Bombay Natural History Society
HORNBILL HOUSE, MUMBAI

BOMBAY NATURAL HISTORY SOCIETY:

Hornbill House, Dr Salim Ali Chowk, Shaheed Bhagat Singh Road, Fort, Mumbai-400001.

E-mail: tender@bnhs.org

Website- www.bnhs.org

NOTICE INVITING e-TENDER

BOMBAY NATURAL HISTORY SOCIETY,

Hornbill House, Dr Salim Ali Chowk, Shaheed Bhagat Singh Road, Fort, Mumbai-400001.

Tender Notice No. 587/04/2026/ Civil/ TENDER / 2026-27 **Dated: 24.04.26**

e-tender in two parts is invited from bonafide, experienced and resourceful contractors of Rajasthan state, other Central Government / State Government / Central PSE or PSU / State PSE or PSU /Statutory Body/ Municipality or Municipal Corporation for the following work: -

- **Name of the work** : "Construction of Establishing Educational Conservation and Research Centre Building within the premises of BNHS Pokhran "
  - **Estimated Cost** : **Rs.25,00,000/- (incl. of GST)**
  - **Earnest Money (EMD)** : **Rs 1,25,000/- (5%of total estimated cost)**
  - **Completion Time** : **52 WEEKS**

Intending bidders desirous of participating in the tender are to log on to the website of BNHS i.e., www.bnhs.org for the tender under the link https://drive.google.com/drive/folders/18bJy0i8pEJnS3M3s4ijJf87uat5dA_Qd?usp=sharing Further other details including qualifying requirements please visit www.bnhs.org or office notice board of the above office.

KEY DATES

A.	Date of Publishing of NIT & other Documents	**27/04/2026 AT 11.00 hrs.**
	Tender Fee payment date – Online mode ONLY	**02/05/2026 upto 15:00 hrs.**
B.	Tender Documents download/share start date	**02/05/2026 AT 16.00 hrs.**
C.	Bid submission starting date	**02/05/2026 AT 16.00 hrs.**
D.	Bid submission closing date	**05/05/2026 AT 11.00 hrs.**
E.	Techno-commercial bid opening date	**08/05/2026 AT 11.00 hrs.**
F.	Techno-commercially qualified bidders" list uploading date	**09/05/2026 AT 14.00 hrs.**
G.	Price bid opening date	**14/05/2026 AT 15.00 hrs.**

- If a Holiday falls on any of the schedule date then schedule date shall be considered on next working day.

SECTION – II

INVITATION OF BID

1. SCOPE OF WORK: -
2. "Construction of Educational Conservation and Research Centre Building within the premises of BNHS Pokhran Site "

3. 2.1. TECHNICAL ELIGIBILITY CRITERIA OF THE BIDDER

The bidder must have successfully completed "similar "nature of works **(Civil)** during last **05`(five) years**, subject to fulfillment of the following criteria:

a) Three similar completed works each costing not less than the amount equal to 50 % of the estimated cost.

Or

b) Two similar completed works each costing not less than the amount equal to 50 % of the estimated cost.

Or

c) One similar completed works each costing not less than the amount equal to 80 % of the estimated cost.

** The word "similar" shall mean similar type of work that contributes towards major financial involvement of the bid.

2.2. COMMERCIAL ELIGIBILITY CRITERIA OF THE BIDDER

a) Average annual turnover during last 3(three) years shall not be less than 30% of the estimated cost.
b) Working capital in the year, proceeding the year of bid submission shall not be less than 30% of the estimated cost.
c) In case documents certifying credit facility from a scheduled Bank is submitted, the requirement given in clause no (b) shall be judged by adding available credit facility and working capital taken together.
d) Annual audited Financial Report for last 3 (three) years to be submitted for verification in respect of bidders for whom audit of account is mandatory. For those whose audit of accounts is not mandatory they shall submit copy of IT returns along with related enclosures (Form 3CA and form 3CB) for last 3(three) years.

***Necessary documentary evidence as detailed herein above shall have to be uploaded by the bidder to ascertain the commercial eligibility criteria.*

4. OTHER STATUTORY REQUIREMENTS: -

The Bidder shall furnish the following documents

a. EPF Registration Certificate and challan for the last month.
b. PAN Card and Copy of I.T. Return for last three financial years.
c. Profession Tax Clearance Certificate for the previous year.
d. E.S.I. Registration Certificate and challan for the last month. (if applicable)
e. Trade License in respect of the prospective Bidder, Proprietorship Firm (Valid Trade License), Partnership Firm (Partnership Deed, Valid Trade License), Ltd Trust (Incorporation certificate ie MOA and AOA, Valid Trade License), Co-operative Society (Society Registration copy, Valid Trade License).
N.B: Any MOU/Temporary Agreement/Joint Ventures/Consortium/ Any other arrangement to constitute an Entity having no statutory Registration Certificates (Non-Permanent Establishment) beyond the above-mentioned entities for the purpose of applying as prospective bidder will not be considered as valid document.
f. GST Registration No. Certificate.
g. Performance as prime contractor for execution of similar nature of work for last **5(five)** years.
h. Information regarding any **past and current litigation** with BNHS /Govt / PSU in which the bidder is involved the party's concerned and disputed amount.
i. List of Machinery and key personnel.
j. Self-attested copy of Electrical Contractor's License with validity in the name of bidder.
k. Self-attested copy of Electrical Supervisor's Certificate of competency issued by the Licensing Board, Government of Maharashtra/India (Current engagement of Electrical Supervisor at prospective bidder's firm needs to be established through notary attested contract agreement on 100 Rs Non-Judicial Stamp Paper)

5. The bidder shall select the tender to bid and initiate payment of EMD through offline mode only. In the event the bid is in the range of **-20% to -80%** of the estimated rate then the bidder shall be liable to furnish an additional **Performance Security,** which shall be equal to 10% of the tendered amount. The additional Performance Security if warranted shall be submitted in the form of Demand Draft/Bankers Cheque from any scheduled bank before issuance of order.

6. The prospective Bidders or any of their constituent partners shall neither have **abandoned or rescission** any work nor any of their contract has been rescinded during the last 5 (five) years. Such abandonment or rescission will be considered as disqualification towards eligibility. (A declaration in this respect has to be furnished by the prospective bidders)

7. BNHS reserves its right to take decision keeping its financial interest. The provisions of Purchase Policy along with the Civil

Works Policy will be applicable.

8. If the offer is submitted without or inadequate Earnest Money, the bid will not be opened. In case of incomplete offer, the tender will be liable for rejection and Earnest Money Deposit will be forfeited.

9. The offer against tender should remain valid for a minimum period of **180 days from the date of submission** of the Price bid or Revised Price bid if any. However, BNHS may, on the merit of case, request for extension of validity of the offer for a further suitable period without any change in terms & conditions of the offer.

10. Any evidence of unfair Trade Practices including over charging, price fixing, cartel etc. as defined in various statutes, will automatically disqualify the bidders.

11. BNHS is not bound to accept the lowest tender and reserves the right to cancel any or all the tenders unilaterally.

12. Any bidder against whom **FIR/Complaint** is lodged with Police by BNHS shall not be eligible to participate in the bidding process.

13. Other information as well as terms and conditions, which are not covered above, will be available in Instructions to Bidders, General Conditions of Contract of this tender along with the Revised Purchase Policy and Civil Works Policy of BNHS, if any.

14. Price Bid of a bidder will be considered only if his Techno-commercial Bid is found acceptable by BNHS. Decision of BNHS will be final and absolute/binding in this respect. The list of techno-commercially qualified bidders will be displayed in the said website in due course.

15. Conditional / Incomplete tender will not be accepted under any circumstances.

16. The bidder is expected to examine carefully all instruction, conditions, forms, schedules terms, annexure, specifications and drawings of the bidding document. Bids, which are determined to be not substantially responsive to the requirement of the bidding document, may lead to rejection.

17. The Bidder at the Bidders own responsibility and risk is encouraged to visit and examine the site of works and its surroundings and obtain all information that may be necessary for preparing the Bid and entering into a contract for the work as mentioned in the Notice Inviting Tender. The costs of visiting the site shall be at the Bidders own expense.

18. Exemption from deposition of earnest money deposit (EMD) shall not be allowed under any circumstances. No interest shall be payable for Earnest Money.

19. The eligibility of a Bidder will be ascertained on the basis of the documents submitted by a Bidder in support of eligibility criteria. If any document submitted by a Bidder is either Incorrect / manufactured / fabricated or false at any stage, his Tender will be out rightly rejected and legal action will be taken against him.

20. The participating bidders may please note that the successful bidder shall have to submit an Indemnity Bond and an Agreement in the prescribed format before commencement of the work.

21. The BNHS reserves the right to cancel the N.I.T. due to unavoidable circumstances and no claim in this respect will be entertained.

22. The documents uploaded by the bidders should be legible otherwise the bid will be rejected without any prejudice.

23. Bid evaluation will be conducted only on the basis of final documents uploaded by the bidders within last date and time of online bid submission. Under no circumstances the bidder will be given any further chance to upload any document (online) after opening of technical bid.

SECTION – III

INSTRUCTION TO BIDDERS

1 GENERAL GUIDANCE FOR TENDERING:

i) Registration of Contractor:

Any contractor willing to take part in the process of Tendering will have to be registered with the Government e-Procurement System, through logging on to http://www.wbtenders.gov.in (the web portal) the contractor is to click on the link for e-Tendering site as given on the web portal.

ii) Digital Signature Certificate (DSC):

a) Contractors willing to take part in the process of e-tendering are required to obtain Digital Signature Certificate (DSC) in the name of person who will sign the tender, from any authorized Certifying Authority (CA) under CCA, Govt of India (viz. nCode Solution, Safescrypt, e-Mudhra). DSC is given as a USB e-Token. After obtaining the Digital Signature Certificate (DSC) from the approved Certifying Authority they are required to register the fact of possessing the Digital Signature Certificates through the registration system available in the website.

b) The bidder can search & download NIT & bid document electronically once he logs on to the said website using the Digital Signature Certificate. This is the only mode of collection of bid document.

c) Submission of Tenders:

Tenders are to be submitted online through the email id tender@bnhs.org. All the documents uploaded by the Tender Inviting Authority form an integral part of the Contract. Tenderers are required to upload all the tender documents along with the other documents, as asked for, in the tender, through the above website/email id ONLY within the stipulated date and time as given in the Tender Notice. Tenders are to be submitted in two folders - one is Technical Proposal and the other is Financial Proposal. The tenderer shall carefully go through the documents and prepare the required documents and upload the scanned documents in Portable Document Format (PDF) to the portal in the designated locations of Technical Bid.

The bidder needs to download the BOQ, fill up the percentage rate in the BOQ in the designated Cell and upload the same in the designated location of Financial Bid.

The documents uploaded shall be virus scanned and digitally signed using the Digital Signature Certificate (DSC). Tenderers should take note of all the addendum/corrigendum related to the tender and upload the latest documents as part of the tender.

2. DOCUMENTS TO BE UPLOADED:

The techno-commercial bid shall contain scanned copies of the following documents

1. Bid documents as uploaded by BNHS.
2. Tender drawings (if any).
3. Self-attested copies of GST registration No., GSTIN, HSN Code & SAC Code, PAN, Professional Tax Paid Certificate, EPF Registration Certificate. I.T. Return Copy for last 3 (three) financial years, ESI Registration (if applicable) and Documentary evidence(s) regarding fulfillment of Commercial eligibility criteria as per clause no.2.3 of "Invitation of Bid".
4. Self-attested copies of orders with work completion certificates from Client to establish work experience as required in the NIT.
5. The tender by a partnership firm must be furnished with full names of all partners and be signed with partnership name, followed by the signature (s), designation(s) of the authorized partner(s) or other authorized representative(s).

** **Completion Certificates** should contain Name of the work, Ordered Amount, Executed Amount, date of completion of the work with detail communicational address and contact number of the Client. Completion Certificate from the concerned Executive Engineer/District Engineer/Divisional Engineer/Assistant Engineer or equivalent rank and above will be treated as valid credential. Also uploading of copy of work order and schedule of work as supporting documents of completion certificate is mandatory.

The above should be arranged in the following manner while making the submission: While making the submission, the documents are to be arranged and with the subject line as "Technical Documents"

Sl. No.	Category Name	Details
01.	Certificates	a) EPF Registration Certificate and challan of the last month b) PAN Card. c) Profession Tax Clearance Certificate d) E.S.I. Registration Certificate and challan (if applicable) e) GST registration No., GSTIN, HSN Code & SAC Code

02	Other Important documents	i) Signed Bid documents as uploaded by BNHS. ii) Tender drawings (if any). iii) Information regarding any past and current litigation with BNHS /Govt / PSU in which the bidder is involved the party's concerned and disputed amount. iv) List of Machinery and key personnel. v) Properly filled up Annexure.
02.	Bidder Detail(s)	i) Trade License No. with validity - for Proprietorship Firm, Partnership Deed, Trade License - for Partnership Firm, Incorporation certificate, Trade License - for Ltd Trust, Society Registration copy, Trade License- for Co-operative Society. ii) Detail communicational address along with contact number.
03.	Credentials	a) Performance as prime contractor for execution of similar nature of work for last **5 (Five)** years. Documents of Credential in the form of work completion certificates and payment certificates. b) Details of work in hand.
04.	Financial Information	a) Annual Audited Financial Report for last **3 years** to be submitted for verification in respect of bidders for whom Audit of Accounts is mandatory. For whose Audits of accounts is not mandatory, they shall submit copy of IT returns along with related enclosures (Form 3CA and Form 3CB) for last **3 years.** [Non-statutory documents]

- **Original documents may be required to be verified.**
- The bidder shall have to go through all the "**Annexures**" enclosed in this bid document and submit the filled in proforma of the appropriate/relevant annexures with the bid document putting the signature with seal of the Company before uploading the tender viz. **Annexure-I** (Letter of undertakings), **Annexure-V** (Bid Proposal), **Annexure-XI** (Declaration of Black Listing/Holiday Listing), **Annexure-XII** (Details of document Uploaded) etc.
- If there is no deviation from the bid, the **Annexure-VIII**, **Annexure-IX**, **Annexure-X** should be stroked out and signed with seal of the Trust before uploading the bid document.
- ***Failure of submit any of the above documents will render the bidder liable to be rejected for techno-commercial bid.***
- In the event, the bidder is not in possession of the Electrical Contractor's License, it may submit the Electrical Contractor's License of another holder of such License with a copy of agreement in a non-judicial stamp paper evidencing that the holder has consented to engage itself in the Electrical portion of the Work and the holder shall exercise his rights proscribed to the rights confirmed in his license and shall be jointly responsible with bidder confined to Electrical portion of the Work.

3. QUOTING OF RATE:

a. Price bid should contain the priced "Bill of Quantities" (BOQ). Bidder is to quote the rate on "Percentage quotation basis" in the space marked for quoting rate in the BOQ.
b. The **quoted price** should be **firm**. There will be no price variation during the pendency of the contract period or thereafter. Bidders are in no way allowed to get any **escalation** of price against this contract.
c. Prices indicated in the schedule of prices deemed to include all the levies/duties/taxes/cess & all other incidentals payable as per statute excluding GST. Relevant GST rule is applicable for the work and shall be paid extra.
d. In case of tenders, invited on percentage basis, if the percentage rate column is left blank, the bid shall be rejected.
e. In case of tenders, invited on item rate basis, if the rate is not quoted against any particular item of work, it will be construed that the item would be executed free of cost and the rates for other items of work are deemed to include its cost. Further, if any error is found in multiplication of quoted unit rate with respective quantities and/or to derive any rate component and/or in summation to arrive at the total quoted price, the same shall be recalculated to arrive at the evaluated price by considering the quoted unit rate as firm. Bidders are in no way allowed to get any escalation of price against this contract.

4. VALIDITY OF BIDS:

Price bid of the tender shall be opened within a stipulated time limit from the date of opening of Part-I preferably within 30 (thirty) days. Bids shall remain valid for a period of **180 (one hundred & eighty) days** from the date of submission of the Price bid or Revised Price bid if any. However, prior to expiry of the original Validity Period, BNHS may, on the merit of case, request for extension of validity of the offer for a further period of maximum 90 (ninety) days without any change in terms & conditions of the offer. The bidder may refuse the request without forfeiting his Bid Security / EMD.

5. OFFLINE COLLECTION AND REFUND OF EMD:

A. The bidder shall select the tender to bid and initiate payment of EMD through offline mode by way of Demand Draft in favour of Bombay Natural History Society payable at Mumbai. Following payment options are available for paying EMD amount through offlline mode:

B. **Refund/ Settlement of EMD Amount:**

- For unsuccessful bidders, EMD amount submitted against the tender shall be refunded through the process subsequent to the conclusion of tender process.
- For successful bid(s), EMD will be refunded from BNHS authority after completion of tendering process and following due procedures.
- The bank account submitted at the time of EMD submission, used for payment of EMD by the bidders shall be maintained operative until the completion of tendering process. All refunds will be made mandatorily to the Bank A/c from which the payment of EMD has been initiated.

6. BID SUBMISSION:

Bids shall be submitted online within the stipulated deadline at tender@bnhs.org with email containing three prerequisites from each bidder i.e., (i) EMD Demand Draft email, (ii) Technical Submissions and (iii) Commercial Submissions.

BNHS may at its discretion, extend the deadline of bid submission by issuing an amendment. In that case all rights and obligations of BNHS and the bidders previously subject to the original deadline shall thereafter be subject to the new deadline as extended.

7. BID WITHDRAWAL/MODIFICATION:

The bidder may modify or withdraw his bid after submission but within the deadline of bid submission, provided written notice of the modification/withdrawal is received by BNHS prior to the deadline for bid submission. No bid shall be modified/ withdrawn after the deadline of bid submission. Modification /withdrawal of bid by any bidder after the deadline of bid submission shall result into forfeiture of EMD.

8. BID OPENING:

a. Techno-commercial bids shall be opened only for those bidders whose EMD has been submitted. Bidder's representatives with written authorization (max. 2 persons per bidder) may attend bid opening. No electronic recording shall be permitted during bid opening in Hornbill House, Mumbai.
b. BNHS will scrutinize and evaluate techno-commercial bid. After that, the list of techno-commercially qualified bidders and date & time of price bid opening will be notified in the web portal.
c. BNHS may, at its discretion, extend the key dates of the bid or cancel the entire bidding process.
d. BNHS reserves to instruct the bidders to submit hard copy of any relevant document (and to produce the original documents for verification) during scrutiny & evaluation of bids. Bidders" failure to comply to such instruction may lead to rejection of bid.

9. PROCESS TO BE CONFIDENTIAL:

a) After the opening of bids, information relating to the examination, clarification, evaluation and comparison of bids, and recommendations concerning the award of contract shall not be disclosed to bidders or other persons not officially concerned with such process.
b) Any effort by a bidder to influence BNHS or other connected in the process of examination, clarification, evaluation and comparison of bids, and in decisions concerning the award of contract, may result in the rejection of his/their bid.
c) Formation of any Cartel, may lead to the cancellation of tenders with penal measures as necessary and BNHS reserves the right to take such unilateral decisions without further notice to anymore.

10. RIGHT TO REJECT BIDS:

BNHS reserves the right to accept or reject the bid, wholly or partly, or to split the work in parts and to add/delete any of the items, without assigning any reason whatsoever.

11. BIDDER'S SITE VISIT:

Before submitting the bid, the bidder is encouraged to visit and examine the site and its surroundings and obtain all information that may be necessary for preparing the bid and entering into a contract for the work. Such site visit shall be at the bidder's own expense, risk and responsibility.

12. COST OF BIDDING:

The bidder shall bear all costs associated with the preparation and submission of his bid and BNHS in no case shall be responsible or liable for these costs, regardless of the conduct or outcome of the bidding process.

13. DETERMINATION OF RESPONSIVENESS:

13.1 Prior to the detailed evaluation of bids, BNHS will determine whether the bid is substantially responsive to the requirement of the bidding document.
13.2 For the purpose of this clause a substantially responsive bid is one which conforms to all the terms, conditions and specification of the bidding document, without material deviation, or reservations. BNHS's determination of bid's responsiveness shall be based on the contents of the bid itself without recourse to extrinsic evidence.
13.3 If a bid is not substantially responsive to the requirements of the bidding document, it may be rejected by BNHS and the same cannot subsequently be made responsive by the bidder by correction.

14. CORRECTION OF ERRORS:

14.1 If there be a discrepancy between the unit price and the total price that is obtained by multiplying the unit price & quantity, the unit price shall prevail and total price shall be corrected.
14.2 If there be a discrepancy in figure and word the total amount stated in word shall prevail.
14.3 The bidder should strike out clearly the portion which is not applicable i.e., above/at par/ below in the price sheet. If the same is not followed, the corresponding part(s) shall be considered below the estimated price and evaluation of tender shall be made accordingly.
14.4 If the percentage rate column is left blank, the bid shall be rejected.

15. TIME SCHEDULE:

The basic consideration and the essence of the contract shall be the strict adherence to the time schedule specified in the bidding document. Delay attributable to the contractor for each day beyond the agreed date in the work order would lead to a penalty of Rs.5000/- per day.

16. EVALUATION AND COMPARISON OF BIDS:

16.1 On examination of documents submitted under different covers, BNHS will evaluate and compare the bid, determined to be substantially responsive at each step.

16.2 Evaluation of bid will include and will take into account:

16.2.1 BNHS shall evaluate and compare only the bids determined to be substantially responsive.

16.2.2 The bids shall be evaluated on the basis of total price for the entire scope of work covered under this bid document.

16.2.3 Evaluated bid-price of all bidders shall be compared among themselves to determine the lowest evaluated bid and as a result of this comparison, the lowest bid will be selected for award of contract.

16.2.4 Conditional rebate, if any, offered by any bidder shall not be considered in Bid evaluation.

17. PROCEDURE OF EVALUATION:

Evaluation of tenders will be done in the following steps:

Step-1 The Earnest Money Deposit will be examined. The mode and amount of deposit must be in conformity with requirements set forth in the "Earnest Money Deposit" clause, failing which the bid is liable for rejection without opening other covers.

Step-2 Techno-Commercial Evaluation for two-part bidding:

Only those bids meeting the requirements of previous step will be examined and assessed. The bidders will be intimated about the non-compliance of various techno commercial requirements and asked for conforming compliance with the condition of bidding document, if allowed by the authority. In case, it is felt necessary by BNHS that post bid discussion are required, the same will be carried out individually with each bidder. The bidders will be required to confirm compliance with all the conditions of bidding document. Bids, which do not satisfy the „Must Conditions" will not be considered for technical evaluation. "Must Conditions" are to be submitted as per format enclosed with this section. No clarification will be asked from the bidder in this regard.

Step-3 Opening of price part and financial evaluation on completion of techno-commercial evaluation. Cover-3 containing price offer of the bidders who have successfully made the requirements of previous steps will be opened in presence of the bidder's representative (maximum two) on subsequent pre-intimated date. Price bid of the bidders who do not fulfill the Techno- Commercial requirements shall not be opened.

18. AWARD OF CONTRACT

18.1 Award of Contract

BNHS will award the contract to the successful bidder whose bid has been determined to be substantially responsive, qualified to satisfactorily perform the contract and evaluated as the lowest bidder.

18.2 BNHS's Right to accept or reject Bids

18.2.1 The right to accept the tender will rest with BNHS. BNHS, however, does not bind himself to accept the lowest bid, and reserves to itself the authority to reject any or all the bids received without assigning any reason whatsoever. At the option of BNHS, the work for which bids have been invited, may be awarded to one Contractor or may be split between more than one bidder, in which case the award will be made for only that part of the work, in respect of which the bid has been accepted. The quoted rate of the bidder should hold good for such eventualities.

18.2.2 Tenders in which any of the particulars and prescribed information are missing or are incomplete in any respect and/or the prescribed conditions are not fulfilled are liable to be rejected. The Tender containing uncalled for remarks or any additional conditions are liable to be rejected.

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

18.2.4 BNHS reserves the right to accept or reject any bid, and to annul the bid process and reject any or all the bids at any time prior to award of contract, without thereby incurring any liability to the affected bidder or bidders or any obligation to inform the affected bidders or bidder of the grounds for BNHS's action.

18.3 Placement of Letter of Award/Order

After approval of bid evaluation by BNHS, BNHS may, at its sole discretion, invite the successful bidder for a pre- award discussion. After such pre-award discussion and prior to the expiry of validity of bid of the successful bidder, BNHS will notify the successful bidder of acceptance of their bid in writing by issuing a detailed Letter of Award (L.O.A.)/Order (mentioned as L.O.A./Order hereinafter and elsewhere in this bid document) in duplicate. The successful bidder sign and return one copy of the L.O.A./Order to BNHS as an acknowledgement of unconditional acceptance of the same within 7 (seven) days of issue of L.O.A./Order.

19. TAXES, DUTIES AND OTHER LEVIES:

19.1 The bidder shall be solely responsible for the taxes that may be levied on the bidder's persons or on earnings of any office employee and shall hold the purchaser indemnified and harmless against any claims that may be made against the purchaser. The BNHS does not take any responsibility what-so-ever regarding taxes under Income Tax Act, for the contractor or his personnel. If it is obligatory under the provisions of Income Tax Act, deduction of Income Tax at source shall be made by BNHS.

19.2 All other duties / levies payable (excluding GST) by the bidder shall be included in the bid price and no claim on this behalf will be entertained by BNHS.

19.3 GST at specified rate shall be payable / allowable over & above the contract price to the selected bidder having GST registration, GSTIN.

21. LAWS GOVERNING CONTRACT:

The contract shall be binding according to Acts/Laws in force in the country and shall be under the jurisdiction of Bombay High Court.

22. LANGUAGE AND MEASURES:

All documents pertain to the contract including specifications, schedule, notice, correspondences, operating and maintenance instructions, drawings or any other writings be written in English language. The metric system of measurement shall be used exclusively in this contract.

23. CORRESPONDENCE:

Any notice to the contractor under terms of the contract shall be served by register mail or by hand at the contractor's principal place of business. Any notice to the owner shall be served at the owner's principal office in the same manner.

24. CORRUPT OR FRAUDULENT PRACTICE:

BNHS expects that bidders/suppliers/contractors observe the highest standard of ethics during the procurement and execution of such contracts. In pursuance of this policy, the owner defines for the purpose of this provision, the terms set forth below as follows:

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

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

24.3 Will reject a proposal for award if BNHS determines that the bidder recommended for award has engaged in corrupt or fraudulent practice in competing for the contract in question.

24.4 Will declare a Firm ineligible either indefinitely or for a stated period of time if BNHS determines any time that the firm has engaged in corrupt or fraudulent practices in competition for, or in executing the contract.

25. INSURANCE:

The bidder on awarding of contract shall arrange, secure and maintain all insurance as may be pertinent to the work and obligatory in terms of law in force to protect the interests of BNHS against all perils. The form & the limit of such insurance together with underwriting in each case shall be acceptable to BNHS. However, irrespective of such acceptance the responsibility to maintain adequate insurance coverage at all times during the period of contract shall be contractor's alone.

SECTION – IV

GENERAL CONDITIONS OF CONTRACT

1. DEFINITION OF TERMS:
   - 1.1 The Trust/purchaser/Owner/Office shall mean the BOMBAY NATURAL HISTORY SOCIETY, having its Office at Hornbill House, Mumbai-400001
   - 1.2 The Engineer-in-Charge/Controlling Officer/Local Consultant shall mean the Engineer designated by the Trust for the purpose of this contract.
   - 1.3 Trust's representative shall mean any person or persons of consulting firm appointed and remunerated by the BNHS to supervise, inspect, test and examine workmanship and materials of the work under this scope.
   - 1.4 The Contractor shall mean the Bidder who will be awarded with the Contract by the Trust and shall include the contractor's executor's administrators, successors and permitted assignees.
   - 1.5 The 'Sub-Contractor' shall mean the person named in the Contract for any part of the works or any person to whom any part of the contract has been sublet by the contractor with the consent in writing of the Engineer. And will include the legal representatives, successors and permitted assigns of such persons.
   - 1.6 Equipment/materials shall mean and include all type of construction equipment & materials etc. required for true and satisfactory completion of the work under this contract.
   - 1.7 Workmanship shall mean the method/manner in which the jobs of the different items, whether included in the schedule or not but are required for true & satisfactory completion of the work under this contract, are executed.
   - 1.8 General Conditions shall mean all the clauses of General Conditions of the proposed contract stated hereinafter: The specification shall mean the specification annexed to or issued with the General Conditions and shall include the schedule and drawings attached thereto.
   - 1.9 The terms Services shall mean all works to be undertaken by the contractor as laid down under the head "scope of contract" or elsewhere in the specification enclosed. When the words "approved", "subject to Approval", "As directed", "Accepted", "Permitted" etc. are used, the approval, judgment, direction etc. are understood to be a function of Trust.
   - 1.10 Month shall mean calendar month.
   - 1.11 "Writing" shall include any manuscript, type written, printed or other statement reproduced in any visible form.
   - 1.12 The work „Site" shall mean the site of proposed work as detailed in the specification or any other place where the work is to be executed under the contract.
   - 1.13 'Date of Contract" shall mean the date on which notification of award of contract/ letter of award/telex award has been issued.
   - 1.14 'Zero Date' will be started from the date of issuance of order/date of handing over of site.

2. SCOPE OF WORK:
   - a. The contract comprises of construction and completion of the civil work, as required including provision of all labour, material, constructional plant, temporary work and everything whether of a temporary or permanent nature required for such construction, completion and maintenance so far as the necessity of providing the same is specified in or responsible to be inferred from the contract.
   - b. The scope of work under this contract shall also include all such works which are not specially mentioned in the Bid Document, as a hole, but are necessary for completion of work in all respects for purposeful functioning of the works, built and/ or renovated under this contract.

3. SUBMISSION DATE OF TENDER;
   - a. Before the deadline for submission of tenders, BNHS may modify the bidding documents by issuing addenda. Any addendum thus issued shall be part of the bidding documents arid shall be communicated through respective website.
   - b. The owner may extend the deadline for submission of tender by issuing an amendment in accordance with clause no h in which case all rights and obligations of the owner and the bidders previously subject to the original deadline will then be subject to the new deadline.

4. SECURITY DEPOSIT:

   Earnest money (EMD) for the successful bidder will be converted to security deposit.
   An additional sum of security money shall be deducted from each progressive bill, so that the total deduction together with Earnest Money (EMD) already deposited along with the tender, shall constitute not less than **FOUR percent (04%)** of the total value of the work as actually done.

5. REFUND OF EARNEST MONEY:

   For unsuccessful bidders, EMD amount submitted against the tender shall be refunded on receipt of updated status of any bid.

6. REFUND OF SECURITY DEPOSIT:

   Refund of Security deposit shall be subject to Trust's right to deduct/appropriate its dues against the contractor under this contract or any other contract. The Security Deposit for all type of bids shall be released only after

satisfactory expiry of the guarantee period/defect liability period and certified as such by the Controlling Officer of the work upon written request by the contractor under following conditions:

a. In case of all Civil works the defect liability period shall be considered **six month** or **expiry of one full monsoon** period, i.e. from June to September **whichever is later** and any defects such as leakages in walls, dampness, defects in drainage etc. should be rectified to the satisfaction of the Engineer-in-Charge.
b. All types of Manufacturer's guarantee/warranty wherever applicable are to be issued/revalidated in the name of the owner by the contractual agency. In the case of all Civil works the defect liability period shall be considered six month or expiry of one full monsoon period, i.e. from June to September whichever is later.

7. FORFEITURE OF EARNEST MONEY/BID GUARANTEE:

Earnest money/bid guarantee shall be forfeited incase of following:

i. If during the period of validity, the bidder withdraws/modifies its bid as a whole or in part.
ii. If the bidder deviates from any clarification/confirmation given by him subsequent to submission of his bid.
iii. In the case of successful bidder, if the bidder fails to accept LOI/Order **unconditionally** and sign contract.

8. DEFECT LIABILITY PERIOD:

a. The term 'defect liability period' shall mean the period of six (6) months from the ***date of acceptance/takeover*** of the work by BNHS. If any defect is found within the defect liability period the contractor shall be liable to rectify/replace the materials at their own cost and responsibility.
b. In case of building or other works of similar nature of work the defect liability period shall be considered ***six month or expiry of one full monsoon period, i.e. from June to September whichever is later*** and any defects such as leakages in roof, effloresces in walls, dampness, defects in drainage etc. should be rectified to the satisfaction of the Engineer-in-charge.
c. Defects/rectification work so notified shall have to be attended and completed satisfactorily within the specified date or as deemed justified by the Controlling Officer. For faithful & due fulfillment of all obligations, this defect liability period shall be covered by the Performance Bond, already submitted by the contractor as per clause no 4 above.
d. After completion of defect liability period, and on completion of satisfactory rectification of effects, if any, reported within the defect liability period, and on receipt of the application from you the Controlling Officer of the work shall recommend for refund of the Security money.

9. MANNER OF EXECUTION OF CONTRACT AGREEMENT

10.1 The successful bidder has to **submit acceptance of the order within 10 days from the date of issue of the order**. The successful bidder shall be required to execute an Agreement on a non-judicial stamp paper of Rs. 500/- with the Trust with all related documents for satisfactory execution of the work.

10.2 Agreement shall be signed on a date and time to be mutually agreed upon in the office of the Controlling Officer of the work and the same has to be signed by both the parties within 30 days from the date of acceptance of the order. Power of attorney of the authorized representative of the contractor who will sign the contract on behalf of the contractor is to be submitted before signing of the agreement.

10.3 The agreement shall be signed in original and five photo copies. The original agreement shall be retained by the Trust and a copy will be handed over to the Contractor.

10. GENERAL REQUIREMENT:

11.1 Cost of Bidding: The bidder shall bear all cost associated with the preparation and submission of their bid and BNHS in no case shall be responsible or liable for these costs, regardless of the conduct or outcome of the bidding process.

11.2 Correctness and sufficiency of rates quoted in the tender: The bidder shall be deemed to have satisfied himself before tendering as to the correctness and sufficiency of his tender for work and the rates and prices stated in the schedule of the items. The rates and prices quoted shall cover all obligation of the bidder under the contract and all materials etc. necessary for the proper completion and maintenance of the work. In this case, Rate should be quoted considering Transportation of materials by Road & River Transport (as required).

11.3 The contractor shall execute, complete and maintain the work as per direction of the Controlling Officer/Engineer-in-Charge of the work or his representative.

11.4 Contractor to submit programme: Within 14 (fourteen) days from the date of issue of Letter Of Intent/ Order the contractor shall submit a programme showing the order, procedure and method in which he proposes to carry out the work.

11.5 Contractor's staff at site: The contractor shall provide at site his authorized representative duly approved by the Controlling Officer (approval may be withdrawn for a particular person, if necessary). The contractor and/or his authorized representative is to be constantly on the work and shall give whole time supervision of the same. Such authorized agent or representative shall receive (on behalf of the contractor) directions and instructions from the Controlling Officer/Engineer or his representative.

11.6 Removal of persons employed at site: The Controlling Officer/Engineer shall be at liberty to ask the contractor to remove from the site any person, employed by the contractor in the execution of the work, who in the opinion of the Controlling Officer/Engineer misconducts himself or is incompetent or negligent in the proper performance of his duties and such persons shall not be again employed upon the work without the permission of the Controlling Officer/Engineer.

11.7 Setting out: The contractor shall be responsible for the true and proper setting out of the work arid for the correctness of the position, levels, dimensions and alignments of all parts of work. If at any time during the progress of the work any error shall appear or arise in the positions, levels, dimensions or alignments of any part of the work, the contractor on being asked to rectify by the Controlling Officer/Engineer, shall at his own expense rectify such error to the satisfaction of the Controlling Officer/Engineer.

11.8 Protection of work: The contractor shall in connection with the work provide and maintain at his own cost all lights, guards, fencing and watching when and where necessary if required by the Trust or by any competent authority or statutory or other authority for the protection of the work or for the safety and convenience of the public or others.

11.9 Care of works: From the commencement to the completion of the work, the contractor shall take full responsibility for the care thereof and of all temporary work and in case of any damage, loss or injury to work or to any part thereof or to any temporary work due to any because whatsoever shall at his own cost repair and make good the same, so that at completion the work shall be in good order and conditions and in conformity in every respect with the requirements of the contract. The contractor shall take every practicable precaution not to damage or to cause injury to any adjoining or other properties or to any person. However, even if any damage or injury occurs, the contractor shall be responsible in meeting the necessary claims and demands as may be required.

11.10 Workmen's compensation for accident or injury to ant workmen: The Trust shall not be liable for damages or compensation payable as per provision of law in respect or consequence of any accident or injury to any workmen or other person in the employment of the contractor. The contractor shall have to pay all claims, demands, preceding costs, charges and expenses whatsoever in respect thereof or in relation thereto. Insurance Policy covering provisions for workmen's compensation for all the workmen to be engaged by the contractor is to be made by him.

11.11 Facilities for other contractors: The contractor shall afford all reasonable facilities for any other contractor employed by the Trust in execution on or near the site of any work not included in the contract

11.12 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 work clean and in a good and tidy condition to the satisfaction of the Engineer-in-Charge.

11. LABOUR LICENSE:

Contractor will have to obtain Labour License in respect of the above work as per Contract Labour (Regulation & Abolition) Act, 1970 as early as possible.

12. COMPLIANCE OF LABOUR LAWS:

The contractor shall comply all statutory labour laws to protect the laborers engaged by them. In this connection the contractor will be required to execute an indemnity bond (as per specimen enclosed as **Annexure-VI**) after placement of Letter of intent/order.

13. NIGHT AND HOLIDAY WORK:

If any work of permanent nature is to be carried out in three shifts and/or in Sundays & Holidays prior written permission of the Controlling Officer shall have to be obtained.

14. DEDUCTION OF PROVIDENT FUND AND REMITTANCE THEREOF IN RESPECT OF CONTRACT LABOURS:

In respect of casual workers or workers engaged for any job for a very short duration or sporadic nature having no employer-employee relationship (for example soil testing, repair of transformer etc done by outer agency) and engaged in works which are neither preparatory, nor incidental nor any way connected with the main operation of the establishment, deduction of provident fund and remittance thereof in respect of the contract labors will not be applicable. However, it is further clarified that no mechanical approach should be adopted in deciding the applicability of the Act and each case should be considered on its own merits.

15. VARIATION, OMISSION. ADDITION & ALTERATION:

The Contractor shall not modify the work except under direction in writing by the Trust. The quantities provided in the Schedule of work are provisional only, which may vary up to any extent or may be deleted altogether. The quoted rate of each item shall remain Firm. The Trust reserves the right to alter, amend, and omit or otherwise vary the quantities as may be necessary but such variation will be limited to ± 25% (plus or minus twenty five percent) of the contract price. Payment shall be made as per actual execution.

16. CONTROLLING OFFICER:

The **LOCAL CONSULTANT, Pokhran appointed by BNHS** shall be the Controlling Officer.

17. PAYING OFFICER:

Payment will be made by the **Head Finance, BNHS, Hornbill House, on receipt of bills duly verified and vetted by local consultant and BNHS authorized supervisor.**

18. SUPPLEMENTARY WORKS:

Whenever supplementary work becomes unavoidable for completion of the work in all respect, the Contractor shall bring the matter to the notice of the Controlling Officer and submit their proposal. However, the controlling officers shall have the right to advise the contractor to proceed with such item (s) of work. Rates for supplementary item shall be arrived at as given hereunder:

19.1 The rates of all supplementary items shall be decided on pro-rata basis from the existing items in the contract.

19.2 When above clause no 19.1 shall not be applicable the rates shall be taken from P.W.D. schedule of rates for building works, sanitary & plumbing works & PWD schedule prevailing at the time of submission of bids.

19.3 When clause no 19.1 & 19.2 above shall not be applicable, the rates should be analyzed, to the mutual acceptance from present market rates of different elements involved in the item, against documentary evidence, with 5% overhead, contractor's profit as 10% and 1% cess towards BOCWWC Act,1996. In that case contractual rate of quotation will not be applicable.

Controlling Officer's decision regarding finalization of rate of non-scheduled item(s) shall be final and binding upon the contractors.

19. MEASUREMENT AND TERMS OF PAYMENT:

20.1 All items of work carried out by the contractor in accordance with the provision of the contract having a financial value shall be entered in the Measurement book/Log book etc. as prescribed by the Trust so that a complete record is obtained of all works performed under the contract and the value of the work carried out can be ascertained and determined therefrom.

20.2 Measurement shall be taken jointly by the Supervising Officer or his authorized representative and by the contractor or his authorized representative. Every measurement thus taken shall be signed and dated by both the parties.

20.3 In the event of failure on the part of the contractor to attend or send his authorized representative after receiving the intimation or to countersign or record objection within a week from the date of measurement, the measurement taken by the Engineer-in-charge or his authorized representative shall be taken to be the correct measurement of the work done.

20.4 Progressive R/A bills, against the prayer of the contractor, for an amount of minimum 20% of the ordered value or as deemed justified by the Controlling Officer shall be released against certification by the Controlling Officer after deducting the amount already paid or other amounts as may be deductable. The bills shall be released within 30 (thirty) days of its submission if all formalities as per terms of contract is maintained. The final bills shall be released on completion of the work in all respect and fulfillment of all contractual obligations by the contractor.

20.5 The Trust reserves the right to recover/enforce recovery of any overpayments detected after payment as a result of post-payment audit or technical examination or by any other means, notwithstanding the fact that the amount of disputed claims, if any, of the contractor exceeds the amount of such overpayment and irrespective of the fact whether such disputed claims of the contractor are subject matter of arbitration or not the amount of such overpayments may be recovered from the subsequent bill, under the contract, failing that from contractor's claim under any other contract with the Trust or from the contractor's security deposit or from the amount retained or the contractor shall pay the amount of overpayment on demand.

20. COMPLETION OF CONTRACT:

All works under the contract must be completed by period of completion mentioned in NIT while portions of work as per programme settled in consultation with the Controlling Officer shall be completed by the date stipulated in the said programme. It is to be noted that time is the essence of the contract and any default on the part of the contractor to complete the work within the stipulated date/dates aforesaid or within the time as may be extended in writing by the Controlling Officer subject to the payment of liquidated damages, the Trust shall have the right, without prejudice to any other clauses, to terminate contract forthwith and to take possession of the balance work/materials and have the same allotted to any other agency and the contractor shall be liable to compensate the loss that may be occasioned to the Trust on that account. Any letter in writing by the Controlling Officer shall be treated as conclusive on behalf of the Trust.

21. DRAWING:

The work shall be carried out as per the instruction and to the satisfaction of the Engineer-in-Charge in accordance with the signed drawing, the specification and schedule of quantities and also as per any further drawings which may be supplied, all instructions which may be given by the Engineer-in-Charge from time to time.

22. MATERIALS AND WORKMANSHIP:

All the work shall be executed with the materials as specified and with best workmanship and/or in the best manner to the satisfaction of the Engineer-in-charge.

23.1 Sample Approval:

The Contractor shall get sample(s) of each & every items/materials/equipments approved as per instruction of the Controlling Officer/Engineer-In-Charge and as far as practicable prior to bringing in at site for use, well in advance. The Controlling Officer/Engineer-In-Charge shall have every discretionary power to allow or disallow any items/materials/equipment's based on submission of the sample (s) by the Contractor. If the items/materials/equipment's brought at site for use at work does not match with the sample (s) thus approved beforehand by the Controlling Officer/Engineer-In-Charge, then Controlling Officer/Engineer-In-Charge shall have the discretionary power to reject those items/materials/equipments brought to site for use at work and instruct the Contractor to remove those items/materials /equipments forthwith. The decision of the Controlling Officer/Engineer-In- Charge shall be binding to the Contractor. The Contractor shall furnish to the Controlling Officer/Engineer-In-Charge for approval, when requested or if required by the specifications, adequate samples of all materials to be used in the work.

Such samples shall be submitted before the work is commenced and with ample time to permit tests and examinations thereof.

23.2 Defective Materials:

If in the opinion of the Engineer-in-Charge, any of the materials brought to the site for use are not of the quality or kind specified in the contract and/or are unfit for the work, he shall be at liberty to order the removal of the said materials and the contractor shall remove the same within 24(twenty four) hours after notice has been given to him and if he fails to remove them within the time the Engineer may cause them to be removed anywhere at the risk of the contractor and any cost incurred in so doing shall be deducted from the dues to the contractor under the contract.

23.3 Tests and test Certificate:

The Controlling Officer/ Engineer-In-Charge may ask the contractor to submit the test certificate of any material (to be used for the work) from the manufacturer(s), in conformity to the relevant Indian Standard Code of Practice. Even after submission of such test certificate, the Controlling Officer/ Engineer-In-Charge may further ask the contractor for testing of particular material, preferably from Govt. Testing Laboratory for acceptance/rejection of material, at the risk and cost of the contractor, till such particular material is allowed to be used for the work.

The "Technical Specification" of the "Bid Document" may also be referred in conjunction with this GCC for further details regarding the above.

23. EXTENSION OF TIME:

If the work is suspended due to reasons beyond the control of the contractor, the contractor shall immediately give notice in writing within 7 (seven) days to the controlling officer for each occasion. On receipt of such notice, the controlling officer may verify the matter and agree to extend the completion period as may be reasonable but without prejudice to other terms and conditions of the contract as the case may be if the reasons behind the suspension of work are found to be justified.

24. LIQUIDATED DAMAGE:

25.1 If the contractor fails to complete the work successfully within the time specified in the Contract or any extension thereof, the Trust shall recover from the contractor as liquidated damages a sum of half percent (0.5%) of the contract value of works for each calendar week of delay or part thereof of delay subjected to the Force Majeure.

25.2 The total recovery against liquidated damage shall not exceed ten percent (10%) of the contract value of the work. An extension of time without imposition of liquidated damage, may be granted for delay in execution of work provided there is no fault whatsoever on the part of the contractor. Such extension may only be granted on the basis of application to be submitted by the contractor who has to establish that the extension of time required by him was not due to his fault.

25. RISK PURCHASE CLAUSE:

In the event of the contractor's inability/non-response to accept and take up the work as per the order & contract agreement, the Owner reserves the right to terminate the contract with forfeiture of E.M.D. along with Contract Performance Guarantee and deploy any separate agency to complete residual portion of this contract. If the contract is terminated in the above manner, the Contractor shall have no claim for compensation against the Owner. the Owner shall have the right to engage any other Contractor to complete the work and any extra cost incurred by the Owner to the get the work completed in all respect will be realized from the pending bill(s) and/or E.M.D. and/or Retention Money and/or Security Deposit and/or any Bank Guarantee(s) of the original Contractor for this contract or any other contract under BNHS.

26. TERMINATION OF CONTRACT:

a. If the contractor neglects or fails to proceed with the work proportionate to the scheduled time of completion of the work or fails to complete the work within scheduled time for completion or within the extended time approved by the Trust, the Trust shall have right to terminate the order/letter of intent after giving notice in writing to the contractor. If the contractor fails, after 14 (fourteen) days' of such notice, to proceed with the work in the manner notified, the Trust shall terminate the contract and call the contractor to take joint measurement along with the Engineer for the finished portion of work. If the contractor does not appear for a joint measurement, ex party measurement by the Trust will be taken as final.

b. In that case the Trust shall take possession of the work site and may engage other agency to complete the work. Extra cost, if incurred to get the unfinished work done through other agency, will be realized from him, from his pending bills and security money. If the contract is terminated as above, the contractor shall have no claim for compensation against the Trust for any loss or deterioration of any materials that he may have collected or engaged or entered into on account of the work.

27. MODE OF MEASUREMENT

As regards specification of materials, execution of work and the mode of measurement relevant stipulation of P.W.D. schedule of rates (applicable at site of work) in this respect will be applicable. The contractor shall arrange and provide all necessary facilities along with necessary manpower for inspection, testing and measurement of work at his own cost.

28. DEPARTMENTAL MATERIALS

BNHS material shall not be issued to the contractor for the work except under special circumstances.

29. DEDUCTIONS OF TAXES AND CESS FOR BOCWWC ACT 1996:
The Contractor is required to follow the Building and other Construction Worker's Welfare Act, 1996.
Registration of his establishment under section-7 of the Building and other Construction Worker's (Regulation and condition of Service) Act, 1996 is to be made after the contract is awarded. 1% cess towards BOCWWC Act, 1996 will be deducted from its total amount of each bill.

30. FORCE MAJEURE:
The Contractor shall not be liable to pay any liquidated damage for delay/failure to perform the contract for reasons of force majeure such as acts of God, acts of the public enemy, acts of Governments, fire, flood, epidemics, quarantine restriction, strikes, freight embargos and provided that the contractor shall within 10(ten) days from the beginning of such delay notify the Trust in writing of the cause of delay. The Trust shall verify the facts and grant such extension as found to be justified without imposing liquidated damage.
The Department shall not be responsible or liable to pay any compensation for any interruption in your work at the site due to strike, lockout, riot, earthquake, flood, cyclone or civil commotion or any other force of accident due to any reason beyond control. The Department shall not be held responsible to or liable to pay for any interruption in your work at the site arising out of resistance from the local public dine to any resistance towards work.

31. SUB-LETTING OF CONTRACT:
The contractor shall not, without the written consent of the Trust, assign or sublet his contract or any part thereof, other than for raw materials, or for any part of the work provided that any such consent shall not relieve the contractor form any obligation, duty or responsibility under the contract. In the event of sub-letting of contract or any part thereof is permitted, the fact that such permission has been accorded shall not establish any contractual relationship between the approved Sub-vendor and BNHS of any of his liabilities and obligations under the contract.

32. ENGINEER'S DECISION:
Controlling Officer's decision is final in respect of all matters which are left to the decision of the Controlling Officer including the granting or with-holding of certificates.
If, in the opinion of the contractor, a decision made by the Controlling Officer is not in accordance with the meaning and intent of the contract, the contractor may file with the Controlling Officer, within 7 (seven) days after receipt of the decision, a written objection to the decision. Failure to file an objection within the allotted time will be considered as an acceptance of the Controlling Officer's decision and the decision shall become final and binding.

33. LIABILITY OF ACCIDENTS AND DAMAGE:
The Contractor shall be responsible for the loss, damage or depreciation of the Trust's materials while in their custody and until the same is taken over by the Trust.
Until the completed work is taken over by the Trust the contractor shall also be liable for and shall indemnify the Trust in respect of all injury to person or damage to properly resulting from the negligence of the contractor or his workmen or sub-contractor or from defective workmanship etc.

34. LANGUAGE AND MEASUREMENT:
All documents pertaining to the contract including specifications, schedule notices, correspondences, operating and maintenance instruction, drawings or any other writings be written shall be in English language. The metric system measurement shall be used exclusively in this contract.

35. SETTLEMENT OF DISPUTES:
All disputes concerning question of act arising under the contract shall be decided by the owner/Trust on receipt of written appeal by the contractor. Any dispute or differences arising out of or in connection with this contract shall to the extent possible be settled amicably. However, the Bombay High Court shall have exclusive jurisdiction in all matters arising under the Contract including settlement of disputes.

36. COMPLETION OF WORK:
Completion of the work means completion of the work in totality and acceptance/takeover of the same by the Trust. Partial or phase wise completion will have no bearing towards consideration of guarantee/defect liability period.

37. IDLE LABOUR/MACHINERY:
Whatever the reasons may be no claim for idle labour and machinery, additional establishment cost| hire and labor charges of tools & plants would not be entertained by the Trust, under any circumstances.

38. SAFETY RULES:
The bidder shall also provide necessary fencing and lights to protect the public from accident.
Fire extinguishers shall be kept by the bidder at the site of works where there is risk of fire hazard.
Adequate washing facilities shall be provided near the place of work.
When the work is done near any place. where there is risk of drowning, all necessary equipments shall be provided and kept ready for use and all necessary steps taken for prompt rescue of any person in danger and adequate provisions shall be made for prompt first aid treatment of all injuries likely to be sustained during the course of work.
These safety provisions shall be brought to the notice of all concerned by displaying on a notice board at a prominent place at the work spot the persons responsible for compliance of code shall be named by the bidder.

To ensure effective enforcement of the rules & regulations relating to safety precautions, the arrangement made by the bidder shall be open to inspection by the employer and BNHS.
Notwithstanding the above clauses there is nothing in those to exempt the bidder from the operations of any other Act or Rule in force in the Republic of India.
All storage, handling & use of flammable liquids shall be under the supervision of qualified persons.
First aid arrangements with the degree of hazard and with no. of workers employed shall be maintained in a readily accessible place throughout the whole of working hours.

i. Reporting of Accident:
All accidents, major or minor, must be reported immediately to BNHS and the contractor will provide first aid to the injured person immediately. The injured person shall report to the First Aid Station along with the 'Injured on work' form as per Appropriate proforma, duly filled in quintuplicate and submit to the Medical Officer of the First Aid Station.

ii. Serious Injuries:
In case of serious injuries, the following procedure shall be adopted by the contractor.
To provide first aid at his own First Aid Station.
To take the injured person to the hospital along with the 'Injured on work' form duly filled in.
To report the accident to BNHS.
Fatal Accident-Fatal accidents must be reported immediately to BNHS as well as to the Police.

iii. Penalty:
Failure to observe the Safety Rules will make the contractor liable to penalty by way of suspension of work and termination of contract adequate arrangement for proper lighting & guarding shall be made at the work site.

39. EQUIPMENT & MACHINERIES:
For timely completion of the work the contractor must have to deploy all necessary equipment, tools & tackles and machineries adequate shuttering to execute the work at a time to perform all works simultaneously as per requirement of BNHS.

42. **Additional Conditions of Contract**

1. The work shall be inspected time to time by BNHS representatives. The contractor shall provide all facilities for such inspection free of cost. Notwithstanding any inspection of the site, BNHS shall have the right to reject any work not conforming to the specification without being liable for any explanation or compensation. The authorized representative of BNHS shall have the free access to the work site, contractor site office and store.
2. During the execution of work, if any, problem arises which is not covered by the specification, the 'Contractor shall seek necessary clarification and instruction from BNHS such Instruction shall be binding on the contractor and shall be observed in full.
3. The contractor shall make his own arrangement for all labour, construction equipment, tools and tackles and construction materials, construction water, office/ labour accommodation, water supply, sanitation etc.
4. Electricity for construction purpose, if supplied by BNHS, the charge shall be borne by the contractor at the rate specified by the BNHS. The contractor cannot claim any compensation for any failure in such supply caused due to any reason whatsoever in case of non-availability of electricity for construction purpose from BNHS. The contractor will have to arrange the same at his own cost.
5. The contractor shall strictly follow the construction safety rules, regulations and instructions issued from time to time. In absence of any particular reference the contractor shall refer to relevant Indian Standard and also the State Government rules and regulations.
6. The contractor shall take all precautions during execution, especially while excavating underground works, such as cable, pipe lines, drains etc. and provide all possible protection to these works and in case any materials got damaged, rebuilt / divert them at his own cost.
7. All guarantees and test certificates obtained by the contractor during the execution of work shall be transferred to the BNHS before issue of final payment.
8. The contractor shall provide all necessary storage at the site in specified areas for all materials such as timber, cement, lime and such other materials which are likely to deteriorate by the action of sun, winds, rain or other natural cause due to exposure in the open in such manner that all such materials shall be duly protected from damage by weather or any other cause. All such stores shall be cleared after completion of the work and the entire site shall be clean and free from debris. All materials shall be stacked in such a manner as to facilitate rapid and easy checking of such materials.
9. The cost of testing of concrete and any other material shall be borne by the contractor.
10. All works are to be carried out with due regard to the convenience of the occupants of the premises or road users and with close co-ordination with other contractors who may be working in the area. All arrangements/ programs of work must be adjusted accordingly. All precautions must be taken to guard against chances of injury or accident to the occupants, users & workers. The contractor must see that all damages to any property, which in the opinion of the Controlling Officer are due to the work of the contractor, are promptly rectified as per his direction and to his satisfaction. The construction of work must be done in such a way as not to dislocate or disturb any sewerage system and existing other structures.
11. It must be clearly understood that BNHS is indemnified by the contractor against payment of any compensation or award on account of any accident, injuries, and damages and if any such payment has to be made by BNHS under order of appropriate authorities, the same shall be recovered from the contractor.
12. Any services if affected by the work must be restored by the contractor on emergency basis at his own cost.
13. After completion of work, the finishes shall be of high quality and of approved standard.

14. No omission or ambiguities in the drawing or in the specifications will relieve the contractor from responsibility for material or completeness of the work.
15. The contractor shall not off-load the Contract or part thereof to any subcontractor without obtaining written permission from the Controlling Officer of the work. In the event sub-letting of contract or any part thereof is permitted the fact that such permission has been accorded shall not establish any contractual relationship between the approved Sub- contractor and BNHS of any of his liabilities and obligations under the contract.
16. A complete list of execution / deviation from the tenderer's scope of work shall be clearly indicated. Similarly, if any departure, commission of substitution from stipulated specifications is made, this fact should be clearly indicated in the offer with reasons. However, BNHS shall have the absolute discretion to summarily reject such offers.
17. BNHS's representative may during the progress of work, order for re-execution of part or whole of the work executed, found not in accordance with the approved drawings/ specifications/instructions. No extra claims shall be entertained for re-execution or altering or such work.
18. The contractor shall provide sufficient strong and stable staging as to ensure safety of the labourers and structures.
19. The contractor shall dismantle and remove the staging and other temporary structures like stores, offices, labour camps etc. on completion of work/ clear and dean the site where such temporary facilities were built and restore the same to original condition.
20. Materials brought to the site shall not be removed from the site without the written consent of the BNHS. The contractor shall submit well in advance for approval of samples, specimens as the BNHS may demand from time to time. Any material brought to the site and rejected by the BNHS shall be removed by the contractor from the site of work immediately.
21. All materials including reinforcing steel, cement for concrete work, sanitary, plumbing & carpentry fittings shall be procured after approval of brand and make by BNHS.
22. All bricks have to be submerged in vats before put to use. Curing shall be done with proper care.
23. The contractor has to make arrangement for temporary cover to enable civil construction works to continue if interrupted due to rains during monsoon.
24. If necessary extra items beyond S.O.W. are executed the Unit Rate shall be as per rates of PWD, Maharashtra Schedule of Work on the date of Bid opening. Those items which are not covered under PWD rates shall be based on analysis of rate on current market rate as applicable, on mutual agreement.
25. Bar chart showing all activities needs to be submitted before commencement of work.
26. Depth of the tube well, if any, shall be complied with Public Health Engineering Directorate recommendations.
27. All drawings supplied with the bid documents are tentative / for guidance only.
28. BNHS shall not be liable under any circumstances for any accident / untoward incidents, if happened during execution of works.
29. The contractor shall submit test certificate from the appropriate authority for pot ability of drinking water indicating presence of Arsenic & other chemicals, if any.
30. If specification of any items of work is not covered in the Bid Documents the same shall be guided from PWD Schedule of Rates.
31. All dismantled departmental materials shall have to be returned to stored/ disposed and stacked in a place (within 500 m lead) provided by the Purchaser without any extra cost to BNHS.
32. Mode of measurement shall be followed as described.
33. The "**Technical Specification**" shall have to be complied with along with the PWDSOR and National Building Code as well as relevant Indian Standard Code of Practice.

SECTION – V

SPECIAL TERMS AND CONDITIONS

1. All works will have to be done according to the drawings duly approved by Engineer-in-charge before the work is taken up. Works shall have to be executed on the basis of the detailed drawings to be provided by BNHS.

2. The tenderer should clearly note that all the drawings cannot be given or handed over at a time. However, BNHS shall make every effort to provide the detailed drawing in time so that work does not suffer. Failure to provide drawing (s) in time shall not be cited as reason for delay in progress of work and no claim whatsoever, on any ground shall be entertained in this regard.

3. All works shall have to be carried out with due regard to the convenient to the surrounding establishments/occupants.

4. Damages to any property during execution have to be rectified as directed by Engineer-in-charge at the cost of the contractor and with the satisfaction of BNHS.

5. All necessary precautions to be adopted at site by the contractor to avoid injuries to any labour or any person. Necessary signage, segregation has to be organized by the contractor at his own cost. Guarding of properties as well as materials during non-working period including at night, Sundays/holidays are also to be arranged by the Contractor, over and above general guarding during normal working hours, at his risk and cost.

6. The contractor shall save, harmless and indemnify BNHS from and against any claims, demands, suits and proceedings for or on account of infringement of any patent right, design, trademark or name or other protected right like cutting of any tree, constructional plants, machine, work materials or things or process used for or in connection with the works or temporary work or any of them.

7. The contractor shall not assign or sublet or employ for any portion of the work through specialized agency/erector if intended or required without bringing it to the notice of BNHS and obtain necessary approval from the above-mentioned authority. The relevant clause (s) of the bid document shall be applicable also.

8. Contractor's establishment and stack yard:
   Due to inadequate space available within the working site, the contractor has to arrange open area next to site at his own cost for the construction of temporary structures and other works which are essential during the complete tenure of construction period: ----
   i) Contractor" site office.
   ii) Contractor's godown.
   iii) Labour camp.
   iv) Steel stack yard
   v) Stack yard for construction materials like stone chips, sand, bricks etc.
   vi) Stack yard for scaffolding and shuttering materials.

   No separate payment will be made for hiring open area in this regard. No extra cost will be paid for double storage and carriage etc. Rate quoted by the contractor deemed to have taken care of all such factors.
9. **The entire bid document including BOQ and Technical Specification should be read altogether while quoting the rate.**

10. Water proofing company has to ensure minimum 10 (ten) years warranty for the water tightness of the structure.

11. For water proofing, external finishes like structural glazing, ACP cladding, warranty for a minimum period of 10 (ten) years shall have to be given by the manufacturer for the materials along with cross warranty of the work by the contractor. In case any defect is observed during this period of warranty, the contractor shall be liable to rectify all those defects observed as intimated by BNHS at the risk and cost of the contractor. Relevant clauses of this bid document shall also be applicable. The date of warranty for the total work shall be reckoned from the date of taking over of the project by BNHS. The date of warranty for the product/material as given by the manufacturer should be as per general practice as in vogue.

12. Prior to the commencement of external finishing work including painting work, the contractor has to make "mock up" sample for approval at free of cost. Relevant clause(s) of the technical specification shall also be applicable.

13. The contractor shall obtain the clearance/approval from the Engineer-in-Charge before the commencement of any type of work.

14. During construction of the building, all necessary precautions and safety norms shall have to be strictly followed.

15. All product manuals, colour shades, descriptions, brochures, etc. for different kind of work are to be submitted with in advance (at least 15 days before) for getting approval from the Owner for actual execution. Further, supplements, requisites etc., if asked for by the Owner to arrive at a decision towards approval of a particular item/work shall have to be provided by the Contractor at his own cost and responsibility.

16. No claim shall be entertained by the Owner for sampling, testing, mock up, approval of samples, documentation, shop drawings etc.

17. BNHS shall have the right to modify/change the working drawings/ construction drawings even after issue of the same to the Contractor. No claim shall be entertained in this regard.

18. The following specifications, standards and codes are made a part of this specification. All standards, tentative specifications, codes of practice referred to herein shall be the latest editions including all applicable official amendments and revisions.

Some of the IS codes that are applicable to the work are listed below:

Sl. No.	IS Code No.	Description	Last year of publication
1.	IS : 73	Specification for paving bitumen	1992
2.	IS : 101	Methods of test for ready mixed paints & enamels	1964
3.	IS : 102	Ready mixed paint, brushing, red lead, non-settling, priming	1962 (Reaffirmed 1991)
4.	IS : 110	Ready mixed paint, brushing, grey, filler, for enamels for use over primers	
5.	IS : 204 Part – 1	Tower bolts: Part - 1 Ferrous metals	1991 (Reaffirmed 1996)
6.	IS : 204 Part – 2	Tower bolts: Part - 2 Non-ferrous metals	1992 (Reaffirmed 1996)
7.	IS : 205	Specification for non-ferrous metal butt hinges	1992 (Reaffirmed 1996)
8.	IS : 206	Tee and strap hinges	1992 (Reaffirmed 1996)
9.	IS : 207	Gate & Shutter hooks & eyes	1964 (Reaffirmed 1996)
10.	IS : 208	Specification for door handles	1996
11.	IS : 269	Specification for 33 grade ordinary Portland cement	1989 (Reaffirmed 1998)
12.	IS : 280	Mild steel wire for general engineering purposes	1978 (Reaffirmed 1997)
13.	IS : 287	Recommendation for Moisture Content for Timber used for Different purposes	1993 (Reaffirmed 1998)
14.	IS : 303	Specification for plywood for general purposes	1989 (Reaffirmed 1998)
15.	IS : 348	French polish	1968 (Reaffirmed 2001)
16.	IS : 362	Specification for parliament hinges	1991 (Reaffirmed 1996)
17.	IS : 363	Specification for hasps and staples	1993 (Reaffirmed 1999)
18	IS : 364	Specification for fanlight catch.	1993 (Reaffirmed 1999)
19.	IS : 371	Ceiling roses	
20.	IS : 383	Specification for coarse and fine aggregates from natural sources for concrete.	1999
21.	IS : 419	Putty, for use on window frames.	1967 (Reaffirmed 1998)
22.	IS : 432 Part - 1	Specification for mild steel & medium tensile steel bars & hard-drawn steel wire for concrete reinforcement: Part - 1 Mild steel & medium tensile steel bars	1982 (Reaffirmed 2000)
23.	IS : 432 Part – 2	Specification for mild steel & medium tensile steel wire for concrete reinforcement: Part - 2 Hard-drawn steel wire	1982 (Reaffirmed 2000)
24.	IS : 455	Specification for Portland slag cement	1989 (Reaffirmed 2000)
25.	IS : 456	Code of practice for plain and reinforced concrete	2000
26.	IS : 458	Specification for precast concrete pipes (with and without reinforcement)	1988
	IS : 459	Corrugated & semi-corrugated asbestos cement sheets	1992
27.	IS : 516	Method of test of strength of concrete	1959 (Reaffirmed 1999)
28.	IS : 636	Non-percolating flexible fire fighting delivery hose (3rd revision)	1988
29	IS : 651	Salt glazed stoneware pipes & fittings	1992 (Reaffirmed 1997)

Sl. No.	IS Code No.	Description	Last year of publication
30	IS : 694	PVC insulated cables for working voltages up to and including 1100V	
31	IS : 702	Specification for industrial bitumen	1988
32	IS : 712	Specification for building limes	1984 (Reaffirmed 1995)
33.	IS : 730	Specification for hook bolts for corrugated sheet roofing	
34.	IS : 732	Code of practice for electrical wiring installation	
35.	IS : 777	Specification for glazed earthenware wall tiles	1988
36.	IS : 778	Specification for copper alloy gate, globe and check valves for water works purposes	1984 (Reaffirmed 1995)
37.	IS : 779	Specification for water meters (domestic type)	1994 (Reaffirmed 1999)
38.	IS : 783	Code of practice for laying of concrete pipes	1985 (Reaffirmed 1996)
39.	IS : 800	Code of practice for general construction in steel	1991 (Reaffirmed 1998)
40.	IS : 802	Code of practice for use of structural steel in over head transmission line towers	1978 (Reaffirmed 1995)
41.	IS : 814	Covered electrodes for manual metal arc welding of carbon & carbon manganese steel	1991 (Reaffirmed 1998)
42.	IS : 816	Code of practice for use of metal arc welding for general construction in mild steel	1969 (Reaffirmed 1998)
43.	IS : 817	Code of practice for training and testing of metal arc welders	1966 (Reaffirmed 1997)
44.	IS : 875	Code of practices for design loads for building and structures	1987 (Reaffirmed 1997))
45.	IS : 884	First Aid hose reel for firefighting (1st revision)	1985
46.	IS : 908	Fire hydrant, stand hose type (2nd revision)	1975
47.	IS : 1003	Specification for timber paneled and glazed shutters	1994 (Reaffirmed 2000)
48.	IS : 1030	Carbon steel castings for general engineering purpose	1998
49.	IS : 1038	Specification for steel doors windows and ventilators	1983 (Reaffirmed 1996)
50.	IS : 1077	Common burnt clay building bricks	1992 (Reaffirmed 1997)
51.	IS : 1080	Code of Practice for design and construction of shallow foundation in soils	1985 (Reaffirmed 1997)
52.	IS : 1081	Code of Practice for fixing and glazing of metal (steel & aluminium) doors, windows and ventilators	1960
53.	IS : 1124	Method of test for determination of water absorption, apparent specific gravity and porosity of natural bldg. stones.	
54.	IS : 1130	Specification for marble (blocks, slabs & tiles)	1969 (Reaffirmed 1998)
55.	IS : 1141	Code of practice for seasoning of timber	1993 (Reaffirmed 1999)
56.	IS : 1161	Steel tubes for structural purposes	1998
57.	IS : 1172	Code of basic requirement for water supply, drainage & sanitation (4th revision)	1993 (Reaffirmed 1998)
58.	IS : 1199	Methods of sampling and analysis of concrete	1959 (Reaffirmed 1999)
59.	IS : 1200 Part 1-28	Methods of measurement of building & Civil engineering works	Latest Publication
60	IS : 1237	Specification for Cement Concrete flooring Tiles	
61	IS : 1239 Part - 1	Mild steel tubes, tubulars & other wrought steel fittings : Part – 1- Mild steel tubes	Part - 1 1990 (Reaffirmed 1995)
62.	IS : 1239 Part - 2	Mils steel tubes, tubular & other wrought steel fittings : Part - 2 – Mild steel tubular & other wrought steel pipe fittings	Part - 2 - 1992
63.	IS : 1258	Bayonet lamp holder	
64.	IS : 1293	Three pin plugs and socket outlets	
65	IS : 1322	Bitumen felt for water proofing and Damp Proofing	
66	IS : 1341	Specification for steel butt hinges	1992 (Reaffirmed 1996)
67	IS : 1344	Specification for calcined clay pozzolana	1981 (Reaffirmed 1999)
68	IS : 1346	Code of practice for water proofing of roofs with bitumen felt.	
69	IS : 1361	Specification for Steel windows for industrial Bldg.	

Sl. No.	IS Code No.	Description	Last year of publication
70.	IS : 1363 Part - 1 to 3	Hexagon head bolts, screws & nuts of product grade C.	1992 (Reaffirmed 1998)
71.	IS : 1364	Hexagonal head bolts, screws and nuts of product grades, A and B	1992 (Reaffirmed 1998)
72.	IS : 1367	Technical supply conditions for threaded steel fasteners	1980 (Reaffirmed 1996)
73.	IS : 1443	Code of practice for laying and finishing of Cement concrete flooring tiles	
74.	IS : 1489 Part - 1	Specification for Portland pozzolana cement : Part - 1 Fly ash based	1991 (Reaffirmed 2000)
75.	IS : 1489 Part - 2	Specification for Portland pozzolana cement Part-2 Calcined Clay based.	
76.	IS : 1538	Specification for cast iron fittings for pressure pipes for water, gas & sewage	1993 (Reaffirmed 1999)
77.	IS : 1542	Sand for plaster	1992 (Reaffirmed 1999)
78.	IS : 1566	Specification for hard-drawn steel wire fabric for concrete reinforcement	1982 (Reaffirmed 2000)
79.	IS : 1608	Method for tensile testing of steel products	1995
80.	IS : 1641	Code of practice for fire safety of buildings (General): General principles & fire grading and classifications (1st revision)	1988
81.	IS : 1646	Code of practice for fire safety of buildings (General) : Electrical installations	
82.	IS : 1726	Specification for cast iron manhole covers and frames	1991
83	IS : 1729	Sand cast iron spigot and socket soil waste & ventilating pipes, fittings and accessories	1979 (Reaffirmed 1996)
84	IS : 1742	Code of practice for building drainage	1983 (Reaffirmed 1996)
85	IS : 1786 (1139 Superseded)	Specification for high strength deformed steel bars and wires for concrete reinforcement	1985 (Reaffirmed 2000)
86	IS : 1834	Specification for hot applied scaling compound for joint in concrete.	
87	IS : 1837	Specification for fanlight pivots	1966 (Reaffirmed 1996)
88	IS : 1838	Specification for preformed fillers for expansion joint in concrete pavements and structures: Part–I: Bitumen impregnated fibre.	
89	IS : 1868	Anodic coatings on aluminium and its alloys	1996
90	IS : 1904	Code of practice for design and construction of foundation in soils : general requirements	1986 (Reaffirmed 1995)
91	IS : 1905	Code of practice for Structural use of un-reinforced masonry	1987 (Reaffirmed 1998)
92	IS : 1948	Specification for aluminium doors, windows and ventilators	
93	IS : 1949	Specification for aluminium windows for Industrial buildings.	
94	IS : 2016	Plain washers	1967 (Reaffirmed 1996)
95	IS : 2062 (226 Superseded)	Steel for structural purpose	1999
96	IS : 2065	Code of practice for water supply in buildings	1983 (Reaffirmed 1990)
97	IS : 2074	Ready mixed paint, air drying, red oxide - zinc chrome, priming specification	1992 (Reaffirmed 1998)
98.	IS : 2096	Asbestos cement flat sheets	1992
99	IS : 2098	Specification for asbestos cement building boards	1997
100	IS : 2114	Code of practice for laying in-situ terrazzo floor finish	1984 (Reaffirmed 1996)
101	IS : 2116	Specification for sand for masonry mortars	1980 (Reaffirmed 1998)
102	IS : 2147	Degree of protection provided by enclosure for low voltage switchgear and control gears	
103	IS :2171	Portable chemical fire extinguishers, dry powder (cartridge type)	

Sl. No.	IS Code No.	Description	Last year of publication
104	IS :2175	Heat detectors	1988
105	IS : 2185 (P-1)	Specification for concrete masonry units – P-1 Hollow & Solid Concrete Blocks	1979 (Reaffirmed 1998)
106	IS : 2189	Code of practice for selection, installation, maintenance of automatic fire detection & alarm (2nd revision)	1988
107	IS : 2190	Selection, installation, maintenance of first aid fire extinguisher (Code of practice)	
108	IS : 2191 Part - 1	Specification for wooden flush door shutters (cellular and hollow core type) : Part - 1 Plywood face panels	1983 (Reaffirmed 1996)
109	IS : 2191 Part - 2	Specification for wooden flush door shutters (cellular and hollow core type) : Part - 2 Particle board and hardboard face panels	1983 (Reaffirmed 1996)
110	IS : 2202	Specification for wooden flush door shutters (solid core type)	1999
111	IS : 2209	Specification for mortice locks (Vertical type)	1976 (Reaffirmed 1996)
112	IS : 2212	Code of practice for brickwork	1991 (Reaffirmed 2000)
113	IS : 2215	Starters for fluorescent lamps	
114	IS : 2250	Code of practice for preparation and use of masonry mortars	1981 (Reaffirmed 1995)
115	IS : 2268	Electric call bells and buzzers	
116	IS : 2309	Code of practice for protection of building and allied structures against lightning	
117	IS : 2339	Aluminium paint for General Purposes	
118	IS : 2386 Part - 1	Methods of test for aggregates for concrete : Part - 1 - Particle size and shape	1963 (Reaffirmed 1997)
119	IS : 2386 Part - 3	Methods of test for aggregates for concrete : Part - 3 - Specific gravity, density, voids, absorption and bulking	1963 (Reaffirmed 1997)
120	IS : 2386 Part - 4	Methods of test for aggregates for concrete : Part - 4 Mechanical properties	1963 (Reaffirmed 1997)
121	IS : 2395	Code of Practice for painting concrete, masonry and plaster surfaces (Part 1 & 2)	
122	IS : 2418	Tubular fluorescent lamps for general lighting service	
123	IS : 2502	Code of practice for bending & fixing of bars for concrete reinforcement	1963 (Reaffirmed 1999)
124	IS : 2551	Danger notice board	
125	IS : 2645	Specification for integral cement waterproofing compounds	1975 (Reaffirmed 1999)
126	IS : 2667	Fittings rigid steel conduits for electrical wiring	
127	IS : 2681	Specification for non-ferrous metal sliding door bolts for use with padlocks	1993 (Reaffirmed 1999)
128	IS : 2690	Specification for burnt clay flat terracing tiles: Part 1 – Machine made.	
129	IS : 2750	Specification for Steel Scaffoldings.	
130	IS : 2751	Recommended practice for welding of mild steel plain and deformed bars for reinforced construction	1979 (Reaffirmed 1998)
131	IS : 2835 (1761 Superseded)	Flat transparent sheet glass	1987
132	IS : 2878	Specification for fire extinguishers, CO2 type, portable trolley mount	2004
133	IS : 2911 (Part-I/Sec.2)	Code of practice for design and construction of pile foundations	1979
134	IS : 2911 (Part IV)	Code of practice for design and construction of pile foundations Part IV – Load test on piles	1979
135	IS : 2932	Specification for enamel, synthetic, exterior type (a) undercoating (b) finishing	

Sl. No.	IS Code No.	Description	Last year of publication
136	IS : 3007	Code of practice for laying of asbestos cement sheets - corrugated and semi-corrugated sheets (Part – 1 & 2)	
137	IS : 3036	Code of Practice for Laying Lime Concrete for a Water – Proofed roof finish.	1992
138	IS : 3043	Code of practice for earthing	
139	IS : 3063	Fasteners – single coil rectangular section spring lock washers – specification.	1994 (Reaffirmed 1999)
140	IS : 3067	Code of Practice of General design details and preparatory work for dump proofing and water – proofing of Building	1988
141	IS : 3068	Specification for broken Brick (burnt clay coarse aggregates for use in lime concrete)	1986
142	IS : 3087	Specification for wood particle boards (medium density) for general purposes	1985 (Reaffirmed 1996)
143	IS : 3097	Specification for veneered particle boards	1980 (Reaffirmed 1996)
144	IS : 3114	Code of practice for laying of cast iron pipes	1994 (Reaffirmed 2000)
145	IS : 3370 (Part 1 & 2)	Code of practice for concrete structures for the storage of liquids : requirements Part - 1 - General requirements Part - 2 - Reinforced concrete structures	1965 (Reaffirmed 1999)
146	IS : 3384	Specification for bitumen primer for use in waterproofing and damp-proofing	1986 (Reaffirmed 1996)
147	IS : 3419	Fittings for rigid non-metallic conduits	1989 (Reaffirmed 2001)
148	IS : 3478	Specification for high density wood particle boards	1966 (Reaffirmed 1998)
149	IS : 3480	Flexible steel conduits for electrical wiring	
150	IS : 3495 (P 1, 2 & 3)	Method of test for burnt clay building bricks	1992 (Reaffirmed 1997)
151	IS : 3536	Specification for ready mixed paint, brushing, wood primer etc.	1999
152	IS : 3564	Specification for door closers	1996
153	IS : 3646	Code of practice for interior illumination	
154	IS : 3696 Part - 1 Part - 2	Safety code of scaffolds and ladders : Scaffolds Ladders	 1987 (Reaffirmed 1996) 1991 (Reaffirmed 1996)
155	IS : 3764	Excavation work - Code of safety	1992 (Reaffirmed 1996)
156	IS : 3837	Accessories for rigid steel conduits for electrical wiring	
157	IS : 3844	Code of practice for installation of internal fire hydrants in multistoried buildings	1989 (Reaffirmed 2010)
158	IS : 3854	Switches for domestic and similar purposes	
159	IS : 4014 Part - 2	Code of practice for steel tabular scaffolding : Part - 2 Safety regulations for scaffolding	1967 (Reaffirmed 1995)
160	IS : 4130	Demolition of buildings - code of safety	1991 (Reaffirmed 1996)
161	IS : 4160	Interlocking switch socket outlets	
162	IS : 4308	Dry powder fire fighting (1st revision)	1982
163	IS : 4351	Specification for Steel door Frames	1976
164	IS : 4457	Specification for ceramic unglazed Vitreous acid resisting files	1982
165	IS : 4615	Switch socket outlets (non-interlocking type)	
166	IS : 4648	Guide for electrical layout in residential buildings	
167	IS : 4948	Specification for welded steel wire fabric for general use	1974
168	IS : 4984	Specification for high density polyethylene pipes for potable water supplies : sewage and industrial effluents	1995
169	IS : 4985	Specification for unplasticised PVC pipes for potable water supplies	2000

Sl. No.	IS Code No.	Description	Last year of publication
170	IS : 5039	Specification for distribution box for voltages not exceeding 1000V	
171	IS : 5133	Boxes for enclosure of electrical accessories Part-1 : Steel & cast iron boxes	
172	IS : 5216	Recommendation safety procedures and practices in electrical works	
173	IS : 5372	Taper washers for channels (ISMC)	1975 (Reaffirmed 1996)
174	IS : 5374	Taper washers for I – Beams (ISMB)	1975 (Reaffirmed 1996)
175	IS : 5410	Cement Paint, Colour as required	1992
176	IS : 5411 Part - 1	Plastic emulsion paint for interior use.	1974 (Reaffirmed 1993)
177	IS : 5491	Code of practice for laying of in-situ granolithic concrete flooring topping	1969 (Reaffirmed 1996)
178	IS : 5523	Method of testing anodic coating on aluminium & its alloys	1983 (Reaffirmed 1999)
179	IS : 5624	Foundation Bolts	1993
180	IS : 5913	Methods of test for asbestos cement products	1989 (Reaffirmed 1998)
181	IS : 6234	Specification for portable fire extinguishers, water type	1986
182	IS : 6248	Specification for metal rolling shutters & rolling grills	1979 (Reaffirmed 1996)
183	IS : 6313 Part - 1	Code of practice for anti-termite measures in buildings Constructional measures	1981 (Reaffirmed 1995)
184	IS : 6313 Part - 2	Code of practice for anti-termite measures in buildings Pre-constructional chemical treatment measures	1981 (Reaffirmed 1998)
185	IS : 6313 Part - 3	Code of practice for anti-termite measures in buildings Treatment for existing buildings	1981 (Reaffirmed 1998)
186	IS : 6403	Code of practice for determination of bearing capacity shallow foundations.	1981 (Reaffirmed 1997)
187	IS : 6639	Specification for Hexagonal Bolts for Steel Structures	1972 (Reaffirmed 1995)
188	IS : 6946	Flexible (pliable) non-metallic conduits for electrical installations	1973 (Reaffirmed 1990)
189	IS : 7215	Tolerances for fabrication of steel structures	1974 (Reaffirmed 1995)
190	IS : 7452	Specification for hot rolled steel sections for doors, windows and ventilators	1990
191	IS : 7676	Glossary of terms for firefighting equipments	1985
192	IS : 8041	Specification for rapid hardening Portland cement	1990 (Reaffirmed 2000)
193	IS : 8042	White Portland Cement	1989
194	IS : 8112	Specification for 43 grade ordinary Portland cement	1989 (Reaffirmed 2000)
195	IS : 8442	Functional requirements for stand part type water for firefighting	1972
196	IS : 8828	Electrical accessories – circuit breakers for house hold and similar application (MCB)	
197	IS : 8869	Specification for washers for corrugated sheet roofing	1978
198	IS : 8963	Chloropyrifos, technical	1978 (Reaffirmed 2001)
199	IS : 9537 (P3) (2509 Superseded)	Conduits for electrical installations : Part - 3 Rigid plain conduits of insulating materials	1983 (Reaffirmed 2001)
200	IS : 9595 (Superseding IS:6227)	Metal arc welding of carbon and carbon manganese steel - recommendation	1996
201	IS : 9862	Ready mixed paint, brushing, bituminous, black, lead-free, acid, alkali, water and chlorine resisting	1981 (Reaffirmed 1999)
202	IS : 9972	Automatic sprinkler hoses	1981
203	IS : 10118	Code of practice for selection, installation and maintenance of switchgear and control gears	
204	IS : 11353	Guide for uniform system of marking and identification of conductors and apparatus	

Sl. No.	IS Code No.	Description	Last year of publication
205	IS : 11360	Specification for portable fire extinguishers, water type	1986
206	IS : 12456	Fire protection of electronic data processing installations	
207	IS : 12866	Specification for plastic transparent made from thermosetting polyester resin	1989
208	IS : 13947	Specification for low voltage switchgear and control gears	
209	IS : 14609	Specification for dry powder for firefighting – Class ABC fires	2001
210	IS : 15301	Installation & maintenance of fire fighting pumps – Code of practice	2003

In addition to the above IS codes, all other IS codes that are applicable to the work should also be followed and provided to BNHS, if asked for, at the risk and cost of the Contractor. Moreover, the relevant schedule of specifications (of PWD) with names of codes and detail specifications shall also be applicable. In case of any dispute, ambiguity etc. the decision of BNHS shall be final and binding to the Contractor.

SECTION VI

GENERAL INSTRUCTIONS

1. All relevant IS Codes or specifications along with PWD specifications shall be applicable in general.

2. In all possible cases sample approval from BNHS is necessary prior to bulk procurement by the Contractor.

3. All approved samples shall be kept at site at the risk and cost of the Contractor for the entire period of Contract.

4. In case of mismatch/difference between approved sample and bulk procured item, the Contractor shall remove the materials within 24 hours of bringing in the materials at site at his risk and cost.

5. Test certificates for materials brought and used at site shall have to be submitted to BNHS, in all possible cases including steel and cement.

6. Over and above, BNHS may instruct the Contractor for further testing of materials at the risk and cost of the Contractor from Government Test Houses/ Laboratories.

7. The "Warranty"/"Guarantee" from the manufacturer shall have to be submitted by the Contractor in the name of BNHS, in all possible cases with cross warranty of installation and/or workmanship by the Contractor. The Decision of BNHS shall be final and binding on the Contractor.

8. Specialized work shall have to be carried out with specialized persons/agency/ authorised applicator etc., as the case may be.

9. No work shall be carried out without the knowledge/prior intimation/approval/ checking etc. by BNHS. If such a case arises, BNHS L may not accept the work and BNHS shall have the right to accept such work/part of work with no admissibility of payment. Recurrence of such incident may attract penal measures on the Contractor as may be decided by BNHS.

10. Work beyond normal working hours and on Sundays/Holidays shall be executed with prior intimation and permission thereof by the Controlling Officer/Engineer-In-Charge.

11. Unless otherwise specified elsewhere in this Contract, all work under this Contract shall be carried out in accordance with the technical specification and the latest issue of the Indian Standard Specification applicable to the particular class of work. If Indian Standards are not formulated for any particular material of work, the relevant British Standard Specification shall apply.

12. Relevant issues of I.S. Specifications, applicable to the particular work have been described along with the Specification for respective works as far as possible. In case of any confusion/ambiguity/dispute etc. regarding the meaning and interpretation of any Specification for the respective works, the decision of BNHS shall be final and binding on the Contractor.

13. All in-situ tests shall have to be carried out in presence of the authorised representative(s) of BNHS at site with prior intimation (at least 72 hours before) to the satisfaction and acceptance of the Owner with attaining the applicability/functionality of the works/materials/equipments etc., as the case may be.

14. All test reports, in-situ as well as tests at site and/or laboratory tests shall form the part of the Contract for acceptance of the work in part and/or whole and the Contractor shall submit the reports/results duly authenticated by him and/or BNHS's representative at site present during the test/authorised signatory of the testing house/ laboratory (for testing at Govt. Test Houses/laboratory) within 15 (Fifteen) days from the actual date of testing or as directed by BNHS specifically.

15. The relevant clauses of G.C.C. and S.C.C. shall also be applicable and should be read in conjunction with this "Technical Specification". In case of any anomaly/dispute, decision of BNHS shall be final and binding on the Contractor.

16. No extra claim for any test, re-test including the tests for pre-commissioning as well as commissioning whatsoever, shall be entertained by BNHS.

17. All the relevant I.S Codes, specifications etc. shall be made available to BNHS by the Contractor against the work during the entire period of Contract.

18. All manuals, brochures etc. shall be handed over to BNHS immediately after execution and testing of each part of the relevant work.

19. The list of approved materials mentioned in the B.O.Q. and/or Technical specification is a guideline to the Contractor only. BNHS reserves the right to instruct the Contractor to procure materials, equipments etc. beyond the list of approved materials mentioned in the B.O.Q. as well as in Technical specifications of equivalent quality.

20. All registers, reports, drawings, diagrams, warranties etc. shall be property of BNHS and the Contractor shall have to submit to BNHS as per terms of the Contract.

21. Any revision of work, drawings etc. shall have to be accepted by the Contractor during execution of the work within the purview of the Contract, as a whole.

22. The following "Order of Preference" shall prevail in case of any ambiguity between specifications, drawings and Bill of Quantities (BOQ).

    i) The Bill of Quantities (BOQ)
    ii) Technical Specification as well as Special Conditions of Contract.
    iii) Execution drawings.

    If no solution can be made by the above "Order of Preference", then the decision of BNHS shall be final and binding.

23. Notwithstanding above or any of the clauses contained in the bid document, decision of BNHS on any clause or for any case shall be final and binding on the Contractor.

24. Whatsoever the case may be, compliance of all the clauses for execution of the entire contract, it shall not relieve the Contractor from any of his obligations under the contract and the Contractor shall remain fully responsible for completeness, accuracy & correctness of all the documents & drawings & works till completion of the contract with the Contractor.

SECTION VII

TECHNICAL SPECIFICATION

TECHNICAL SPECIFICATION FOR GENERAL CIVIL WORK

1 GENERAL

1.1. Scope of work

This technical specification is general in nature & description. The relevant description of a particular item shall be guided by the item description in the Schedule of Rates of this Bid Document. THE PWDSOR along with relevant IS Specifications and the National Building Code shall have to be followed as a general guideline. In case of any dispute/discrepancy, the decision of the Engineer-In-Charge and/or Technical Controlling Officer shall be final & binding on the bidder.

The work contemplated under this contract includes General Construction for the aforesaid project, all as detailed in the Bill of Quantities, Specifications and Drawings. Such other works which are not included in the aforesaid Bill of Quantities are generally intended to be executed through a separate agency. Notwithstanding the above, the BNHS (Bombay Natura History Society) reserve the right to order additional works under the same Contract. The BNHS also reserve the right to omit any item of work included in the aforesaid Bill of Quantities and award the same to any other Contractor or not perform it at all at their discretion and the Contractor shall not have any claim because of the same.
The Contractor for this work shall be required to work in co-operation and co-ordination with other agencies on site and give them all reasonable assistance and help for the execution of the work in an efficient manner all as directed. The words "approved" or "as directed" shall be deemed to convey approval or the discretions of BNHS.

1.2 Indian Standard Specifications

The particular Specifications for the work is as detailed hereinafter. These specifications shall be read in conjunction with the relevant Indian Standard Specifications and the obtainable local practice as detailed in various regional handbooks of practice and the work shall be executed accordingly. Where the specifications in any of the standards are at variance with the specifications detailed herein, the specifications herein shall govern. In case of any ambiguity/contradiction among different specification, the decision of BNHS shall be final and binding on the Contractor.

1.3 Quality of materials & General Standards of work

The Contractor under this contract commits himself to use first class materials and assumes full responsibility for the quality of all material incorporated or brought for incorporation in the work. The work shall be executed in accordance with best engineering practice and as per direction of BNHS. In all possible cases, sample approved shall be done by the Contractor from BNHS before bringing in the materials in bulk at site and the approved sample shall be well preserved at site at the risk and cost of the Contractor as a ready reference. Over and above, the submission of test certificate by the manufacturer, BNHS may instruct further sample testing from Govt. Laboratories/ testing houses at the risk and cost of the Contractor for submission of test reports to become eligible for payment for those particular items used at work. In all possible cases, where the warranty of manufacturers are sought for by BNHS, the Contractor shall submit the cross warranty in the form and manner as directed by BNHS including workmanship etc. along with the manufacturer's warranty certificate.

The relevant IS and PWD specification shall have to be complied with for all possible cases. The relevant clauses of GCC shall also be applicable and should be read in conjunction with technical specification of this contract

1. In case of any anomaly / contradiction, decision of BNHS shall be final and binding on Contractor.
2. No extra claim shall be admissible for sample testing, sample approval, testing of sample at site etc to the Contractor and shall be considered as deemed to have been included in the rates quoted by the Contractor.

1.4 Power for construction

Construction power may be provided by BNHS, if applied for by the Contractor as per prevailing rules and regulations of BNHS. However, all charges for the construction power shall have to be borne by the Contractor. The relevant clause may also be referred to GCC in this regard. Alternatively, the Contractor shall have to arrange required capacity D.G. set at his own cost, risk and responsibility to work. Necessary permission to operate DG set to be obtained from the concerned authority by the Contractor. Arrangement of DG may also be kept for exigencies or power failure.

1.5 Scaffolding

All scaffolding and ladders required for the proper execution of the work shall be provided by the Contractor. The scaffolding should be stout and strong to prevent any collapse or displacement. Proper measure for safety of workmen working on scaffolding should be taken by the Contractor.

1.6. Measurements

The mode of measurements, wherever possible is specifically mentioned in these documents, where it has not been mentioned, it shall be as per provision of the PWDSOR and relevant Indian Standards IS 1200. All the measuring equipments, labour, manpower and other accessories necessary, shall be provided by the Contractor at his own risk and cost

1.7 Tools and plant

The bidder along with his bid furnish a list of tools, plant and machinery which he intends to use for the works (as per proforma, if enclosed with the bid document). The list should indicate the exact type of machine, its capacity, and year of manufacture, kind and capacity of propelling force, spare parts readily available and all other pertinent informations. The Contractor is obliged to use all the machinery mentioned in his list mentioned or others as required and instructed if BNHS considers it necessary.

1.8 Setting out

The Contractor shall set out the building or other involved works after clearing the site and get the same approved by the owner. 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 owner. The Contractor shall assume the full responsibility for proper setting out, alignment, elevation and dimension of each and all parts of the work.

1.9 Surveying and Staking

It is the express responsibility of the Contractor to bring to site all surveying instruments necessary for the marking out, fixation of levels, etc. and conduct these survey operations himself with utmost accuracy. The Contractor shall put-up stable bench marks etc. as necessary for the work. Representative (s) of BNHS may become present when this work is being carried out and will inspect all these operations with the Contractor's assistance. The Contractor shall be entirely responsible for accurate setting out of the work and he shall at his own expense make good any defects arising from errors in line and levels.
Before commencement of excavation, spot levels on an approved grid covering the entire plot shall be taken by the Contractor in consultation with the owner and a proper record of these levels shall be kept jointly signed by the Contractor and the owner.

1.10 Dewatering

Dewatering of accumulated water in all locations on jobsite from whatever source or cause until the virtual completion of the entire work shall be done by the Contractor at his own expense and shall not be separately paid for. The rate quoted by the Contractor shall be deemed to be inclusive of this.

1.1.11. Access to site, approach roads and roads within the premises

The Contractor shall at his own cost provide all approach roads required for the purpose of carrying out the work in the most expeditious and efficient manner and shall remove the temporary roads on completion. He shall acquaint himself thoroughly regarding condition and suitability of public roads leading upto the limits of the premises and will provide vehicles for transportation of materials which meet the requirements of these road conditions. It shall also be responsibility of the Contractor to maintain at his own cost these roads till the construction is completed. The tenderer shall also acquaint himself with local laws and By laws and complying with all police and traffic requirements.

2. EARTH WORK

2.1 Excavation

Excavation for trenches over areas and for pits, etc. shall be done to widths, lines and levels as shown in drawings or to such lesser or greater widths lines and levels as directed. The bottom and side of excavation shall be trimmed to required levels, profile, etc. watered and thoroughly rammed. Where the Contractor excavated below required level in good ground inadvertently or carelessly, they shall make up the void in concrete (1:5:10) at his own expense. In general, during excavation the Contractor shall take necessary precaution to retain earth (viz sal ballah piling, shoring etc.) so that the earth will not slide or fall down to avoid any accident and hamper the progress of work at his own risk & responsibilities. They will take necessary step to prevent the damage the adjacent structure or existing services. They shall repair and make good any such damage at their own expense to the satisfaction of the owner. A suitable path for men and materials around the excavated pit should be maintained throughout the work.

2.2 Shoring

The sides of excavation should be timbered and supported in such a way as is necessary to secure these 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 be approved by the owner to hold the sides of the excavation in position and ensure safety of persons and properties. The shoring shall be removed as directed after the items for which it is required are completed. Unless & otherwise mentioned in the schedule of quantities, no extra payment will be made for shoring, unless & otherwise specifically instructed in writing by BNHS over and above the general requirement as mentioned in clause no. 1.2.1 under the heading "Excavation" in this tender document.

2.3 Dewatering

All water which may get accumulated in excavations during the progress of work from whatever cause or source, shall be bailed or pumped out as necessary. The rate for excavation shall be deemed to include for the same.

2.4 Silver sand filling

Filling sand may be silver sand having silt content less than 5% by weight and 300mm compacted thick layers will be spread, wetted & saturated to achieve the compaction. However, for any special case, BNHS may instruct filling by sand other than silver sand which the Contractor shall comply. The specification etc shall be guided by relevant IS code.

2.5 Filling

Filling under floors or other places indicated shall be done by fine sand or silver sand brought from outside by the Contractor. The material should generally be good quality. Filling shall be done in layers not exceeding 15 cms. thick and each layer shall be fully inundated and consolidated properly by 8 to 10 tones power rollers in the case of where floor is coming or pneumatic rammers wherever conditions permit. If it is not possible, the consolidation shall be done by hand rollers and pneumatic/plate vibrator followed by hand rammer. The surface of the filling shall be finished true to lines and levels as required. The filling shall be compacted in such a manner as to guarantee full stability. The compaction shall be such that minimum relative density obtained on testing is 90%.In general, test shall be performed for every 1000 M2 of compacted area. The filling final level after compaction then cutting and ready to take up soling work under the floor item, shall be checked by BNHS.

2.6 Disposal of excavated materials

All materials unearthed shall be removed from the site of excavation and disposed off during excavation with prior written permission of BNHS from the site in an approved manner with the approval of local authority. The disposal of the materials can be in any of the following ways as directed by BNHS:

1. Removal of surplus material outside the plot for disposal.
2. Removal of surplus materials to a particular place / dumping ground as directed by the owner. No extra claim on any account will be entertained. The Contractor must also secure the approval of the owner regarding the quantity of surplus materials to be removed prior to commencement of this item of work.

2.7 Back 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 sides of excavation shall be refilled to the original surface with approved excavated materials in layers 15 cm in thickness watered and rammed. 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 is to be used for refilling, it shall be brought from the place where it is temporarily stacked and used in refilling. No excavation of foundation shall be filled in or covered up until all measurements of excavation, masonry, concrete and other works below ground level are jointly recorded. Black cotton soil shall not be used for back filling or in plinth filling.

2.8 Measurements

Measurements for all excavation, filling, carting away and earthwork shall be in solid measure. The rates quoted by the tenderers are thus for solid measure units. The following factors shall be applied to obtain quantities of solid measure.

- Excavation : No reduction in volume (as per drawing area).
- Filling : Volume shall be determined and consolidated by levels taken before and in layers after compacted filling and by measuring the length and breadth as required.

The mode of measurement for various types of excavations shall be as under: -

a) In case of trenches, pits and areas, measurements shall be on the basis of size of foundation & the depth of bottom of foundation (bottom of bed concrete if provided) formation. Surface dressing shall be measured in plan projection only.

b) In case of pipe trenches and drains, measurement of width of trench shall be diameter of the pipe plus an allowance of 50 cms. to allow for collars, flanges etc.

c) The relevant clauses of IS Code and/or PWDSOR shall be applicable.

2.9 Sub-grade conditions

Sub soil investigation report will be provided by BNHS, if sought for by the Contractor in writing.

2.10 Brick Soling

Where brick soling is required to be provided, it shall conform to the following specifications: -

It shall be flat of the bricks touching each other as per item. Soling shall be closely packed leaving no interstices or gaps. The interstices to be filled with fine sand and shall be sprayed with water. If crevices appeared between two bricks after spraying with water it shall be mended again by spreading fine sand.

3. CONTROLLED CONCRETE, PLAIN & REINFORCED CONCRETE

3.1 General

Concrete and reinforced concrete work shall be carried out generally in conformity with the latest Indian Standards IS : 456 except for provisions indicated herein below. All work is to be carried out with utmost precision and upto date scientific know-how and the Contractor shall employ thoroughly competent staff to achieve the highest standards.

3.2 Cement

- Cement for the work shall be either of ordinary Portland Cement conforming to the latest Indian Standards IS:8112 – 1989 for 43 grade and IS 12269 -- 1987 for 53 grade or Portland Pozzolana Cement conforming to IS 1489 (Part 1) 1991- specification (fly ash based), IS 1489 (Part 2) 1991 - specification (Calcined clay based) or Portland Slag Cement as per IS:455 (with latest revision), as instructed & approved by the E-I_C and/or Technical Controlling Officer for the work and of the best normal setting quality unless a quick setting quality is expressly instructed in the specifications or otherwise during the course of the work by BNHS. If directed the Contractor shall purchase Portland cement as fresh as possible after manufacture and where there is reason to believe the cement has been

long stored, BNHS may demand a Laboratory Test Certificate regarding the character of cement and the Contractor shall furnish the same at no extra cost. BNHS shall reject any cement which in its opinion does not meet the required standards.

- The list of manufactures for cement shall be as per the list provided in the bid document and/or PWDSOR and/or as instructed in writing by BNHS.

Any field or laboratory test for cement, if asked for by BNHS shall be carried out at the risk and cost of the Contractor as per provision of relevant IS codes. All bags and containers in which cement is packed shall be stored in a dry, weather-tight, properly ventilated structure with adequate provision against absorption of moisture. The Contractor shall at all times maintain for the inspection of BNHS, a log book indicating the receipt of cement, brand and agent from whom obtained and the age of cement. Cement which has caked or perished by being wet or otherwise shall on no account be used on the work. Cement shall be consumed on the works in the same sequence as that of their receipt at site. Cement reclaimed from cleaning of bags or from spillage from containers or otherwise shall on no account be used. The cement is to be stacked in an orderly and accessible way to permit BNHS physical verification of existing stock at all points of time. The Contractor has to ensure furnishing a copy of manufacturer batch test certificate along with every lot of supply.

If so felt, BNHS may instruct the Contractor for further testing of cement in Govt. laboratories/testing houses as has been detailed in the relevant clause of GCC, over and above the submission of test certificates at the risk and cost of the Contractor.

3.3 Sand

Sand: fine aggregate shall generally conform to latest Indian Standards (IS:383). Sand shall be natural sand, crushed gravel sand or crushed stone sand at the discretion of BNHS. Use of sea sand is prohibited. It shall be composed of hard siliceous material and shall be clean and of sharp angular grit type. Sand shall be properly graded minimizing all voids. Its grading shall fall within the limit of grading zone I , II for non-plastering work and Zone III for plastering work, of Table 1 (Ref clause no 3.1.4.3 of CPWD specifications 1996 , revised to 2000 vide page no 33 .). Allowance for bulking of sand shall be made. Silt content on sand should not be more than 5%. Laboratory equipment such as measuring jars etc. are to be kept at site for time to time checking of bulkage and silt content. For sand testing periodicity may be given at the rate of every 150 cum of concrete work of all kinds (apart from RMC) and part thereof. For plastering work however, a separate periodicity of testing in term of every 500 SQM of plastering of any thickness irrespective of number of coats and part thereof is to be adopted. For brick masonry one test for 100 cum or part thereof for masonry may be adopted. The tests so mentioned shall have to be carried out through reputed Central/State Government registered testing house/ laboratory and not from site testing facilities.

All tests, to carry out field as well as laboratory tests shall be borne by the Contractor.

3.4 Coarse Aggregate

Coarse aggregate shall be approved hard aggregate generally conforming to latest Indian Standards: IS - 383. The following tests should be carried out for every new lot of supply:---

- Crushing value
- Impact value
- Sieve analysis
- Deleterious material
- Flakiness index

For every 150 CUM of concrete work of all kinds (apart from RMC) and part thereof one test shall be carried out.
All costs to carry out field as well as laboratory tests shall be borne by the Contractor.

3.5 Types of concrete, strengths etc.

The Bill of Quantities specifies M20 grade of reinforced cement concrete. The strength corresponding to this grade is given as under:-

TYPE OF CONCRETE

Sl. No.	Type of concrete	Characterize design strength N/mm2	Target design strength N/mm2
1.	M - 20	20	≥27

Even though the Bill of Quantities specified various types of concrete, it is possible that the type may be altered to suit the site conditions. The compressive strength indicated above pertains to pressure test on works test cubes 15 x 15 x 15 cm. after normal curing for 28 days. The strength of preliminary test cubes shall be as per IS :456 (latest revision)
Sufficient number of cube mould should be kept ready at site. Relevant IS code of Specification and PWDSOR shall have to be followed. The type of concrete for any particular situation or work shall be as per instructions given to the Contractor by BNHS notwithstanding anything contained in the foregoing clauses.

3.6 Water

Water conforming to IS 456 - 2000 for all concrete work shall be clean, free from deleterious matter such as oils, acids, alkalis, sugar and vegetable matter. Every attempt shall be made to use potable water. Water storages facilities provided by the Contractor shall be maintained properly to preclude contamination of water by any of the harmful substances. BNHS may instruct the Contractor to carry out test of water sample as per provision of relevant IS code, in Govt. laboratories and the Contractor shall comply the same at his risk and cost. The quantity of water to be added to concrete for mixing shall be such as to afford workability consistent with strength. Water/cement ratio shall be recorded in every batch of concrete. Arrangement for slump cone test shall be kept at site to arrive workability whenever BNHS wants to check at site. The periodicity of testing may be conducted as once in six weeks and part thereof or as specifically instructed by the Owner.

3.7 Tests for determination of strength of Reinforced concrete

As will be apparent from the Bill of Quantities, the strength of concrete specified is the criterion and the Contractor shall make every effort to obtain the specified strengths by good quality control. In case of concrete which does not obtain the specified strength at 28 days, such work shall be demolished and reconstructed to obtain the requisite strengths all as directed by BNHS. To determine whether concrete in any particular part of the work is of the requisite strength or not, test cubes (works test cubes) shall be made from samples collected from the concrete being poured for the particular part and determined as per acceptance criteria detailed hereinafter. The salient features for the collection of samples is as indicated below :

3.8 Testing of Concrete Cubes for determining Compression Strength for Reinforced Concrete Work at own cost

3.8.1. Quality as specified.
3.8.2. Compression Strength shall be as specified for the particular type of concrete.
3.8.3. Criteria for acceptance of work

The test and acceptance criteria shall comply to relevant IS codes including IS :456 Part or element of concrete work shall be deemed to be acceptable, provided the three cubes tested for 28 days strength conform to the following:
3.8.3.1 Average of the three cubes strengths shall not be less than the specified strength.
3.8.3.2 No individual cube strength shall be less than 90% of the specified strength.
3.8.3.3 If any individual cube strength exhibits more than 133% of the specified strength, such cube shall be classified as freak and criteria in 1.3.9.3.1 and 1.3.9.3.2 above, shall be applied for the remaining two cubes only and the acceptability determined.

3.8.4 Quantum of cubes and testing

The decision of BNHS in this regard shall be final and binding. Cube testing shall be done at site regularly and at least 20% of this testing shall be carried out in the reputed laboratory (as approved by the Owner) as defined in the relevant clause of GCC.
Testing machine with valid calibration certificate to be kept at site for crushing of cubes. The testing shall be duly witnessed and approved by BNHS.
All costs to carry out tests at field as well laboratory shall be borne by the Contractor.

3.9 Making of non-RMC concrete

All mixing of aggregates, cement and plasticizer shall be done by volume which is equivalent to design mix. All the necessary equipment such as measuring boxes, devices for determination of moisture and bulk in sand, slump cone etc. shall be provided by the Contractor. Concrete shall be machine mixed until there is a uniform distribution of materials and uniform colour and consistency is achieved and under no circumstances for less than two minutes.

A wooden board approximately 30 cms. x 40 cms. shall be put up at the concrete mixer on which shall have been legibly written in English and the local language, the quality of concrete that is being mixed, the proportions and other relevant data.

3.9.1 Cubes

The size of cubes to be prepared and tested shall be 15 x 15 x 15 cm.(6" x 6" x 6").
The minimum number of cubes to be collected from each samples as detailed below shall be six. Three cubes each are intended for testing at 7 and 28 days respectively and determining the strength. Cubes tested at 7 days should give a strength of not less than 70% of the corresponding strength at 28 days. It shall however be expressly understood that the test results at 28 days only shall govern and the 7 days tests are intended to obtain a fair idea only. Relevant IS codes including IS : 456 (latest revision) shall be followed by the Contractor . All costs for sampling and field as well as laboratory testing shall be borne by the Contractor.

3.9.2 Number of tests

The number of cube tests in a work shall be entirely guided by the relevant IS Codes and/or at the discretion and as directed by the Controlling Officer of the work. Cubes shall generally be collected for various structural members and also for works at various levels. It shall also be collected whenever the usual quality for a particular strength is in suspect. The number of cubes may at most be twelve or even more as instructed by BNHS and as per provisions of relevant IS code on any given day in a particular work. However, in case other important casting works are running in parallel with a major concreting work, additional cubes in the range of six or twelve shall be taken for each of them as well.

3.9.3 Preparation and Testing of Cubes

Casting of cubes, preparation of moulds for the same, processing and curing the cubes and pressure testing the same shall be as per detailed instructions which will be issued to the Contractor from BNHS from time to time or as per relevant Indian Standard as amended upto date as directed. All costs including construction of vat for curing of cubes at site shall have to be borne by the Contractor.

3.9.4 Equipment modules, testing etc.

It is the entire responsibility of the Contractor to prepare and get the cubes tested and provide for all material, labour, modules, equipment, facility and charges for sampling, testing, curing etc. The Contractor's quoted rate work shall be deemed to include for these and no extra payment whatsoever is admissible on this account.

3.9.5 Slump

If in the opinion of BNHS, slump cone tests are required to be performed to establish workability the same shall be carried out at free of cost. Slump tests are however, to serve as guide only.

3.10 Transporting and pouring of concrete

No mixing of concrete shall be started unless the situation where they are to be poured are prepared and kept ready. Concrete shall be poured immediately on preparation. Transporting of concrete shall be done as speedily as possible and also in a manner to prevent segregation of aggregates. No re-tempered concrete shall be allowed to be used on the works. No concrete shall be allowed fall through a height more than 1.20 M. where the concrete to be placed from more height it should be done through chute as per relevant IS specification and as directed by BNHS.

Before fresh concrete is placed against an already cast and hardened section, such surfaces shall be roughened, swept clean, moistened with water and treated with cement slurry. Fresh concrete shall then be poured as required. Under no circumstances, concrete mixed more than stipulated initial setting time as per IS code shall be used. Dewatering of excavations for concreting where necessary shall be carried out by the Contractor as directed and the rates quoted by the Contractor are deemed to be inclusive of such dewatering. No concreting shall be done in adverse weather condition, except exigencies with proper precautions or prior approval from BNHS.

3.11 Ready Mixed Concrete

If allowed and approved by BNHS, the Contractor shall buy the RMC from a manufacturer approved by the Owner. The Contractor in association with the manufacturer will make a suggested trial mix with correct water cement ratio, slump and workability. To verify this, the test cubes from the concrete used should be made and tested. The tests results will determine the cement content and water cement ratio that produces the required strength. If the test result satisfies the BNHS this mix design shall be followed throughout the work for RMC work, until and unless there is variation in shape and size of course aggregate, fineness of fine aggregate, cleanliness moisture content etc. The design mix as per stipulated strength of concrete mentioned in this technical specification shall be approved by the Consultant or any other designated authority as directed by BNHS.

RMC will be supplied by manufacturer at site from a mixing area by transit mix trucks. The Contractor will get a assurance from manufacturer that initial setting will not start during the distance to be travelled from batching plant to job site. Again the Contractor will take a written statement from the manufacturer that within which time concrete should be delivered and discharged from transit truck mixer after the introduction of water to cement and aggregate and when the initial setting will start.

The manufacturer will also ensure that transit mix truck will discharge concrete with slump designated for the job. The time period between the discharge and placement in position should also be worked out and got approved.

The Contractor should arrange a material hoist to carry the wheelbarrow to the floors under construction for transferring of concrete and a smooth runway is to be provided for their travel to avoid any segregation or concrete mix may be carried by head load for placing of concrete as directed by BNHS from the point of transfer of concrete at upper floors. During transferring of concrete to walls or deep beams baffle board, downspout or chute to be used for prevention of segregation. It is essential to closely supervise the discharging of concrete to prevent segregation at all points. The alternative approach can be to pump out the ready mixed concrete to the location. The method of pumping/placing, the W/C ratio and the plasticizer used need to be approved before commencing the operation as defined herein above in this clause.

Regular mandatory tests on the consistency and workability of the concrete after transferring from transit mix trucks at job site shall be done to achieve the specified compressive strength of concrete. The frequency of testing and the acceptability criteria will be according to I.S : 456 and I.S:516. A register of work test of concrete shall be maintained at site by the Contractor. Cube testing register in standard CTE format is to be kept at site. BNHS shall decide whether a particular set of cubes would be tested at site or at a reputed central/state government registered testing house/laboratory. In any case, at least 20% of the testing would be carried out at such laboratories. The Contractor shall undertake the entire cost of transporting of cubes to such testing facilities outside the site and testing charge therein.

In general, payment for RMC shall be made on the basis of actual measurement or as per drawing whichever is less, of different reinforced concrete elements at site. If any deviation from the original drawing is required as per decision of the Controlling Officer, the Contractor shall comply to the same during execution. In such case, the payment will be made based on the actual measurement of different reinforced concrete elements or as per revised drawing issued subsequently whichever is less

. No extra payment will be made for wastage during transfer of RMC at site or extra concreting done by the Contractor at his own

. The rate includes the cost of materials and labour for carrying of RMC to upper floors, placing, consolidating, finishing, curing & testing etc.

The Contractor shall submit the design mix report and its further corroboration through trial cube tests (both 7 days and 28 days) from a reputed institute for approval by BNHS and adoption at site. All related cost would be borne by the Contractor.

No RCC work shall be taken up till such time final test report of trial design mix is not available with BNHS.
In case any admixture is used in RMC it shall conform to IS : 9103 latest edition and after obtaining necessary approval from BNHS.
For RMC concreting, regular cube tests in the multiple of six (three for 7 days and three for 28 days respectively) are to be carried out as per IS :456 (latest revision) and the works to be carried out as per stipulations laid down in IS codes and clearance by BNHS. The decision of BNHS shall be deemed as final in this regard.

3.12 Formwork

3.12.1 Materials and Design

a) The method and design of form work to be adopted by the Contractors is to be produced for approval of the same by the BNHS before any form work is taken up. The form work shall be of approved 12 mm. thick water proof ply surface to be in contact with concrete, to be planed smooth. In every case joints of the shuttering are to be such as to prevent the loss of liquid / water from concrete. In ply shuttering the joints shall be perfectly close and lined. Steel shuttering using hydraulic jacks shall preferably be used in all possible cases and as directed by BNHS. If any particular materials or materials be specified in the schedule of quantities for form work such particularly specified material or materials shall be used in work. The form work shall be so constructed as to remain sufficiently rigid during placing of the concrete. All shuttering and forming must be adequately stayed and braced to the satisfaction of BNHS for properly supporting the concrete during the period of hardening. The forms shall have sufficient strength and rigidity to hold concrete and withstand the pressure of remaining and vibration without excessive deflection from the prescribed lines and more so when the concrete is vibrated. The surface of all forms in contact with concrete shall be clean, rigid, watertight and smooth. Suitable devices shall be used to hold corners, adjacent ends and edges of panels of other forms together in accurate alignment.

b) The form work shall conform to the shape, lines and dimensions to suit the R.C.C. members as shown on drawings and be so constructed. Form work shall be adequately designed to support the full weight of workers, fresh placed concrete without yielding settlement or deflection, and to ensure good and truly aligned concrete finished in accordance with the construction drawings. A camber in all directions of 6mm for every 5 M span in all slab and beam centering shall be given to allow for unavoidable sagging due to compression or other causes, unless otherwise specifically instructed in writing by BNHS.

c) The form work shall be as designed that the sides of the beams retain its position and does not get bulged these however should be so designed that the sides of the beams can be first struck leaving the soffit of beams and the supporting props in position. Props shall be designed to allow accurate adjustment and to permit of their being struck without jarring the concrete. No bamboo propping shall be used. Bulged section shall not be accepted and need to be rectified or rebuilt as per instruction of BNHS. No extra claim, in any case shall be entertained by BNHS.

d) Temporary openings shall be provided at the base of columns forms and at other points where necessary to facilitate cleaning and observation immediately before concrete in deposited.

e) Unused and new waterproof ply of 12 mm thickness is to be sited only and it shall be good enough to withstand a maximum of 5 (five) repetitions. In case in the opinion of BNHS the formwork is seen to be no longer in order even before undergoing the maximum permissible 5 (five) repetitions, the same would be rejected and forthwith removed from site.

f) Vertical Shuttering

The vertical shuttering shall be carried down to such solid surface and is sufficiently strong to afford adequate support and shall remain in position until the newly constructed work is able to support itself. Props shall be securely braced against lateral deflection. Where timber props are used like bullies, they shall be a minimum diameter of 10cm. and shall be straight and adequately strong. The spacing of such struts shall be designed to carry to carry loads imposed on it without undue deflection of the members supported by the props. The spacing of props shall be approved by the BNHS and any alterations suggested by him shall be carried out at Contractor's expense. Bracing shall be provided as directed without extra cost. Contractor shall allow in his rates for providing props and struts for any height shown in the working drawings issued to Contractor from time to time.

g) Curve & Circular shuttering

Unused and new waterproof ply of 6 mm thick supported by good quality wooden batten shall be used. Repetition of the material will be same as stated above for the other shuttering.

3.12.2 Water Tightness

It is the Contractor's responsibility to ensure that the forms are checked for water tightness just before concreting operation starts and to make good any deficiencies.

3.12.3 Cleaning and Treatment of Forms

All rubbish, particularly chippings, shavings and saw dust, shall be removed from the interior of the forms before the concrete is placed and the form work in contact with the concrete shall be cleaned and thoroughly wetted or treated with an approved composition. Care shall be taken that such approval composition is kept out of contact with the reinforcements. Interior of all moulds and boxes must be thoroughly washed out with a hose pipe or otherwise so as to be perfectly clean and free from all extraneous matter previous to the deposition of concrete.

Prior approval of the form work should be taken from the BNHS before placing reinforcements on form work. No concrete shall be commenced until the BNHS has inspected the form work and until his approval is obtained. A notice of at least 24 hours shall be given to the opinion of the BNHS any materials is not accordance with the specification or the form work, is wrongly done or otherwise defective the Contractor shall immediately remove such materials from site and replace the same and rectify any other defects in accordance with the instruction of the BNHS and to his entire satisfaction.

The lines, levels, form work, reinforcement etc shall be checked by the Contractor with subsequent approval / checking by BNHS prior to allowing of concreting, by BNHS . However, the cost, labour etc for such checking shall be borne by the Contractor and this will not relieve any of the obligations under this contract.

3.12.4 Stripping

Forms shall be left in place and removal shall be done as per norms laid down in IS codes and as instructed by the BNHS and shall then be removed with care so as to avoid injury to concrete. In no circumstances shall forms be struck until the concrete reaches a strength of at least twice the strength as to which the concrete may be subjected at the time of striking. The strength referred to shall be that of concrete using the same cement and aggregates, with the same proportions, and cured under conditions of temperature and moisture similar to these existing on the work. Where possible, the form work should be left longer as it would assist the curing. Exposed surfaces of concrete which are indicated/ required to be plastered shall be roughened with wire brushes and hacked out closely immediately after removal of formwork by free of cost.

Any honeycomb , appeared after removal of form work shall be mended as per procedures laid down in IS codes including pressure grouting required , if any, as instructed by BNHS with risk and cost of the Contractor without any further claim.

3.12.5 Stripping Time

In normal circumstances (generally where temperature are above 20°C) and where ordinary cement is used, forms shall be struck after expiry of the following periods and as per relevant IS code , CPWD manuals unless otherwise directed at site by BNHS.

3.12.6 Form Work In Lift For Continuous Surfaces

Where forms for continuous surface are placed in successive units, (as for example in columns or walls) the forms shall fit tightly over the completed surface so as to prevent leakage of slurry from the concrete and to maintain accurate alignment of the surface.

3.12.7 Procedure While Removing The Form Work

All form work shall be removed without such shock or vibration as would damage the reinforced concrete. Before the soffit and strata are removed the concrete surface shall be exposed where necessary in order to ascertain that the concrete has sufficiently hardened. Proper precautions shall be taken to allow for the decrease in the rate of hardening that occur with all cements in the cold-weather.

3.12.8 Tolerances

The following shall be the maximum permissible tolerance :-

a) On general setting out dimensions upto 4 M. in length a tolerance upto 3mm will be allowed.

b) On lengths of more than 4 M. tolerance of not more than 5mm will be allowed.

c) On the cross sectional dimensions of columns, beams, slabs, faces, chajjas, mullions, grills, fins, louvers, and such other members tolerance more than 2mm will not be allowed.

d) The top surface of concrete floor slab will be within plus/minus 3mm of the level and line shown on the drawings.

e) Columns and walls and other vertical members shall not be more than 3mm out of plumb in their storey height and not more than 6 mm out of plumb in their full height.

f) If work is not carried out within the tolerance set out above (a) to (d) the cost of all rectification measures of dismantling and reconstructing as decided by the BNHS shall be borne by the Contractor. In case of work dismantled, the same shall not be measured and no payment even for cement and reinforcement shall be allowed.

3.13 Consolidation and processing of concrete

Concrete for all works shall be compacted by means of suitable vibrating equipment. One or more spare vibrators which are in complete working condition shall always be kept ready at sites to be put into commission in case of failure of the vibrators under use. The vibrators shall be operated by skilled personnel, thoroughly instructed as regards the mode, frequency, duration etc. regarding vibration. Concrete of low volume/ quantum for a particular work may however, be permitted by BNHS at their sole discretion to be consolidated by hand only after prior permission.

3.14 Finish to concrete surfaces

Finish to concrete surfaces at various situations shall be as per directions of BNHS. Where form finish is specified, the final surface shall be smooth and even and no-undulations, ridges, spots etc. shall be permitted. They shall be laid to pattern as directed. In case surfaces intended and directed for form finish, exhibit any of the defects above mentioned, the surfaces shall be rubbed with carborundum or plastered and finished all as directed at the risk and cost of the Contractor. The decision as to the acceptability or otherwise of a surface will be notified by BNHS and the Contractor will implement the instructions accordingly.

3.15 Concrete cover for reinforcement

Where not specifically indicated in the drawings, concrete cover for reinforcement shall be as per the latest Indian Standards IS 456 - 2000 and as per directions at site from time to time. Proper concrete cover blocks adequately cured to suit various covers as required shall be provided in adequate numbers sufficiently ahead of the work.

3.16 Construction joints

Construction joints in concrete work shall be provided as far as possible only at predetermined places as per direction and in consultation with BNHS. Joints shall be provided as specified in latest Indian Standards or as directed by BNHS.

3.17 Curing

It is very important that all cement concrete work shall be cured properly. All concrete work shall be kept continuously in a damp or wet condition by pouring or by covering with a layer of moist sack, canvas, hessian or similar material for a period as stipulated in the relevant IS codes and specifications from the date of concreting. Water used for curing shall also be free from any deleterious substances and shall generally be fit for drinking. The work shall be adequately protected from drying, winds and direct sun rays. The Contractor should arrange at his own cost a temporary water supply line with provision of centrifugal pump, valves etc. for curing and constructional purpose at higher level. A sample sketch is enclosed for the reference purpose.

3.18 Openings and inserts

All openings and inserts which are designated in due time or as required for services, will be exactly provided by the Contractor. The Contractor should also fix the anchors or such items which may be supplied by the Proprietor in exact position and in perfect lines and levels. Inserts apply to such items as timber, dowels, bolts, loop, brackets, suspension irons, hooks, screws, plates, pipe of various types and diameter etc. etc. Openings in concrete or masonry must be provided in exact location to correct shape, size and depth or slightly bigger, if directed so, as shown in drawings or as instructed. It must be clearly understood that the provisions of inserts and openings as contemplated in this contract are to be carried out with "utmost precision" and any deviation of the same from that as shown in drawing or instructed, have to be rectified by the Contractor at his own cost and responsibility. The Contractor should make provision of openings to deep beams and their members at bottom or at lower level as necessary for cleaning purpose prior to concreting.

3.19 Tor Steel Reinforcement

TMT bar for reinforcement shall be of tested quality and shall conform to the relevant Indian Standards (IS:1786). Reinforcement shall be fabricated to shapes and dimensions shown on the drawing and shall be placed where indicated on the drawings or required to carry out the intent of drawing and specifications or as directed by BNHS. Before placing, reinforcement shall be thoroughly cleaned of loose rust, coating etc. which would result in reducing or destroying the bend. Oiling the bars to clean them is strictly prohibited. Bending, straightening, cutting etc. operations shall be carried out in a manner not injurious to the material. List of manufacturers for reinforcement shall be as per BOQ and/or as per PWDSOR (Latest amendment) and/or list given in the technical specification of the "Bid Document" and finally, as instructed in writing by BNHS.

All reinforcement shall be bent cold. Unless otherwise directed, reinforcement shall not be spliced at points of maximum stresses. BNHS shall be informed well in advance before such splicing is taken up . Laps and splicing shall conform to the latest Indian Standards.

Reinforcement shall be accurately tied at all intersections and laps with 16 SWG soft drawn binding wire, such that the reinforcement will give a rigid structure. Binding wire will not be measured or accounted for separately. The Contractor's rate for reinforcement will be measured and paid for according to bending lists without allowances for cutting, wastages, binding wire etc. Authorised laps, hooks, chairs, spacers etc. shall, however be accounted for. In case, the Contractor or BNHS desires to resort to welding, there shall however be made as if the laps have been provided and no extra claim whatsoever shall be admissible on this account. The relevant IS code and schedule of specification shall be followed and applicable for the case also.

Reinforcement shall be assembled in place with proper concrete cover blocks to suit various covers as required.

The Contractor has to ensure furnishing of manufacturer certificate with every lot of supply.

If felt necessary, BNHS may ask for testing of reinforcement sample, over and above, submission of manufacturer's certificate, in Govt. laboratories/ testing houses as detailed in the relevant clause of GCC , at the risk and cost of the Contractor .

4. MASONRY AND PLASTERING

4.1 Materials

4.1.1 Bricks

All bricks shall be table moulded, burnt bricks of crushing strength not less than 75 kg/Sq cm. They shall be hard sound and well burnt with sharp edges and of uniform sizes and shapes. Bricks shall be neither under-burnt nor over-burnt and shall be free from cracks, stone floats, or other such defects as defined in relevant IS code and relevant schedule of specification.

When immersed in water for 24 hours, bricks shall not be absorb more water than 20% of its dry weight. All bricks shall be identical/equal to samples submitted and approved by BNHS before the commencement of the work. Metallic sound of brick is also a criteria.

4.1.2 Cement and Sand

Cement and sand used for masonry and under the heading plastering work shall conform to the specifications laid down under the heading "Plain and Reinforced Concrete" as per clause of 1.3 above and relevant IS code, PWDSOR and schedule of specifications.

4.1.3 Additives

Additives, like integral waterproofing compounds, shall be of the approved type from reputed manufacturers and as per instruction in writing by BNHS. These shall be used strictly in accordance with the manufacturer's instructions/specification. The additives shall conform to IS : 9103.

4.2 Samples

When demanded by BNHS, the Contractor shall produce samples of materials or carry out samples of work for BNHS approval. All materials used as also works carried out shall conform to the quality of approved samples. Production of these samples shall be at Contractor's cost. However, approval of samples by BNHS shall not relieve the Contractor's obligation of the Contract during entire period of Contract.

Testing of bricks shall be carried out in respect of dimension, crushing strength, water absorption and efflorescence in a standard sample size of six bricks. The periodicity of testing may be taken as once for every 50 CUM of brick masonry of nominal thickness not less than 250 mm and part thereof. Similarly for half brick masonry once for every 500 sqm and part thereof. These tests shall be guided as per relevant IS code and CPWD specifications at the risk and cost of the Contractor.

4.3 Brick masonry

Brick shall be soaked in clear water for at least six hours in a vat before use. Bricks shall be laid in English bond unless specified otherwise. No half or quarter brick shall be used except as closers. Brick shall be accurately raised to plumb.

Brick work shall be raised uniformly all round and no part shall be raised more than 1 metre above another at any time, and the work shall be properly toothed and racked back .In case of 125 mm. thick brick walls, wire mesh shall be provided in every third course as per relevant specification and as instructed by BNHS. The wire mesh shall be properly bedded in mortar , as directed.

Joints in brick work shall not be more than 10 mm. thick. Brick work shall not be raised more than 10 courses a day. The work shall be kept watered thrice a day for 10 days and afterwards twice a day for 3 weeks. All joints shall be thoroughly flushed with mortar at every course. Care shall be taken to see that bricks are properly bedded and all vertical joints completely filled to the full depth. The jointed of brick work shall be raised out to a depth not less than 10mm. as the work proceeds. The surface of brick work shall be cleaned down and watered properly before the mortar sets.

4.4 Plastering

Plastering work in general shall proceed from top to bottom. An entire unobstructed area shall be plastered in one operation. The surface to be plastered shall be thoroughly cleaned, watered and roughened to provide key. Joints in brick work shall be raked out and cleaned. The surface shall be watered and well wetted for at least 24 hours before the commencement of work.

The entire plastered work shall be truly vertical and to proper lines and levels. All exposed angles shall be carefully flushed to provide neat and even surface. Any work that does not conform to approved samples or is not to the satisfaction of BNHS shall be rejected and the Contractor shall be liable to redo the work at his own cost.

Cement sand plaster will be used. Sand will be coarse or fine (Zone-III) .

Where waterproofing compound is specified to be provided in mortar for plaster, approved integral waterproofing compounds shall be used. These shall be used and plastering work shall be carried out strictly as per manufacturer's recommendations.

4.5 Measurements

4.5.1 General

All the rates quoted by the Contractor shall be for a fully finished item of work and shall include for all material, labour, miscellaneous works like storage, loading/unloading, scaffolding, hoisting gear etc. as also all taxes, duties, overheads, profits, etc. complete. The measurement of all items shall be guided by relevant provisions of the GCC and specification, in general .

4.5.2 Masonry

Accounts on masonry shall be settled on the basis of cubic metres or square metres as indicated in the Bill of Quantities. Quantities will be decided on the basis of pertinent plans. Openings and recesses which exceed 0.10 sqm. will be deducted from quantities. Openings left initially on specific instructions or as required shall be closed at a later date, if so instructed by BNHS, at no extra cost. Similarly, all openings, recesses, grooves etc. shall be provided at no extra cost.

4.5.3 Plastering

Accounts on plastering shall be settled on the basis of square metre, as arrived at from pertinent plans and for a particular type of plaster. Accounts shall be settled on the basis of dimensions of raw structure.

Grooves, notches, drip notches etc. shall be provided in plaster free of cost, wherever indicated by BNHS or shown in drawings. Similarly, no special compensation shall be paid for plastering in recesses, grooves, etc. shall be accounted for under relevant item of work. However, providing cleavage or similar miscellaneous works shall be deemed to have been include in the rates quoted by the Contractor and shall not be separately paid for.

5. DOORS

5.1 Wood Work

The work consists of supply of m a t e r i a l s , fabrication, joinery, carpentry, delivery and erection at site on wooden door and window, flush doors as specified in Bill of Quantities. The measurements, materials etc shall be guided by relevant IS code and relevant specification .

5.1.1 Materials

Timber shall be best quality teak locally available or well- seasoned Sal wood (as per BOQ)uniform in texture, free from large, loose dead or cluster knots, waves injurious open shakes, discoloration, soft or spongy spots. It shall have uniform colour, reasonably straight grains and shall be free from all defects.

All samples of wood work shall be got approved by BNHS before bringing in bulk quantity at site and the samples shall be kept at site for future reference. Samples of wood may be sent for testing in Govt. laboratories / testing houses, if instructed by BNHS at the risk and cost of the Contractor. The tests shall be governed by relevant IS codes and relevant specifications. Necessary test certificates shall have to be submitted, if asked for by BNHS irrespective of further testing of samples as detailed above.

Wood work abutting against or embedded in masonry or concrete shall be painted with a coat of solignum paint before being placed in position. No wood work shall be painted prior to checking and subsequent approval by BNHS.

5.1.2 Fixing/erection in position of door frames

Before the frames are fixed in position, these shall be inspected and passed by BNHS. The frames shall be placed in proper position and fixed to the walls with suitable holdfasts/clamps as per IS Code and relevant specification as shown in drawing.

In case the door frames without sills the vertical members shall be buried in floor 50 mm. deep at least. Sills shall be provided where so directed. The door frames without sills while being placed in position shall be provided with temporary wooden bracings well wedged between the styles at the sill level. The sills shall be retained to keep the frames from warping during construction. These frames shall also be protected from damages during construction.

5.1.3 Shutters (Block Board)

Flush doors shall be solid core type with commercial or decorative faces. All flush door shall be obtained from approved manufacturer. This should be solid core with 1 mm thk. decorative laminates on both sides of approved shade & quality as desired by BNHS and as mentioned in the approved list of materials with teak wood lipping all around and bonded with phenol formaldehyde synthetic resin as per IS specification. The specification generally should conform to I.S.2202/1966. Necessary test certificates shall have to be submitted by the Contractor, if asked for by BNHS. Samples shall be approved well in advance prior to bringing in bulk quantities at site. Rejected materials shall be removed from site within 48 hours.

5.1.4 Tolerance

Tolerance on width and height shall be + 2mm and on thickness it will be + 1.2mm. The thickness of shutter shall be uniform throughout with a variation not exceeding 0.8 mm. when measured at any two points.

5.1.5 Adhesives

Only synthetic resin adhesives conforming to IS No.IS-851/1964 or latest amendment shall be used for bonding core members to one another including core frame and other exposed parts. The adhesive used for bounding cross band to core and face veneers to cross band shall conform to IS:848/1957 (Phenolic and Aminoplastic), or equivalent IS standards with latest amendment.

5.1.6 Fittings

Fitting shall be of Stainless Steel made of approved manufacturer.

The sample of fittings to be actually provided in a particular work shall however be approved by BNHS prior to bringing in bulk quantities at site. Approved samples shall be kept at site for any reference.

Screws used for fittings shall be of the same metal.

The rate quoted for doors shall include all necessary hardware and screws as generally required to complete the job, as specified in the relevant items of BOQ and as per IS Code and relevant specifications.

5.2 Measurement

The rate quoted by the Contractor under for the entire work is applicable for a complete finished item and no claims by the Contractor in this regard shall be admissible. Supplying and fixing of all the fittings and iron mongery shall be deemed to have been covered by the relevant item of the S.O.W./B.O.Q and consequently, shall not be paid for separately.

6. FLOORING

6.1 Kota Stone Flooring, Dado & Skirting

Kota Stone shall be of selected quality, hard, sound, dense and homogenous in texture free from cracks, decay, weathering and flaws. They shall be hand or machine cut and shall be of approved colour of even shade as far as permissible. The stones having yellowish strips, dent, black patch and broken edges shall not be used. The slabs shall conform to the sizes of 600 mm. x 600 mm. or as required and shall be laid to pattern as directed. The edges will be perfect vertical and in right angled to each other. Minimum thickness of slabs shall be 20 mm. and the minimum thickness of floor finish including bedding mortar shall be 40 mm or as specified in the relevant items of BOQ and IS specification. The floor surface to be tiled shall be closely picked or hacked and thoroughly watered and cleaned. Mortar for bedding shall be 1 part of cement, 4 parts of sand with a layer of neat cement slurry. The stone slabs shall be laid on this bedding immediately and as each stone is laid it shall be taped with a wooden mallet and set. Flush joints shall not exceed 1 mm thick and shall be as per pattern indicated by BNHS. The joint shall be set close with white cement, stone dust, adhesive and admixture of pigment matching the shade of kota stone. After the work has set, the surface shall be machine polished to the satisfaction of BNHS. The final polished surface shall then be washed of all dirt, mortar, etc. by using Oxalic Acid and handed over in a neat condition. Measurement will be taken on finished dimensions. Before the start of kota laying work, approval should be taken from BNHS on the sample work and the approved sample(s) shall be kept at site for ready reference. For dado, 1200mm high,

300mm wide and 20mm thick Kota shall be fixed in wall, raised from the plastered surface matched with floor joints or as directed by BNHS.

a) Rate quoted by the Contractor shall be deemed to include all labour, materials and equipments, cleaning the sub-base laying mortar bed and cement grout and fixing marble slabs and making the joints and polishing and shall also include:
b) Any cutting and waste if required.
c) Curing
d) Cleaning the floor and wall from all stains etc complete.

6.2 Ceramic Tile Flooring and Dado/Skirting:

6.2.1 General

This item relates to the furnishing of materials and installations of ceramic tiles in flooring, dado, etc. Tiles shall conform to IS: 15622 and workmanship shall be per IS: 1443.

6.2.2 Materials:

The ceramic tiles shall be of high quality of approved manufacturers as specified by BNHS. The size of tiles shall be as specified or as directed in the drawing and shall be of appropriate minimum thickness as mentioned in the item of ceramic tile flooring & dado in BOQ. No chipped, cracked, crazed or warped tiles shall be used. Glazed rounded corners and cups (convex or concave) shall be provided at corner of walls, edge, junctions of floor and dado etc., if so specified. The mortar shall be in the proportion 1:4. (Cement: Sand)

6.2.3 Laying:

The fixing shall generally conform to IS: 1443.

6.2.4 Workmanship:

The surface to be covered shall be plastered rough to a thickness of 12 mm. Fix 12 mm size stone chips (5 nos. one in each corner and one in the middle of each tile with Adhesive viz., Araldite of equivalent for keying action) or with approved chemical of reputed brand and the tiles shall be soaked in water for at least 2 (two) hours prior to fixing at site. A thin layer of cement paste shall be buttered on the back of the tile and on the side after which the tile shall be pressed and tapped home taking care that the corner tiles are perfectly matching. After the backing coat has set the tile joints shall be grouted with neat, white cement slurry with necessary pigment. All surplus slurry that remains on the surface shall be carefully wiped off before it sets. Care shall be taken to ensure that the finished surface is absolutely plumb and to proper levels without any profusions, waviness or zigzag. Joints between tiles shall be uniform in straight level lines. After completion of the entire work or part of it , the surface shall be cleared of all stains, cement etc., by washing with oxalic acid (1:10) or any other approved compound.

6.2.5 Fixing tiles for Dado and Skirting / Facia: -

The dado work, shall be done only after fixing the tiles / slabs on the floor. The approved glazed tiles before laying shall be soaked in water for at least 2 hours. Tiles shall be fixed when the cushioning mortar is still plastic and before it gets very stiff. The back of the tile shall be covered with this layer of cement mortar 1:3 using fine sand (table III, zone IV, IS383-1963), and the edge of the tile smeared with neat white cement slurry. The tile shall then be pressed in the mortar and gently tapped against the wall with a wooden mallet. The fixing shall be done from bottom of wall upwards without any hollows in the bed of joints. Each tile shall be as close as possible to one adjoining. The tiles shall be jointed with white cement slurry. Any thickness difference in the thickness of the tiles shall be arranged out in cushioning mortar so that all tiles faces are in one vertical plane. The joints between the tiles shall not exceed 1.00 mm in width and they shall be uniform. While fixing tiles in dado work, care shall be taken to break the joints vertically. The top of the dado shall be touched up neatly with the rest of the plaster above. After fixing the dado / skirting etc. they shall be kept continuously wet for 7 days. If doors, windows or other openings are located within the dado area, the corners, sills, jambs etc. shall be provided with true right angles without any specials. The Contractor will not be entitled to any extra claims on this account for cutting of tiles if required.

6.2.6 Cleaning

After the tiles have been laid in a room or the day fixing work is completed, the surplus cement grout that may have come out of the joints shall be cleaned off before it sets. After the complete curing, the dado or skirting over shall be washed thoroughly clean. In the case of flooring, once the floor has set, the floor shall be carefully washed clean and dried. When dry, the floor shall be covered with oil free dry sawdust. It shall be removed only after completion of the construction work and just before the floor is used.

6.2.7 Pointing and Finishing

The joints shall be cleaned off with wire brush to a depth of 3 mm and all dust and loose mortar removed. Joints shall then be flush pointed with white cement and floor kept wet for 7 days and then cleaned. Finished floor shall not sound hollow when tapped with a wooden mallet.

6.2.8 Testing of the tiles

The tiles used for dado including border tiles are to be tested as per IS 13630 from Part I to Part 13 whichever is applicable In the periodicity of the testing shall be one set of tiles for every 300 Sqm of dado area and part thereof. The tiles used for the flooring are to be tested as per IS 13630 from Part I to Part 13 whichever is applicable and in case of its periodicity of testing may be done as one set of tiles for every 100 sqm and part thereof. The Contractor shall submit the test certificates of the manufacturer (s). Over and above, sample testing may have to be done, if so directed by BNHS, at the risk and cost of the Contractor from Govt. laboratories / testing houses.

6.3 Ceramic Mosaic Tiles

Ceramic mosaic tiles of size 25 mm x 25 mm unglazed of reputed manufacturer as approved by BNHS. Manufacturing Trust available in sheets of 300 mm x300 mm shall be used for external building cladding. At first, apply a coat of cement sand plaster on the external surface of 6 mm thick in a proportion of 1:3 (1 cement: 3 coarse sand) with proper leveling and alignment and check it to plumb. Then apply a coating of 4 mm thick pure cement slurry over the wet plastered surface and let the coating dry for 15-30 minutes and then use a wire brush to scratch the surface in zigzag pattern. On the un appeared side of shon mosaic tile sheet apply a thin layer of white cement in paste form and fix the sheet on the plastered wall in such a way that the papered side of the mosaic sheet faces the applicator. Let the tile fix for about 1 to $11/_2$ hours. Then wet the paper with water with a soft painting brush and peel off the paper starting from the top corner and moving down words. Clean the tile surface and apply cement paste putties with colour pigment, as required, to fill the cavities, if any and then wash the shon surface with dilute hydrochloric acid and water combined solution.

6.3.1 Testing of the tiles

The Contractor shall have to submit test certificates from the manufacturer (s). Over and above, the tiles used for wall including border tiles are to be tested as per IS 13630 In the periodicity of the testing shall be one set of tiles for every 400 Sqm of wall area and part thereof or as directed by BNHS and as per specification.

6.4 Granite Cladding

6.4.1 Sampling

6.4.1.1 Granite need for cladding work shall be sampled and criteria for selection shall conform to IS 3376-1974 and IS 14223 (Part-I):1995 and as per CPWD specification.

6.4.1.2 Variation efface dimensions on any granite shall not exceed 1 mm in 900 mm

6.4.1.3 Total variation of thickness on any granite shall not exceed ±3 mm

6.4.1.4 Any bow or twist on finished faces of any stone shall not vary from the plane by a dimension exceeding 1 mm in 1200 mm.

6.4.1.5 All granite, unless otherwise designed, shall stand up square at all face corners so that any deviation in length or heights dimensions is reasonably uniform.

6.4.1.6 Water absorption shall be maximum 0.5 with a dry density of 2.60 to 2.68, as laid down in relevant IS Code and specification.

6.4.2 Cutting, Drilling and Fitting

6.4.2.1 Provide holes required for anchors, cramps, dowels and other devices requires to support stone and to accommodate other items that connect to or penetrate the stone.

6.4.2.2 Include all cutting, drilling and fitting of stonework required to accommodate the work of other trades. In cutting and fitting, carefully cut and grind edges to a neat tight fit. Execute cutting in such a manner so as not to impair strength or appearance of stone. Use physical templates from the proper trade for all cutting and drilling of work.

6.4.3 Treatment of Granite

6.4.3.1 Mortar mixes, setting beds, leveling screed and joint sealant shall be as specified and to approval.

6.4.3.2 Where required granite joints shall be sealed with joint sealant.

6.4.3.3 Where required shall be grouted with Elastiment Grout.

6.4.3.4 Fabric mesh reinforcement shall be incorporated in the leveling screed exceeding 75 mm thick.

6.4.3.5 Leveling screed shall be laid to the required thickness as indicated in the Contract Drawings or as required by the Architect.

6.4.4 Setting Generally

6.4.4.1 When ready for setting, all stone units shall be clean and free from stains , dirt or dust. If necessary scrub face with mild soap and clean water applied with stiff fiber brushes. Rinse well with clean water.

6.4.4.2 Keep exposed faces of stone units free of mortar or joint sealant. And mortar or joint sealant that gets on exposed faces shall be immediately removed. To prevent marking of stone masking tape shall be applied to either side of the joint. The materials, labours etc deemed to have been included in the rate quoted by the Contractor and no claim in this regard shall be entertained by BNHS.

7. WATERPROOFING

7.1 Waterproofing of underground reservoir

The waterproofing work shall be guided by relevant IS Code and relevant specifications and PWDSOR and as per BOQ also.

Proposed system (Given as guidance only):

- SikaTop Seal 107 or equivalent of reputed manufacturer as approved by BNHS, acrylic, cementitious waterproof coating
- Intraplast EP or equivalent of reputed manufacturer as approved by BNHS, Expanding grout admixture
- A food grade epoxy coating Sikagard 67 or equivalent of reputed manufacturer as approved by BNHS, on concrete

Surface Preparation:

- Clean the PCC surface from dust, oil, grease, loosely adhering particles etc. Apply 12mm plaster (C:S::1:3) on the surface.

Application Methodology (Given as guidance):

Application methodology shall be as per manufacturer. However, as a guidance, the methodology is listed below:

- Apply two coats of acrylic cementitious waterproof coating of Sika® Top Seal 107 or equivalent of reputed manufacturer as approved by BNHS, on the prepared substrate.
- A 12mm thick plaster (C:S::1:4) should be given on the waterproof coating before fixing of the reinforcements. The plaster should be prepared by mixing an integral waterproofing compound, Plastocrete Plus or equivalent of reputed manufacturer as approved by BNHS, @ 100gms per bag of cement or as specified by the manufacturer.
- Drill hole up to half of the depth of the concrete and fix nozzles min. 15mm dia, 100mm long GI nozzle 1.5 m C/C in a grid pattern in the interior surface of retaining wall with the help of quick setting compound Sika 2 or equivalent of reputed manufacturer as approved by BNHS.
- Extra nozzle should be provided on the construction joint.
- Inject Cement slurry enriched with Intraplast EP or equivalent of reputed manufacturer as approved by BNHS - Non shrink grouting compound through the fixed nozzle in a pressure of 2.8 kg /cm^2 or as specified by the manufacturer (s) with the help of hand operated grouting pump. Injection operation should be executed after 28 days of concreting.

7.2 Retaining Wall (Given as guidance):

- After the release of shuttering, repair all bug or pin hole with polymer modified mortar on the exterior surface of underground retaining wall.
- Make a 20X20 groove along with the construction joint and seal the same with polymer modified mortar, specially the starter joint of the retaining wall.
- Prior to apply SikaTop Seal 107 or equivalent compound of reputed manufacturer as approved by BNHS, the surface should be made SSD.
- Apply first coat of SikaTop Seal 107 or equivalent compound of reputed manufacturer as approved by BNHS over prepared surface. Coating should be continued over the projected portion of the raft and also 300mm above from the G.L. Allow the coated surface air cure for 4 hrs.
- Before application of 2nd coat, surface should be wet again with the help of sprinkling water. Apply second coat of SikaTop Seal 107 or equivalent of reputed manufacturer as approved by BNHS over the executed first coat.
- The coating shall be covered with 12 mm thick plaster added with waterproofing admixture Plastocrete Plus or equivalent of reputed manufacturer as approved by BNHS 0.2% by weight of cement with a cement - sand mortar (1:4) or as specified by the manufacturer.
- Drill hole up to half of the depth of the concrete and fix nozzles min. 15mm dia, 100mm long GI nozzle 1.5 m C/C in a grid pattern in the interior surface of retaining wall with the help of quick setting compound Sika 2 or equivalent of reputed manufacturer as approved by BNHS as per manufacturer specification complying to relevant IS Code and specification.
- Extra nozzle should be provided on the construction joint.
- Injection grouting shall be executed as mentioned above complying IS Code and specifications.

After necessary surface preparation, apply two coats of water based, epoxy coating Sikagard 67 or equivalent of reputed manufacturer as approved by BNHS, on the RCC surface from inside. This is two component system, comp.A : comp.B:: 1:1 by weight and density is 1.2 kg/l or as specified by the manufacturer complying IS and CPWD specifications.

7.3 Terrace Waterproofing

7.3.1 Proposed system (Given as guidance):

- SikaTop 77 or equivalent of reputed manufacturer as approved by BNHS
- Screed with panels

Surface Preparation (Given as guidance):

- The substrate shall be rendered sound, free from contaminants such as fungus, algae, dust, etc., by removing all weak layers and cleaning with up to 5% solution of Sodium Hypochloride and using water jet.
- The drainpipe openings shall be just above the prepared substrate and if they are not, either the substrate shall be repaired or the drain pipe relocated suitably.
- Should any defect be present in the substrates, the Contractor or applicator shall carryout all the necessary rectification works and preparatory works before the installation of the specified waterproofing system at his risk and cost .
- Cracks running through the sections shall be repaired using low viscosity, solvent free epoxy injection resin system, Sikadur 53 UF or equivalent compound of reputed manufacturer as approved by BNHS.
- Any surface cracks shall be chased open into a „V" groove, and filled with Sika Latex or equivalent compound of reputed manufacturer as approved by BNHS, modified cementitious mortar. In case the cracks are " Live " , it is recommended to seal the same with a flexible single component polyurethane sealant Sikaflex or equivalent compound

of reputed manufacturer as approved by BNHS, Construction after opening up the joint in a V groove at risk and cost of the Contractor ..

- Special attention shall be given on substrate preparation on the internal surfaces of drain pipe openings to ensure it is carried out to properly.
- The detailing at the penetrations of any pipes, cables, air-con mountings, etc., shall be carefully carried out as specified in the drawing or as directed by BNHS.

Application Methodology (Given as guidance):

- The prepared substrate shall be treated with SikaTop Seal 107 or equivalent compound of reputed manufacturer as approved by BNHS, a two-component acrylic polymer modified, cementitious, ready to use waterproofing slurry in two coats at right angles to each other and taking the coatings over the vertical parapet up to at least 300mm on the exterior surface of the parapet and as per manufacturer's specification or as directed by BNHS.

- Special care shall be taken to ensure proper coating of the inner surfaces of the drain openings in the parapet wall

- When the cementitious membrane is dried, an acrylic bond coat of SikaTop 77 or equivalent of reputed manufacturer as approved by BNHS shall be applied. When the bond coat becomes tacky, the treated roof area shall be laid with avg. 75mm thick concrete screed admixed with the waterproofing admixture, Plastocrete Plus or equivalent compound of reputed manufacturer as approved by BNHS, ensuring that the screed gently slopes towards the drain pipes. The concrete screed should be cast in panels of 2mx2m maintaining 10mmx10mm groove using solvent free polyurethane pavement sealant, or as directed by BNHS.

- All corners and joints such as those between the parapet wall and the roof slab, chimney and roof slab, etc shall be chamfered with 150mm X 150 mm fillet of mortar (Cement: sand – 1:4) admixed with SikaTop 77 or equivalent of reputed manufacturer as approved by BNHS. Before chamfering a prime coat shall be given with the slurry of SikaTop 77 or equivalent compound of reputed manufacturer as approved by BNHS.

7.4 Sunken slab waterproofing

7.4.1 Proposed system (Given as guidance)::

- SikaTop Seal 107 or equivalent of reputed manufacturer as approved by BNHS, acrylic cementitious waterproof coating
- Coving with acrylic emulsion and waterproof additive SikaTop 77 or equivalent of reputed manufacturer as approved by BNHS
- Sealing of pipe mouth with Sikagard 694 F (I) or equivalent of reputed manufacturer as approved by BNHS, moisture insensitive epoxy putty

Surface Preparation:

- Clean the RCC surface from dust, oil, grease, loosely adhering particles etc. and it should be rendered smooth with cement sand mortar.

Application Methodology (Given as guidance):

- A 1:3 cement – sand mortar, mixed with SikaTop 77 or equivalent compound of reputed manufacturer as approved by BNHS – the polymer modified high quality emulsion, shall be installed as a coving at the corners of floor and the vertical surface in the sunken area, and between floor and walls in the remaining area.
- SikaTop Seal 107 or equivalent compound of reputed manufacturer as approved by BNHS – the cementitious, flexible waterproof coating shall be applied onto the prepared surface in a continuous film on the floor of the sunken area, taking the coating over the vertical surfaces on to the floor and over the coving on to the wall (before tiling) to at least 300mm above the final finished floor level. The coating shall also be continued on to the inner surfaces of the pipe penetration holes. Two coats shall be applied. The coating shall be protected with 15mm plaster admixed with Plastocrete Plus or equivalent compound of reputed manufacturer as approved by BNHS, an integral waterproofing compound @ 100gms per bag of cement. Application of compound should confirm to manufacturer's specification and as per IS and CPWD specifications.
- Tiles are to be fixed with ready to use tile adhesive for vitrified tiles, Sika Ceram (Grey) or equivalent compound of reputed manufacturer as approved by BNHS.

Pipe penetrations

Where the pipes are already installed:

Sikagard 694F(I) or equivalent compound of reputed manufacturer as approved by BNHS, a moisture insensitive epoxy putty shall be installed in a continuous, 10mm thick gasket around the pipes to a width of approximately 15mm.

8. PAINTING

8.1 Scope of work

The scope of work as enumerated under this tender includes painting of external plastered and concrete surface, steel work, timber surfaces, pipes, as detailed in the Bill of Quantities. The work shall be carried out as per IS Code and PWDSOR and specification and finally, as directed by BNHS.

8.2 Materials

The paints to be used for this work shall be of first-class quality paint of reputed manufacturers and of approved type by BNHS.

8.3 Preparation prior to painting

The surfaces to be painted shall be thoroughly cleaned of all dirt, cement slurry with coir or wire brush. The slight surface cracks shall be made good with hard stopping or filled with approved compound. Special care shall be taken in case of exposed concrete or shutter finish work.

8.4 Finishing Coats

All earlier coats of paints shall be thoroughly dry before subsequent coats are applied and shall be rubbed down with fine sand paper. The finishing coats are intended generally as follows: (The exact type of finish shall be as described in Bill of Quantities).

- External wall surface -Cement based waterproofing paint/Textured paint or as directed by BNHS in compliance to the BOQ.

8.5 Samples

The Contractor shall be required to prepare the sample of painting at least three different samples or combinations (each sample not exceeding approx. 4 M2 in area) at the site for approval as per the painting scheme prepared by BNHS at his own risk and cost, and the same shall be approved by BNHS through its appointed local consultant.

8.6 Mode of Measurement

All measurement unless otherwise specified in these documents shall be as per latest Indian Standard and specifications for mode of measurement.

8.7. General

The rates shall include for all materials like putty, fillets, rubbing compound primer, paint etc. as also labour for repertory works and painting all for a completed item of work.

The work shall be done as per best engineering practice. Samples and shades of paint should be approved by BNHS prior to execution of work. Consumption of materials and the special precautions etc. shall be as per manufacturer's specifications. Necessary equipment for spray painting shall be supplied by the Contractor.

Guaranty /warranty for paint should be given by the manufacturer along with cross warranty for entire work by the Contractor.

8.8 Primer: All surface for painting, if they are new, should have a coat of priming before application of the paint as per relevant item of BOQ. The primer should be of approved quality as directed by BNHS of ready-mix primer.

8.8.1 Wood Primer: Wood primer of approved brand (by BNHS) and as per manufacturer's specification is to be applied on the wooden surface which would be free from moisture and loose particles.

8.8.2 Steel Primer: For steel surface red oxide primer, zinc chromate primer of approved brand (by BNHS) and is to be applied on the surface as per manufacturer's specification and as approved by BNHS. The surface should be made free of grease, rust, moisture and loose particles. All blistered surface should be made free by hammering, filling or otherwise so as to have smooth surface before priming.

8.8.3 Cement Primer Coat (Alkali Resisting Primer): Cement primer coat is to be used as base coat on wall finish of cement, lime or lime cement plaster or on asbestos cement surface before application of any wall coating e.g. oil bound distemper, oil-based paints, synthetic enamel, plastic emulsion etc. on them. The cement primer is composed of a medium and pigment which are resistant to the alkalis present in the cement, lime or lime cement in wall finish and provides a barrier for the protection of subsequent coats of oil bound distemper or paints. Priming coat shall be preferably applied by brushing and not by spraying. Hurried priming shall be avoided particularly on absorbent surface. New plaster patches in old work before applying oil bound distemper paints etc. should also be treated with cement primer. The surface shall be thoroughly cleaned of dust, all white or colour wash by washing and scrubbing. The surface shall then be allowed to dry for at least 48 hours. It shall then be sand papered to give a smooth and even surface. Any unevenness shall be made good by applying putty, made of plaster of Paris with water on the entire surface including filling up the undulation and then sand papering the same after it is dry. The cement primer shall be applied with a brush on the clean dry and smooth surface. Horizontal stroke shall be given first. Vertical strokes are to be applied after horizontal stroke is absorbed on wall/ ceiling surface immediately afterwards. This entire operation will constitute one coat. The surface shall be finished as uniformly as possible leaving no brush mark. It shall be allowed to dry for at least 48 hours before oil bound distemper or paint is applied. The entire process of application shall conform to manufacturer specification and as per IS Code and specification and as per decision of BNHS.

8.8.4 Waterproofing Cement base paint

Waterproof cement-based paint of approved manufacturer, and IS code 5410:1992 Part 2: 1972 of desired shade/shads shall be applied over the Cement primer coat. Ensure that the surface is thoroughly dry before painting to avoid premature paint failure. When preparing the surface for painting ensure that all loose and flaking paint or foreign matter is removed and get an absolute smooth surface dried at ambient temperature outside. Wherever textured paint is applied it is to be ensured that the textured matt finish of smooth granular feeling is obtained after application of 2 coats of "Weather shield" or equivalent compound of reputed manufacturer as approved by BNHS acrylic exterior textured paint. The entire process of application shall conform to manufacturer specification and as per IS Code and specification and as per decision of BNHS.

8.9 Precaution

8.9.1 Brushes should be quickly washed in water, immediately after use and kept immersed in water during break periods to prevent the paint from hardening on the brush.

8.9.2 In the preparation of walls for plastic emulsion painting, an oil base putty shall be used in filling cracks, holes etc.

8.9.3 Splashes in floors etc. shall be cleaned out without delay as they will be difficult to remove after hardening.

8.9.4 Washing of surface treated with emulsion paints shall not be done within 3 to 4 weeks of application or the time specified by manufacturer.

9. STRUCTURAL GLAZING

9.1 Scope of Works:

The scope of works under this contract includes design, supply installation, protection guarantees, testing and maintenance upto the defects liability period of Structural glazing, openable panels, glass doors and fixed glazing.

The work under the section includes all labour, materials, equipment and services as required for the engineering, preparation of shop drawings, testing, fabrication, assembly, delivery anchorage, installation, installation, protection and waterproofing of the structural glazing openable panels, glass doors and fixed glazing system and all in accordance with the true intent and meaning of the specifications and drawings taken together, regardless of whether the same may or may not be particularly shown on the drawings or described in the specification provided that the same can be reasonably inferred therefrom. Anchorage includes all primary and secondary anchor assemblies and supportive structural framing as required to secure Structural glazing system glass doors and fixed glazing. The materials, work etc shall be as per relevant IS codes and specification and overall direction of BNHS.

The detailed scope of work is as outlined hereunder-

The Structural glazing system and openable panels described hereafter shall include but will not necessarily be limited to the following:

9.2 Frames

Openable panels where indicated, inclusive of all accessories, fittings, etc. All caulking, sealing and flashing including sealing at junctions with roof waterproofing and exterior wall, raised kerbs and in window surrounds. Sealant within and around the perimeter of all work under this section. Separators, neoprene / EPDM and silicon gaskets, trims, etc. Inserts in concrete, anchor fasteners etc. for the anchorage of all work under this section is subject to the approval of WBNHS. Isolation of all dissimilar metal surfaces as well as moving surfaces similar or dissimilar. Fire-stops, flashing, sealing of all interfaces with buildings etc. Protection during storage and construction unit handing over Engineering proposals, drawings and data. Shop drawings, engineering data and structural calculations of all systems including framing, fasteners. Scheduling and monitoring of the work All samples, mock-ups and test units Coordination with work of Main Civil Contractor and other agencies / Contractors employed on site. All final exterior and interior cleaning of the Structural glazing system, doors, etc. Hoisting, staging, scaffolding and temporary services Specified tests, inclusive of necessary reports, Maintenance manuals, Performance guarantees. Periodic inspection, supervision and advice by tenderer's Principal as well as a back-up guarantee in an acceptance format by the Principal for the quality and performance of works. Construction monitoring for regular quality control and technical inspection to ensure the work conforms to the shop drawing details (including any modification made during testing) and acceptable standards of quality.

9.3 Reference And Standards

Materials and workmanship shall comply with the latest edition of the following standards as follows (but not limited to this list of standards) :

ANSI Z97.1.84.	Safety Glazing Materials used in Buildings
ASTM C1036-90	Specification for Float Glass
ASTM C1048-90	Specification for Heat Treated Float Glass
ASTM C864-90	Specification for Compression Seal Gaskets
ASTM C1115-89	Specification for Silicon Rubber Gaskets
ASTM C920-87	Specification for Sealants
ASTM C509-90	Specification for Sealing Material
GTA Specification	Specification for environment durability for heat strengthened
No. 89-1-6	Spandrel Glass with Applied Opacifiers
BSCP 118	Structural use of Aluminium

In general, the Contractor may follow any international Standards subject to his satisfying BNHS that these specifications are equivalent to latest specifications issued by ASTM, ISO, AAMA, BSS & SSIR or equivalent Indian standard as approved by BNHS.

Copies of all codes proposed to be followed for design, materials, installation and testing shall be submitted to BNHS within 2 weeks of issue of Works Order.

9.4 Building Regulations

Design of the Structural glazing system shall comply with all IS codes and regulations for wind design. All calculations shall comply with the requirements of the relevant National Building Code and Indian Standard Code, unless specified otherwise.

9.5 Guarantee/Warranty

The Contractor shall be fully responsible for and shall guarantee proper design safety and performance of this installed system for such a period as per manufacturer by providing guarantee/ warranty provided by the manufacturer along with the cross warranty by the Contractor and as directed by BNHS as per terms of the contract from the date of taking over of works by the Owner.
In addition, specific, guarantees/warrantees in approved formats shall be given for performance of glass, double-glazed units, anodizing and sealants. All the guarantees /warrantees shall be submitted before payment from the date of actual completion of work, and shall not in any way limit any other rights to correction which the BNHS may have under the Contract.

9.6 Contractor's Responsibilities

The Contractor's responsibilities include but are not necessarily limited to the following items:

The Contractor shall provide and install all supplementary parts necessary to complete all items generally implied in the drawings and in the specifications though not specifically shown or mentioned.
This shall include providing, assembly & erection of all sections and anchor assemblies to meet the performance and furnishing and installation of all inserts, fasteners, clips bracing and framework as required for the proper anchorage of the structural glazing system elements to the structure, unless otherwise noted or specified to be furnish / installed by another agency. Alternate anchorage proposals will be considered, if in the opinion of BNHS the general design and intent of the drawings and specifications are maintained.

The Contractor's system therefore must perform satisfactorily as a whole.

Drawings and specifications indicate the required basic dimensions, profiles and performance criteria. The Contractor shall have the option of modification and addition of details provided the visual concept and performance requirements are fulfilled. Proposed modification shall be clearly shown on shop drawings as "Design Modifications" and acceptance of the same will not relieve the Contractor from sole responsibility for performance of the structural glazing and other system. The Contractor shall be solely and fully responsible for due performance of his installation based on his own design and details. This should be done after approval of BNHS, in writing, subject to the modified design and drawings with all necessary calculations etc and approved by BNHS.

In-plant and job site inspection: The Contractor shall afford for BNHS and / or their authorised agent full access to plants, shops and assembly points to view and inspect the processes and methods employed in the fabrication, assembly and finishing of the structural glazing and other system for this project at their own expense, whatsoever. This should be guided by the relevant clause of GCC of this contract.

BNHS will have the right to reject any Structural glazing and other system, components, assemblies during assembly and erection if the workmanship and intent are not in strict conformity with the approved shop drawings, documentation, certifications, samples and mock-up and shall be binding on the Contractor. Replacement, modification, removal of rejected materials shall be done at the risk and cost of the Contractor.

All costs of shop drawings, documentations, maintenance manuals, certificates, sampling etc. including their resubmissions shall be borne by the Contractors without any extra claim.

Glass, sealants and other items or materials procured by purchase shall be back-to-back guaranteed by the manufacturer and cross guarantee/ warranty by the Contractor.

9.7 Shop Drawings

Within 15 days upon award of contract, the Contractor shall prepare shop drawings by necessary modifications, if any to the preliminary drawings and two (2) copies of all shop drawings along with the plan and method to execute the job mentioning the brand of materials, other accessories to be used for the work shall be submitted to BNHS for review and approval. BNHS"s review of all shop drawings will be limited to their conformity to the concept & specifications. BNHS"s approval of the shop drawings will not relieve the Contractor from any of the responsibilities and requirements as stated in Contract documents. No work shall be fabricated until the shop drawings and all other relates submission, documentation, certifications, samples and the mock-up for that work have been reviewed and approved by BNHS. On approval the Contractor shall submit 4 copies of drawings to BNHS for release to site.
Shop drawings shall incorporate scaled and dimensioned plans, elevations, sections and full-size details for all work in this section. Shop drawings shall indicate the desired dimensional profiles and modules function, performance standards and, in general, delineate the scope of work. The Contractor shall verify and co-ordinate these items with all applicable and / or related trades,

contract drawings and specifications. Since the dimensions and modular references shown on the drawings are for specific and / or typical detail, the shop drawings shall include a full complete layout of all modular and referenced dimensions for all the Structural glazing , openable panels, glass doors and fixed glazing and their related elements. All dimensions / modules, etc. shall be fixed and checked as required.

The full size details shall show and specify all metal sections, types of finishes; areas to be sealed and sealant materials, gaskets; direction and magnitude of thermal expansion, direction and magnitude of all applicable construction including fasteners and welds, all anchorage assemblies and components; the fabrication and erection tolerances for the work and applicable related works adjoining, attached to or in some way related to the work covered by these specifications. The location of all static and dynamic anchor assemblies, the direction of thermal and other applicable building movements, coordination with concrete works and the sequence of installation shall be designated on the applicable plans, elevations and / or sections. All details shall be subject to BNHS's approval.

Shop drawings shall indicate the desired profiles, dimensions, details of metal finish and in general delineate the scope of the work. Profile adjustments in the interest of economy, fabrication, erection, weather-ability to satisfy the performance requirements may be made only with the written approval of BNHS, provided that the general design and intent of the drawings and specifications are maintained.

Six (6) copies plus two reproducible sepia print and one soft copy each of all final approved shop drawings shall be submitted to BNHS.

9.8 Samples and Manuals

Within 2 weeks of issue of order, the following samples of actual job site materials together with detailed technical data / catalogues shall be submitted in duplicate, unless otherwise noted, and in the sizes noted, for BNHS review alike for approval of all other samples to be used for the work at site and approval. Any omission of an item, or items which require the Contractor's compliance with these documents does not relieve him from such responsibility.

Aluminium Extrusions – one of each section, 300 mm long of specified thickness.

Glass; Each type and kind, 300 X 250 mm of specified thickness and including frame

Glazing gaskets, tapes, separators, glass setting blocks, etc. each section of unit, 300 mm long or unit.

Fasteners and connecting devices, each type and size

Finish samples: after approval of the final finish coating BNHS is to be provided with six (6) approved samples. Patch fitting door mongery and all accessories, as applicable.

Flashings and finish samples

Samples submitted should also include assembly of various components forming a typical fixing detail complete with glazing, extrusion, fastener, sealant, etc.

9.9 Maintenance Manual

The Contractor shall submit six (6) copies of maintenance manuals each along with one soft copy at no extra claim, if applicable of detailed procedures for the periodic inspection maintenance and cleaning of all the structural glazing, openable panels, glass doors, windows and fixed glazing, finishes, etc.

9.10 Structural Properties

The design of structural glazing system / other fixing systems and all related components shall comply in general with the requirements of National Building Code IS-875 and Indian Standard Code IS-456 along with all relevant IS Code and specification .No structural glazing / other glazing system including sealants and sealed joint shall sustain permanent deformation or failure under loading equivalent to 1.5 times the design wind pressure herein specified.

Deflections: The specified deflections must be reduced if they are in any way detrimental to the Structural glazing and sealants.

The maximum deflection shall not exceed 1/300 of span of transom / sill/ head members.

Under 1.5 times design wind pressure there should be no permanent deflection of framing member exceeding 1/1000 of span length.

Maximum deflection of glass under design wind pressure at centre of any panel shall not exceed 15 mm or as recommended by the manufacturer whichever is less.

9.11 General

All braces, supports and connections for the structural glazing shall be designed, provided and installed complete as required.

Anchors for curtain wall sections shall be located with a maximum distance of 500 mm above or below the RCC floor slab unless specifically approved otherwise by the BNHS.

Variations from Schematic layouts indicated on the drawings may be permitted at the risk, cost and responsibility of the Contractor but only if a proposed revision does not, in BNHS"s opinion, deviate from the design intent, cause excessive stress in the structure, cause excessive deflection, inhibit thermal and building movement or conflict with other requirements.

Member shapes and / or profiles if schematically shown on BNHS's drawings are not necessarily the exact shapes required or best suited for the particular condition. Final shapes and locations shall be as designed by the Contractor and are subject to BNHS's review and approval.

The horizontal or lateral load on such transom / railing (where not backed by an RCC concrete) shall be designed in accordance with the following criteria i.e. a horizontal UDL at 0.74 KN/m run, UDL supplied to the infill of 1.0 KN/m2 and a part load applied to part of the infill at 0.5 KN.

No holes shall be burned, filed or drilled in any structural steel members unless expressly approved by the BNHS in writing.

The Contractor shall provide detailed layouts, alignments jigs etc. for the proper and exact placement of all welded anchor studs, anchorage components without any harmful effect to the structural glazing.

No field forming, cutting and / or alterations of primary wall elements will be allowed. All framing members shall be shop fabricated and finish coated. No furnished surfaces will be permitted on exposed surfaces.

9.12 Concrete Tolerances

The Contractor shall take into account tolerance in concrete and masonry surfaces to which the structural and glazing framework is fixed.

Fire stop and Interface with Building

Joints in the structural glazing system between successive floors shall have the required fire resistance of at least 2 hours and shall comply with requirements of CFO.

A fire-stop-cum-smoke seal shall be provided at each window head level. In addition the Contractor shall provide an aluminium flashing to approved design at the window sill level and on 2 sides of vision panels.

All interfaces with building structure, and other elements shall be sealed / flashed provided with expandable gaskets to BNHS's approval.

9.13 Sound Control

Provisions shall be made (e.g. capping of all ends of mullions) to prevent sound transmission through the system. Provisions shall also be made to prevent metal to metal rubbing noise due to thermal changes and wind pressure.

9.14 System Description

The front seal structural glazing system is semi unitized system. In this specially designed extruded aluminum mullions are fixed to the building structure by means of SS brackets of angles 100 X 100 X 12 mm of minimum 300 mm long with necessary aluminum packing for true alignment, suitable chinch anchor bolts of minimum 150 X 10 mm shall be provided for fixing the brackets. On to these mullions, the transoms are fixed by means of pre-positioned angle cleats. After installing the grid work of mullion and transom, the entire frame work is aligned in perfect line, level and plumb. Drainage chamber, pressure equalization system and openable panel shall be provided.

Bonding of glass is not to be done on site. Panels are glazed in the factory under controlled conditions as per silicone manufacturer's recommendation to achieve required bonding result. These pre-glazed panels are brought to the site and fixed on to the preinstalled aluminum gird work. The gap between the adjacent glass panels are thereafter filled with silicone sealant to have complete homogenous surface of glass without any grooves and cavities and this shall depend upon the systems offered. The tenderer will indicate the details of systems offered along with the tender.

9.15 Frame Work

Frame work consists of specially designed mullion of minimum size of 101.6 mm X 57 mm X 3 mm (Alloy 6063-T-5/T-6 temper) B.S. 1474. Selection of mullion will depend upon the floor-to-floor height, distance between two. Mullions wind pressure and other required structural stabilities. Transoms of minimum 83 X 57 X 2.25 mm (E 91 WP(IS) 1285) are attached to this mullion by means of aluminum angle cleats. The material shall be of reputed manufacturer as approved by BNHS. Extruded section sample before anodization shall be produced to BNHS for approval.

All aluminum sections shall be black matt anodized to 15 microns minimum. Bolts for connections of frame work shall be high tensile steel minimum 100 mm length and pop rivets shall be used and two samples shall be submitted for approval. Test shall include, DFT, film hardness, dry, cross batch adhesion, boiling water adhesion, test & glass measurements & general appearance and shall meet the following performance requirements. Sample testing shall be done at Govt. laboratories / testing houses at the risk and cost of the Contractor, as directed by BNHS.

Salt spray resistance 3000 hrs exposure to 5% salt solution at 95% RH, 37.5^{0}C> 125 mm creepage or loss of adhesion from scribed lines or cut edges.

Humidity resistance

Abrasion resistance

Mortar resistance

Detergent resistance

Color retention

Guarantee for peeling, cracking, checking, blistering, fading, chalking, color change.

Cleats & spigots: 6351 alloy T6 temper and SS screws shall be used for fixing the panels.

9.16 Fasteners:

The type, size, alloy and quantity and spacing of all fasteners and anchoring devices shall be as required for the specified performance standards. The material shall be of reputed manufacturer, as approved by BNHS.

Bolts, anchors and fastening devices shall be self-locking, suitable for conditions encountered and shall be torque tightened when required to achieve maximum Torque Tension relationship in fasteners, washers, nuts all ancillary items shall be same material as fasteners.

Fastening devices between aluminium and aluminium shall be AISC type 302 (18-8) stainless steel unless otherwise approved.

Fastening devices between aluminium and dissimilar material shall be 300 series non-magnetic stainless steel unless otherwise approved.

Exposed fasteners shall be of stainless steel.

Self-locking fasteners shall be stainless steel with nylon inserts or patches.

Proper care shall be taken in anodizing process to proper adhesion of the structural silicone to the anodized aluminium substrate. The anodizer shall be apprised that the extrusion to be finished will be used for structural glazing application. Sample of fasteners shall be submitted to BNHS before anodisation for approval.

After a long period of time, anodised surface may develop an aluminium hydroxide surface film. This film shall be removed by detergent free boiling hot water rinse. Random production samples of anodised extrusions must be tested by silicone sealant manufacturers and certified by them. The sample testing shall be done at Govt. laboratories / testing houses at the risk and cost of the Contractor, as directed by BNHS.

9.17 Glazed Panels

These are factory made glazed panels of approved make (as of BNHS) which are brought to site of work and are bolted on the pre-fixed gird work of mullions and transoms. The entire safety and principle of structural glazing depends on these panels, in which the glass is bonded to the aluminium frames by means of structural silicone sealant. This has to be done in perfectly controlled conditions and as per the procedure recommended by sealant manufacturer. The sealant manufacturer shall visit the

place of application for on-site testing of bonding by deglazing few panels. Necessary certification by the sealant manufacturer shall be furnished indicating that the glazing has been carried out as per their recommended procedure, based on which the Contractor shall submit the warranty along with the certification of the manufacturer.

9.18 Sealants

All sealant applications must be clearly designated on the applicable shop drawing details and reference to a master sealant schedule specifying materials special instructions and application procedures.

The compatibility and sequence of installation for all sealants must be carefully considered in all proposals in order to ensure the required cure and optimum performance. Sealants must not degrade and / or fail under all design conditions including, but not limited to thermal movement, water, ultraviolet exposure and / or other adverse environmental conditions. The following sealant materials are specified for performance standards only. All proposals must be equal to or better than the materials herein specified. The designation of sealant types noted on the drawings is intended for general design guidance. Final selection by the Contractor for the sealant types shall be based on their conformity with the Performance Requirements herein specified and meet with BNHS's approval. Maximum precautions shall be taken to prevent failure of sealant. Necessary warranty certificate by the manufacturer along with cross warranty by the Contractor shall have to be submitted.

9.19 Front Sealing

After glass panels are installed, leveled and aligned, the groove between two glasses on al the sides which depends upon the systems adopted shall be as minimum as possible. This groove is then filled with weather grade 789/79B black silicone sealant from outside to give one smooth surface. This silicone filled grooves shall allow for thermal movements in the glass. Sleek grooves are to be provided for esthetical requirement.

9.20 Structural Sealant

Dow Corning silicone sealant 995/GE ultra-glaze 4000. All exposed and concealed metal to metal (including tight or butt type metal to metal assembly prior to assembly), perimeter metal to concrete joints shall be silicone base sealant, preferably two components, in approved colour, conforming to the manufacturer's recommendations for the specific uses and performance criteria. The manufacturer shall conduct laboratory test for adhesion for each lot of aluminium sections and glass. Laboratory reports shall be submitted to BNHS. Submission of warranty by the manufacturer and cross warranty by the Contractor is required.

9.21 Weather Sealant

Grade of sealants for concealed metal to metal and metal to concrete joints are to be installed or embedded in a full bed sealant and shall be of Dow Corning / GE. Joint fillers and back up materials shall be of neoprene and as per the written recommendation from sealant manufacturer. Shape, size hardness, compatibility and bond breaking requirements are to be considered. All sealants shall be non-staining as per norms.

All sealants shall be given guarantee/warranty for materials by the manufacturer along with cross warranty including, workmanship and performance from the date of taking over of the work by BNHS.

9.22 Caulking compound

Dow Corning 790, one part gun grade consistency, colour to match adjacent material or approved by BNHS for use around frame or between frame and floor slab.

9.23 Installation

The GI bracket having three-way adjustments are first fixed to the building structure as per approved detailed drawings. On to these brackets, the mullions are bolted. The mullion to mullion joint on each floor is achieved by special aluminium sliding sleeve. There is an expansion gap between two mullions to allow thermal movements.

9.24 Smoke Seal

The gap between the building structure and the structural glazing frame is closed with perforated aluminium tubes. These smoke seals will stop the smoke, travelling from one floor to other floor as well as will stop the noise, travelling from one floor to other floor and shall be two-hour fire resistant. Necessary tests shall be conducted at the risk and cost of the Contractor to check the functioning of smoke seal as directed by BNHS complying to IS code and specifications.

9.25 Glass

For structural glazing, minimum 6 mm thick grey, tinted heat strengthened glass shall be used for spandrel areas and 24 mm thick insulated glass with 6 mm thick reflective toughened glass +12 mm air gap +6 mm thick clear toughened glass for other areas. The colour of the glass shall be as per the design of the BNHS. Prior to bringing the materials in bulk, sample approval shall be done by BNHS. Material shall be of reputed manufacturer and approved by BNHS.

All glass and glazing materials shall be verified and co-ordinated with the applicable performance requirements.

Furnish and install glass and glazing work as indicated on the drawings and as specified herein. All glass shall be cut to required sizes and ready for glazing. Any pane which does not fit any section of the glazing and shop front will be rejected and a replacement made at the Contractor's expense. All glass shall be of accurate sizes with clear undamaged edges and surfaces which are not disfigured. Sample testing shall be done at the risk and cost of the Contractor as directed by BNHS, over and above , the submission of test certificate from the manufacturer .

Heat strengthened glass shall not deviate in surface flatness by more than 0.23 mm within 260 mm of leading or trailing edge, or 0.076 mm in centre. Direction of ripples shall be consistent. Distortion of glass shall be controlled as much as possible during heat strengthening. Sag distortion shall be uni-directional as per BNHS's option. Surface compression stress of heat strengthened glass shall be within 320-450 kg/cm2.

Permanent identification marking on glass shall be accomplished by a technique selected by the manufacturer. The location of the marking shall be proposed by the Manufacturer and approved by BNHS. All glass shall be delivered to site with the manufacturer's label of identification attached along with the test certificate of the manufacturer.

Submit for BNHS's approval a complete list of materials to be used, including the sealants proposed and such samples as BNHS may require. All glass and glazing methods and materials including the design and profile dimensions of glazing pockets shall be as approved and recommended in writing by the applicable glass and sealant manufacturers. A sealant substrate test

report shall be submitted for each type of sealant for adhesion and compatibility. If required , BNHS may ask the Contractor for further sample testing of sealants in Govt. laboratories /testing houses at the risk and cost of the Contractor . Warranty of the material by the manufacturer along with cross warranty including workmanship etc. shall be submitted by the Contractor.
Sealants in factory-glazed panels shall be fully cured prior to shipment to project site and installation.
All glass breakage caused by the Contractor or his sub-Contractor because of negligence or caused by the installation of faulty work by him shall be replaced by the Contractor at his own expense without delay to the project completion.
The Contractor shall be responsible for replacement of any unit of glass and glazing that fails within the guarantee/warranty period of the manufacturer without charge.
The glass glazed panels / structural glazing frames for the structural glazing system shall be designed to withstand lateral imposed loads and comply with requirements of local building codes.
Glass thickness should be selected in accordance with IS 875:1987(Part III) to satisfy design performance requirements and local design codes.
Glass shall be free from defects or impurities detrimental to its performance Defects such as bubbles, waves, spots, scratches, spalls, discoloration, visibly imperfect coating, chipping and bubbles or delamination of opacifier film shall be limited in accordance with the Manufacturer's / trader's guidelines. The glass is to be produced in such a way that the rollers will be parallel to what will be the horizontal position of the glass. Glass shall be consistent in colour.
Manufacturers" glazing instructions regarding installation, clearance, dimensional tolerance, bite edge clearance etc. shall be followed and shall also be guided by relevant IS codes and specifications.
All solar control glass panels shall be stored with particular care and protected against abrasion, sun and moisture prior to installation.
Precautions specified by glass manufacturers to minimise thermal stress must be followed. A thermal stress analysis shall be obtained from glass manufacturer prior to fabrication and their recommendations shall be followed. Allowances shall be made for thermal movements due to an air temperature range of 600C and a material temperature range of 1000 C.
Glass panels shall be selected / rejected on the basis of product quality standards specified by the manufacturer concerning scratches, pinholes, clusters, distortion, colour variations, flaws in coating and other defects. Decision of BNHS in this regard shall be final and binding to the Contractor.
Each type of glass shall be obtained from only one manufacturer and in one lot. Adequate spare quantity shall be ordered to cover for breakage and for replacement during maintenance period.
Setting blocks for glass shall be extruded neoprene with minimum 80 durometer hardness.

9.26 Gaskets

Gaskets and seals shall be extruded EPDM of approved quality, compatible with substrates, finishes and other components they are in contact with. All gaskets exposed directly on the exterior face shall be silicon gaskets.
Extruded EPDM sections shall have the following properties:

Shore Hardness	:	70 ±5A
Tensile strength	:	Min. 70 kg / cm2
Elongation	:	300%
Ozone Resistance	:	No crack at 50± 5pphm, test temp of 40±2^{0}C, test duration of 96 hours and 20% strain

Extruded neoprene sections if specifically permitted shall have the following properties :

Physical Property	Test Method	Performance
Hardness, Durometer A	ASTM D 2240	601.5 points
Tensile strength	ASTM D 412	1800 psi, minimum
Elongation at break	ASTM D 412	25% min
Brittleness temperature	ASTM D 746	40^0 F
Resistance to heat	ASTM D 573	
Change in original properties after 70 hrs. at 100^0 C		
Hardness	-	+ 10 points, max.
Elongation	-	40%, max.
Tensile strength	-	15% max.
Resistance to permanent set compression set after 70 hrs. at 1000 C	ASTM D 395	25% max.

Expansion joints

Expansion joints shall be with EPDM moulding.
Peripheral Flashing shall be done with aluminium anodized black with extruded 6101 alloy T6 tamper with DC multi seal.
Necessary test certificate from the manufacturer shall have to be submitted, if so instructed by BNHS, the Contractor shall submit the test report of gasket sample tested through Govt. laboratories / testing houses at the risk and cost of the Contractor, over and above submission of the above test certificate.

9.27 Surface Preparation

9.27.1 Solvent cleaning

Dirty glass edges shall be cleaned with a solvent such as isopropyl alcohol (IPA), Oily metal surfaces shall be cleaned with degreasing solvent such as toulene, or xylene. Glass and metal finish manufacturers shall ensure compatibility of the solvent used for cleaning. Primer shall be applied as per the manufacturer's recommendations. Silicon sealant shall be applied as soon as possible to prevent built up of dirt, moisture and other contaminants from affecting adhesion of silicone to substrates.

Silicone used shall be natural curing type. Acetoxy curing sealant which release acetic acid during the cure process are not recommended for use.
All adjacent surfaces shall be masked prior to sealant application. Backer rods shall be carefully positioned.
Sealant shall be applied in a continuous operation from a caulking gun or pump. Positive pressure, adequate to fill the entire joint cavity shall be applied by pushing the sealant bead ahead of application nozzle. The sealant must fill the entire joint and firmly contact with the glass and metal surfaces. Water, soaps or alcohol solutions shall not be used as tooling aids. After tooling, the masking shall be removed.

9.28 Separators
Separators between steel and aluminum members shall be of rigid type, high impact smooth both side Teflon with minimum thickness of 0.8 mm.
9.29 Quality & Certificates
All required certificates shall be furnished against each concerned supply.
Certificate of conformance for anodized finishes and thickness along with the test result.
Test certificates from sealant manufacturers issued at regular intervals during building process, conforming compatibility of materials and adhesion properties and workmanship of the system, testing of adhesion and chemical compatibility of all elements and design review in accordance with sealant manufacturer.
Physical and chemical properties of aluminum sections used.
Over and above the submission of test certificate from the manufacturer, BNHS may instruct the Contractor for sample testing at Govt. laboratories / testing houses at risk and cost of the Contractor.
9.30 Leakage Test
The leakage test shall be conducted through hose pipes with water supplied at a pressure of 5 kg / sq.cm. at his own cost.
9.31 Accessories
All accessories shall conform to the relevant IS standard and shall meet all required functional aspects.
9.32 Warranty
The tenderer shall provide full warranty for structural glazing and other works carried out by them in this contract which shall include:
Against non-falling of glasses
Sturdiness of the system
Against water penetration
Against air infiltration
Smooth operation of the doors.
The structural glazing, door & fixed glazing systems shall be warranted for a period as stipulated in the bid documents or as provided by the manufacturer, whichever is later, and all repairs to the structural, sealant and other items if required shall be carried out without any additional cost. The warranty shall be furnished in stamped paper in the form to be provided after the award of work.
If breakage of glass / structural defects occurs due to faculty design and execution within the warranty period, the same shall be replaced without any additional cost and the same shall be replaced within 2 weeks. The decision of BNHS shall be final.
Complete drainage system in the structural glazing panes. Water leakage and condensation shall be drained or discharged to exterior face of wall and shall be sealed off at every floor and water shall not be retained.
9.33 Drawings
On receipt of the order, the tenderer within 15 days shall submit detailed fabrication and erection drawings indicating all fixing details and panel arrangement, door details etc. for approval and fabrication to be taken up after approval of these drawings.
9.34 Packing
Packing shall be made with PVC adhesive tape for anti-scratch requirements.
Transport of glazed units shall be done only after the sealant is cured fully.
9.35 Payment
The opening area of structural glazing / door opening shall be measured for payment. The measurement shall be guided by the relevant specification and GCC. In case of any dispute, decision of BNHS shall be final and binding on the Contractor. The rate quoted shall be deemed to include cost of all materials viz. Aluminum, sections, making frames, erection, glazing sealants, weather strips, fittings and fixtures, all fixing arrangements testing, fabrication at plants and erection at site including labour, machinery, scaffolding, staging, chipping of wall, beams, columns, tests, pre commissioning test, commissioning test , rectification of plaster, painting if required, for the complete job.
The GCC shall be read and applicable in conjunction with technical specification.

10. GYPSUM BOARD FALSE CEILING
G.I. perimeter channels of size 0.55mm thick having one flange 20mm and another flange30mm and a web of 27mm. Suspending G.I. intermediate channels of size 45mm, 0.9m thick with two flanges of 15mm each from the soffit at 1220mm. Centres with ceiling angle of width 25mm X 10mmX 0.55mm thk. fixed to soffit with GI cleat and steel expansion fasteners. Ceiling section of 0.55mm thk having knurled web of 51.5mm and two flanges of 26mm each with lips of 10.5mm are then fixed to the intermediately channel with help of connecting clip and in direction perpendicular to the intermediate channel at 457mm Centres. 12.5mm thick tapered edge Gypboard conforming to IS : 2095 (latest amendments) is then screw fixed to ceiling section with 25mm dry wall screw at 230mm centres.
Finally the boards are to be jointed and finished so as to have a flush look which includes filling and finishing the tapered and square edges of the board with jointing compound, paper tape and two coats of primer suitable for Gypboard (as per manufactures specification).

Test certificate from the manufacturer with warranty shall be submitted. The cross warranty attaching warranty of the manufacturer shall be submitted by the Contractor. BNHS may also ask for further testing of sample of material at the risk and cost of the Contractor.

11. ROLLING SHUTTERS:

11.1 General

The rolling shutters shall be of approved make and the design and shall be suitable for fixing in the position shown in the drawing i.e., inside, outside, or below lintel or below joists. The shutter shall be of the manually push and pull type upto 9 sq.m. If the area of the shutter is between 9 sq.m. and 12 sq.m. There ball bearing shall be provided for easy operation. When the area is more than 12 sq.m. mechanical gear arrangements shall be provided. The rolling shutters shall generally conform to IS : 6248. The shutter shall be complete with door suspension, shafts, locking arrangements, pulling handles and other accessories. The laths shall not be less than 1.25 mm. in thickness .and 80 mm wide. Guide channels shall be of minimum 75 mm depth and made of steel sheets of not less than 3.15 mm thick.

Material testing of samples shall be done at Govt. laboratories /testing houses at the risk and cost of the Contractor and submitted to BNHS.

11.2 Mode of Measurement:

11.2.1 Measurements shall be guided by provisions of GCC and specifications.

11.2.2 Payment shall be made for the clear size of the opening only and the Contractor shall include in his rate for the side guide rails, pipe shaft, springs, hood/ cover and brackets.

11.2.3 Rate shall include for all materials, fabrication, transport, erection, maintaining in place till completion of the job. One coat of shop paint, all tools, tackle, plant, equipment, scaffolding, testing etc., required for the completion of the job as per the specifications.

12. ALUMINIUM WINDOWS & VENTILATORS

12.1 Materials

12.1.1 All sections shall be obtained from approved, reputed, manufacturers, as approved by BNHS and shall be extruded from aluminum alloy conforming generally to IS : 733 - 1983 and IS : 1285 - 1975.

12.1.2 Sections shall conform to IS : 1948-1961.

12.1.3 All sections shall be coloured anodised. Anodising shall be done from reputed agencies as approved by BNHS with the warranty by the anodizing agency. The thickness of anodising shall be a minimum of 15 microns and the Contractor shall furnish necessary evidence in proof of this to the satisfaction of the BNHS.

Samples of extruded aluminum section shall be approved by BNHS and kept at site by the Contractor for ready reference.

12.1.4 The engineer at his discretion may send samples to an independent laboratory for testing at the cost of the Contractor and if the test report from the laboratory indicates any deficiency the materials shall be rejected. Warranty certificate from the manufacturer shall be submitted by the Contractor.

12.2 Workmanship:

12.2.1 All frames for windows, ventilators etc., shall be flat, with all corners at right angles and shall not be warped.

12.2.2 Frames shall be fabricated from sections machine cut to length, mitred and rivetted with clips at corners. Sub- dividing bars shall be tenoned and rivetted into the frame.

12.2.3 Hinged door shall be provided with approved quality floor springs, and aluminum push plates. Push plates shall extend the full width of the shutter, and shall be provided with tower bolts and approved quality lock.

All the members of all shutters have built -in grooves to take on snap on aluminum beading. Neoprene gaskets shall be provided to prevent direct contact between glass and aluminum and make the shutter completely weather seal.

12.2.4 The Contractor shall measure each opening before fabrication. The employer shall not be responsible for any variation in the widths and heights of openings.

1.12.2.5 Frames shall be fabricated so that during fixing 6 mm clearance is obtained all round.

1.12.2.6 The Contractor before fabrication shall submit shop drawings to the BNHS for prior approval.

1.12.2.7 Before erecting, frames coming in contact with masonry, plaster, concrete care should be taken that a distinct gap as directed by BNHS should be kept and the same to be sealed with colourless polysulphide sealant all-round the frame on both sides . The Contractor shall provide necessary treated wooden spacer blocks or frame before erecting and finalizing the alignment of the aluminium frame with respect to the masonry opening.

12.2.8 Plain or tinted glass glazing, as specified shall be fixed.

12.3 Mode of Measurement and Payment:

12.3.1 Measurements shall be guided by provisions of GCC and specifications.

12.3.2 The rate for window and Glass partitions shall include for all materials including glazing, fabrication, transport to site, erection, cost of scaffolding, maintaining in position till completion of job and including all tools, tackle, plant and equipment, testing etc. and all other necessary works incidental to the completion of the work as per these specifications. For partitions with Bison panel in Aluminium frame the rate should also be inclusive all materials labour and tools and plants.

13. ALUMINIUM COMPOSITE PANEL CLADDING

13.1 Cladding shall be non-toxic composite aluminium panels of adequate strength with approved aluminium details. The panels shall be 4mm thick composite units finished with PVDF (Polyvinylidene difluoride) coating overall 35 micron thick of approved metallic colour. The resin content of the PVDF (Polyvinylidene difluoride) coating shall be 75% to 80%. The back of the panel shall be chromatised 3-4 micron thick, compatible with adhesives for stiffeners if any or given a polymer coating.

13.2 The fabrication and installation of the cladding systems shall be carried out as per manufacturer's instructions with invisible/concealed fastenings, aluminium sub-structure, silicon sealants properly tooled etc.

13.3 All cladding panels of one kind shall be obtained in one lot from the manufactures.

13.4 Each panel shall be guaranteed for a flatness of ± 1mm from the true face after installation under no-wind conditions. Deviations from the true alignment of adjoining panels shall not be cumulative. Full load deflections shall be kept to the minimum possible. Each panel shall be capable of withstanding 300 Kg/Sq.m wind pressure without any permanent deformation.

13.5 The cladding system shall be adequately ventilated. The air-gap between the cladding panels and the concrete /block –wall shall be at least 50 mm to allow proper ventilation of the rain screen system. The cavity shall be closed by a perforated bird/vermin-proof closer at bottom and by a flashing at top or any other method as mentioned in the drawing. The wall behind should be treated with approved water proof paint applied over plastered surface as directed by the BNHS.

13.6 The fabrication processes including cutting, grooving, benching, folding, root-in as well as installation shall be performed as per manufacturer"s instructions. The panels shall be backed by approved aluminium support framework, fixed to wall with aluminium/galvanized steel brackets. Cross warranty attaching the warranty of the manufacturer shall be submitted by the Contractor to BNHS in approved form and manner.

13.7 The composite Aluminium panels shall satisfy the following fire codes requirements:

BS476	part6	Class	0
ASTM E-84	Flame Spread Index	0	
Smoke developed	Index		<15

UBC 26-9 & NFPA for 30-minute Intermediate scale Multi-story Apparatus. Test to prove no flame spread beyond the area directly exposed to fire source.
Sample approval from BNHS shall have to be got done by the Contractor prior to bringing the material in bulk at site. Necessary test certificate with warranty from the manufacturer shall have to be submitted by the Contractor. Over and above the submission of test certificate, BNHS at its discretion may ask for sample testing further in Govt. laboratories / test house at the risk and cost of the Contractor.

14. INTERLOCKING PRE-CAST TILES FLOORING

Materials: Interlocking concrete pavers are composed of Portland cement, fine and coarse aggregate, color is often added. Admixtures are typically placed in the concrete mix to reduce efflorescence. Pavers are made in factory- controlled conditions with machines that apply pressure and vibration.

Application: Interlocking concrete pavements are typically constructed as flexible pavements on a compacted soil sub-grade and compacted aggregate base. Concrete pavers are then placed on a thin layer of bedding sand, compacted, sand swept into the joints, and the unit compacted again.

Do not use the sand to fill depressions in the base. These eventually will be reflected in the surface of the finished pavement. Fill any depressions with base materials and compact.

50 mm thick concrete mat finish factory made tiles of M25 grade shall be provided over 50 mm thick coarse sand over 100 mm thick PCC 1:2:4 in the location of road and other areas of the building as shown in drawing. The same will be measured in Sqm. The interlocking paving tile shall be factory made of makes as specified in the list of approved manufacturers ". The size, Shapes and pattern shall be as approved by BNHS. The compressive strength shall be checked from reputed laboratory from each lot and shall be kept on record, over and above, the submission of test certificate from the manufacturer.

15 GLASS MOSAIC TILE

After checking the surface for leveling, spread the adhesive (GTA) of Pidilite/ Balendula/ laticrete or equivalent with 2mm notch trowel. Place the tile sheet available in 300 x 300 mm in size in perfect alignment vertically and horizontally. Soak the back paper of tile sheet with a sponge soaked in water. Peel off the water soaked back up paper starting from a corner. After removing the paper, the mosaic tile surface shall be washed with the water to remove any residual glue. Fill the joint grooves with Birla white cement mixed with colour pigment as approved and grouting admixture using a rubber trowel and clean the surface again with wet sponge and leave the surface for 8 hrs for curing. Lastly, clean the surface with diluted HCL in a ratio of acid to water as 5: 95.

16 APPLICABLE CODES AND SPECIFICATIONS

List of major Indian Standards has been given in the list of IS Codes in "Special Conditions of Contract" of this bid document.

LIST OF APPROVED MANUFACTURERS (The Approved Brand / Manufacturer, if mentioned in the Working schedule, will have to follow that)

Sl. No.	Description of Approved Material	Approved Brand / Manufacturer
1	Cement	ULTRATECH(L&T)/AMBUJA/ACC/NUVOCO CONCRETO
2	Reinforcement Steel	SAIL/TATA/RINL/JSWL/JSPL/SRMB
3	Structural Steel	SAIL/TATA/RINL
4.	Glazed Tile	JOHNSON /KAJARIA /SOMANI
5.	Ceramic Floor Tile	JOHNSON/ KAJARIA / SOMANI
6.	Vitrified Ceramic Floor Tile	JOHNSON / KAJARIA/ RESTILES CERAMIC LTD
7.	Cement Bonded Particle Board Conforming to IS 14276 – 1995	"BISON PANEL" – INDIA – NCL INDUSTRIES LTD. (Boards Division) / EVEREST INDUSTRIES LTD .
8.	Ply Wood, Shuttering Ply Conforming to IS 303-1989 / IS 4990-1993	M/s. Century Plyboards (I) Ltd. / M/s. Green Ply Industries Ltd.
9.	Wooden Frame	Siliguri Sal / Malayasian Sal
10.	Fire Door	Shakti met-dor
11	Rolling Shutter	Bengal Rolling Shutter
12.	Stainless Steel Section	SAIL/ TATA
13.	Stainless steel hardware for doors	Dorma /Haffelle
14	Glazing	Saint Gobain / Asahi Float Glass Ltd / Hindusthan Safety Glass Works Ltd. / Modi.
15.	Injection water proofing, waterproofing coating, water repellents Conc. Admixtures	Sika Qualcrete Ltd./ Structural Waterproofing Co. / Pidilite Industries Ltd. / „Fosroc
16.	Synthetic Enamel Paints, Distemper, Acrylic Emulsion Paints, Melamine Coating , Aliphatic Acrylate	I.C.I (I) Ltd. / Berger Paints (I) Ltd. / Jenson & Nicholson (I) Ltd. / Asian Paints (I) Ltd. / Goodlass & Nerolac , FOSROC Chemicals(I) Pvt Ltd .
17.	Flush door (Factory made)	Century Ply / Green Ply
18.	Aluminium Sections and Extrusion shall conform IS:733-1983 and IS:1285-1975	INDAL / JINDAL/BECO
19.	General Hardware	
	a) Latches, hinges etc.	GODREJ / DORMA / HAFFELLE
	b) Locks , Flush bolt	GODREJ / DORMA / HAFFELLE
	c) Handles	GODREJ / DORMA/ HAFFELE
	d) Screw	GKW / ND/ Nettlefold
	e) Door Closure	GODREJ / DORMA/HAFFELE
	f) Floor Spring	GODREJ /EVERITE Gencies Pvt. Ltd. /Garnish
	g) Aldrop	ISI Marked

	h)Tower bolt	ISI Marked
	I) PVC Buffer block	ISI Marked
	J) Door Stopper	ISI Marked
	k) Patch fittings for toughened glass	Dorma Systems
20.	Laminates	"DECOLAM" (Bakelite Hylam Ltd.) / "MERINO" (Century Laminating Co. Ltd.)./ GREENLAM (GREEN PLY)
21	Marble	
a) b) c)	White Variety (Indian) Green Variety (Indian) Italian Marble	Abu White Super Udaipur As per approved shade
	Granite	
a)	Red	Ruby Red
b)	Black/Grey	Premium
22	Kotah stone (Bluish grey)	Premium
23	Waterproof Adhesive for Tile / Slab fixing to wall or floor	SIKA/Fosroc/Pidilite/Roffe
24	Sealant	
25	Tile Jointing Materials	
26	Decorative Ply (Teak / Cedar / Mahegony / Walnut Veneer)	Century Ply/Green Ply
27.	Cement Based Exterior Textured Paint	ICI/Asian Paints /Berger/ Snowcem India Ltd.
28	Glass Mosaic tiles	Shon/Kent/Bisazza
29	Glass for structural glazing & canopy (Coloured Reflective toughened glass)	Saint Gobain / Hindustan Pilkington/ Ashai float glass
30	Silicone Sealant	GE/Dow Corning
31.	Aluminium composite panel	Aluco bond/Aludecor/Alstrong/Alupan
32.	MS Conduit pipe	BEC /SUPREME/ AKG
33.	PVC Conduit pipe	AKG /PLAZA/ PADAM
34.	Pre-constructional Anti-termite (Chloropyriphos)	Pest Control India or approved by BNHS
35.	Cement Primer	ICI / BERGER / ASIAN
36.	Textured Paint	ICI / BERGER / ASIAN PAINTS ,
37.	Waterproofing acrylic emulsion exterior grade paint	ICI / BERGER / ASIAN PAINTS
38.	Acrylic Polymer waterproofing coat	SIKA / FOSROC / PEDILITE / ROFFE
39.	Expanding grout admixture	SIKA / FOSROC / PEDILITE / ROFFE
40.	Integral waterproofing compound	SIKA / FOSROC / PEDILITE / ROFFE
41.	Waterproofing admixture	SIKA / FOSROC / PEDILITE / ROFFE
42.	Plasticizer	SIKA / FOSROC / PEDILITE / ROFFE
43	APP membrane	SIKA / TEXSA / PEDILITE
44	PVC door	SINTEX OR AS APPROVED BY BNHS
45	Aluminium anodized louver	HUNTER DOUGLAS
46	Structural glazing	JINDAL/HINDALCO
47	Stainless steel handrail with baluster	GODREJ / DLINE
48	False ceiling	GYPSUM/EVEREST/ARMSTRONG

Note:

If the approved brands mentioned above are not available, equivalent make as may be approved by BNHS only is to be used for the work. The items for which brand name or name of the manufacturer have not been mentioned in the above list, shall be given by BNHS to the contractor during the execution of work. The above list is not comprehensive and BNHS reserve the right to ask the contractor for use of any alternate brand / manufacturer during execution of work, of equivalent quality.

ALUMINIUM SECTION DETAILS:

Specifications for different component will be as follows.
(HINDALCO/BECO/or any approved /ISI marked Aluminium Extruded Sectioms)

SL.NO.	ITEM	*HINDALCO*	*BECO*
(A)	***Sliding Window:***		
I.	***2 Track Sliding***		
	Frame:	*4095*	*151.155*
	Bottom Member	*4096*	*151.154*
	Top & Side Member		
	Shutter:		
	Bottom & Top Member	*4148*	*151.161*
	Style Side	*9777*	*151.152*
	Inter Lock	*9778*	*151.153*
II.	***3-Track Sliding***		
	Frame:		
	Bottom Member	*4097*	*151.157*
	Top & Side Member	*4098*	*151.156*
	Shutter:		
	Bottom & Top Member	*4148*	*151.161*
	Style Side	*9777*	*151.152*
	Inter Lock	*9778*	*151.153*
III.	***4-Track sliding***		
	Frame:		
	Bottom Member	*4121*	*151.67*
	Top & Side Member	*4120*	*151.66*
	Shutter:		
	Bottom & Top Member	*4148*	*151.161*
	Style Side	*9777*	*151.152*
	Inter Lock	*9778*	*151.153*
Accessories:*EPDM Gasket, Adhesive, Screw, Cleat Angle. Glass (clear bubble free float glass)*			
(B)	***Casement Window:***		
I.	***40 series (40 mm depth).***		
	Outer Frame: *Peripheral members* *Mullion* *Shutter:* *Frame members:* *Glazing Clip* *CleatAngle. (Non-Anodized)*	 *4133* *9149* *9148* *4135* *2081*	 *151.1* *151.79* *151.81* *151.96* *151.167*
II.	***34 series (34 mm depth).***		
	Outer Frame: *Peripheral members* *Mullion*	 *2082* *9139*	 *151.164* *151.163*

	Shutter:		
	Peripheral members	*2082*	*151.164*
	Mullion	*9139*	*151.163*
	Shutter:		
	Frame members:	*4124*	*151.165*
	Glazing Clip	*4125*	*151.166*
	CleatAngle. (Non-Anodized)	*2081*	*151.167*
Accessories:*Stainless steel/ Aluminium Functional, Hinge, EPDM Gasket –T&U type, Adhesive, Screw, Cleat Angle. Glass*			
(C)	***Louvered Window: Outer***		
	Frame.		
	Top, Bottom & Slide Member	*9835*	*303.1*
	Louvered		
	Light- 18G	*1702*	Local make
	Medium- 16G	*1702*	
	Heavy- 14G	*1702*	
(D)	***Fixed glazing on all tracks with member of fixed glazing flushed on one side only***		
	Frame		
	Top, Bottom & Side	*9210*	*151.53*
	Mullion	*9207*	*151.52*
	Glazing Clip	*4660*	*151.17*
Accessories: *EPDM Gasket, Glass*			
(E)	***Fixed Partition -for height of clear opening more than 1.0 metre.***		
I.	*Unsupported length (Vertical member) up to 1.5 m height*		
	Members:		
	Side, Top & Bottom	*9210*	*151.53*
	Intermediates	*9207*	*151.52*
	Glazing Clip	*4660*	*151.17*
II.	*Unsupported length (Vertical Member) above 1.5 m height Members*		
	Members:		
	Side, Top & Bottom	*9210*	*151.53*
	Intermediates	*9207*	*151.52*
	Glazing Clip	*4660*	*151.17*
III.	*Both ends restrained (with horizontal members or masonry walls / concrete members where the horizontal members can be screwed) for panels within 0.9 Sq.m.*		
	Members:		
	Side, Top & Bottom	*9210*	*151.53*
	Intermediates	*9207*	*151.52*
	Glazing Clip	*4660*	*151.17*
IV.	*Both ends restrained (with horizontal members or masonry walls / concrete members where the horizontal members can be screwed) for panels within 0.9 Sq.m.*		
	Members:		
	Side, Top & Bottom	*9210*	*151.183*

	Intermediates	*9207*	*151.193*
	Glazing Clip	*4660*	*151.17*
	Accessories: *EPDM Gasket, Glass/ Board*		
(F)	***Movable door shutters fully glazed, partly glazed Partly pre-laminated and rimless doors.***		
I.	***Movable door Door Frame, (Required only when there is masonry wall/concrete member).***		
	Top Side member	*9210*	*151.183*
	Shutter:		
	Top Rail	*9201*	*151.261*
	Bottom Rail	*9200*	*151.231*
	Lock Rail	*9240*	*151.218*
	Door vertical	*9241*	*151.23*
	Glazing Clip	*4660*	*151.17*
	Handle	*5140*	*151.13*
II.	***Rimless Door***		
	Top & Bottom Rail	*9206*	*151.51*
	Accessories: *1. Heavy duty floor spring & top pin assembly make: Garnish/Nita/Hardyn or any approved make conforming to IS: 6315* *2. EPDM Gasket* *3. Wool Pile* *4. Lock-Ramson* *5. Handle-Standard/Decorative/Acrylic* *6. Sundries: Adhesive, screw, Cleat Angle*		

TECHNICAL SPECIFICATION FOR WATER SUPPLY & SANITARY DRAINAGE SYSTEM (GENERAL)

I. GENERAL:

1. The Contractor shall arrange with local municipal authorities for getting the water and sewerage connections.

2. The Contractor shall arrange for submission of plans to the statutory authorities / local bodies etc. and obtaining sanction of the same.

3. The rates are of complete works/items as defined in the respective items of the B.O.Q. as fixed in position and overall costs- e.g. cutting of holes, chases, etc., and also for provision of fixing arrangement viz., clamps, brackets, wooden blocks priming, painting etc. and include restoration to original condition of all damages to walls, floors etc., during the process of fixing sanitary installations, water supply and drainage. All debris of plumber's excavation, etc., shall be removed without any extra charge. The plumbing work/or the building work effected by the plumber work shall be left thoroughly cleaned to the satisfaction of BNHS.

4. Unless specified to the contrary, all material should conform to ISI specification and be of best quality and make as approved by the BNHS. Testing shall be undertaken for various materials samples; pipe lines etc. and as may be directed by the BNHS at the risk & cost of the Contractor.

5. All G.I pipes (except concealed pipes and underground pipes) and brackets and fixtures and manhole covers shall be painted with 2 coats of synthetic enamel paints of approved brand over a coat of Red-oxide Primer/ Red lead primer, as directed.

6. All concealed and underground G.I pipes and specials shall be painted with 2 coats of bituminous paint & primer of approved brand as directed by BNHS.

7. All priming and painting work shall be carried out to the satisfaction of the BNHS and cost thereof shall be covered in the rates of all the respective items.

8. The Plumbers shall obtain the drainage completion certificate and the certificate of adequate water supply from the Local statutory body / Panchayat / Municipality and shall abide by the rules and regulations prescribed by them or other authorities concerned, wherever necessary.

9. In case of concealed G.I pipe work, the chases in floors and walls shall be made as approved by BNHS. The pipes shall be secured tightly to the walls with clamps. The chases shall be filled with cement concrete 1:2:4 (1 cement: 2 coarse sand: 4 graded stone aggregate of 20mm nominal size). Payment shall be made for cutting chases and filling in the cement concrete and making them good as per relative item in the Bill of quantity for renewal items as per relevant specifications.

10. The cast iron pipes shall be laid exposed on wall with M.S. holder bat clamps made from 32mm thick. M.S. flats of approved design and required size. A clear minimum gap of 25mm between the wall and the pipe shall be left. All the clamps shall be embedded in cement concrete blocks sized 20cm x 20 x 10 cms. in 1:2: 4 mix (1 cement :2 coarse sand : 4 graded stone aggregate - 20mm. nominal size) . The holes in walls and RCC work shall be made at point approved by BNHS, and shall be made by the Contractors. Payment shall be made as per respective item in the Bill of Quantities complying with relevant specifications.

11. All plumbing and sanitary fixtures, pipes and pipe fittings, traps etc., which are to be embedded into the concrete or masonry work or other building work shall be placed in position and embedded for concealed at the time of casting of concrete and during the work shall be placed in position and embedded for concealed at the time of casting of concrete and during the work of construction. In case where chasing or cutting of concrete, masonry, or other structural or constructional work is unavoidable, the location of such fittings, pipe lines and traps etc., shall be chalked out at the various places and the cutting, chasing or disturbing of the construction work shall be proceeded only after the due approval of BNHS.

12. All cuttings, chasing and fixing work shall be completed before commencement of any plastering, tiling or finishing work. Any rectification required shall be done at the risk & cost of the Contractor to the entire satisfaction of BNHS.

13. Galvanized iron pipes of "TATA" make of "Medium" quality, E.R.W. as per IS – 1239, P-I; and Pipe Fittings shall be of "Heavy" quality, as per IS – 1239, P-II, of Galvanized Malleable Cast Iron, with Material code conforming to IS-1879 of "HB", or "NB" , "Zoloto", Leader, "JSI" or equivalent Brand.

Test certificates from the manufacturer shall be submitted by the Contractors. Over & above the submission of test certificates; BNHS may also ask to the Contractor's for further testing of samples in Govt. laboratories/test houses at the risk & cost of the Contractor.

14. Samples:

In all cases samples of the materials proposed to be used shall be submitted for approval of the BNHS, before taking up the work in hand and the samples shall be well preserved at site by Contractor at his own risk & cost.

15. Materials, Workmanship & Samples:

All the materials and workmanship are to be of the best possible description and to the entire satisfaction of BNHS and the Contractors shall immediately remove from the site any materials and /or workmanship which, in the opinion of BNHS, is defective or unsuitable and shall substitute proper materials and /or workmanship forthwith at Contractor's risk& cost.

16. The Contractors shall, if required by BNHS, arrange to test material and / or portions of the works at his own cost in order to prove their soundness and efficiency, physical & chemical properties from Govt. laboratories / test houses. If after any such test, the work or portion of works is found in the opinion of the BNHS, to be defective or unsound, the Contractor shall pull down and re-execute the same at his own cost. DEFECTIVE materials shall be removed from the site within 7 days from receipt of such order at his risk & cost. No extra claim whatsoever shall be entertained by BNHS.

Wherever reference has been made to Indian Standard or relevant specifications or any other specifications, the same shall mean to refer to the latest specifications irrespective of any particular edition of such specifications being mentioned in the specifications or schedule of quantities. In case of any dispute, the decision of BNHS shall be final & binding on the Contractor.

Bidders should note that the quantities in the Bill of quantities are approximate and are subject to variation to any extent.

This Technical specification shall be read in conjunction with other part / specification of the contract, viz. GCC SCC etc.

BNHS shall have the right to modify / change the working drawing even after issue to the Contractor.

II. MATERIALS:

General: a) All materials shall be of best of their kind and shall conform to the latest Indian Standard specifications.

b) A set of specification samples of all approved materials shall be kept well preserved at site, cost of which is to be borne by the Contractor.

1.0 SANITARY WARES:

All sanitary wares and fittings shall be of first-class quality white vitreous China as manufactured by Hindware, or Parryware or Cera and sample brand approved by BNHS prior to the procurement in bulk by the Contractor.

Stainless steel sinks and draining board shall be of best quality stainless steel of "Imagine" SS Sink from "Hindware"/ "Nirali" / "Parryware" with sample and brand approved by BNHS prior to the procurement in bulk by the Contractor.

2.0 CAST IRON SOIL & WASTE PIPE:

All cast iron soil pipes shall be of Sand cast with Socket & Spigot ends of standard make. The thickness and specification shall conform to Indian Standard specifications IS: 3989- "Centri" cast.

Pipes and fittings shall be true to shape smooth cylindrical, their inner and outer surfaces being as nearly as practicable concentric.

Pipe when tested for soundness by striking with a light hand- hammer shall emit a clear ringing sound. The pipes shall be free from cracks, laps, pinholes or other imperfection and shall be neatly dressed and carefully felted.

The fittings shall be of easy clean type. The access door fittings shall be designed so as to avoid dead spaces in which filth may accumulate. Door shall be provided with (3mm) rubber insertion packing and when closed and bolted, these shall be water tight.

Pipes and fittings shall be supplied without ears. Each pipe fittings shall have the trade mark of the Manufacturer and nominal size suitably marked on it.

M.S. stays and clamps shall be made from minimum 1.6mm thick M.S. flat of minimum 30mm width bent to the required shape and size to fit tightly on the socket, when tightened with screw bolts. Lead to be used for the jointing of the pipes shall be refined lead of best quality.

Floor traps shall be of approved make, „P" type with minimum of 2" (50mm) water seal. At the top of each of these Floor Traps there shall be provided with 5" dia.(125mm) CP brass circular Grating of approved make.

These shall be Sand Cast iron pipes (class „SWR") conforming to Indian Standard specification IS: 3989- "Centri" cast.

Sample and brand / make approval shall be done by BNHS prior to procurement in bulk quantities by the Contractor. BNHS at its discretion may ask the Contractor for sample testing through Govt. test house / laboratories at the risk and cost of the Contractor.

2.1 Lead Caulked Joints:

The annular space between the socket and spigot will be first well packed in with spun yarn leaving 25 mm.(1") from the lip of the socket for lead . the joint may be headed by using proper leading rings or if they are not available , by wrapping a ring of hemp rope covered with clay round the pipe. The lead shall be rendered thoroughly fluid and each joint filled in one pouring. Before caulking, the projecting lead shall be removed by flat chisel and the joint caulked round with proper caulking tools and a hammer of 1 to 1.1/2 kg (2 to 3 pounds) in weight in such a manner as to make the joint quite sound. After being well set, the joint is to be flush, neat and even the sockets. The specifications etc, shall comply to the relevant IS & CPWD specifications.
The approximate depth and weight of pig lead for various diameters of C.I pipes and specials shall be as given below (as a guide-line) :

LEAD FOR DIFFERENT SIZES OF PIPES

Nominal Size of Pipe (mm)	Lead/Joint (Kg.)	Depth of lead Joint (mm)
80	1.8	45
100	2.2	45
125	2.6	45
150	3.4	50
200	5.0	50
250	6.1	50
300	7.2	55
350	8.4	55
400	9.5	55
450	14.0	55
500	15.0	60
600	19.0	60
700	22.o	60
750	25.0	60

Note :

The quantity of lead given in the table are provisional and a variation of 20 percent is permissible, at the discretion of BNHS. The approximate depth and weight of pig lead for various diameters of C.I pipes and specials shall be as per relevant IS & CPWD specifications.

2.2 Smoke Testing:

All CI Sewer & Waste pipes and fittings including joints will be tested by a smoke test and left in working order after completion. The smoke test shall be carried out as stated under. No extra payment will be made for the tests. Smoke shall be pumped into the brains at the lowest end from a smoke machine which consists of a blow and burner. The materials usually burnt are greasy cotton waste which form clear pungent smoke which is easily detectable by sight as well as smell if leaking at any point of drain.

the Contractor will have to rectify all defects traced in such tests at his own expense to the complete satisfaction of the BNHS. The test shall be carried out at the risk & cost of the Contractor at Site, in presence of BNHS complying to the relevant IS code & relevant specifications.

2.3 Testing of Materials and works:

As and when required by the BNHS, the Contractor shall arrange to test materials and /or portions of works at his own cost to prove their soundness and efficiency. if after tests, any materials, work or any portions of work are considered defective or unsound by the BNHS, the Contractor shall remove the same from the site forthwith at his own risk & cost. No extra claim for this or for any rectification / modification shall be entertained by BNHS. All testing shall be guided by relevant IS code & relevant specifications at the risk & cost of the Contractor.

3.0 G.I PIPES AND FITTINGS:

All G.I. pipes shall be of galvanized iron "Medium" quality (as per IS-1239, P-I) of "TATA" make unless otherwise specified or separately / specifically approved / allowed by BNHS. All fittings shall be of „HB", or „NB", „Zoloto", „Leader" brand or other equivalent make bearing ISI certification mark. The pipes shall be seamless screwed of socketted conforming to the requirement of IS : 1239-1985. These shall be of the diameter (nominal bore) specified. The pipes and sockets shall be cleanly finished, well galvanized in and other defects. All screw threads shall be clean and well cut. the ends shall be cut cleanly and square with the axis of the tube. Sample tests for physical & chemical properties may be asked for by BNHS at the risk & cost of the Contractor from Govt. laboratories / Test houses over & above submission of Manufacturer's Test certificates.

4.0 (FULL WAY) GATE VALVES:

These shall be of Bronze / Gun metal (PN-10) or (PN-16) quality of "ZOLOTO" or "SANT", „Leader" conforming to the relevant IS specifications and tested to 21 kg. per sq. cm. for 2 minutes. Necessary Test certificates shall be submitted by the Contractor with warranty from the manufacturer as asked for by BNHS.

5.0 C.P. TOILET FITTINGS:

5.1. C.P. Brass Bib Cocks, Two-way Bib Taps, Stop cocks, Angle Stop cocks, Pillar cocks :

These shall be of Chromium plated Brass „heavy" quality, threaded to BSPT (F) of Jaquar/Marc/Hindware/Essco make (as per B.O.Q) conforming to IS specification as per IS- 8931. Sample approval shall be taken by the Contractor from BNHS prior to procurement in bulk quantities with samples well preserved at Site at the risk & cost of the Contractor.

C.P. Brass Pillar Cock (with control box) (for wash basins):

This shall be of Jaquar/Marc/Hindware/Essco make with wall mounted Control Box below the Wsah Basins, threaded to BSPT (F) and conforming to IS-8931. Sample approval shall be taken by the Contractor from BNHS prior to procurement in bulk quantities with samples well preserved at the risk & cost of the Contractor.

5.3 Health Faucets:

This shall be of Jaquar/Marc/Essco model, to be fitted with the two-way bib cocks inside each W.C.s (except Driver"s Toil), threaded to BSPT (F) and conforming to IS-8931. Sample approval shall be taken by the Contractor from BNHS prior to procurement in bulk quantities with samples well preserved at Site at the risk & cost of the Contractor.

6.0 BALL FLOAT VALVE:

The ball float valves shall be of brass body of high pressure or of Pressure as specified. The Ball valve shall be of brass and the float of PVC of high pressure withstanding capacity. The minimum gauge of PVC Ball Float, the body of the ball valve shall be capable of withstanding a pressure of 200 lbs. per sqm.(14 kg. per sqm). The ball valve shall conform to IS specification No. 1708-1962. Necessary test certificates with warranty shall be submitted from manufacturers by the Contractor to BNHS when asked for.

7.0 SUBMERSIBLE PUMP OF BORE WELL
(To supply underground water from subsoil aquifer to the R.C.C underground tank.)

Supply, installation in bore well, testing & commissioning of submersible multistage pump motor set Capacity- 16.5 M3/Hr. max (i.e., 275 LPM) at 50 M head with 'Submersible' type suitable HP Rated Motor (min. 3.7 kw , 5HP) at 2900 / or 1450 RPM; including supplying of 35 Mtr. long suitably rated & suitable cross-sectioned 3 1/2 -core "Submersible" type PVC insulated Sheathed Armoured Cable with Cable Clamps (Cable size as per Manufacturer's standard) as required, and including 415 Volt, 3- phase, 50 Hz Star-delta Starter Panel suitable to withstand +/_ 10% voltage variation and +/_ 3% frequency variations with Switch Fuse unitsand Isolators etc, of approved Make/Brand, including all other necessary accessories complete as required.

(Make: - CALAMA / KSB / CRI).

Necessary test certificates with "warranty" from manufacturers as asked for by BNHS shall have to be submitted by the Contractor with functional testing at site at the risk & cost of the Contractor in presence of BNHS's representative.

7.1 Testing of Water Sample

Necessary chemical and bacteriological tests as per IS specifications for potable water shall have to be done by the Contractor at his risk & cost from Govt. laboratories / test houses as directed by BNHS prior to commissioning of the Project.

7.2 Bleaching Dosing Tank

The bleaching dosing tank as shown in the drawing should be constructed and the dosing shall comply the specification & requirements of relevant IS code & specifications.

8.0 WATER LIFTING PUMP FROM UG TANK TO TERRACE TANK

It shall be of horizontal centrifugal type pumps for transfer of treated water from U/G Domestic Treated Water Reservoir to the Terrace Tanks of both Hostel Block and Training Centre to fill the Terrace Fire Tank first, which will re-circulates to the adjacent Terrace Domestic tank to store the treated water suitable to suit the drinkable water quality (as per IS-10500). The Treated Water from the individual Terrace Tank shall be distributed „Down-Gravity" to respective individual Toilets.

(Treated water lifting pumps should be with C.I. Impeller, integrally coupled with submersible type 3 – phase 2900 R.P.M., 415 Volts, A.C. Motor, capable to withstand a voltage variation of (+/-) 10% and frequency variation of (+/-) 3%, including Pump Control Panel).

Pump of Capacity – 162.0 LPM @ 34.0 M head – with 2.2 KW (3 H.P) Motor input, 2900 rpm 3-phase integrally coupled Motor.

(To be located inside the Treated Water U/G Tank)
(Make- Kirloskar/KSB/Crompton Greaves).

Necessary test certificates with "warranty" from manufacturers as asked for by BNHS shall have to be submitted by the Contractor with functional testing at site at the risk & cost of the Contractor in presence of BNHS's representative. GLOBE

VALVE :

Bronze / Gun-metal Globe valve, rising / non-rising Spindle type (IS-778), screwed in Bonnet, provision of repacking under pressure, Teflon Gland packing, Class-I, with 'OPEN'/ 'SHUT' indicator and locking device, and also with C.I. Wheel of approved quality (screwed end).

(Make :- Zoloto / SBM / Leader)

It shall be of Bronze body Globe Valve with C.I. Wheel, screwed-in Bonnet, rising Spindle, Lubricated Gland Packing, conforming to IS-778, class-I, Bronze Disc & Disc nut, Brass Stem, with Asbestos Gland packing, and valve of approved quality (screwed end-female threaded).
Necessary test certificates with warranty from manufacturers as asked for by BNHS shall have to be submitted by the Contractor with functional testing at site at the risk & cost of the Contractor in presence of BNHS's representative.

10.0 PRESSURE REDUCING VALVE:
(At inlet main to every individual toilets and kitchen/canteen, except the top floor)

It shall be of 50mm and 32mm nominal diameter of Rubber Diaphragm type Pressure Reducing Valve of Bronze Body / Bottom Cover & Lock-nut (as per IS- 318 LTB 2), Spring loaded, screwed (female) end as per B.S.-21 class with reduced Set pressure range (Up-stream - to - Down-stream) of 3.5 Kg. / sq. cm. - to - 1.0 Kg. / sq. cm., with C.I. Camber & Bonnet, Seat Ring & Stem of S.S. (AISI 410), Bolt/nut & Tommy Bar of M.S., C.I. Spring Disc & Carbon Steel Spring, & EPDM Diaphragm, C.A.F. Gaskets (IS- 2712, Gr.-C), and the Valve with a Test Pressure (Hydraulic) of 35 Kg. / sq. cm. & with S.S. Screw / bolts / washers etc., and also with Teflon Thread Seal etc., all complete.

(Make - ZOLOTO- Product Catalogue no.-1040 / Leader)
Necessary test certificates with warranty from manufacturers shall be submitted by the Contractor, as asked for by BNHS. The functionality shall be tested at site in presence of BNHS's representative at the risk & cost of the Contractor.

11.0 NON-RETURN VALVE (N.R.V.):

Bronze body "VERTICAL -LIFT" type Non-Return ("Check") valve with S.S. (AISI-410) body Seat Ring, two-piece design, S.S.(AISI-410) Disc, Screwed to BSPT-female (BS-21), with necessary 'Teflon' Thread Seal, including accessories.

(Make - ZOLOTO- Product Catalogue no.-1045 / Leader)
(At Submersible Raw water Supply Pump Discharge pipe at the U/G Reservoir).

Necessary test certificates with warranty from manufacturers shall be submitted by the Contractor, as asked for by BNHS. The functionality shall be tested at site in presence of BNHS's representative at the risk & cost of the Contractor.

12.0 GATE VALVE (BRONZE BODY):-

It shall be of 40mm nominal diameter of Gate Valve of Bronze Body, hand wheel operated, screwed (female) end as per B.S.-21 class with Non-Rising Spindle, Screwed in Bonnet, and Lubricated Gland packing, & with a provission of re-packing, Valve conforming to IS- 778, Class -I, outer body with Bronze conforming to IS-318 LTB 2, Bonnet, Stuffing Box & Gland of Bronze/ forged Brass conforming to IS-318 LTB 2 / or IS-6912 FLB, Brass Stem, Bronze or Brass Gland nut, with C.I. Hand wheel conforming to IS-210 Gr.- FG 200, & with S.S. Screw / bolts / washers etc., and Valve Test pressure of 1.0 M Pa, and also with Teflon Thread Seal etc., all complete.
(Make - ZOLOTO- Product Catalogue no.-1035 / Leader)
(At Submersible Pump Discharge pipe).

Necessary test certificates with warranty from manufacturers shall be submitted by the Contractor, as asked for by BNHS. The functionality shall be tested at site in presence of BNHS's representative at the risk & cost of the Contractor.

13.0 NON-RETURN VALVE (N.R.V): C.I. BODY:-
(At Hydro-pneumatic Pump Discharge pipe)

These should be of C.I. Body, Check valve, Horizontal "Lift" – type with PN – 10 rating, with M.S. "Slip-on" type matching Flanges, along with CAF gaskets and appropriate M.S. Bolts, nuts, plain round Washers etc, all complete
(Make:- "Zoloto", code- 1067) / Leader)
Necessary test certificates with warranty from manufacturers shall be submitted by the Contractor, as asked for by BNHS. The functionality shall be tested at site in presence of BNHS's representative at the risk & cost of the Contractor.

14.0 AIR-RELEASE VALVE : BRONZE/GUN METAL BODY:-
(At Water Supply Lie top to different Blocks & to Kitchen pipe Riser top)

It shall be of Bronze / Gun metal body "Parallel Slide" – "Blow-off"valve with BS-10 Table-H / E Flanged ends, sliding action Discs, spring loaded, rack-pinion arragt., S.S Discs, Body Seat Ring of S.S., Grahite Asbestos packing, M.S. Key, with Hyd. Test pressure of 500 p.s.i.g, with adjustable „OPEN" / „SHUT" arragt. of approved quality (Flanged end)
(Make:- "Zoloto", Code- 1052 / Leader)
Necessary test certificates with warranty from manufacturers shall be submitted by the Contractor, as asked for by BNHS. The functionality shall be tested at site in presence of BNHS's representative at the risk & cost of the Contractor

15.0 BLOW-OFF VALVE : BRONZE / GUN METAL BODY :-
(At Water Supply delivery Main Line Hydro-pneumatic system for blow-off due extra pressure in main back to the U/G treated tank)
It shall be of Bronze / Gun metal body "Parallel Slide" – "Blow-off" valve with BS-10 Table-H / E Flanged ends, sliding action Discs, spring loaded, rack-pinion arragt., S.S Discs, Body Seat Ring of S.S., Grahite Asbestos packing, M.S. Key, with Hyd. Test pressure of 500 p.s.i.g, with adjustable „OPEN" / „SHUT" arrangement of approved quality (Flanged end).
(Make:- "Zoloto", Code- 1052 / Leader)
Necessary test certificates with warranty from manufacturers shall be submitted by the Contractor, as asked for by BNHS. The functionality shall be tested at site in presence of BNHS's representative at the risk & cost of the Contractor.

16.0 DRAINAGE- STONE WARE PIPES:

All pipes shall be of best salt glazed variety conforming to IS specification. The pipes shall be free from visible defects such as fire cracks or hair cracks. The glaze of the pipe shall be free from blisters. The pipes shall conform to IS: 651-1965.

17.0 SANITARY INSTALLATION :

Sample approved shall be done prior to bringing in bulk quantities at site by the Contractor.

17.1 The W.C. Pans shall be of white vitreous China Wall mounted Pattern with C.I. Chair Bracket of fitted with „P" or „S" trap (with a conversion bend) of vitreous China with effective 2" seal and 2" vent as per IS : 771-1963 & IS:2556 (Part II & VII) , 1967.

17.2 Fixing:

The W.C. Pan shall be laid in floor sloped towards the pan in a workman like manner, care being taken not to damage the pan in the process of fixing. It shall be fixed on a base of cement concrete 1: 3: 6 mix. (1 cement: 3 coarse sand: 6 stone ballast 40 mm and down gauge) taking care that the cushion is uniform and even without having any hollows between the concrete and pan. The joint between the W.C. pan and the trap shall be made with cement mixed with water proofing compound and made leak proof.

17.3 Flushing by PVC „Low Level" Cistern : (manually)

The flushing of W.C. pan shall be done by "Hindware" / Parryware / Cera / Neycer make, PVC „Low Level" Cistern- manually operated with push lever.

17.4 Brackets : (for Wall mounted W.C.- fixing)

The fixing bracket of Wall mounted W.C."s should be of C.I. „Chair" Bracets to remain fully concealed & embedded in wall and partially in floor finish. The W.C. shall be fixed to the chair Bracket with proper galvanised fixing Bolts, Nuts, and Wahers etc, to the satisfaction of the Engineer- in charge.

17.5 Flush Pipe :

The outlet of flush pipe from the cistern shall be of 32 mm (1.1/2") rigid P.V.C. (as per ASTM D 1785), schdl.-40 pipe to remain concealed inside the wall & finish upto the mouth of the Inlet port of the „Wall hung" W.C."s, and that shall be connected with the W.C. pan by means of an approved type of joint.

17.6 Seat & Lid :

These shall be of black plastic or any approved matching colour hygienic seat and lid or as specified with rubber buffers, CP brass hinges and screws of standard „Hindware" or „Parryware" makes relative to the or equivalent approved Models & makes as in the schedule of Quantities.

18.0 URINALS :

The urinal basin shall be flat back of white vitreous China of specified size. It shall be fixed in position by using wooden plugs and screws at a height such that the outside bottom of Urinal Basin remains at 600 mm. from the finished floor level. The Urinal Basin shall be of "Flat-back-Large" type. Standard height of the Urinal Basins shall be as per the respective Manufacturer's standard. At least 200mm is to be given for fixing the "Jaquar" Sensor Installation Box from the top of the urinal (where the CP Spreader inlet Hole), if such installation is directed by BNHS. Each urinal shall have 32 mm. dia. CP Bottle Trap with connected CP Waste Pipes, CP Waste Couplings etc, (as per the drawings).

18.1 Waste Pipes-concealed & Traps :

Each concealed Waste pipes (in proper slope) from the Urinals shall have 32 mm. dia. Rigid PVC (ASTM D 1785), schdl.-40) and this shall be further connected to 40 mm. lead of PVC waste pipe conforming to ASTM D 1785, complete with G.I. unions, elbows, tees (equal or unequal) (as per IS-1879) of approved make as specified in the schedule of quantities, including wiped plumber joint complete with unions shall be terminated upto the mouth of respective extension pieces of the 100mm dia C.I. „P" traps (below floor finish).

The main and distribution pipes fittings and clamps shall be of C.P brass unless otherwise specified in the schedule of quantities, distribution pipes shall feed the urinals with C.P. brass spreaders of approved make.

18.2 Painting :

In case of cast iron flushing cisterns , painting shall be done as specified in the Bill of quantity.

19.0 KITCHEN SINK :

The above item shall be of Salem Stainless Steel Kitchen Sink - (AISI-304, conforming to IS-13983), Single Bowl, built with superior steel, with Bowl size not less than- 560 x 410mm and with Bowl depth of 205mm to 215mm; and total overall size - 1145 x 510mm, with a provision of a Drain-board, also including with 40mm Salem Stainless Steel Unique Waste Coupler and Coupler knob with C.I. / MS fixing Brackets, and C.P. screws/washers etc.

(Make - Hindware / Parryware / Nirali)

19.1 Fittings :

Each Sink shall have single pillar tap (Sink Cock with swinging lever of "Jaquar", model-Clarion). It"s a special tap for the type of the sink specified and other fittings as specified , of Jaquar/ Marc / Essco make 40 mm (1.1/2") C.P. brass waste (CP) . C.P. brass angle valve with inlet connection of C.P. brass chain and rubber plug.

19.2 Waste Connection :

Waste pipe shall be of 1.1/2" dia. (32 mm.) rigid P.V.C. (concealed) pipe of approved make (as per ASTM D 1785), complete with unions. This shall discharge into a Floor trap.

19.3 Fitting :

Sinks shall be provided with 1/2"(15 mm C.P. brass valve) mixing fitting of „Jaquar", or „ESSCO" make complete with swinging spout.

19.4 Waste Connection :

The waste pipe shall be of PVC 1.1/2" (32 mm.) dia. As per ASTM D 1785, discharging upto the Floor trap. The rates shall include the cost of all materials and labour involved in all the operations described above.

20.0 TOILET REQUISITES :

Sample approved shall be done prior to bringing in bulk quantities at site by the Contractor.

20.1 Mirror :

Mirrors shall be of 6.0 mm. thick plate glass Saint Gobain / Modi-guard / Ashai make or approved equivalent make. The glass shall be uniformly silver plated at the back. Silvering shall have a uniform protective coating of red lead paint. The mirror shall have Plastic moulded frame of approved quality and colour. The mirror and its 6mm thick hard backing shall be fixed on the wall face to wooden cleats with C.P. brass screws and washers.

Toilet paper holder shall be of chromium plated as specified in the B.O.Q.

20.2 CP Robe Hooks (with double/ single Forks):

Theses should be of CP Robe Hooks with double / or single forks, of Hindware / Jaquar / Essco supported on anodized chromium plated base, fixed with 40mm long screws, rawl plugs etc., all complete.

WATER CLOSETS :

Samples shall have to be got approval from BNHS prior to bringing in bulk quantities at site by the Contractor.

21.1 European type water Closets (EWC) : "Floor mounted type"
(Make - Hindware / Parryware / Neycer)

The W.C. Pans shall be of white Vitreous China Wall mounted Pattern with C.I. Chair Bracket of fitted with „P" or „S" trap (with a conversion bend) of vitreous China with effective 2" seal and 2" vent as per IS : 771-1963 & IS:2556 (Part II & VII) , 1967.

Fixing:

The W.C. Pan shall be laid in floor sloped towards the pan in a workman like manner, care being taken not to damage the pan in the process of fixing. It shall be fixed on a base of cement concrete 1: 3: 6 mix. (1 cement: 3 coarse sand: 6 stone ballast 40 mm and down gauge) taking care that the cushion is uniform and even without having any hollows between the concrete and pan. The joint between the W.C. pan and the trap shall be made with cement mixed with water proofing compound and made leak proof.

22.0 FLUSHING BY PVC FLUSHING CISTERN: (MANUALLY)

22.1 Brackets: (for wall mounted W.C. fixing)

The fixing bracket of Wall mounted W.C."s should be of C.I. „Chair" brackets to remain fully concealed & embedded in wall and partially in floor finish. The W.C. shall be fixed to the chair Bracket with proper galvanized fixing Bolts, Nuts, and Washers etc, to the satisfaction of BNHS.

22.2 Flush Pipe :

The outlet of flush pipe from the cistern shall be of 32 mm (1.1/2") rigid P.V.C. (as per ASTM D 1785), schdl.-40 pipe to remain concealed inside the wall & finish upto the mouth of the Inlet port of the „Wall hung" W.C."s, and that shall be connected with the W.C. pan by means of an approved type of joint.

22.3 Seat & Lid :

These shall be of black plastic or any approved matching colour hygienic seat and lid or as specified with rubber buffers, CP brass hinges and screws of standard „Hindware" / „Parryware" / „Neycer" makes relative to the or equivalent approved Models & makes as in the schedule of Quantities.

22.4 W.C. Pan

22.4.1 The W.C. Pans shall be of white vitreous china wall mounted pattern with C.I. chair bracket fitted with „P" or „S" trap (with a conversion bend) of vitreous China with effective 2" seal and 2" vent as per IS : 771-1963 & IS:2556.

22.4.2 Fixing:

The W.C. Pan shall be laid in floor sloped towards the pan in a workman like manner, care being taken not to damage the pan in the process of fixing. It shall be fixed on a base of cement concrete 1: 3: 6 mix. (1 cement: 3 coarse sand: 6 stone ballast 40 mm and down gauge) taking care that the cushion is uniform and even without having any hollows between the concrete and pan. The joint between the W.C. pan and the trap shall be made with cement mixed with water proofing compound and made leak proof.

22.5 Flushing by Flush valve : (manually)

The flushing of W.C. pan shall be done by Jaquar / Essco / Hindware make, CP Flush valve with 32mm dia CP Control cock (Wall mounted), with push lever.

22.6 Brackets : (for Wall mounted W.C.- fixing)

The fixing bracket of Wall mounted W.C."s should be of C.I. „Chair" Bracets to remain fully concealed & embedded in wall and partialy in floor finish. The W.C. shall be fixed to the chair Bracket with proper galvanised fixing Bolts, Nuts, and Washers etc, to the satisfaction of BNHS.

22.7 Flush Pipe :

The outlet of flush pipe from the cistern shall be of 32 mm (1.1/2") rigid P.V.C. (as per ASTM D 1785), schdl.-40 pipe to remain concealed inside the wall & finish upto the mouth of the Inlet port of the „Wall hung" W.C."s, and that shall be connected with the W.C. pan by means of an approved type of joint.

22.8 Seat & Lid :

These shall be of black plastic or any approved matching colour hygienic seat and lid or as specified with rubber buffers, CP brass hinges and screws of standard „Hindware" or „Parryware" makes relative to the or equivalent approved Models & makes as in the schedule of Quantities.

23.0 RAIN WATER PIPES OF PVC (IS-13592) & PVC/CI PIPE FITTINGS & SPECIALS AS PAR IS: 1729

All Rain Water pipes and fittings shall be of PVC, conforming to the latest Indian standard specifications for rain pipes. CI pipe clips or CI holder bat clamps are to be used for proper clamping on the wall.

These shall be free from cracks and other flaws. The interior of pipes and fittings shall be clean and smooth and the pipes are to be painted outside with paints matching with the colour of the building outside wall paints.

The access door fittings shall be of proper locations and in no circumstances less than as shown in the drawings. Doors shall be provided with 3 mm. (1/8") rubber insertions packing and when closed and bolted they shall be fully water tight.

23.1 Fixing :

The pipes and fittings shall be fixed to walls by using proper holder UPVC Pipe Clips (at every 2.0 metres intervals on the outside Building exterior wall pipes, i,e., Stacks or Pipes in slopes). The pipes shall be fixed perfectly vertical or in a line as directed. The spigot end and the shoulder of the socket leave no annular space in between. All Rain water pipes shall be carried up above the roof and shall have proper UPVC Bends of required degree near the roof and at the bottom of Rain water pipes. Connections between main pipe and the branch pipes shall be made by using proper branches and bends invariable with access- doors for cleaning. All vertical pipes should be covered on top with a wire down. The pipes and fittings should be firmly attached to the wall at least 5 mm. clear of the wall & should be strongly supported at the foot upon a bed of concrete.

23.2 Joints of Pipes & Fittings (by jointed by solvent cement joints / joints with Rubber gasket insertion) for CI pipes etc.

The annular space between the socket and spigot will be jointed by solvent cement joints / joints with Rubber gasket insertion between the pipes & Pipe Fittings. This shall be done with 100% Leak-proof under Hydro-static Pressure Test under 4.0 Kg-f / cm^2 (g) pressure with a minimum Holding time of 1.0 hour and those joints after found tested OK shall be preserved and care is to be taken in such a manner so that there should be no undue load / impact / hammerrage on those tested joints so as to make the joint quite sound. After being well set, the joint is to be flushed, neat and even the sockets.

The Pipes shall be of "SWR" class.

Under some extreme conditions and with the approval of BNHS, the joints in a few locations may be considered by Solvent cement joints.

23.3 Testing :

All PVC Rain water pipes/CI pipes and fittings including joints will be tested by Hydro-static Pressure Test under 4.0 Kg-f / cm^2 (g) pressure with a minimum Holding time of 1.0 hour and those joints after found tested OK shall be tagged "Tested OK" for those portion of the tested pipe and shall be preserved and care is to be taken in such a manner so that there should be no undue load / impact / hammerrage on those tested joints so as to make the joint quite sound.

Smoke test can also may be allowed and left in working order after completion. The smoke test shall be carried out as stated under.

Smoke shall be pumped into the brains at the lowest end from a smoke machine which consists of a blow and burner. The materials usually burnt are greasy cotton waste which form clear pungent smoke which is easily detectable by sight as well as smell if leaking at any point of drain. the Contractor will have to rectify all defects traced in such tests at his own expense to the complete satisfaction of the BNHS. The test shall comply to relevant IS code & specifications and shall be done in presence of BNHS's representative at site.

No extra payment will be made for the tests.

23.4 C.I. Floor Traps :

The traps shall be of self cleaning design provided with a minimum 50 mm (2") Water seal at the Trap to arrest Foul smell there stopping it to enter into the building inside from the respective Stacks. Furthermore every Floor Trap will associated with a S.S. "Chilly" make cockroach arrestor trap with SS Circular Grating.

23.5 Waste Connections :

Waste from Wash Basins, floor traps , Sinks, Ablution Traps inside wc"s etc, shall separately discharged into the Waste Stacks that terminated & fed to the Gully Traps on the building outside ground level / Plinth protection level and shall be separately connected to (IP) Inspection Pits that leads to the Septic tank.

23.6 Anti- Syphonage (Vent) Pipes : 50mm dia C.I (sand cast as per IS-1729)

Anti-syphonage Vent pipe shall be HCI pipes of sand cast (as per IS-1729) with lead caulked joints and tob remained connected at a point with the Sewer Stack above every Junction Branches (keeping a gap of at least 450mm above the top-most Junction Branches per floor from the Stack and finally that 50mm dia Vent Stack after running parallelly with Sewer Stack joined again with the Sewer Stack by 100 x 100x 50 mm dia Inverted unequal junction (IS-1729) above the top most finish floor level at a point above all the other horizontal junction points.

In every floor with the main anti-syphonage pipe junction Tees shall be 50 mm. (2") internal diameter or as specified.

23.7 Painting :

All the exposed CI Stacks / Pipes and fittings shall be painted with two coats of synthetic enamel paint over one coat of primer of approved quality, manufacture, colour and shade to match the surroundings. The cost of such painting should be included in the Contractor"s rates for pipe work.

The surface of pipes and fittings to be painted shall be cleaned thoroughly, Red lead or other primer shall be painted as specified and allowed to dry. the finishing shall be done by painting 2 or more coats with paint in an approved colour and shade.

24.0 WATER SUPPLY:

Sample and brand / make shall be got approved by BNHS prior to bringing in bulk quantities at site by the Contractor. Necessary test certificates shall have to be submitted from the manufacturer. Over & above the submission of test certificates, BNHS may ask the Contractor for further test from Govt. test house / laboratories at the risk & cost of the Contractor.

24.1 G.I. Pipes and Fittings:

The pipes shall be of galvanized steel, ERW, (IS-1239, P-I) „Medium", screwed and socketed and shall conform to latest Indian Standard specifications for medium quality.

The pipes shall be tested to a pressure of 50 kg/sqm. (700 lbs. per sq. inch). these shall have threads and the sockets, paralleled threads complying to the relevant IS code & specifications.

24.2 Laying & Fixing:

Where pipes have to be cut or re-threaded, ends shall be care-fully filled out so that no obstruction to bore is offered.

In jointing the pipes, the inside of the sockets and the screwed end of the pipe shall rubbed over with white lead and few turns of hemp yarn wrapped round the screwed end of the pipe which shall then be screwed home in the socket with a pipe wrench. Care must be taken that all pipes and fittings are kept at all times free from dust and dirt during fixing.

24.3 Internal Work:

For internal work, G.I pipes and fittings inside and outside the walls shall be fixed either visible (not in chase) by means of standard pattern holder bat clamps keeping the pipe 12 mm (1/2") clear of the wall everywhere or concealed as specified in Bill of Quantity. When it is imperative to fix the pipe in front of house or in any conspicuous position where it looks unsightly chasing may be adopted.

All pipes and fittings shall be fixed truly vertical and horizontals or as directed by the BNHS.

24.4 External Work:

For external work G.I pipes and fittings shall be laid in trenches. the width of the trench shall be the minimum width required for working the pipes laid underground level. they shall not be less than 60 CMS (2 feet) from the ground level, and wrapped with gunny cloth dipped in hot bitumen. The work of excavation and refilling shall be done in accordance with the instruction of the BNHS.

24.5 Painting:

All internal G.I pipes and fittings shall be painted with two coats of synthetic enamel paint over one coat of red lead primer of approved quality manufacture, colour and shade as directed by BNHS. The cost of such painting shall be deemed to have been included in the rates of respective items of the B.O.Q.

24.6 Testing:

All G.I pipes and fittings shall be tested to a pressure of 7 kg. per sqm. (100 lbs. per sq. inch) as specified in the relevant IS code & specifications to ensure that pipes have proper threads and that proper materials (such as white lead and hemp) have been in jointing . All leaky joints must be made leak-proof by tightening at Contractor"s expense. BNHS may ask the Contractor to submit the necessary test certificates in this regard.

25.0 BRASS WATER FITTINGS:

All water fittings shall be of standard manufacture as approved by BNHS and shall be in all respects comply with the latest Indian Standard Specifications. the brass fittings shall be fixed in the pipe line in a workmanship like manner. Care shall betaken to see that joints between fittings and pipes are made leakproof. The fittings and joints shall be tested to pressure of 21 kg per sqm. (300lbs. per sq. inch) unless otherwise specified. The defective fittings and the joints shall be repaired or replaced.

26.0 SPECIFICATION OF WATER SUPPLY MATERIALS:

General:

a) All materials shall be of best of their kind and shall conform to the latest Indian Standard specification.

b) A set of specification samples of all approved materials shall be kept & well preserved at site by the Contractor for ready reference, cost of which is to be borne by the Contractor.

c) Over & above the list of specifications, BNHS reserves the right to ask the Contractor for fixing of materials / fittings of equivalent quality other than mentioned in the list.

27.0 DRAINAGE:

27.1 Stone Ware Pipe:

Pipes: All pipes must be new and perfectly sound, free from fire cracks and imperfection of glazing, cylindrical straight and of standard nominal diameter, length and depth of socket. They shall be hard burnt stoneware of dark grey colour and thoroughly salt glazed inside and outside. They should conform IS: 651-1965.

27.2 Trenches for S.W. Pipe Drains:

Excavation: The trenches for the pipes shall be excavated to lines and levels as directed. The bed of the trench shall be truly and evenly dressed throughout from one change of grade to the next.

The gradient is to be set out by means of bending rods and should the required depth be exceeded at any point the trench shall be refilled by means of cement concrete of the specification of the bed concrete, at the Contractor's own expense. the bed of the trench if in soft or made up earth shall be well watered and rammed and depressions thus formed filled with sand or other suitable materials as directed by BNHS before laying the bed concrete.

If rock is met with, it shall be removed to 15 cms. (6") below the level of the pipe and the trench will be refilled with concrete, sand or other suitable material as directed by BNHS to bring it to required bed level. the excavated materials shall be kept away from the edge of the trench at a distance equal to 1 Metre (3 ft.) or equal to half the depth of the trench which - ever is greater.

The trench shall be kept free from water. Shoring and timbering shall be provided wherever required.

The trench width shall be the nominal diameter of the pipe plus 36 cms. (15") but it shall not be less than 52 cms. (21") in case of all kinds of soils excluding rock and not less than 92 cms.(3 feet) in case of rock.

Wherever the drain runs deeper, the width of the trench in the upper reaches may be increased as per the directions of the BNHS.

28.0 ROAD CROSSINGS:

All road crossings shall be excavated half at a time, the second half being commenced ,after the pipes have been laid in the first half and the trench refilled. The trench at the existing road crossings shall be filled in with mud concrete for the full depth except for the 15 cms (6") layer, which shall be filled with cement concrete 1:2: 4 or as directed.

29.0 PROTECTION OF EXISTING SERVICES:

All pipes, water mains , cables etc., met within the course of excavation shall be carefully protected and supported. Such mains will be hung from timbers placed across the trench. Care shall be taken not to disturb the electrical and communication cables. BNHS may, solely at their discretion, arrange for removal of such services, at the Contractor"s cost.

30.0 LIGHTING AND WATCH:

The open trenches shall be provided with requisite fencing and watchman to guard against accidents. Red flags during day and red light during night shall be provided at the ends and at intervals along the sides of the trenches.

Sign boards with necessary wording such as "SLOW, ROAD CLOSED" etc. shall be provided at least 30 metres ahead of road crossing where the work is in progress. The precautions will be continued till the surface is restored.

Temporary bridges or planks shall be provided over the trenches for keeping open the access to private or public property.

31.0 REFILLING :

Refilling in trenches for pipes shall be commenced as soon as the joints and concrete have been passed. The refilling on the top and around the drain shall be done with great care and in such a manner as will obtain the greatest amount of compactness and solidity possible . For this purpose the earth shall be laid in regular layers of 15 cms (6") watered and rammed at each layers. All surplus earth shall be disposed off as directed by BNHS at the Contractor"s cost.

32.0 CONCRETING:

All S.W. pipes shall be laid on a bed of 15 cms. (6 ") thick cement concrete as specified with projection on each side of the pipe to the full width of the trench and surrounding the pipes all-round with 1:4:8 concrete mix.

All NP-3 RCC pipes below Road crossing / Car Parking areas shall be laid on a bed of 15 cms. (6 ") thick cement concrete as specified with projection on each side of the pipe to the full width of the trench with 1:4:8 concrete mix.
The pipes with their crown level at 1.22 Metre (4 ft.) depth and less from ground shall be covered with 15 Cms. (6") thick concrete above the crown of the pipe and slipped off to give a minimum thickness of 15 Cms. (6 ") all-round the pipe or as per construction drawing.

Pipes deeper than these shall be concreted upto haunches level with the top of the pipe.

33.0 LAYING AND JOINTING S.W. PIPES :

33.1 Laying :

The pipes shall be carefully laid to the levels and gradients shown on the plans and sections. Great care shall be taken to prevent sand etc., from entering the pipes. The pipes between two manholes shall be laid in straight line without vertical or horizontal undulations.

The pipes will be laid "socket up" the gradient. The body of the pipe shall for its entire length rest on an even bed.

33.2 Jointing :

The cement mortar joints shall be cured at least for seven days.

33.3 Testing :

All joints shall be tested to a head of 61 Cms. (2") of water above the top of the highest pipe between two manholes. The lowest end of the pipe shall be plugged watertight. Water shall then be filled in manhole at the upper end of the line. The depth of water in the manhole shall be 61 cms. (2) plus the diameter of the pipe. The joints shall then be examined. Any joint found leaking or sweating shall be remade or embedded into 15 Cms. (6") layer of cement concrete (1:2:4) in length and section re - tested, at the Contractor"s expense until satisfactory results are obtained.

34.0 GENERAL:

34.1 Under-ground Storm Water Drain Pipes:

NP-3 R.C.C. pipes are used for storm water drainage, on a concreting at pipe bed with 1:4:8 mix. The cement mortar for jointing with the Pipes and Collars will be 1:2 or that as specified in the Schedule of Quantities. Testing of joints also. will be required under a Hydro-static Pressure Test under 1.5 Kg-f I cm^2 (g) pressure with a minimum Holding time of 1.0 hour and those joints after found tested OK shall be tagged "Tested OK" for those portion of the tested pipe and shall be preserved and care is to be taken during back-filling in such a manner so that there should be no undue load I impact I hammerrage on those tested joints so as to make the joint quite sound.

34.2 Precaution:

To avoid logging of drains, both ends shall be kept plugged until the construction of manholes is completed in every respect. On completion, care shall be taken that each plug is removed and the face of the drain made smooth.

34.3 Measurements:

The measurements for providing, laying and jointing R.C.C. pipes shall be recorded for the finished length of the pipe line i.e., from inside of one manhole to the inside of other manhole.

35.0 S.W. GULLY TRAPS :

This must be new, perfectly sound free from fire cracks and other imperfections of glazing of standard nominal diameter and other dimensions . It shall be made of hard burnt stoneware of dark grey colour and thoroughly salt glazed inside and outside.

Each gully traps shall have a C.I. piping 15 x 15 Cms. (6" x 6") and one water tight C.I. cover with frame 30 x 30 Cms. (12" x 12") (inside dimensions) with machine seating faces or as specified.

35.1 Excavation :

The excavation for gully traps shall be done true to dimensions and levels as indicated on plans or as directed by the Engineer-in- Charge.

35.2 Fixing :

The gully trap shall be fixed on cement concrete foundation 70 Cms. (2"3") square and not less than 10 Cms. (4") thick.

The mix for the concrete will be 1 :3 : 6 (1 Cement : 3 Sand : 6 Stone ballast) 40 mm (1.1/2" gauge) or as specified.

The jointing of gully outlet to the branch drain shall be done similar to jointing of S.W. pipes.

35.3 Masonry Chamber :

After fixing and testing the gully and branch drain , a brick masonry Chamber 30 x 23 Cms (12" x 9") (inside in first class brick in cement mortar 1:5 shall be built with 11 Cms. (4.1/2") thick around the gully trap from the top of the bed concrete upto ground level . The space between the Chamber walls and the trap being filled in with cement concrete of the specifications of bed concrete. The upper portion of the Chamber i.e. above the top level of the trap shall be plastered inside with cement mortar 1:3 (1 cement : 3 sand) finished with floating coat of neat cement. The corners and bottom of the Chamber shall be rounded off so as to slope towards the grating.

35.4 C.I. Cover :

C.I. cover with frame 30 x 23 Cms. (12" x9") or as specified with mechanical seating faces shall then be fixed on the top of the brick masonry with cement concrete 1 : 2 : 4 and rendered smooth. The finished top of cover shall be left 15 Cms. (6") above the adjoining ground level so as to exclude the surface water from entering the gully trap.

36.0 MANHOLES, INSPECTION PITS, GULLY CHAMBER ETC. :

36.1 Manholes: (The size of Manholes) : The size specified shall be in the internal size of the manhole. The work shall be done strictly as per drawings and specifications. The following specifications shall be adopted.

36.2 Excavation: The manhole shall be excavated true to dimensions and levels, shown on the plan or as directed by BNHS.

36.3 Brick Work: The brick work shall be with best quality brick in cement mortar 1:4 , brick work in arches shall be with 1st class brick in cement mortar 1:4 , brick masonry round the pipes shall also be with 1st class brick in cement mortar 1:4 , the joints shall be made thoroughly leak proof.

36.4 Bed Concrete: The manhole shall be built on a bed of 15 Cms. (6") thick cement concrete (1 : 3 : 6) over a layer of brick flat soling.

36.5 Plaster:

Inside of the walls be plastered with 12 mm. (1/2") thick cement plaster 1:3 (1 cement : 3 coarse sand) finished with a floating coat of neat cement.

In wet ground, 12 mm. (1/2") thick cement plaster of the above specifications shall be done on the outside surface of the walls also. This plaster shall be done with waterproofing admixture as approved by BNHS. The plastering shall be done upto 30 cms.(1 foot) above the wet soil line. Extra shall be paid for plastering the outside surface wherever directed.

36.6 Pointing :

Pointing shall be done with cement mortar 1:2.

36.7 Benching :

The channels is and benching shall be done in cement concrete 1:2:4 and rendered smooth with neat cement.

The following sizes of the channels shall be adopted for the benching :-

Size of the Drain	Depth at the Centre	Depth at sides i.e. , at walls
100 mm. (4")	15 Cms (6")	20 Cms
150 mm. (6")	20Cms (8")	25 Cms
250 mm. (9")	28 Cms(11")	38 Cms
300 mm. (12")	35 Cms(14")	45 Cms

36.8 R.C.C. WORK :

R.C.C. work for slabs or lintels shall be in cement concrete 1:1$^1/_2$:3 with steel reinforcement as per details. Plain concrete, if used for fixing manhole covers, shall be of (1:2:4) proportion, unless otherwise mentioned specifically in the BOQ / drawings etc.

36.9 FOOT RESTS :

These shall be of C.I. standard / or by M. S square rod 22 mm. (7/8") or as specified and shall be galvanized or painted with coal tar. These shall be embedded in masonry in cement mortar at least 23 Cms. (9") while the brick work is in progress. These shall be fixed 30 Cms. (1foot) apart vertically and staggered laterally and shall not project more than 11 Cms., (4.1?2") from the wall.

36.10 C.I. MANHOLE COVERS :

The C.I covers shall be of tough homogeneous cast iron of „heavy" or „Medium" type as specified in the Bill of quantities, are the clear internal dimensions. The approximate weights of the various types of manhole covers with frames and their internal size will be as per specification in schedule of quantities & conform to IS : 1726-1966. Variations in weight ton the extent of 6 percent on either sides shall be permissible. the covers used in manhole on sewer lines shall invariably bear the work „SEWER" on the top and those used for storm water drains shall bear the word „S.W.D." .These markings shall be done during casting of the covers.

The frame of manhole cover shall be embedded firmly in the R.C.C slab or plain concrete as the case may be on the top of the masonry.

After the completion of the work , manhole covers shall be sealed by means of thick mortar greased. All exposed surfaces of the frames and covers shall be painted with coal tar. The cost of such paintings should be included in the Contractor"s rates for the manhole cover.

37.0 PLAIN MANHOLE (INTERNAL WORKS):

As per drawing or 60 cms. x 45 cms. (3" x 1"-6") when not mentioned / shown specifically. This type of manhole is minimum generally constructed within compounds for house drainage only. Due to shallowness and narrowness the manhole is

provided with cover with bigger opening to facilitate cleaning and repairs. Cover of size 90 Cms. x 45 Cms. (3" x 1"-6") shall be used.

38.0 PLAIN MANHOLE (EXTERNAL WORKS):

As per drawing or 1.2 X 0.9 M (4" x 3") when not mentioned / shown specifically. This type of manhole is constructed for main drainage work for depth less than 2.4 Meters (8").

When the manhole is built on the footpath ,this shall be provided with 45 Cms. (18") internal diameter light type C.I cover , when it is built within the width of the road under traffic, it shall be provided with 53 Cms. (21") internal diameter heavy type C.I cover.

39.0 LEVELS OF INVERT OF INSPECTION PITS AND STORM WATER MANHOLES :

All Invert levels as specified in the drawing to be maintained strictly as minimum requirement. All Invert levels (I.L.) given in the drawings are with respect to the (±) 0.00 level as specified in the drawings.

Unless some acute problem as per the Site conditions the Invert levels as mentioned in the drawing shall have to be maintained.

For any alterations in Invert levels as per the Site conditions (if any) shall have to be approved by BNHS before executing the job.

The invert of the smaller sewer at its junction with main shall be at least 2/3rd dia. of the main above the invert of the main . The branch sewer should deliver sewage in the manhole in the direction of main flow and the junction must be made with ease so that flow in the main is not impeded.

40.0 MEASUREMENTS :

The depth of the manhole wall be reckoned from the invert level of the channel to the top level as to the C.I cover . The depth shall be measured correct to nearest 25 mm.

41.0 HOUSE CONNECTIONS :

No drain from house fittings e.g. gully trap or soil pipe etc., to manhole shall exceed a length of 6 Meters (20 feet) unless it is unavoidable.

42.0 DROP CONNECTIONS (DROP MANHOLES) – IF ANY :

In case where branch pipe sewer enters the manholes on main pipe sewer at a higher level than the main sewer, a drop connection should be provided.

C.I. Inspection bend shall be fixed in position at right angle to the drop pipe at the level of the inlet branch drain. The plain C.I. shoe at the bottom shall be fixed in the benching cement concrete 1:2:4 (1 cement : 2 sand : 4 stone ballast ¾" size) so as to discharge into the channel (the joints be lead caulked as per specification for the cast iron pipes for water supply).

43.0 C.I. PIPE DRAINAGE :

43.1 C.I. Drainage :

C.I. pipe drainage shall be adopted (IS-3989 or IS-1729) in the case mentioned below:-

a) When the drain passes under a structure.
b) When the drain passes under a road which is subject top heavy traffic and where the covering cushion is not considered sufficient.
c) When the drain passes through a place where it is subjected to vibrations.
d) In hilly places where the slopes are very steep.
e) When drainage lines run on the surface or above ground.

43.2 Trenches :

Specifications for trenches for stoneware pipe drains will apply in this case.

43.3 Pipes :

The pipes used shall conform to the Indian Standard specifications for class "A" pipes.

43.4 Fittings :

C.I. trap with hopper , C.I inspection bends C.I. inspection Chambers etc., shall conform to Indian Standard specifications for C.I fittings.

43.5 Laying :

For laying C.I pipes and fittings , specifications for C.I water mains will apply .

The joints for pipes and fittings shall be lead caulked joints under water supply. the joints shall be leak proof.

All inspection doors etc., shall be provided with felt washers and strong brass bolts and nuts.

43.6 Testing :

Testing of joints for C.I pipes and fittings shall be done by smoke test as specified under C.I pipes and fittings.

43.7 Masonry Chamber :

C.I inspection chambers and bends for underground shall be enclosed in masonry chambers.

Note:
In case of non- availability of any particular brand of material as specified in the Bill of Quantities bidder may propose any other equivalent approved brand or material or equipment conforming to the latest I.S specifications subject to the approval of BNHS.

LIST OF APPROVED MANUFACTURER

Sl. No.	Description of Approved Material	Approved Brand / Manufacturer
1	G.I. Pipes - medium class (As per 15-1239, P - I)	TATA
2	G.I. Pipe fittings (As per IS-1239, P - II); of material with Galvanized Cast Iron Fillings, with material code conforming to IS- 1879	HB'/ "NB' I "ZOLOTO"/Leader or as approved by BNHS
3.0	C.P. on brass fittings	
3.1	CP Bib cock	ESSCO „Delux"/Marc or equivalent as approved by BNHS
3.2	CP 'Long Nose' / or' Long Body' Bib cock	Do -
3.3	CP Angle valve	Do -
3.4	CP 'Concealed' Stop cock 'Heavy' type with adjustable CP wall Flange	Do -
3.5	CP Shower Rose	Do -
4	Gun metal body Ball Float valve with PVC (High pressure) Ball Float	Zoloto" / Leader"/ "Sant" or as approved by BNHS
5	15 mm dia. PVC Connector pipe with Symet nuts at both ends. - (for Wash Basin Pillar tap & W.C. & Urinal - Cistern connections)	PRAYAG or equivalent as approved by BNHS
6	Wall Outlet Connection Flexible Pipe - 15mm dia	"Jaquar" or equivalent as approved by BNHS
7	Bronze / Gun metal-body Gate valve with threaded screwed ends, "Non-rising Spindle" type (PN-1.0) / or (PN-1.6) class	Sant / "Leader" / "Zoloto"-for Bronze body or equivalent as approved by BNHS
8	Bronze -body Globe valve with 'BSPT(F), threaded screwed ends, "Non-rising Spindle" type (PN-1.0) (PN-1.6) class	'Zoloto' / 'Leader' or equivalent as approved by BNHS
9	CI body Gate / Sluice valve with flanged ends rising Spindle" type IPN-1.0\ 1 or IPN-1.6) class	Zoloto / Leader / Sant or equivalent as approved by BNHS
10	CP Urinal Spreader-15mm (for Urinals only)	Hindware / Parryware / Neycer or equivalent as approved by BNHS
11	Soil, waste & vent pipes I and Pipe Fittings & Specials :- C.I. Centri cast (as per 15-3989)	'NECO'I 'HEPCO' 1 'KAPILANSH DHATU UDYOG (P) L TD.'
12	Sanitary wares (Vitreous chinaware) :- W.C. - (European type) – with 'S' I 'P' -Trap - Floor mounted type, without PVC Flushing Cistern, ii) Wash Basins - "Oval" pattern "Under Counter" type - with Jaquar Sensor Pillar Tap, iii) Urinal - Flat back "Large" with CP Spreader, CP Waste coupling, CP Bottle Traps with waste pipes & also with "Jaquar' Sensors with installation box.	'Hindware- /'Parryware' / 'Cera' /"Neycer" or equivalent as approved by BNHS
		Wash Basin :- 'Hindware' - /Parryware / Neycer or equivalent as approved by BNHS
		WC flushing :- PVC 'Low-level' "Dual- Flush" Cistern of 'Hindware' / Parryware / Neycer
		Urinals :- Hindware / Parryware /Neycer
		Urinal Partitions 'Division Plate' :- 'Hindwarwe'/Parryware/Neycer or equivalent as approved by BNHS
13	Wall Mirror	6mm thick „Saint Gobain" /'Modiguard' / 'Ashai' or equivalent as approved by BNHS, with 12mm thick hard-board backing
14	C.P. on brass fittings	

14.1	C.P. on brass fittings C.P. Waste Coupling, ii) C.P. Bottle Trap, iii) C.P Robe Hook, iv) C.P. Towel Rail. v) CP Two way Bib Tap	ESSCO „Delux" or equivalent as approved by BNHS
14.2	CP Toil. Paper Holder	Do -
14.3	CP Towel Ring	Do -
14.4	CP Soap Dish Holder	Do -
14.5	CP Bottle Trap with CP wall connection Pipe	Do -
14.6	CP Robe Hooks	Do -
14.7	CP "Two-way" Bib cock	Do -
14.8	CP Shower Rose	Do -
15	Rigid PVC (Concealed) Waste pipe, [Schdl.-40], (as per ASTM D .1785)- (concealed or exposed)	Supreme / Oriplast or equivalent as approved by BNHS
16	Rain Water Pipes :- PVC' - "SWR" class, ' as per (IS: 13592)	NECO'/'HEPCO'/'KAPILANSH DHATU UDYOG (P) Ltd. or equivalent as approved by BNHS
17	Rain Water Pipe Fittings :- 'Sand cast Iron' - "SWR" class, as per (IS: 13592)	DO
18	Salem Stainless Steel Sink as per AISI 304 (18/8) conforming to I.S.- 13983	"Hindware" / "Hafele" / "'Nirali' / 'Parryware' or equivalent as approved by BNHS
19	Stainless Steel Kitchen Chimneys	Kutchina / Hindware or equivalent quality as approved by BNHS
20	Stone- Ware Pipes, and S.W. Pipe Fittings	Sonali / GINNI / NIRALI or equivalent as approved by BNHS
21	C. I. Manhole Cover (I.S. - 1726) - "Medium" or "Heavy" Grade' (Light duty only on Oil/Grease Trap Chamber)	NECO' / 'HEPCO'/ Swastika / „BPL" or equivalent as approved by BNHS
22	NP-2 class R.C.C. Pipes and Pipe Fittings (i.e., RCC Collars etc. ,)	Eastern Spuncrete / „Maharashtra Concrete Industries (P) Ltd. / „HINDUSTAN" / „SUR" or equivalent as approved by BNHS
23	Stone- Ware Gully Trap	Sonali / GINNI / NIRALI / Hind or equivalent as approved by BNHS
24	C. I. Grating- (Over Catch Pit I Yard Gully Chamber), (I.S. - 1726) - "Medium" or "Heavy" Grade	NECO' / 'HEPCO' / „BPL" or equivalent as approved by BNHS
25	"Enclosed" type Analogue type Water Meter ("Bulk" Type), conforming to IS- 2373 with Calibration Certificate, including all necessary accessories	"Dashmesh" / 'Kaycee" / "Capstan" or equivalent as approved by BNHS
26	Bronze body "Parallel Slide" 'Blow-off valve ("Spring loaded, blow-off pressure sellable" type), with flanged ends, also with matching Flanges (PN-1.0) / or (PN- 1.6) class	„Zoloto" / Sant / Leader or equivalent as approved by BNHS
27	Air-Release Valve	
	Bronze body "Parallel Slide" 'Blow-off valve ("Spring loaded, blow-off pressure sellable" type), with flanged ends, also with matching Flanges (PN-1.0) / or (PN- 1.6) class	Zoloto" / Sant / Leader or equivalent as approved by BNHS
28	Bronze I Gun metal -body Ball valve with 'BSPT(F), threaded screwed ends, "quarter turn Lever operated" type IPN-1.m / or (pN-1.6) class	„Leader' / 'Zoloto' / Sant or equivalent as approved by BNHS
29	Gaskets-CAF 'Full face' conforming to IS-2712, Gr.- C; (3mm thick)	"Klinger" / "Permanite" / "Champion" or equivalent as approved by BNHS

SECTION-VIII
ANNEXURES

Annexure- I

PROFORMA OF LETTER OF UNDERTAKINGS (To be submitted by the Bidder along with his Bid) (To be executed on non-Judicial stamp paper of requisite value)

Ref..... Date.....

To

Dear Sir,

1. I/We* have read and examined the following Bidding Documents relating to the.....(full scope of work).

a) Notice Inviting Tender

b) "Invitation to Bid" (INV), "Instruction to Bidders (ITB)", "General Conditions of Contract (GCC), Scope, and other conditions of contract.

2. Technical Specification.

   a) and relevant Drawings.

3. I/We* hereby submit our Bid and undertake to keep our Bid Valid for a period of 120/180* days from the date of opening price bid. I/We* hereby further undertake that during said period I/We* shall not vary alter or revoke my/our Bid.

This undertaking is in consideration of BNHS, agreeing to open my/our* Bid and consider and evaluate the same for the purpose of award of Work in terms of provisions of clause entitled "Award of Contract" under Section "Instruction to Bidders (ITB)" in the Bidding Documents. Should this Bid be accepted, I/We* also agree to abide by and fulfill all the terms and conditions of provisions of the above-mentioned Bidding Documents.

Signature along with Seal of Co.....

(Duly authorized to sign the Tender on behalf of the Contractors)

Name.....

Designation .....

Name of Co.....

(IN BLOCK LETTERS)

WITNESS

Signature.....

Date.....

Name & Address.

Telegraphic Address.

Telephone No. Fax No.....

E-mail.....

***Strike out whichever is not applicable**

PROFORMA OF BANK GUARANTEE FOR CONTRACT PERFORMANCE
(To be executed in non-judicial stamp paper of Rs. 500.00)

Ref.....

Bank Guarantee No..... **Date :**

To

.....

.....

.....

Maharashtra

Dear Sirs,

In consideration of Bombay Natural History Society., (herein after referred to as the "Owner" which expression shall unless repugnant to the context or meaning thereof include its successors, administrators and assigns) having awarded to M/s..... ..... with registered/Head office at.....(hereinafter referred to as "Contractor" which expression shall unless repugnant to the context or meaning thereof include its successors, administrators, executors and assigns), a Contract issued by Owner's Letter of Award No... ..... .dated.. ..... for..... (scope of work) and the same having been acknowledged by the Contractor, resulting in a Contract bearing No..... dated .....Contractor having agreed to provide a Contract Performance Guarantee for the faithful performance of the entire Contract equivalent to Rs..... being (10%) (Ten Percent) of the said value of the Contract to the Owner.

We ..... (Name & Address) having its Head Office at.....(hereinafter referred to as the "Bank", which expression shall, unless repugnant to the context or meaning thereof, include its successors, administrators, executors and assigns) do hereby guarantee and undertake to pay the Owner, on demand any or all monies payable by the Contractor to the extent of Rs. ..... as aforesaid at any time up to ..... * (day/month/year) without any demur, reservation; contest, recourse or protest and/or without any reference to this Contractor.

Any such demand made by the Owner on the bank shall be conclusive and binding notwithstanding any difference between the Owner and the Contractor or any dispute pending before any Court, Tribunal Arbitrator or any other authority. The Bank undertakes not to revoke this guarantee during its currency without previous consent of the Owner and further agrees that the guarantee herein contained shall continue to be enforceable till the Owner discharges this guarantee.

The Owner shall have the fullest liberty without affecting in any way the liability of the Bank under the guarantee from time to time to extend the time for performance or the Contract by the Contractor. The Owner shall have the fullest liberty, without affecting this guarantee, to postpone from time to time the exercise of any powers vested in them or of any right which they might have against the Contractor and to exercise the same at any time in any manner and either to enforce or to for bear to enforce any covenants, contained or implied in the Contract between the Owner and the Contractor or any other course or remedy or security available to the Owner. The Bank shall not be relieved of its obligations under these presents by any exercise by the Owner of its liberty with reference to the matters aforesaid or any of them or by reason of any other act of omission or commission on the part of the Owner or any other indulgences shown by the Owner or by any other matter or thing whatsoever which under law would, but for this provision have the effect of relieving the Bank.

The bank also agrees that the Owner at its option shall be entitled to enforce this guarantee against the Bank as a principal debtor, in the first instance without proceeding against the Contractor and not withstanding any security or other guarantee the Owner may have in relation to the Contractor's liabilities.

Notwithstanding anything contained herein above our liability under this guarantee is restricted to Rs. ..... and it shall remain in force upto and including **(day/month/ year) and shall be extended from time to time for such period as may be desired M/s on whose behalf this guarantee has been given.

Unless a demand or claim is lodged on us within and including .....*(day/month/year) we shall be discharged from all liabilities thereafter.

Dated this.....day of.....20.....at.....

WITNESS

.....	.....
Signature)	(Signature)
.....	.....
(Name)	(Name)
.....	.....
(Official Address)	(Official Address)
Attorney as per Power	
of Attorney No.	
Date.....	

*** Till 3 (three) months after the validity of the Bank Guarantee.**
**** Upto 3 (three) months after the expiry of warranty/guarantee period.**

Notes:
1. The stamp paper of appropriate value shall be purchased in the name of issuing bank. .
2. The sum shall be 10% (ten percents) of the Contract Price. The performance Bank Guarantee/Security Deposit Bank Guarantee shall be valid as per terms of contract. A period of three (3) months should be added as claimed period from the last date of validity of the Bank Guarantee.

Annexure-III

PROFORMA OF EXTENSION OF BANK GUARANTEE

Ref. .....

Date:

To

.....

.....

.....

Maharashtra

Dear Sirs,

Sub: Extension of Bank Guarantee No..... for Rs..... favoring yourselves, expiring on..... on account of M/s..... in respect of Contract No.....dated ..... (hereinafter called original Bank Guarantee).

At the request of M/s..... We.....Bank, branch office at..... and having its Head Office at ..... do hereby extend our liability under the above-mentioned Bank Guarantee No..... dated..... for a further period of.....(Years/Months] from..... to expire on..... Expect as provided above, all other terms and conditions of the original bank guarantee No.....dated ..shall remain unaltered and binding.

Please treat this as an Integral part of the original bank guarantee to which it would be attached.

Yours Faithfully,
For.....
Manager/Agent/Accountant.

Power of Attorney No.....

Dated.....

SEAL OF BANK

NOTE: The non-judicial stamp paper of appropriate value shall be purchased in the name of the bank who has issued the Bank Guarantee.

Annexure-IV

PROFORMA FOR EVIDENCE OF ACCESS TO OR AVAILABILITY OF CREDIT /FACILITIES (TO BE GIVEN BY BANKER OF BIDDER)

BANK CERTIFICATE

This is to certify that M/s. ..... (FULL NAME AND ADDRESS) who are submitting their Bid to ..... against their tender specification vide Ref. No..... and date..... is our customer for the past.....years.

Their financial transactions with our bank have been satisfactory. They enjoy the following fund based and non-fund based limits including, guarantees, L/C and other credit facilities with us against which the extent of utilization as on date is also indicated below:

SI.No.	TYPE OF FACILITY	SANCTIONED ON DATE	UTILIZATION AS ON DATE .....

This letter is issued at the request of M/s.....

Sd/-

Name of Bank.....

Name of authorized Signatory.....

Designation .....

Phone No.....

Address.....

SEAL OF THE BANK

BID PROPOSAL

Bidders Name & Address:
Bid Proposal Reference:
Person to be contacted:
Designation:
Telephone No.: Mail ID:

To
The .....
.....
.....

Sub : Proposal for .....
Ref : Tender Notice no : .....

Dear Sirs,

1.0 We, the undersigned Bidder, have read and examined in detail the specifications and Bid documents of the above work and hereby propose to execute the work as detailed in specification and documents.

2.0 PRICES AND VALIDITY

2.1 Our prices stated in the bid are Firm/Variable*. Price adjustment is applicable /not applicable* in line with the bidding documents. Our quoted prices and other terms and conditions of this proposal are valid for a period of 120 days/180 days* after the date of opening of price bid. We further declare that prices stated in our Proposal are in accordance with your "Instruction to Bidders" included in Condition of Contracts of Bid documents.

2.2 We do hereby confirm that our bid prices as quoted in Quotation sheet includes all the taxes, duties and levies and confirm that any such taxes, duties and levies additionally payable shall be to our account. We further confirm that no tax & duties in any form shall be payable by the Owner except GST.

3.0 We have studied clause 25.1 & 25.2 of Section ITB relating to Tax and we hereby, declare that if any income-tax, surcharge on income-tax or any other corporate tax is attracted under the law, we agree to pay the same.

4.0 EARNEST MONEY DEPOSIT/BID GUARANTEE

We have submitted a Earnest money deposit / Bid Guarantee, in the form of .....
.....
(Please fill in alternative chosen)
for a sum of .....
(Amount in Words & Figures)
in original and two copies of the original, valid for a period of 30 days beyond the bid validity date, in accordance with documents, for packages as per the following details :

Form of Earnest money deposit /Bid Guarantee	Value of of Earnest money deposit /Bid Guarantee

We have also ensured that the above Bid guarantee furnished by us is in line with the Bid documents and complete in respect of following:

a) Value of non judicial stamp paper purchased in the name of executing bank.
b) Signature, foil name, designation and address of witness are there.
c) Complete mailing address of the Head Office of the Bank is indicated.

5.0 BID PRICE

We declare that our total bid price in Indian Rupees is given in ..... of Schedule.....submitted in Cover-III for the entire scope of work as specified in your Bidding Documents.

6.0 DEVIATIONS

6.1 We declare that the Works shall be performed strictly in accordance with the specifications and documents except for the variations and deviations, all of which have been detailed out exhaustively in the following Schedules (submitted in cover-II), irrespective of whatever has been stated to the contrary anywhere else in our proposal.

Sl.No.	Schedule	**Schedule No.**
1.	**Commercial Deviations Schedule**	Annexure-IX
2.	**Technical Deviations Schedule**	Annexure-X

We confirm that specified stipulation of following Clauses are acceptable to us and no Deviation/exceptions are taken on any account, whatsoever in the following Clauses:

a)	Terms of Payment	Clause No.20.0 of Section : IV (GCC)
b)	Earnest Money Deposit/Bid Guarantee	Clause No. 5.0 of Section: III (ITB)

c)	Contract Performance Guarantee	Clause No. 4.0 of Section: IV (GCC)
d)	Liquidity Damages for Delay	Clause No. 25.0 of Section: IV (GCC)
e)	Bid Price basis	Clause No. 3(b) of Section: III (ITB)
0	Defect Liability Period	Clause No. 9.0 of Section: IV (GCC)

7.0 BID PRICING

We further, declare that the prices stated in our Proposal are in accordance with your 'Instruction to Bidders' included in Conditions of Contract of Bid documents.

8.0 PRICE BASIS

We declare that our price components are on **FIRM BASIS/VARIABLE BASIS** (Strike out the portion which is not applicable)

9.0 QUALITY PLANS:

The bidder is responsible for the proper execution of work as per drawing. The work beyond the customer's hold points will progress only with the Owners consent. The Owner will also undertake quality surveillance and quality audit of the Contractor's/Sub contractor's works, systems and procedures and quality control activities. The Contractor farther agrees that any change in the Quality Plan will be made only with the Owner's approval. The Contractor shall also perform all quality control activities, inspection and tests agreed with the Owner to demonstrate full compliance with the contract requirements.

10.1 The Contractor also agrees to provide the Owner with the necessary facilities for carrying out inspection, quality audit and quality surveillance of Contractors and its Sub-Contractor's Quality Assurances System.

10.2 It is expressly agreed to by the bidder that the quality tests and inspection by the Owner shall not in any way relieve the Bidder of its responsibilities for quality standards, and performance guarantee and their other obligations under the Agreement.

10.3 If Is further agreed by the -Bidder that the contract performance guarantee shall in no way be constructed to limit or restrict the Owner's right to recover the damages/compensation due to poor workmanship or under any other clause of the Agreement. The amount of damages/compensation shall be recoverable either by way of deduction from the contract price, contract performance guarantee and or otherwise.

10.4 The contract performance guarantee furnished by the bidder is irrevocable and unconditional and the Owner shall have the powers to invoke it notwithstanding any dispute or difference between the owner and the bidder pending before any court, tribunal or any other authority.

10.5 This Agreement constitutes full and complete understanding between the parties and terms of the presents. It shall superseds and prior correspondence terms and conditions contained in the Agreement. Any modification of the Agreement shall be effected only by a written instrument signed by the authorized representative of both the parties.

10.0 CHECKLIST

We-have included a Check List duly filled in.

Dated this ..... day of ..... 20 .....

Signature..... in the capacity of .....

duly authorized to sign for and on behalf of .....

(IN BLOCK CAPITALS)

*Strike out the portion which is not applicable

SPECIMEN COPY OF INDEMNITY BOND

(To be executed on Non judicial Stamp Paper of a Rs.100/-)

BY THE PRESENT INDEMNITY BOND EXECUTED by me / us on this .....Day of.....20...,I/We having Registered Office / residing at .....
(herein after called "OBLIGOR / OBLIGORS" which expression shall mean and includes my / our successors legal representatives, assigns) do hereby binds myself /ourselves and also our Trust / firm ..... after having the power to bind so with the promise and undertaking in favour of the Bombay Natural History Society Trust within the meaning of sec.617 of the Indian Trust's act having registered office at Hornbill House, Mumbai, 400001 (hereinafter called as OBLIGEE, which expression shall mean and include it's legal representative, administrators assigns.

Whereas OBLIGOR / OBLIGORS has / have been awarded to execute the job / works under letter memo no.....dated..... issued by the OBLIGEE after having observing necessary formalities, the details of which is described in the schedule given hereunder as per letter mentioned herein-above and whereas the said job / works will be / likely to be done in places covered under Employees' State Insurance Act (ESI) and / or the Employee compensation Act (E. C. Act) and / or other laws relating to the Labour Management and Welfare.

And whereas according to the condition of the contract the OBLIGOR / OBLIGORS is /are under obligation to execute this Indemnity Bond before the commencement of actual execution and OBLIGOR / OBLIGORS is/are aware that unless this Indemnity Bond is executed in accordance with the condition of contract before the actual execution in accordance with law the OBLIGEE shall have the power to deem that actual work has been started within the meaning of the contract before the execution of this Indemnity Bond.

Now this indenture witnesses that I / we the OBLIGOR / OBLIGORS do hereby undertake:-

1. THAT the OBLIGEE shall not be held responsible for any type of accident which may take place during the course of work undertaken by the OBLIGOR / OBLIGORS.
2. THAT the OBLIGOR / OBLIGORS will take / adopt all safety norms in respect of each and every workmen labour personnel according to the rules or to the satisfaction of the OBLIGEE in all cases.
3. THAT the OBLIGOR / OBLIGORS undertakes/undertake to engage only those labour worker or any other personnel whether skilled or unskilled or any other person whether in technical management or non-managerial or any other capacity in the area covered under Employee' State Insurance Act who has/have insurance coverage within the meaning of Employees' State Insurance Act and further undertakes NOT to engage any person in the area covered under Employees State Insurance Act., who does / do not has / have insurance coverage within the meaning of Employees' State Insurance Act.
4. That the OBLIGOR / OBLIGORS further undertakes/undertake to engage only those labour, worker, or any other personnel, whether skilled or unskilled, whether in technical, managerial or non-managerial or any other capacity in the area NOT covered under Employees' State Insurance Act, who has life insurance for the sum assured equivalent to the amount of Compensation under the Employees Compensation Act in case of accidental death or inquiry and such insurance has been effected by the OBLIGOR / OBLIGORS.
5. THAT the OBLIGOR / OBLIGORS undertakes / undertake to indemnify and keep harmless the OBLIGEE from all claims, action, proceedings and of risk, damage, danger to any person whether belonging to / or not belonging to OBLIGOR / OBLIGORS.
6. THAT the OBLIGOR / OBLIGORS shall keep harmless the OBLIGEE from all claims, compensation, damages, any proceedings in respect of any of its employee / workmen under the Employee compensation Act or any other laws for the time being in force.
7. THAT , if during the course of execution of work as stated in the letter mentioned hereinabove issued by the OBLIGEE, it is found that the OBLIGOR / OBLIGORS has/have not complied with guidelines/formalities within the meaning of Employees' State Insurance Act or Workmen Compensation Act or any other laws relating to the Labour Welfare for the time being in force, and also has not observed the safety norms in accordance with the law to the satisfaction of the OBLIGEE, the OBLIGEE shall have the right to stop the execution of work / job and the period of such stoppage shall continue till adequate safety and other compliance mentioned hereinabove under the labour welfare legislation have been observed and such period of stoppage shall not be taken into account for the calculation of the total period of completion of work for which the OBLIGOR / OBLIGORS is responsible to complete the work / job and it will be deemed that discontinuance was due to default of OBLIGOR / OBLIGORS.
8. THAT, if at any time, due to exigency, the OBLIGEE i.e. the BNHS, becomes liable to pay any such compensation mentioned hereinabove, whether on failure of the OBLIGOR / OBLIGORS or for any other reason, the OBLIGEE shall

have the right to recover the said amount from any amount receivable by OBLIGOR / OBLIGORS or any bank guarantee deposited or anything payable whether in connection with this contract or other contract by the OBLIGEE to the OBLIGOR / OBLIGORS.

9. THAT the OBLIGOR / OBLIGATOR is / are aware and accept that for the persistent or repeated violation of any condition mentioned in this Indemnity Bond, the OBLIGEE shall have right to terminate the contract of work issued by the OBLIGEE to OBLIGOR / OBLIGATOR.

SIGNED AND DELIVERED
BY THE OBLIGOR / OBLIGORS

Signature .....
.....

WITNESS:

1) Name, Designation Signature
.....
.....

2) Name, Designation Signature
.....
.....

PROFORMA OF AGREEMENT

(To be executed on Non judicial Stamp Paper of Rs.500/-)

ARTICLES OF AGREEMENT MADE this..... day of .....in the year..... between BOMBAY NATURAL HISTORY SOCIETY, MUMBAID (BNHS), having its Head Office at "Hornbill House", Shaheed Bhagat Singh Marg, Opp. Lions Gate, Mumbai, -400001, hereinafter referred to as the "Trust" (which expression shall unless excluded by or repugnant to the context be deemed to include its successors and assigns) of the ONE PART.

AND

.....here in after referred to as the "Contractor" (which expression shall unless excluded by or repugnant to the context be deemed to include its heirs, executors, administrators, representatives and permitted assigns) of the OTHER PART.

WHEREAS the Trust invited tender vide Tender Notice No ..... (Annexed hereto) for "..... ....

AND WHEREAS in pursuance of such invitation for tenders the Contractor submitted a tender vide no. ..... dt..... the Techno-commercial part of which was opened on ..... and the Price bid was opened on ..... (the tender offer is in custody of the Trust at present).

AND WHEREAS AFTER consideration of the tender submitted by the Contractor, with clarification(s), the Trust accepted the said tender submitted by the Contractor and placed Letter of Award no. .....

NOW THERFORE, The Trust and the Contractor agree as follows:

1. The Contractor agrees to undertake the work of .... "as per Letter of Award no ..... dt.....referred to above.

2. The Trust agrees to pay the contractor as per the Letter of Award no ..... dt. .....referred to above.

3. Both the Contractor and the Trust agree that for the purpose of jurisdiction of court in regard to any dispute arising out of this agreement, this agreement shall be deemed to have been executed within the jurisdiction of the original side of the High Court, Mumbai.

IN WITNESS WHEREOF the parties have hereunder affixed their signature, on the day, the month and year written as above.

SIGNED, SEALED AND DELIVERED

..... Contractor	..... Trust
..... Witness	..... Witness
..... Witness	..... Witness

ANNEXURE-VIII

SCHEDULE FOR DEVIATION FROM THE SPECIFICATION

Tender Notice No. .....

We/I have carefully gone through the Technical Specification, the general conditions of Contract and all other terms & conditions mentioned in tender document and We/I have satisfied ourselves /myself and hereby confirm that our/my offer strictly conforms to the requirement of the Technical Specification, General Conditions of Contract and all other terms & Conditions mentioned in tender document except for the deviation which are given below:

Item	Description	Clause No.	Stipulation in Specific alien	Deviation Offered	*Remarks*

Signature with date & seal of the Bidder

Annexure-IX

COMMERCIAL DEVIATIONS

Bidder's Name & Address :

To

.....
.....
.....

Dear Sirs,

Sub : Commercial Deviations for .....

The following are the Commercial! Deviations and variations from and exceptions to the specifications and documents for the subject package. These deviations and variations are exhaustive. Except these deviations, the entire work shall be performed as per your specifications and documents.

Volume /Clause	**Reference /Page No.**	As specified in the specification	Commercial deviation and variations to the

Date :

Place : (Signature).....

(Printed Name) .....

(Designation)... .....

(Common Seal) .....

Note: Continuation sheets of like size and format may be used as per Bidder's requirements and annexed to this schedule.

Annexure-X

TECHNICAL DEVIATIONS

Tender Notice No. .....

Bidder's Name & Address :

To

.....

.....

.....

Dear Sirs,

Sub : Technical Deviations for .....

The following are the Technical Deviations and Variations from and Exceptions to the specifications and documents for the subject package. These deviations and variations are exhaustive. Except these deviations, the entire work shall be performed as per your specifications and documents.

Vol./Clause	Ref./Page No.	As specified in the specification	Technical deviation and variations to the specification

Date :
Place :

(Signature) .....

(Printed Name) .....

(Designation) .....

(Common Seal) .....

Note

1. Continuation sheets of like size and format may be used as per Bidder's requirements and annexed to this schedule.

2. The deviations and variations, if any, shall be brought out separately for each of the equipment and are to be submitted in five copies.

PROFORMA OF DECLARATION OF BLACK LISTING HOLIDAY LISTING

In the case of a Proprietary Concern:

I hereby declare that neither I in my personal name or in the name of my Proprietary concern M/s ..... which is submitting the application for enlistment nor any other concern in which I am proprietor nor any partnership firm in which I am involved as a managing Partner have been placed on black list or holiday list declared by BNHS or any central/state power utility services, except as indicated below:

(Here give particulars of blacklisting or holiday listing, and in absence thereof state "NIL")

In the case of a Partnership Firm:

We hereby declare that neither we, M/s ..... submitting the application for enlistment nor any partner involved in the management of the said firm either in his individual capacity or as proprietor or managing partner of any firm or concern have or has been placed on black list or holiday list declared by BNHS or any central/state power utility services except as indicated below:

(Here give particulars of blacklisting or holiday listing, and in absence thereof state "NIL")

In the case of a Trust:

We hereby declare that we have not been placed on any holiday list or black list declared by BNHS or any central/state power utility services, except as indicated below:

(Here give particulars of blacklisting or holiday listing, and in absence thereof state "NIL")

It is understood that if this declaration is found to be false in any particular BNHS or is Administrative Ministry, shall have the right to reject my/our enlistment/bid and if the bid has resulted in a contract, the contract is liable to be terminated.

Signature with date & seal of the Bidder

CHECKLIST

DETAILS OF DOCUMENTS UPLOADED

N.I.T. NO.		
	Technical	
Sl.No.	**Submission of documents**	**Ref. no. with validity if any**
1	Type of Firm	Proprietorship/Partnership/Ltd. Trust/Co-operative Society/Others
2	Detail communicational address along with contact number.	
3	Trade License No. with validity - for Proprietorship Firm Partnership Deed, Trade License -for Partnership Firm Incorporation certificate, Trade License - for Ltd Trust, Society Registration copy, Trade License- for Co-operative Society.	
4	EPF registration No	
5	PAN Number	
6	Professional Tax Paid Certificate No.	
7	ESI Registration No.	
8	GST registration No.	
9	Signed Bid documents as uploaded by BNHS uploaded.	Yes/No
10	Information regarding any past and current litigation with BNHS / any other NGO /State Govts. / PSU in which the bidder is involved the party"s concerned and disputed amount uploaded.	Yes/No
11	Properly filled up Annexure-I,V,XI and XII uploaded.	Yes/No
12	Properly filled up Annexure-VIII, IX and X uploaded.	Yes/No
13	List of Machinery and key personnel- The bidder along with his bid furnish a list of key personnel, tools, plant and machinery which he intends to use for the works uploaded.	Yes/No
14	Performance as prime contractor for execution of similar nature of work. Documents of Credential in the form of work completion certificates and payment certificates. Completion Certificates should contain Name of the work, Ordered Amount, Executed Amount and Date of completion of the work.	Name of relevant work with executed amount and date of completion
15	Details of work in hand uploaded	Yes/No
	Commercial	
1	**Average annual turnover during last three years (shall not be less than 30% of the estimated cost).**	
2	**Working capital in the year, proceeding the year of bid submission (shall not be less than 30% of the estimated cost).** [In case documents certifying credit facility from a scheduled Bank is submitted, the requirement given in clause no (b) shall be judged by adding available credit facility and working capital taken together.]	
3A	**Annual audited Financial Report for last three years (for whom audit of account is mandatory) uploaded**	Yes/No
3B	**For those whose audit of accounts is not mandatory, they shall submit copy of IT returns along with related enclosures (Form 3CA and form 3CB) for last five years uploaded.**	Yes/No

BILL OF QUANTITY (SCHEDULE-A , GENERAL CIVIL WORK)

S.No.	Sch. No.	Detail of Item	Unit	Total Qty.	Rate	Amount
1	1.31	Clearing jungle including uprooting of rank vegetation, grass, brush wood, trees and saplings of girth upto 30 cm measured at a height of 1 m above ground level and removal of rubbish upto a distance of 50 m outside the periphery of the area cleared.	Sqm	323.00	5	1615.00
2	1.8	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 taking out the excavated soil and depositing and refilling of jhiri with watering & ramming and disposal of surplus excavated soil as directed with in a lead of 50 meter. All kinds of soils	Cum	79.93	178	14227.92
3	3.1	Providing and laying in position cement concrete including curing, compaction etc. complete in specified grade excluding the cost of centering and shuttering - All work up to plinth level.				
	3.1.4	M10 grade Nominal Mix 1: 3: 6 (1 cement : 3 coarse sand : 6 graded stone aggregate 20mm nominal size).	Cum	37.66	3847	144864.82
4	6.1.6	Random Rubble stone masonry for with hard stone in foundation and plinth in Cement Sand mortar above 30 CM thick wall in: Cement Mortar 1:6 (1-Cement : 6-Sand).	Cum	47.40	2838	134516.09
5	11.26	Random rubble dry stone Kharanja under floor.	Cum	23.07	932	21502.75
6	1.27 (b)	Supplying and Filling in plinth with blown sand under floors including watering ramming consolidating and dressing complete including cost of sand.	Cum	59.25	450	26663.34
7	1.36	Diluting and injection Chloropyrifos Emulsifiable concentrate 20% with 1% concentration for PRE-CONSTRUCTIONAL Anti termite treatment as per IS 6313 part III as amended from time to time and creating a continuous chemical barrier under and around the column pits, wall trenches, basement excavation, top surface of plinth filling, junction of wall and floor along the external perimeter of building expansion joints, over the top surface of consolidated earth of which aproch is to be laid surrounding of pipes and conduits etc. complete as per specification (Plinth floor area only shall be measured for payment and excluding the cost of chemical emulsion) .	Sqm	87.39	47	4107.37
8	1.34	Supplying chemical emulsion in sealed containers including delivery as specified. Chlorpyriphos/Lindane emulsifiable concentrate of 20%	ltr	21.85	243	5308.99
9	4.9	Centering and Shuttering with plywood or steel sheets including strutting, propping bracing both ways and removal of formwork for foundation , footings, strap beam, raft , bases of columns etc.	Sqm	18.32	157	2876.87
10	4.1	Providing and laying in position specified grade of cement concrete for all RCC structural elements upto plinth level including curing, compaction, finishing with rendering in cement sand mortar 1:3 (1 cement: 3 coarse sand) and making good the joints and cost of plastizers(if required) excluding the cost of centering, shuttering and reinforcement. M20 grade Nominal Mix / Design Mix	Kg	2.75	4934	13561.59
11	4.13.3	Providing and fabricating reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding (including cost of binding wire) all complete up to floor five level. ('Original producers' who manufacture billet directly from iron ores and roll the bilets to produce steel conforming to IS:1786) Thermo-mechanically Treated bars (Conforming of relevent IS code)	Kg	274.86	77	21164.22
12	6.2.4	Random Rubble stone masonry with hard stone in superstructure above plinth level and upto five level above 30cm. thick walls in Cement Mortar 1:4 (1-Cement : 4-Sand).	Cum	35.73	3824	136636.11
13	6.3.4	Add extra for Random Rubble stone masonry with hard stone in Wall upto 30cm. and less thickness.	Cum	35.73	186	6646.00
14	6.4.2	Add extra for facing as per design and detailed specifications including additional cost of stones Course rubble facing Second sort.	Sqm	119.10	491	58480.06
15	12.31	Pointing on stone masonry in cement sand mortar 1:3 (1 cement : 3 sand) :				
	12.31.2	Raised and cut pointing.	Sqm	119.10	233	27751.23
16	6.108	Stone work in plain Ashlar in Supersturcture upto 4.5M height from ground level in CM 1:6 including pointing with cement stone dusty mortar 1:2 with and admixture of pigment matching the stone slab:				
	6.108.1	(A)Red sand stone or equivalent.	Cum	30.06	7538	226623.94
17	6.105	Supplying and fixing Jaisalmer stone Chhajja (including projection) 5 to 7 cm. Thick fully dressed carved with cut stone work weather dripped complete.				
	6.105.1	(A)For Tibaries	Sqm	4.91	1375	6756.75
18	6.94	Supplying and fixing Jaisalmer stone side kanwalies (Jambs) upto 15 cm. Thick fine dress including ornamental cut stone work in face complete:-				
	6.94.1	Only cobula or swastik engraved.	Cum	1.17	12125	14240.81
19	6.93	Supplying and fixing Jaisalmer stone Dassa (sills) fine dressed upto 15 cm. Thickness including panny type ornamental work.	Cum	0.84	14375	12128.91
20	6.1	Supplying and fixing Jaisalmer stone todies 7 to 10 cm thick fully dressed carved upto full depth with ornamental cut stone work complete.	Sqm	0.90	2575	2575.00

BILL OF QUANTITY (SCHEDULE-A , GENERAL CIVIL WORK)						
S.No.	**Sch. No.**	**Detail of Item**	**Unit**	**Total Qty.**	**Rate**	**Amount**
21	6.107	Supplying and fixing Jaisalmer stone rain water spouts fully dressed and moulded with cut stone work projection 45 cm. And front end 10 cm x 10 cm. And tapering to other end 15cm. X 10 cm. In hexagonal shapes with ornamental work complete.	EACH	4.00	892	3568.00
22	9.1	Structural steel work in single section fixed with or without connecting plate including cutting, hoisting (height upto 10 m), fixing in position and applying a priming coat of approved steel primer all complete.	Kg.	1233.52	72	88813.44
23	9.1.1	Add Extra if I/rail section is used	Kg.	1233.52	7.2	8881.34
24	6.52	Supply and fixing 7 to 10 cm. Soorsagar or equivalent stone chaps in lime mortar or gypsum rough dressed more than 0.60 m. length	Sqm	11.15	344	3834.91
25	10.16	Stone slab roofing on ground floor with fine grained stone slab from approved quarry including filling of joints of parapet and slab on both sides in cement sand mortar 1:4, with ceiling pointing in cement sand mortar 1 : 3 complete as per specification and instruction of Engineer In Charge	Sqm	50.01	1648	82419.78
26	10.16.1	Add extra for subsequent story	Sqm	50.06	1977.6	98998.26
27	10.17.1	Grading roof for water proofing treatment with water proffing compound Cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size)	Cum	4.77	4483	21376.85
28	10.22	Providing gola 75x75 mm in cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 stone aggregate 10mm and down gauge) including finishing with cement mortar 1:3 (1 cement : 3 fine sand) as per standard design :	Rmt	84.44	111	9372.84
29	10.23	Making khurras 450 x 450mm with average minimum thickness 50mm cement concrete 1 : 2:4 over P.V.C. Sheet 1 Mtr. x 1 Mtr. x 40micron finished with 12mm cement plaster 1 : 3 and one coat of neat cement, rounding edges and making and finishing the out let complete.	Nos	4.00	154	616.00
30	10.24	Providing & laying broken glazed titles on roof (broken glazed tiles not less than 9 Kg/Sqm) on top of hot bitumen @ 1.7 Kg/Sqm. (1.40 Kg of VG-40 (30/40)grade and 0.30 Kg/Sqm. Of VG-10 (80/100) grade) and joints filled with cement mortar 1 :2 (1 cement:2 marble dust mixed with water proofing compund all complete as per direction of Engineer-in-charge.	Sqm	98.76	317	31306.13
31	5.8.1	Half brick masonry in Superstructure , above plinth level upto floor V level using bricks of designation 75 Cement mortar 1 : 3 (1 cement : 3 coarse sand)	Sqm	37.91	583	22102.70
32	5.9	Add extra providing and placing in position 2 Nos. ,6mm Ø M.S. bar at every third course of half brick masonry .	Sqm	37.91	64	2426.37
		SUB HEAD : FINISHING WORK				
33	12.2.2	Plaster on new surface on walls in cement sand mortar 1:4 including racking of joints etc. complete fine finish : 20mm thick .	Sqm	292.10	202	59004.20
34	12.5	6 mm thick cement plaster to ceiling of mix 1:3 (1cement : 3-fine sand)	Sqm	87.39	139	12147.32
35	12.22.1	Providing and applying white cement based putty over plastered surface to prepare the surface even and smooth complete New Plastered Surface (three or more coats)	Sqm	293.54	84	24657.34
36	12.40.1	Wall painting with plastic emulsion paint of approved brand and manufacture to give an even shade including all scaffolding: Two or more coats on new work including prepartion of base with primer, putty, lippy etc complete in all respect	Sqm	293.54	80	23483.18
37	7.25.4	P & F 1st quality Heavy Duty Vitrified Double Charged tiles on floor, skirting and steps etc.in different sizes (thickness minimum 10mm) with water absortion less than or equal 0.08% and conforming to IS 15622 of approved make in all colour and shade, laid with 20 mm thick CM 1: 4 including grounting the joints with white cement and matching pigment etc complete. Size 600mm x 1200mm	Sqm	87.80	1425	125117.85
38	11.13	Precast terrazo tiles of approved make, 20mm thick with marble chips of size upto 6mm laid in floors, and landing, jointed with neat cement slurry mixed with pigment to match the shade of the tiles, including rubbing and polishing complete on 20mm thick bed of cement sand mortar 1 : 4.				0.00
	11.13.2	Medium shade using approximately 50% white cement and 50% ordinary cement.	Sqm	66.42	549	36464.58
39	7.1.3	Providing and fixing Marble stone flooring table rubbed, 15-18 mm thick over 20mm (Av.) thick base of CM 1:4 (1 cement : 4 coarse sand) jointing with white cement mortar 1:2 (1 white cement : 2 marble dust) with pigment to match the shade of the marble slab including grinding, rubbing and polishing complete. Makrana 'Adanga'. Above 3601 Cm2 Slabs	Sqm	3.00	1674	5022.00
40	7.24.1	P & F 1st quality Heavy Duty Vitrified glazed MAT tiles on floor, skirting and steps etc.in different sizes (thickness minimum 10mm) with water absortion less than or equal 0.08% and conforming to IS 15622 of approved make in all colour and shade, laid with 20 mm thick CM 1: 4 including grounting the joints with white cement and matching pigment etc complete. size 600 mm X 600 mm	Sqm	7.73	1183	9150.27
41	7.22.4	P & F 1st qualityHeavy Duty Vitrified Polished Digital tiles on floor, skirting and steps etc.in different sizes (thickness minimum 10mm) with water absortion less than or equal 0.08% and conforming to IS 15622 of approved make in all colour and shade, laid with 20 mm thick CM 1: 4 including grounting the joints with white cement and matching pigment etc complete size 600 mm X 1200 mm	Sqm	39.96	1415	56539.16

BILL OF QUANTITY (SCHEDULE-A , GENERAL CIVIL WORK)						
S.No.	**Sch. No.**	**Detail of Item**	**Unit**	**Total Qty.**	**Rate**	**Amount**
42	'7.5.1	Providing and fixing Granite stone slab mirror polished and machine edge cut in walls, pillars, steps, Shelves, Sills Counters, Floors etc. laid on 12mm (Av.) thick base of cement mortar 1:3 (1 cement : 3 coarse sand) jointing with white cement mortar 1:2 (1white cement : 2 marble dust) with pigment to match the shade of the marble slab including grinding, rubbing and polishing complete.Jhunjhunu / Jalore (Red/Choclate/Black/Pink Colour) Above 3601 Cm2 Slabs	Sqm	27.65	3028	83715.12
43	7.6.2 (i)	Extra for providing edge moulding to 15-18mm thick marble/ Granite/Kota stone counters, Vanities etc. including machine polishing to edge to give high gloss finish etc. complete as per design approved by Engineer-in-Charge. Granite/Kota Stone Work Full Edge moulding	Rmt	52.00	233	12116.00
44	7.7	Extra for fixing marble /granite stone over and above corresponding basic item, in facia and drops of width upto 150 mm with epoxy resin based adhesive including cleaning etc. complete	Rmt	52.00	24	1248.00
45	7.8	Extra for providing opening of required size & shape for wash basins/ kitchen sink in kitchen platform, vanity counters and similar location in marble/Granite/stone work including necessary holes for pillar taps etc. including rubbing and polishing of cut edges etc. complete	Each opening	1.00	256	256.00
46	9.6	Providing and fixing pressed steel door frames confirming to IS 4351 manufactured from commercial mild steel sheet of 1.25 mm thickness including hinges jamb, lock jamb, bead and if required angle threshold of mild steel angle of section 50x25mm, or base ties of 1.25mm pressed mild steel welded or rigidly fixed together by mechanical means, adjustable lugs with split end tail to each jamb including steel butt hinges 2.5mm thick with mortar guards, lock strike-plate and shock absorbers as specified and applying a coat of approved steel primer after pre-treatment of the surface including filling with CC 1:2:4(M15 grade) complete as directed by Engineer-in-charge :				0.00
	9.6.2	Profile C	Mtr.	26.77	469	12555.13
47	8.13.3.3	Providing and fixing external grade board solid core single leaf flush door shutters ISI 2202-67 marked using Phenol formal dehyderesin in glue both sides with approved steel fittings complete as per annexure 'A' : 35 mm thick . Decorative teak veneer both side	Sqm	12.12	2505	30353.09
48	8.35.2	Providing & Fixing mica of approved make for inner/outer side of shutters with fevicol & nails complete as per approved by engineer in charge. 0.8mm thick mica	Sqm	25.45	762	19389.62
49	. 16.45	Providing and fixing of uPVC Sliding windows: Frame Made from the Extruded uPVC Window Profile Section of size 106w x 50h mm having outer wall thickness of 2.5mm (+/- 0.2mm) and 3 box multi-chamber construction, White in finish, duly reinforced with 1.2 mm thick GI section. Frame shall have three track configuration, two for sliding of window shutter and one for mosquito mesh shutter. Vertical member of frame which bears the sliding shutter load shall have aluminium rail/track for smooth sliding of shutter rollers. All the four corners shall be mitered cut & thermal welded so as to form window frame. Frame shall be milled with drain and air equalizer hole in order to be water tight and for drainage of acCumulated water, if any, to outer side. Shutter : The shutter of sliding window shall be made of 39w x 69h mm Extruded 3 box multi- chamber uPVC Window Profile Section of white colour having outer wall thickness of 2.5mm (+/- 0.2mm) provided with reinforcement of 1.5mm thick GI section duly mitered cut & thermal welded at all corners and fitted with uPVC glazing bead of size 22 x 20 mm with inner and outer co-extruded EPDM/TPE-E weather seal gaskets alongwith 6mm thick ISI make plain float glass. Mesh shutter shall be made of 39w x 69h mm Extruded 3 box multi-chamber UPVC Window profile section of white colour having outer wall thickness of 2.5mm (+/- 0.2mm) provided with reinforcement of 1.5 mm thick GI section duly mitered cut & thermal welded at all corners and fitted with nylon/polymer mesh and rollers/pully.	Sqm	9.12	5158	47025.49
50	8.7(a)	Extra for providing frosted glass panes instead of ordinary float glass panes in doors, windows and clerestory window shutters. (Area of opening for glass panes excluding portion inside rebate shall be measured).	Sqm	9.12	306	2789.80
49	16.6.1	Providing and fixing double action hydraulic floor spring of approved brand and manufacture IS : 6315 marked, for doors including cost of cutting floors as required, embedding in floors and cover plates with brass pivot and single piece M.S. :With stainless steel cover plate	Nos	5.00	1426	7130.00
51	8.31	Providing and fixing bright finished Mortice lock of approved make Godrej or equivalent with pair of CP handles for doors with necessary screws etc complete (Best make of approved quality) as per direction of Engineer-in-charge.	Each	5.00	629	3145.00
52	16.19	Providing and fixing factory made P.V.C. door frame of size 50x47mm with a wall thickness of 5mm, made out of extruded 5mm rigid PVC foam sheet mitred at corners and joined with 2 Nos. of 150mm long brackets of 15x15mm M.S. square tube, the vertical door profiles to be reinforced with 19x19mm M.S. square tube of 19 gauge, EPDM rubber gasket weather seal to be provided through out the frame. The door frame to be fixed to the wall using M.S. screws of 65/100mm size complete as per manufacturers specification and direction of Engineer-in-Charge.	Rm	18.48	277	5118.96

BILL OF QUANTITY (SCHEDULE-A , GENERAL CIVIL WORK)						
S.No.	**Sch. No.**	**Detail of Item**	**Unit**	**Total Qty.**	**Rate**	**Amount**
53	16.18	Providing and fixing to existing door frames 30mm thick factory made polyvinyl chloride (PVC) door shutter made of stiles and rails of a uPVC hollow section of size 60x30 mm and wall thickness 2mm +/- 0.2mm with inbuilt decorative moulding edging on one side. The stiles and rails mitred and joined and the corners by means of M.S.galvanized/plastic brackets of size 75x220 mm having wall thickness 1.0mmand stainless steel screws. The stiles of the shutter reinforced by inserting galvanized M.S.tube of size 25x20 mm and 1mm +/- 0.1mm wall thickness. The lock rail made up of 'H' section, a uPVC hollow section of size 100x30 mm and 2mm +/- 0.2mm wall thickness fixed to the shutter stiles by means of plastic/galvanized M.S.tube 'U' cleats. The shutter frame filled with a uPVC multi-chambered single panel of size not less than 610mm,having overall thickness of 20mm and 1mm+/- 0.1mm wall thickness. The panels filled vertically and tie bar at two places by inserting horizontally 6mm galvanized M.S.rod and fastened with nuts and washers.complete as per manufacturer's specification and direction of Engineer-in-charge.(For W.C.and bathroom door shutter)	Sqm	3.15	1829	5761.35
55	9.19	Providing and fixing steel glazed doors windows and ventilator shutters of standard rolled steel section (IS 1038-1983) joints mitred and welded with steel lugs 13x3mm, 10cm. long embedded in cement concrete block 15x10x10cm. of 1:3:6 (1cement : 3 coarse sand : 6 graded stone aggregate 20mm nominal size) or with wooden plugs and screws or rawl plugs and screws with fixing clips or with bolts and nuts as required including providing and fixing of plain glass panes 4mm thick with cooper glazing clips and special metal sash putty of approved make or metal beading with screws complete including priming coat of approval steel primer, excluding the cost of metal beading and other fitting except necessary hinges of pivots steel handles peg stay etc. as required :				0.00
	9.19.4	Partly fixed and partly openable [fixed area not to exceed 33%]	Sqm.	9.34	3090	28866.78
56	12.42	Finishing walls with Acrylic Smooth exterior paint of required shade including all scaffolding. New work (Two or more coat applied @ 1.67 ltr/10 Sqm over and including base coat of water proofing cement paint applied @ 2.20 kg/ 10 Sqm).	Sqm	45.99	86	3955.48
57	12.46	Painting with synthetic enamel paint of approved brand and manufacture to give an even shade :				
	12.46.1	Two or more coats on new work	Sqm	14.01	69	966.90
58	16.21	Providing and fixing of false ceiling with grid of M.S.tube section of size 19mm X 19mm and with a wall thickness of 1mm+/- 0.2mm.The side pipe and the intermediate pipes is fixed to the roof from the top with the help of ceiling angles/wire grid shall be covered by the uPVC profile section of size 6mm X 250mm with wall thickness of 0.80mm +/- 0.2mm,with the help of self tapping screw of 6mm X 13mm, 6mm X 19mm.Necessary cutouts for electric connections, lighting, air conditioning etc, shall be provided at required place. The perimeter edge shall be covered by extruded PVC corner beading section of size 9mm X 28mm or 25mm X30mm with a wall thickness of 1mm+/-0.2mm fixed by applying cynoacrylic adhesive complete as per manufacturer's specification and direction of Engineer-in-charge.	Sqm	32.28	996	32152.08
		Total PART A				**1904095.085**
	PART B	**SANITARY INSTALLATIONS & C.P FITTINGS**				
1	1.2.	P & F Indian type white glazed vitreous china 1st quality W.C. orissa pan (IS :2556 Mark) with 100 mm vitreous china P or S trap including cutting and making good the wall and floor:				
	1.2.2	Size 580x440mm.	each	1.00	3080	3080
2	1.20	P & F Low level Flushing Cistern of 10 litres capacity (IS : 2556mark). Of approved make with complete fittings C.I. brackets duly painted, brass ball cock with ball, (IS: 1703 mark) complete including cutting and making good the wall:				
	1.20.2	PVC with PVC bend as per IS : 7231 .	each	1.00	1291	1291
3	1.4	P & F European type white glazed vitreous china 1st quality Double syphonic W.C (IS :2556 Mark) with P or S trap including cutting and making good the wall and floor	each	1.00	5198	5198
4	1.36	P & F WVC Wash basin (Ist quality IS:2556 Mark) of approved make with C.I. brackets duly painted 1 No. 15 mm C.P. Pillar cock (IS:8934 Mark) & 32 mm C.P. brass waste coupling of approved make, P.V.C Waste pipe with PVC nut 32 mm complete including cutting & making good the wall :				
	1.36.3	Size 550 mm x 400 mm	each	2.00	2598	5196
5	1.36.10	Add extra for using 25mm GI waste pipe instead of PVC waste pipe	each	2.00	90	180
6	1.44	P & F Bevelled edge Mirror/mirror with teak wood lipping around of special glass of approved make as per direction of Engineer-in-charge complete with 6mm thick commercial ply base fixed to wooden screws & washers.				
	1.44.2	other Sizes	sq Mtr	2.00	1538	3076
7	1.38	P & F Kitchen & Lab. Sink of approved make with C.I. brackets duly painted, 40 mm C.P. waste coupling, C.P. Brass chain with rubber plug, 40 mm G.I. waste pipe up-to floor level complete including cutting and making good the wall & floor :				
	1.38.9	1.0 mm thick stainless steel AISI -304 & IS 13983-1994 kitchen sink of approved make as per Engineer-in-charge with large waste coupling.				
	1.38.9.4	37 x 18 x 7 17x15x7 (with drain board)	each	1.00	5576	5576
8	1.43.3	P& F waste Pipe with all fitting P.V.C. with C.P. nut 40 mm dia	each	3.00	157	471

BILL OF QUANTITY (SCHEDULE-A , GENERAL CIVIL WORK)						
S.No.	**Sch. No.**	**Detail of Item**	**Unit**	**Total Qty.**	**Rate**	**Amount**
9	1.14	P & F lst quality WVC Urinal (IS:2556 mark) with 25mm dia G.I. waste pipe, dome waste couplings, concealed iron brackets or screws etc complete.				
	1.14.2	Flat Back Large or Half stall size 610 x 400 x 80mm	each	1.00	4637	4637
11	2.7.2	P & F Bib Cock (IS : 8931 Mark), Superior quality of approved make: P.V.C.heavy duty, 15mm nominal bore.	each	5.00	106	530
12	2.13.3	P & F 15 mm. Dia Connection Pipe of approved quality/make : PVC pipe with C.P. Brass nuts upto length, 450 mm	each	3.00	101	303
13	1.65	P & F C.P. Health Faucet with 1Mtr. Long Tube & Hook of approved make and heavy as per direction of Enginner-inCharge	each	1.00	605	605
14	2.33	Providing and fixing Superior quality CP Brass fittings of approved make as per direction of Engineer-in-charge.				
15	2.12	P & F Inlet Connection (Angle Valves) Superior quality, of approved make, for Wash basin, Gyser etc.				
	2.12.1	C.P. Inlet connection 15mm.Brass (IS : 8931 marked)	each	8.00	501	4008
16	1.81	Providing & Fixing Premium quality Bottle trap internal portion 32mm, size 250mm long wall connection pipe & wall flange as per approved by Engineer in Charge.	each	3.00	1599	4797
17	1.49	P & F Liquid Soap Container with brackets complete of approved make:				
	1.49.1	C.P. brass	each	3.00	238	714
18	1.47	P & F Towel Rail or Ring of approved quality/make:				
	1.47.1	C.P. brass Towel Rail elbow type with concealed screws size 450mm (Heavy duty).	each	3.00	468	1404
22	1.48	P & F Grating of approved quality/make:				
	1.48.5	(-do-) Square 150 x 150 x 8mm. (Anti Cockroach)	Each	5.00	358	1790
23	3.44	Providing and Fixing Unplasticized Poly Vinyl Chloride (UPVC) SWR Pipes Type B for sciland waste discharge system (IS:13592 : 1992 Marked) of approved quality /make				
	3.44.2	110 mm	Mtr	3.00	336	1008
24	3.45	Providing and Fixing Unplasticized Poly Vinyl Chloride (UPVC) SWR Pipes fittings type B for sciland waste discharge system (IS:13592 : 1992 Marked) of approved quality /make.				
	3.45.1	Coupler				
	(ii)	110mm dia	Each	1.00	108	108
	3.45.4	Bend 87.5 Dg.				
	(ii)	110mm dia	Each	2.00	155	310
	3.45.5	Bend 45 Dg.				
	(ii)	110mm dia	Each	2.00	132	264
	3.45.6	Door Bend 87.5 Dg.				
	(ii)	110mm dia	Each	1.00	193	193
	3.45.12	Pipe Clip				
	(ii)	110mm dia	Each	2.00	31	62
	3.45.30	Vent Cowel				0
		110mm dia	Each	2.00	59	118
25	2.38	Providing and fixing Chlorinated Polyvinyl Chloride (CPVC) pipes, having thermal stability for hot & cold water supply including all CPVC plain & brass threaded fittings i/c fixing the pipe with clamps at 1.00 m spacing. This includes jointing of pipes & fittings with one step CPVC solvent cement and the cost of cutting chases and making good the same including testing of joints complete as per direction of Engineer in Charge. (Concealed work including cutting chases and making good the walls etc.,)				
	2.38.2	20mm dia nominal outer dia pipes	Mtr	20.00	289	5780
	2.38.3	25mm dia nominal outer dia pipes	Mtr	20.00	376	7520
26	2.32	Supply & fixing G.I. Union ISI marked in G.I. pipe line as required complete in all respect of size :				
	2.32.2	20mm dia nominal bore	each	1.00	140	140
	2.32.3	25mm dia nominal bore	each	1.00	164	164
27	2.16	P & F Gun-metal Non-return Valve or Check Valve (IS :Make) of approved make, superior quality:				
	2.16.3	25mm horizontal	each	1.00	496	496
28	2.15	P & F Full-way Valve (IS:778 Mark) or wheel valve of approved make :				
	2.15.3	Gunmetal 25mm nominal bore.	each	1.00	529	529
29	2.26.5	P & F PVC Storage Tank ISI Marked (IS : 12701) indicating the BIS license No), of approved make with cover, 25mm dia 1M long G.I. over-flow pipe & 25 Cm. long wash out pipe with plug & socket, including making connection etc., complete of approved design: 1000 litres capacity.	each	1.00	7841	7841
30	3.27	Construction of septic Tank in all types of soil with 40 Cm .thick masonry in CM 1:6, 15 Cm thick C.C bed of 1:5:10, M-15 grade C.C floor & RCC slab covering with M15 grade c.c. floor, 50 mm thick stone slab partition walls, 20 mm thick plaster in CM 1:6 finished with neat floating cement, 4 Nos stone foot rests of approved design ,two No. 450 mm dia each Ferro cement cover with frame, earth work etc. complete as per approved drawing including disposal of surplus earth within a lead of 50 Mtr:-				
	3.27.1	Size 200x100x130 cm.(for 10 users) with 115 mm thick RCC (M-20) slab with Tor steel reinforcement 8mm ϕ @15 cm c/c bothways including shuttering complete in all respect.	Each	1.00	27322	27322

BILL OF QUANTITY (SCHEDULE-A , GENERAL CIVIL WORK)						
S.No.	**Sch. No.**	**Detail of Item**	**Unit**	**Total Qty.**	**Rate**	**Amount**
31	3.22	Construction of soakage well in all type of soil with 300 mm thick dry masonry, top and bottom 300 mm course in CM 1:6, 80mm thick stone slab, jointing of slab in CM 1 : 3, Ralthal, Kharanja, 40 mm thick M-15 grade C.C flooring , earthwork complete as per approved drawing including disposal of earth within a lead of 50 Mtr.:				
	3.22.3	Size 240 Cm. dia outside & 240 Cm. depth.	each	1.00	16100	16100
32	3.21	Construction of chamber in all type of soil with 300 mm thick masonry in CM 1:6 m,10 cm thick C.C. 1:5:10 in foundation, 20mm thick insider plaster in Cm 1:6, finished with floating neat cement, 50mm thick M-15 grade C.C. flooring , earthwork etc. complete as per design including disposal of surplus earth within a lead of 50 Mtr.				
	3.21.2	-do- size 450 x 450mm depth upto 0.5 M Cement cover with frame	each	2.00	2332	4664
		Total B Cost of Plumbing Work				**115475**
		PART C Electrification				
						Based On BSR-2022
S.No.	BSR CODE	Description	Unit	Qty	RATE	AMOUNT
1	1.1	Wiring of light point/ fan point/ exhaust fan point/ call bell point with 1.5 sq. mm nominal size FR PVC insulated unsheathed flexible copper conductor 1.1 kV grade and 1.5 sq. mm nominal size FR PVC insulated unsheathed flexible copper earth conductor 1.1 kV grade (IS:694) in recessed ISI marked MMS (IS:9537 P - III) virgin material PVC conduit & it's ISI marked (IS:3419-1988) accessories, round tiles, 1.2 mm thick Hot Dipped Galvanized Modular Box with earth terminal, 10A Modular switch,Modular face plate with grid plate, 3 pin ceiling rose / Holder /3 way connector, screws, making connections, testing etc. as required. For specification of copper Conductor, Phenolic Laminated sheet's & Electrical/ Wiring accessories refer Chapter E - 04, E - 05 & E - 07 For additional technical parameters of product / work refer Annexure 'A' attached with this BSR				
	1.1.1	Short point (up to 3 Mtr.)	Each	12.00	359	4308
	1.1.2	Medium point (up to 6 Mtr.)	Each	10.00	578	5780
	1.1.3	Long point (up to 10 Mtr.)	Each	3.00	772	2316
2	1.3	Wiring of 3/5 pin 6 amp. Light plug point with 1.5 sq. mm nominal size FR PVC insulated unsheathed flexible copper conductor 1.1 kV grade and 1.5 sq. mm nominal size FR PVC insulated unsheathed flexible copper earth conductor 1.1 kV grade(IS:694) in recessed ISI marked MMS (IS:9537 P - III) PVC conduit & it's ISI marked (IS:3419-1988)accessories, Hot Dipped Galvanized Modular box of 1.2 mm thick with earth terminal, 10 A modular switch, 3/5 pin 6 A modular socket, Modular face plate with grid plate, screws, making connections, testing etc. as required. For specification of copper Conductor, Phenolic Laminated sheet's & Electrical/ Wiring accessories refer Chapter E - 04, E - 05 & E - 07 For additional technical parameters of product / work refer Annexure 'A' attached with this BSR				
a	1.3.1	On board	Each	10.00	357	3570
3	1.4	S&F following sizes (dia.) of ISI marked virgin material MMS (IS:9537 P - III) PVC conduit along with ISI marked (IS:3419-1988) accessories as required in recess including cutting the wall, covering conduit and making good the same as required. For additional technical parameters of product / work refer Annexure 'A' attached with this BSR				
b	1.4.2	25 mm	Meter	75.00	56	4200
4	4.1	Supplying and drawing FR PVC insulated & unsheathed flexible copper conductor as per PWD specification for electrical Works with ISI marked (IS:694) and as per IS 8130 : 2013 of 1.1 kV grade . Wire should be made from 99.90 % purity copper, class 5 stranding in acc. to IS:8130/IEC 60228 for lower watt loss , oxygen free for less chances of oxidization, insulation PVC type A/C/D , flame retardant as per IS 10810-53, better amperage rating as per IS:3961 part 5, in existing surface or recessed PVC/ MS conduit/casing capping making connections with Copper Lugs of suitable size, Ferrules,testing etc. as required. OEM Must have its own in house NABL lab setup for all testing facilities for wires. For additional technical parameters of product / work refer Annexure 'A' attached with this BSR				
a	4.1.3	3x 1.5 sq.mm	Meter	75.00	63	4725
b	4.1.7	2 x 2.5 sq. mm. + 1x1.5Sqmm	Meter	75.00	81	6075
c	4.1.14	2 x 4.0 sq. mm. + 1 x 2.5 sq. mm.	Meter	55.00	122	6710
5	5.9	P & F 1.2mm thick M.S. Recessed fan box, hexagonal/ round of size 130 mm dia, depth 75mm, 12 mm dia rod fan hook with 100 mm length extended on each side . All as per pre approved by Engineer in charge. For additional technical parameters of product / work refer Annexure 'A' attached with this BSR	Each	2.00	128	256
6	15.7	Providing & Fixing of BEE Star rated copper wounded double ball bearing capacitor start, aluminium body & Metallic blade ceiling fan Conforming to all the performance requirements laid down in IS 374:2019 including all amendments, as applicable ; & Carry BIS licensing (i.e. ISI marking) with down rod up to 80 cm with secondary support safety cable (steel rope) , cotter pin with 3 x 1.5 sq.mm pvc insulated flexible copper conductor making connection testing etc. as required. All as per pre approved by Engineer in charge. For additional technical parameters of products/ work , refer Annexure "A" attached with this BSR .				
	15.7.1	1200 mm Sweep BEE 1 Star rated (service value >=4.0 to < 4.5)	Each	2.00	1890	3780

BILL OF QUANTITY (SCHEDULE-A , GENERAL CIVIL WORK)						
S.No.	**Sch. No.**	**Detail of Item**	**Unit**	**Total Qty.**	**Rate**	**Amount**
7	15.15	Providing&FixingofSweepOscillatingtypeWallmounting/ Pedestaltype fanswithThreespeed,ONandOFFposition,SinteredIron bushoil impregnated,withmetalfrontandback120ormore ribsguard; Threeno.Aluminiumblades,minimumAirdelivery100Cum./Minute, MinimumServiceValue1.11Cum./min/watt,noiselevelshouldbe<=75 dB,powerconsumption<=120watts,motorprotectionthroughthermal overloadprotectiondevice, including fixingwithanchor bolts,making connectiontestingetc.asrequired.AllasperpreapprovedbyEngineer incharge. Foradditional technicalparametersofproducts/work ,refer Annexure "A" attached with this BSR .				
	15.15.2	Pedestal Type with Adjustable Height	Each	4.00	5294	21176
8	15.5	Providing & Fixing of of BLDC Technology ventilating fans , single phase with PVC impeller, ABS body, Double Ball bearing, automatic back lower shutter including making connection, testing etc. as required. All as per pre approved by Engineer in charge. For additional technical parameters of products/ work , refer Annexure "A" attached with this BSR .				
	15.5.3	250 mm sweep with Min. Air delivery 1150 cmh, 1300 RPM	Each	2.00	2741	5482
9	6.1	Providing & Fixing of 240/415 V AC MCB with positive isolation of 10 kA breaking capacity (B/ C/D tripping characteristic as per type of load and site requirement) 4 KV impulse withstand voltage, ISI marked IS 8828(1996) / conforming to IEC 60898-1 2002, IEC 60947-2, low watt losses, trip free mechanisum , energy limiting of class 3 as per IEC, minimum phase termination capacity of 35sq.mm. , conductor line load reversibility , IP 20 contact protection and fitted in existing distribution board/sheets, minimum electrical operation 20,000 upto 20 A rating and 10,000 upto 63 A, 5000 for 80 A & above rating including making connections, testing etc. as required. OEM shall have submit NABL / CPRI / ERDA accrediated lab type test reports & All as per pre approved by Engineer in charge. For additional technical parameters of product / work refer Annexure 'A' attached with this BSR				
i	6.1.1	Single pole MCB (With B/C curve tripping Characteristics)				
a	6.1.1.2	6 A to 32 A rating	Each	6.00	187	1122
ii	6.1.2	Double pole MCB(With B/C curve tripping Characteristics)				
a	6.1.2.2	6 A to 32 A rating	Each	2.00	566	1132
10	6.1	Providing & Fixing of Recessed/surface mounting heavy duty horizontal type Double Door (Metal / Glazed)Distribution board with Metal end box made out from Galvanized steel / CRCA sheet not less then 1.2 mm thick conforming to IS-8623-1 & 3 / IEC 61439- 1 & 3, powder painted complete with reversible door (for double door DB only)100 amp. insulated copper bus bar/shorting link , copper neutral link, copper earth link , color coded interconnecting wire set of suitable rating and din bar,masking sheet, making internal DB terminations with copper lugs, Ferrules, detachable gland plate, including making connections, testing etc. as required. OEM shall have submit NABL / CPRI / ERDA accrediated lab type test reports & All as per pre approved by Engineer in charge. For additional technical parameters of product / work refer Annexure 'A' attached with this BSR				
	6.10.2	Glazed door (single phase) IK-09 and IP-43 with Metal end box				
a	6.10.2.3	8 Way (8+2)	Each	1.00	2581	2581
11	7.32	Providing & Fixing of Wiring Accessories OEM fabricated following size GI box of 1.2 mm thick with earthing terminal and adjustable floating clamp in recess/ surface suitable for modular accessories as required.All as per pre approved by Engineer in charge. For additional technical parameters of products/ work , refer Annexure "A" attached with this BSR .				
	7.32.1	1-2 Module	Each	5.00	86	430
	7.32.2	3 Module	Each	11.00	120	1320
12	7.37	Supplying and fixing of power plug point with Modular accessories as per PWD specification for electrical Works, on hot dipped galvanized modular box of 1.2 mm thick with earthing terminal/connector on surface or in recessed with suitable size of modular face place with grid plate and cover plate including cost of ISI marked modular 16 amp. Switch (IS :3854) and 6/16 amp. socket outlet (IS:1293) making connection , testing , etc. as required. For specification of Wiring accessories refer Chapter E - 07 related item & For additional technical parameters of product / work refer Annexure 'A' attached with this BSR	Each	6.00	580	3480
13	7.27	Providing & Fixing of modular type switch/ bell push duly ISI marked (IS :3854) with CM/L no. printed and made out of unbreakable and fire retardant vergin UV Stabilized Polycarbonate with brass terminals and captive screws & silver alloy contact tip with IP-20 rating ,minimum width of switch toggle(PUSH PART) should not less then 20mm, including all as per pre approved by Engineer in charge,making connections, testing etc. as required. For additional technical parameters of product / work refer Annexure 'A' attached with this BSR				
a	7.27.1	10 A one way switch	Each	1.00	55	55
14	7.26	Providing & Fixing of ding dong/musical chime bell as per PWD specification for electrical Works, including making connection testing etc. as required.All as per pre approved by Engineer in charge. For additional technical parameters of products/ work , refer Annexure "A" attached with this BSR .	Each	1.00	328	328

BILL OF QUANTITY (SCHEDULE-A , GENERAL CIVIL WORK)						
S.No.	**Sch. No.**	**Detail of Item**	**Unit**	**Total Qty.**	**Rate**	**Amount**
15	7.28	Providing & Fixing of modular type lockable feature socket duly made out of unbreakable and fire retardant vergin poly carbonate with brass terminals and captive screws & silver alloy contact tip with IP-20 rating , including all as per pre approved by Engineer in charge,making connections, testing etc. as required. For additional technical parameters of product / work refer Annexure 'A' attached with this BSR				
a	7.28.4	25 Amp. 2 Module Socket	Each	5.00	228	1140
16	7.29	Providing & Fixing of modular type 120 W Step Fan regulator duly ISI marked (IS 11037:1984) with CM/L no. printed made out of unbreakable and fire retardant vergin poly carbonate with brass terminals and captive screws & silver alloy contact tip with IP-20 rating , including all as per pre approved by Engineer in charge,making connections, testing etc. as required. For additional technical parameters of product / work refer Annexure 'A' attached with this BSR				
	7.29.1	5 step fan regulator 2 Module 360 dgree rotating	Each	2.00	398	796
17	14.2	Plate Earthing as per IS:3043 with Hot dipped G.I. Earth plate of size 600mm x 600mm x 6.0mm by embodying 3 to 4 Mtr. below the ground level with 20 mm dia. G.I. 'B' class watering Pipe ,including all accessories like nut, bolts, reducer, nipple, wire meshed funnel, and Heavy duty weather proof poly-propylene earth pit chamber with lockable Jam free lid suitable for safe working load 5000 Kg or more of size Top Dia. 225 to 260 mm, Bottom Dia 300 to 350 mm. and Height 250 to 300 mm. and embodying the pipe complete with alternate layers salt and coke/ charcoal, testing of earth resistance for value of 5 ohms or less as required & must record by engineer in charge during site visit and ensure to enter in measurment book.All as per pre approved by Engineer in charge. For additional technical parameters of products/ work , refer Annexure "A" attached with this BSR .	Each	1.00	5733	5733
18	14.5	Supply & Laying following size earth strip in horizontal or vertical run in surface by means of Earth strip DMC Insulator including riveting/ soldering/ welding, Jointing shall be done by overlapping and with 2 set of Brass (for Cu strip) / GI (for GI Strip) nut bolt & spring washer spaced at 50cm making connection etc. as required.All as per pre approved by Engineer in charge. For additional technical parameters of products/ work , refer Annexure "A" attached with this BSR .				
	14.5.15	25mm x 6mm G.I. (Hot Dipped) Strip	Meter	15.00	196	2940
19	14.7	Supply & Laying following size' B ' class , G.I. Pipe confirming to IS : 1239 P - 1 (2004) with accessories like bend, socket etc. for laying earth conductor/ strip / cable in ground/ surface/ recess as required. All as per pre approved by Engineer in charge. (Earth Excavation will be Paid Extra)All as per pre approved by Engineer in charge. For additional technical parameters of products/ work , refer Annex ure "A" attached with this BSR .				
	14.7.5	40 mm dia.	Meter	4.00	516	2064
20	17.1	Providing & Fixing of IP20 SMD Mid Power LED batten type integrated light fixture made from Powder coated Extruded aluminium housing with in built driver , System lumen efficacy ≥ 110 lm/Watt output, internal surge protection of 2.5 KV with Short & Open circuit protection ,THD < 10% , P. F.≥0.95, CRI >80 , life time of minimum 50000 Burning Hours with , 70% of intial Lumen maintaned till life ends , CCT 3000°K / 4000°K / 5700°K /6000°K/6500°K (As per ANSI Bin) , Maximum power consumption should not more than the specified rating and Fixture shall be of BIS standard and trade mark certificate (T.C.). Manufactures Word Mark/ Name Engraved/ Embossing/ Screen printing on housing. OEM must have its own in house NABL lab setup for all testing facilities for LED fixtures. (LM79 & LM80) certificate / Report from OEM shall be submitted. All as per pre approved by Engineer in charge. For additional technical parameters of products/ work , refer Annexure "A" attached with this BSR .				
	17.1.1	1170mm(+/-10%) LED batten with min. lumen output 2200 lm	Each	10.00	492	4920
21	17.9	Providing & Fixing of energy efficient /energy saving IP 20 LED direct retrofit Bulb in existing holder or fixture as required with system lumen efficacy ≥100 lm/Watt output ,pf 0.95 , CRI >70, minimum life time of minimum 25000 Burning Hours with , 70% of intial Lumen maintaned till life ends , CCT 3000°K / 4000°K / 5700°K /6000°K/6500°K (As per ANSI Bin) , maximum power consumption should not more than the specified rating and Fixture shall be of BIS standard and trade mark certificate (T.C.). Manufactures Word Mark/ Name Engraved/ Embossing/ Screen printing on housing. OEM must have its own in house NABL lab setup for all testing facilities for LED fixtures. (LM79/LM80) certificate / Report from OEM shall be submitted. All as per pre approved by engineer in charge . for additional technical parameters of product/ work, refer Annexure "A" attacheded with this BSR.				
	17.9.3	9 Watt	Each	10.00	115	1150

BILL OF QUANTITY (SCHEDULE-A , GENERAL CIVIL WORK)						
S.No.	**Sch. No.**	**Detail of Item**	**Unit**	**Total Qty.**	**Rate**	**Amount**
22	16.1	Providing&FixingofVertical(BEE5starrated)/Horizontal(BEE3star rated) storagewater heaterwithouter casingmadeof Engineering Plasticsheet(Upto25Ltr)/Metal rustproofBody(35&50Ltr),Glass line/TitaniumEnamelcoatedPressurePumpCompatible8barpressure Innertank,GlassLineCoated,mineralfilledheatingelement,stem type, snapaction adjustablethermostat,Dual indicatinglamps InjectedPUF insulation,Multi FunctionValveetc. as requiredheld inpositionwith 2/4no. 10/12mmanchor Fastener, dulywiredwith3 core2.5/4.0 SqmmPVCinsulated&sheathedcopperconductorand16A/25Athree pinplugtopwithPortableResidualCurrentDevice(PRCD) , including makinginlet,outletFlexiblealloy connection, testingetc.asrequired. AllasperpreapprovedbyEngineer incharge. Foradditional technical parametersofproducts/work , refer Annexure"A"attachedwiththis BSR				
	16.1.2	10 Ltr.	Each	3.00	9189	27567
23	22.24	Supply , Installation, Testing and Comissioning of Inverter type Air Cooled Hi Wall split type Air conditioners with latest star rating system as per BEE amended upto date complete with Indoor unit(IDU), Out door unit (ODU), surface / concealed copper Refrigerant piping with insulation (closed cell elastomeric nitrile rubber tubular pipe section) upto 3 Mtr (IDU to ODU), copper power cable upto 3.5 Mtr (IDU to ODU), R-32/R 410 Green Refrigerant, wireless Remote control, suitable for working between 230V +/- 10% with low & high voltage cutoff and 50 hz , single phase AC supply capable of performing cooling, dehumidification, air circulation of following capacity with Scroll / rotary compressor. All as per pre approved by Engineer in charge. For additional technical parameters of products/ work , refer Annexure "A" attached with this BSR .				
	22.24.3	1.5 TR ISEER not less then 3.8	Each	2.00	48875	97750
		Total C ELECTRICAL				222886
		GRAND TOTAL A+B+C				22,42,456.09

NOTE : Due to the remoteness of the project location, the total project cost may vary by up to 10%.

DESIGNERS

PROJECT
FOR

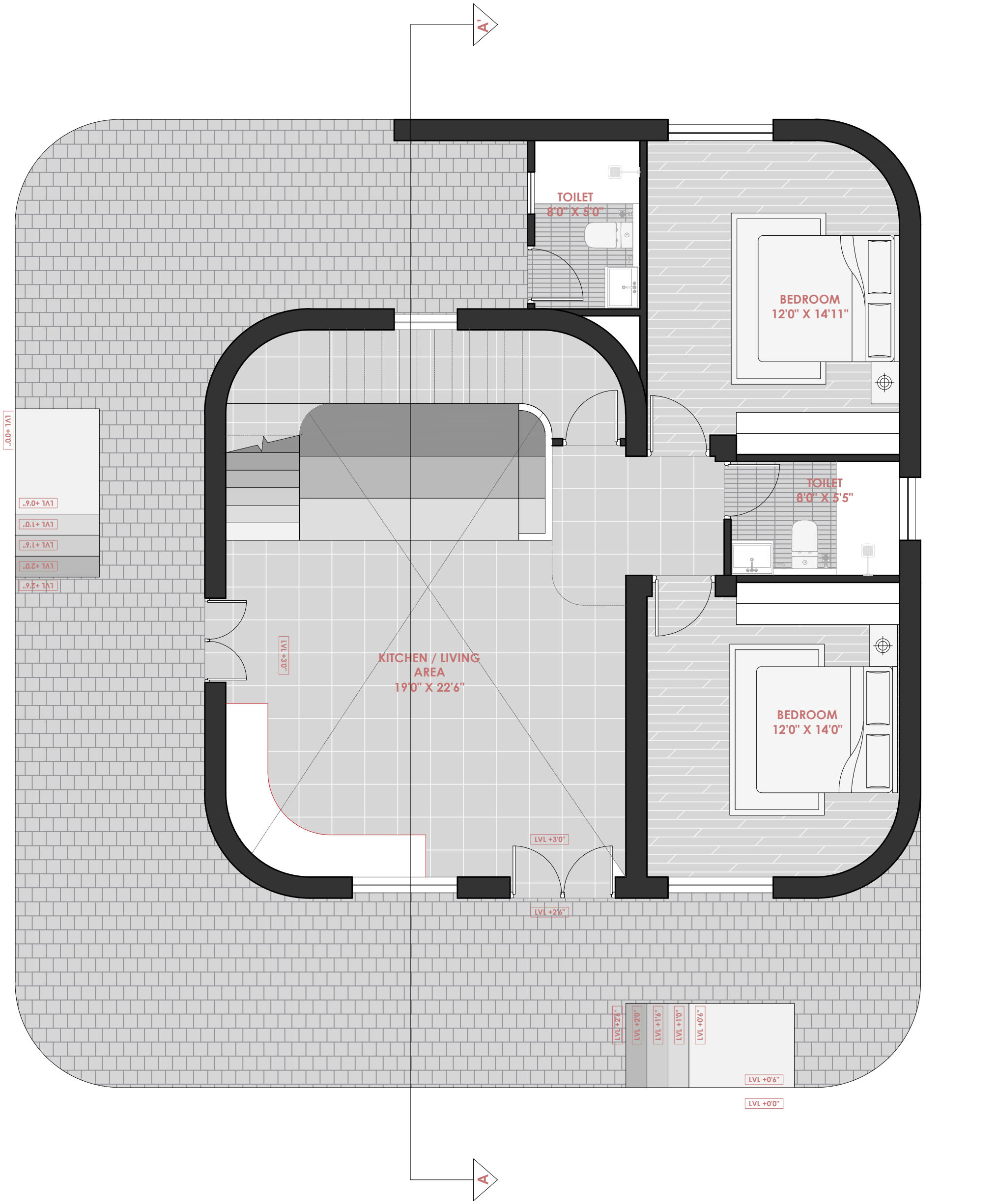
RESEARCH CENTRE-
BNHS (POKHRAN)

EXTERIOR VIEWS


BNHS


BNHS


BNHS



GROUND FLOOR PRESENTATION PLAN

SCALE : *NOT TO SCALE*

DESIGNERS

CENTRE FOR

BHNS (POKRAN)

PRS NO.

DEALT BY :

AR. NAMAN PARIHAR

CHECKED BY :

AR. AMIT SANKHLA

REMARKS:

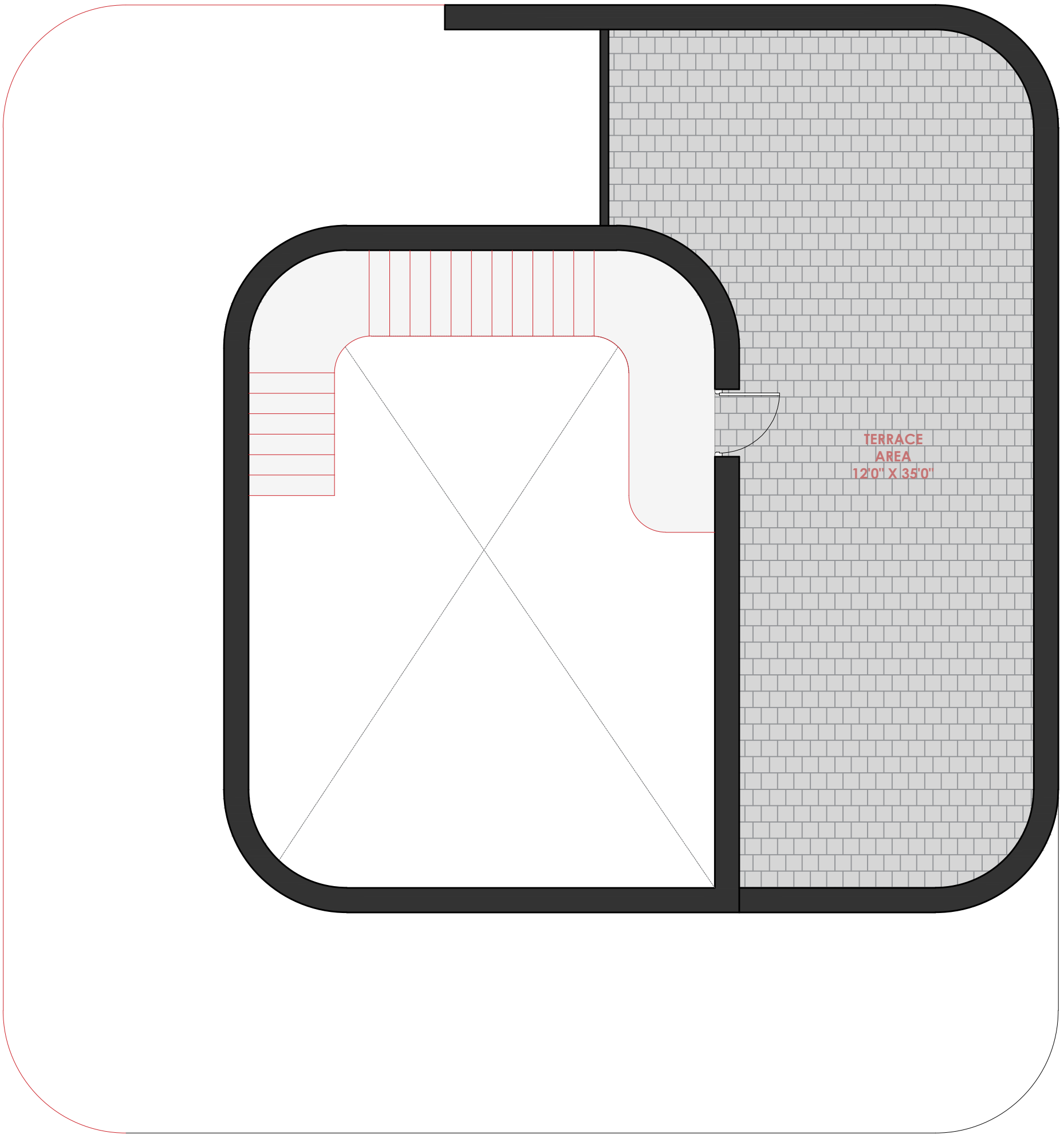
1: Drawing not to be scaled, only written dimensitions to be followed.
2: For structural and MEP details refer consultant's drawing.
3: Any ambiguities or discrepancies should be cleared with the architect before proceeding the work.
4: All measurements are in feet - inches unless mentioned.

DRAWING NO. :

A1.R0

WEST SOUTH EAST N

ADDRESS: 13, Hanuwant Nagar, Circuit House Road, Ratanada, Jodhpur-342001, Rajasthan, India **CONTACT:** Ph.: +91-291-2516621, +91-9929762621 **EMAIL:** *mail.gmdesigners@gmail.com* **WEBSITE:** *www.gmdesigners.com*



TERRACE FLOOR PRESENTATION PLAN

SCALE : NOT TO SCALE

DESIGNERS

CENTRE FOR

BHNS (POKRAN)

PRS NO.

DEALT BY :

AR. NAMAN PARIHAR

CHECKED BY :

AR. AMIT SANKHLA

REMARKS:

1: Drawing not to be scaled, only written dimensitions to be followed.
2: For structural and MEP details refer consultant's drawing.
3: Any ambiguities or discrepancies should be cleared with the architect before proceeding the work.
4: All measurements are in feet - inches unless mentioned.

DRAWING NO. :

A1.R0

WEST SOUTH EAST N

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