paint as specified in the description of the item. Stopping shall not be done before the priming coat *is* applied as the wood will absorb the oil in the stopping and the latter is therefore liable to crack.

Ii) Iron & Steel Surface

All rust and scales shall be removed by scrapping or by brushing with steel wire brushes. Hard skin of oxide formed on the surface of wrought Iron during rolling which become loose by rusting, shall be removed.

All dust and dirt shall be thoroughly wiped away from the surface. If the surface is wet, it shall be dried before priming coat is undertaken.

iii) Plastered surface

The surface shall ordinarily not be painted until it has dried completely. Trial patches of primer shall be laid at intervals and where drying is satisfactory, painting shall then be taken in hand. Before primer is applied, holes and undulations, shall be filled up with plaster of paris and rubbed smooth.

4.2 Application

The primer shall be applied with brushes, worked well into the surface and spread even and smooth. The painting shall be done by crossing and laying off as described in cement paint above.

5.0 PAINTING WITH READY MIXED PAINT / SYNTHETIC ENAMEL PAINT

5.1 Painting on new surface

The surface which has not been painted earlier, or the paint has been removed by paint remover, burning, caustic Soda etc. shall be considered to be new surface.

5.2 Preparation of Surface

i) Wood work

The surface shall be cleaned and all unevenness removed as specified in wooden surface. Knots, if visible, shall be covered with a preparation of red lead. Holes and indentations on the surface shall be filled in with glazier's putty or wood putty and rubbed smooth before painting is done.

The surface should be thoroughly dry before painting

Ii) Iron and Steel Work

The priming coat- shall have dried up completely before painting is started. Rust and scaling shall be carefully removed by scrapping or by brushing with steel wire brushes, AU dust and dirt shall be carefully and thoroughly wiped away.

iii) plastered surface

The priming coat shall have dried up completely before painting is started. All dust of dirt that has settled on the priming coat shall be thoroughly wiped away before painting is started

5.3 Application

The specifications described in Cement paint shall hold good as far as applicable. The number of coats to be applied will be as stipulated in the item. The powder surface shall present a *uniform* appeared Ice and glossy/mat finish 2S described in schedule of quantities free from streaks, blisters etc.

6.0 FRENCH SPIRIT POLISHIN

Pure shellac varying from pale orange to lemon color free from raisin or shall be dissolved in mentholated spirit at the rate of 140 gm of shellac to 1 lt of spirit. Suitable pigment shall be added to ~et the required :)13dc.

6 .1 Polishing new surface

Preparation of surface : The surface shall be cleaned. All unevenness shall be rubbed down smooth with sand paper and well dusted. Knots, if visible, shall be cove-reo with! a preparation of red lead and glue sized and used hot. Holes and indentations or: the surface shall be slopped with glazieries putty The surface shall be then given a Goat of wood filler made by mixing whiting (ground chalk in mentholated spirit at tile rate (If I 5 kg of *whiting* per liters of *spirit).* The surface shall *again* be rubbed down peddle smooth with glass paper and wired clean.

7.0 METHOD OF MEASUREMENT

Measurements for painting on plastered surfaces shall be the same as that for plaster. For doors, windows etc., *the* following multiplying factors will be considered .

Sl. No.	Description of work	How measured	multiplying coefficients

I. <u>Woodwork - Doors, windows etc.</u>

1. Paneled or framed doors, windows etc.	Measured flC3t (not girthed) including chowkhat or frame edges chocks, cleats etc. shall be deemed to be included in the item	1.30 (for each braced L side)	
2. Flush doors etc.	Do··	120(-do-)	
3. Part paneled and part. glazed or Gauged doors. Windows	Do	1.00do	
4.Fully glazed or gauzed doors, windows etc	do	0.80 (do)	
5. Fully venetioned or louvered doors, windows etc	do	1.8 (do)	
6. Trellis (or Jaffna) work one *way or* two *way* shall be made for open spaces	Measured float, no deduction , supporting members Shall not be measured separately	2 (for painting all over)	
7. plain sheeted steel Doors or windows	measured flat (not girthed) including frame edges etc.	1.10 (for each side) 0.50 (do)	
8. Fully glazed or gauzed doors and windows	do	0.50(do)	
9. Partly paneled and	do	0.80 (do)	

10. Corrugated sheeted or windows	steel doors do	1.25 (do)	
11. Collapsible gates	measured flat	painting	1.50(for all over)
12. Rolling shutters of interlocked laths	Measured fiat (size' of . opening) all over: jambs, guides, bottom rails and locking arrangements etc shall be included in the item (Top cover sha11 be measured separately)	1.10 (for each side)	

General

13. Expanded metal, (for hard drawn steel here fabric of approved quality, grill work and gratings in guard bars and balustrades railing partitions and ms bars in window frames.	measured flat overall no dedication shall be made for open spaces supporting members shall not be measured separately		1.00 all over)
14. Corrugated iron sheeting In roof, side cladding etc.	measured flat (not girthed)		1.14 (for each side)
15. AC corrugated sheeting in roof, side cladding etc.	do	1.20 (do)	
16 A. c semi-corrugated sheeting in roofs, side daddlfl9 etc.	do	1.00 (do)	
17 Wire gauge! Shutters including painting of wire gauge	do		1.00 (do)

SECTION – H

METAL DOORS/WINDOWS

1.0 STEEL DOORS, WINDOWS ETC

The windows shall be obtained from approved specialized manufacturers. The frames of doors, windows, ventilators etc. shall be formed by cutting section to required lengths and mitered. The corners shall be welded to form a solid framed welded joints. Sash bars of units shall be tanned and riveted into the frames and where they intersect the vertical tie shall be broached and the horizontal tie threaded through it, and the intersection closed by hydraulic pressure. For fixing steel hinges, slots shall be cut in the fixed frame and the hinges inserted inside and welded to the frame at the back. For fixing hinges to inside frame, the method described for fixing to outside frame may be adopted but weld shall be cleaned or holes made in the inside frame and hinge riveted. The hinge pin and washer shall be galvanized or, aluminum alloy 51 S-WP of suitable thickness.

The handle shall be mounted on handle plate which shall be welded to the opening frames. The handle shall have a two points nose which will engage with suitable tapered striking plate provided on the fixed frame

Top hung and bottom hung ventilators shall be provided with two plain hinges, with peg stays of sufficient length 3~ specified earlier

Centre hung ventilators shall be made with two outer frames, With mastic water-proof compound embedded between these two (Jute! frames Unless otherwise specials the ventilators shall be provided with spring catch whir-I) when pulled by a Cold, will allow Il Ie shutter bolero half to open outside and the top half opening inside.

Steel windows and ventilators shall be fixed to brick or concrete surface as shown In drawing or with M. S. Jugs of *sizes* 100 x 16 x 3 mm and to concrete work by means of 125 mm long counter sunk screw, or raw rules or other approved fastener after drilling into concrete With a power drill as specified in the item The lug shall be grouted it I concrete (1:2:4) mix of dimension as directed.

The frames should not be fixed in position until the structural work has been completed and the free deflection has taken place. The doors, wiredraws, etc. shall be erected in true plumb, line and level.

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All steel doors, windows, ventilators shall be given a coat of anti-corrosive primer at the shop before delivery to site for erection but in no case prior to the materials have been inspected by the representative of Employer/Consultant.

Final painting shall be done after obtaining approval from the

representative of E employer / Consultant

2.0 STEEL GRILL AND RALINGS

The grills and railings for windows, verandah and balcony etc. shall be of mild steel. The design of grills/railings and shape and sizes of various components shall be according to the drawings. Where ever grills integrated with windows are specified they shall be manufactured at windows manufacturers shop

The edge angles and corners sl'1all be cleaned and true to shape. The joints, if possible, shall be mechanically interlocked and neatly spot welded in such a way that the grill is rigid. Grinding of the joints to achieve. a neat regular finish shall be done. The grills shall be fixed to true plumb, line and level as per drawing.

All grills, railings etc. after being fixed in position, shall be cleaned off dust, dirt, rust and loose scales before applying a coat of protective zinc chromate primer.

3.0 ROLLER SHU1TER

These shall be fixed in position as shown in drawing.
Brackets shall be fixed on the lintel or under the lintel as specified with rawl-pluges, and screw bolts etc. The shaft along with the spring shall then be fixed on the brackets.

The lath portion (shutter) shall be laid on ground and the side guide channels shall be bound *with* it with ropes etc. The shutter shall then be placed in position and top fixed with pipe shaft with bolts and nuts. The side guide channels and the cover frame shall then be fixed to the walls through the plate welded to the guides. These plates and bracket shall be fixed by means of steel screw bolts, and raw plugs drilled in the wall .The plates and screw bolts shall be concealed in plaster to make their location invisible shall be done accurately in a workman like manner that the operation of the shutter is easy and smooth.

After being fixed in position, these shall be cleaned off dust, dirt, rust or scales before applying a protective coat of zinc chromate.

4.0 COLLAPSIBLE GATE

T-iron shall be fixed to the' floor and to the lintel at top by means of another bolts embedded in cement concrete of floor and lintel. The anchor bolts shall be placed approximately at 45 cm centers alliteratively in the two flanges of the T -iron The bottom runner (T-iron) shall be embedded in the floor and propel you've shall be formed along the runner for the purpose. The collapsible shutter shall be fixed at Sides by fixing the end double channels with T-iron rails and also by hold-fasts bolted to the end double channel and fixed in the masonry of the side walls

a)

a)

5.0 ALUMINIUM DOORS /WINDOWS/CURTAIN WALLS

All aluminum doors, windows etc shall be procured from an approved manufacturer. Aluminum section Shall be extruded hollow sections conforming to latest IS Specifications including IS, 1948 and 1.S. 733. All sections have been approved by Employer/Consultant before placing the order. All extruded sections shall have approved IS specification with thickness The aluminum section; shall be anodized color and with micron thickness as specified in the schedule of quantities or as per approved IS specification.

Open able windows shall be double weather-stripped. One weather strip shall be provided in the other frame and other weather strip in the shutter frame. The *weather* strip shall be extruded neoprene and of a size to make the windows completed .weather tight. The weather-strip shall be dovetailed in the window sections.

The hinges of operable windows shall be strong. Pin of the hinges shall be stainless steel with nylon/PVC washers. In case the windows are projected type, these shall be provided with brass pivots sliding on stainless steel guides. Concealed type friction stays shall be provided to keep the windows open in any desired position. The window shall be provided with the handle (or two-point locking or single point locking as required and directed. The glass used shall be 4mm thick or 5.0mm sheet glass of first quality and approved make, free from scratches, waviness, bubbles, etc. all as shown drawing or as specified and directed. Sliding windows wherever used should have tile sliding tracks, rollers, pins and the locking clamps as directed by the Employer/Consultant. General fabrication shall be as earlier given for steel windows and doors.

6.0 Method of Measurements

61 Steel Windows

Shall be measured in sq. m. up to two decimal places, the height and width being measured correct to 0.5 cm between out-to- out of frame.

6.2 Rolling Shutter

Shall be measured net in sq.m. Up to two decimal places, the width being measured overall out-to-out of guide towards channels and height taken as clear opening height, all measurements correct to 0.5 cm

6.3 **Collapsible gate**

Shall be measured In sq m. up to two decimal places. the width being measured In fully stretched position and height taken as between out to out as top runner, all correct to 0 .5 cm.

6.4 **Grills/railings etc**:

Shall be measured Nett in kg up to three decimal places, the sectional weights being taken as per IS Codes up to three decimal places. No extra wilt be entertained for welding etc.

6.5 **Aluminum windows/Doors**

Shall be measured in sq. cm up to two decimal places, the height and width being measured correct to 0.5 cm. between out - to -out of frame.

SECTION -I

SPEIFICACTION FOR WATER PROOFING

1.0 DAMP PROOF COURSE (D P C)

DPC shall be of thickness as shown in drawing or in the schedule of quantities unless otherwise mentioned, proportion shall be 1 parts of cement 2 parts of sand and 4 parts of aggregate mixed with approved water proofing compound as per manufacturers specification. Before laying the concrete the top surfaces of the wall shall be thoroughly cleaned of all dirt and loose particles, mortar droppings at and laitance, if any, scrubbing with coir or steel wire brush or by hacking, if necessary. The surface is then thoroughly wetted and the concrete is placed. The concrete shall be laid in every case for the full width of the plinth or as shown in drawing. The top surface shall be kept rubbed or rough or double-chequered for adhesion of mortar for brick *work.* Proper curing shall be done before starting the brick work over 0 P ~.

2.0 BRICK COBA WATERPROOFING

The treatment shall be got executed by approved specialist firms and a guarantee of 10 years in the approved format is to be submitted along with a back-to-back separate guarantee by the main *contractor. Moreover,* in case of variations between specifications given below and the specification of the manufacturer, the tatter shall prevail

a: Terrace

The roof surface shall be thoroughly cleaned and prepared to receive water proofing treatment. Construction joints, if any, arc raked and cleaned Cement slurry with resinous admixtures of Specialist film is spread to penetrate into the:' structure and to till cracks and other porous areas.

15 mm thick cement mortar 1:4 (1 cement: 4 coarse sand) with resinous admixtures of specialist is laid over *the* prepared surface.

A layer of brick bats (Coba) ;6 laid over the mortar layer giving the required gradient for adequate drainage (A slope 01 1 in 120 is considered adequate). The joints between 1 he brick bats shall! generally be kept between 15-25 mm wide' Those joints arc filled with cement mortar (1 4) with *resinous* admixtures of *specialist* firm Curing is done *for:* two days

The top is finished smooth with 20 mm thick cement mortar (1 :4) with resinous admixtures of Specialist firm and marked with 300 mm x 300 mm false squares. Curing is done for two weeks. '

b: Sunk Slabs

any existing covering on slab is removed and surface is prepared. Construction joints if any, are raked and cleaned. Cement slurry with resinous admixtures of Specialist firm is spread which penetrates into the structure. This fills cracks and other porous areas.

20 mm thick cement mortar 1:4 (1 cement: 4 coarse sand) with resinous admixtures of Specialist firm is laid over the prepared surface.

A layer of brick bats (Coba) is laid over the mortar layer giving the required gradient for adequate drainage. The joints between the brick bats are generally kept between 15-25 mm wide. These joints are filled with cement mortar (1:4) with resinous admixtures of Specialist firm Curing is done for two days.

The top IS finished smooth with 20 min thick cement plaster (1:4) with resinous admixtures of Specialist firm. Curing is done for two days

Existing covering, if any, is removed and surface is prepared upto the required height (A height of 150 mm above upper floor level IS considered adequate). A cement slurry coating with resinous admixtures of Specialist firm is given.

The side wall is provided with cement plaster (1:4) 20 nun thick with resinous admixtures of Specialist firm up to the height specified A vatta (Gala) 01 specified design is made in cement mortar (1 :4) With resinous admixtures at Specialist firm Curing is done for two weeks.

c. Method of Measurement

The measurement tor the complete work as per specification shall be taken clear between the walls. No separate measurements for "Golai" treatment to vertical surfaces shall be made.

SECTION-J

1.0 WOODWORK AND JOINERY

1.1 TIMBER

i) Unless otherwise specified all timbers for frames and shutters for doors windows, ventilators, cupboards, etc. shall be free from knots, snakes, fissures, flaws, sub-cracks and other defects The planed surface shall be smooth and free from blemishes and discolorations.

ii) All timber for carpentry and joinery in touch with masonry or concrete shall be creosoted before fixing.

iii) All full fabricated timber shall be air seasoned at site of work for a period of not less than one month to allow for any shrinkage that may take place The preparation of timber for joinery is to commence simultaneously with H 12 beginning of the project work generally and should proceed continuously until all the wood work is prepared and fixed/stacked on or near the site as the case may

iv) Paneled shutter may be obtained from factories approved by Consultants/ Employer provided the contractor can ensure proper quality control to the satisfaction of Consultant/Employer

v) Paneled shutters shall be manufactured after taking correct measurements of openings so as to ensure that the dimensions of rails styles are not reduced than that indicated in schedule/drawing.

1.2 Workmanship and Constructions

A) The workmanship shall be first class and to the approval of the Representative of Employer/Consultant. Scantlings and board shall be accurately sawn and shall be of required width and thickness All carpenters work shall be wrought except where otherwise described. The workmanship and Joinery shall be framed together and securely fixed set out in strict conformity according to the drawings and shall be framed together and securely fixed in approved manner and with properly made joints. All work is to be properly tenured shouldered, wedged, pinned, braced etc. and properly glued with approved quality glue to tile; satisfaction of the representative of Employer/Consultant

B) Screws: Unless otherwise specified all screws to be used in woodwork and joinery shall be of cadmium plated and of approved quality. The size (diameter and Length) should conform to those specified in hardware schedule.

C) Tolerance: 1.5 mm (1/16)will be allowed for each wrought face of sizes specified except where described as finished in which case they shall hold to the full dimensions

D) Protection: All edges of timber frames shall be protected from being damaged during construction by providing rough timber casino securely fixed and other adequate protective measures.

E) If it is decided by the representative of Employer/Consultant to provide ant termite treatment, the buildings contractor shall co-ordinate his work suitably as directed by the representative of Employer/Consultant.

F) Door/Window frames shall have cut rebate. Planted rebates shall not be permitted unless shown in drawings. .

G) wooden cover, moulds of sizes shown in drawings shall be provided all round painted or finished as in doors. This will be paid as a separate Item as described in Schedule of Quantities.

1.3 **Holdfasts:** Three holdfasts shall be fixed to each post of the door frame. The MS holdfasts shall be of the size 37 cm x -10 mm x 3 mm or as mentioned in the Schedule of Quantities and shall be fixed to the frames by means of screws and not nails. The other end of the holdfasts shall be fixed into jambs with 1:2:4 P.C.C of dimensions as directed. Ends of holdfast will be fish trailed

Whenever the frames are abutting to concrete surface approved metal expansion as directed shall be provided for frame, hangers rough grounds

The rates quoted for woodwork and joinery shall exclude the cost for all types of holdfasts or Raw Plugs or other frames shall be out and shall not be used as holdfasts,

The items of holdfast, metal fasteners etc. shall be paid as a separate item as described In Schedule of Quantities The rate for holdfasts shall include for cement grouting and fixing to frame work with screws etc. The rate tor *metal* fasteners shall *include* for nuts etc. as required.

2.0 Door/window Frame

Specified timber swan in the direction of grain and truly straight and square shall be used. The scanting shall be planed smooth and accurate to the full dimension, rebates, rounding & mouduling as shown in the drawing before assembling. All joints shall be mortice and Tenon type, simple near strong the joint shall be glued framed put together and pinned with timber.

a)

2.1 WOODEN FLUSH SHUTTER (SOLID CORE TYPE)

Wooden flush shutters shall be of solid core type: and obtained from approved manufacturer pressed and phenol formaldehyde synthetic resin shall also be provided with external lapping fixed to shutter with synthetic adhesives & head-less pins

2.2 Paneled Shutters:

Where specified in the Schedule of quantities Shutters shall be manufactured from Kiln Seasoned and chemically treated commercial hardwood of approved quality Thickness and sizes of styles rails and panels etc. shall be as specified in the Schedule of Quantities and/or drawings Panel shall be in a single width piece. Shutters shall be manufactured conforming to the relevant IS Specification and an approved· sample shall be kept in the site office of the representative of Employer/Consultant.

2.3 Teak wood glazed shutters :

The general specifications for glazed shutter shall be similar to that for paneled shutters described. Styles and rails in the glazed shutters shall be rebated *5/8"* x 1/2" (16 mm x 12 mm) to receive the glass unless otherwise specified.
Sash bars shall be of full thickness of the shutter and of width as shown in the drawings. These shall be molded and rebated miter on side to receive the glass as per drawing unless otherwise specified glass panels shall be fixed by means of molded teak beads and suitable G.I screws. Finished thickness of the shutter shall be as mentioned in the schedule of quantities. The rate shall be for *the* completed *work* fitted and fixed in position. An approved sample should be kept in the office of the representative of Employer/Consultant at the site for reference. The glass shall conform to specification as described under head galliard. The thickness of glass shall be mentioned in the Sct1edule of Quantities

3.0 Method of measurements

Door shutters shall be measured in square meter upto two decimal places
The height and width shall be clear height and width of shutter.
Frames shall be measured along the centre line, no extra being allowed for embedment in floors.

2.1 WODDEN FIUSH SHUTTER (SOLID TYPE)

Wooden flush shutters shall be of solid core type and obtained from approved manufacturers as listed, Shutters shall be hot pressed and phenol formaldehyde synthetic resin shall also be provided with external lapping fixed to shutter with synthetic adhesives & head-less pins.

2.2 Paneled Shutters:

Where specified in the Schedule of Quantities Shutter shall be manufactured from Kiln Seasoned and chemically treated commercial hardwood of approved quality, Thickness and sizes of styles rails and panels etc shall be as specified in the Schedule of Quantities and/or drawings Panel shall be in a single width piece. Shutters shall be manufactured conforming to the relevant I.S Specification and an approved sample shall be kept in the site office of j he representative of Employer/Consultant.

2.3 Teak Wood And Glazed Shutters:

The general specifications for glazed shutters shall be similar to that for paneled shutters described. Styles and rails in the glazed shutters shall be rebated 5/8" x ½ (16 mm x 12 mm) to receive the glass unless otherwise specified. Sash bars shall be of full thickness of the shutter and of width as shown in the drawing. These shall be molded and rebated mitre on side to receive the glass as per drawing unless otherwise specified glass panels shall be fixed by means of molded teak beads and suitable G.I. screws. Finished thickness of the shutter shall be as mentioned in the schedule of quantities. The rate shall be for the tile completed work fitted and fixed in position. An approved sample should be kept in the office of the representative of Employer/Consultant. The glass shall conform to specification as described under head glazing the thickness of glass shall be mentioned In the schedule of quantities.

3.0 METHOD OF MESUREMENTS

Door shutters shall be measured in square metre upto two decimal places.
The height and width shall be clear height and width of shutter.
Frames shall be measured along the centre line, no extra being allowed for embedment in floors.

SECTION "K"

ANTI-TERMITE TREATMENT

1.0 **GENEREL**

The work should be executed through a specialized firm approved by the representative of Employer/Consultant. Approval of such firm shall be obtained from the representative of Employer/Consultant before commencement of work

2.0 SOIL TERATMENT SHALL CONFORM TO THE FOLLOWING

2.1 Chemicals: The treatment of the area shall be carried out by applying of chlorphyriphos chemical 20% EC at 1% or Endosulfan (30% EC) with 0.5% concentration. The chemicals shall be obtained from approved manufacturer.

2.2 Records: A daily record shall be maintained by the contractor indicating the amount of work done and quantity of chemical consumed for the: work The~; record book shall be property of the representative of Employer/Consultant.

2.3 Tests : The contractor should perform test at his own cost of the chemical to be used in the work and the result of the test should be submitted to the representative of Employer/Consultant.

2.4: Method of Application: The following paragraphs specify the manner and sequence of operations, which must be followed. The rates of applications of chemical as indicated in the following pares for various operation should be followed. This specifications represent the minimum rates of application of each operation and the contractor shall actually apply chemicals at rates that they may consider necessary for effectiveness during the 10 years guarantee period. In other words responsibility of applying adequate amounts of chemical as required to sustain the 10 years guarantee shall be that of the contractor but in no case shall actual rates of application be less than specified in the technical specifications.

2.4. TREATMENT OF JUNCTION OF WALL AND THE FLOORS

Special care shall be taken to establish continuity of the chemical barrier on the inner wall surface from ground level. To achieve this a small channel of 30 mm x 30 mm shall be made at the junction of walls and columns with the floor and rod holes made in the channel up to ground level 150 mm apart and the iron rod moved backward to break up the earth and chemical emulsion poured along the channel at the rate of 7.5 litres per square metre of the vertical wall or column surface so as to soak the soil right to the bottom

2.4.2 TRATMENT OF TOP SURFACE OF PLINTH FILLING

The top surface! of the consolidated earth within plinth wells shell be treated with chemical emulsion at the rate or ~ liters per square metre of U1e surface before the sub-grade is laid. If the filled earth has been well rammed and the surface does not allow the emulsion to seep through, notes up to 50 to 70 mm deep at 150 mm centre both ways may be made with 12 mm diameter mild steel rod on the surface to facilitate saturation of the soil with the chemical emulsion.

2.4.3 Treatment of soil surrounding Pipes, Wastes and Conduits

When pipes, wastes and conduits enter the solid inside the area of the foundations, soils surrounding the point of entry shall be loosened around each of such pipe, waste or conduit for a distance of 150 mm and to a depth of 75 mm before treatment is commenced. When they' enter the soil external to the foundations, they shall be similarly treated for a distance of over 300 mm unless they stand clear of the walls of the building by about 75 mm.

2.4.4 Treatment of soil along External Perimeter of Building:

After the building is completed the earth along the external perimeter of the building should be rotted at intervals of 150 mm and to a depth of 300 rnrn. lhe rod should be moved backward and forward parallel to the wall to back up the earth and chemical emulsion poured along the wall at the rate of 7.5 fit res per square meter of *vertical* surfaces After the treatment, the earth should be tamped back into place. Should the earth outside the building be graded on completion of the building, this treatment should be carried out on completion of such grading.

In the event of filling being more than 300 mm, the external perimeter treatment shall be extended to the full depth of tilling up to the ground level so as to ensure continuity of the chemical harrier.

2.5 Treatment Shall not be made if the soil or fill is excessively wet or immediately after heavy rains to avoid surface flow of toxicant from application site. Unless the treated areas are to be immediately covered, percolation shall be taken to prevent distribution of the treatment by human or animal contact with treated soil.

2. 6. Guarantee : 10 (ten) years guarantee should be submitted on non-judicial stamp paper as per the Performa attached. The guarantee shall be signed by the main contractor and the specialized who have execute the work. In the unlikely event of any treatment becoming necessary subsequently during the guarantee period, required inspection and treatment shall be carried out free of cost.

2.7 The work should be executed in stages according to the progress and in

Co-ordination with the general building and other contractors. Idle labour, if any, for the same shall not be entertained.

2.8 **<u>Stages of Payment</u> :** The work has to be carried out in stages according to the progress of works.

2.8.1 The contractor shall have to furnish a guarantee on non-judicial stamp paper for 10 years as per the Performa. In the unlikely event of any treatment becoming necessary subsequently during the guarantee period, required inspection and treatment shall be carried out free of cost by the contractor.

2.8.2 Payment will be made on the plinth/floor area measurement and the rates should include to cover treatment to parts of structure as detailed out subject to deduction 1 for retention money, payment will be made in stages as under

a) On completion of treatment al junction and Floor & Ceiling.

……. 75%

b) On completion of treatment of all parts of structure required *and* pi pipes, waste conduits etc. etc.

……100%

SECTION - X

TECHNICAL SPECIFICATION FOR SANITARY AND PLUMBING WORK

INDEX

SECTION - I

TECHNICAL SPECIFICATIONS FOR SANTARY FITTINCS

1.0 SANITARY AND ALLIED FITTINGS

All sanitary wares with their allied fittings must be first quality (best) of approved make and brand.

2.0 SQUATTING PATTERN W.C. PAN (INDIAN TYPE)

The W. C. Pan shall be of white vitreous China of specified size and pattern (Orissa or long pattern as specified) with an integral flushing rim. JI shall have the flushing horn in the hack unless it is not possible to accommodate cistern to *suit this* design. The pan shall be of approved quality. It shall have 100 mm C. I. Of porcelain trap 'P' or 'S' type with minimum effective seal of 50 mm and 50 vent ann.

2.1 Fixing of W.C. Pan

'The Squatting type W. C. Pan shall he sunk in floor sloped toward" the pan III a workmanship like manner, care being taken not to damage the pan in the process of fixing. If damaged it shall be replaced at Contractor's cost. It shall be fixed on a proper cement concrete base of 1 :3:6 proportion taking care that the cushion is uniform and even without having any hollows between the concrete base and pan and finished just below level of rim of pan to receive the specified thickness of the floor finishing. No extra for concrete bed shall be paid for.
'The joint between the pan and the trap shall be made with cement mortar 1: 1 and shall be leak proof.

3.0 PEDESTRAL WASHDOWN SYPHONIC (SINGLE OR DOUBLE TRAP)WATER CLOSET (EUROPEAN TYPE)

The W. C. pan shall be of white vitreous China unless otherwise specified of one piece construction of wash down type with integral P or S trap as required. It shall be of approved quality and pattern.

3.1 Installation

The weight of the fixture and user arc supported on the floor and not on The drainage pipe and this should be done in standard approved method.

3.2 seat and cover

The double solid scat with lid shall he of welt plastic seat as specified in the schedule with rubber buffers and shall be fixed in position by using Chromium plated brass hinges and screws. It shall be non-absorptive and free from crack and crevices in the materials, The plastic seat and cover, where specified, shall conform to I.S. Specifications, and shall be of white colour unless otherwise specified.

3.3 Flushing

The flushing of the Squatting and pedestal w.c. Pan shall be done by 10w level' valueless symphonic flushing cistern of approved quality and capacity, as specified. In the former case, the connection between the flush pipe of the cistern and w.c. pan shall be made by using Rigid PVC pipe connection as specified. The. other specification will be as for Squatting pattern w.c. Pan.

The Hush pipe shall be fixed to wall by using holder bat clamps or embedded, as required.

As specified, low level Cisterns of specified capacity shall be with all internal fittings, brackets and C.P. brass flushing handle, and connected to the w.c. pan by means of 40 nun diameter Chromium Plated brass bend and rubber or any other, as specified.

4.1 BRACKETS

The cistern shall be fixed on Cast Iron Of rolled steel cantilever brackets Nylon braced of required strength which shall be firmly embedded in the wall or fixed by using wooden plug and screws, to *the* satisfaction of the Consultant/Employer. Depending on (the characteristics of work any type of sanitary fixtures, the fixing of cistern should vary in quality of material and design also. Or it may be installed in other ways like placing on the top at the back of the w.c.

4.2 OVERFLOW

The Cistern shall be provided with 20 mm pipe with fittings which shall terminate into mosquito proof coupling secured in a manner that will permit it to be readily cleansed or renewed, when necessary.

4.3 . FLUSH PIPE:

Unless otherwise stated in the schedule of quantities, the outlet or flush pipe from the low level cistern shall be of 40mm rigid PVC/ brass chromium pipe

minimum thickness of 2.6 mm as specified or PVC pipe as directed by the consultant/employer which shall be connected to the W.C pan by means of an approved type of joint adapts. The flush pipe shall be fixed to wall by using holder bat clamps or embedded as require.

4.4 PAINTING C.I. CISTERN

Inside Of cisterns and fittings shall be painted with approved biutumastic paint and outside of the cisterns, if required, brackets, overflow and ibis pipes, if required shall be painted, with 2 coals (If synthetic enamel paint of approved primer to give an even appearance. The cost of such painting shall be include in the rates quoted for concerned items.

5.0 STANDING URINALS

5.1 Bowl Urinal

The urinal sha1l be flat hack or angular pattern lipped front basin of required dimensions of white vitreous china and one piece construction with internal flushing' box rim of an approved make as specified. It shall be fixed in the position by using wooden plug embedded in the wall with screw of proper size, Each urinal shall be connected to a 40 mm dia, waste lead pipe unless otherwise specified, which shall discharge into a channel or a floor trap, or as specified.

5.2 Half Stall Urinals

The urinal stall and it'' screen shall he of white vitreous China of approved quality and manufacturer, The stall shall be 114 cm high and 46 cm wide and 40 cm deep. The stall shall be provided with 84 cm x 36 cm division plates. In case of two or more urinals there shall he further division plates similar to end screens, the range shall have 15 cm deep tread plates of first class quality unless otherwise specified,

5.3 FLUSHING

Where not specified the stall shall be provided with white glazed vitreous China automatic flushing cistern of proper capacity with 6 mm minimum hotly thickness unless s otherwise specified. The cistern shall be complete with fittings and brackets which shall be fixed 10 the: wall the cistern shall be connected to the stall through standard size C.P. brass flush pipe with spreader arrangement and damp unless otherwise specified. Where cistern have not been specified it will be from distribution line through Brass C.P. connector and spreaders.

5.4 Outlet

Each of Half stall shall be provided with C.P. brass outlet grating of size 32mm for each half stall arid then through PVC pipe to urinal channel

6.0 SQUATTING URINALS

6.1 SQUATTING PLATES

The urinal plates shall be of white glazed vitreous China with integral flushing rim of size 600 mm X 350 mm or as specified. There shall be white vitreous channel with stop and outlet pieces in front. The plate and channel shall he of approved quality.

The joint between the urinal plate and the flush pipes shall he made with putty or white lead mixed with chopped hemp.

6.2 Outlet

The squatting plate or a range of squatting plates shall be provided with a 65 mm dia. standard urinal C.I trap with vent arm having 65 mm C.P. brass outlet grating or as specified,

6.3 Walling

The squatting plate shall have 1.22 M high wall in front and on either side, these shall be lined as specified.

7.0 CISTERN

7. I Material

if not specified a high level cistern is intended to operate with minimum height of 191 cm and a low level cistern with a height of 60 cm approx. from the floor finish and the underside of the cistern.
The body thickness of' an earthenware cistern 1.3 cm. The cistern with internal parts shall be free from manufacturing faults and other defects and operate smoothly and efficiently. The cistern shall be considered mosquito proof only if there is no clearance anywhere which would permit a I.6 mm wire to pass through coupling in the permanent position (i. e. flushing or filling) or the cistern. The outlet tilting of each cistern shall he securely concern to the cistern. In the case die outlet shall he fix low *level* 40 mm dia. Nominal bore). The outlet of flush pipe from the cistern shall be connected to

the pan by means of putty or cement and for E.P.W.C. with rubber joint and putty. The Wish pipe shall he fixed 10 wall by using holder hat clamps.

The discharge rate of cistern shall be about 5 liters in 3 seconds when connected to an appropriate flush pipe and there shall be no appreciable change in the full discharge. The cistern shall have discharge capacity of 5, 10, 12.5, and 13 liters with tolerance of +/- 0.5 ltr.

b)

7.2 CAPACITY OF CISTERNS AND THE SIZE OF FLUSH PIPE FOR FLAT BACK (BOWL) URINAL

Capacity: The capacity of the flushing cistern and the SIze of the Hush pipe for the number of urinals in a range *will* be as follows

Number of urinals in range	Capacity of flushing cistern	size of pipe	
		Main	ditribution
1	5 liters	20 mm	15 mm
2	10 liters	20 mm	15mm
3	10 liters	25 mm	15 mm
4	15 liters	25 mm	15 mm

The joint between the urinal basin flush and waste pipe shall be means of putty of white lead mixed with chopped hem, or as specified in case of PVC pipe.

7.3 For Squatting Plate Urinal

Capacity : The capacity of the Hushing cistern and the size of the flush pipe for the number of squalling place urinals in a range will he as follows

Number of urinals In range	capacity of flushing cistern	size of flushing pipe	
		Main	distribution

1	5 liters	25 mm	20mm
2	10 liters	25mm	20mm
3	15 liters	32mm	20mm
4	15 liters	32mm	20mm

The cistern shall be fixed on R.S. C.I. cantilever brackets of requisite strength which shall he embedded or fixed to the wall by means of wooden plugs and screws,

8.0 WASHING BASINS

8.1 BASIN: The wash basins shall be of white or colored vitreous China as specified and of approved quality, make and pattern. It shall be one piece construction with an integral combined overflow. The size of the basin shall be as specified.

8.2 FITTINGS: Each wash basin shall be provided with 15 mm C.P. brass pillar taps as specified, 32 mm C.P. waste - chain and rubber plug, unions, joint') etc. complete in all respects of approved quality.

8.3 FIXING: The basin shall be supported on a pair of M.S. or C.I. Cantilever or Nylon type brackets of requisite strength embedded or fixed in position by means of wooden cleats and screws. These metal brackets shall be painted to the required shade including a coat of anti-corrosive paint. The wall plaster on the rear shall he cut to overhang the top ~ of the basin.

8.4 WASTE CONNECTION :

The waste shall discharge into a floor trap leading to a gully trap on ground floor and on upper floor may be connected to waste stack. Where specified wash basins shall be provided with a 20 mm G.I. puff pipe terminating with a brass perforated cap screwed on to *it* on the outside of the wall or connected to antisyphon stack. When the waste pipe discharge freely into a channel or floor trap and is or short length without all bends, no puff will be necessary

9.0 KITCHEN SINKS

Unless otherwise mentioned, the kitchen sink with drain hoard shall be of stainless sled and (If approved quality, make and pattern . It shall be of one piece construction with an integral combined overflow the size of the sink and drain board shall he as specified,

9.1 Fittings

Each sink shall be provided with 15 mm brass C.P. long body bib cock, 40/32 mm waste, chain and rubber plug, unions, joints etc. complete in all respects as specified and of approved quality.

9.2 Fixing

The sink shall be supported on a pair of M.S or C.I cantilever brackets of requisite strength embedded or fixing in position by means of wooden cleats and screws. The brackets shall be painted to required shade including a coat of anticorrosive paint.

9.3 Waste Connection

The waste shall discharge into a floor trap leading to a gully trap, OJ) ground floor and on upper floor it may he connected to waste pipe stack with bottle trap P.v.c. waste pipe.

10.0 TOILET REQUISITES

10.1 Mirror

The mirror shall be of approved make glass with beveled edges. The size and shape of the mirror shall be as specified. It shall be mounted on an asbestos sheet hack and provided with fiberglass frame.

10.2 Shelf

The shelf shall be of glass of approved quality with edge rounded off or of vitreous China (colored or white) of approved make. The size of the shelf shall be as specified. The shelf shall have C.P, brass or aluminum guard rail with rubber washers on positions resting 011 class plate and C P. brass Of aluminum brackets which shall he fixed with c.p. brass or aluminum screws 10 wooden plug firmly embedded in the wall.

10.3 Towel Rail

The towel rail shall be of C. P. brass or aluminum with two C. P. brass or aluminum brackets. The size of the rail shall be as specified. The bracket shall be fixed by means of c.p. brass or aluminum screws to wooden cleats firmly embedded in the wall which win projected 75 mm from wall surface,

10.4 chromium plated stop cock, taps, bib cocks, shower set, gun metal peets valves

If not mentioned otherwise in schedule, cocks and taps arc to be of brass standard head chromium plated of approved make and pattern. They must be capable to withstand at least 10.5 kg per sq.cm. pressure applied for 5 minutes without leakage. The valve arc to be of peel type gunmetal valves. Other conditions remain same as cocks and laps.

10.5 Liquid Soap Holder

This shall be glass Of P.V.C. Of C.P. brass as specified. It shall be fixed in position by means of c.P. brass screw to wooden *cleats* embedded in the wall. The liquid soap holder shall be or approved make,

10.6 Toilet Paper Holder

The paper holder shall be of C.P brass or vitreous chaina as specified. The rolled wooden paper holder shall be made of well seasoned take wood. This should preferably recessed type.

Section-II

SOIL, WASTE, RAIN WATER PIPES & FITTINGS

UPVC SWR (soil, w:aste, rain water) drawings system provides a r:lllge of pipes and fittings for soil, waste, vent, sewer and rain water drainage application and are extremely like in weight.
SWR drainage system is design to carry discharge from toilets baths and basin its consist of a range of pipes and injection molded fittings which are required to correct the waste and vent from each fixture to the sewer drain.

All traps arc to be supplied with either inlet (sockctened) of 125 mm or 110 mm and outlet (spigot end) 01110 mm only. The traps with 125 mm inlet are commonly used to the Indian w.c. pan. All traps have smooth / glazed inside.

Clean the outside of the! pipe's sought end and the inside of the scaling grove of the fitting. Apply the lubricant supplied by us unifonn1y to spigot and sealing ring and pass the spigot end into tile socket containing scaling ring only fully home. Make Rule position of the socket edge with the pencil of felt-tip pen on the: pipe, then withdraw the pipe from the soc 'ct by approx. 10 mm (towards (thermal expansion gap).

With horizontal runs, the pipe clips should be spaced at intervals of no more than ten times the outside diameter of the pipes. Vertical lines are spaced *at* interval" of one meter to *a* maximum of two metres according to pipe diameter.
The wan / concrete slots should allow for a stress-free installation. Pipes and fitting to be inserted molded the slots without a cement base have to be applied fit with a thin cost of pvc solvent cement followed by sprinkling of dry sand(medium size). Allow it to dry. This process gives a sound base to cement fixation. This process is ,.repeated while jointing PVC material to CI/AC materials

the Supreme UPVC SWR drainage system can he put to use immediately after installation, as no waiting lime required for joints to be set and. direct. However for testing, seal hermetically all openings below the top of the section to be tested. The water level shall then be raised to a height of not less than three meters above highest point of the section being tested or as din the inspection. Officer may direct every .I0in1 shall be carefully examined tor leaks.

SECTION-III

TECHNICAL SPECIFICATIONS FOR WATER SUPPLY PIPES & FITTINGS

1.0 G.I. PIPES AND FITTINGS

1.1 General

All galvanized iron pipes arc to he of mild steel continuously welded, screwed & socketed tubes, medium quality of Miss TAT A, Jamshedpur make. The pipes and sockets shall be cleanly finished when galvanized in and out and free from cracks surface flaws, lamination, and any other defects. The threads shall be well cut and clean. 1 be details of pipes and sockets regarding nominal] bore, thickness, and weight in kg/m are given below. All G.I. fittings shall *be* of approved brand or make as specified. The pipes and fittings arc to be screwed conforming to British Standard gas thread. In jointing the pipes, threaded portion of both pipes and sockets shall he oiled and rubbed over with white Zinc and fine spun yam wrapped round the screwed end of the pipe which then shall be screwed home to the socket with a pipe wrench. Care must he taken that all pipes and fittings are kept at all times free from dust and dirt during fixing. Any thread remaining exposed after jointing shall be painted.

The zinc coating or galvanised tubes is to be 6% heavier than Black tubes. Every length or tube is to be hot stamped at manufacturing stage with TATA symbol and letter M.

Approx dia in mm	nominal	scrcwed and socketed			sockts	
		light	medium	heavy	approx out side dia.mm	minimum length mm
21.3	15	0.961	1.220	1.46	27	37
26.9	20	1.42	1.570	1.991	32.5	39
33.7	25	2.03	2.430	2.99	39.5	46
42.4	32	2.61	3.130	3.87	49	51
48.3	40	3.29	3.600	4.47	56	51
60.3	50	4.18	5.100	6.24	68	60
76.1	65	5.92	6.540	8.02	84	69
88.9	80	6.98	8.530	10.3	98	75
114.3	100	10.2	12.500	14.7	124	87

139.7	1 25	-	16.400	18.3		151	96
165.1	150	-	19.500	21.8		178	96

1.2 Laying of pipes

The layout of the mains and service pipes will be according 10 the drawings. The Contractor is to work out the exact position of flanges and (he exact run or all the pipes and must ascertain from the Consultant/Employer that these are approved, before commencing the work,

Where pipes are to be cut and rethreaded, ends shall be carefully filed so that no obstruction to the bore is offered.

All cutting holes, chases, trenches ere, at any place necessary in connection with the work as per items of this tender and subsequent mending damages are to be included in the rates and Hot to he paid extra unless otherwise specified.

1.3 External Line

Where the pipes run underground these must be fixed at least 45cm below ground level, The galvanized iron pipes and fittings shall be laid in trenches, the width and depth of the trenches for different dimensions of the pipes shall be as given below :

Dia. Of pipe	width of trench	depth of trench
1 5 mm to 50 mm	30 cm	60 cm
65 mm to 100 mm	45 cm	75 cm

At joints the trench width shall be widened where necessary.

The pipe shall be painted with two coats of anticorrosive bit mastic paint of approved quality. the pipes shall be laid on a layer of 7.5 mm sand and filled up to 15 mm above pipes and the remaining shall then be filled with excavated earth with proper ramming as described in Excavation and refilling. Pipes shall not be hid so as to pass through manhole, catch pit drain under any circumstances. Where it is unavoidable, the pipe shall be carried in sleeve MS/GI pipe as approved by the Consultant/Employer, cost of which should be included in the item rate. Where the service pipe will enter the budding below ground level a sleeve pipe is to be provided. The underground water service pipe should be kept at a sufficient distance apart

from sewer line, at least 30 cm above where it will cross over the sewer pipe or In common trench. The rates for all above work should he included in item of pipes.

1.4 internal work

Where the pipes run along walls these are to be fixed at 25 mm away by clamps fixed at a distance not exceeding 1.80 cm apart and both sides of turning point. Where the pipe lines are chased in wall as shown in the drawing or specified in the bill of quantities the pipes are to be secured to wall by hook fixed at an interval of 1 M and hooks at all sides of the branches and turning point. Where the pipes cross RCC/masonry wall, column, beam or pillar, these must pass through the appropriate higher sizes of CI/GI sleeve pipe and arc to be included in the rates. No extra claim wills he entertained. In case the pipe is embedded in walls and floors, it should be painted with anticorrosive bit mastic paint of approved quality and the pipe shall be wrapped in burlap of hessian cloth impregnated with bitumen. The wrapping shall be made to fit tightly over the pipe and where wrapping with a new piece it shall overlap the old one and the joint shall be tied with M.S. wire or nylon thread.

It should not come in contact with lime mortar or. Lime concrete as it is corroded by lime. All pipes should be fixed truly horizontal and vertical,

Under the floor the pipes shall be laid ttl a layer of sand filling done under concrete floors.

For pipes 15 mm to 50 mm diameter the holes in the walls and Floors shall be made by drilling 'With chisel or jumper and not dismantling the brick work Of concrete. After fixing, the holes shall be made good with cement mortar 1:3 and properly Finished to match the adjacent surface. Union is to be provided in each of the vertical riser or drop on and from water tank one each near the peets valve. The long screw fittings arc to are to be fitted at an interval of 3 meters for long horizontal line and inside the lavatory/kitchen/laboratory etc after 2 meters,

1.5 Testing the Joints and Lines

After laying and jointing the pipes and Linings shall be inspected under working condition of pressure and flow. Any joint found leaking should be removed and replaced without extra cost The pipes and fittings after they are laid shall be tested to hydraulic pressure of 6 kg/sg.cm. (60 metre or double the design working pressure whichever is more) for internal work and for CI water main a pressure of 7 kg. per sq.cm. The pipes shall be carefully charged with water allowing all *air* to escape and voiding all shock or water hammer. As water comes out of taps, slop cocks shall then be dosed and specified hydraulic pressure shall be applied gradually. Pressure gauge should be accurate and preferably should have been tested. The lest pressure should he maintained without loss for at least half an hour.

1.6 Painting (Exposed)

On completion of the test the exposed pipes and arc to be painted with two coats of synthetic enamel paint. or approved colour over coat of ;printing and the pipes running underground shall be painted with two coats of anticorrosive bitumastic pain! with sand bed all round.

Measurement

The length shall he measured in running metre correct to 2. decimal places for the finished work, which shall include the GI pipes and fittings such as bends, tees, elbows etc. but excludes brass or gun metal fixtures like taps, cocks, valves, PVC connectors, etc. The length shall be taken along the centre line of the pipes and fittings as mentioned above. All pipes and fittings shall he classified according to their diameters, method of jointing and fixing substance, *quality and* finish. TIIC diameter shall be the nominal diameters of the internal bore.

2.0 BALL VALVE

2.1 Material

The ball valve shall be of high or low pressure class as mentioned in the schedule of quantities and shall be obtained from approved and reputed manufacturer. The nominal size of a *ball* valve shall be that corresponding to the size of pipe for which it is used. Unless otherwise specified the ball valve. shall be of brass or gunmetal and the float for low pressure in polythene and for high pressure in copper. Details of an associated components and their materials are to be best available quality.

The ball valve shall generally conform to IS-1703-1968. The weight of ball cock and .the size of the ball shall be as per table given below:

Dia.	Total weight in gms.	
	H.P.	L.P
15	524	481
20	986	867
25	1549	1411
32	2120	1873

40	2646	2303
50	4454	3959

The ferruless for connection with CI main shall be obtained from the approved manufacturer as specified. It shall be non-ferrous material with a CI bell mouth cover and shall be of nominal bore as specified. The ferrule shall be fitted with a screw and plug or value capable of complete shutting off the supply to the connected pipes as and when required. For fixing fefrule the empty main shall be drilled and tapped at 45 degree to the vertical and ferrule screwed in. The ferrrule must be so fitted that no portion of the sunk shall be left projecting within the main to which it is fitted.
or val

DIAMETER OF IN AND OUT OPENINGS

DIA IN	DIA OUT	DIA IN	DIA OUT
1/8"	½"	½"	½"
¼ "	½"	¾"	¾"
3/8 "	½"	1"	1"

4.0 BRASS GUN METAL. NON-RETURN VALVE (CHECK YALVE)

The non return valve shall be of brass or gunmetal as specified and shall be of horizontal or vertical flow type and of the size as listed. The Valve shall be approved quality heavy type and shall be obtained from the approved manufacturer and shall have the following weights with a tolerance of 5 percent.

Dia in mm	horizontal type n kg.	vertical type in kg.
15	0.30	0.25
20	0.55	0.25
25	0.90	0.75
32	1.25	0.90
40	1.70	1.20

50	2.90	1.45
65	5.25	2.15
80	7.70	4.10

5.0 FOOT VALVE

This is generally placed at the lower end or the suction pipe of centrifugal or other pump to prevent the suction pipe from emptying. When the pump is first started it does not have to exhaust the air from the suction with pipe, the result is that prompt starting 0(' the pump is secured. Foot valve is particularly useful when the suction lift or vertical height of the pipe is considerable.

6.0 SLUICE VALVE

The sluice valves is used in a pipe line for controlling or stopping flow of water, This should be of inside screw, non-rising spindle type, sluice Valves from 50 mm to 300 mm sizes with hand wheel *for* operation usually. These shall be obtained from the approved listed manufacturer. Sluice valve shall be of two classes and the test pressure and maximum working pressure arc as follows:

	Test Pressure		Maximum Working Pressure
	Kg/cm2	Kg/cm2	
	Body	Seat	
Class PN I	15	10	10
Class PN 1.6	24	16	15

The bodies, domes, covers, stuffing box, thrust plates, hand wheel, wedges, gland shall be of cast iron and spindle shall be machines from rolled, extruded or forged high tensile brass or aluminum bronze. The tensile strength or he rolled, extended or forged metal shall be *less* than 44 kg/m2 with a minimum elongation of 20 percent on a gauge of 5cm. The rings and spindle nut may be of non-ferrous or ferrous metal.

MINIMUM FINISHED WEIGHT OF SLUICE VAVE
(all dimensions in millimeter)

Sl no.	particulars	weight in kg of nominal size (mm)
1.	weight of value Excluding cap Or hand wheel	
	Class pn I	20 22 30 43 55 70 120 175 240
	Class 1.6	24 27 36 55 67 185 150 225 300
2.	weight uf cap	
	Class pn 1	1.3 1.3 1.3 1.3 1.3 1.3 1.5 1.9 2.4
	Class 1.6	1.3 1.3 1.3 1.3 1.3 1.3 1.5 1.9 2.4

The test shall be conducted under constant pressure for a period of Lime sufficient for a thorough inspection of the valve but not less than 2 minutes for each test. For sluice valves above 300 mm size should conform to relevant IS Specification.

Air Valves

They are placed at every summit in the pipe to permit the escape of air when main is filled and afterwards air, if any is carried into 'the main (They were also placed on long stretches of nearly level main).

Scour Valves

These arc placed at the bottom of all depressions for emptying the main or letting out sediment.

Reflux Valves

These arc fixed on the ascending parts of the main which open in the direction of flow but automatically close if a burst occurs and the water flows back. They diminish the damage done hy the escape of water at a burst

Safety or relief values

These are fixed at the downstream end of long lengths of mains: and where water hammer may take place so as to reduce to the normal any excessive pressure that may occur.

7.0 WATER METERS

7.1 WATER METERS (Domestic Type)

The water meter body shall be of bronze, gunmetal or brass and marked to read in liters complete with registration box, can and lid. The water meters shall be provided with strainers. Strainers shall be of material which *is* not susceptible to electrolytic corrosion. 'They *shall* be rigid, easy to remove and clean and shall be fitted on be inlet side of water meter. It shall be possible to remove and clean the strainer in such the way as not to pen nit disturbing the registration box for cleaning, and shall be fitted with an additional external strainer on the inlet side and rates quoted by contractor shall include *for* same.

The nominal sizes of Domestic meter arc 15, 20, 25, t10 and 50 rnm and denote he nominal bore of its inlet.

The meter casting shall he fitted in the pipe line by two conical or cylindrical nipples or tail pieces with connecting nuts. Water meters should be made of the same materials as specified for body.

7.2 WATER METERS (Bulk type)

This shall be of size 50 mm to 500 mm. Water meter may be either vane wheel type ranging from 50 mm to 300 mm of Helical type ranging from 50 mm to 300 mm.

In vane wheel type mercer runner or impeller is mounted (Ill a vertical spindle which has several vanes symmetrically spaced around the axis. In helical meter running is provided with nos. of vanes forming a multi threaded helix.

7.3 Marking

Each meter have be marked with the following information

(a) Nominal size

(b) Direction of flow

(c) I.S.I. certification mark
(d) Manufacturers name and trade mark.

7.4 General

Water meter and their parts, especially parts coming in continuous contact with water, shall be made or materials resistant to corrosion and shall be non-toxic. Use of dissimilar metals in contact under water shall he avoided as far as possible to minimize electrolytic corrosion. The drop in pressure, in feet of water in passing through the meters (of all sizes) should be staled specifically.

7,5 Body

The body of the meter shall be made from east iron of non-ferrous metals but no aluminum alloy, where made of cast iron, the quality of cast iron shall conform to Grade 20 of LS. 210-1 *Y62:* where made of non-ferrous metals, it shall be made from bronze, brass or any other corrosion resistant metal *having* physical properties not less than Grade 2. The body shall he made free from all manufacturing and processing defects such as blow holes and spongy structure and shall not be repaired by plugging, welding or by the addition of the materials. The internal shape shall ensure easy dismantling.

7.6 Connection

The meter casing shall be fitted into pipe line by means of a double flange, the internal diameter of which shall be equal to the nominal size of the meter. Flange shall be machined flat, that is without raised joint face.

7.7 Screws, Studs *and Nuts*

Screws, studs and nuts shall be of mild steel, brass or other corrosion resistant material of approved type and quality.

7.8 Cap

The cap shall be of same material as those specified for body or shall be made or brass or approved type and quality.

Cap May he made 01 suitable aluminum alloy where so desired. The edge shall lap over the circumference of the registration box in order to prevent the penetration of drill '1 he transparent window which covers the dial shall be inserted from inside into the cap. The protective lid shall he secured by a robust hinge or other suitable method of robust construction. The provision shall be such that it may he conveniently operated from the top. Where the provision is designed for use in conjunction with pad locks the hole provided for pad locks shall be of a diameter not less than 4 mm.

Where so required, for dry type water meters, tile transparent window covering the dial shall be provided with a wiper on the inner side for wiping of condensed water.

8.0 BRASS BID COCK AND STOP COCK

A Bib Cock is a draw off tap with a horizontal inlet and lice outlet and Stop Cock is a valve with a suitable means or connection for insertion in a pipe line for controlling or stopping the flow. '1IICY shall he of screw down type. The closing device should work by means disc, carrying a renewable non-metallic washer which shuts against water pressure on a seating at right angles to the axis of the threaded spindle which operates it. The handle shall be either crutch or butter fly type or standard head securely fixed to the spindle. Valve shall be of the loose leather seated pattern.

The cocks shall open in anti-clock wise direction: The bib cock and stop cock shall be polished bright, if chromium plated. Finish must be of approved type. Finished weight of the bib tape and stop taps arc as follows :

Size in nun	Minimum finished Weight in. Kg	
	Bib taps	Stop taps
15	0.40	0.40
20	0.75	0.75
25	1.25	1.36
32		1.80
40		2.25
50		3.85

In finish and appearance the plated articles when inspected shaft he tree from plating defects such as blisters, pits, roughness and unplanted areas and shall not be stained or discolored. Before a fatling is plated, the washer plates shall he removed from the fillings. The gland packing shall be protected from the plating solution.

8.1 Gunmd.al Bib Cock-and Stop Cock

These shall be be of gun metal screw down patterns. So far as the general requirements or materials are concerned these shall be similar to those as described above. The weights arc also same.

9.0 BRASS FULLWAY VALVE

Full way valve is a valve with suitable means of connection for insertion in a pipe for controlling or stopping the flow. The valve shall be of brass tilted with a cast iron wheel and shall be of gale valve type opening full way and of the size as specified.

The valve shall be of best quality of approved make as listed and shall have the following approximate weights with tolerance of 5%.

Dia. (in mm)	flanged end (kg)	screwed end (kg)
15	1.021 (provisional)	0.567 (provisional)
25	1.503 "	0.680 "
32	3.232 "	1.077 "
40	4.082 "	1.559 "
50	6.691 "	3.232 "
65	10.149 "	6.804 "
80	13.381 "	8.845 "

9.1 Gun Metal Full Way Valve with Wheel

This shall be of the gun metal fitted with wheel and shall be of gate valve type opening full way. This shall generally be of approved make as listed.

10.0 Water Tank

Installing, hoisting of readymade PVC, mild steel, galvanized iron pressed steel,
Asbestos cement water tanks constructing the RCC tanks shall be carried out with proper care, using best quality materials, care being taken that no part

of the tank or of the structure is damaged during operation. the tanks shall he installed to level and drawing. Steel tanks of capacity up to 1800 liters (Mild steel or galvanized iron as specified) shall be 1.6 mm thick shed riveted to 32 rum x 32 nuns x 6 mm angle iron frame complete with stills' cover with locking arrangement including providing pads of sizes as required for inlet and outlet pipes. GI overflow pipe piece of specified size with mosquito nrool coupling and with backing nut of required sizes shall also he provided. SUPPOrt8 for tank." sisal be provided as specified and shall be measured and paid for separately. P.S. tanks, details and arrangements, installation should be as per manufacturers' specification.

10.1 Pipe Inserts/Puddle Piece

GI pipe inserts or *MS/CI* puddle pieces to be kept in position for outlets, wash out and interconnection of tanks while casting RCC/masonry tank shall be of the specified size and diameter and shall be threaded throughout *its* length. For GI Pipe insertion a] 50 mm x 1 SO mm MS plate 6 mm thick shall be welded centrally on to the threaded body of pipe as directed. Rates quoted shall include for the same.

SECTION – IV

TECHNICAL SPECIFICATIONS FOR SEWERS AND DRAINS

1.O STONEWARE PIPES

1.1 Materials

The S. W. Pipes with spigot & socket ends and fittings should be Grade 'A' and shall he obtain from approved manufacturer listed in the tender. The pipe shall conform to IS 651-1955.

These shall be sound and free from visible defects such as fire crack or hair crack and Haw or blister, The pipe shall give a sharp clear note when struck with a 11ght hammer and should be perfectly salt glazed. The approximate thickness of 60 cm, Long pipes shall be as given in the table below:

1.2 S.W pipes

Internal diameter of the pipe in mm.	Thickness of the barrel & socket in mm,	weight of each pipe per miter in kg
100	12	14
150	15	22
200	16	33
230	19	44
250	20	52
300	25	79

The length of pipes shall be 60 cm exclusive of the internal depth of socket

1.3 EXCAVATION OF TRENCHES

The gradient is to be set out by means of sight and bonning rods and the required depth be excavated at any point. The trench shall be excavated as directed the consultant/employer. The depth of the trench shall not be less than 1 miter measured from the top of the pipe to the surface of the ground under roads and less than 0.75 cm elsewhere. The width of the trench shall be nominal diameter of the pipe plus 40 cm but it shall not be less than 80 cm

incase all kind of soil excluding rocks and not less than 55 cm. in case of work.

The bed of the trench, if in soil Of made up earth, shall be well watered and rammed before laying (he pipes and the depressions if any shall be properly tilled with earth ahead consolidated in 20 cm lavers.

If rock is met with, it shall be removed to l5 cm below the level of the pipe and the trench will be refilled with excavated materials and consolidated . the excavated materials shall not be placed within 1 (one) mere or half of the depth of the trench whichever is greater from the edge of the trench, l .

The materials excavated shall be separated and stacked so that in refilling they may be re-laid and compacted in the same order to the satisfaction of the Consultant/Employer.

After the excavation of the trench is completed, foundation of cement concrete (1 :3 :6) or lime cone. as specified of proper width and thickness to be laid with proper level all along under the length of the pipe with hunching as per drawing.

1.4 Laying, .Jointing, t launching of the pipe and fittings

The rain pipes shall he laid in straight lines and to even gradients as shown on the drawings. The socket end of the pipes shall face upstream. Adequate care shall be exercised in gelling out and determining the levels of the pipes and the contractor shall provide suitable instruments, templates sight rails, bending rod. s and equipment s necessary for the purpose tilt: joints arc to be kept wet until the cement joints are properly set with wet bag. The cement mortar joints shall he cured at least for seven days.

In case of S. W. Pipes joint" (socket and spigot), they should he caulked first with tarred jute (spun) soaked in cement slurry of requisite diameter, almost quarter depth of the socket, at ("T which cement mortar (I: I) is pushed in with wooden chisel and finished beveled at outside al 45 degree. Instead of jute or hemp rubber gasket of proper size may *also* be used.
in case of pipes less than 25 cm ,dia. joints should be made at ground level with 3 pipes at a time and for larger ones 2 pipes at. a time and after curing they should be rolled in foundation with the help of ropes ..
An pipes should be properly launched and/or provided with chair as per drawing. Details of the foundation and covering etc. are to be taken from the drawing provided. Where the pipes are crossing the building or road around concrete *1:4:8 is to be* done to 15 cm thick over the barrel of the pipe.
Any treasure-trove, coin or object or antiquity which may he found on the site shall be molded over the Employer.

4.0 **R.C PIPES**

4.1 MATERIAL

RCC pipes should usually he NP2 class' if not specified otherwise and shall be obtained from approved manufacturer as list.;;d. These should he (If best quality, true to shape, straight, perfectly sound, free from cracks and flaws, and densely packed. '111C internal and external surface of the pipes 3ha11 be smooth and hard. The approximate thickness and weight of R.C.C. Pipes NP-2 are given below

R.C.C. Spun pipes NP2 Class

Inside (Nominal) dia. of pipe	'Dlkkness of cl wall	Min. cca king spac	Min. thickncss colt	Mill. leng of colle	Longitudinal reinforcements		Spiral reinforcements
mm	mm	mm	mm	mm	No.	Wt, Kg.lm	Kg./m
100(100)	25	13	25	150	6	0.86	0.17
150(100)	25	13	25	150	6	0.86	0.22
200(200)	25	13	25	150	6	0.&6	0.46
250(250)	25	13	25	150	6	0.86	0.71
300(300)	30	16	30	150	8	1.00	1.29
350(350)	32	16	32	150	8	1.00	1.75
400(400)	32	16	32	150	8	1.00	2.25
450(450)	35	19 .	35	200	8	1.25	2.75
500(500)	35	19	35	200	8	1.25	3.22
600(540)	4S	19	40	200	8		4.90
700(68O)	50	19	40	200	8	1.7X	6.05
800(790)	50	19	,15	*200*	8	1.7R	(}.IO

4.2 HANDLING AND LAYING OF PIPES

Reasonable care shall be exercised in loading, transporting, avoid impact and sorting out the broken and defective ones.

Pipes shall be carefully lowered true to line and grade specified and always proceeded upgrade of a slope. The socket end shall face upstream. In the loose collar joint, the collar shin be slipped on before the next pipe IS laid.

Adequate and proper expansion joint shall he provide where necessary.

Tile sections of the pipe shall be joined together in such a manner that there shall be as little unevenness as possible along the inside of the pipe.
If the foundation conditions arc unusual i.e. in proximity of trees or poles, under manholes, etc. the pipe shall be encased in low strength concrete bedding as mentioned in S. W. Pipes.

4.3 Condition of laying

For the purpose of laying RC. Pipe, conditions stipulated in relevant is. Code are to be followed.

4.4 Trench Condition .

Where a trench is excavated and refilled after laying the pipe, settlement of the earth in the filled trench take place. The filling above the top of the pipe settles relevantly more than the side of the trench, there by developing fractional resistance. The contractor is required to take special preconception against the while refilling the trenches, produce for back filling as stipulated earlier should be strictly followed.

4.5 Bedding

In cases where natural foundation is inadequate the pipes shall be laid either in concrete cradle Supported on routable structures as per drawing. If a concrete crate bedding is used the depth of below the booms of the pipes shall be at least ¼ of the internal diameter and shall extend up the sides of the pipe least to *a* distance of 1/4th of the outside diameter for pipes 300 mm dia. and over The pipe shall be laid in this concrete bedding before the concrete has set. Pipes laid in trenches in earth shall be bedded wetly and firmly and as fur up the haunches of the pipe as to safely transmit the load expected from backfill through the pipe to the bed. This shall be done either by excavating the around the curve of the pipe to from an even bed.

a)
When the pipes are laid completely above the ground the foundation shall be made even and sufficiently compacted to support the pipeline without any material settlement. Alternative the pipeline shall be supported on PCC saddle blocks similar argument shall be made to retain the pipe line in proper alignment, such as by shaping the top of the support to fit the lower part of the pipe. The pipe shall be supported shall in on the joints. In no case shall the joint come in certain of the span.

4.6 jointing of pipes

A few skeins of spun yarn soaked in neat cement slurry be insecure in the grove at the end of the pipe and two adjoining pipes.

Object of the yarn is to centre the two ends of the pipes within the collar and to prevent the cement motored the joint penetrating into the pipes.

Cement mortar 1:1 (1 cement : 1 sand) or as & specified shall be slightly moisture and must on no account be soil or sloppy, shall be inserted carefully by hand into the joint. It shall then be crammed with a caulking tool More cement mortal' shall be added until the space of the joint has been filled completely with tightly caulked mortar. The joint shall he finished off neatly outside the collar on both sides at an angle of 450,
Any surplus mortar projecting inside the joint is to be removed and to guard against any such projections sack or gunny bags shall be drawn past each joint after completion.
The cement *mortar* joints shall be cured at *least* for 7 days.

4.7 Testing

Same as that for S, W. pipe drain except that the head of water for testing shall be 2 meters above the top of the highest pipe between two manholes.

4.8 measurement

The measurement fur providing, laying & jointing S.W. pipes and R.C.C. pipes and their fitting shall be taken along then centre tines. The measurement shall be taken from mid of one manhole to inside of the other manhole.

5.0 CHAMBERS/MANHOLES

5. I Size

At every change of alignment, gradient or diameter of a drain there shall he a manhole or inspection pit. The maximum distance between manhole chamber shall be 30 M for road, 15 M within compound.

5.2 Size

All manholes shall have internal dimensions as shown on drawings The depth of invert shall be according (0 the gradient.

5.3 foundation

The base concrete shall be 15 cm thick and with 1:4:8 cement concrete laid over the brick flat soling. The slab shall be finished 75 mm beyond the external the face of the brick work.

5.4 Brick Work

The brick work shall he in cement sand mortar in the proportion. 1:5 and 250 nun thick or as mentioned in the tender. The joints shall be raked out.

Plaster

Inside walls and bottom of pit shall be plastered as specified in the item and shall be finished with floating, coat of neat cement. In wet ground, 20 mm thick plaster shall be done on the exterior surface of the walls also and this plaster shall be waterproof with the addition of approved water proofing compound :15 per manufacturer's specification,

Pointing

In dry ground pointing shall be done in 1:2 cement mortar to the outside surface.

5.5 Hunching and construction

On the top or the base slab from half pipe channel longitudinally at the centre, the channel is to be hunched up with concrete slopping towards from the edge of channel to meet the side of the chamber at gradient of 1:6, The channel an the benching arc to he floated to smooth *hard* surface *with a* coat of cement mortar. Extra cement Sewers are unequal sectional area shall not be joined at the event in a manhole unless it IS unavoidable. The branch sewers should deliver sewage in the hole in the direction of main flow and the junction must be made with heel rest bend at the bottom of drop connection C. J. shall he provided with heel rest bend at the bottom and bend with access door at the top for cleaning purposes.

5.6 Channel

Channel for drains corning from side of the manhole chamber shall be curved to meet the main drainage channel. The channels and bench shall he done in cement concrete 1:3:6 and rendered smooth with neat cement The depth of channels and benching shall be as follows :

Size of drain In mm	top of channel at the center above Bed concrete (cm)	depth of benching of side walls above bed concrete (in cm)
100	15	20
150	20	30
200	25	35
250	30	40
300	35	45
350	40	50
400	45	55
450	50	60

the brick work in shallow manhole shall be corbelled to the required size for the cast iron manhole cover and frame.

Footrest

C. I. fool rests or MS. Foot rest with rods of 20 mm dia shall be embedded in masonry. They shall be fixed 225 mm apart vertically and 30() mm horizontally in staggered fashion and projecting 125 film from the wall lace. Foot fest shall be painted with bitumen as directed. First footrest shall he 450 mm from top.

6.0 CUTTLNG HOLEs, chases, etc, repairing the same:

Holes and chases to be cut into walls, slabs, etc. must be of the minimum size and extent required to run the service and in no case superfluous cueing is 10 be resorted to. After the services are laid, the chases and holes must be made good in cement concrete with suitable Finish, These repairs must be done very carefully S() that the finished surface is uniform and harmonious with the rest of the adjoining surface. No extra claim will be entertained in his respect.

7.0 RCPC AND POLYELASTOMER STREET MANHOLE COVERS AND FRAMES:

7.1 Unless otherwise mentioned the covers and frames shall be at IS 2592

Unless otherwise mentioned the covers and frame shall be of IS 2592 Part I and Part 11 obtained from approved manufacturer and shall he of approved make and brand as listed.

Covers and frames shall be cleanly cast, they shall be free from air and sand holes, cold shut" and wrapping which are *likely* to impair the utility of the casting. All casing shall he free from voids whether due to shrinkage, gas inclusion or other causes. 'I he covers shall be gas tight and water tight with proper seal arrangement, but can be easily opened and closed and it shall be fitted in the frame in workmanship like manner. The cover used for sewer line should bear sewer engraved on top of casting. Simibr1y for storm line it shall be marked 'storm'. Size and dimensions are given .below with weight. 2.5 variations in weight shall be permissible. Size of cover shall be the clear internal dimensions of frame. Covers shall have raised chequered design to provide an adequate non-slip grip. The covers and frames shall be coated with anticorrosive paint of bituminous composition. 'I1IC frame of manhole cover shall be firmly embedded to correct alignment and levels in R.C.C. slab or plain concrete 3S the case may Be

8.0 GULLY PIT

To be of the standard size 1.06 m x 0.03 m and to be built in cement mortar (3:1) as specified in *strict* accordance with be drawings. The internal side and the floor are to be finished whit 12 mm cement plaster to be fitted with a 150 mm C.I. overflow pipe with hinged cover and handle 0.90 x 0.45 C.I. gully grid of the stander weight, 15 cm siphon. The gully grid and frame are to be of rcpc bearing capacity 20 M.T. size grating 700 x525 x 70 mm and frame 820 x 670 x165 mm.

S.W. GULLY TRAP

S. W. Gully trap of specified sizes and quality shall be fixed on 15 cm thick cement concrete 1:3 :6 bedding and tile gully outlet of the branch drain shall be joined similar to joining of S. W. pips, A brick masonry chamber 30 cm x 30 cm internally shall be constructed half brick masonry with 1 :6 cement mortar and the space between the trap and the wall filled up with cement concretel:4:~ and the upper portion of the chamber finished internally with 1:3 cement mortar and finished with neat cement, the corners and the bottom of the chamber shall be rounded off so as to slope towards the grating. in addition the chamber shall have a C.I. grating with frame 30 cm x 30 cm (inside) with machined seating faces, fixed on the top of be brick with cement concrete 1:2:4 and rendered smooth. The weight off grating shall not be Jess than 4.53 kg. and that of frame 2.72 kgs.

SANITARY AND PLUMBING WORKS

LIST OF APPROVADE BRAND AND MANUFACTURERS

1. SANITARY FIXTURE(FIRST QUALITY VITREOUS CHINA)
M/S PARRY INDIA LTD,M/S HINDUSTAN SANITARY WARES.M/S MADHUSUDAN CERAMICS

2. FOR stainless steel sink: M/S EID PARRY INDIA LTD,M/S SAIL,M/S JYOTI INDUSTRIES(NIRALI) JAYNA BRAND

3. PVC FLUSHING CISTERNS – SLIMELINE/COMMANDO/DUROLITE

4. CHROMIUM PLATED BRASS FITI1NGS: ESSCO, Jaquar
Kingston, MARE, ESSESS,

5. a) UPVC(SWR). SOIL, WASTE RAIN WATER PIPE AND FITfINGS -IS 13592
SUPREME,PRINCE,ORIPLAST .

b)HCI son, WASTE PIPE AND FITTING IS 1729 : ALC, BIC, AMC,

6)GALVANISED IRON PIPES –IS 1239 :TATA ,NEZONE JINDAL I

8.G.I. FITTINGS: IS:879 'R' Brand manufactured by M's R.M. Engineering Ltd.,
. Ahmedabad, 'SUN' Brand, NMC, AA, I-IB, Nil

9.GUNIv1ETAL VALVE & COCK: IS:778-84
'Leader' Jallundhcr, *Mls* Bombay Metal & Alloy Mfg. Co.(J» ltd., Zoloto Industries, lallamlhar.

10. R.C.C. DRAIN PIPES - IS:458
NP2 class pipe manufactured hy: M/S
Hindustan Concrete Pipe, M/S

M/S BHAGIRATHI HUME PIPES: SONALI
BRAND,DURGAPUR M/S WEST BENGAL CONCRETE
INDUSTRIES Pvl. LTD

11. GLAZED STONWE WERE PIPE & FITTING IS-651/1955 M/s I LIND CERARNICS LTD.

12. WHITE REGID PVC PIPES & FITTING IS 4985 SQER SUPRIM, PRINCE, ORIPLAST.

13.H.D.P.E. PIPE & FITTINGS IS 4984 ORIPLAST, EMCO BRAND.

Annexure - I

PARTICULARS TO BE FURNISHED FOR CONSTRUCTION OF bank building at ----------

1. Name of Company / Firm:

2. Registered Address of the Company with Telephone No., FAX & E-mail ID:

3. Address of the company in New Delhi / Faridabad with Telephone No., FAX & E-mail ID:

4. Year of Establishment:

5. Status of the Company (whether Proprietary / private Ltd. / Public Limited/ Co-operative Society / Public Sector / Autonomous body / Govt. Department):

6. Name of the Proprietor / Directors / Partners / Controlling body:

   i)

   ii)

   iii)

7. Whether registered with the Registrar of Companies / Registrar of Firms / Registrar of Co-operative societies. If so, please mention the number of such registration and date:

8. a) Name and Address of Bankers:

i)

ii)

iii)

a) Enclose Solvency certificate from at least one Banker in a sealed envelope marked confidential.

9. Whether registered for GST. If so, please mention the GST registration number and furnish a copy of such registration certificate:

10. Whether an assessee of Income Tax. If so, please mention the Permanent Account Number:

11. Furnish copies of audited Balance Sheet with Profit & Loss account for last three Years : **2015-16 2016 -17 2017-18**

12. Whether empanelled with other PSU Banks / Govt. Deptts. / PSUs / Autonomous bodies. If so, please furnish the following particulars:

Name of the Organisation / Trade/Services Date of Empanelment

Validity Financial Institution

13. Furnish the names of three responsible persons who will be in a position to certify about the quality as well as past performance of your organization

i)

ii)

iii)

The particulars furnished in the application are true to the best of my/our knowledge & belief. I/we understand that if any of the particulars is found incorrect, even at a later stage, my/our empanelment will be cancelled.

Date:
Signature of Applicant

(Seal)

Annexure – II

Detailed Particulars for the works done in past seven years:

work completed	Name of organization	Name of work	Value	Compliance of stipulated completion time

(Furnish photocopies of credentials)

Annexure -III

Particulars in respect of work executed

Sr. No.	Name of work/Project with address	Short description of work executed	Name & address of owner	Value of work executed	Stipulated time of completion	Actual time of completion	Name of Architect / Consultant

Annexure –IV

Key personnel permanently employed

Sr. No.	Name	Designation	Qualification	Experience	Years with the firm	Any other

Annexure - V

Other relevant information

Work Force:

Sr. No.	Permanently employed	No.	Any other	Years with the Firm
1	Masons			
2	Carpenters			
3	Mechanics			
4	Electricians			
5	Mate/helpers			
6	Others			

Annexure – VI

Workshop facilities:

Sr. No.	Location	Land Area	Type of structure	Type of facilities

ANNEXURE - VII

ARTICLES OF AGREEMENT

ARTICLES OF AGREEMENT made this ---------- day of two thousand ---------- between "**UCO Bank**, a body corporate, constituted under the Banking Companies (Acquisition & Transfer of Undertakings) Act, 1970 as amended from time to time having its Head Office at No.10, BTM Sarani, Kolkata-700001 and a Circle Office amongst other places at …….. hereinafter referred to as "**the Employer**" (which expression shall unless excluded by or repugnant to the subject or context be deemed to mean and include its assigns, administrators and successors) of the **"ONE PART**".

and

M/s……having its office at…… represented by its ……., son of …….. (hereinafter called the **"CONTRACTOR** (which expression should include its successors and assignee/s.) of the **OTHER PART**,

WHEREAS the Employer is desirous of executing the General Building, Sanitary & Plumbing and Area development work in connection with construction of Bank Building at ----------of UCO Bank and has caused drawings and specifications describing the work to be prepared by **MIs ----- (Name & Address)---------- (hereinafter called the "CONSULTANT').**

AND WHEREAS the said **DRAWINGS** numbered as mentioned in the tender document and to be issued from time to time, the Specifications and the Schedule of Items and quantities have been signed by and on behalf of the parties hereto.

AND WHEREAS the **Contractor** has agreed to execute upon and subject to the conditions set forth herein and Schedule of Items and quantities, *General* Conditions of Contract, Special Conditions of Contract including all other conditions as mentioned in the tender document, specifications and all correspondence exchanged by or between the parties from the submission of tender till *the* award of work, *both letters* inclusive, (all of which are collectively hereinafter referred to as **"the said conditions"**) the work shown upon the said drawings described in the said specification and included in

the schedule of items and quantities at the respective rates therein set forth amounting to sum of Rs. …..... (Rupee..... only) as therein arrived at or such other sum as shall become payable thereunder **(Hereinafter referred to as "the said Contract amount").**

NOW IT IS HEREBY AGREED AS FOLLOWS:

1. In consideration of the said contract amount to be paid at the times and in the manner set forth in the said conditions, the Contractor shall upon and subject to the said conditions execute and complete the work shown upon the said drawings and described in the said specifications and *the schedule* of items and quantities.

2. The Employer shall pay the Contractor the said contract amount or such other sum as shall become payable, at the times and in the manner specified in the said conditions

8. The Consultant in the said conditions shall mean the **M/s ---------- (Name & Address)----------** or, in the event of their ceasing to the Consultant for the purpose of this Contract for whatever reason, such other person or persons as shall be nominated for that purpose by the Employer, provided always that no person subsequently appointed to be Consultant under this contract shall be entitled to disregard or overrule any previous decision or approval or direction given or expressed in writing by the Consultant for the time being.

9. The said conditions and Appendices thereto shall be read and considered as forming part of this Agreement, and the *parties* hereto shall respectively abide by, submit themselves to the said conditions and perform the agreement on their part respectively in the said conditions contained.

10. The plans, agreements and documents mentioned herein shall form the basis of this contract.

11. This contract is neither a fixed lump sum contract nor a piece work contract but is a contract to carry *out* the work in respect of *General* building, Sanitary, Plumbing and Area development work relating to construction of Bank Building at ---------- as per the scope described and to be paid for according to actual measured quantities at the rates contained in the Schedule of rates and probable quantities or as provided in the said conditions.

12. The Employer reserves to itself the right of altering the drawings and nature of the work by adding to or omitting any items of work or having portions of the same carried out without prejudice to this

contract.

13. Time shall be considered as the essence of this contract. and the contractor hereby agrees to commence *the* work on the day of handing over of *the* site or within fourteenth days from the date of issue of formal work order whichever is later as provided for in the said conditions and to complete the entire work within ---(------) calendar months subject nevertheless to the provisions for extension of time **AS WOULD BE GRANTED BY THE EMPLOYER IN WRITING.**

9. All payments *by* the *Employer* under *this* contract *will* be made at New Delhi.

10. THE TERMINATION OF CONTRACT AND ITS EFFECT WOULD BE IN ACCORDANCE WITH THE STIPULATIONS LAID DOWN IN GENERAL CONDITIONS OF CONTRACT.

11. Any dispute *arising* under this Agreement shall be referred to arbitration in accordance with the stipulations laid down in the general conditions of contract.

12. That the several parts of this contract have been read by the contractor and fully understood by the contractor.

In witness whereof the Employer and the Contractor have set their respective hands to these presents through their authorized official and the said two duplicates hereof to be executed on its behalf of the day and year first herein above written.

---------- ----------

Signed on behalf of the UCO Bank by its Duly authorized official

Signed on behalf of the Contractor

In the presence of :

In the presence of :

(1) Signature: ---------- (1) Signature : ----------

Name with address: ---------- Name with address: ----------

(2) Signature: ---------- (2) Signature : ----------

Name with address: ---------- Name with address: ----------

ANNEXURE – VIII

RUNNING ACCOUNT BILL / FINAL BILL

i) : Name of Contractor / Agency :
ii) : Name of work
iii) : SL No. of this bill
iv) : No. and date of previous bill
v) : Reference to Agreement No
vi) : Date of commencement
vii) : Date of completion as per Agreement
viii) : Contract amount
vix) : Validity of Insurance
a) : Workmen Compensation:
b) : Contractor's All Risk Insurance
x) : Validity of Labour License:
xi) : Total retention money including Earnest Money to be deducted as per contract.

xii) : Earnest Money deposited :
xiii) : Total retention money including Earnest Money and ISD deducted up to this bill
xiv) : Period of execution of work for which this bill has been submitted

sl no	Item des-cripction	unit	Rate (R.S)	As per tender Quantity	Amount (R.S)
(1)	(2)	(3)	(4)		(5)

Up to previous R A. bill		Upto date (Gross)		Present Bill	
Quantity	Amount	quantity	Amount	quantity	Amount
(6)		(7)		(8)	

Net value since previous Bill (9) Remarks (10)

NOTE : i) If part is allowed for any item, it should be indicated with reason for allowing such rate. ii) If ad hoc payment is made, it should be mentioned specifically.

MEASUREMENT CERTIFICATE

The measurements on the basis of which the above entries for the running bill No. were made have been taken jointly on --------- and are recorded at pages……. To……. of Measurement Book ……

Signature and Date of Contractor | Signature and date of Consultant's representative | Signature and date of site Site Engineer/PMC

The work recorded In the above mentioned measurements have been done at the site satisfactorily as per tender drawings, conditions and specifications

---------- ----------

Consultant | Site Engineer / PMC / Bank's Engineer

ACCOUNT OF SECURED ADVANCE, IF ADMISSIBLE ON MATERIALS HELD AT SITE BY THE CONTRACTOR

No.	Item	quantity	Unit	Amount	Remark
1.	2.	3.	4.	5.	6.

Total value of materials at site

Secured Advance @ ----- %of above value (B)

Certified (i) that the materials mentioned above have actually been brought by the Contractor to the *site* of the **work** *and* no advance on any quantity of any of this item *is* outstanding on their security, (ii) that the secured advance against all the materials are payable as per contract and all are required by the Contractor for use in the work in connection with the items for which rates of *finished* work have *been* agreed upon.

Date .....

Signature of Site Engineer /PMC preparing tile bill

Date: .....

Signature of Contractor

Date:

Signature of Consultant's Site Engineer

Date:

.....

Signature of Consultant at New Delhi

MEMORANDUM OF PAYMENT

Date.

1. Name of work:
2. Name of owner:
3. Name of Contractor
4. Contact Amount
5. Date of Commencement
6. Stipulated date of Completion

7: Actual date of completion

8: Insurance Valid up to

a. Workmen Compensation Act

b. All Risk Insurance Policies

9. Gross value of work done Up to …….....bill

Less : Rebate @ as Per tender

10, Retention money

11. Add: Secured Advance against materials:

12. Less: Payment made up to Bill: (-) Rs.

13. Less: Adhoc payment certified

……

Rs

(-) ……

Rs

……

Say: Rs

The bill amounting to Rs. ---------- (Rupees ----------) has been scrutinized by me after due test checking of the measurements of work as required and is recommended for payment.

……
Signature of Employer's Engineer with date.

Statutory Deductions :

(1) Total amount due : Rs……

(2)Less: I.T. Payable
(-) : Rs…… , .

3) Less: Sales Tax on Works Contr . (-): Rs……

Net payable : Rs……

The figures given in the Memorandum of Payment has been verified and the *bill* passed for payment of Rs. ---------- (Rupees----------)

……..
Signature of Authorized Official of UCO Bank

Date:

CERTIFICATE OF PAYMENT

(TO BE GIVEN ON BILLS AS WELL AS ON MEASUREMENT BOOKS)

Certified that the various items of work claimed in this ---------bill by the Contractor
---------- have been completed to the
extent claimed and at appropriate rates and that the items are In accordance with and fully conforming to the standard/prescribed specifications and drawings. We further certify that we have checked the measurements to the extent of 100%. Hence the bill is recommended for payment of Rs: ……

……
Signature of Consultant

ANNEXURE - IX

PROFORMA OF GUARANTEE BOND FOR ANTI-TERMITE TREATMENT

The Bond is to be Submitted in a Non-Judicial stamp paper of appropriate value

The General Manager
UCO Bank
Circle Office,

Pre-construction anti-termite treatment for construction of Bank Building at ----------

The above work has been executed *by* us on behalf of *M/s* ..... as per the relevant I.S. Code.

We hereby certify that the foundation and the structure of the above premises of UCO Bank has been pre-treated against subterranean termites infestation in accordance with the specifications, stipulated in relevant I.S. Code and terms and conditions under which the said work has been awarded to us.

We hereby guarantee that the foundation and structure with its fittings and fixtures of the said premises of the UCO Bank shall be absolutely safe against subterranean termite attack or infestation for a minimum period of 5 (Five) years from the date of handing over of the work to the UCO Bank. The date of handing over of the work is **DD/MM/YYYY.**

In the event of said structures with its fittings and fixtures and foundation being or becoming subject to subterranean termite attack(s) or infestation(s) at any time during the guarantee period of **SEVEN YEARS**, we agree to carry out as often as it becomes necessary, entirely at our cost and expenses, all and every treatment that may be necessary to render the said foundation and structure free from such subterranean termite attack(s) or infestation(s) **FAILING WHICH WE SHALL BE LIABLE TO PAY RS..... AS DAMAGES AND COMPENSATION WITHIN A MONTH FROM THE DATE OF DEMAND MADE ON US BY YOU/EMPLOYER IN WRITING.**

The question whether the foundation and structure of the said premises are or become subject to subterranean termite attack(s) or infestation(s) and whether any anti-termite treatment is or has become necessary shall be

decided by the UCO Bank and we agree that their decision in this regard shall be final and binding on us.

……
Signature of the specialized
Contractor With Official Seal

Witness and address :

1.

2.

……
Signature of the Main Contractor with official seal.

ANNEXURE-X

PROFORMA OF GUARANTEE BOND FOR WATERPROOFING TREATMENT WORK

[This bond is to be submitted on non-judicial stamp papers of appropriate value by the Main Contractor and the specialized agency separately]

General Manager
Circle Office,

Water proofing treatment to the roof and sunken floor of toilets etc. - Construction of Bank Building at ----------

We hereby guarantee that before ……day of the month of ……..of year ……. If at any time or times the roofs, moris, sunken floor of toilets, water tanks and any other portion thus treated by us, M/s..... (Name of specialised contractor) on behalf of MIs ..... (Name of Main Contractor), start leaking or in any way give way to the influence of water including forming wet patches, dampness etc. due to the inadequacy of the work carried out or due to any other reason whatsoever relating to the specification, workmanship etc. including the responsibility for any surface treatment and plumbing etc. works carried out by other agencies, we shall without any extra cost to the Employer or to the occupants carry out necessary remedial measures to such extent and so often as may be necessary to free the **AFORESAID** premises from leakage etc. The question of whether there is any leakage or the treatment has given way to water or moisture after completion of the treatment aforesaid and before,……., shall be decided by the Employer and the decision of the Employer in this regard shall be final and binding on us. We shall reinstate the surface to its original condition after carrying out the rectification work, if necessary by bringing new materials at no extra cost to the employer.

Notwithstanding anything contained hereinbefore, we shall not be held responsible for any leakage caused by earthquake or other **NATURAL CALAMITIES OR RIOTS ETC** causing damage to the roofs, underground reservoir, overhead reservoir and sunken floors of the said Residential Flats for UCO Bank at Faridabad (Haryana). **IN CASE OF DEFAULT OR REFUSAL BY US YOU/EMPLOYER WILL BE AT LIBERTY TO CAUSE THE SAID REPAIRING WORKS DONE BY ANY OUTSIDE AGENCIES AND IN THAT EVENT WE SHALL BE LIABLE TO**

PAY THE SAID COST ON DEMAND MADE ON US BY YOU/EMPLOYER.

Witness with address:

Signature of the specialized
Contractor with official seal

1 ..... Place

2 ..... Date

Signature of the Main Contractor
with official seal .

ANNEXURE - XI

BOND FOR SECURED ADVANCE

KNOW ALL MEN by these presents that we, ... engaged as Contractor by the UCO BANK (Hereinafter known as the Employer for the work of **CONSTRUCTION OF BANK BUILDING AT ----------** and upon the terms and conditions as mentioned in the work Order …… from the Employer and assigns ……firmly by these presents duly signed by us dated ---------.

WHEREAS the Employer allowed us Secured Advance for various constructional material lying at Site for an amount of Rs. ------Lakhs (Rupees ----------Lakh) in our …… Bill for the above work. Whereas these are lying **AT THE SITE AT ----------CUSTODY AT OUR OWN RISKS AND RESPONSIBILITIES**. The Employer has full and complete lien over these materials AND SO we hereby undertake to provide full security arrangements of the materials at our own risk and cost. The material will be utilized by us from time to time for the bonafide purpose of the work after giving prior intimation to the Employer.

We further indemnify the Employer on the materials from all risks and responsibilities. In the event of any unforeseen eventuality, we take full responsibility to replace the damaged/missing materials entirely at our cost, we agree not to shift these materials from the present site Store without the Employer's prior permission or concurrence.

WE HEREBY AUTHORISE YOU that the said secured advance may either be adjusted from our running bills or the materials can be lifted from our site at any time AS ON WHEN YOU desire.

THIS MAY BE STATED THAT after all the secured advances **MADE TO US BY YOU/EMPLOYER** are adjusted **FROM THE BILLS DRAWN ON YOU BY US/ CONTRACTOR.**

In THE presence of :-

Signed for and on behalf
of the Contractor

ANNEXURE – XII

FORM OF BANK GUARANTEE FOR INITIAL SECURITY DEPOSIT

Form No. Dated :

M/s UCO Bank,
Circle Office,

Dear Sirs,

GUARANTEE NO. :

AMOUNT OF GUARANTEE:

GUARANTEE COVER FORM:

LAST DATE OF LODGEMENT OF CLAIM:

This Deed of guarantee executed **ON THIS ..... DAY OF..... BETWEEN UCO BANK, A BANK CONSTITUTED UNDER THE BANKING COMPANIES (ACQUISITION & TRANSFER OF UNDERTAKINGS) ACT, 1970 AS AMENDED FROM TIME TO TIME HAVING ITS HEAD OFFICE AT 10,B.T.M SARANI, KOLKATA -700001 AND HAVING INTER ALIA A CIRCLE OFFICE AT ---- ---------- (HEREINAFTER REFERRED TO AS THE "EMPLOYER/UCO BANK")WHICH EXPRESSION SHALL INCLUDE ITS SUCCESSOR/ASSIGNEES.**

AND

..... BANK, A BANK CONSTITUTED UNDER THE BANKING COMPANIES (ACQUISITION & TRANSFER OF UNDERTAKINGS) ACT, 1970 HAVING ITS HEAD OFFICE AT ..... AND INTER ALIA A BRANCH OFFICE AT .....(HEREINAFTER REFERRED TO AS "THE GUARANTOR"))WHICH EXPRESSION SHALL INCLUDE ITS SUCCESSOR/ASSIGNEES.

AND

……, A COMPANY REGISTERED UNDER THE COMPANIES ACT, 1956, HAVING ITS HEAD OFFICE AT ……..(HEREINAFTER REFERRED TO AS "THE CONTRACTOR") WHICH EXPRESSION SHALL INCLUDE ITS SUCCESSOR/ASSIGNEES.

WHEREAS THE CONTRACTOR M/S …….. HAS BEEN AWARDED A CONTRACT FOR CONSTRUCTION OF BANK BUILDING AT ----------FOR RS …… (Hereinafter referred to as the 'said contract') AND ACCORDING TO THE SAID CONTRACT, THE SAID CONTRACTOR IS REQUIRED TO DEPOSIT INITIAL SECURITY DEPOSIT OF RS ……

AND WHEREAS IN CONSIDERATION OF THE EMPLOYER/UCO BANK HAVING AGREED TO EXEMT THE CONTRACTOR FROM DEPOSITING THE SECURITY DEPOSIT OF RS …… UNDER THE TERMS AND CONDITIONS OF THE SAID CONTRACT ENTERED INTO BY AND BETWEEN THE EMPLOYER/UCO BANK AND THE CONTRACTOR ON THE CONTRACTOR FURNISHING A BANK GUARANTEE FOR SECURITY DEPOSIT AMOUNT IN FAVOUR OF THE EMPLOYER/UCO BANK FOR THE DUE FULFILLMENT OF THE CONTRACT BY THE CONTRACTOR.

AND WHEREAS THE CONTRACTOR HAS APPROACHED THE GUARANTOR BANK FOR ISSUE OF SUCH A GUARANTEE IN FAVOUR OF THE EMPLOYER/UCO BANK ON BEHALF OF THE CONTRACTOR FOR THE PERFORMANCE AND DISCHARGE OF THE OBLIGATIONS OF THE CONTRACTOR UNDER THE SAID CONTRACT ENTERED INTO BY AND BETWEEN THE EMPLOYER/UCO BANK AND THE CONTRACTOR.

AND WHEREAS THE EMPLOYER/UCO BANK HAS FORWARDED A DRAFT BANK GUARANTEE WHICH THE CONTRACTOR HAS SCRUTINISED AND APPROVED AND THEREAFTER REQUESTED THE GUARANTOR BANK TO ISSUE A BANK GUARANTEE IN FAVOUR OF THE EMPLOYER/UCO BANK IN ACCORDANCE WITH THE TERMS CONTAINED IN THE DRAFT BANK GUARANTEE PROVIDED BY THE EMPLOYER UCO BANK.

NOW, THEREFORE, THESE PRESENTS WITNESSETH AND THE PARTIES HEREBY AGREE AS FOLLOWS:

1. **THE GUARANTOR BANK HEREBY UNDERTAKES TO PAY TO THE EMPLOYER/UCO BANK UPTO RS …… AS MAY BE DUE AND PAYABLE UNDER THIS GUARANTEE ON THE FIRST DEMAND BEING MADE WITHOUT ANY DEMUR IRRESPECTIVE OF ANY DISPUTE BETWEEN THE**

CONTRACTOR AND THE EMPLOYER/UCO BANK IN RESPECT OF ANY AMOUNT OF CLAIM AGAINST THE CONTRACTOR AS BEING DUE BY WAY OF LOSS OR DAMAGE CAUSED TO AND SUFFERED BY THE EMPLOYER/UCO BANK WITHOUT ANY QUESTION AS TO THE FACTUM OR QUANTUM THEREOF PROVIDED THAT THE LIABILITY OF THE GUARANTOR BANK UNDER THIS GUARANTEE SHALL BE RESTRICTED TO AN AMOUNT NOT EXCEEDING RS ……..

2. **THE BANK GUARANTEE CONTAINED HEREIN SHALL REMAIN IN FULL FORCE AND EFFECT FOR A PERIOD OF ……YEARS FROM THE EXECUTION HEREOF AND THAT IT SHALL CONTINUE TO BE ENFORCEABLE B Y THE EMPLOYER BANK TILL ALL THE DUES THEREUNDER OR BY VIRTUE OF ANY AGREEMENT HAVE BEEN DULY PAID AND THE CLAIM WILL BE SATISFIED OR DISCHARGE OR THAT THE SAID AGREEMNT/CONTRACT IS FULLY CARRIED PUT BY THE SAID CONTRACTOR .**

3. **THE GUARANTOR BANK AGREES AND DECLARES THAT THE EMPLOYER/UCO BANK HAVE FULLEST LIBERTY WITHOUT THE WRITTEN CONSENT OR PRIOR APPROVAL AND WITHOUT AFFECTING ANYTHING IN ANY MANNER ANY OBLIGATION HEREUNDER TO VARY ANY OF THE TERMS AND CONDITIONS OF THE SAID AGREEMENT/CONTRACT OR TO EXTEND THE TIME OF PERFORMANCE BY THE CONTRACTOR FROM TIME TO TIME OR TO POSTPONED AT ANY TIME OR FROM TIME TO TIME ANY OF THE POWERS EXCECISABLE BY THE EMPLOYER UCO BANK AGAINST THE CONTRACTOR AND TO FORBEAR TO ENFORCE ANY OF THE TERMS AND CONDITIONS RELATING TO THE SAID AGREEMENT/CONTRACT AND IT IS DECLARED THAT NOT WITHSTANDING ANY SUCH VARIATION OR EXTENSION OR FORBEARANCE, ACT, OMMISSION OR INDULGENCE ON THE PART OF THE EMPLOYER/UCO BANK IN FAVOUR OF THE CONTRACTOR, THE GUARANTOR BANK SHALL NOT BE RELEASED OF ITS LIABILITY BY REASON OF ANY SUCH VARIATION, EXTENSION, ACTS OR FORBEARANCE.**

4. **THE GUARANTOR BANK HEREBY UNDERTAKES NOT TO REVOKE THE GUARANTEE DURING ITS CURRENCY EXCEPT WITH THE PREVIOUS CONSENT OF THE EMPLOYER/UCO BANK AND THIS GUARANTEE WILL NOT BE DISCHARGED DUE TO THE CHANGE IN THE CONSTITUTION OF THE EMPLOYER BANK OR THE GUARANTOR BANK OR THE CONTRACTOR.**

5. **ANY CLAIM FOR THE BREACH OF CONTRACT BY THE CONTRACTOR OR FOR ANY LOSS OR DAMAGES SUFFERED BY THE EMPLOYER/UCO BANK SHOULD BE MADE BY INVOCATION OF THESE BANK GUARANTEE WITHIN ITS VALIDITY PERIOD. NO CLAIM UNDER THIS GUARANTEE SHALL BE ENTERTAINED BY THE GUARANTOR BANK AFTER 3 MONTHS FROM THE DATE OF EXPIRY OF THE**

BANK GUARANTEE PERIOD.

6. **THAT ON INVOCATION OF THE BANK GUARANTEE THE BANK WOULD PAY TO THE EMPLOYER UCO BANK WITHOUT ANY QUESTION AS TO ANY BREACH OF THE AGREEMENT OR LOSS SUSTAINED OR OTHERWISE AND THE INVOCATION IN TERMS OF THE GUARANTEE WILL BE TAKEN AS FINAL AND CONCLUSIVE.**

NOTWITHSTANDING ANYTHING CONTAINED HEREIN :

(1) **OUR LIABILITY UNDER THIS BANK GUARANTEE SHALL NOT EXCEED RS ……(RUPEES……) ONLY**

(2) **THIS BANK GUARANTEE SHALL BE VALID UPTO ……AND**

(3) **WE ARE LIABLE TO PAY THE GUARANTEED AMOUNT OF ANY PART THEREOF UNDER THIS BANK GUARANTEE ONLY AND ONLY IF YOU SERVE UPON A WRITTEN CLAIM OR DEMAND ON OR BEFORE ……(DATE OF EXPIRY OF GUARANTEE).**

IN WITNESS WHEREOF THE PARTIES HEREIN EXECUTED THESE PRESENTS ON THE ……..DAY OF …….. OF ……. AT ……

Signed, sealed and delivered by

……. Bank by its
Authorized agent Mr ……..
Being the Manager of ……Bank
Of ……..Branch.

In the presence of:

1.

2.

Signature

ANNEXURE - XIII

FORM OF PERFORMANCE SECURITY

(BANK GAURANTEE)

IN CONSIDERATION OF THE UCO Bank (hereinafter called the Employer) having agreed to place order on M/S ---------- (hereinafter called the Contractor) for execution of contract against the tender being tender no. ……. Dated ……for construction of Residential Buildings, Sanitary & Plunging and Area Development work for Construction of Bank Building at ---------- as per agreement dated …….. and the Contractor having agreed to execute the contract against the said tender and the contractor having agreed to furnish a Bank Guarantee of Rs. ---------- (Rupees ---------- Only) litigations for fulfillment of said contract in terms and conditions of the said tender we (Name of the Bank) do
hereby undertake to pay to the Employer an amount not exceeding Rs: ..... against any loss or damage caused to or suffered by the Employer by reasons of any breach of the said contract of any of the terms and conditions contained in to said tender.

We (Name of Bank) do hereby undertake to pay the amounts due and payable under this guarantee without any demur merely on demand from the Employer stating that the amount claimed is due by way of the contractor's failure to perform the Agreement to be executed between Employer and contractor. Any such demand made on the Bank shall be conclusive as regards the amount due payable by Bank under this guarantee. However, our liability under this guarantee, shall be restricted to an amount not exceeding Rs. ---------- (Rupees ----------Only) **AND FOR THE PERIOD OF ……YEARS/MONTHS FROM THE DATE HEREOF**.

We undertake to pay the Employer any money so demanded notwithstanding any dispute or disputes by the Contractor in any suit or proceeding pending before any court of Tribunal relating there to, or liability under this present being absolute and prequivocal.

The payment so made by us under this **GUARANTEE** shall be a valid discharge of our liability or payment there under and the contractor shall have no claim against us for making much payment.

We (Name of Bank) further agrees that the guarantee herein contained shall remain in full force and effect during the period that would be taken for the performance *or* the Agreement to be executed between Employer and contractor and that, it shall continue to be enforceable till all dues of the Employer under or by virtue the said Agreement have been full paid and its claims satisfied or discharged or till appropriate Authority certifies that terms and conditions of the said Agreement have been fully and properly carried out by the said contractor and accordingly discharges this guarantee. Unless a demand or claim under this guarantee is made on us in writing on or before the (Date) ----------we shall be discharged from all liability under this guarantee.

We (Name of Bank) further agree/s with the Employer that the Employer shall have the fullest liberty, without our consent and without affecting in any manner our obligations of the said Agreement to extend time of performance by the said contractor from time to time or to postpone for any time or from time to any of the powers exercisable by the Employer against the said Contractor, and to *forebear* or enforce any if the terms and conditions relating to the said Agreement, and we shall not be relieved to the said Agreement and we shall not be relieved from our liability by reasons of any such variation or for any such variation or for any forbearance ay or omission on the part of the Employer any indulgence by the Employer to the said contractor .

.

By any such matter or thing whatsoever, which under the law relating to sureties would but for this provision have effect of so relieving us.

This guarantee will not be discharged due to the change in the constitution of the bank or of the Contractor.

We (Name of Bank) **FURTHER** AGREE **THAT WE SHALL NOT REVOKE** this guarantee during the currency **OF THIS GUARANTEE EXECPT** with the previous consent of the employer**/UCO BANK** in writing.

Notwithstanding anything contained herein :

(1) Our liability under this Bank guarantee shall not exceed Rs ……(Rupees……) only
(2) This Bank Guarantee shall be valid upto ……and
(3) We are liable to pay the guaranteed amount of any part thereof under this Bank Guarantee only and only if you serve upon a written claim or demand on or before ……(date of expiry of Guarantee).

Signature and seal of the guarantor.

Name of Bank ----------

Address ----------

Date ----------

ANNEXURE - XIV

FORM OF INDEMNITY BOND

On Rs.----/-- Stamp Paper

KNOW all men by these presents that I/We ----------(name of the contractor) having its registered office at----------, being the indemnifier do hereby execute indemnity bond in favour of UCO Bank having their Head Office at 10, B.T.M Sarani, Kolkata-700 001 and a Zonal Office amongst other places at ---------- Pin----------. on this--- day of ---------, 2015.

WHEREAS the UCO Bank has appointed us as civil contractor for their proposed building at ---------- and M/s ----------as their Architects/Engineers.

In consideration of the Bank having agreed to award the aforesaid contract to us more particularly described and stated in the aforesaid Articles of Agreement dated ---------- and the related tender documents, we do hereby agree ad undertake that we, being the indemnifier shall, at the time hereinafter save and keep the bank harmless and indemnified including its respective Directors, officers and employees and keep them indemnified from and against

1. Any third party claims, civil or criminal complaints/ liabilities, site mishaps and other accidents or disputes and/or damages occurring or arising out of any mishaps at the site due to faulty work, negligence, faulty construction and/or for violating any law, rules and regulations in force, for the time being while executing civil work by me/us.

2. Any damages, loss or expenses due to/resulting from any negligence or breach of duty on the part of me/us or any sub-contractor/s if any, servants or agents.

3. Any claim by an employee of mine/ours or of sub-contractors if any, under the Workmen Compensation Act and Employer Liability Act or any other law, rules and regulations in force for the time being and any acts replacing and/or amendments thereof as may be in force at the time and under any law in respect of injuries to persons or property arising out of and in the course of execution of the contract work and/or arising out of and in course of employment of any workmen/employee.

4. Any act or omission of mine/ours or sub-contractors if any, ours/theirs servants or agents which may involve any loss, damage, liability, civil or criminal action.

5. We further agree and undertake that we shall during the contract period, ensure that all permissions, authorizations, consents are obtained from the local and or municipal and//or governmental authorities, as may be required under the applicable laws, regulations, guidelines, notifications, orders framed or issued by any appropriate authorities.

6. If any, additional approval, consent or permission is required by us to execute and perform the contract during the currency of the contract, we shall procure the same and/or comply with the conditions stipulated by the concerned authorities without any delay.

7. Our obligations herein are irrevocable, absolute and unconditional in each case irrespective of the value, genuineness, validity, regularity or enforceability of the aforesaid agreement or the insolvency, bankruptcy, reorganization, dissolution, liquidation or change in ownership of the bank or indemnifier.

8. Our obligation under this bond shall not be affected by any act, omission, matter or thing which would reduce, release us from any of the indemnified obligation under this indemnity or diminish the indemnified obligations in whole or in part, including in law, equity or contract (whether or not known to it, or to the bank).

9. This indemnity shall be governed by and construed in accordance with the laws of India. We irrevocably agree that any legal action suit or proceedings arising out of or relating to this indemnity may be brought in the Courts, Tribunals at ----------. Final judgment against us in any such action, suit or proceedings shall be conclusive and may be enforced in any other jurisdiction by way of suit on the judgment/decree, a certified copy of which shall be conclusive evidence of the judgment/decree, or in any other manner provided by law. By the execution of this indemnity, we irrevocably submit to the exclusive jurisdiction of such Court/Tribunal in any such action suit or proceeding.

IN WITNESS WHEREOF ---------- has set his/their hands on this ----day of ----------, 2015

SIGNED AND DELIVERED BY THE
AFORESAID----------

IN THE PRESENCE OF WITNESS

1)

2)

ANNEXURE - XV

LIST OF MANDATORY TEST

Material	Test	Test	Minimum quantity	Frequency
		Producer		
1.	2.	3.	4.	5.
Lime	Chemical and Physical Properties Of time	IS-6932	5 M tones	10 M.T. or part thereof.
Sand	a. Silt content Chemical	filed	25 Cum	25 cum. Or Part thereof.
	b. Bulking	"	25 Cum	-DO-
	c. Particle size distribution.	"	50 Cum	every 50 cum or part thereof Required for R.C.C work.
	d. Percentage of deleterious materials	IS-2386 Pt.II -1963	100 Cum.	Every 100 cum or part
Stone/ coarse aggregate	a. soft & deleterious materials	IS - 2386 (part-ii)-1963	2 nos.	
	a.Particles size distribution	field	50 Cum.	Every 50 cum. or part thereof for RCC work for rest of Work as desired by the consultant.
	c. impact/crushing strength.		2 nos.	

1	2	3	4	5			
Bricks		1. dimensions	Desiganatio		100 ·50000		Every 50,000 or Part there
			-Do-	75} 50} 35}	1,00,000		Every 100000 or part thereof
	2	Water absorption and Effloresceno	IS-1077-1970		1,00,000		One test for source of manufacture.
	3.	Compressiv Strength	Designa-tion - 100 Designation 75) 50) 35)		50,000 100,000		50,000 or part thereof Two test for 1s1 lot of 1,00,000 and one test later for every 2,00,000 or part thereof.
Water		1. PH value 2. Percentag of solids			IS:8025-1S90		Once before undertaking the work or the source is changed.
Cement concrete Or RCC		1. Slump 2. Cube Strength	Field		(i)	20 Cum. for slabs, beams connecte columns.	Once a day or as desired. (i) Every 20 Cum. Of day's or part thereof.
					(ii)	5 Cum. for columns.	(ii) Every 5 cum

1	2	3	4	5		
Timber		Moisture Content a Stiles Rails in shutter		15267	50 SafT":	a) One for every 50 sqm or part
		b Scantlings		1 Cum.		b). One for every 1 cum. or thereof.
Flush door	i: ii: iii:	End immersion Knife. Adhesion	IIS-2202	No. of shutter 22 65-100 101- 181- 301- 501 &	1 2 2 3 4 5	Dimension test
Steel	(i) (il)	Tensile strength Bend Test	I IS-1529		20MT for each individual dia.	Every 20.00 M.T. or part thereof for each individual
Cement		Compressiv Strength Fineness Soundness Setting (initial & final).	, 18-269/455 and othe appliances		-do-. -do-	Every 50.00 M.T or part thereof.
Marble	i) ii)	Moisture absorption Mhor's	IS 1124		50Sqm.	One set for every 50 sqm, or part thereof.

hardness test I

	2	3	4	5
Aluminum door / Window fittings	Thickness of anodic coating	IS 5523-1969		
Mortice lock	Testing of Springs	IS 2209-1976	100 NOS	100 NOS or part thereof.
Terrazzo Tiles	Transverse strength Water absorption Abrasion test	IS 1237 -do- -do	2000 Tiles -do- -do-	2000 Tiles of part thereof. -do- -do-
Lead	Composition	IS 782-1986	---	Once before use
Ordinary Door Closure	---	Paragraph 5.1 & 8.1 of IS 3564-1975	50 NOS	100 NOS or part thereof.

Note –

1. Cost of testing and transport shall be borne by the contractor and no additional payment will be made on this account.

2. If instructed by the Employer\Consultant the contractor shall get any other material tested at laboratory at his own cost and the above cost shall be included *in* his quoted rates.

3. Frequency stated above is minimum and the contractor may have to te6t materials With any frequency as directed by the Employer /Consultant at his own cost.

ANNEXURE - XVI

PROFORMA OF REGISTERS TO BE MAINTAINED

TABLE -I

CEMENT REGISTER

Name of work : …….

Name of Contractor: ..... .

Agreement No : .....

Date Receipt	Source of receipt with reference to S.O./indent	Quantity received	Progressive total	Date of issue	Quantity issued	Item of work for which issued	Quantities returned at the end of the day
1	2	3	4	5	6	7	8

Total issued	Daily balance at hand	Contractor's initials	Site Engineer's initial	Initial of Bank's Engineer/Consultant	Remarks
9	10	11	12	13	14

TABLE -II

STEEL REGISTER

Name of work……

Name of Contractor…….

Sl no	Source of receipt with reference to S.O./indent	Consumption per measurement vide M.B. No. & page No. Or issues to other works and their T.E Nos.	Mild steel …… 6mm 8mm 10mm 12mm 15mm ……	total ……
1	2	3	4	5

Tor Steel 6mm 8mm 10mm 12 15m -- -- ------- ----- --	TOTAL	Initial of Site Engineer	Initial of Contractor	Initial of Bank's Engineer/Consultant
6	**7**	**8**	**9'**	**10**

……

N. B.: Number of diameters given is only illustrative. Open more columns for other diameters wherever needed.

TABLE – III

PESTICIDE/WATER PROOFING /PAINT/LEAD MATERIALS / BITUMEN REGISTER

Name of work:

Name of contractor: .....

Dt. Of receipt	Source of with reference S.O./Indent	Quantity Received	Progressi total	Date of issue	Quantity assured	Qty .returned the end of
1	2	3	-t	5	6	7

Total issued	Daily balance in hand.	Where used	Contractor's Initials	Site initials	initial of Bank Enaineers/ Consultant	Remarks

---

TABLE-IV

C. I. RAIN WATER PIPE 100/150 MM DIA. REGISTER

Sl no	As per standard	As per site	Initial of Site Engineer	Initial of contractor	Initial of Banks Engineer/consultant
	Description of water pipe	Description wt. of pipes Averages			

TABLE - V

H C I PIPE REGISTAR

Sl no.	As per standard			actual		
	Nominal Bore mm	Thick-ness mm	Over all weight of pipe ---------- 1.50m long 1.89m long 2.00m long	Nominal Bore mm	Thick Ness mm	Overall wt. of pipe ---------- 1.50 av. long 1.80 av long 2.00 av long M wt. m wt. m wt.
1	**2**	**3**	**4 5 6**	**7**	**8**	**9 10 11 12 13 14**

Initial of Site Engineer	Initial of Contractor	Initial of Bank's / Consultant's Representative	Remarks
15	**16**	**17**	**18**

TABIE- VI

BULKAGE TEST OF SAND REGISTER

Sl	Date of test	Values of dust sand in Cylinder	Values of Inundated Sand in Cylinder	Percentage of Bulkage	Signature of Site Engineer	Signature of Contractor	Signature of Bank's / Consultant's representative
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**

TABLE – VII

SLUMP TEST REGISTER

Sl	Date of Test	Type of work for which slump taken	Specified slump		Slump obtained		Signature of Site Engineer	Signature of Contractor	Signature of Bank's / Consultant's representative
			When vibrators are used	When vibrators are not used	When vibrators are used	When vibrators are not used			
1	**2**	**3**	**4**		**5**		**6**	**7**	**8**

TABLE - VIII

SILT TEST REGISTER

Sl no	Date of test	Height of sand in cylinder inundated and stirred	Height of silt	Max percentage of silt as specified	Percentage of silt obtained	Signature of site engineer	Signature of contractor	Signature of banks consultant
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**

TABLE-IX

BRICK TEST REGISTER

SL	Date of collection of sample	Identification marks	Area in cm2	Date of initial cutting	Date of filling of frog	Date of testing	Size of brick in cms	Time of cutting
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**

Test Results		Standard strenath in Per Ka/Cm2	Sample Sandina ref	Signature of Site Engineer	Signature of Con-tractor	Signature of Bank's/Con-sultant's representative
Compressiv resistive strenath for each brick in M.T.	average strenath In					
10	11	12	13	14	15	16

TABLE - X

SIEVE ANALYSIS OF COARSE AGGREGATE REGISTER

Sl	Date of Testing	Wt. of materials tested	Nominal size Of Aggre-gate	I.S. Sieve designation	Standard % passing for aggregate of nominal size
1	**2**	**3**	**4**	**5**	**6**

Test Result s	obtained Passina	Signature Sit.e	Signature Contract	Signature of Bank's icon-sultant's tative	Remarks
7	**8**	**9**	**10**	**11**	**12**

TABLE-XI

SIEVE ANALYSIS OF FINE AGGREGATE REGISTER

SL NO	Date of test	Materials to be tasted	Wt of materials to be tested	Sieve as per I.S. designation	Wt. of sand retained in sieve	%retained in each sieve successively
1	**2**	**3**	**4**	**5**	**6**	**7**

Cumulative % retained in each sieve	F. M.	Signature of Site Engineer	Signature of Contractor	Signature of Bank's / Consultant's representative	Remarks

TABLE-XII

G.I. PIPE REGISTER

Nominal Bore	AS PER STANDARD					
	OUTSIDE DIA OF PIPE		THICKNESS OF PIPE IN MM	WT. OF PIPOE IN KG/M	APPROX.OUTSIDE DIA OF SOCKET IN MM	LENGTH OF SOCKET IN MM
	Max. MM	Min. MM				
1	**2**	**3**	**4**	**5**	**6**	**7**

As per actual				Initial of Site Engineer	Initial of Contractor	Initial of Architect's representative	Remarks
Th. Of pipe in Mm	Wt. of pipe in Kg/M	Outside Dia of socket in MM	Length of socket in MM				
8	**9**	**10**	**11**	**12**	**13**	**14**	**15**

TABLE - XIII

HINDRANCE REGISTER

Name of work :……

Date of start of work:……

Name of contractor:……..

Period of completion:…….

Agreement No:……

Actual completion of work ……

Sl	Nature of hindrance	Date of occurrence of hindrance	Date on which hindrance was removed	Period for which hindrance existed	Initial of site Engineer	Remarks
1	**2**	**3**	**4**	**5**	**6**	**7**

TABLE-XIV

ABNORMALLY HIGH/LOW RATED ITEMS

Sl	Item No. of Agreement	Nomenclature of item	Qty as per agreement	Qty executed				Initial of Site Engineer	Remarks
				RA Bill No. 1	RA Bill No. 2	RA Bill No. 3	RA Bill No. 4		
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**

TABLE-XV

REGISTER OF CUBE TEST OF CONCRETE

1. Name of work……..

2. Name of CONTRACTOR……..
3. Agt. No.:……
4. Sample No. : ……..
5. Compressive strength specified (i) 7 days : …… Kg/cm2
   (ii) 28 days: …….Kg/Cm2
6. Identification No: .....
7. Portion of work and quantity: …….

8. Date &. Time of casting cubes: …….

7 DAY TEST

1. Due date of Test : ..
2. Actual date of Test.
3. Actual Comp : Strength

   Cube No. I a) min:
   Cube No .2 b) max:
   Cube No . 3 c) average:

4. Average of Max. & Min. : .....…….

   Comp : strength

5. 15% of average strength
6. diff. between 3 (a) and 3 (b)
7. Is 6 less than : ?

8. If the answer to 7 is 'Yes' Acceptable

28 DAYS TEST

1. Due date of test:
2. Actual date of test:
3. Delay in testing:
4. Increase in strength
   1.50 g/Cm2 per day of delay

5.Anticipated comp, strength (Min. specified --4)

6. Actual comp: Strength

Cube NO.4 a) Min
Cube No.5 b) Max
Cube NO.6 c) Average

7. Is comp strength equal to or more than specified Anticipated strength

8. If the" answer to 7 is “Yes” Acceptable

Annexure - XVII

Integrity Pact

UCO Bank a body corporate, constituted under the Banking Companies (Acquisition & Transfer of Undertakings) Act, 1970 as amended from time to time having its Head Office at No.10, BTM Sarani, Kolkata-700001 and a Circle Office amongst other places at ……..……..(Address of concerned CO) hereinafter referred to as "**The Principal**" (which expression shall unless excluded by or repugnant to the subject or context be deemed to mean and include its assigns, administrators and successors) of the **"ONE PART**"

And

…… Hereinafter referred to as "The Bidder/Contractor".

Preamble

The Principal intends to award, under laid down organizational procedures, contract/s for……The Principal values full compliance with all relevant laws of the land, rules, regulations, economic use of resources and of fairness/transparency in its relation with its Bidder (s) and / or contractor (s).

In order to achieve these goals, the Principal will appoint an independent External Monitor (IEM), who will monitor the tender process and the execution of the contract for compliance with the principles mentioned above.

Section 1 – Commitments of the Principal.

1.The Principal commits itself to take all measures necessary to prevent corruption and to observe the following principles:-

a. No employee of the Principal, personally or through family members, will in connection with the tender for, or the execution of a contract, demand, take a promise for or accept, for self or third person, any material or immaterial benefit which the person is not legally entitled to.

b. The Principal will during the tender process treat all Bidder(s) with equity and reason. The principal will in particular, before and during the tender process, provide to all Bidders (s) the same information and will not provide to any Bidders (s) confidential/additional information through which the Bidder(s) could obtain an advantage in relation to the process or the contract execution.

c. The Principal will exclude from the process all known prejudiced persons.

2. If the Principal obtains information on the conduct of any of its employees which is criminal offence under the IPC/PC Act, or it there be a substantive suspicion in this regard, the Principal will inform the Chief Vigilance Office and in addition can initiate disciplinary actions.

Sections 2 – Commitments of the Bidder (s)/Contractor(s)

1. The bidder(s) /contractor(s) commit himself to take all measures necessary to prevent corruption. He commits himself to observe the following principles during his participation in the tender process and during the contract execution.

a. The Bidder(s) contractor(s) will not directly or through any other persons of firm, offer promise or give to any of the Principal's employees involved in the tender process of the execution of the contract or to any third person any material or other benefit which he/she is not legally entitled to in order to obtain in exchange any advantage or during the execution of the contract.

b. The Bidder(s) /Contractor(s) will not enter with other Bidders into any undisclosed agreement of understanding, whether formal or informal. This applies in particular to prices, specifications, certifications, subsidiary contracts, submission or non submission of bids or any other actions to restrict competitiveness or to introduce cartelization in the bidding process in the bidding process.

c. The Bidder(s)/Contractor(s) will not commit any offence under the relevant IPC/PC Act, further the Bidder(s) / contractors will not use improperly for purposes of competition or personal gain, or pass on to others, any information or document provided by the Principal as part of the business relationship, regarding plans, technical proposals and business details, including information contained or transmitted electronically.

d. The Bidder(s) / Contractor (s) of foreign origin shall disclose the name and address of the Agent/representatives in India, if any. Similarly the bidder(s)/contractor(s) of Indian Nationality shall furnish the name and address of the foreign principals, if any. Further details as mentioned in the "Guidelines on Indian Agents of Foreign Suppliers" shall be disclosed by the Bidder(s)/Contractor(s). Further, as mentioned in the Guidelines all the payments made to the Indian agent/representative have to be in Indian Rupees only. Copy of the "Guidelines on Indian Agents of Foreign Suppliers" as annexed and marked as Annexure.

e.The Bidder(s)/Contractor(s) will when presenting his bid, disclose any and all payments he has made is committed to or intends to make to agents, brokers or any other intermediaries in connection with the award of the contract.

2. The Bidder (s) /Contractor(s) will not instigate third persons to commit offences outlined above or be an accessory to such offences.

Section 3: Disqualification from tender process and exclusion from future contracts

If the Bidder(s)/Contractor(s), before award or during execution has committed transgression through a violation of Section 2, above or in any other form such as to put his reliability or credibility in question, the Principal is entitled to disqualify the Bidder (s)/Contractor(s) from the tender process or take action as per the procedure mentioned in the "Guidelines on Banning of business dealings". Copy of the "Guidelines on Banning of business dealings" is annexed and marked as Annex-B".

Section 4 : Compensation for Damages

1. If the Principal has disqualified the Bidder(s) from the tender process prior to the award according to Section 3, the Principal is entitled to demand and recover the damages equivalent to Earnest Money Deposit/Bid Security.
2. If the Principal has terminated the contract according to Section 3, or if the Principal is entitled to terminate the contract according to Section 3, the Principal shall be entitled to demand and recover from the Contractor liquidated damages of the Contract value of the amount equivalent to Performance Bank Guarantee.

Section 5 : Previous Transgression

1. The Bidder declares that no previous transgressions occurred in the last three years with any other company in any country conforming to the anti corruption approach or with any other public sector enterprise in India that could justify his exclusion from the tender process.
2. If the bidder makes incorrect statement on this subject he can be disqualified from the tender process for action can be taken as per the procedure mentioned in "Guidelines on Banning of business dealings".

Section 6: Equal treatment of all Bidders/Contractors/subcontractors.

1. The Bidder (s)/Contractor(s) undertake(s) to demand from all subcontractors a commitment in conformity with this Integrity Pact, and to submit it to the Principal before contract signing.
2. The Principal will enter into agreements with identical conditions as this one with all bidders, contractors and subcontractors.
3. The Principal will disqualify from the tender process all bidders who do not sign this Pact or violate its provisions.

Section 7 : Criminal charges against violation Bidder(s)/Contractor(s)/Sub contractor(s).

If the Principal obtains knowledge of conduct of a Bidder, Contractor or subcontractor, or of an employee or a representative or an associate of a Bidder,

Contractor or Subcontractor which constitutes corruption, or if the Principal has substantive suspicion in this regard, the Principal will inform the same to the Chief Vigilance Officer.

Section 8 : Independent External Monitor/Monitors

1. The principal appoints competent and credible Independent External Monitor for this Pact. The task of the Monitor is to review independently and objectively, whether and to what extent the parties comply with the obligations under this agreement.
2. The Monitor is not subject to instructions by the representatives of the parties and performs his functions neutrally and independently. He reports to the Chairman & Managing Director, UCO Bank.
3. The Bidder(s)/Contractor (S) accepts that the Monitor has the right to access without restriction to all project documentation of the Principal including that provided by the Contractor. The Contractor will also grant the Monitor, upon his request and demonstration of a valid interest, unrestricted and unconditional access to his project documentation. The same is applicable to subcontractors. The Monitor is under contractual obligation to treat the information and documents of the Bidder (s)/Contractor(s)/Subcontractor(s) with confidentiality.
4. The Principal will provide to the Monitor sufficient information about all meetings among the parties related to the Project provided such meetings could have an impact on the contractual relations between the Principal and the Contractor. The parties offer to the Monitor the option to participate in such meetings.
5. As soon as the Monitor notices, or believes to notice, a violation of this agreement he will so inform the Management of the Principal and request the Management to discontinue or take corrective action, or to take other relevant action. The monitor can in this regard submit non-binding recommendations. Beyond this, the Monitor has no right to demand from the parties that they act, in a specific manner refrain from action or tolerate action.
6. The Monitor will submit a written report to the Chairman & Managing Director, UCO Bank within 8 to 10 weeks from the date of reference or intimation to him by the Principal and should be occasion arise, submit proposals for correction problematic situations.
7. Monitor shall be entitle to compensation on the same terms as being extended to / provided to Independent Directors on the UCO Bank.
8. If the Monitor has reported to the Chairman & Managing Director, UCO Bank a substantiated suspicion of an offence under relevant IPC/PC Act, and the Chairman & Managing Director, UCO Bank has not, within the reasonable time taken visible action to proceed against such offence or

reported it to the Chief Vigilance Officer, the Monitor may also transmit this information directly to the Central Vigilance Commissioner.

9. The word "Monitor" would include both singular and plural.

Section 9 – Pact Duration.

This pact begins when both parties have legally signed it, if expires for the contractor 10 months after the last payment under the contract, and for all other Bidders & Months ---- the contract has been awarded.

If any claim is made lodged during this time, the same shall be binding and continue to be valid despite the lapse of this pact as specified above, unless it is discharged / determined by Chairman and Managing Director, UCO Bank.

Section 10 – Other provisions

- This agreement is subject to Indian Law, Place of performance and jurisdiction of Courts in Ahmedabad only.
- Changes and supplements as well as termination notices need to be made in writing. Side agreements have not been made.
- If the Contractor is partnership or a consortium, this agreement must be signed by all partners or consortium members.
- Should one or several provisions of this agreement turn out to be invalid, the remainder of this agreement remains valid. In this case, the parties will strive to come to an agreement to their original intensions.

_____ ----------

(For & on behalf of the Principal) (For & On behalf of Bidder/Contractor)

(Office Seal) (Office Seal)

Place_____

Date_____

Witness 1 :

(Name & Address) _____

Witness 2 :

(Name & Address) _____

SCHEDULE OF QUANTITIES FOR THE PROPOSED CONSTRUCTION OF BUILDING OF RURAL SELF EMPLOYMENT TRAINING INSTITUTE [RSETI] FOR UCO BANK,AT BHAGALPUR

Item No.	Ref.	Item	Unit	Quantity	RATE		TOTAL AMOUNT
					IN DIGIT	IN WORDS	
PART-1 : CONSTRUCTION OF COMMERCIAL BUILDING.							
HEAD A : CIVIL WORK							
SH-II: EARTHWORK							
1.2.01	2.8.1	Earth work in excavation by mechanical means (Hydraulic excavator) /manual means in foundation trenches or drains (not exceeding 1.5 m inwidth or 10 sqm on plan), including dressing of sides and ramming ofbottoms, lift upto 1.5 m, including getting out the excavated soil and disposal of surplus excavated soil as directed, within a lead of 50 m. All kinds of soil.	Cum.	178.20			
1.2.02	2.25	Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. in layers not exceeding 20cm in depth, consolidating each deposited layer by ramming and watering, lead up to 50 m and lift upto 1.5 m.	Cum.	127.58			
1.2.03	2.27	Supplying and filling in plinth with sand under floors, including watering,ramming, consolidating and dressing complete..	Cum.	237.33			
S.H. III: MASONRY WORK							
1.3.01	6.2	Brick work with common burnt clay modular bricks of class designation 7.5 in foundation and plinth in:					
	6.2.1	cement mortar 1:4 (1 cement : 4 coarse sand)	cum	158.36			
1.3.02	6.8	Brick work 7 cm thick with common burnt clay F.P.S. (non modular) brick of class designation 7.5 in cement mortar 1:3 (1 cement : 3 coarse sand) in superstructure above plinth level and upto floor five level.	cum	101.62			
1.3.03	6.12	Half brick masonry with common burnt clay F.P.S. (non modular) bricks of class designation 7.5 in foundations and plinth in :					
	6.12.2	Cement motar 1:4 (1cement : 4coarse sand)	sqm.	776.20			
SH-IV: CONCRETE WORK							

1.4.01	4.1.2	Providing and laying in position cement concrete of specified grade excluding the cost of centering and shuttering - All work up to plinth level :1:1½:3 (1 Cement: 1½ coarse sand (zone-III) : 3 graded stone aggregate 20 mm nominal size).	Cum.	14.26			
1.4.02	5.1.2	Providing and laying in position specified grade of reinforced cement concrete, excluding the cost of centering, shuttering, finishing and reinforcement - All work up to plinth level :1:1.5:3 (1 cement : 1.5 coarse sand (zone-III): 3 graded stone aggregate 20 mm nominal size).	cum	88.16			
1.4.03	5.2	**Reinforced cement concrete work in walls (any thickness), including attached pilasters, buttresses, plinth and string courses, fillets, columns, pillars, piers, abutments, posts and struts etc. above plinth level up to floor five level, excluding cost of centering, shuttering, finishing and reinforcement :**					
	5.2.2	1:1.5:3 (1 cement : 1.5 coarse sand(zone-III) : 3 graded stone aggregate 20 mm nominal size).	cum	45.00			
1.4.04	5.3	**Reinforced cement concrete work in beams, suspended floors, roofs having slope up to 15° landings, balconies, shelves, chajjas, lintels, bands, plain window sills, staircases and spiral stair cases above plinth level up to floor five level, excluding the cost of centering, shuttering, finishing and reinforcement, with 1:1.5:3 (1 cement : 1.5 coarse sand (zone-lll) : 3 graded stone aggregate 20 mm nominal size).**	cum	218.70			
1.4.05	5.34	Extra for providing richer mixes at all floor levels.					
	5.34.3	Providing M-40 grade concrete instead of M-25 grade BMC/ RMC.(Note : Cement content considered in M-40 is @ 360 kg/ cum)	cum	218.70			
1.4.06	5.9	Centering and shuttering including strutting, propping etc. and removal of form for all heights :					
A	5.9.1	Foundations, footings, bases of columns, etc. for mass concrete	sqm	143.88			
B	5.9.3	Suspended floors, roofs, landings, balconies and access platform	sqm	1383.42			
C	5.9.5	Lintels, beams, plinth beams, girders, bressumers and cantilevers	sqm	608.60			
D	5.9.6	Columns,Pillars,Piers,Abutments,Posts and struts.	sqm	300.00			
E	5.9.7	Stairs, (excluding landings) except spiral-staircases	sqm	64.11			
1.4.07	4.11	Providing and laying damp-proof course 50mm thick with cement concrete 1:2:4 (1 cement : 2 coarse sand(zone-III) : 4 graded stone aggregate 20mm nominal size).	sqm	56.74			

SH-V: STEEL WORK							
	5.22	Reinforcement for R.C.C work including straightening, cutting, bending, placing in position and binding complete.					
1.5.01	**5.22.6**	Thermo-Mechanically Treated barsTMTC-500-**8mm dia**	Kg.	8113.29			
1.5.02	**5.22.6**	Thermo-Mechanically Treated barsTMTC-500-**10mm dia**	Kg.	3245.32			
1.5.03	**5.22.6**	Thermo-Mechanically Treated barsTMTC-500-**12mm dia**	Kg.	8113.29			
1.5.04	**5.22.6**	Thermo-Mechanically Treated barsTMT FE-500-**16mm dia**	Kg.	8113.29			
1.5.05	**5.22.6**	Thermo-Mechanically Treated barsTMT FE-500-**20mm dia**	Kg.	4867.97			
1.5.06	**10.26**	Providing and fixing hand rail of approved size by welding etc. to steelladder railing, balcony railing, staircase railing and similar works,including applying priming coat of approved steel primer.					
	10.26.3	G.I. pipes	kg	284.06			
1.5.07	**10.18**	Providing and fixing circular/ Hexagonal cast iron or M.S. sheet box for ceiling fan clamp, of internal dia 140 mm, 73 mm height, top lid of 1.5 mm thick M.S. sheet with its top surface hacked for proper bonding, top lid shall be screwed into the cast iron/ M.S. sheet box by means of 3.3 mm dia round headed screws, one lock at the corners. Clamp shall be made of 12 mm dia M.S. bar bent to shape as per standard drawing.	Each	5.00			
1.5.08	**9.48**	Providing and fixing M.S. grills of required pattern in frames of windows etc. with M.S. flats, square or round bars etc. including priming coat with approved steel primer all complete.					
	9.48.2	Fixed to openings /wooden frames with rawl plugs screws etc.	kg	1670.65			
S.H. VI : WOOD & ALUMINIUM WORK							
1.6.01	**9.1**	Providing wood work in frames of doors, windows, clerestory windowsand other frames, wrought framed and fixed in position with hold fast lugs or with dash fasteners of required dia & length (hold fast lugs or dash fastener shall be paid for separately).					
	9.1.3	Kiln seasoned and chemically treated hollock wood	cum	2.25			
1.6.02	**9.21**	Providing and fixing ISI marked flush door shutters conforming to IS : 2202 (Part I) non-decorative type, core of block board construction with frame of 1st class hard wood and well matched commercial 3 ply veneering with vertical grains or cross bands and face veneers on both faces of shutters:					
	9.21.1	35 mm thick including ISI marked Stainless Steel butt hinges with necessary screws	Sqm	31.50			
1.6.03	**9.97**	Providing and fixing aluminium tower bolts, ISI marked, anodised (anodic coating not less than grade AC 10 as per IS : 1868) transparent or dyed to required colour or shade, with necessary screws etc. complete					
	9.97.4	150 x 10 mm	Each	33.00			

1.6.04	9.77	Providing and fixing bright finished brass 100 mm mortice latch with one dead bolt and a pair of lever handles of approved quality with necessary screws etc. complete.	Each	33.00			
1.6.05	9.82	Providing and fixing bright finished brass hanging type floor door stopper with necessary screws, etc. complete.	Each	33.00			
1.6.06	9.830	Providing and fixing aluminium die cast body tubular type universal hydraulic door closer (having brand logo with ISI, IS : 3564, embossed on the body, door weight upto 35 kg and door width upto 700 mm), with necessary accessories and screws etc. complete	Each	33.00			
1.6.07	21.1	Providing and fixing aluminium work for doors, windows, ventilators and partitions with extruded built up standard tubular sections/ appropriate Z sections and other sections of approved make conforming to IS: 733 and IS: 1285, fixing with dash fasteners of required dia and size, including necessary filling up the gaps at junctions, i.e. at top, bottom and sides with required EPDM rubber/ neoprene gasket etc. Aluminium sections shall be smooth, rust free, straight, mitred and jointed mechanically wherever required including cleat angle, Aluminium snap beading for glazing / paneling,C.P. brass / stainless steel screws, all complete as per architectural drawings and the directions of Engineer-in-charge. (Glazing, paneling and dash fasteners to be paid for separately) :					
	21.1.2	For shutters of doors, windows & ventilators including providing and fixing hinges / pivots and making provision for fixing of fittings wherever required including the cost of EDPM rubber / neoprene gasket required (Fittings shall be paid for separately)					
	21.1.1.2	Powder coated aluminium (minimum thickness of powder coating 50 micron)	Kg	1225.14			
1.6.08	21.3	Providing and fixing glazing in aluminium door, window, ventilator shutters and partitions etc. with EPDM rubber / neoprene gasket etc. complete as per the architectural drawings and the directions of Engineer-in-charge . (Cost of aluminium snap beading shall be paid in basic item):					
	21.3.1	With float glass panes of 4.0 mm thickness	Sqm	103.51			
S.H. VII : FLOORING WORK							
1.7.01	11.1.1	Brick on edge flooring with bricks of class designation 7.5 on a bed of12 mm cement mortar, including filling the joints with same mortar, with common burnt clay non modular bricks: 1:4 (1 cement : 4 coarse sand)	sqm	769.84			
1.7.02	4.1.5	Providing and laying in position cement concrete of specified grade excluding the cost of centering and shuttering - All work up to plinth level :1:3:6 (1 Cement : 3 coarse sand (zone-III) : 6 graded stone aggregate 20 mm nominal size).	Cum.	47.84			

1.7.03	11.36	**roviding and fixing Ist quality ceramic glazed wall tiles conforming to IS: 15622 (thickness to be specified by the manufacturer), of approved make, in all colours, shades except burgundy, bottle green, black of any size as approved by Engineer-in-Charge, in skirting, risers of steps and dados, over 12 mm thick bed of cement mortar 1:3 (1 cement : 3 coarse sand) and jointing with grey cement slurry @ 3.3kg per sqm, including pointing in white cement mixed with pigment of matching shade complete.**	sqm	337.22			
1.7.04	11.37	**Providing and laying Ceramic glazed floor tiles of size 300x300 mm (thickness to be specified by the manufacturer) of 1st quality conforming to IS : 15622 of approved make in colours such as White, Ivory, Grey, Fume Red Brown, laid on 20 mm thick cement mortar 1:4 (1 Cement : 4 Coarse sand), jointing with grey cement slurry @ 3.3kg/sqm including pointing the joints with white cement and matching pigment etc., complete.**	sqm	144.31			
1.7.05	11.3	Cement concrete flooring 1:2:4 (1 cement : 2 coarse sand : 4 gradedstone aggregate) finished with a floating coat of neat cement, includingcement slurry, but excluding the cost of nosing of steps etc. complete.					
	11.3.1	40 mm thick with 20 mm nominal size stone aggregate	sqm	616.55			
1.7.06	11.41.1	**Providing and laying vitrified floor tiles in different sizes (thickness to be specified by the manufacturer) with water absorption less than 0.08% and conforming to IS: 15622, of approved make, in all colours and shades, laid on 20mm thick cement mortar 1:4 (1 cement : 4 coarse sand), jointing with grey cement slurry @ 3.3kg/sqm including grouting the joints with white cement and matching pigments etc., complete.Size of Tile 500x500 mm**	sqm	39.62			
1.7.07	11.26.1	**Kota stone slab flooring over 20 mm (average) thick base laid over and jointed with grey cement slurry mixed with pigment to match the shade of the slab, including rubbing and polishing complete with base of cement mortar 1 : 4 (1 cement : 4 coarse sand) :11.26.1 25 mm thick**	sqm	97.93			

1.7.08	16.68	**Providing and laying 60mm thick faciory made cement concrete interlocking paver block of M -30 grade made by block making machine with strong vibratory compaction, of approved s;ze, design & shape, laid in required colour and pattern over and including 50mm thick compacted bed of coarse sand, filling the joints with line sand etc. all complete as per the direction of Engineer-in-charge.**	sqm	120.00			
SH-VIII: PLASTER WORK							
1.8.01	13.4	12 mm cement plaster of mix :					
	13.4.1	1:4(1 cement :4 coarse sand)	Sqm.	1220.40			
1.8.02	13.16	6mm cement plaster to ceiling of mix:					
	13.16.1	1:3(1 cement: 3 coarse sand)	Sqm.	1383.42			
1.8.03	13.6	20mm cement plaster of mix :					
	13.6.2	1:6 (1 cement: 6 coarse sand)	sqm	578.82			
S.H. IX : FINISHING WORK							
1.9.01	13.81	Distempering with 1st quality acrylic distemper, having VOC (Volatile Organic Compound) content less than 50 grams/ litre, of approved brand and manufacture, including applying additional coats wherever required, to achieve even shade and colour.					
	13.81.2	Two or more coat on new surface.	Sqm	1220.4			
1.9.02	13.84	Painting with synthetic enamel paint, having VOC (Volatile Organic Compound) content less than 150 grams/ litre, of approved brand and manufacture, including applying additional coats wherever required to achieve even shade and colour.					
	13.84.2	Two coats	Sqm.	1235.09			
1.9.03	13.46	Finishing walls with Acrylic smooth exterior paint of required shade:					
	13.46.1	New work (Two or more coat applied @ 1.67 ltr/ 10 sqm over and including priming coat of exterior primer applied @ 2.20 kg/ 10 sqm)	Sqm.	578.82			
PART - B :- CONSTRUCTION OF BOUNDARY WALL							
S.H. I: EARTH WORK							
2.1.01	2.8.1	Earth work in excavation by mechanical means (Hydraulic excavator) / manual means in foundation trenches or drains (not exceeding 1.5 m in width or 10 sqm on plan), including dressing of sides and ramming of bottoms, lift upto 1.5 m, including getting out the excavated soil and disposal of surplus excavated soil as directed, within a lead of 50 m.	Cum.	29.16			
2.1.02	2.25	Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. in layers not exceeding 20cm in depth, consolidating each deposited layer by ramming and watering, lead up	Cum.	10.53			

		to 50 m and lift upto 1.5 m.					
2.1.03	2.28	Supplying and filling in plinth with sand under floors, including watering, ramming, consolidating and dressing complete.	Cum.	3.24			
S.H.II:MASONRY WORK							
2.2.01	6.1.2	Brick work with common burnt clay F.P.S. (non modular) bricks of class designation 7.5 in foundation and plinth in:	Cum.	24.99			
2.2.02	6.8	Brick work 7 cm thick with common burnt clay F.P.S. (non modular) brick of class designation 7.5 in cement mortar 1:3 (1 cement : 3 coarse sand) in superstructure above plinth level and upto floor five level.	Cum.	21.75			
S.H. III:CONCRETE WORK							
2.3.01	4.1.4	Providing and laying in position cement concrete of specified grade excludingthe cost of centering and shuttering - All work up to plinth level :1:2:4 (1 Cement : 2 coarse sand (zone-III) : 4 graded stone aggregate 40 mm nominal size).	Cum.	3.24			
2.3.02	5.1.2	Providing and laying in position specified grade of reinforced cement concrete, excluding the cost of centering, shuttering, finishing and reinforcement - All work up to plinth level :1:1.5:3 (1 cement : 1.5 coarse sand (zone-III): 3 graded stone aggregate 20 mm nominal size).	cum	22.63			
1.3.03	5.3	**Reinforced cement concrete work in beams, suspended floors, roofs having slope up to 15° landings, balconies, shelves, chajjas, lintels, bands, plain window sills, staircases and spiral stair cases above plinth level up to floor five level, excluding the cost of centering, shuttering, finishing and reinforcement, with 1:1.5:3 (1 cement : 1.5 coarse sand (zone-III) : 3 graded stone aggregate 20 mm nominal size).**	cum	0.45			
	5.34	Extra for providing richer mixes at all floor levels.					
	5.34.3	Providing M-40 grade concrete instead of M-25 grade BMC/ RMC.(Note : Cement content considered in M-40 is @ 360 kg/ cum)	cum	0.45			
2.3.03	5.2	Reinforced cement concrete work in walls (any thickness), including attached pilasters, buttresses, plinth and string courses, fillets, columns, pillars, piers, abutments, posts and struts etc. above plinth level up to floor five level, excluding cost of centering, shuttering, finishing and reinforcement :					
	5.2.2	1:1.5:3 (1 cement : 1.5 coarse sand(zone-III) : 3 graded stone aggregate 20 mm nominal size).	cum	4.50			
2.3.04	5.9	Centering and shuttering including strutting, propping etc. and removal of form for all heights :					
A	5.9.1	Foundations, footings, bases of columns, etc. for mass concrete	Sqm	10.80			

B	5.9.5	Lintels, beams, plinth beams, girders, bressumers and cantilevers	Sqm	91.60			
C	5.9.6	Columns, Pillars, Piers, Abutments, Posts and Struts	Sqm	64.80			
S.H. IV: STEEL WORK							
	5.22	Reinforcement for R.C.C work including straightening, cutting, bending, placing in position and binding complete.					
2.4.01	5.22.6	Mild steel **6.0 mm dia**	Kg.	7476.05			
2.4.02	5.22.7	THERMO-Mechanically Treated bars TMTC-500-**8mmdia**.	Kg.	1.26			
2.4.03	5.22.8	THERMO-Mechanically Treated bars TMTC-500-**10mmdia.**	Kg.	-6.00			
2.4.04	5.22.9	THERMO-Mechanically Treated bars TMTC-500-**12mmdia**.	Kg.	122.63			
2.4.05	9.48.2	Providing and fixing M.S. grills of required pattern in frames of windows etc. with M.S. flats, square or round bars etc. including priming coat with approved steel primer all complete.	Kg.	1807.68			
S.H.V:FLOORING WORK.							
2.5.01	11.1.1	Brick on edge flooring with bricks of class designation 7.5 on a bed of 12 mm cement mortar, including filling the joints with same mortar, with common burnt clay non modular bricks: 1:4 (1 cement : 4 coarse sand)	Sqm.	32.40			
S.H. VI: PLASTERING WORK							
2.6.01	13.40	**12 mm cement plaster of mix :**					
	13.4.2	1:6 (1 cement : 6 coarse sand)	Sqm	162.80			
	6.22	Tile brick masonry work 5 cm thick with common burnt clay F.P.S. (non modular) tile bricks of class designation 10 in cement mortar 1:3 (1 cement : 3 coarse sand) in superstructure above plinth and upto floor five level	sqm	74.70			
S.H. VII: FINISHING WORK							
2.7.01	13.50.3	Applying priming coat with ready With ready mixed red oxide zinc chromate primer of approved brand and manufacture on steel galvanised iron/ steel works	sqm	79.68			
2.7.02	13.84	Painting with synthetic enamel paint, having VOC (Volatile OrganicCompound) content less than 150 grams/ litre, of approved brand and manufacture, including applying additional coats wherever required to achieve even shade and colour.					
	13.84.2	New steel work (two or more coats)	sqm	79.68			
2.7.03	13.46	**Finishing walls with Acrylic Smooth exterior paint of required shade :**					
	13.46.1	New work (Two or more coat applied @ 1.67 ltr/10 sqm over and including priming coat of exterior primer applied @ 2.20 kg/10 sqm)	sqm	162.80			
S.H. VIII: FINISHING barbed wire WORK							

2.8.02	16.53	Providing and fixing concertina coil fencing with punched tape concertina coil 600 mm dia 10 metre openable length (total length 90 m), having 50 nos rounds per 6 metre length, upto 3 m height of wall with existing angle iron 'Y' shaped placed 2.4 m or 3.00 m apart and with 9 horizontal R.B.T. reinforced barbed wire, stud tied with G.I. staples and G.I. clips to retain horizontal, including necessary bolts or G.I. barbed wire tied to angle iron, all complete as per direction of Engineer-in-charge, with reinforced barbed tape(R.B.T.) / Spring core (2.5mm thick) wire of high tensile strength of 165 kg/ sq.mm with tape (0.52 mm thick) and weight 43.478 gm/ metre (cost of M.S. angle, C.C. blocks shall be paid separately)	mt	220.00			
SECTION - 3 : PHE WORK							
S.H. - I : SANITARYWARE							
1.2.1.01	17.31	Providing and fixing 600x450mm bevelled edge mirror of superior glass (of approved quality) complete with 6mm thick hard board ground fixed to wooden cleats with C.P brass screws and washers complete.	Each	12.00			
1.2.1.02	17.70	Providing and fixing Wash Basin withC.I brackets,15mmC.P brass pillar taps,32mm C.P brass waste of standard pattern, including painting of fitting and brackets,cutting and making good the walls whereever required.					
	17.7.2	White Vitreous China Wash basin size 630x450 mm with a single 15 mm C.P. brass pillar ta	Each	12.00			
1.2.1.03	17.2	Providing and fixing white vitreous china pedestal type water closet (European type W.C. pan) with seat and lid, 10 litre low level white P.V.C. flushing cistern, including flush pipe, with manually controlled device (handle lever), conforming to IS : 7231, with all fittings and fixtures complete, including cutting and making good the walls and floors wherever required :					
	17.2.2	W.C. pan with ISI marked black solid plastic seat and lid	Each	12.00			
1.2.1.04	17.4	Providing and fixing white vitreous china flat back or wall corner type lipped front urinal basin of 430x260x350mm and 340x410x265mm sizes respctively with automatic flushing cistern with standard flush pipe and C.P brass spreaders with brass unions and G.I. clamps complete, including painting of fittings and brackets, cutting and making good the walls and floors wherever required:					
	17.4.1	One urinal basin with 5 litre white P.V.C. automatic flushing cistern	Each	2.00			
1.2.1.05	17.10	Providing and fixing Stainless Steel A ISi 304 (18/8) kitchen sink as per IS: 13983 with C.I. brackets and stainless steel plug 40 mm, including painting of fittings and brackets, cutting and making good the walls wherever required :					
	17.10.1.4	510x1040 mm bowl depth 178 mm	Each	2.00			
S.H. - II : C.P. FITTINGS & ACCESSORIES							
1.2.2.01	17.28	Providing and fixing P.V.C waste pipe for sink or wash basin including P.V.C waste fittings complete.					

	17.28.2	Flexible pipe					
	17.28.2.1	32mm dia	Each	12.00			
1.2.2.02	17.34	Providing and fixing toilet paper holder :					
	17.34.1	C.P.brass	Each	6.00			
1.2.2.03	17.69	Providing and fixing PTMT Waste Coupling for wash basin and sink, of approved quality and colour :					
	17.69.1	Waste coupling 31mm of 79mm length and 62 mm breadth weighting not less than 45gms.	Each	12.00			
1.2.2.04	17.70	Providing and fixing PTMT Bottle Trap for wash basin and sink,					
	17.70.1	Bottle trap 31mm single piece moulded with height of 270 mm, effective length of tail pipe 260mm from the centre of waste coupling 77 mm breadth with 25mm minimum water seal, weighting not less than 260gms	Each	6.00			
1.2.2.05	17.71	Proving and fixing PTMT liquid soap container 109mm wid, 125mm high and 112 mm distancefrom wall of standard shape with bracket of the same materials with snap fittings of approved quality and colour , weighting not less than 105 gms.	Each	4.00			
1.2.2.06	18.49	Providing and fixing C.P. **brass bib cock** of approved quality conforming to IS :8931					
	18.49.1	15 mm nominal bore	Each	6.00			
1.2.2.07	18.52	Providing and fixing C.P. brass stop cock (concealed) of approved standard design and of approved make conforming to IS:8931					
	18.52.1	15 mm nominal bore	Each	6.00			
S.H. - III : PIPE FITTINGS & ACCESSORIES							
1.2.3.01	12.41	Providing and fixing on wall face unplasticised Rigid PVC rain water pipes conforming to IS : 13592 Type A, including jointing with seal ring conforming to IS : 5382, leaving 10 mm gap for thermal expansion, (i) Single socketed pipes.					
(a)	12.41.1	75mm diameter	Mtr.	40.00			
(b)	12.41.2	110 mm diameter	Mtr.	70.00			
1.2.3.02	12.42	Providing and fixing on wall face unplasticised - PVC moulded fittings/ accessories for unplasticised Rigid PVC rain water pipes conforming to IS : 13592 Type A, including jointing with seal ring conforming to IS : 5382, leaving 10 mm gap for thermal expansion.					
(a)	12.42.1	Coupler					
(i)	12.42.1.1	75mm	Each	8.00			
(ii)	12.42.1.2	110mm	Each	6.00			
(b)	12.42.2.1	Single Pushfit Coupler					

(i)	12.42.2.1	75mm	Each	8.00			
(ii)	12.42.2.2	110mm	Each	6.00			
(c)	12.42.3	Single tee with door					
(i)	12.42.3.1	75x75x75mm	Each	8.00			
(ii)	12.42.3.2	110x110x110mm	Each	6.00			
(d)	12.42.5	Band 87.5					
(i)	12.42.5.1	75mm bend	Each	8.00			
(ii)	12.42.5.2	110mm bend	Each	6.00			
(e)	12.42.6	Shoe (Plain)					
(i)	12.42.6.1	75mm Shoe	Each	3.00			
(ii)	12.42.6.2	110mm Shoe	Each	3.00			
1.2.3.03	18.58	Providing and fixing PTMT grating of approved quality and colour.					
	18.58.1	Rectangular type with openable circular lid					
	18.58.2.1	150 mm nominal size square 100mm diameter of the inner hinged round grating	Each	6.00			
1.2.3.04	18.11	Providing and fixing G.I. Pipes complete with G.I. fittings and clamps, i/c making good the walls etc. concealed pipe, including painting with anti corrosive bitumastic paint, cutting chases and making good the wall					
A	18.11.1	15 mm dia nominal bore	Mtr.	90.00			
B	18.11.2	20 mm dia nominal bore	Mtr.	80.00			
1.2.3.05	18.19.1.2	Providing and fixing G.M. Non-return valve Vertical Type of approved quality as per specification and direction of Engineer-in-charge. 25 mm dia.vertical.	Each	2.00			
1.2.3.06	18.19.3.2	Providing and fixing G.M. Non-return valve Vertical Type of approved quality as per specification and direction of Engineer-in-charge. 40 mm dia.vertical	Each	2.00			
S.H. -IV: EXTERNAL WATER SUPPLY							
DRINKING WATER TUBE-WELL & P.V.C SINTEX TANK							
1.2.4.01	23.1	Boring/drilling bore well of required dia for casing/strainer pipe, by suitable method prescribed in IS 2800 part I including collecting samples from different strata, preparing and submitting strata chart/bore log, including hire & running charges of all equipments, tools, plants & machineries required for the job, all complete as per direction of Engineer - in - charge, upto 90 metre depth below ground level.					
	23.1.1	All types of soil					
	23.1.1.1	300 mm dia	Metre	90.00			

1.2.4.02	23.2	Boring/drilling bore well of required dia for casing/strainer pipe, by suitable method prescribed in IS 2800 part I including collecting samples from different strata, preparing and submitting strata chart/bore log, including hire & running charges of all equipments, tools, plants & machineries required for the job, all complete as per direction of Engineer - in - charge, beyond 90 metre & upto 150 metre depth below ground level.					
	23.2.1	All types of soil					
	23.2.1.1	300 mm dia	Metre	60.00			
1.2.4.03	23.3	Supplying, assembling, lowering and fixing in vertical position in bore well, unplasticized PVC medium well casing pipe of required dia, confirming to IS 12818, including required hire and labour charges, fitting & accessories etc all complete, for all depths, as per direction of Engineer-in-charge.					
	23.3.1	100 mm nominal size dia	Metre	90.00			
	23.3.2	150 mm nominal size dia	Metre	60.00			
1.2.4.04	23.4	Supplying, assembling, lowering and fixing in vertical position in bore well, unplasticized PVC medium well screen (RMS) pipes with ribs, confirming to IS 12818, including hire and labour charges, fitting & accessories etc all complete, for all depths, as per direction of Engineer-in-charge.					
	23.4.1	100 mm nominal size dia	Metre	90.00			
1.2.4.05	23.8	Gravel packing in tubewell construction in accordance with IS 4097, including providing gravel fine/medium/coarse, in required grading & sizes as per actual requirement, all complete as per direction of Engineer- in - charge.	Cum	6.00			
1.2.4.06	23.9	Providing and fixing factory made precast RCC perforated drain covers, having concrete of strength not less than M-25, of size 1000x450x50 mm, reinforced with 8 mm dia four nos longitudinal and 9 nos cross sectional T.M.T hoop bars, including providing 50 mm dia perforations @ 100 to 125 mm c/c, including providing edge binding with M.S flats of size 50 x 1.6 mm complete as per direction of Engineer-in - charge.	Each	2.00			
1.2.4.07	23.12	Development of tube well in accordance with IS 2800 to establish maximum rate of usable water yield without sand content with required capacity air compressor running the compressor for required time till well is fully developed, measuring yield of well by V notch method, measuring static level and draw down etc. by step draw down method, collecting water samples and getting tested in approved laboratory all complete including hire and labour charges of air compressor, tools and accessories etc., all as per requirement and direction of Engineer- in - charge.	Hour	8.00			
1.2.4.08	23.13	Providing and fixing suitable size threaded mild steel cap or spot welded plate to the top of bore well housing/casing pipe, removable as per requirement, all complete for borewell of.					
	23.13.2	150 mm dia	Each	1.00			
1.2.4.09	23.14	Providing and fixing M.S clamp of required dia to the top of casing/housing pipe of tubewell as per IS 2800 including necessary bolts and nuts of required size complete.					
	23.14.2	150 mm clamp	Each	1.00			
1.2.4.10	23.15	Providing and fixing bail plug/bottom plug of required dia to the bottom of pipe assembly of tubewell as per IS 2800 PART I.					
	23.15.1	100 mm dia	Each	1.00			

1.2.4.04	18.48	Providing and placing on terrace (at all floor levels) polyethylene water storage tank ISI : 12701 marked with cover and suitable locking arrangement and making necessary holes for inlet,utlet and overflow pipes but without fittings and the base support for tank	**Per litre**	3000.00			
1.2.4.04	M.R	Establishment of 1.5 HP Submersible Pump	Each	1.00			
		S.H -V: SEPTIC TANK & SOAK PIT					
1.2.5.01	2.8.1	Earth work in excavation by mechanical means (Hydraulic excavator) /manual means in foundation trenches or drains (not exceeding 1.5m in width or 10 sqm on plan), including dressing of sides and ramming of bottoms, lift upto 1.5 m, including getting out the excavated soil and disposal of surplus excavated soil as directed, within a lead of 50 m.	Cum.	36.00			
1.2.5.02	2.27	Supplying and Filling in plinth with local sand and under floors including watering ,ramming consolidating and dressing complete.	Cum.	1.80			
1.2.5.03		Brick work with common burnt clay F.P.S. (non modular) bricks of class designation 7.5 in foundation and plinth in					
	6.1.1	cement mortar 1:4 (1 cement : 4 coarse sand)	cum	9.20			
1.2.5.04	6.5	Extra for brick work / AAC block masonry / Tile brick masonry in superstructure above floor V level, for each four floors or part thereof by mechanical means.	cum	9.20			
1.2.5.05	6.12	Half brick masonry with common burnt clay F.P.S. (non modular) bricks of class designation 7.5 in foundations and plinth in .	Sqm.	6.50			
1.2.5.06	6.14	Extra for half brick masonry in superstructure, above floor V level for every four floors or part thereof by mechanical means.	sqm	6.50			
1.2.5.07	6.15	Extra for providing and placing in position 2 Nos 6mm dia. M.S. bars at every third course of half brick masonry.	sqm	6.50			
1.2.5.08	4.1	Providing and laying in position cement concrete of specified grade excluding the cost of centering and shutering-all work upto plinth level.					
	4.1.3	"1:2:4 (1 cement : 2 coarse sand (zone-III) : 4 graded stone aggregate 20 mm nominal size	cum	1.35			
1.2.5.09	5.1	Providing and laying in position specified grade of reinforced cement concrete **excluding** the cost of centring, shuttering, finishing and reinforcement**-All work upto plinth level.**					
	5.1.2	1:1.5:3 (1 cement : 1.5 coarse sand (zone-III): 3 graded stone aggregate 20 mm nominal size).	cum	2.70			
1.2.5.10	5.2.2	**Reinforced cement concrete work in walls** (any thickness), including attached pilasters, buttresses, plinth and string courses, fillets, columns, pillars, piers, abutments, posts and struts, etc. upto floor five level excluding cost of centring, shuttering, finishing, and reinforcement.					
		1:1.5:3 (1 cement : 1.5 coarse sand(zone-III) : 3 graded stone	cum	0.58			

		aggregate 20 mm nominal size).					
1.2.5.11	5.3	Reinforced cement concrete work in beams, suspended floors, roofs having slope up to 15° landings, balconies, shelves, chajjas, lintels, bands, plain window sills, staircases and spiral stair cases above plinth level up to floor five level, excluding the cost of centering, shuttering, finishing and reinforcement, with 1:1.5:3 (1 cement : 1.5 coarse sand (zone-III) : 3 graded stone aggregate 20 mm nominal size).	Cum.	2.70			
	5.9	Centring and shuttering including strutting, propping etc. and removal of form for:					
1.2.5.12	5.9.3	Suspended floors, roots, landings, balconies and access platform.	sqm	18.00			
1.2.5.13	5.9.5	Lintels, beams, plinth beams, girders, bressumers and cantilevers.	sqm	6.00			
1.2.5. 14	5.9.6	Columns, Pillars, Piers, Abutments, Posts and Struts	sqm	4.50			
1.2.5.15	5.22	Reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete.					
	5.22.1	Mild steel and Medium Tensile steel bars Mild steel 6.00mm dia	kg	10.00			
1.2.5.16	5.22.6	Thermo-Mechanically Treated bars of grade Fe-500D or more.THERMO-Mechanically Treated bars TMTC-415-**8mmdia**.	Kg.	90.00			
1.2.5.17	5.22.6	Thermo-Mechanically Treated bars of grade Fe-500D or more.THERMO-Mechanically Treated bars TMTC-415-**10mmdia.**	Kg.	60.00			
1.2.5.19	11.1	Brick on edge flooring with bricks of class designation 7.5 on a bed of 12 mm cement mortar, including filling the joints with same mortar, with common burnt clay non modular bricks:	sqm	18.00			
1.2.5.20	13.4	Cement plaster in course sand 12mm cement plaster of mix :					
	13.4.1	1:4 (1 cement: 4 fine sand)	sqm	70.00			
1.2. 5.21	13.18	Neat cement punning	Sqm	70.00			
1.2.5.22	19.18.2	Supplying and fixing C.I. cover without frame for manholes :500 mm diameter C.I. cover (medium duty) the weight of the cover to be not less than 58 kg	Each	2.000			
1.2.5.23	19.32.1	Making soak pit 2.5 m diameter 3.0 metre deep with 45x45 cm dry brick honey comb shaft with bricks of class designation 75 and S.W drain pipe 100 mm diameter ,1.8 m long complete as per standard design with F.P.S bricks of class designation 7.5.	Each	1.000			
S.H -VI: DRAINAGE WORK							

1.2.6.01	2.8.1	Earth work in excavation by mechanical means (Hydraulic excavator) /manual means in foundation trenches or drains (not exceeding 1.5 m in width or 10 sqm on plan), including dressing of sides and ramming of bottoms, lift upto 1.5 m, including getting out the excavated soil and disposal of surplus excavated soil as directed, within a lead of 50 m.	Cum.	25.00			
1.2.6.02	2.25	Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. in layers not exceeding 20cm in depth, consolidating each deposited layer by ramming and watering, lead up to 50 m and lift upto 1.5 m.	Cum.	20.00			
1.2.6.03	2.28.1	Surface dressing of the ground including removing vegetation and inequalities not exceeding 15 cm deep and disposal of rubbish, lead up to 50 m and lift up to 1.5 m.All kinds of soil	Cum.	5.00			
1.2.6.04	19.6.2	Providing and laying non-pressure NP2 class (light duty) R.C.C pipes with collars jointed with stiff mixture of cement mortar in the proportion of 1:2(1 cement :2 fine sand) including testing of joints etc. complete.1**50mm dia. R.C.C pipe**:	Metre	40.00			
1.2.6.05	19.7.1.1	Constructing brick masonary manhole in cement mortar 1:4 R.C.C top slab with 1:2:4 mix foundation concrete 1:4:8 mix inside plastering 12mm thick with cement mortar 1:3 finished with floating coat of neat cement and making channel in cement concrete 1:2:4 finished with a floating coat of neat cement complete of size 90x80cm and 45cm deep including c.i cover with frame (light duty)455x610mm internal dimensions total weight of cover and frame not less than 38 kg with F.P.S bricks class designation 75	Each	6.00			
S.H -VII: UNDERGROUND SUMP WITH CENTRIFUGAL PUMP							
1.2.7.01	2.8.1	Earth work in excavation by mechanical means (Hydraulic excavator) /manual means in foundation trenches or drains (not exceeding 1.5m in width or 10 sqm on plan), including dressing of sides and ramming of bottoms, lift upto 1.5 m, including getting out the excavated soil and disposal of surplus excavated soil as directed, within a lead of 50 m.	Cum.	30.00			
1.2.7.02	2.27	Supplying and Filling in plinth with local sand and under floors including watering ,ramming consolidating and dressing complete.	Cum.	1.50			
1.2.7.03		Brick work with common burnt clay F.P.S. (non modular) bricks of class designation 7.5 in foundation and plinth in					
	6.1.1	cement mortar 1:4 (1 cement : 4 coarse sand)	cum	8.50			

1.2.7.04	6.5	Extra for brick work / AAC block masonry / Tile brick masonry in superstructure above floor V level, for each four floors or part thereof by mechanical means.	cum	8.50			
1.2.7.05	6.12	Half brick masonry with common burnt clay F.P.S. (non modular) bricks of class designation 7.5 in foundations and plinth in .	Sqm.	6.00			
1.2.7.06	6.14	Extra for half brick masonry in superstructure, above floor V level for every four floors or part thereof by mechanical means.	sqm	6.00			
1.2.7.07	6.15	Extra for providing and placing in position 2 Nos 6mm dia. M.S. bars at every third course of half brick masonry.	sqm	6.00			
1.2.7.08	4.1	Providing and laying in position cement concrete of specified grade excluding the cost of centering and shutering-all work upto plinth level.					
	4.1.3	"1:2:4 (1 cement : 2 coarse sand (zone-III) : 4 graded stone aggregate 20 mm nominal size	cum	1.35			
1.2.7.09	5.1	Providing and laying in position specified grade of reinforced cement concrete **excluding** the cost of centring, shuttering, finishing and reinforcement**-All work upto plinth level.**					
	5.1.2	1:1.5:3 (1 cement : 1.5 coarse sand (zone-III): 3 graded stone aggregate 20 mm nominal size).	cum	2.40			
1.2.7.10	5.2.2	**Reinforced cement concrete work in walls** (any thickness), including attached pilasters, buttresses, plinth and string courses, fillets, columns, pillars, piers, abutments, posts and struts, etc. upto floor five level excluding cost of centring, shuttering, finishing, and reinforcement.					
		1:1.5:3 (1 cement : 1.5 coarse sand(zone-III) : 3 graded stone aggregate 20 mm nominal size).	cum	0.58			
1.2.7.11	5.3	Reinforced cement concrete work in beams, suspended floors, roofs having slope up to 15° landings, balconies, shelves, chajjas, lintels, bands, plain window sills, staircases and spiral stair cases above plinth level up to floor five level, excluding the cost of centering, shuttering, finishing and reinforcement, with 1:1.5:3 (1 cement : 1.5 coarse sand (zone-III) : 3 graded stone aggregate 20 mm nominal size).	Cum.	2.40			
	5.9	Centring and shuttering including strutting, propping etc. and removal of form for:					
1.2.7.12	5.9.3	Suspended floors, roots, landings, balconies and access platform.	sqm	15.00			
1.2.7.13	5.9.5	Lintels, beams, plinth beams, girders, bressumers and cantilevers.	sqm	6.00			
1.2.7.14	5.9.6	Columns, Pillars, Piers, Abutments, Posts and Struts	sqm	4.50			
1.2.7.15	5.22	Reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete.					
	5.22.1	Mild steel and Medium Tensile steel bars Mild steel 6.00mm dia	kg	10.00			

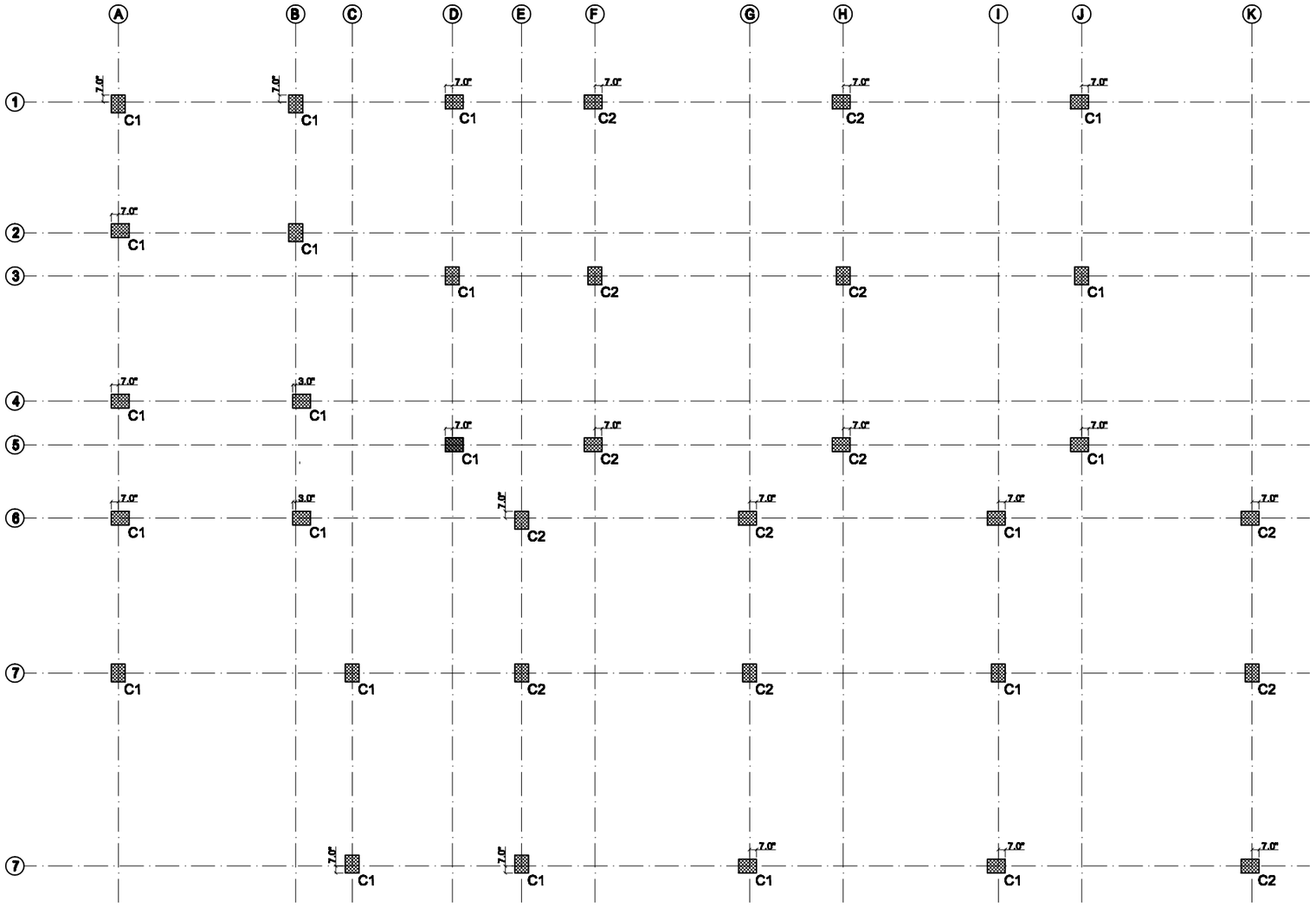
1.2.7.16	5.22.6	Thermo-Mechanically Treated bars of grade Fe-500D or more.THERMO-Mechanically Treated bars TMTC-415-**8mmdia**.	Kg.	90.00			
1.2.7.17	5.22.6	Thermo-Mechanically Treated bars of grade Fe-500D or more.THERMO-Mechanically Treated bars TMTC-415-**10mmdia.**	Kg.	60.00			
1.2.7.19	11.1	Brick on edge flooring with bricks of class designation 7.5 on a bed of 12 mm cement mortar, including filling the joints with same mortar, with common burnt clay non modular bricks:	sqm	15.00			
1.2.7.20	13.4	Cement plaster in course sand 12mm cement plaster of mix :					
	13.4.1	1:4 (1 cement: 4 fine sand)	sqm	65.00			
1.2.7.21	13.18	Neat cement punning	Sqm	65.00			
1.2.7.22	19.18.2	Supplying and fixing C.I. cover without frame for manholes :500 mm diameter C.I. cover (medium duty) the weight of the cover to be not less than 58 kg	Each	2.000			
1.2.7.23	MA	Centrifugal pump	Each	1.000			
SECTION - 4 :ELECTRICAL WORK							
S.H. I : WIRING							
1.3.1.01	1.3.3 D.S.R	Point wiring in PVC conduit, with modular type switch: Wiring for light point / fan point / exhaust fan point / call bell point with 1.5 sq mm FR PVC insulated copper conductor single core cable in surface / recessed PVC conduit, with modular type switch, modular plate, suitable sizeG.I.box etc.as required					
	1.3.3	Group C	Point	100.00			
1.3.1.02	1.4 D.S.R	Wiring for twin control light point with 1.5 sq.mm FRLS PVC insulated copper conductor single core cable in surface / recessed steel conduit, 2 way modular switch, modular plate, suitable GI box and earthing the point with 1.5 sq.mm FRLS PVC insulated copper conductor single core cable etc. as required.	Point	15.00			
1.3.1.03	1.5 D.S.R	Wiring for light/ power plug with 2X4 sq. mm FRLS PVC insulated copper conductor single core cable in surface/ recessed steel conduit alongwith 1 No. 4 sq. mm FRLS PVC insulated copper conductor single core cable for loop earthing as required	Meter	120.00			
1.3.1.04	1.7 D.S.R	Wiring for circuit/ submain wiring alongwith earth wire with the following sizes of FRLS PVC insulated copper conductor, single core cable in surface/ recessed steel conduit as required.					
(a)	1.7.1	2 x 1.5 sq.mm. + 1 x 1.5 sq. mm earth wire	Meter	170.00			
(b)	1.7.2	2 x 2.5 sq.mm. + 1 x 2.5 sq. mm earth wire	Meter	130.00			
(c)	1.7.3	2 x 4 sq.mm. + 1 x 4 sq. mm earth wire	Meter	115.00			
(d)	1.7.10 D.S.R	4 X 10 sq. mm + 2 X 6 sq. mm earth wire	Meter	80.00			
(e)	1.7.11 B.S.R	4 X 16 sq. mm + 2 X 6 sq. mm earth wire	Meter	60.00			

1.3.1.05	1.18.2 D.S.R	Telephone wiring in existing conduit: Supplying and drawing following pair, 0.5 sq. mm FR PVC insulated copper conductor, unarmoured telephone cables in existing surface / recessed steel / PVC conduit as required					
	1.18.2	2 Pair	Metre	80.00			
1.3.1.07	1.21 D.S.R	S/F PVC conduit: Supplying and fixing of following sizes of PVC conduit along with accessories in surface/ recess including cutting the wall and good the same in case of recess conduit as required.					
	1.21.1	20 mm	Metre	200.00			
1.3.1.08	1.24 D.S.R	Supplying and fixing following modular switch/ socket on the existing modular plate & switch box including connections but excluding modular plate etc. as required.					
(a)	1.24.1	5/6 A switch	Each	30.00			
(b)	1.24.4	3 pin 5/6 A socket outlet	Each	12.00			
(c)	1.24.6 D.S.R	Telephone socket outlet	Each	4.00			
(d)	1.24.7 D.S.R	TV antena socket outlet	Each	4.00			
1.3.1.09	1.27 D.S.R	S/F modular boxes, base & cover plate: Supplying and fixing following size/ modules, GI box along with modular base & cover plate for modular switches in recess as required.					
	1.27.1	1 or 2 Module (78 mm x 78 mm x 45 mm)	Each	8.00			
1.3.1.10	1.25 D.S.R	Supplying and fixing two module stepped type electronic fan regulator on the existing modular plate switch box including connections but excluding modular plate etc. as required	Each	25.00			
1.3.1.11	1.26 D.S.R	Supplying and fixing modular blanking plate on the existing modular plate & switch box excluding modular plate as required.	Each	20.00			
1.3.1.12	1.31 D.S.R	S/F light plug point with modular type accessories: Supplying and fixing suitable size GI box with modular plate and cover in front on surface or in recess including providing and fixing 5 pin 5/6 amps modular socket outlet and 5/6 amps modular switch, connection, painting etc. as required.(For light plugs to be used in non residential buildings.)	Each	18.00			
1.3.1.13	1.32 D.S.R	S/F power plug point modular type accessories: Supplying and fixing suitable size GI box with modular plate and cover in front on surface or in recess, including providing and fixing 6 pin 20/16 amps modular socket outlet and 20/16 amps modular switch, connection, painting etc. as required.	Each	10.00			
1.3.1.14	1.33 D.S.R	S/F ceiling rose: Supplying and fixing 3 pin, 5 amp. Ceiling rose on the existing junction box / wooden block including connection etc. as required.	Each	20.00			
1.3.1.15	1.34 D.S.R	S/F batten holder: Supplying and fixing batten / angle holder including connection etc. as required.	Each	15.00			

1.3.1.16	1.44 D.S.R	Installation testing and commissioning of ceiling fan and regulator including wiring the down rod of standard length with 1.5 sq mm PVC insulated, copper conductor , single core cable etc. as required.	Each	25.00			
1.3.1.17	1.50.1 D.S.R	Installation of exhaust fan up to 450 mm sweep in the existing opening, including making the hole to suit the size of the fan, making good the damage, connection, testing commissioning etc as required.	Each	4.00			
1.3.1.18	10.1.1 D.S.R	Supplying and making indoor cable end jointing with cast resin compound, including lugs and other jointing materials, for following size of 3 core, XLPE aluminium conductor cable of 11 kV grade as required.70 sq. mm	Mtr.	50.00			
1.3.1.19	10.2.1 D.S.R	Supplying and making outdoor cable end jointing with cast resin compound, including lugs and other jointing materials, for following size of 3 core, XLPE aluminium conductor cable of 11 kV grade as required.70 sq. mm	Mtr.	50.00			
1.3.1.20	7.1.1 D.S.R	Laying of one number PVC insulated and PVC sheathed/XLPE power cable of 1.1 kv grade of following size direct in ground including excavation, sand cushioning, protective covering and refilling the trench etc as required	Mtr.	100.00			
S.H. II : FITTINGS & ACCESSORIES							
1.3.2.01	MA	Providing and fixing 30 W CFL light with all nessesary settings make philips /approved equivalent	Each	95.00			
1.3.2.02	MA	Providing and fixing 30 W CFL light for exterior with all nessesary settings make philips /approved equivalent	Each	15.00			
1.3.2.03	MA	Providing and fixing 40 W tube light with all nessesary settings make philips /approved equivalent	Each	30.00			
1.3.2.04	1.38 D.S.R	Supplying and fixing call bell/ buzzer suitable for single phase, 230 V, complete as required.	Each	10.00			
1.3.2.05	RA(E-6.04)	Supplying fitting and fixing 1200 mm dia ceiling fan Crompton with three coat metallic paint system, high speed, wider tip blades, improved performrnce even at low voltage inclusive of all taxes royalty etc. all complete as per specification and direction of E/I.	Each	55.00			
1.3.2.06	MA	Supplying fitting and fixing 450 mm dia exhaust fan Crompton with plastic body and blade, self closing louvers in the fan, to provide off mode protection against birds etc. inclusive of all taxes royalty etc. all complete as per specification and direction of E/I.	Each	17.00			

S.H. III : BOARD & D.B.'s							
1.3.3.01	**2.4.2 DSR**	Supplying and fixing following way, horizontal type three pole and neutral, sheet steel, MCB distribution board, 415 V, on surface/ recess, complete with tinned copper bus bar, neutral bus bar, earth bar, din bar, interconnections, powder painted including earthing etc. as required. (But without MCB/RCCB/ Isolator)					
		6 way (4 + 18), Double door	Each	2.00			
1.3.3.02	**2.5.2 DSR**	Supplying and fixing of following ways surface/ recess mounting, vertical type, 415 V, TPN MCB distribution board of sheet steel, dust protected, duly powder painted, inclusive of 200 A, tinned copper bus bar, common neutral link, earth bar, din bar for mounting MCBs (but without MCBs and incomer) as required. (Note : Vertical type MCB TPDB is normally used where 3 phase outlets are required.)					
		8 way (8 + 24), Double door, vertical type	Each	2.00			
1.3.3.03	**2.10.1 DSR**	Supplying and fixing 5 A to 32 A rating, 240/415 V, 10 kA, ñCò curve, miniature circuit breaker suitable for inductive load of following poles in the existing MCB DB complete with connections, testing and commissioning etc. as required.					
		single pole,	Each	30.00			
1.3.3.04	**2.12 DSR**	S/F 'C' series, SP MCB: Supplying and fixing following rating, 240 volts, 'C' series, miniature circuit breaker, suitable for inductive load of following poles in the existing MCB DB complete with connections, testing and commissioning etc. as required.					
	2.12.1	6/32 amps, Single pole	Each	20.00			
	2.12.7	50/63 amps, TPN	Each	10.00			
1.3.3.05	**2.2 DSR**	Providing and fixing following rating and breaking capacity and pole MCCB with thermomagnetic release and terminal spreaders in existing cubicle panel board including drilling holes in cubicle panel, making connections, etc. as required.					
(a)	**2.2.7**	250 A, 35 kA,TPMCCB	Each	1.00			
1.3.3.06	**2.1 DSR**	Providing and fixing following capacity TP&N disconnector fuse switch unit inside the existing panel board with ISI marked HRC fuses including drilling holes in cubicle panel, making connections, etc. as required.					
	2.1.6	200 A, TP&N	Each	1.00			
	2.1.7	315 A, TP&N	Each	1.00			
1.3.3.07	**2.7 DSR**	S/F ON - load/ panel mounted changeover: Supplying and fixing following capacity 4 Pole ON- load/panel mounted changeover switches in existing cubical panel board, making connections, earthing the body etc. as required.					
	2.7.5	160 amps, 4 pole	Each	1.00			
1.3.3.08		Providing and fixing following items of approved make in existing control panel of HAVELLS, CROMPTON, STANDARD or equivalent make as per requirement and direction of E/I.					
	6.23.2 DSR	S/F wall mounted iron sheet cubical panel14 SWG	Sft	20.00			
1.3.3.09	**3.4 DSR**	Supplying, installing, testing and commissioning of following capacity End Feed Unit made of 1.6mm thick sheet steel enclosure duly painted with powder coating to existing rising mains complete with TPN disconnector FSU and HRC fuses, mounting stands, cable end box, brass compression gland, connections, earthing etc. as required.					
(a)	**3.4 .2**	300 A, TPN	Each	1.00			
S.H.-IV : EARTHING WORK							

1.3.4.01	5.5 D.S.R	**Copper earth plate electrode:-** Earthing with copper earth plate 600 mm x 600 mm x 3 mm thick including accessories, and providing masonry enclosure with cover plate having locking arrangement and watering pipe etc. (but without charcoal or coke or salt) as required.	Set	1.00			
1.3.4.03	5.10 DSR	**P/F 25 mm x 5 mm copper earth strip in pipe :-** Providing and fixing 25 mm X 5 mm copper strip in 40 mm dia G.I. pipe from earth electrode including connection with brass nut, bolt, spring, washer excavation and re-filling etc. as required.	Metre	25.00			
1.3.4.04	5.14 D.S.R	**P/F 25x5 mm copper earth strip in surface: -** Providing and fixing 25 mm X 5 mm copper strip on surface or in recess for connections etc. as required.	Metre	20.00			
		TOTAL					



COLUMN SCHEDULE TIES =AS/TYP.ELVE.

COLUMN MARK / LEVEL	C-1	
	COLUMN SIZE	MAIN R/F. SHAPE OF TIES SPACING
FOOTING TO ROOF	1'-2" × 18"	A = 12-#16 CR- #10@4"c/c NR- #8 @6"c/c
	C-2	
	COLUMN SIZE	MAIN R/F. SHAPE OF TIES SPACING
	1'-2" × 18"	A = 8-#20 B = 4-#16 CR- #10@4"c/c NR- #8 @6"c/c

COLUMN LAYOUT PLAN

NOTES:-
1. CONTRACTOR TO CHECK AND VERIFY ALL DIMENSIONS BEFORE EXECUTION OF THE WORK.
2. ALL DIMENSIONS ARE IN FEET-INCH
3. FIGURED DIMENSIONS SHALL BE FOLLOWED.
4. FOR ALL GENERAL NOTES & TYP. DETAILS DRAWING REFER SHEET NO.8/10,9/10 AND 10/10

SL.NO	DATE	DESCRIPTIONS	INITIAL

REVISION

CONSULTANT:-

ATTIK ARCHITECTS
TILKAMANJHI, IBS BUILDING SITHLA ASTHAN ROAD
BHAGALPUR, BIHAR.812001
PH.NO.9899677299,9430546484,7503821328

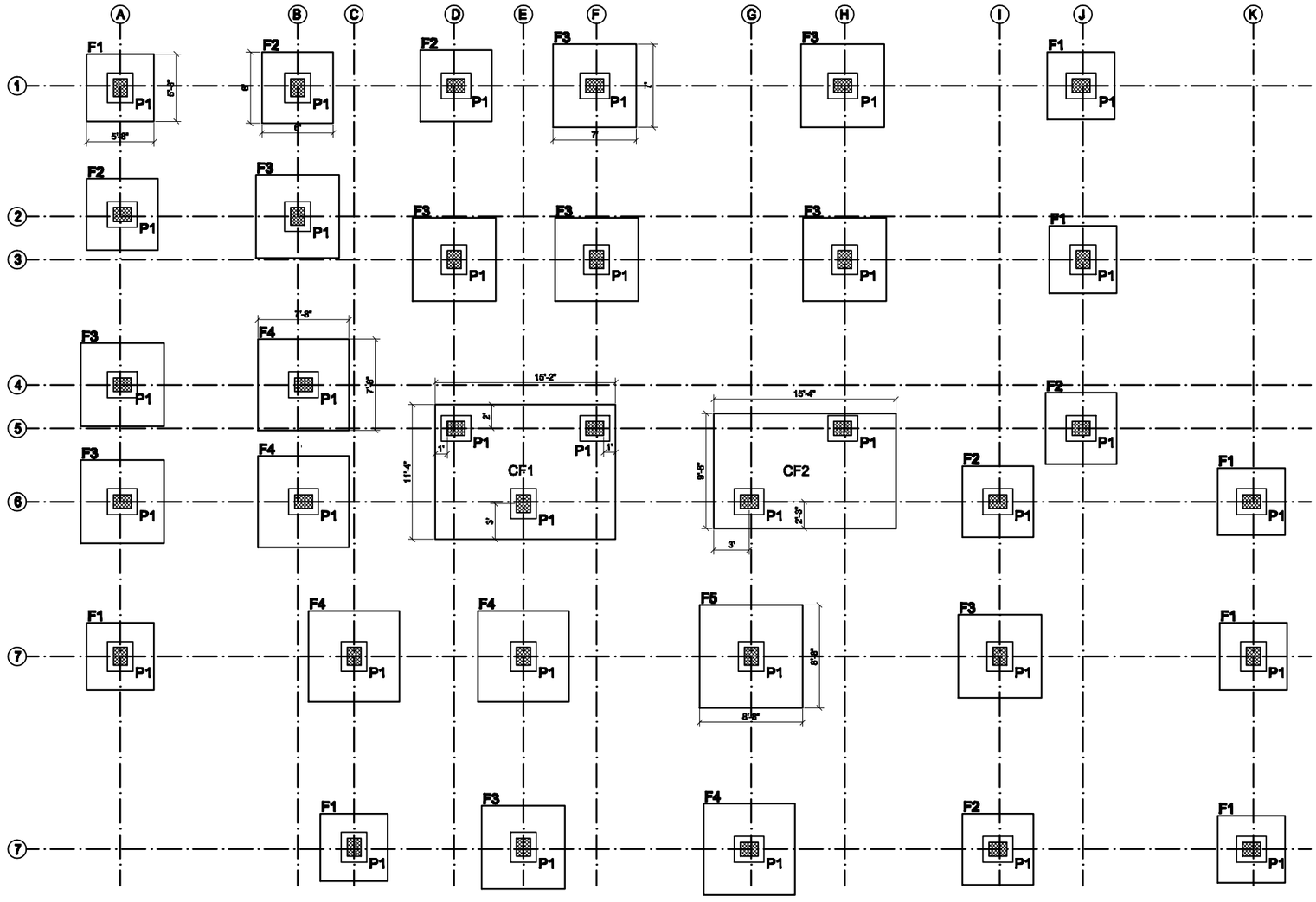
PROJECT TITLE :-
PROPOSED RURAL SELF EMPLOYMENT TRAINING INSTITUTE [RSETI] FOR UCO BANK,AT BHAGALPUR

BUILDING TITLES :-
TRAINING INSTITUTE AT UCO BANK

DRAWING TITLES :-
COLUMN LAYOUT PLAN & SCHEDULES

DATE	26-02-2018		SHT NO 1/10
DRN	SURJEET		
SCALE	N.T.S	DRG NO :	

VETTED BY



FOUNDATION PLAN

SCHEDULE OF COLUMN FOOTINGS

S.NO	FOOTING NO	LENGTH (L) (LONGER DIRECTION)	WIDTH (W) (SHORTER DIRECTION)	MAT THICKNESS (D)	REINFORCEMENT AT BOTTOM BOTHWAYS DIA	REINFORCEMENT AT BOTTOM BOTHWAYS SPACING C/C	REINFORCEMENT AT TOP BOTHWAYS DIA	REINFORCEMENT AT TOP BOTHWAYS SPACING C/C	REMARKS
1.	F-1	5'-6"	5'-6"	16"	10#	5"	-	-	PEDESTAL (AB/DETAIL)
2.	F-2	6'-0"	6'-0"	16"	10#	5"	-	-	PEDESTAL (AB/DETAIL)
3.	F-3	7'-0"	7'-0"	16"	12#	5"	-	-	PEDESTAL (AB/DETAIL)
4.	F-4	7'-6"	7'-6"	20"	16#	5"	-	-	PEDESTAL (AB/DETAIL)
5.	F-5	8'-6"	8'-6"	22"	16#	5"	-	-	PEDESTAL (AB/DETAIL)
6.	CF-1	15'-2"	11'-4"	20"	16#	5"	10#	5"	PEDESTAL (AB/DETAIL)
7.	CF-2	15'-4"	9'-6"	16"	16#	5"	10#	5"	PEDESTAL (AB/DETAIL)

(NOTE: CENTER OF FOOTING AND COLUMN SHALL COINCIDE UNLESS OTHERWISE MENTIONED)

NOTES:-

1. CONTRACTOR TO CHECK AND VERIFY ALL DIMENSIONS BEFORE EXECUTION OF THE WORK.
2. ALL DIMENSIONS ARE IN FEET-INCH
3. FIGURED DIMENSIONS SHALL BE FOLLOWED.
4. FOR ALL GENERAL NOTES & TYP. DETAILS DRAWING REFER SHEET NO.8/10,9/10 AND 10/10

SL.NO	DATE	DESCRIPTIONS	INITIAL
		REVISION	

CONSULTANT:-

ATTIK ARCHITECTS
TILKAMANJHI, IBS BUILDING SITHLA ASTHAN ROAD
BHAGALPUR, BIHAR.812001
PH.NO.9899677289,9430548484,7503821328

PROJECT TITLE :-

PROPOSED RURAL SELF EMPLOYMENT TRAINING INSTITUTE [RSETI] FOR UCO BANK,AT BHAGALPUR

BUILDING TITLES :-

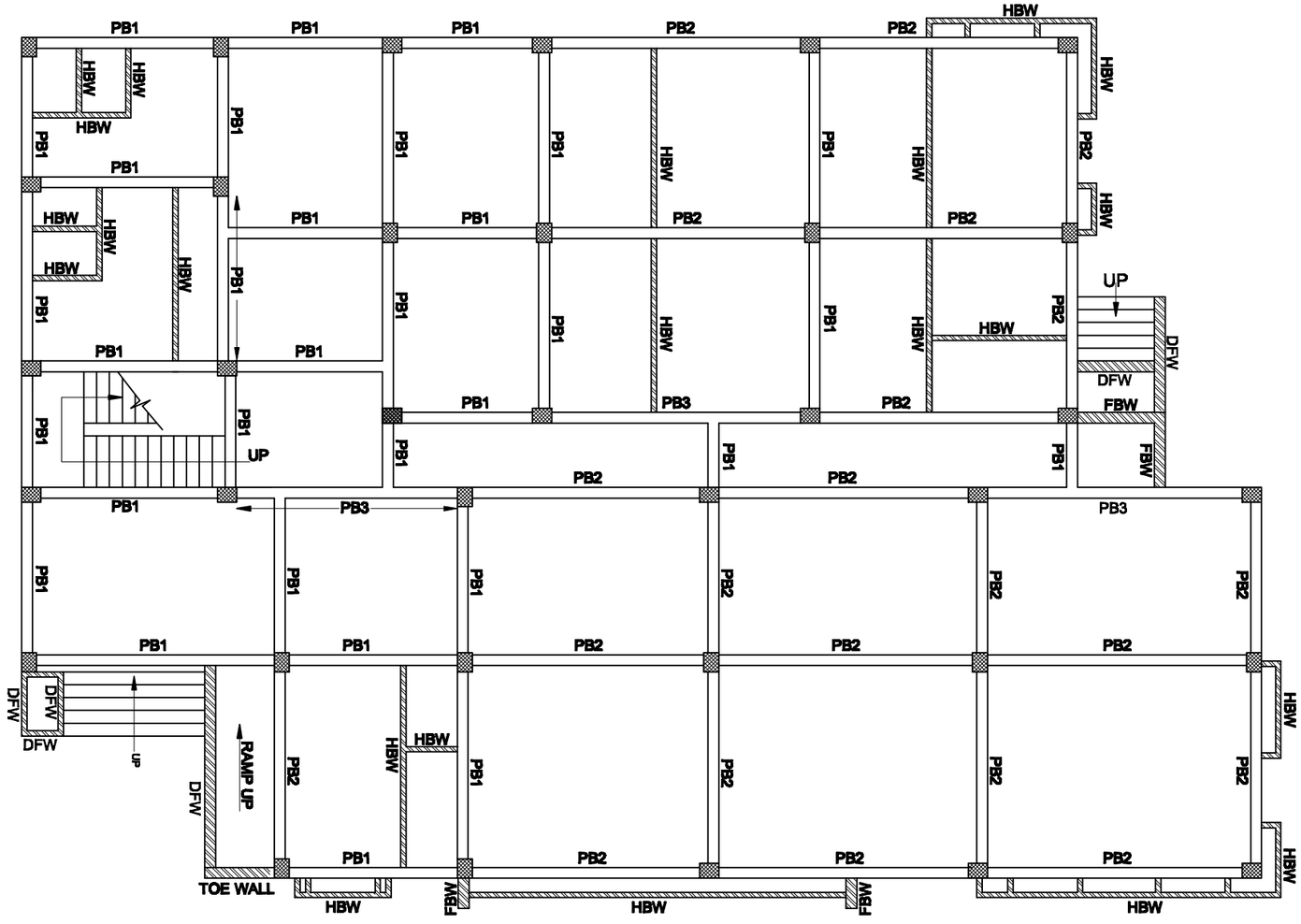
TRAINING INSTITUTE AT UCO BANK

DRAWING TITLES :-

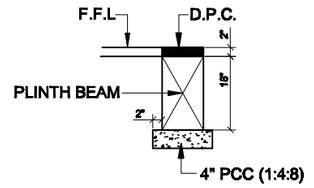
FOUNDATION PLAN & SCHEDULES

DATE	26-02-2018		SHT NO 2/10
DRN	SURJEET		
SCALE	N.T.S	DRG NO :	

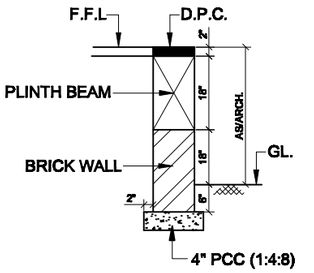
VETTED BY



PLINTH BEAM PLAN



SECTION OF INTERNAL PLINTH BEAM



SECTION OF EXTERNAL PLINTH BEAM

NOTES:-

1. CONTRACTOR TO CHECK AND VERIFY ALL DIMENSIONS BEFORE EXECUTION OF THE WORK.
2. ALL DIMENSIONS ARE IN FEET-INCH
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SL.NO	DATE	DESCRIPTIONS	INITIAL
REVISION			

CONSULTANT:-

ATTIK ARCHITECTS
TILKAMANJHI, IBS BUILDING SITHLA ASTHAN ROAD
BHAGALPUR, BIHAR.812001
PH.NO.9899677289,9430546484,7503821328

PROJECT TITLE :-

PROPOSED RURAL SELF EMPLOYMENT TRAINING INSTITUTE [RSETI] FOR UCO BANK,AT BHAGALPUR

BUILDING TITLES :-

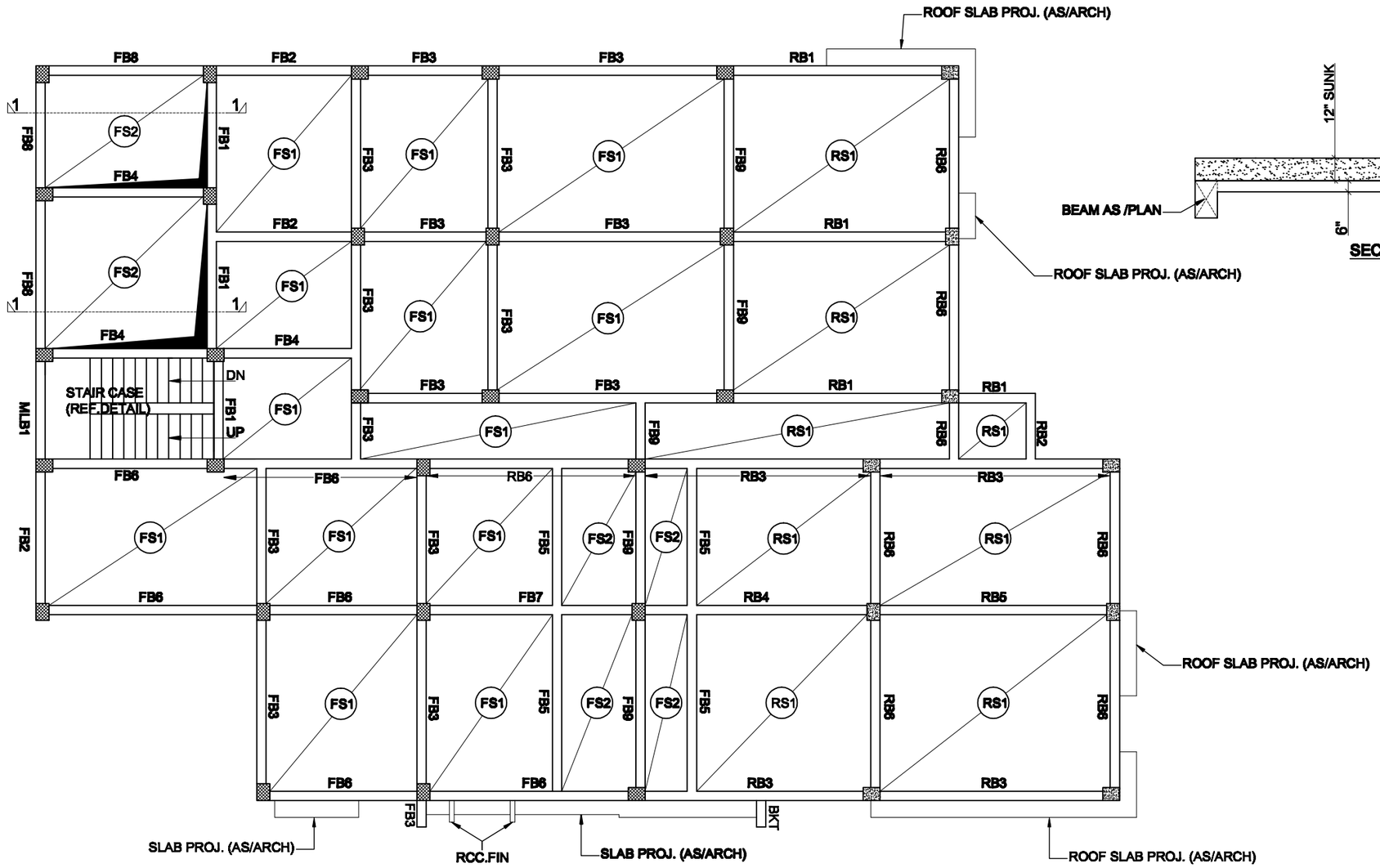
TRAINING INSTITUTE AT UCO BANK

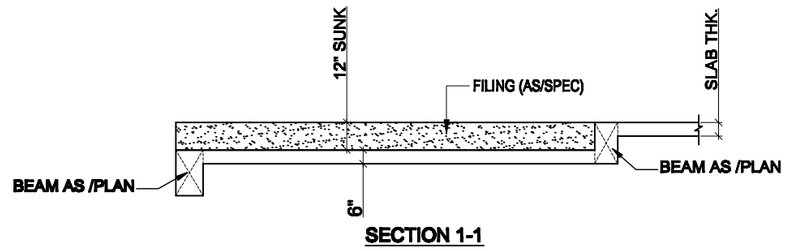
DRAWING TITLES :-

PLINTH BEAM PLAN & DETAILS

DATE	26-02-2018		SHT NO 3/10
DRN	SURJEET		
SCALE	N.T.S	DRG NO :	

VETTED BY





SECTION 1-1

FIRST FLOOR BEAM & SLAB PLAN

NOTES:-

1. CONTRACTOR TO CHECK AND VERIFY ALL DIMENSIONS BEFORE EXECUTION OF THE WORK.
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4. FOR ALL GENERAL NOTES & TYP. DETAILS DRAWING REFER SHEET NO.8/10,9/10 AND 10/10

SL.NO	DATE	DESCRIPTIONS	INITIAL
REVISION			

CONSULTANT:-

ATTIK ARCHITECTS
TILKAMANJHI, IBS BUILDING SITHLA ASTHAN ROAD
BHAGALPUR, BIHAR.812001
PH.NO.9899677289,9430546484,7503821328

PROJECT TITLE :-

PROPOSED RURAL SELF EMPLOYMENT TRAINING INSTITUTE [RSETI] FOR UCO BANK,AT BHAGALPUR

BUILDING TITLES :-

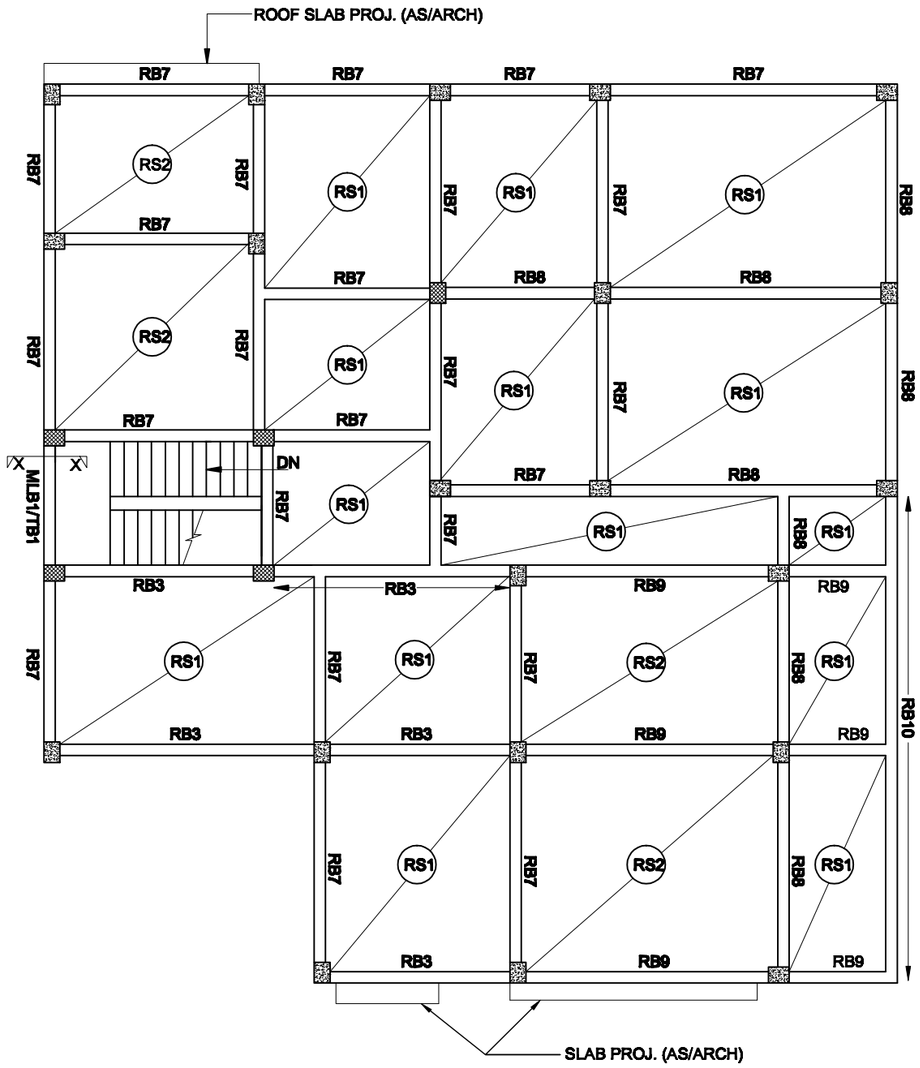
TRAINING INSTITUTE AT UCO BANK

DRAWING TITLES :-

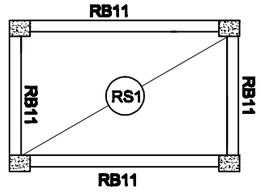
FIRST FLOOR BEAM AND SLAB PLAN & SECTIONS

DATE	26-02-2018	SHT NO 4/10
DRN	SURJEET	
SCALE	N.T.S	DRG NO :

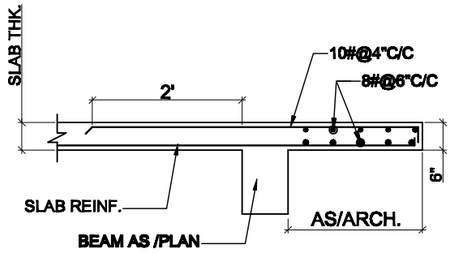
VETTED BY



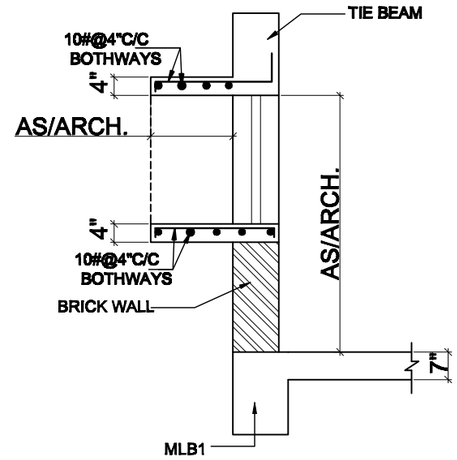
ROOF BEAM & SLAB PLAN



MUMTY BEAM & SLAB PLAN



TYPICAL ROOF SLAB
PROJ. (AS/ARCH.)



SECTION X-X

SCHEDULE OF SLABS

Sl. No.	NAME OF SLAB	THICKNESS (IN mm)	MAIN BAR (BOTTOM REINFORCEMENT)				TOP REINFORCEMENT				REMARKS
			ALONG SHORT SPAN		ALONG LONG SPAN		ALONG SHORT SPAN		ALONG LONG SPAN		
			MID SPAN	EDGE	MID SPAN	EDGE	DISCONTINUOUS EDGE	CONTINUOUS EDGE	DISCONTINUOUS EDGE	CONTINUOUS EDGE	
1	FS1	6"	#8@4"c/c	#8@8"c/c	#8@4"c/c	#8@8"c/c	#8@8"c/c	#8@4"c/c	#8@8"c/c	#8@4"c/c	-
2	FS2	6"	#10@5"c/c	#10@10"c/c	#10@5"c/c	#10@10"c/c	#8@8"c/c	#10@5"c/c	#8@8"c/c	#10@5"c/c	SUNKEN SLAB
3	RS1	6"	#8@4"c/c	#8@8"c/c	#8@4"c/c	#8@8"c/c	#8@8"c/c	#8@4"c/c	#8@8"c/c	#8@4"c/c	-
4	RS2	6"	#10@5"c/c	#10@10"c/c	#10@5"c/c	#10@10"c/c	#8@8"c/c	#10@5"c/c	#8@8"c/c	#10@5"c/c	SLAB SUPPORTING WATER TANK

NOTES:-
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SL.NO	DATE	DESCRIPTIONS	INITIAL
REVISION			

CONSULTANT:-

ATTIK ARCHITECTS
TILKAMANJHI, IBS BUILDING SITHLA ASTHAN ROAD
BHAGALPUR, BIHAR.812001
PH.NO.9899677289,9430546484,7503821328

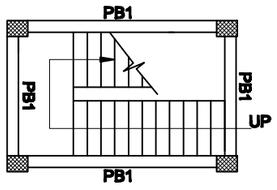
PROJECT TITLE :-
PROPOSED RURAL SELF EMPLOYMENT TRAINING INSTITUTE [RSETI] FOR UCO BANK,AT BHAGALPUR

BUILDING TITLES :-
TRAINING INSTITUTE AT UCO BANK

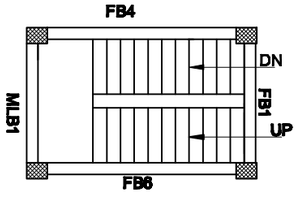
DRAWING TITLES :-
ROOF BEAM AND SLAB PLAN & SCHEDULES & DETAILS

DATE	26-02-2018		SHT NO 5/10
DRN	SURJEET		
SCALE	N.T.S	DRG NO :	

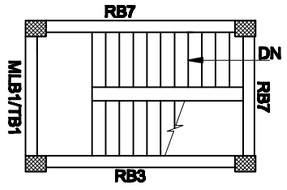
VETTED BY



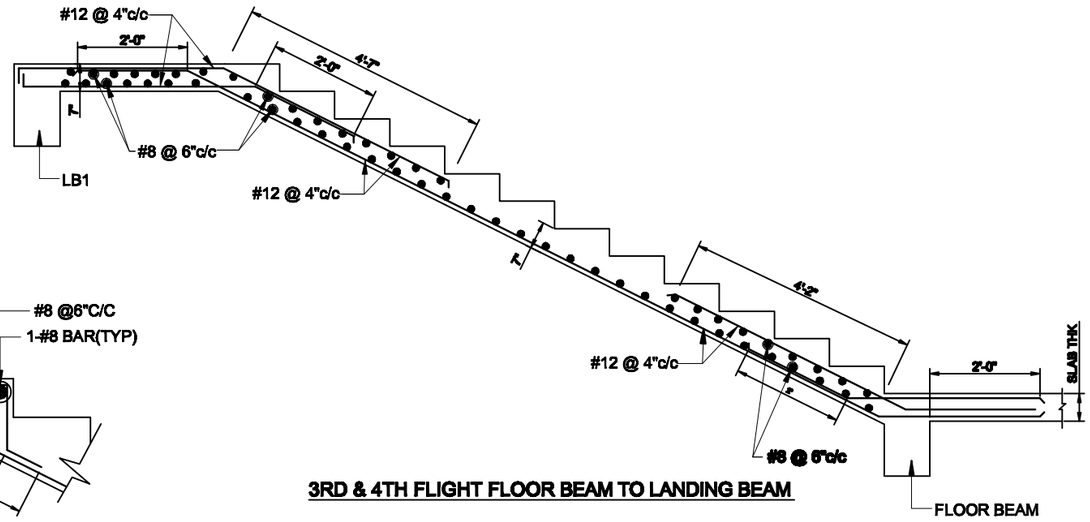
STAIR CASE PLAN AT GROUND FLOOR LVL.



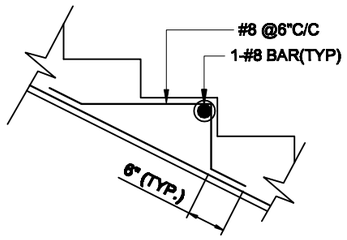
STAIR CASE PLAN AT FIRST FLOOR LVL.



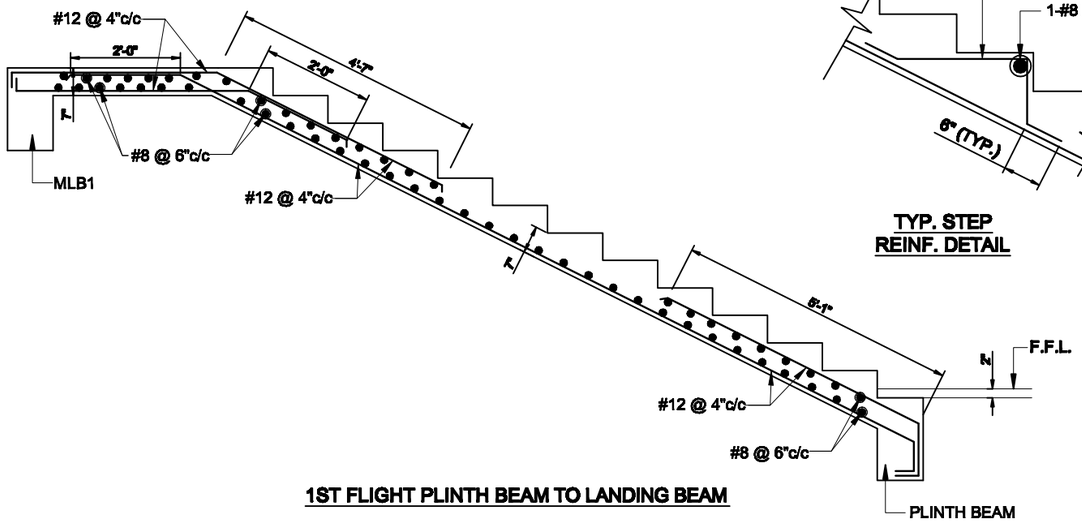
STAIR CASE PLAN AT ROOF LVL.



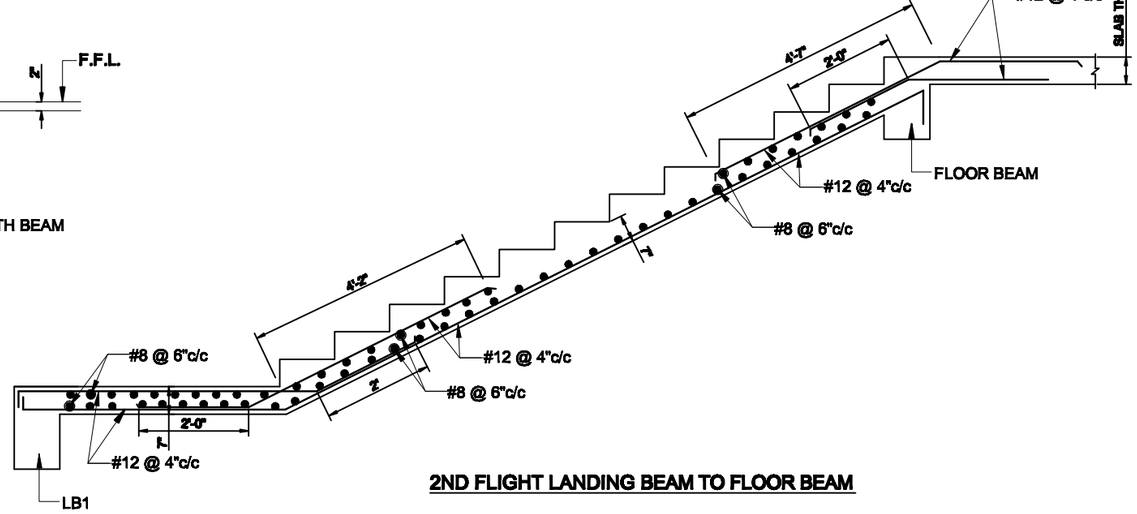
3RD & 4TH FLIGHT FLOOR BEAM TO LANDING BEAM



TYP. STEP REINF. DETAIL



1ST FLIGHT PLINTH BEAM TO LANDING BEAM



2ND FLIGHT LANDING BEAM TO FLOOR BEAM

NOTES:-

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SL.NO	DATE	DESCRIPTIONS	INITIAL

REVISION

CONSULTANT:-

ATTIK ARCHITECTS
TILKAMANJHI, IBS BUILDING SITHLA ASTHAN ROAD
BHAGALPUR, BIHAR.812001
PH.NO.9899677299,9430546484,7503821328

PROJECT TITLE :-

PROPOSED RURAL SELF EMPLOYMENT TRAINING INSTITUTE [RSETI] FOR UCO BANK,AT BHAGALPUR

BUILDING TITLES :-

TRAINING INSTITUTE AT UCO BANK

DRAWING TITLES :-

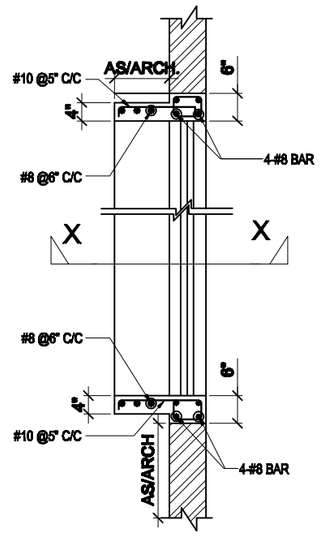
STAIR CASE PLAN & SECTIONS

DATE	26-02-2018		SHT NO 6/10
DRN	SURJEET		
SCALE	N.T.S	DRG NO :	

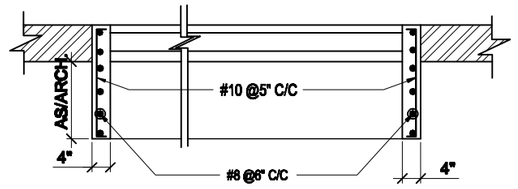
VETTED BY

SCHEDULE OF BEAMS

S.NO	BEAM MARK	SIZE		REINFORCEMENT									REMARKS
				MAIN BARS THROUGH		EXTRA BARS			STIRRUPS				
									X1 / X2			X3	
		B Width	D Depth	BOTTOM BARS	TOP BARS	EXTRA BOTTOM AT MID SPAN	EXTRA TOP AT COLUMN END SUPPORT	EXTRA TOP AT COLUMN CONTINUOUS SUPPORT	DIA	NO.OF LEGS	SPACING	SPACING	
1	PB1	10"	20"	3-#16	3-#16	-	-	-	#8	2	4"	6"	-
2	PB2	10"	20"	3-#16	3-#16	-	2-#12	2-#12	#8	2	4"	6"	-
3	PB3	10"	20"	3-#16	3-#16	-	-	-	#8	2	4"	4"	-
4	FB1	10"	20"	3-#16	3-#16	-	2-#12	2-#12	#8	2	4"	6"	-
5	FB2	12"	20"	3-#16	3-#16	-	-	-	#8	2	4"	6"	-
6	FB3	12"	20"	4-#16	3-#16	-	2-#16	2-#16	#8	2	4"	6"	-
7	FB4	12"	20"	3-#16	3-#16	-	2-#12	2-#12	#8	2	4"	6"	-
8	FB5	10"	16"	4-#16	4-#16	-	-	-	#8	2	4"	6"	-
9	FB6	12"	20"	4-#16	4-#16	-	2-#16	2-#16	#10	2	4"	4"	-
10	FB7	12"	20"	2-#20+ 1-#16	2-#20+ 1-#16	-	2-#20	2-#20	#10	2	4"	4"	-
11	FB8	12"	20"	3-#16	3-#16	-	-	-	#8	2	4"	6"	BEAM DOWN BY- 12" INCHE
12	FB9	12"	20"	2-#20+ 1-#16	2-#20+ 1-#16	-	2-#16	2-#16	#8	2	4"	6"	-
13	RB1	12"	20"	4-#16	3-#16	-	2-#16	2-#16	#8	2	4"	6"	-
14	RB2	10"	16"	3-#12	3-#12	-	-	-	#8	2	4"	6"	-
15	RB3	12"	20"	3-#16	3-#16	-	2-#16	2-#16	#8	2	4"	6"	-
16	FB4	12"	20"	2-#20+ 1-#16	2-#20+ 1-#16	-	2-#20	2-#20	#10	2	4"	4"	-
17	RB5	12"	20"	2-#20+ 1-#16	2-#20+ 1-#16	-	-	-	#8	2	4"	6"	-
18	RB6	12"	20"	3-#16	4-#16	-	-	-	#8	2	4"	6"	-
19	RB7	10"	20"	3-#16	3-#16	-	-	-	#8	2	4"	6"	-
20	RB8	10"	20"	3-#16	4-#16	-	-	-	#8	2	4"	6"	-
21	RB9	12"	20"	3-#16	2-#20+ 1-#16	-	2-#16	2-#16	#8	2	4"	6"	-
22	RB10	10"	20"	3-#16	2-#20+ 1-#16	-	-	-	#8	2	4"	6"	-
23	RB11	10"	20"	3-#12	3-#12	-	-	-	#8	2	4"	6"	-
24	MLB1	12"	16"	4-#16	3-#16	-	-	-	#8	2	4"	4"	MID LANDING BEAM
25	TB1	10"	16"	3-#16	3-#16	-	-	-	#8	2	4"	6"	TIE BEAM



TYPICAL DETAIL OF WINDOW RCC FIN



SECTION AT X-X

NOTES:-
1. CONTRACTOR TO CHECK AND VERIFY ALL DIMENSIONS BEFORE EXECUTION OF THE WORK.
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SL.NO	DATE	DESCRIPTIONS	INITIAL
REVISION			

CONSULTANT:-

ATTIK ARCHITECTS
TILKAMANJHI, IBS BUILDING SITHLA ASTHAN ROAD
BHAGALPUR, BIHAR.812001
PH.NO.9899677289,9430546484,7503821328

PROJECT TITLE :-
PROPOSED RURAL SELF EMPLOYMENT TRAINING INSTITUTE [RSETI] FOR UCO BANK,AT BHAGALPUR

BUILDING TITLES :-
TRAINING INSTITUTE AT UCO BANK

DRAWING TITLES :-
BEAM SCHEDULE & RCC. DETAIL

DATE	26-02-2018		SHT NO 7/10
DRN	SURJEET		
SCALE	N.T.S	DRG NO :	

VETTED BY

GENERAL NOTES

1 CONTRACTOR TO CHECK AND VERIFY ALL THE DIMENSIONS BEFORE STARTING EXECUTION OF THE WORK.

2 ALL RCC WORK SHALL BE IN M-1" (DESIGN MIX).

3 LINTEL & LINTEL BAND :-
(a) LINTEL BAND SHALL BE PROVIDED ON WALLS AT LINTEL HEIGHT, SIZE OF LINTEL BAND SHALL BE AS SHOWN IN CONTINUOUS LINTEL BAND DETAIL.
(b) IN CASE OF RCC FRAMED STRUCTURE LINTEL BAND WILL BE CONNECTED TO ADJACENT COLUMN BY PROVIDING TWO NOs F.I. 25X3, 12" LONG EMBEDDED 4" IN COLUMN AS SHOWN DET 'A'.
(c) REINFORCEMENT OF LINTEL BAND ALSO HAS TO BE EXTENTED INTO LINTEL OVER OPENINGS IN FULL LENGTH OF OPENING IRRESPECTIVE OF WHAT IS SHOWN ELSEWHERE.
(d)FOR LINTELS OVER OPENINGS REFER SCHEDULE OF LINTEL

4 REINF STEEL SHALL BE TMT BARS OF Fe-500 D GRADE AS/IS:1786 FOR ALL STRUCTURES.

5 CLEAR COVER TO SECONDARY REINFORCEMENT SHALL BE AS UNDER:-
I) FOOTINGS: 2" II) COLUMNS : 1 ½"
III) BEAMS : 1" MM IV) SLABS :1"
V) WAIST SLAB OF STAIR : 1"

6 CORNERS OF MASONRY WALLS SHALL BE PROVIDED WITH 1 NO 10 # CORNER BARS (EMBEDDED IN TO FDN CONC BY Ld) IF THE CORNER DOES NOT HAVE RCC COLUMN.

7 F.I PIECES (25X3) 16" LONG EACH WILL BE PROVIDED @ 12" C/C AT THE JUNCTION OF RCC COLUMN AND WALL, (EMBEDDED BY 6" IN THE COLUMN) IN CASE OF MASONRY JUTTING OUT BEYOND THE FACE OF COLUMN.

8 WHEN BARS OF DIFFERENT DIA ARE TO BE SPECIFIED LAP LENGTH SHALL BE CALCULATED BASED ON LARGER DIA.

9 SPACER BARS OF 25# SHALL BE PROVIDED @ 3' C/C WHEREVER REINFORCEMENT IS PLACED IN TWO LAYERS.

10 FOUNDATION HAS BEEN DESIGNED FOR SAFE BEARING CAPACITY 175 KN / SQ.M AT 5' FEET DEPTH AND WILL NEED REVISION IF IT IS FOUND AT VARIANCE DURING ACTUAL EXECUTION.

11 COLUMNS SHOWN IN FDN PLAN SHALL BE CONTINUED UP TO THE TOP OF THE STRUCTURE (IN THAT PORTION) WITH THE SAME DESIGN, IF NOTHING ELSE HAS BEEN SPECIFIED.

12 TO KEEP THE TOP FACE REINF. OF SLAB IN PLACE, CHAIRS MADE OUT OF 3'-4" LONG PIECES OF 12 # BARS SHALL BE PROVIDED @ 1 NO PER SQM. CHAIRS FOR THE FOUNDATION REINF SHALL BE 16 # BARS 4'-8" LONG EACH.

13 FOR THE RCC COLUMNS AND BEAMS THE DEVELOPMENT LENGTH SHALL BE TAKEN AS Ld+10d ONLY. Ld SHALL BE TAKEN AS 50 TIMES DIA OF BAR.

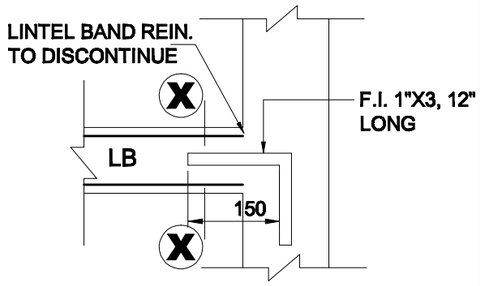
14 PVC WATER TANK SHALL BE PLACED AT CORNER OF SLAB CLOSE TO OR ON THE BEAM AS SHOWN IN STRUCTURAL ROOF PLAN, IRRESPECTIVE OF LOCATION SHOWN IN ANY OTHER DRGS.

15 IN COLUMN , IN CASE OF CHANGE OF DIA OF BAR IN SUBSEQUENT FLOOR , THE REINFORCEMENT BAR OF LOWER STOREY WILL NOT BE CURTAILED AT SLAB LEVEL , BUT TAKEN UPTO SPLICING ZONE OF NEXT STOREY AND REINFORCEMENT BAR OF LESSER DIA WILL START FROM SPLICING ZONE OF THAT STORY ONLY (REFER SPLICING DETAILS)

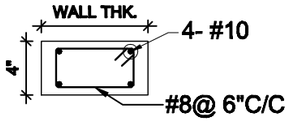
16 AT ALL BEAM INTERSECTIONS, BOTTOM MAIN STEEL OF SECONDARY BEAM SHALL PASS ABOVE THE BOTTOM MAIN STEEL OF THE PRIMARY BEAM.

17 SEISMIC DATA CONSIDERED IN DESIGN: ZONE-IV, SOIL TYPE = II (MEDIUM), RESPONSE REDUCTION FACTOR = 5, IMPORTANCE FACTOR = 1.0.

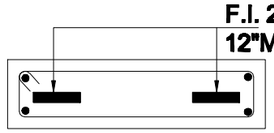
TYP DETAIL OF STIRRUPS



DETAIL OF LINTEL BAND JUNCTION WITH COLUMN

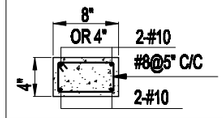
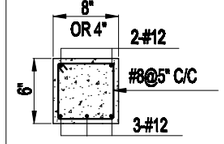
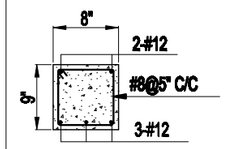
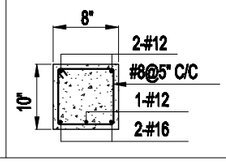


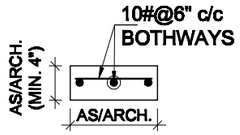
CONTINUOUS LINTEL BAND



SECTION X-X

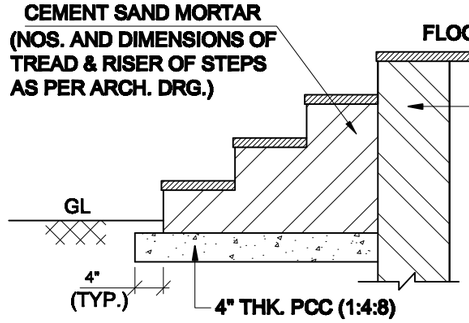
SCHEDULE OF LINTEL

CLEAR SPAN	TYPICAL SECTION	END BEARING
0 TO 3'		4"
3' TO 5'		6"
5' TO 5'-6"		7"
5'-6" TO 10'		8"

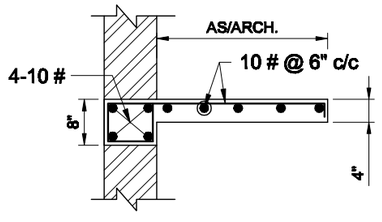


RCC SILL DETAIL OF WINDOW AS/ARCH. DRG.
(SAME SHALL BE PROVIDED ALONG PERIPHERY OF CIRCULAR AND RECTANGULAR OPENINGS)

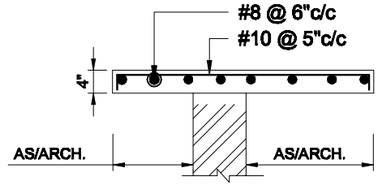
BRICK /BLOCK WORK IN 1:6 CEMENT SAND MORTAR (NOS. AND DIMENSIONS OF TREAD & RISER OF STEPS AS PER ARCH. DRG.)



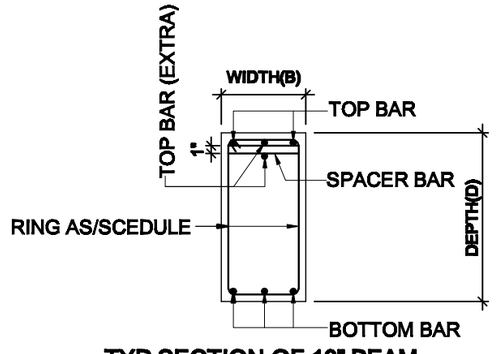
TYP. DETAIL OF STEPS



TYP. SHELF DETAIL



TYPICAL COUNTER DETAIL



TYP SECTION OF 10" BEAM WITH R/F. ARRANGEMENT

NOTES:-
1. CONTRACTOR TO CHECK AND VERIFY ALL DIMENSIONS BEFORE EXECUTION OF THE WORK.
2. ALL DIMENSIONS ARE IN FEET-INCH
3. FIGURED DIMENSIONS SHALL BE FOLLOWED.

SL.NO	DATE	DESCRIPTIONS	INITIAL

REVISION

CONSULTANT:-

ATTIK ARCHITECTS
TILKAMANJHI, IBS BUILDING SITHLA ASTHAN ROAD
BHAGALPUR, BIHAR.812001
PH.NO.9899677289,9430546484,7503821328

PROJECT TITLE :-
PROPOSED RURAL SELF EMPLOYMENT TRAINING INSTITUTE [RSETI] FOR UCO BANK,AT BHAGALPUR

BUILDING TITLES :-
TRAINING INSTITUTE AT UCO BANK

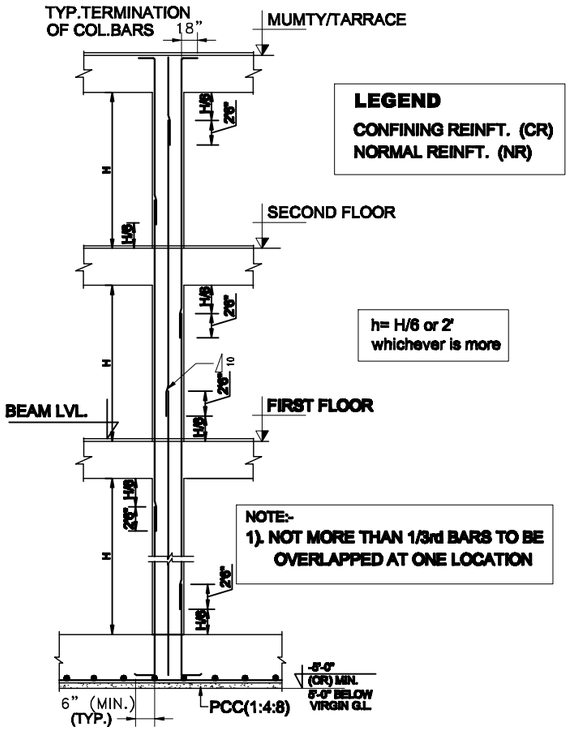
DRAWING TITLES :-
GENERAL NOTES & TYPICAL DETAILS (1)

DATE	26-02-2018
DRN	SURJEET
SCALE	N.T.S

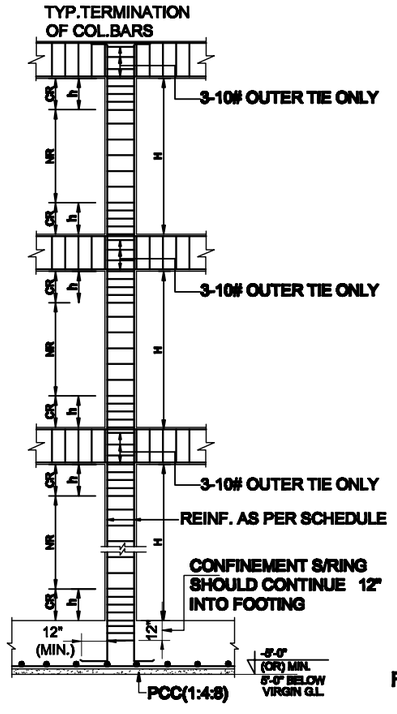
SHT NO 8/10

DRG NO :

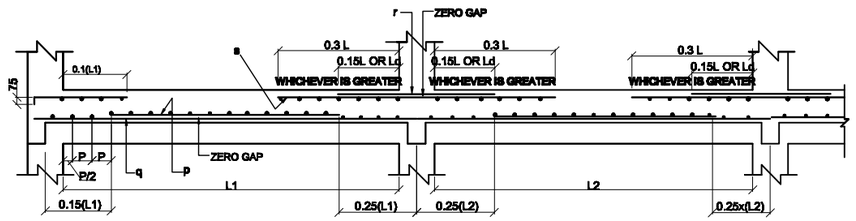
VETTED BY



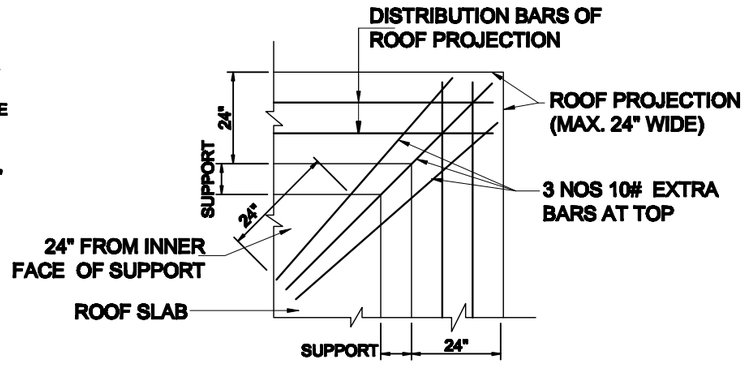
TYP. SPLICING DETAIL FOR COLUMN REINF. AT INTERMEDIATE LEVELS



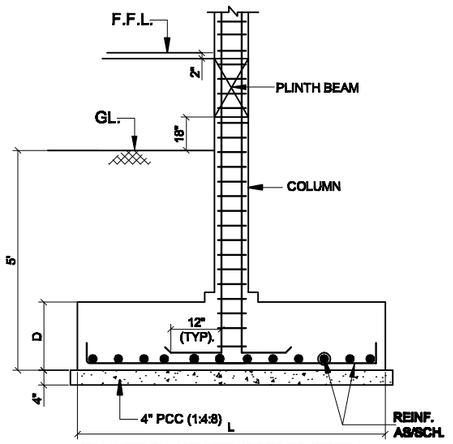
TIE SPACING DETAILS



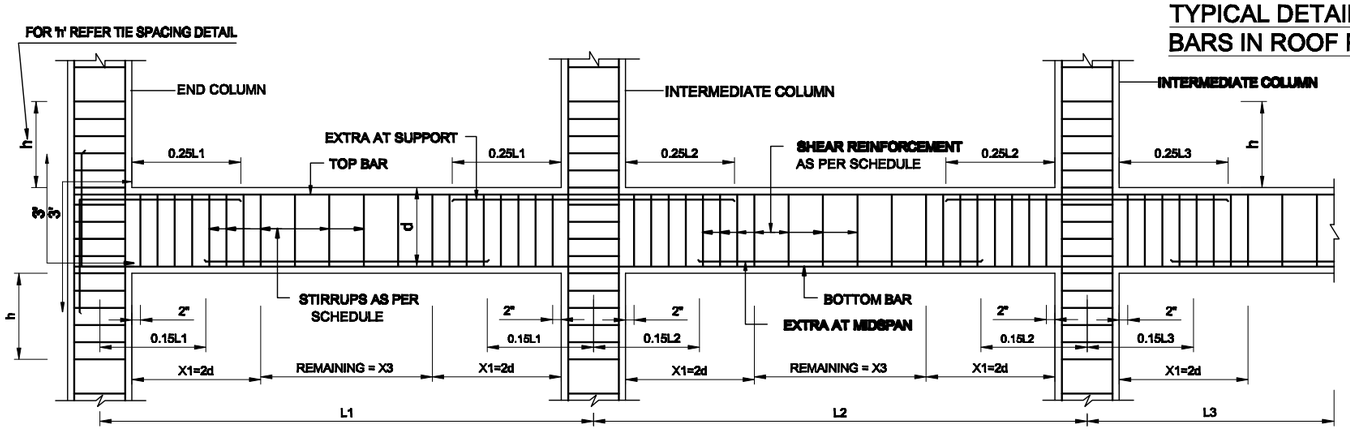
NOTE:-
1. "L" IS GREATER OF ADJACENT SPAN L1 & L2
2. "Ld" STAND FOR DEVELOPMENT LENGTH IN TENSION AS PER DIA CALCULATIONS.
3. 50% BOTTOM REINFORCEMENT i.e 'q' BARS WILL BE PROVIDED FROM SUPPORT TO SUPPORT WHERE AS BALANCE 50% i.e.'p' BARS SHALL BE CURTAILED AS INDICATEDIN TYP. DETAIL ABOVE.
4. SIMILARLY FOR TOP REINFORCEMENT AT CONTINUOUS END 50% BARS i.e.'r' SHALL BE 0.15L FROM SUPPORT AND BALANCE 50% i.e.'s' SHALL BE PROVIDED UPTO 0.3L FROM SUPPORT AS SHOWN IN TYP. DETAIL ABOVE



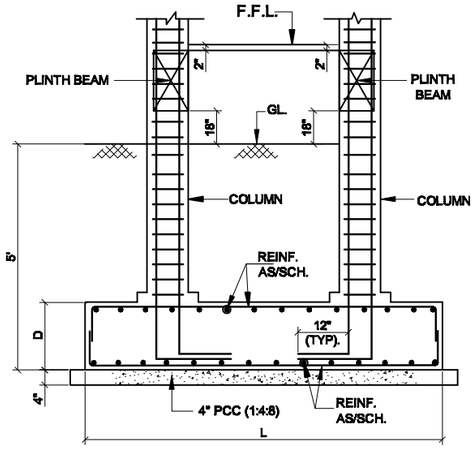
TYPICAL DETAILS OF CORNER BARS IN ROOF PROJECTION



FOOTING SECTION Y-Y (TYP.)



TYPICAL DETAIL OF BEAM COLUMN JUNCTION



COMBINED FOOTING SECTION Z-Z (TYP.)

NOTES:-
1. CONTRACTOR TO CHECK AND VERIFY ALL DIMENSIONS BEFORE EXECUTION OF THE WORK.
2. ALL DIMENSIONS ARE IN FEET-INCH
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SL.NO	DATE	DESCRIPTIONS	INITIAL
REVISION			

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BUILDING TITLES :-
TRAINING INSTITUTE AT UCO BANK

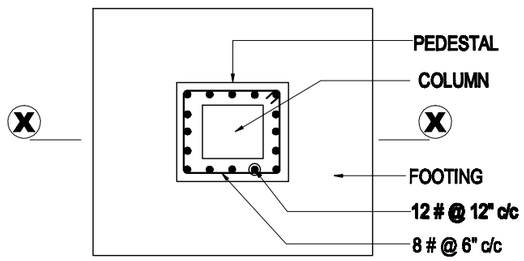
DRAWING TITLES :-
TYPICAL DETAILS (2)

DATE	26-02-2018
DRN	SURJEET
SCALE	N.T.S

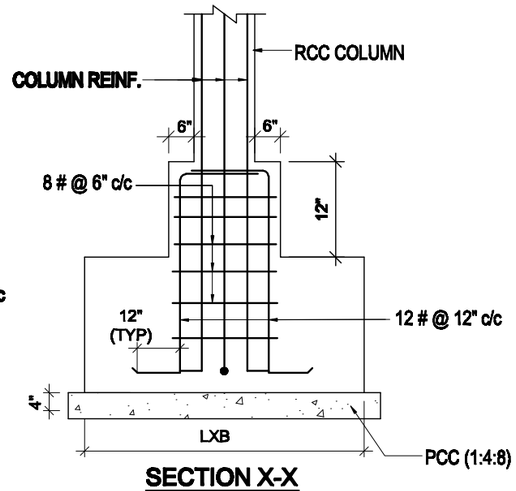
SHT NO 9/10

DRG NO :

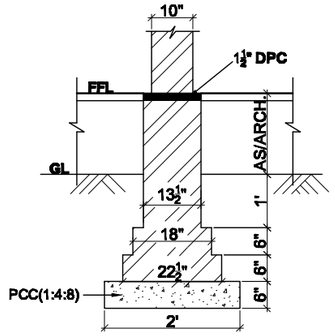
VETTED BY



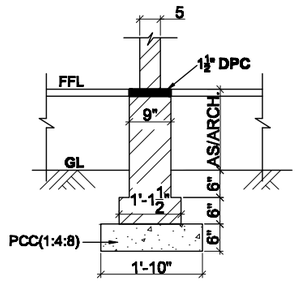
PEDESTAL(P1) PLAN



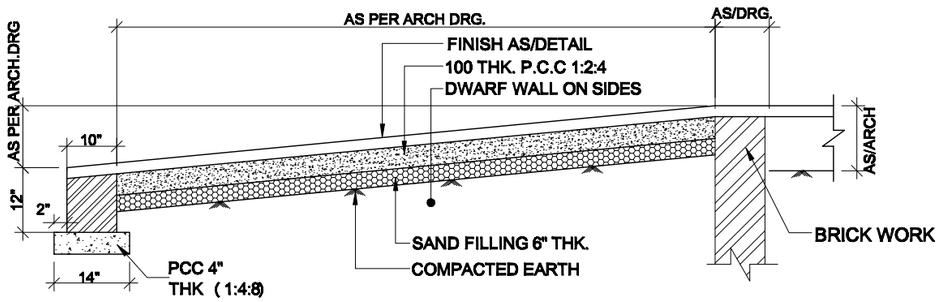
SECTION X-X



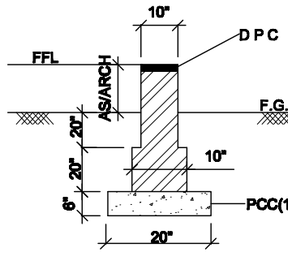
FOUNDATION DETAIL OF
9" BRICK WALL(FBW)



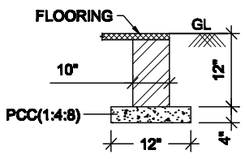
FOUNDATION DETAIL OF
HALF BRICK WALL(HBW)



TYP. DETAIL OF RAMP



DWARF WALL FOUNDATION(DFW)
(UPTO 24" HEIGHT)



DETAIL OF TOE WALL
(IF REQUIRED)

NOTES:-
1. CONTRACTOR TO CHECK AND VERIFY ALL DIMENSIONS BEFORE EXECUTION OF THE WORK.
2. ALL DIMENSIONS ARE IN FEET-INCH
3. FIGURED DIMENSIONS SHALL BE FOLLOWED.

SL.NO	DATE	DESCRIPTIONS	INITIAL

REVISION

CONSULTANT:-

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DRAWING TITLES :-
TYPICAL DETAILS (3)

DATE	26-02-2018	
DRN	SURJEET	
SCALE	N.T.S	DRG NO :

SHT NO 10/10

VETTED BY