

Tender No.: 1 of 2026-2027

**OFFICE OF THE CHIEF ENGINEER ZONE-II,
PUBLIC HEALTH ENGINEERING DEPARTMENT
GOVERNMENT OF MIZORAM**

**TENDER DOCUMENT FOR SURVEY, DESIGN,
SUPPLY, INSTALLATION, TESTING & COMMISSIONING OF
AUGMENTATION & IMPROVEMENT OF THINGSAI
WATER SUPPLY SCHEME (Grid Pumping)
(UNDER NABARD RIDF-XXXI)**



Tender amount	Rs. 5,74,05,000.00
Earnest money	Rs. 11,48,100.00
Last date of sale of tender	20th August, 2026 upto 16:00 hrs
Last date of submission of tender	24th August, 2026 upto 12:00 hrs
Date of opening	24th August, 2026 at 14:00 hrs
Cost of tender document	Rs. 1,500.00
Time allowed for execution of work	18 months

PRESS TENDER NOTICE
PUBLIC HEALTH ENGINEERING DEPARTMENT

The Chief Engineer, PHED, Zone-II, on behalf of the Governor of Mizoram invites bids two envelope system with sealed item rate tender in prescribed form affixing Court Fee Stamp worth not less than **Rs. 7.5/-** (non-refundable) for non-tribal and up-to-date House Tax Payee Certificate for tribal from reputed PHED contractors experienced in similar type of works. The tender will be received in the office of the undersigned up to **12:00 hours** on **24th August, 2026**. Late submission of tender will not be accepted. The tender so received will be opened on **24th August, 2026** at **14:00 hours** in presence of the intending tenderer or his authorized representative. If for any unforeseen reason, the tenders could not be received & opened on the stipulated date & time, the same will be received and opened in the next working day at the same time for which no separate communication will be made.

NIT No.	Name of Work	Tendered Amount	Earnest Money	Time of completion	Cost of Tender Document	Eligibility Class of Contractor
1 of 2026-2027	Survey, design, supply, installation, testing and commissioning of Augmentation & Improvement of Thingsai Water Supply Scheme (Grid Pumping) under NABARD RIDF-XXXI	₹ 5,74,05,000.00	₹ 11,48,100.00	18 Months	₹ 1,500.00	PHED Contractor Class-II and above

Detailed tender document may be obtained from the office of the undersigned on any working days **between hours of 11:00 to 16:00 from 7th August, 2026 to 24th August, 2026** on payment of tender cost as mentioned above (non - refundable) without which, the tender shall summarily be rejected. The undersigned reserves the right to reject any or all of the tenders without assigning any reason thereof. **The same may also be downloaded from PHED's website at www.phed.mizoram.gov.in. If the documents are downloaded from the website, the cost of tender document shall be included in a separate envelope in the Technical Bid.**



(K. ZOHMINGLIANA)
Chief Engineer, PHED, Zone-II
Aizawl, Mizoram

Memo No. B.17011/79/2024-CE/PHE(Z-II)/13

Dated: 7th August, 2026

Copy to-

1. PS to Hon'ble Minister of State, PHED, Mizoram for favour of your kind information.
2. The Secretary (PHED), Govt of Mizoram for favour of kind information.
3. The Engineer-in-Chief (PHED), for favour of kind information.
4. The Superintendent of Engineer, PHED, Lunglei WATSAN Circle for favour of kind information.
5. The Executive Engineer, PHED, Hnahthial WATSAN Division for favour of kind information.
6. The Director, Information and Public Relation Department, Govt. of Mizoram for information and necessary action with a request to publish the tender notice in two issues of local newspaper.
7. The System Analyst, PHED for information and upload of tender notice and documents to PHED's website.
8. Concerned file.
9. Office notice board.



Chief Engineer, PHED, Zone-II
Aizawl, Mizoram

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**OFFICE OF THE CHIEF ENGINEER, ZONE-II,
PUBLIC HEALTH ENGINEERING DEPARTMENT
AIZAWL, MIZORAM.**

**NOTICE INVITING TENDER
(TENDER NO. 1 of 2026-2027)**

Item rate tender is invited on behalf of Governor of Mizoram from reputed PHED registered contractors for the work: **Survey, design, supply, installation, testing and commissioning of Augmentation & Improvement of Thingsai Water Supply Scheme (Grid Pumping) under NABARD RIDF-XXXI.**

1. The enlistment of contractor should be valid on the last date of sale of tender.
In case the last date of sale of tender is extended, the enlistment of contractor should be valid on the original date of sale of tender.
 - a. The work is estimated to cost **Rs. 5,74,05,000.00** inclusive of all taxes viz. GST, Cess etc.
 - b. Tender will be issued to contractors registered under MPHED with definite proof from appropriate authority. Standing order for eligibility of different classes of contractor corresponding on the tendered amount will be followed.
2. Tender document consisting of plans, specifications, schedule of quantities of the various classes of work to be done and the set of terms & conditions may be seen in the office of the Chief Engineer, PHED, Zone-II, between hours of **11:00 to 16:00 hrs from 7th August, 2026 to 24th August, 2026 except on Saturday and Sundays and Public Holiday.**
3. Tender document, excluding standard form, will be issued from this office, during the hours specified above, on payment of Rs. 1,500/- (Rupees One Thousand five hundred only) in cash.
4. Receipt of application for issue of forms shall be stopped by **16:00 Hrs on 19th August, 2026**. Receipt of tender shall be stopped by **12:00 Hrs on 24th August, 2026**.
5. Tender must be accompanied with **Earnest money of Rs 11,48,100.00** (2% of Tender Amount) in the form of bank guarantee/ fixed deposit receipt or demand draft of a scheduled bank in Mizoram issued in favour of the Chief Engineer, PHED, Zone-II. The tender document along with supporting documents and designs shall be placed in one sealed envelope marked '**Technical Bid**'. Another sealed envelope marked '**Financial Bid**' shall contain only proforma of schedules (Schedule of Quantities). Both the envelopes shall be submitted together in another sealed envelope with the name of work and due date of opening written on it.

ELIGIBILITY cum TECHNICAL BID shall comprise of the following:

- i) GST registration
- ii) House tax payee certificate/court fee stamp
- iii) Earnest money
- iv) Qualification information in prescribed forms and supporting documents
- v) Power of Attorney for signing of bid
- vi) Bid Security Declaration
- vii) Certificate of Understanding
- viii) Designs, Drawings and Charts as necessary to comply with requirements
- ix) Site Visit Certificate from Concern SO/SDO (NIT Sl. No. 28)
- x) Authenticated Completion Certificates from a competent authority verifying the execution of at least 3 similar schemes of value not less than 40% of the estimated cost put to tender.

FINANCIAL BID shall comprise of the following:

i) Proforma of Schedules (Schedule of Quantities)

6. The bidder whose tender is accepted will be required to furnish **Performance Guarantee** of 5% (five percent) of the contract amount within 10 days from issue of Letter of Intent. This guarantee shall be in the form of deposit at call receipt/ demand draft/ government securities/ fixed deposit receipts/ bank guarantee bonds of any scheduled bank in Mizoram. In case the selected bidder fails to deposit the said performance guarantee within the period as indicated, the contract shall be liable to be terminated.
7. Technical eligibility criteria for tenderer should be:- The bidder must have a minimum working experience of successfully executing similar works of at least three similar schemes of value not less than 40% of the estimated cost put to tender.
8. Financial eligibility criteria for tenderer should be:- Average annual financial turnover on construction works should be at least 50% of estimated cost put to tender during the immediate last three consecutive financial years.
9. Canvassing whether directly or indirectly, in connection with tenderer is strictly prohibited and the tender submitted by the contractor who resort to canvassing will be liable to rejection.
10. The tenderer shall not be permitted to tender for works in the Zone/Circle/ Division responsible for award and execution of contracts, in which his near relative is posted as Accounts Officer or as an officer in any capacity between the grades of Chief Engineer and Junior Engineer (both inclusive). He shall also intimate the names of persons who are working with him in any capacity or are subsequently employed by him and who are near relatives to any gazetted officer in the department. Any breach of this condition by the contractor would render him liable to be removed from the approved list of contractors of this department.
11. No engineer of gazetted rank or other gazetted officer employed in engineering or administrative duties in the department is allowed to work as a contractor for a period of one year after his retirement from government service without the previous permission of the Government of Mizoram in writing. Engagement of any such official shall render the bid as invalid.
12. The tender document along with latest CPWD Form 8 shall form part of the document. However, applicability of clauses of CPWD Form 8 listed at General Rules and Directions of this NIT may be referred, if any contradiction arises between any clause of this NIT and clauses in CPWD Form 8, clauses in NIT supersede clauses in CPWD Form 8. If any clause of this NIT is not mentioned clearly, then CPWD Works Manual will be referred and applied.
13. The Government shall deduct CESS & GST, etc as admissible on the value of work done from each bill of the contractor as per prevailing government instruction/orders. In lieu, the department shall issue a certificate of deduction of the tax at source to the contractor.
14. **Quoted rate above the tendered amount shall be rejected summarily and PHE Department is not liable to accept the lowest tenderer if the Department found the quoted Rates is not workable at site.**

15. No tender will be considered for acceptance unless tender document is duly purchased by the intending tenderer. A copy of the receipt for the money deposited against purchase of tender document shall have to be submitted along with the tender as a proof of purchasing the same. If the document is downloaded from the website, the cost of tender documents may be included in a separate envelope in the technical bid.
16. **Tenderer has to read all terms and conditions of this tender documents carefully. Tenderer has to accept and comply with all terms and conditions of this tender. Overwriting in the proforma of schedules is not acceptable and corrections, if any should be initialed and dated by the tenderer.**
17. Defect liability period of the contract shall be 12 (twelve) months from the date of commissioning. Any defect noticed in the system during this period shall have to be rectified by the contractor at his/ their own cost and risk and any further defect during the other 4 (four) years of maintenance period shall have to be rectified by the contractor at free of cost and materials cost will be borne by the department.

Comprehensive Operation and Maintenance:

- The contractor shall provide 5 years comprehensive maintenance of the water pumping system set, which shall include corrective maintenance as well as routine service visits during guarantee period. The bidder shall rectify defects developed in the system as specified above.
 - The contractor shall provide 1-year comprehensive maintenance of civil structures, RCC Reservoir and Intake system which shall include corrective maintenance as well as Leakage during guarantee period. The bidder shall rectify defects developed in the Reservoir & Intake system as specified above.
 - Apart from monitoring and regular periodical maintenance, inspection of system has to be done quarterly basis during the period specified above. Maintenance report has to be maintained in a prescribed table format in a register maintained at the site which should contain month, inspection date, action taken against the defects found in the system and remarks of the representative of the department not below the rank of Junior Engineer along with signatures of both parties.
18. During the operation and maintenance period, training on the operation and maintenance of the system shall be provided to the WATSAN Committee/Department responsible for the operation and maintenance of the system after the expiry of the maintenance period. Upon completion of the five (5) year operation and maintenance period of the Raw Water Pumping System and the Clear Water Surface Pumping System, the system shall be formally handed over to the concerned WATSAN Committee/Department. A tripartite agreement shall be executed at the time of such handover.
 19. The Public Health Engineer Department, Govt. of Mizoram reserves the right to reject or accept any or all tenders wholly or partly with proper reason on the ground considered advantageous to the department whether it is the lowest tender or not.
 20. The Public Health Engineering Department, Govt. of Mizoram takes no responsibility for delay, loss or non-receipt of tenders sent by post. Unsealed tenders shall not be considered for acceptance.
 21. The tender document shall remain the property of the Public Health Engineering Department, and if obtained by one intending tenderer, shall not be used by any other tenderer.
 22. The tender shall be completely filled in all respects and shall be tendered together with requisite information. Any tender incomplete in any particular shall be liable to be rejected.

23. Tenderers who are not the manufacturer or authorized dealer shall produce support letter from the manufacturer or authorized dealer in regard to supply, installation, testing and commissioning.
24. The tendering authority reserves the right to select any qualified bidder for the tendered work given there is sufficient evidence that it is in the best interest of the quality of work.
25. List of staff and their **Educational Qualifications** (with attested copy) of those who are proposed to be engaged for the work and after sale service shall be submitted along with the tender, failing which, the tender may be termed as invalid.
26. Bidder shall have to submit copies of GST registration number issued by the appropriate authority.
27. The terms, conditions and specifications mentioned in tender document shall be binding on tenderer and no condition or stipulation contrary to the conditions shall be acceptable. It may please be noted that the tenderer who do not accept terms and conditions stipulated in this tender document, their offers shall be liable to be rejected without assigning any reason whatsoever. ***Tenderer should sign in each and every numbered page (i.e. blank pages need not be signed) as a token of acceptance of each and every terms of the tender document.*** The pages of the tender should be submitted in proper way in an organized manner.
28. **Requisite for pumping systems.:**
- Two (2) units of raw water submersible pumps will be installed to lift raw water from jackwell to treatment plant. Submersible raw water pump sets (1 running + 1 standby) suitable for a discharge of at least 26.40 cum/hr with an approximate static head of 25m with a pumping main pipeline of GI pipe 80mm dia. (M) of length 200m (approx.) along with suitable electric motors, control panels, power supply cables (copper make), operating equipments and valves of suitable length of rising spindle to discharge adequate quantity of water demand will be provided. Pump house of area 3.6m x 3.6m will be constructed upon the jackwell.
 - Flash mixer complete with agitator of appropriate capacity for 0.264ML within 10 hours.
 - Back wash pump of appropriate capacity for treating 0.264ML within 10 hours.
 - Chlorinator Mac-50
 - HOT crane 2 metric ton capacity, span 0-6m, with all accessories complete like trolley, girder, rail, base plate, etc. 1 set each at both clear water pumping stations.
 - Two (2) units of clear water horizontal multistage centrifugal pump set (1 running + 1 standby) and pump foundations suitable for discharge of 22.30 cum/hr at an approximate static head of 585m with a pumping main pipeline of GI pipe 100mm dia. (H) of length 5500m (approx.) along with suitable electric motor, control panel, cables (copper materials), operating equipments and valves, etc will be provided for Stage-I pumping station.
 - Two (2) units of clear water horizontal multistage centrifugal pump set (1 running + 1 standby) and pump foundations suitable for discharge of 22.30 cum/hr at an approximate static head of 581m with a pumping main pipeline of GI pipe 100mm dia. (H) of length 6500m (approx..) along with suitable electric motor, control panel, cables (copper materials), operating equipments and valves, etc. will be provided for Stage-II.
 - There should be a name plate fixed on all the Electro-mechanical systems which will bear the following specifications:
 - a. Name of manufacturer
 - b. Model number

- c. Serial number
- d. Year of manufacture

29. *Tenderer must visit the proposed project site to conduct thorough site survey and techno-economic feasibility studies of the project on his own expenses.* The tenderer shall also obtain a site visit certificate from the concerned Sectional Officer which will be verified by SDO, Hnahthial Sub-Division, Hnahthial, and shall be submitted in original along with the tender. **The site visit certificate shall be accompanied by self-photographs of the visitor the proposed raw water pumping location along with Lat-Long of proposed site printed on the photographs. Tenders submitted without the site visit certificate shall be summarily rejected.** The department shall scrutinize thoroughly each design of all tenderers and shall only consider the tenderer(s) whose design is/are found to be technically and economically feasible under the condition of Mizoram.
30. The system must be designed and planned using computer-based tools that can closely the optimum efficiency of the pumping systems. Planning and design should be done showing monthly water output in line with water requirement. The discharge/day must be of the following requirements:
- a. Average daily water delivery within a year in m^3/day for 10 pumping hours in a day.
 - b. Average daily discharge of leanest month shall meet ultimate daily requirement
 - c. Water delivery pattern of a whole year in m^3
31. The tenderer must submit the design in binding clearly showing all the design parameters for each stage. The check list will be:
- i. Motor & pump efficiency (%)
 - ii. Rated power of pump set (KW)
 - iii. Flow rate (m^3/hour) at duty head (Required discharge shall be achieved at duty head)
 - iv. Dynamic head (m)
 - v. Total head (m)
 - vi. Head loss (m)
 - vii. Speed of motor (rpm)

Note: Hazen-Williams or Darcy-Weisbach formula may be used in calculation.

The following must also be included:

- i. Data sheets/ customized pump characteristics
32. Sub-letting of the works is not allowed.
33. Successful tenderer shall be responsible for providing, arranging and maintaining all materials, tools & plants, water, electricity access, facilities, etc at his own cost for workers and all other services required for executing the work unless otherwise specifically provided for in the contract documents. Before supplying the machineries, successful tenderer must submit test report.
34. The date of starting the work will be 10 days from the date of signing agreement. Contract agreement shall be signed within 10 days from issue of LOI.
35. The system must have double dry run protection to protect the system in event of low water levels. The dry run protection must be of modular design, exchangeable and preferably a float mechanism.
36. Size of power cable proposed shall be furnished.

37. Handing over of the system to the department only after:

- Testing and trial of the installed system
- Operator training on repair and maintenance of the system
- Handing over of warranty papers to the department/VWSC.
- Handing over of operation and maintenance manual/document to the department/VWSC.
- Completion report along with complete drawing to the department/VWSC

38. Warranty:

- a. Whole system including pump set shall be warranted for 5 years. The pumping systems must be warranted against any manufacturing/design/installation defects for a minimum period of 5 years.
- b. Sufficient spares for trouble free operation during warranty period shall be made available as and when required.
- c. A warranty card for motor pump set should also be provided to beneficiary at the time of handing over of the system.

39. The successful tenderer should submit actual detailed technical diagrams and specifications of the pumping system within 1 (one) month after commissioning of the system.

40. The successful tenderer should intimate and consult the concern SDO/SO before starting the work.



(K ZOHRINGLIANA)
Chief Engineer, PHED, Zone-II

PURCHASE RECEIPT OF TENDER DOCUMENT

Item rate tender & contract for work

- (A) Tender No. 1 of 2026-27 _____
- (B) For the work of **Survey, design, supply, installation, testing and commissioning of Augmentation & Improvement of Thingsai Water Supply Scheme (Grid Pumping) under NABARD RIDF-XXXI.**
- (C) To be submitted latest by **12:00 hours on 24th August, 2026.**
- (D) To be opened at **14:00 hours on 24th August, 2026.**

Issued to:

.....

Signature of officer issuing the document

Designation:

Date of Issue:

DECLARATION OF TENDERER

I/We have read and examined the notice inviting tender & its clauses of contract, general conditions of contract, general rules and directions, special conditions for contractor's own design, general specifications, scope of works, detailed specification of works, bill of quantities, schedule of quantities, qualification information and all other contents in the tender document for the work.

I/We hereby tender for the execution of the work specified for the Governor of Mizoram within the time specified and in accordance to all respect with the instructions in general conditions of contract, general rules and directions, special conditions for contractor's own design and general specifications.

I/We agree to keep the tender open for ninety (90) days from the due date of its opening and not to make any modification in its terms and conditions.

A sum of Rs. **11,48,100.00** is hereby forwarded as **Earnest money** (2% of Tender Amount) in the form of bank guarantee/ fixed deposit receipt or demand draft of a scheduled bank in Mizoram. I/We agree to furnish the prescribed **Performance Guarantee** (5% of Contract Amount) within prescribed period, failing which the department have the right to black list me/us and will not bid any contract under Public Health Engineering Department for a period of 2 (years). Further, if i/we fail to commence work as specified, i/we agree without prejudice to any other right or remedy available in law that the said performance guarantee shall be forfeited for the property of the Government of Mizoram.

I/We hereby declare that i/we shall treat the tender document, drawings and other records connected with the work as secret/confidential documents and shall not communicate information/derived there to any person other than a person to whom i/we am/are authorized to communicate the same or use the information in any manner prejudicial to the safety of the State.

Dated:

Witness

Signature:

Name :

Postal address:

Mobile number:

Tenderer

Signature:

Name:

Postal Address:

Mobile number:

GENERAL CONDITIONS OF CONTRACT

1. Signing of contract		Successful tenderer/contractor, on acceptance of his tender by the accepting authority, shall, within 10 days from the date of issue of letter of intent, sign contract agreement.
2. Performance guarantee	i	Contractor shall submit an irrevocable performance guarantee of 5% (Five percent of Contract amount) of his Contract amount within 10 (ten) days from the date of issue of LOI.
	ii	The performance guarantee shall be valid up to the stipulated date of completion plus 60 days beyond that.
	iii	In the event of the contract being terminated or rescinded, the performance guarantee shall stand forfeited in full and shall be absolutely at the disposal of the Governor of Mizoram.
3. Recovery of security deposit		An amount of 2.5% of the gross amount of each bill shall be deducted as a security deposit. This amount shall be released @ 20% per annum for 5 years of maintenance period for raw and clear water pumping system and machineries. For other various civil works included under the project the Security Deposit shall be released after the successful completion of the one (1) year maintenance period , subject to satisfactory performance and compliance with the terms and conditions of the contract.
4. Compensation for delay	(i)	For delay of work, the contractor shall pay compensation to the government @ 1.5% per month not exceeding 10% of the tendered value of work or of the tendered value of the item or group of completed items of work.
	(ii)	The amount of compensation may be adjusted or set-off against any sum payable to the contractor under this or any other contract with the Government.
5. Time and extension		Time allowed for execution of the work or extended time as specified shall be the essence of the contract
6. Terms and conditions of payment		1. Payment will be made to the contractor in time on submission of bills based on progress of the work subject to availability of fund. 2. The contractor shall be at liberty to submit bills for payment every month during the construction period. While payment of such bills, an amount of 2.5% of the gross amount of each bill shall be deducted as a security deposit.

7. Materials to be provided by the contractor	The contractor shall, at his own expense, provide all materials, required for the works other than those which are stipulated to be supplied by the government. The contractor shall, at his own expense and without delay; supply to the engineer-in-charge samples of materials to be used on the work and shall get these approved in advance. All such materials to be provided by the contractor shall be in conformity with the specifications laid down or referred to in the contract. The contractor shall, if requested by the engineer-in-charge furnish proof, to the satisfaction of the engineer-in-charge that the materials so comply. The engineer-in-charge shall within thirty days of supply of samples or within such further period as he may require intimate to the contractor in writing whether samples are approved by him or not. If samples are not approved, the contractor shall forthwith arrange to supply to the engineer-in-charge for his approval, fresh samples complying with the specifications laid down in the contract. When materials are required to be tested in accordance with specifications, approval of the engineer-in-charge shall be issued after the test results are received. The contractor shall at his risk and cost submit the samples of materials to be tested or analyzed and shall not make use of or incorporate in the work any materials represented by the samples until the required tests or analysis have been made and materials finally accepted by the engineer-in-charge. The contractor shall not be eligible for any claim or compensation either arising out of any delay in the work or due to any corrective measures required to be taken on account of and as a result of testing of materials. The contractor shall, at his risk and cost, make all arrangements and shall provide all facilities as the engineer-in-charge may require for collecting, and preparing the required number of samples for such tests at such time and to such place or places as may be directed by the engineer-in-charge and bear all charges and cost of testing unless specifically provided for otherwise elsewhere in the contract or specifications. The engineer-in-charge or his authorized representative shall at all times have access to the works and to all workshops and places where work is being prepared or from where materials, manufactured articles or machinery are being obtained for the works and the contractor shall afford every facility and every assistance in obtaining the right to such access. The engineer-in-charge shall have full powers to require the removal from the premises of all materials which in his opinion are not in accordance with the specifications and in case of default, the engineer-in-charge shall be at liberty to employ at the expense of the contractor, other persons to remove the same without being answerable or accountable for any loss or damage that may happen or arise to such materials. The engineer-in-charge shall also have full powers to require other proper materials to be substituted thereof and in case of default, the engineer-in-charge may cause the same to be supplied and all costs which may attend such removal and substitution shall be borne by the contractor. The contractor shall, at his own expense, provide a material testing lab at the site for conducting routine field tests. The lab shall be equipped at least with testing equipment.
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8. Mobilization advance	Mobilization advance of 10% of the contract value at 10% per annum simple interest shall be given to the contractor if applied for in writing.
9. Work to be executed in accordance with specifications, drawings, orders, etc.	The contractor shall execute the whole and every part of the work in the most substantial and workmanlike manner both as regards materials and otherwise in every respect in strict accordance with the specifications. The contractor shall also conform exactly, fully and faithfully to the design, drawings and instructions in writing in respect of the work signed by the engineer-in-charge and the contractor shall be furnished free of charge one copy of the contract documents together with specifications, designs, drawings and instructions as are not included in the standard specifications of Central Public Works Department or in any Bureau of Indian Standard or any other, published standard or code or schedule of rates or any other printed publication referred to elsewhere in the contract. The contractor shall comply with the provisions of the contract and with the care and diligence execute and maintain the works and provide all labor and materials, tools and plants including for measurements and supervision of all works, structural plans and other things of temporary or permanent nature required for such execution and maintenance in so far as the necessity for providing these, is specified or is reasonably inferred from the contract. The contractor shall take full responsibility for adequacy, suitability and safety of all the works and methods of construction.
10. Foreclosure of contract due to abandonment or reduction in scope of work	If at any time after acceptance of the tender, government shall decide to abandon or reduce the scope of the works for any reason whatsoever and hence not require the whole or any part of the works to be carried out, the engineer-in-charge shall give notice in writing to that effect to the contractor and the contractor shall act accordingly in the matter. The contractor shall have no claim to any payment of compensation or otherwise whatsoever, on account of any profit or advantage which he might have derived from the execution of the works in full but which he did not derive in consequence of the foreclosure of the whole or part of the works. The contractor shall be paid at contract rates, full amount for works executed at site.
11. Suspension of work	(i) The contractor shall, on receipt of the order in writing of the engineer-in-charge, (whose decision shall be final and binding on the contractor) suspend the progress of the works or any part thereof for such time and in such manner as the engineer-in-charge may consider necessary so as not to cause any damage or injury to the work already done or endanger the safety thereof: The contractor shall, during such suspension, properly protect and secure the works to the extent necessary and carry out the instructions given in that behalf by the engineer-in-charge.
12. Compensation in case of delay of supply of material by government.	The contractor shall not be entitled to claim any compensation from government for the loss suffered by him on account of delay by government in the supply of materials where such delay is covered by the difficulties relating to the supply of wagons, force majeure or any reasonable cause beyond the control of the government. This provision shall apply only to contracts in which supply of materials by the Government is stipulated.

13. Action in case work not done as per specifications	All works under or in course of execution or executed in pursuance of the contract, shall at all times be open and accessible to the inspection and supervision of the engineer-in-charge, his authorized subordinates in charge of the work and all the superior officers, officers of the quality assurance unit of the department or any organization engaged by the department for quality assurance and of the Chief Technical Examiner's office, and the contractor shall, at all times, during the usual working hours and at all other times at which reasonable notice of the visit of during the usual working hours and at all other times at which reasonable notice of the visit of such officers has been given to the contractor, either himself be present to receive orders and instructions or have a responsible agent duly accredited in writing, present for that purpose. Orders given to the contractor's agent shall be considered to have the same force as if they had been given to the contractor himself.
14. Contractor liable for injuries, damages, defects	If the contractor or his working people, equipment or machineries cause injury to human/animals or break, deface, destroy any property or cause any damage to any item of the work, from any cause whatever or if any defect or other faults appear in the work, the contractor shall upon receipt of a notice in writing on that behalf make the same good at his own expense.
15. Contractor to supply tools & plants etc.	The contractor shall provide at his own cost all materials, machinery, tools & plants required for work execution and maintenance.
16. Labor laws to be complied by the contractor	(i) The contractor shall obtain a valid license under the Contract Labour (R&A) Act, 1970, and the Contract Labour (Regulation and Abolition) Central Rules, 1971, before the commencement of the work, and continue to have a valid license until the completion of the work. The contractor shall also abide by the provisions of the Child Labour (Prohibition and Regulation) Act, 1986. The contractor shall also comply with the provisions of the building and other Construction Workers (Regulation of Employment & Conditions of Service) Act, 1996 and the building and other Construction Workers Welfare Cess Act, 1996. Any failure to fulfill these requirements shall attract the penal provisions of this contract arising out of the resultant non-execution of the work. (ii) No labour below the age of eighteen years shall be employed on the work. (iii) The engineer-in-charge may require the contractor to dismiss or remove from the site of the work any person or persons in the contractors' employ upon the work who may be incompetent or misconduct himself and the contractor shall forthwith comply with such requirements. In respect of maintenance/ repair or renovation works etc. where the labour have an easy access to the individual houses, the contractor shall issue identity cards to the laborers, whether temporary or permanent and he shall be responsible for any untoward action on the part of such labour. AE/JE will display a list of contractors working in the colony/Blocks on the notice board in the colony and also at the service centre, to apprise the residents about the same.

17. Work to be executed as per the approval of engineer-in-charge	All works to be executed under the contract shall be executed under the direction and subject to the approval of the engineer-in-charge who shall be entitled to direct at what point or points and in what manner they are to be commenced, and from time to time carried on.
18. Settlement of disputes & arbitration	All questions and disputes relating to the meaning of the specifications, design, drawings and instructions here-in before mentioned and as to the quality of workmanship or materials used on the work or as to any other question, claim, right, matter or thing whatsoever in any way arising out of or relating to the contract, designs, drawings, specifications, estimates, instructions, orders or these conditions or otherwise concerning the works or the execution or failure to execute the same whether arising during the progress of the work or after the cancellation, termination, completion or abandonment thereof shall be dealt by a Dispute Redressal Committee duly constitute by the State Government:
19. Levy /taxes payable by contractor	(i) Sales tax/VAT/ GST, etc. Building and other Construction Workers Welfare Cess or any other tax or Cess in respect of this contract shall be payable by the contractor and government shall not entertain any claim whatsoever in this respect.
20. Termination of contract on death of contractor	Without prejudice to any of the rights or remedies under this contract, if the contractor dies, the divisional officer on behalf of the Governor of Mizoram shall have the option of terminating the contract without compensation to the contractor.

GENERAL RULES AND DIRECTIONS

Officer inviting Tender:	Chief Engineer, PHED Zone-II Aizawl, Mizoram
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Definitions:

1	Engineer-in-charge	Executive Engineer, PHED Hnahthial WATSAN Division
2	Accepting authority	Engineer-in-Chief, PHED
3	Standard schedule of rate	MPWD/PHE Schedule of Rates
4	Department	PHE Department
5	Latest standard CPWD Contract Form GCC	Applicability of the Clauses under CPWD Form 8 for this particular tender are listed below

Clause 1:

1	Time allowed for submission of performance guarantee from the date of issue of letter of intent:	10 Days
2	Maximum allowable extension beyond the period provided in (1) above	5 Days

Clause 1(A):

I	Security deposit	2.5% from each running bill as well as final bill. The security deposit will be released @ 20%per annum for 5 years of maintenance period for raw and clear water pumping system and machineries. For other various civil works included under the project Raw water Pumping System. For Raw Intake, RCC Intake, RCC Clear water Sump and ZR Filter , the Security Deposit shall be released after the successful completion of the one (1) year maintenance period
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Clause 2:

I	Authority for fixing compensation under clause 2:	Superintending Engineer, PHED, Lunglei WATSAN Circle
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Clause 2A (Incentive for early completion):

i	Whether Clause 2A shall be applicable	No
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Clause 3& 3A (When contract can be terminated) : Applicable

Clause 4 (Contractor liable to pay compensation even if action not taken under Clause3) : Applicable.

i	Number of days from the date of issue of letter of intent for reckoning date of start:	20 Days	
ii	Milestone(s) as per table given below:-		
Sl. No	Description of milestone (Physical)	Time allowed in days for execution of work (from date of start)	Amount to be withheld in case of non-achievement of milestones
	No description of milestone (Physical) in The DPR	As before column	Penalty clause applicable as per clause-2 of CPWD Form-8.
	“NIL”	“ NIL”	
iii	Time allowed for execution of work::		18 Months
iv	Authority to decide:		
	(i) Extension of time:		As per CPWD Works Manual
	(ii) Rescheduling of mile stones:		Superintending Engineer, PHED Lunglei WATSAN Circle

Clause 5 (Time and extension for delay):

Clause 6, 6A (Measurements of work done) : Clause applicable

Clause 7 (Payment on inter to intermediate certificate to be regarded as advances) : Not applicable

Gross work to be done together with net payment /adjustment of advances for material collected, if any, since the last such payment for being eligible to interim payment:	Rs.....
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Clause 8, 8A and 8B (Completion Certificate and Completion Plans) : Applicable

Clause 9 (Payment of bill): Payment will be made depending on the availability of fund and no other claims shall be made by the contractor. Interest shall not be claimed by the contractor if payment is not made due to unavailability of fund.

Clause 10A (Materials to be provided by contractor) : All materials will be provided by the contractor at his own expense.

List of testing equipment to be provided by the contractor at site lab (Contractor may list down all testing equipments).

1		2		3	
4		5		6	

Clause 10B(ii): Mobilization advance: Applicable if the contractor made a request in writing provided fund is available.

Clause 10C: Payment on account of increase in price/wages due to statutory orders : Not applicable. Clause

10CA: Payment due to variation in prices of materials after receipt of tender : Not applicable Clause 10CC:

Payment due to increase/decrease in prices/wages : Not applicable

Clause 10D: Dismantled materials Govt. property : Applicable.

Clause 11: Applicable, all specification and appropriate latest IS Code and CPHEEO Manual will be followed for each item.

Clause 12: Deviation on extra items, substituted items, quantities etc. : Applicable

Clause 13: Foreclosure of contract due to abandonment or reduction in scope of work : Applicable

Clause 14: Carrying out part work at risk & cost of contractor : Applicable

Clause 15: Suspension of work : Applicable

Clause 16: Action in case work not done as per specifications : Applicable

Clause 17: Contractor liable for damages, defects during maintenance period : Applicable

Clause 18: Contractor to supply tools and plants :

List of mandatory machinery, tools & plants to be owned or leased by the contractor are as follow. Contractor has to list down the items with quantity, owned or leased and related documents must be furnished.

Sl. No.	Item Description	Quantity	Unit	Owned/Leased
1	Generator 3 KVA or more capacity	1	No	
2	Concrete mixer of full bag capacity or more	1	No	
3	Needle vibrator (Electric driven)	1	No	
4	Needle vibrator (Engine driven)	1	No	
5	Excavator	1	No	
6	Pickup/ tipper four wheel drive	1	No	
7	Concrete slump testing cone	1	No	
8	Jackhammer	1	No	
9	Digital clamp meter (AC/DC)	1	No	
10	Safety equipment's			
	a. Safety helmets	10	No	
	b. Safety harness	4	No	
	c. Ropes	5	No	
	d. Fire extinguishers	4	No	
	e. First aid kits	4	No	

Clause 18A & 18 B : Applicable

Clause 19 (Labour Laws to be complied by the contractor) : Applicable

Clause 20 (Minimum Wages Act to be complied with) : Applicable

Clause 21 (Works not to be sublet. Action in case of insolvency) : Applicable

Clause 22 : Applicable

Clause 23 (Changes in firm's constitution to be intimated) : Applicable

Clause 24 : Applicable

Clause 25: (Settlement of disputes & arbitration) : Applicable

Constitution of Dispute Redressal Committee (DRC)	Competent authority to appoint
As per provisions of CPWD Works Manual.	Secretary to the Govt. of Mizoram, PHE Department.

Clause 26: (Contractor to indemnify Govt. against patent rights) : Applicable

Clause 27: (Lumpsum provisions in tender) : Applicable

Clause 27: (Lumpsum provisions in tender) : Applicable

Clause 28: (Action where no specifications are specified) : Applicable

Clause 29 & 29A: (Withholding and lien in respect of sum due from contractor) : Applicable

Clause 31, 31A & 32: (Water supply) : Applicable

Clause 33: (Return of surplus materials) : Applicable

Clause 34: (Hire of plant & machinery) : Applicable

Clause 35: (Condition relating to use of asphaltic materials) : Applicable

Clause 36 (i): These are minimum requirement. If available, in addition to this may also be mentioned.

Sl No	Minimum qualification of technical representative	Discipline	Number
1	Graduate engineer	Civil	1
2	Graduate engineer	Electrical	1
3	Graduate engineer	Mechanical	1
4	Diploma engineer	Civil	1
5	Diploma engineer	Electrical	1
6	Diploma engineer	Mechanical	1

Note: A retired assistant engineer from government service holding diploma will be treated at par with graduate engineers.

Clause 37: (Levy/Taxes payable by contractor) : Applicable.

Clause 38: Conditions for reimbursement of levy/taxes if levied after receipt of tender : Not applicable.

Clause 39:(Termination of contract on death of contractor) : Applicable

Clause 40:(If relative working in the department then contractor not allowed to tender) : Applicable

Clause 41:(No gazetted engineer to work as contractor within one year of retirement) : Applicable

Clause 43: Compensation during war situations : Not applicable

SPECIAL CONDITIONS FOR CONTRACTOR'S OWN DESIGN

- 1** The contractor shall use a computerized design software and design solar water pumping scheme with the following department given data:

Raw water pumping system:

a) Number of stage	:	1
b) Pumping hour	:	10 hrs/day
c) Capacity of pump	:	26.4 m ³ /hr
d) Static head	:	25 m (Aprox)
e) Size of pumping main	:	80 mm Ø GI pipe
f) Length of pumping main	:	200 Rm (Aprox)

Clear water pumping system:

a) Number of stages	:	2
b) Pumping hour	:	10 hrs/day (Stage-I & II)
c) Capacity of pump	:	22.3 m ³ /hr (Stage-I)
d) Static head	:	585 m (Approx) (Stage-I)
e) Size of pumping main	:	100 mm Ø GI pipe
f) Length of pumping main	:	5500 Rm (Aprox) (Stage-I)
g) Capacity of pump	:	22.3 m ³ /hr (Stage-II)
h) Static head	:	581 m (Approx))Stage-II)
i) Size of pumping main	:	100 mm Ø GI pipe
j) Length of pumping main	:	6500 Rm (Aprox) (Stage-II)

- 2** The designed output data shall be submitted with all designed parameters along with the tender document. The tenderer shall submit comments/notes on the design methodology stating the feasibility for the project.
- 3** The comments/notes on design will be checked by the engineer-in-charge of the department and the tender will be accepted and work order will be issued by the competent authority only after verification and accepted by competent authority that the design submitted fulfill the requirements of the scheme.
- 4** The contractor shall submit three copies of detailed design and drawing of the architectural, structure, piping works and hydraulics within 10 days of acceptance of tender as per Contractor Actual Resurvey data.
- 5** The design engineer will be required to attend the office of engineer-in-charge for preliminary discussion for scrutiny, remarks, etc. whenever required with all reference data, books, IS specification etc. at his own cost.
- 6** It will be binding on the design engineer of contractor to clarify, modify, redesign and drawings in accordance with scrutiny remarks made by the department within 5 (five) days of communication of remarks.
- 7** On approval of design, contractor shall supply free of cost eight (8) sets of design and drawing duly bound for use of the department. The contractor shall also furnish the sheet along with program of execution for completion of work within the time limit stipulated in the tender.
- 8** Security deposit of the tender shall be forfeited if he fails to modify his design as per scrutiny remarks within specified time after levy of compensations as per tender agreement.

- 9** Even though the design and drawing submitted by the contractor are approved by department, the contractor will not be relieved of his contractual obligations to hand over the structure in sound condition duly tested.
- 10** In case of any damage / failure either during construction testing or after commissioning, whether due to faulty design or defective construction all repairs or reconstruction of the structure shall have to be carried out by the contractor, entirely at his risk and cost.

GENERAL SPECIFICATIONS

- 1 Materials and methods of construction for all civil works shall be as per relevant Indian standard specification; part of which are incorporated in the standard specification of PHED and MPWD and they all will be followed during the execution of the work. The work shall be executed as per the guidelines and provisions of BIS. All materials shall conform to Indian standard code of practice, National Building Code and CPHEEO manual to maintain quality of work.
- 2 All materials to be used shall conform to the relevant specifications as per the latest version of the Indian Standards, unless otherwise stated in the detailed specifications of items of work. A set of specimen samples of all approved materials shall be kept in bottles or otherwise at site, cost of which is to be borne by the contractor.
- 3 Water required for the execution of the work and for the water tightness test of the water retaining structures shall be supplied/provided by the contractor at his own cost to the satisfaction of the Engineer-in-Charge.
- 4 Hydraulic tests of water retaining structures shall have to be undertaken by the contractor without any extra cost. Filling of water retaining structures/reservoirs shall be carried out gradually at a rate not exceeding 30 cm rise in water level per hour and shall not exceed 2.0 meter within 24 hours for a total period of 72 hours. Records of leakages at different levels of water retaining structures/reservoirs if any shall be archived for reference. The reservoir once filled shall be allowed to remain in its state for seven days before any readings of drop in water levels are recorded. The level of the water shall be recorded again at subsequent intervals of 24 hours over a period of seven days. The total drop in surface level over a period of seven days shall be taken as an indication of the water tightness of the reservoir, which for all practical purposes shall not exceed 40 mm.
- 5 If even after extending the period of test, the drop is more than permissible, the contractor should empty the reservoir, rectify the defects by re-plastering wherever necessary by applying water proofing compounds, etc. and continue the water tightness test till the drop in level is within the permissible limit. This shall be repeated at the cost of the contractor without claiming any extra costs. Any delay in giving water tightness will invite penal action under relevant topics/standards of the tender agreement.
- 6 **Bricks:**
Only 1st class kiln burnt bricks shall be used unless otherwise specified. They shall be of a uniform deep cherry color; thoroughly burnt, regular in shape with sharp, uniform and square areas and they must emit a clear ringing sound on being struck.

They must be free from cracks, chips, flaws, stones or lumps of any kind and they shall not absorb water more than one seventh of their own weight after soaking them in water for 15 minutes. Bricks shall show no sign of efflorescence either dry or subsequent to soaking in water.
- 7 **Sand:**
The source from which sand is to be obtained shall be subject to the approval of Engineer-in-Charge. The sand shall be clean, sharp and gritty to touch and be freed from earth and other impurities by washing. The sand shall be washed to such a degree that when a handful is mixed with clean water in a glass and allowed to stand for an hour the precipitate of mud over the sand shall not exceed 5%.
- 8 **Course Sand:** It is to be screened through a sieve of 64 meshes to the square inch so as to exclude large particles from the work. The fineness modulus shall not be less than 1.0

- 9 **Fine sand:** It is to be screened through a sieve of 64 meshes to the square inch so as to exclude large particles from the work. The fineness modulus shall not be less than 2.5. The sand should conform to IS 382-1982 for fine and course aggregates from natural sources.
- 10 **Stone chips:** It shall be obtained from crushing trap quartzite or hard stones and from quarries approved by Engineer-in-Charge. It shall be of approved quality and proper grade. It shall pass through ¾" mesh and retained on ¼" mesh. It shall be free from dirt, leaves, clay and any organic matter. The material shall conform generally to IS 383-1983 for course and fine aggregate from natural sources or IS 515-1959 for natural and manufactured aggregates for use in mass concrete with latest revisions.
- 11 **Cement:**
Ordinary or lowest heat Portland cement conforming to IS : 269 –1989 or PPC conforming to IS : 1489 (Part 1 & 2) shall be used with approval of the Engineer-in-Charge. All cement shall be fresh when delivered. Cements of different types/makes are not to be mixed with one another. Consignments shall be used in the order of delivery. Admixture, if any, shall be used only after their approvals.
- 12 **Reinforcement:**
Steel reinforcement shall be of mild steel of tested quality conforming to IS - 432 -1966/ H.Y.S.D. bars conforming to IS -1786/1779- with latest amendments of reputed make.

All the reinforcement shall be clean and free from rusts, mild scales, dusts, paints, oils, grease, any adhering earth or other materials or coating that may impair bonding between the concrete and reinforcement, or cause corrosion of the reinforcement or disintegration of concrete.

Neither the size nor length of bar or wire shall be less than the size or length described in the bar schedule or elsewhere and the length shall not be more than 50 mm in excess of the length as described.

Welded joints in reinforcement may be used but in cases of important connection, tests shall be made to prove that the joints are of the full strength of bars connected, welding of reinforcement shall be done in accordance with the recommendations of the relevant Indian standards for welding mild steel bars used in the reinforcement concrete construction.

Bending and overlapping, placing in position, fabrication, binding, reinforcement with wire of approved gauge shall be done as per I.S. 432 – 1960 (revised) and I.S. 1786 – 1966 and I.S. 2502 (revised). Handling and storage of materials for concrete or RCC should be followed as per I.S. 4082 –1977.
- 13 **Water:**
Water to be used for making and curing of concretes, mortars, etc. shall be free from objectionable quantities of silts, organic matters, injurious amount of oils, acids, salts and other impurities, etc. as per IS-456-1978. The Engineer-in-Charge or his authorized representatives will determine whether or not the quantities of impurities which are objectionable.

Such comparisons will usually be made by testing of compressive strength, water requirement, time of setting and other properties of concrete made with distilled or clean water and concrete made with the water proposed for use, permissible limit for solids when tested in accordance with I.S. 3025-1964. shall be as tabulated below:

1) Organic	200 mg/litre.
2) Inorganic	3000 mg/litre.
3) Sulphate (As SO_4)	500 mg/litre.
4) Chloride (As Cl)	2000 mg/litre for P.C.C and 1000 mg/litre for R.C.C. work
5) Suspended matters	2000 mg/litre.

If any water to be used in concrete, suspected by the Engineer-in-Charge/or his authorized representative of exceeding the permissible limits of solids, samples of water will be obtained and get tested by Engineer-in-Charge in accordance with IS: 3025-1964.

14 Cement Mortar:

The mortar shall consist of cement and sand mixed in proportion as defined in relevant schedule items for various item of work. Only measured quantity shall be used. The sand shall be shoveled in a wooden measure of a clean masonry platform, after removing the measure box and spreading out sand if necessary, the cement (in required proportion) shall be emptied on the top of sand.

The sand and cement shall be then turned over with shovels once dry and made into the form of a hollow cone; into this water can be poured and the whole shall then be turned over completely twice. The color and consistency shall at this stage be quite uniform, if not, further turning shall be done.

Water shall be added by measured quantities if the Engineer so direct. Only such quantities of mortar shall be mixed at one time as can be used at once before it can set. No mortar, which has once caked or begun to set, shall be used, nor shall such mortar be remixed; but it shall be removed from the site of the work immediately.

15 Cement concrete:

The concrete shall consist of an aggregate of the proportion by volume defined in relevant schedule item or work. Only measured quantity shall be used.

16 Laying: The cement, sand and stone chips shall be mixed properly in mechanical mixer in such a manner as to avoid loss of water. The concrete shall be mixed for minimum period of 2 minutes or until it is of even colour and uniform consistency throughout. As soon as the concrete is mixed it should be removed to the work in iron vessels as rapidly as practicable. The concrete laid will be vibrated for compaction by the vibrators. Slum test will be carried at site during execution of work.

17 Curing: The concrete laid shall not be disturbed and shall be kept thoroughly damped by means of wet matting and sand until it shall have become thoroughly set and hard enough to prevent its drying and cracking.

The aggregate shall consist of stone ballast of quality approved by Engineer-in-Charge and shall consists of graded size 20 mm and down wards as per specification or the size mentioned in the item description. Curing period for PCC/RCC shall be 14/21 days minimum. Use of curing compound shall be opted as per manufacturer's specification.

18 Formworks: The contractor shall furnish on the site of work sufficient number of centering, moulds or templates for its expeditious execution. The forms shall be made of MDF board and in such a way and of such materials which will ensure a smooth surface on the finished concrete. Forms and centering shall be left in place until the concrete has set sufficiently to permit the removal without danger to the structures and as per specified at 2.12.2.

Brick masonry works:

- 19 Materials:** The brick works shall consist of bricks and mortar in accordance with general specification and plans.
- 20 Soaking bricks:** All bricks shall be soaked in clean water in tank for a period of at least twelve hours immediately before use. The contractor shall provide at his expense soaking tanks of sufficient capacity to admit simultaneous immersion to two days supply of bricks for the work in its normal rate of progress.
- 21 Laying:** All the best shaped uniformly coloured bricks shall be picked out and used for face work without any extra payment to the contractor.

All courses unless otherwise specified or ordered by the Engineer-in-Charge, shall be truly horizontal and the walls shall be taken up truly vertical by plumb bob. Mortar joints shall never exceed 10 mm in thickness and this thickness shall be uniform throughout.

Vertical joints in alternate courses shall come directly over one another. The joints shall be raked out not less than 12 mm deep when the mortar is green so as to provide proper key for the plaster or pointing to be done.

Each face brick shall be set with both bed and vertical joints quite full of mortar. No damaged or broken bricks shall be used in any part of the work except such as may be cut to size for closing the course.

The masonry shall be carried up regularly and no step shall be allowed more than 60 cm. Where the masonry of one part has to be delayed, the work must be raked back at an angle not exceeding 45° Angles and Junctions. At all angles forming the junction of walls, the brick shall at each alternate course be carried into their respective walls so as to thoroughly unite the work with English bond. Care shall be taken that when a brick is left out to allow support for the scaffold pole on the wall face, such brick shall always be a header and that not more than one header for each pole shall be left out.

- 22 Scaffolding:** Proper scaffolding shall be provided whenever necessary having two sets of vertical supports and shall be subjected to the approval of the Engineer-in-Charge, who may order the contractor to alter or strengthen the scaffolding if considered necessary, without thus becoming responsible either for the safety of the work or workmen or for any additional payment.

Holes shall be made good by bricks to match the face work when scaffolding is removed.

- 23 Curing:** All bricks work shall be kept well watered for 10 days after laying.

24 Reinforced Cement Concrete:

All R.C.C. work shall be of the grade M-20, M-25 and M-30 as given in specifications and as provided in latest IS: 456-2000 (Amendment). The materials will be measured when dry. The stone chips should be thoroughly washed in clean water and stacked.

For water retaining structures minimum grade of concrete shall be M-30 (IS: 3370 latest)

- 25 Laying:** Cement, sand and stone chips shall be mixed properly in a mechanical mixer in such a manner as to avoid loss of water. The concrete shall be mixed for minimum period of 2 minutes or until it is of even color and uniform consistency throughout. As soon as the concrete is mixed it

should be removed to the work in iron vessels as rapidly as practicable. The concrete laid will be vibrated for compaction by vibrators. Slum test will be carried at site during execution of work.

- 26 **Curing:** The concrete laid should not be disturbed and shall be kept damped by means of wet matting and sand until it shall have become thoroughly set and hard enough to prevent its curing and cracking.

The aggregate shall consist of stone ballast of quality approved by Engineer-in-charge and shall consist of graded size 20 mm and downwards as per IS and CPHEEO specification or the size mentioned in the item description.

- 27 **Formwork:** Contractor shall furnish on the site of work sufficient number of centering, forms, moulds or templates for its expeditious prosecution, the forms shall be made in such a way and such material as will ensure a very smooth surface on the finished concrete. Forms and centering shall be left in place until the concrete has set sufficiently to permit the removal without danger to the structure.

- 28 **Reinforcement:** Steel bars for reinforcing concrete shall be of such shape to afford an approved mechanical bond with concrete to ensure intimate control between steel and concrete.

Steel reinforcement shall be either mild steel of tested quality confirming to IS-432-1996 or cold worked steel high strength deformed bars as per IS-1786-1979 in strength grade Fe-415 or hot rolled high yield strength steel deformed bars with minimum yield strength of 425 N/mm as per IS – 1939 – 1966 (Amended 1968) Reinforcement bars will be rejected if the actual weight varies more than 5% from the standard weight.

All bars must conform to the requirement of Indian standard specification. They shall be protected at all time before placed in the concrete from mechanical injury and the weather and when placed in the work, they shall be free from dirt, scales, loose or scaly rust, paint and oil.

Bars which are to be embodied in concrete but remain exposed for sometime after being placed in the work shall, if directed be immediately coated with a thin grout of equal part of cement and sand. Bars shall be bent to the shape shown on the drawings and in conforming to approved templates. When bars are cut and bent on the work the contractor shall employ competent men and provide the necessary appliances for the purpose.

All steel shall be rigidly held in place with 18 gauge annealed steel wire, cement mortar (1:2) cubes. M.S. chairs and spacer shall be used in order to ensure accurate positioning of reinforcement. All joints in steel reinforcement shall be overlapped. The length of overlap for tension and compression shall be as per the requirement of Indian standard specification.

In water retaining structures a clear cover of 40 mm from the face of the steel should be provided.

- 29 **Construction Joints:**

Construction joints shall be provided, where directed as approved by the Engineer-in-charge. Such joints shall be kept minimum and shall be right angles to the direction of main reinforcement. In case of column and walls the joint shall be horizontal and 8 to 15 cm below the bottom of the beam or slab running into the column or wall head or below the anchor reinforcement of beam and slab coming into the column and wall and the portion of the column or wall between the stopping level and the top of slab shall be concerted with the beam or slab.

- 30 Vertical Joints:** At the end of any days work or run of concrete, the concrete should be finished off against temporary shutter stop, which should be vertical and securely fixed. This stop should be removed as early as weather permits.
- 31 Horizontal Joints:** Horizontal joints should be washed down two hours after a casting in the manner described above for vertical joints.
- If the concrete has been allowed to harden excessively, the surface shall be chipped over its whole surface to depth of at least 10 mm and there after thoroughly washed. Before fresh concrete is added on the other side of a construction joints, the surface of the old concrete will be thoroughly wetted then covered with a thin layer of cement mortar (1:2).
- All the construction joints in all concrete structure in contact with water or earth shall be provided with approved PVC water stops on both side with hot asphalt or approved metallic strips. The longitudinal joints in water stops shall be preferably hot welded.
- 32 Expansion joints:** Expansion joints shall be provided wherever directed by the Engineer-in-Charge where necessary as per standard specification and practice. The filler to be used shall be of approved material.
- 33 Cement Plaster:**
- 12 mm thick cement plaster in (1:4) proportion shall be applied on outside surfaces of all concrete works from 30cm below ground level up to top. The surface in contact with water will have 12 mm thick cement plaster of not less than (1:3) proportion with 3% water proofing compound. The concrete surface shall be properly hacked, washed, cleaned and applied with thick cement slurry before applying. All brick works unless otherwise specified will be plastered externally and internally with 12mm cement plaster (1:6) proportion or as specified by the Engineer-in-Charge.
- The plaster shall be protected from sun, rain and frost at the contractors expense by such means as the Engineer-in-Charge may approve.
- To protect plaster from sun, ordinarily the whole surface shall be covered with wet sacks. The contractor shall keep the plaster continuously wetted for a period of seven days after application.
- 34 Flooring:**
- Except where in otherwise specified, flooring will have minimum 15cm thick sand filling, one brick flat soling and 100mm thick P.C.C (1:2:4) in ground floor and 25 mm thick patent stone flooring shall be provided over this base. In case of flooring in raw water pump house, 25mm patent stone flooring shall be provided directly over R.C.C. slab in strip placed in suitable manner to avoid construction cracks.
- 35 Doors and Windows:**
- All the doors and windows shall be of good quality, well seasoned and well-dressed Sal wood with oxidized iron fittings. All windows shall be provided with M.S. grill of approved design.
- Rolling shutter of approved make and size 3m wide x 2.8m height (for clear water pump house) and 2m wide x 2.8m height (for raw water pump house) with pusher and pull operated properly fabricated Dura-ultima make including all accessories and necessary fitting of approved quality as per PWD specification will be provided in the pump house.
- All the doors and windows shall be painted with two coats of enamel paints over a coat of primer. The materials, the size, the shape and the fitting of doors and windows shall be approved by Engineer-in-Charge before installed in position.

- 36 **Roof:**
R.C.C. grade as per provision made in IS:456 will have to be provided in roof slab of adequate thickness.
- 37 Wherever necessary, stainless steel pipe posts of size 40 mm dia. and 1.0m height fixed rigidly in cement concrete at 1.50 m apart with 3 rows of horizontal 25 mm dia. stainless steel pipes including painting, etc. will be provided as railing and safety.
- 38 **Snowcem Wash**
All the building shall have two coat of snowcem wash of approved shade over a coat of cement primer including preparing the plastered surface smooth with sand paper, scaffolding, centering etc. all complete as per building specification.
- 39 **Painting:**
All steel or wood shall have two coats of synthetic enamel paint over a coat of primer as specified by the manufacture of the paint.

The make, shade and color of the paints shall have to be approved by the Engineer-in-Charge before use.
- 40 **Plants, machineries, equipments, devices, etc:**
All items under this should be made of standard materials and designs based on best performance relative to efficiency, sturdiness and handling, etc.
- 41 **Inspection and Testing:**

The contractor should arrange inspection team from the Department to perform inspection of pumps, motors, engines and other machineries and equipments at the manufacturer's site before dispatch, at his own cost. Moreover, all the other appurtenances should also be approved by the Engineer-in-Charge before installation, at the contractor's own cost. Materials will not be considered acceptable without inspection-cum-acceptance certificate of approved PHED inspection personnel.

All pipes and other installation subjected to pressure shall be hydraulically tested to 2 times the designed pressures or as directed by the Engineer-in-Charge.
- 42 **Guarantee for equipments:**
All electro-mechanical equipments and appurtenances supplied and erected by the contractor shall be covered by a guarantee for satisfactory working with a minimum period of 5 years from the date of satisfactory commissioning. Any defective parts detected during this guarantee period shall be replaced by the contractor at his own cost, such replacement shall be arranged by the contractor expeditiously as may be directed by the Engineer-in-Charge.
- 43 **Completion Drawings:**
On completion of the work and handing over of the same to the Department, the Contractor shall prepare three sets of white print plans mounted on cloth, showing the working details of the several components, units of the plant, machineries and equipments, including civil works (i.e. buildings, etc.) installed and erected, together with a descriptive specification for the daily working, operation and maintenance and also a list of spares along with the plant. The original cloth tracings of the above completion plans shall also be handed over to the Department for record. A section of filter media together with its density, sizes, depth and specifications, shall be enclosed in triplicate duly attested.

SCOPE OF WORK

1 Site development work:

Site development will be carried out for construction of intake jackwell, raw water pump house, water treatment plant, clear water sumps, filter house, pump houses, control room, duty house, etc. and earth spoil, etc. will be properly disposed off to prevent environmental problems, damage to property, etc.

2 Intake Jackwell cum Raw Pump House:

RCC intake Jackwell having multiple openings will be constructed at a suitably selected location at Thingsai village side bank of Tiau lui by installation of 100mm dia. GI inlet pipes with control valves with appropriate rising spindle at 3 different water levels of weir depending on annual weather conditions to facilitate withdrawal of required volume of raw water.

Two (2) units of raw water submersible pumps will be installed to lift raw water from jackwell to treatment plant. Submersible raw water pump sets (1 running + 1 standby) suitable for a discharge of at least 26.40 cum/hr with an approximate static head of 25m with a pumping main pipeline of GI pipe 80mm dia. (M) of length 200m along with suitable electric motors, control panels, power supply cables (copper make), operating equipments and valves will be provided. Pump house of area 3.6m x 3.6m will be constructed upon the jackwell.

3 Water Treatment Plant:

Water treatment units capable of treating 0.264 ML within 10 hours including treatment loss consisting of cascade aerator, flash mixer and mixing chamber, rectangular plain sedimentation tank, rapid sand filter – 2 units, back-wash tank for rapid sand filter of capacity 68,640 liters including back-wash pump (1-set) with standard operating system will be constructed.

4 Chemical House:

Chemical house for storage of chemicals for treating raw water of area 2.9m x 2.9m will be constructed.

5 Clear water Pump House & Duty Quarters:

Clear water Pump House of area 6m x 6m & Duty Quarters of area 4m x 6m each will be constructed at Stage-I and Stage-II pumping stations with standard furnishing items.

6 Clear Water Sump-I & II:

RCC Clear water sump with concrete mix of M30 having capacity of 1,00,000 litres for Stage-I and Stage-II will be constructed with standard operating system.

7 Clear Water Pumping System:

Two (2) units of clear water horizontal multistage centrifugal pump set (1 running + 1 standby) and pump foundations suitable for discharge of 22.30 cum/hr at an approximate static head of 585m with a pumping main pipeline of GI pipe 100mm dia. (H) of length 5500m along with suitable electric motor, control panel, cables (copper materials), operating equipments and valves, etc will be provided for Stage-I pumping station.

Two (2) units of clear water horizontal multistage centrifugal pump set (1 running + 1 standby) and pump foundations suitable for discharge of 22.30 cum/hr at an approximate static head of 581m with a pumping main pipeline of GI pipe 100mm dia. (H) of length 6500m along with suitable electric motor, control panel, cables (copper materials), operating equipments and valves, etc. will be provided for Stage-II.

8 Chlorinator Mac-50:

Chlorinator Mac-50 along with suitable electric power supply, control panels, power supply cables (copper make), operating equipments will be provided at the top of main reservoir at Thingsai.

9 HOT Crane:

A hand operated crane of capacity 2 metric ton with all accessories like trolley, girder, rail, nuts, bolts, base plates, etc will be installed inside both clear water pump houses.

10 *If there are varying or conflicting statement made in any of the above mentioned scope of works or items of works/materials found to be missing which is then deemed necessary during the execution of works for the overall success and functioning of the grid pumping system, the Tender Accepting Authority shall be the deciding Authority with regard to the addition/deletion of the scope of works and his decision shall be final and binding on the contractor.*

DETAILED SPECIFICATION FOR WORKS

1 Intake Jackwell cum Raw water Pump House:

The contract includes construction of:

(i) Intake Jackwell:

RCC intake Jackwell having multiple openings with valves with appropriate rising spindle at different water levels to facilitate withdrawal of required volume of raw water throughout the year will be constructed at a suitably selected location at Thingsai village side bank of Tiau lui. The intake jackwell shall be designed to withstand monsoon flood and to be of height above ground level which may not allow silts deposited inside the jackwell during highest flood level.

Two (2) units of raw water submersible pumps will be installed to lift raw water from jackwell to treatment plant. Submersible raw water pump sets (1 running + 1 standby) suitable for a discharge of at least 26.40 cum/hr with an approximate static head of 25m with a pumping main pipeline of GI pipe 80mm dia. (M) of length 200m along with suitable electric motors, control panels, power supply cables (copper make), operating equipments and valves will be provided. Pump house of area 6m x 6m shall be constructed upon the jackwell.

(ii) Raw water pump house:

Type	=	Earthquake resistant RCC framed structure
Plinth area	=	12.96 sqm (Ground floor)
Wall height	=	3 m
Foundation depth	=	@ 2.5 m
Amenities	=	Automatic sprinkler with alarm, lightning conductor, cable trenches and drainages.
Services	=	Internal water supply system with storage tank, sanitary installation and internal electric installation.

2 Treatment Plant:

Conventional water treatment plant shall be provided to treat 0.264 ML of water requirement in 10 hours. It should also be possible to overload the treatment plant by 50%.

The treatment plant will comprise of the following processes:

- (i) Aerator
- (ii) Flash mixer
- (iii) Plain sedimentation tank
- (iv) Rapid sand filter (2 units)
- (v) Back wash
- (vi) Chemical House

(i) **Aerator:**

Cascade aerator of loading rate 0.264 ML within 10 hours with 4 Nos. of steps with an aeration time of 0.5-1.5 seconds will be constructed.

(i) **Flash mixing chamber and agitator:**

To prevent uneven chemical distribution, reducing chemical wastage, rapidly and uniformly disperse coagulation chemicals (like alum or PAC) into raw water and enhancing the removal of turbidity and suspended solids flash mixing chamber with a detention period of 30-60 seconds and mechanical agitator will be constructed.

RCC cylindrical flash mixers with the following parameters shall be provided:

Quantity	=	1 unit
RCC grade	=	M 30
Detention time	=	45 second
Temporal mean velocity gradient	=	600 per second
GT	=	27000

(ii) Plain sedimentation tank with inspection gallery:

RCC sedimentation tank with the following parameters shall be provided:

Quantity	=	1 unit
RCC mix	=	M 30
Surface loading rate	=	264 m ³ /in 10 hours

Inlets shall be designed to distribute the water equally and at uniform velocities. A baffle should be constructed across the basin close to the inlet and should project several feet below the water surface to dissipate inlet velocities and provide uniform flow;

Outlet weir or submerged orifice shall be designed to maintain velocities suitable for settling in the basin and to minimize short-circuiting. A baffle should be provided in front of the weir to stop the floating matter from escaping into the effluent.

(iii) Rapid sand Filter:

RCC filter tank with the following parameters shall be provided :

Quantity	=	2 units (1 running + 1 standby)
RCC mix	=	M 30
Filtration rate	=	26.4 m ³ /hr

All the necessary appurtenances like measuring devices, rate controllers, etc. should be provided as per Engineer-in-Charge direction and approval.

All inside walls and back wash gutter will be of mosaic tile finishes.

Filter sand and gravel shall be of the following specifications:

i) Sand Specifications:

- a) Effective size of sand : 0.45 to 0.70 mm
- b) Uniformity coefficient : 1.3 to 1.7
- c) Sand shall be hard, resistant quartz and free from clay, dust, roots and other impurities.
- d) When immerse it should not be soluble in water and dilute HCl acid in 24 hours.
- e) Specific Gravity : 2.55 to 2.65
- f) Wearing Loss : 3 % maximum by weight
- g) Filter Media Sand and Gravel : Shall be as per IS : 8419 (Part I)
- iii) Depth of sand : 700 mm (coarser sand below finer sand)
- iv) Gravel support media sand : 500 mm
- ii) Gravel size grading : 2 mm at top and 50 mm at bottom

Size and spacing of under-drainage system shall be as per standard design. The perforations size and spacing shall be as per standard design.

Back wash gutter, air compressor, backwash pump, valves, etc. with complete back washing system of standard capacity and design shall be provided of in each filter unit.

Indicator type flow meter should be provided for both air and wash water lines. Since air and wash water have to be increased slowly, the control valves shall be of a type permitting slow opening.

Globe valve for air and butterfly valve for water shall be preferred. For all filter valves which are subjected to heavy wear and tear, only standard and sturdy best reputed type valves shall be provided.

Filter rate controller should be of sound and accurate design. Its efficiency and functioning shall be critically examined.

Railing:

Wherever necessary, stainless steel posts of 40 mm dia. and 1.2 meter height fixed rigidly in cement concrete at 1.50 m apart with 3 rows of horizontal 25 mm dia. stainless steel pipes including painting, etc. will be provided as railing and safety.

(v) R.C.C. back wash tank:

R.C.C. rectangular tank for filter back washing of 5.2m length, 4m width and 3.3m depth of capacity 68,640 liter shall be provided. The level difference between the under drainage and the tank should be 8.5-10 m.

Necessary pipe assembly for rising, delivery, overflow and wash out mains with puddle collars, specials and valves arrangement of cast iron of adequate sizes shall be provided, suitable water level indicator and mosquito proof wire netting on the ventilating lantern should be provided.

(vi) Back wash pump:

Back wash water pump (1 unit) of suitable capacity to fill wash water tank in 1 (one) hour to be provided as per CPHEEO Manual including CI pipes specials, sluice valves etc. complete should be provided.

The wash water is proposed to be disposed off in nearby nallah through gravity. The wash water gutter invert level should therefore be fixed considering HFL of nallah so that drainage by gravity during flood can be possible.

(vii) Air Blower:

Air blower (appropriate capacity) for backwashing to assist in cleaning filter media by loosening particles with all standard attachments must be installed

(viii) Chemical House:

Chemical house for storage of chemicals for treating raw water of area 2.9m x 2.9m will be constructed.

Standards for purified water:

The purified water shall meet the standards as mentioned in latest Water Supply and Treatment Manual published by CPHEEO.

3 Clear Water Sumps:

RCC reservoirs will be provided for storing treated water.

Quantity = 2 Nos.

Capacity = 1,00,000 liter each

Grade of RCC = M-30

Shape = Circular

Wall height = Less than diameter, more than radius

Free board = Not less than 0.3m.

Clear water reservoir near Treatment Plant shall have inlet channels connected with filter outlet channel. Walls of the reservoir and roof shall be of R.C.C treated with two layers of tar felt over it and a layer of the tar painting in the ceiling. The slope of the reservoir roof should be such that it is free of water accumulation at any area.

There will be adequate number of air-vents suitably placed and provided with mosquito proof nettings. Proper surface drain shall be constructed around it which will ultimately be connected to the general drainage system. The top floor of the reservoir will have sufficient opening with G.I. vent pipes and cowls.

The floor level is to be kept as high as possible in consistent with the filter outlet channels which feed it. Care should be taken to maintain clear water sump floor level to maintain NPSHr of clear water pump sets. The reservoir bottom floor shall be provided with proper slope as to allow the entire water to be drained out from drain pipe provided at the time of its cleaning and washing.

Consideration of soil pressure from outside when reservoir is empty and up lift pressure of sub-soil water shall be taken into consideration in the design of the reservoir.

Lightning conductor shall be provided on the sumps as per Engineer-in-Charge approval.

Thickness of the wall shall not be less than 215 mm and two layers of reinforcement shall be used and the design and construction shall be as per CPHEEO Manual and IS:3370.

Ladder made with non-corrosive, non-toxic materials safe for easy accessibility placed at 25 cm to 30 cm apart and rungs 45 cm wide shall be provided with 75° to vertical at the floor in both clear water sumps.

All pipes and valves connected both in inlet and outlet chambers shall be as per I.S Specifications. Manhole easily openable and accessible with non-corrosive and safe cover shall be provided.

Outlet valve of suitable size and pressure shall be provided for pump suction line. Outlet pipe should be placed 15 cm above the floor level to provide space for sedimentation. Suitable strainer with adequate volume of pump suction shall be provided in the outlet pipe.

Scour pipe and valve will be provided at the bottom of the reservoir with sluice valve. The down pipe should have a gravity chamber at the bottom to prevent entry of rodents for scour valves. Water level indicator shall be provided.

4 Clear water pump houses and duty quarters:

(i) Clear water pump house (Stage-I):

Type	=	Earthquake resistant RCC framed structure
Plinth area	=	36 sqm ground floor
Wall height	=	6 m
Length	=	6m
Breadth	=	6m
Foundation depth	=	@ 1.7 m
Amenities	=	Automatic sprinkler with alarm, lightning conductor, telephone conduit
Services	=	Internal water supply system with storage tank, sanitary installation and internal electric installation.

(ii) Clear water pump house (Stage II):

Type	=	Earthquake resistant RCC framed structure
Plinth area	=	36 sqm ground floor
Wall height	=	6 m
Length	=	6m
Breadth	=	6m
Foundation depth	=	@ 1.7 m
Amenities	=	Automatic sprinkler with alarm, lightning conductor, telephone conduit
Services	=	Internal water supply system with storage tank, sanitary installation and internal electric installation.

(iii) Duty Quarters (Stage-I):

Type	=	Earthquake resistant RCC framed structure
Plinth area	=	24 sqm ground floor
Wall height	=	3 m
Foundation depth	=	@ 1.5 m
Amenities	=	Automatic sprinkler with alarm, lightning conductor, telephone conduit
Services	=	Internal water supply system with storage tank, sanitary installation and internal electric installation.

(iv) Duty Quarters (Stage-II):

Type	=	Earthquake resistant RCC framed structure
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Plinth area	=	24 sqm ground floor
Wall height	=	3 m
Foundation depth	=	@ 1.5 m
Amenities	=	Automatic sprinkler with alarm, lightning conductor, telephone conduit
Services	=	Internal water supply system with storage tank, sanitary installation and internal electric installation.

Both the pump houses shall be of adequate size and shall be located at suitable place by the side of clear water sump and shall be of adequate size to accommodate 2 units of pumping sets of suitable capacity each.

They should also be capable of accommodating bus-bar channel, starter, O.C.B. sluice valves, reflux valves and trenches for electrical cables, concrete work for delivery pipe line, trench for water drainage, etc. for clear water pumping main of 100 mm dia in the pump houses and also supporting structures for cables and pipes.

The foundation and floor design of pump house should be done properly and due considerations for vibration should be given in its design. Further, the height of plinth of pump house above ground level shall not be less than 0.6 M.

The pump chamber shall be kept well lighted and ventilated with natural light and excess of air through long glass panels and window as per approved drawing. The front will have glass cover where needed and have fine architectural look. Toilet, wash basin, exhaust and ceiling fan, etc. shall be provided inside each pump house and every duty quarter by the contractor.

Following furniture, etc should be provided in each pump house and duty quarters:

- | | | |
|---|---|--------|
| a) Steel table with laminated plywood top of size 0.9 m X 1.5 | - | 2 Nos. |
| b) Steel chair with plastic netted base and rest | - | 5 Nos. |
| c) Steel cupboard (Full size) | - | 2 Nos. |
| d) Steel locker for employees with 12 lockers | - | 1 No. |
| e) Kitchen wares with complete set of utensils | - | 1 Unit |
| f) Wooden bed | - | 3 Nos. |
| g) Fire extinguisher | - | 3 Nos. |

All bricks masonry work should be in cement mortar with 1:3 and should be plastered with 1:3 on both the sides with smooth neat finish. The thickness of the plaster shall be 20 mm from one side and 12 mm on another side for all the brick masonry work. The inner surface of wall of the pump chambers shall be painted with plastic emulsion paint and outer surface with snowcem.

All inside surface shall have three coats of painting of approved quality and shade. The front elevation and exterior finish of the building shall be designed aesthetically and architecturally. The department reserves the right to alter the front elevation of filtration plant/filter house if it does not appeal to the department on contractor's cost. The exterior plastered walls should be painted with three coats of approved, quality and shade paint. All doors, (except central main door), windows and ventilators shall be of steel as per I.S.1038-1975 and I.S.1081-1960.

The position of windows and ventilators should be such that these will be opened outside and closed easily when necessary. The total shutter area of doors, windows and ventilators shall not be less than 30% of the floor area. All windows and doors on the outer walls shall be provided with 1.0 m wide RCC chajjas.

The central main external door shall be aluminium fully glazed as per I.S.1948-1961 and 1081-1960. The size shape and finish of the door shall be specially selected so as to improve the get-up of filter house. The entrance of the filter house shall preferably be in the form of foyer, with suitable porch in the front.

Sanitary block consisting of one Indian type water closet, wash basin, towel rail, mirror etc. shall be provided with all necessary pipe fittings as per the instruction of the Engineer-in-charge and one urinal and wash basin having a carpet area of 6 sqm should be provided. A septic tank with soak pit of suitable capacity shall also be provided at proper place for safe disposal.

5 Space Required for Pumping System:

(a) Sufficient space should be available in the pump house to accommodate the pump, motor, valves, piping, control panels and cable trays in a rational manner with easy access and with sufficient space around each equipment for their maintenance and repairs.

The minimum space between two adjacent pumps/motors should be 0.6 meter for small and medium units and 1 meter for large units.

(b) Space for control panels should be planned as per the Indian Electric Rules (I.E), as per these rules:

(i) Clear space of not less than 915 mm in width shall be provided in front of switch-board, or as per the recommendation of the manufacturers with approval of the Engineer-in-charge.

(ii) The space behind the switch-board shall not be less than 230 mm or more than 750 mm in width measured from the farthest part of any attachment or conductor with approval from the Engineer-in-Charge.

(iii) If the switch-board exceeds 760 mm in width, there shall be a passage-way from either end of the switch-board with a clear height of 1,830 mm.

(c) Service bay should be provided in the pump house with a space that the largest equipment can be accommodated there for overhauling and repairs.

(d) A ramp or place for loading and unloading bay/space should be provided as per the decision of the Engineer-in-Charge/ Executive Engineer.

(e) Head room and material handling tackle/crane:

(i) In case of vertical pumps with hollow shaft motor, the clearance should be adequate to lift the motor clear off the face of the coupling or pump stool and carry the motor to the service bay without interference with any other equipments. The clearance should also be adequate to dismantle and lift the largest column assembly.

(ii) The travel of the lifting tackle/ crane should cover all bays and all equipments.

(iii) In the case of horizontal pump or vertical pump with solid shaft motor the head room should permit transport of the motor above the other equipments with adequate clearance.

(iv) The rated capacity of the lifting tackle/ crane should be adequate for the maximum weight to be handled at any time.

6 HOT crane:

The tenderer shall also quote for supply and erection of 2 M.T. capacity hand operated over-head travelling crane with chain pulley block shall be provided in both the pump houses. The pump houses shall be provided with gantry girders and proper size rails for 2 M.T capacity gantry crane. The crane should move horizontally from one end to other and across. The space from the top of the rail to the ceiling shall not be less than 1.2 meter.

7 Gantry Girder:

Cantilever projection not less than 0.3 m shall be provided all around on the inner side of the pump house wall and at 3.0 m height from floor level, to support gantry girder crane through RCC columns/RCC wall. Rails of suitable size will be provided all around this projection; over which the gantry girder crane will move along the circumference.

8 Piping layout in the Pump Houses:

Suction Piping:

(a) The suction piping should be as short and straight as possible to minimize bends.

(b) Any bends and elbows should be of long radius.

(c) The size of suction pipe should be 2 size larger than the nominal suction size of the pump or the suction pipe should be of such size that the velocity shall be about 2 m/sec.

(d) Where bell-mouth is used, the inlet of the bell-mouth should be of such size that the velocity at the bell-mouth shall be 1.5 m/sec.

(e) Where suction lift is encountered, no point on the suction pipe should be higher than the highest point on the suction part of the pump.

(f) When a reducer is used, it should be of the eccentric type. When on suction lift, the taper side of the reducer should be below the centre line of the pump.

(g) The suction strainer should have net open area, minimum equal to 3 times the area of the suction pipe.

Discharge Piping:

- (a) Discharge piping should be 1 size higher than the nominal delivery size of the pump or delivery pipe should be of such size that the velocity shall be about 2.5 m/sec.
- (b) Discharge piping connected to a common manifold/ header should be connected by a radial tee or 30 degree or 45° bend.
- (c) Dismantling joint must be provided between the pump and the valves. The design of the dismantling joint should be such that no pull or moment is transmitted to the pump.

9 Valves

Suction valves:

- (a) When suction lift is encountered, foot valve with strainer shall be provided to facilitate priming or vacuum pump priming.
- (b) For positive suction head, a sluice or butterfly valves is provided on the pump suction, for isolation. The sluice valve should be installed with their axis horizontal to avoid formation of air-pockets in the dome of the sluice valves.
- (c) The suction valves pressure shall not be less than PN-1.6.

Delivery Valves:

- (a) Near to the pump, a Non-Return Valves (reflux valves) and a delivery valves (sluice valves Cl-300) should be provided.
- (b) The NRV Cl-300 should be between the pump and the delivery valves.
- (c) The size of the valves should match the size of the delivery piping.
- (d) Detail specification as per the instruction from the Engineer-in-charge.

10 Trenching:

Pipe and cable Trench :

- (a) Trench shall be excavated at required depth and width to accommodate piping, cables and valves.
- (b) The trench shall be covered with MS plate of thickness 5 mm to allow easy movement on it.
- (c) The trench bottom shall be made slope (1:20) for proper drainage and shall be of PCC M-15 grade.
- (d) The walls of the trench shall be made of brick masonry and plastered with water proof compound.

11 Supports:

All valves and piping should be supported independent of each other and independent of the pump foundation.

12 Plants, machineries, equipments, devices, etc.

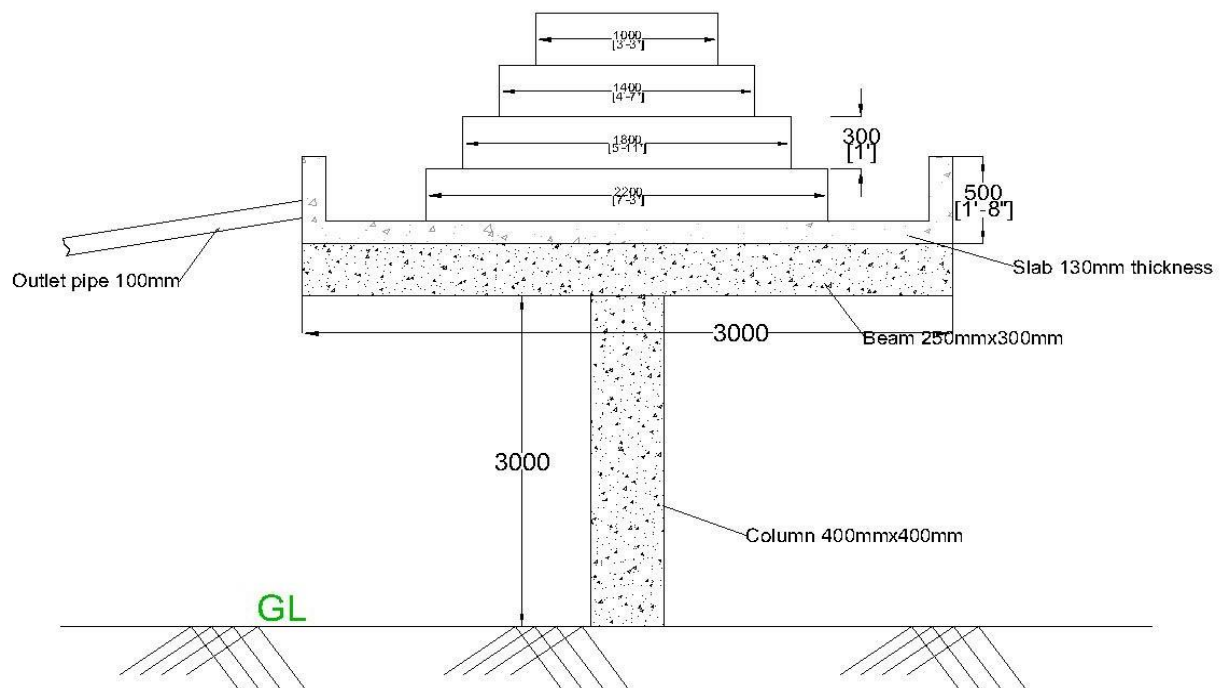
All items under this should be made of standard materials and designs based on best performance relative to efficiency, sturdiness and handling, etc.

13 Civil drawings:

The contractor may refer to the following drawings appended while designing various civil components of the work and in consultation with the Engineer-in-Charge.

14 Civil drawings:

The contractor may refer to the following drawings appended while designing various civil components of the work and in consultation with the Engineer-in-Charge.



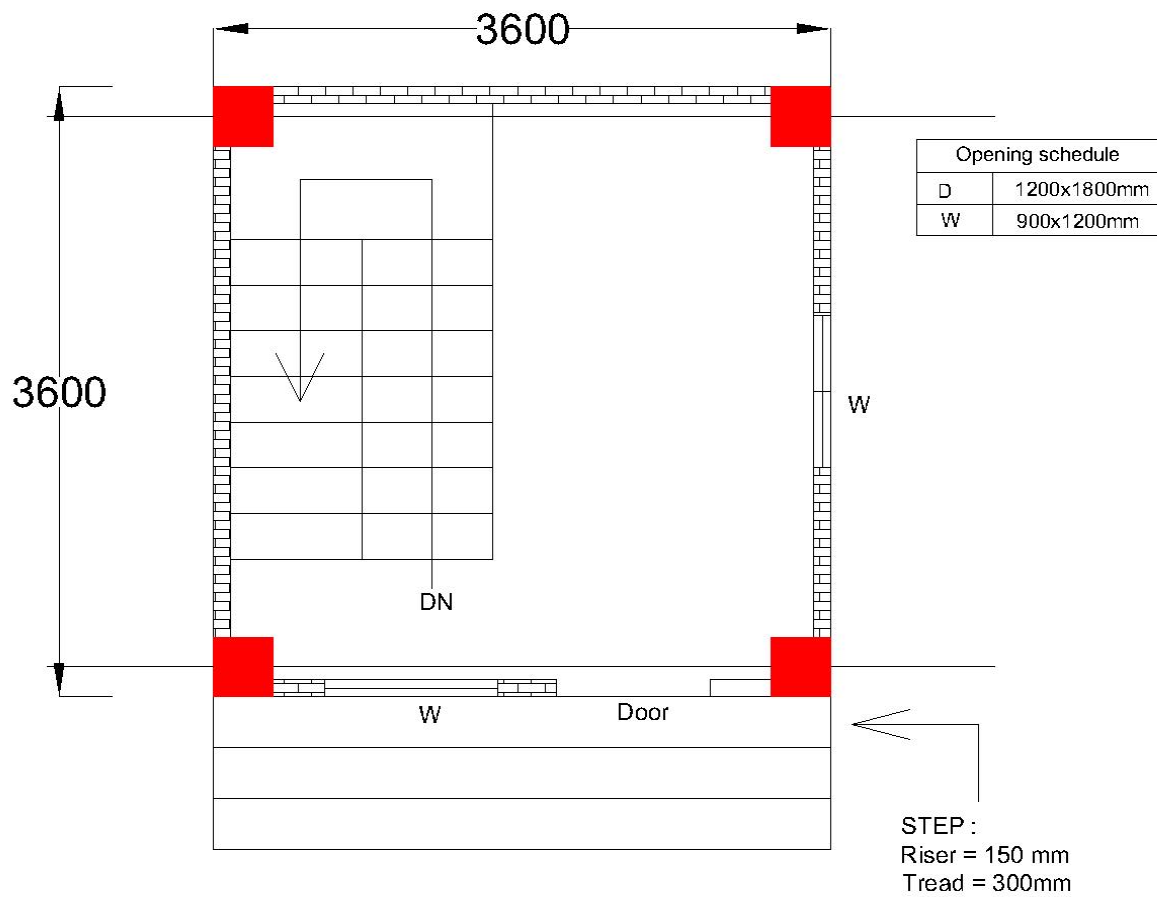
Aerator

Name of Work: Augmentation & Improvement of Thingsai WSS (Grid Pumping)

Title: Drawing of Cascade Aerator

Scale: NTS

All Dimensions in mm



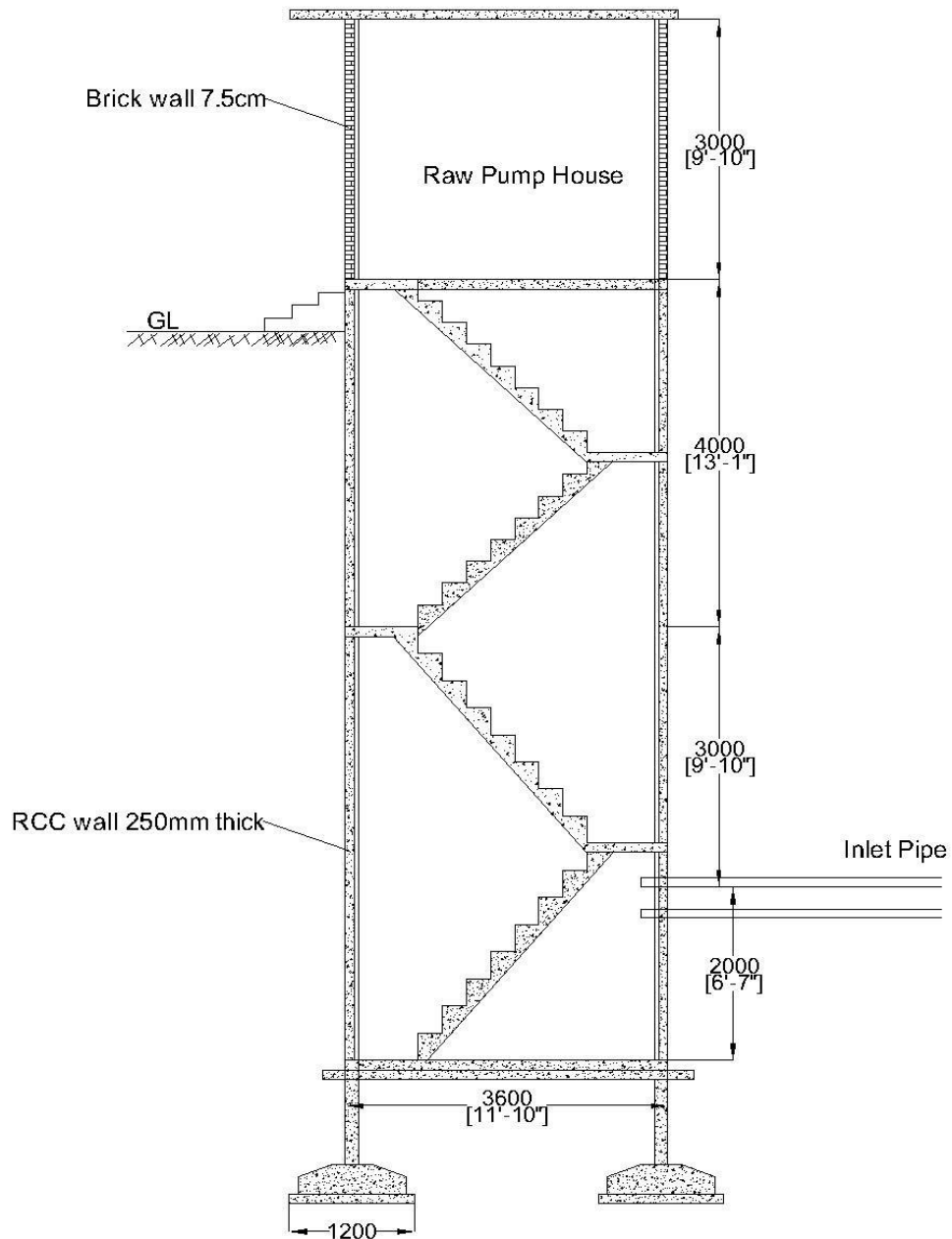
FLOOR PLAN

Name of Work: Augmentation & Improvement of Thingsai WSS (Grid Pumping)

Title: Drawing of Intake structures cum
Raw Pump House

Scale: NTS

All Dimisers in mm



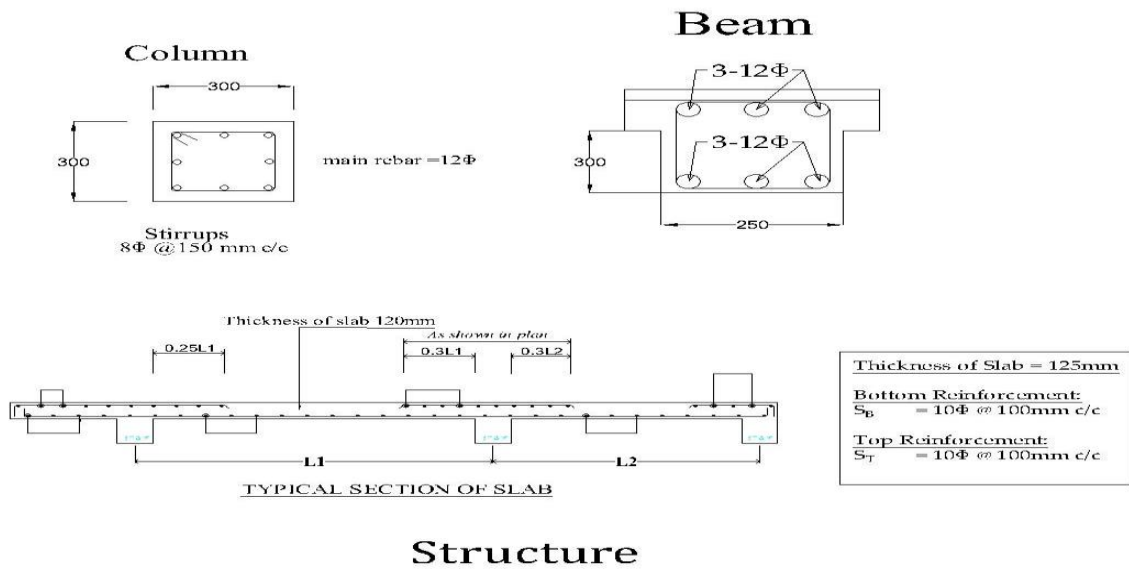
SECTION VIEW

Name of Work: Augmentation & Improvement of Thingsai WSS (Grid Pumping)

Title: Drawing of Intake structures cum
Raw Pump House

Scale: NTS

All Dimensions in mm



Name of Work: Augmentation & Improvement of Thingsai WSS (Grid Pumping)

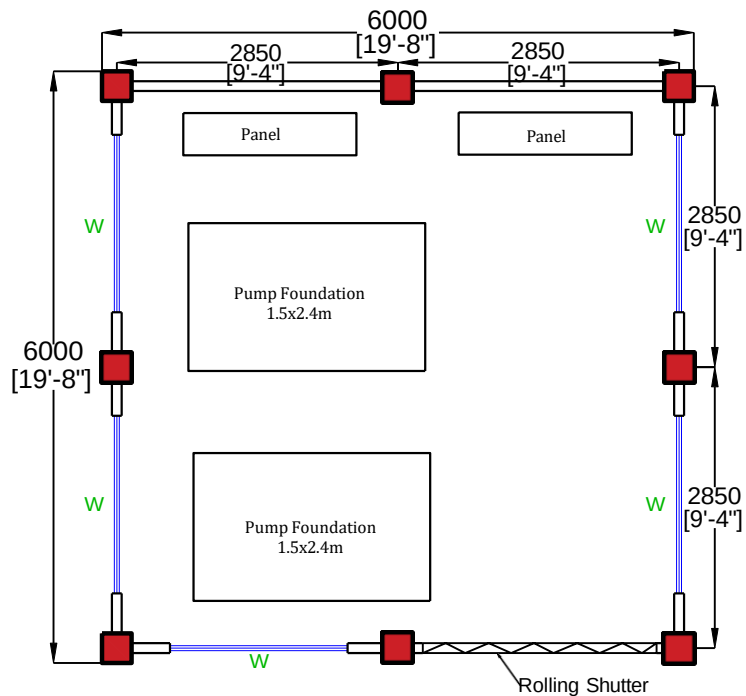
Title: Drawing of Intake structures cum
Raw Pump House

Scale: NTS

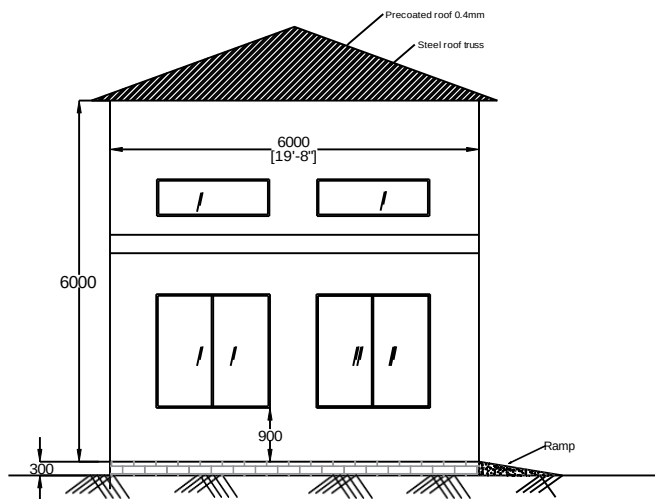
All Dimensions in mm

Clear water Pump House

Floor Plan



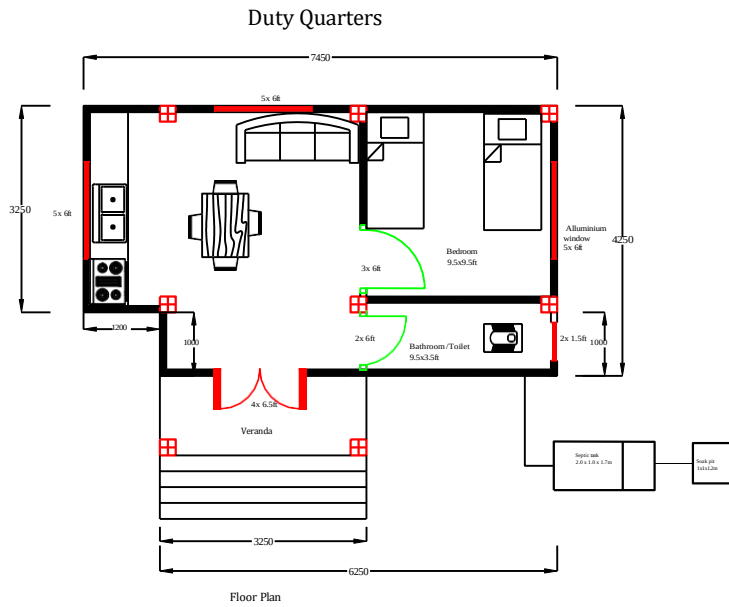
Name of Work: Augmentation & Improvement of Thingsai WSS (Grid Pumping)



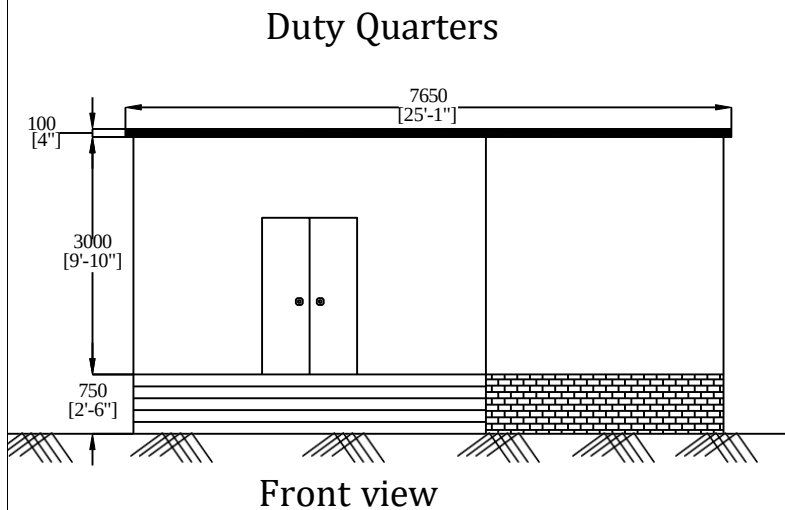
Side View

Name of Work: Augmentation & Improvement of Thingsai WSS (Grid Pumping)

Duty Quarters



Name of Work: Augmentation & Improvement of Thingsai WSS (Grid Pumping)



Name of Work: Augmentation & Improvement of Thingsai WSS (Grid Pumping)

A. BILL OF QUANTITIES FOR CONSTRUCTION OF INTAKE JACKWELL CUM RAW WATER PUMP HOUSE

Sl. No.	SoR No.	Particulars	Qty.	Unit	Rate (Rs.)	Amount with cost index (Rs.)
1	2.18	Earth work in excavation by mechanical means (Hydraulic excavator)/manual means over areas (exceeding 30 cm in depth, 1.5 m in width as well as 10 sqm on plan) including getting out and disposal of excavated earth lead upto 50 m and lift upto 1.5 m	321.00	m ³	244.30	1,05,514.51
2	2.08	Earthwork in excavation in foundation trenches etc. not exceeding 2 meters depth including dressing of bottom and sides of trenches.				
		(b) Hard Soil (pick work)	10.37	m ³	466.60	6,510.39
3	4.01	Providing and laying in position cement concrete of specified grade excluding cost of centering and shuttering - All work upto plinth level:				
		(a) 1:1.5:3 (1 cement :1.5 course sand :3 stone aggregate 20mm nominal size)	1.87	m ³	9,108.20	22,917.00
4	5.01	Providing and laying in position reinforced cement concrete excluding cost of centering and shuttering , finishing and reinforcement in -				
		1:1.5:3 (1 cement :1.5 course sand :3 stone aggregate 20mm nominal size)	1.73	m ³	9,405.20	21,892.63
5	5.02	Providing and laying in position reinforced cement concrete excluding cost of centering and shuttering , finishing and reinforcement in -				
		1:1.5:3 (1 cement : 1.5 coarse sand : 3 graded stone aggregate 20mm nominal size)				
		Column	3.78		9,405.20	47,834.75
		Beam	2.7		9,405.20	34,167.68
		RCC stairs	2.34		9,405.20	29,611.99
6	5.03	Reinforced cement concrete work in walls including attached pillasters, columns, pillars, posts, piers, abutments, return walls, retaining walls, struts, buttresses, string All Work above plinth level upto floor V level				
		Column	1.08	m ³	10,666.70	15,500.21
		Beam	0.9	m ³	9,811.60	11,881.36
		Slab	5.6	m ³	9,811.60	73,928.44
		Wall	32.4	m ³	9,811.60	4,27,728.85
7	5.18	Steel reinforcement for RCC work including straightening, cutting, bending, placing in position and binding all complete.				
		Thermo-Mechanically Treated bars of grade Fe-500 or more.	3008.75	Rm	101.60	4,11,304.55
8	6.06	7.5 cm thick brick masonry with first class brick in superstructure above plinth level upto floor two level including curing, etc. complete.				
		(a) in cement mortar 1:3 (1 cement : 3 coarse sand)	39.42	m ²	1,044.40	55,394.57
9	20.11	Plaster: 15mm cement plaster 1 : 3 (1 cement : 3 fine sand).	885.60	m ²	333.90	3,97,866.83

10	5.10	Centering and shuttering including strutting, propping etc. and removal of form for all heights :				
		(a) Columns, pillars, piers, abutments, posts and struts.	50.40	m ²	618.40	41,935.68
		(b) Walls including attached pillasters, buttresses, string courses, etc.	259.2	m ²	512.00	1,78,561.84
		(a) Lintels, beams, plinth beams, girders, bressumers and cantilevers, etc.	21.6	m ²	480.10	13,953.05
		Suspended floors, roofs, landings, shelves and their support, balconies and chajja,etc.	25.92	m ²	618.40	21,566.93
11	9.06	Providing 1st class local wood dressed in frames of chaukat for doors, windows, clerestory windows fixed in position	0.06	m ³	51,372.80	4,147.33
12	9.11	Providing and fixing 1st class local wood panelled shutters for doors etc. including				
		M.S. butt hinges with necessary screws, etc. complete.	1.62	m ²	3,076.70	6,706.31
13	11.01	Providing and fixing anodised aluminium work for doors, windows, ventilators and partitions with extruded built up standard sections/ other sections of approved make conforming to IS : 733 and IS : 1285 fixing with dash fasteners of required dia and size, including necessary filling up of gaps at junctions, at top, bottom and sides with required PVC/ neoprene gaskets etc. Aluminium sections shall be smooth, rust free, straight, mitred and jointed mechanically wherever required including cleat angle, aluminium snap beading for glazing /panelling, CP brass /stainless steel screws all complete including fixing of glasses but excluding cost of glasses.				
		(b) Powder coated				
		(i) 2 - track sliding windows/ventilators.	2.16	m ²	5,638.20	16,386.19
14	11.02	Supplying of glass panes at site.				
		(b) 4mm thick plate sheet glass.	2.16	m ²	654.80	1,903.03
15	20.74	Wall painting with water and weather proof paint (Latex Emulsion base) on cement works of approved brand and manufacture (ISI/ISO certified) of required shade on new work (two or more coats) to give an even shade.				
		(a) in cement mortar 1:3 (1 cement : 3 coarse sand)	108.54	m ²	1,044.40	1,52,524.77
						20,99,738.90
					Adding 6% GST from base amount	
					Total A	
16	PHED SoR	Inlet Valve- Copper Alloy Bronze/Gunmetal) Globe valves conforming to IS 778 2010 along with appropriate length of rising spindle for different water level (100mm)	3	Nos.	26,654.00	79,962.00
17	PHED SoR	Fixing following copper alloy valves (gate and globe) in G.I. pipe line including cutting and threading the pipe and making long screws etc. complete (threaded connection)	3	Nos.	2,710.00	8,130.00
					Total B	
					Total A+B	
					Say	
(Rupees twenty three lakh) only						

- Note – Cost Index not included for items under PHED SOR for all BOQ

B. BILL OF QUANTITIES FOR SITE DEVELOPMENT WORKS FOR THINGSAI WSS

Sl. No.	SoR No.	Particulars	Qty.	Unit	Rate (Rs.)	Amount including cost Index (Rs.)
1	1.02	Clearing and grubbing road land including uprooting rank vegetation, grass, brush shrubs, saplings and trees of girth upto 300 mm, removal of stumps, disposal of unserviceable material and stacking of serviceable material upto 100 metres from road boundary.	11310	m ²	13.6	₹ 2,06,959.43
2	2.18	Earth work in excavation by mechanical means (Hydraulic excavator)/manual means over areas (exceeding 30 cm in depth, 1.5 m in width as well as 10 sqm on plan) including getting out and disposal of excavated earth lead upto 50 m and lift upto 1.5 m, as directed by Engineer-in-charge.	260	m ³	244.3	₹ 85,463.47
Total						₹ 2,92,422.90
Adding 6% GST from Base amount						₹ 16,586.99
G. Total						₹ 3,09,009.88
Say						3,09,000.00
(Rupees three lakh nine thousand) only						

C. BILL OF QUANTITIES FOR CONSTRUCTION OF CASCADE AERATOR

Sl. No.	SoR No.	Particulars	Qnty.	Unit	Rate (Rs.)	Amount with cost index (Rs.)
1	2.07	Earthwork in excavation in foundation trenches or drains etc. (not exceeding 1.5m in width or 10sqm on plan) including dressing of sides and ramming of bottoms, lift upto 1.5m including getting out excavated soil and disposal of surplus excavated soil as directed within a lead of 50 metres. Ordinary and Hard Soil	2.16	cum	419.90	1,220.34
2	4.01	Providing and laying in position cement concrete of specified grade excluding cost of centering and shuttering - All work upto plinth level: (a)1:1.5:3 (1 cement :1.5 course sand :3 stone aggregate 20mm nominal size)	0.14	cum	9108.20	1,715.71
3	5.01	Providing and laying in position reinforced cement concrete excluding cost of centering and shuttering , finishing and reinforcement in - (a) 1:1.5:3 (1 cement :1.5 course sand :3 stone aggregate 20mm nominal size)				
		F1	0.5	cum	9405.20	6,327.35
			0.85	cum	9405.20	10,756.49
4	5.02	Providing and laying in position reinforced cement concrete excluding cost All Work upto plinth level Columns				
		C1	0.18	cum	9405.2	2,277.85
5	5.02 (a)	Reinforced cement concrete work in walls including attached pillasters, columns, pillars, posts, piers, abutments, return walls, retaining walls, struts, buttresses, string or lacing courses, fillets etc. upto floor five level excluding cost of centering shuttering etc complete.				
	5.03 (a)	All Work above plinth level upto floor V level Columns				
		C1	0.48	cum	10666.70	6,888.99
		Beams				
		slab	2.79	cum	10666.70	40,042.20
		Wall				
		perimeter	0.64	cum	9811.30	8,448.70
6	5.18	Steel reinforcement for RCC work including straightening, cutting, bending, placing in position and binding all complete. (b)Thermo-Mechanically Treated bars of grade Fe-500 or more.				
		foundation	539.62	kg	101.60	73,767.02
			59.803	kg	101.60	8,175.23
		slab	181.44	kg	101.60	24,803.35
		wall	88.868	kg	101.60	12,148.48
7	6.06	Half brick masonry with first class brick in superstructure above plinth level upto floor V level. (b)in cement mortar 1 : 4 (1 cement : 4 coarse sand)				
		wall	6.03	sqm	1635.00	13,265.35

8	20.2	Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. in layers not exceeding 20cm in depth, consolidating each deposited layer by ramming and watering, lead up to 50 m and lift upto 1.5					
		RCC wall	11.3	cum	129.50	1,968.94	
9	20.1	Plaster: 15mm cement plaster 1 : 3 (1 cement : 3 fine sand).	81.52	sqm	333.90	36,623.88	
10	5.10	Centering and shuttering including strutting, propping etc. and removal of form for all heights					
		(c) Columns, pillars, piers, abutments, posts and struts.					
		All Work above plinth level upto floor V level					
		Columns					
		C1	3.6	sqm	618.40	2,995.41	
		(d) Lintels, beams, plinth beams, girders, bressumers and cantilevers, etc.					
		Beams					
		B1a	5.1	sqm	480.10	3,294.47	
		Suspended floors, roofs, landings, shelves and their support, balconies and chajjaj,etc.	7.07	sqm	618.40	5,882.65	
11	20.7	Wall painting with water and weather proof paint (Latex Emulsion base) on cement works of approved brand and manufacture (ISI/ISO certified) of required shade on new work (two or more coats) to give an even shade .	81.52	sqm	152.90	16,770.86	
Total						2,77,373.28	
Adding 6% GST from base amount						14,859.28	
G. Total						2,92,232.56	
Say						2,92,000.00	
(Rupees two lakh ninety two thousand) only							

D. Bill of Quantities for construction of Flash Mixer for Thingsai WSS						
Sl. No.	SoR No.	Particulars	Qty.	Unit	Rate (Rs.)	Amount including cost index (Rs.)
1	4.02	Providing and laying in position cement concrete of specified grade excluding cost of centering and shuttering etc.in all works upto				
	a)	01:02:04	0.1	m ³	8324.6	1120.07
2	5.28	Providing and laying in position machine batched, machine mixed and machine vibrated design mix M-20 grade reinforced cement concrete excluding cost of centering and shuttering and reinforcement in -				
	a)	All works upto plinth level	0.64	m ³	10,678.70	9195.64
	b)	All works above plinth level	2.02	m ³	11,443.00	31101.04
3	5.3	Extra for providing richer or leaner mixes respectively at all floor levels				
	b)	Providing M-30 grade concrete	2.66	m ³	244.00	873.28
4	5.18	Steel reinforcement for RCC work including straightening, cutting, bending,placing in position and binding all complete.				
	b)	Thermo-mechanically treated bars of grade fe-500 or more	279.7	kg	101.60	38241.38
5	5.1	Centering and shuttering including strutting, propping etc and removal of form work in-				
		(a)Foundationsetc. for mass concrete.	1.12	m ²	359.10	541.15
		b)Wall	20.2	m ²	512.00	13888.14
6	20.1	15mm cement plaster 1 : 4	22.1	m ²	309.70	9217.43
7	20.5	Applying one coat of water thinnable cement primer of approved brand and manufacture on wall surface.	10.1	m ²	80.50	1091.79
8	20.8	Wall painting with water and weather proof paint (Latex Emulsion base) on cement works of approved brand and manufacture	10.08	m ²	152.90	2073.73
Total						1,07,343.67
Adding 6% GST from Base amount						5,750.55
Total						1,13,094.22
PIPING WORKS						
1	PHE, SOR	Providing Copper Alloy (Bronze/Gunmetal) Globe valves conforming to IS 778 2010 -	1	No	14,740.00	14740.00
2	PHE, SOR	Fitting Copper Alloy (Bronze/Gunmetal) Globe valves conforming to IS 778 2010 -	1	No	1,601.00	1601.00
3		Providing Ladder for inside			LS	6,000.00
4		Adding Carriage of material			LS	10,000.00
5		Adding for SITC of mixer motor with impeller, etc			LS	1,00,000.00
G.Total						2,45,435.22
Say						2,45,000.00
(Rupees two lakh forty five thousand) only						

E. BILL OF QUANTITIES FOR CONSTRUCTION OF PLAIN SEDIMENTATION TANK

Sl. No.	SoR No.	Particulars	Qty.	Unit	Rate (Rs.)	Amount with cost index (Rs.)
1	2.06	Earthwork in excavation over areas including disposal of excavated earth etc. (a) Ordinary Soil & hard soil	24.37	m ³	411.50	13,493.02
2	2.07	Earthwork in excavation in foundation trenches or drains etc. including dressing of sides and ramming of bottoms, lift upto 1.5m including getting out excavated soil and disposal of surplus excavated soil as directed within a lead of 50 metres. (a) Ordinary soil	15.00	m ³	419.90	8,474.63
3	4.02	Providing and laying in position cement concrete of specified grade excluding cost of centering and shuttering - All work upto plinth level: (a) 1:2:4 (1 cement :2 course sand :4 stone aggregate 20mm nominal size)	1.00	m ³	8324.60	11,200.75
4	5.02	Providing and laying in position reinforced cement concrete excluding cost of centering and shuttering , finishing and reinforcement in - (a) 1:2:4 (1 cement :2 course sand :4 stone aggregate 20mm nominal size)	5.51	m ³	8633.00	64,002.52
5	5.28	Providing and laying in position machine batched, machine mixed and machine vibrated design mix M-20 grade reinforced cement concrete excluding cost of centering and shuttering and reinforcement in - a) All works upto plinth level				
			13.67	m ³	10678.70	1,96,413.17
			28.93	m ³	11443.00	4,45,422.38
6	5.30	Extra for providing richer or leaner mixes respectively at all floor levels b) Providing M-30 grade concrete instead of M-20 gade BMC/RMC.	36.15	m ³	244	11,868.12
7	5.18	Steel reinforcement for RCC work including straightening, cutting, bending, placing in position and binding all complete.				
		(b)Thermo-Mechanically Treated bars of grade Fe-500 or more.	5046	kg	101.60	6,89,744.23
8	5.10	Centering and shuttering including strutting, propping etc and removal of form work in-				
		Foundations, footings, bases of columns etc.	7.42	m ²	359.1	3,585.11
		Wall	204.4	m ²	373.1	1,02,610.04
		Slab, beam & column	144.90	m ²	673.30	1,31,268.55
9	20.12	15mm cement plaster 1 : 4 (1 cement : 4 fine sand).	404.53	m ²	309.70	1,68,568.20
10	20.50	Applying one coat of water thinnable cement primer of approved brand and manufacture on wall surface.	112.2	m ²	80.50	12,152.69
11	20.74	Wall painting with water and weather proof paint (Latex Emulsion base) on cement works of approved brand and manufacture (ISI/ISO certified) of required shade on new work (two or more coats) to give an even shade .	112.20	m ²	152.90	23,082.56
12		Providing inside ladder		LS		12,000.00
						18,93,885.97
Adding 6% GST from base amount						1,01,458.18
Total						19,95,344.14
Say						19,95,000.00
(Rupees nineteen lakh ninety five thousand) only						

**F. Bill of Quantities for construction of Rapid Sand Filter and Filter House
for Thingsai WSS**

Sl. No.	SoR No.	Particulars	Qty.	Unit	Rate (Rs.)	Amount including cost index (Rs.)
1	2.18	Earth work in excavation by mechanical means including getting out and disposal of excavated earth lead upto 50 m and lift upto 1.5 m, as directed by Engineer-in-charge				
	a)	All kinds of soil	121	m ³	244.3	39,773.38
2	2.06	Earthwork in excavation over areas including disposal of excavated earth, lead upto 50m and lift upto 1.5m, disposed earth to be levelled and neatly dressed.	28.51	m ³	411.50	15,785.22
3	4.01	Providing and laying in position cement concrete of specified grade excluding cost of centering and shuttering - All work upto plinth level:				
	a)	1:1.5:3	4.8	m ³	9108.20	58,824.40
4	5.01	Providing and laying in position reinforced cement concrete excluding cost of centering and shuttering , finishing and reinforcement in - upto plint level				
	a)	1:1.5:3	18.63	m ³	9405.20	2,35,757.00
5	5.02	Reinforced cement concrete work in walls including attached pillasters, columns, pillars, posts, etc. upto floor five level excluding cost of centering shuttering etc complete. 1:1.5:3				
		All Work above plinth level upto floor V	6.93	m ³	10666.70	99,459.67
6	5.28	Providing and laying in position machine batched and machine mixed design mix M-20 grade cement concrete for reinforced cement concrete work etc.				
		Filter wall	11.41	m ³	11443.00	1,75,674.71
7	5.30	Extra for providing richer or leaner mixes respectively at all floor levels .				
		Providing M-30 grade concrete instead of M-20 grade	11.41	m ³	244.00	3,745.93
8	5.03	Reinforced cement concrete work in beams, suspended floors, roofs having slope up to 15° landings, balconie etc. complete..				
	a)	All Work above plinth level upto floor V level	33.17	m ³	9811.30	4,37,880.62
9	5.18	Steel reinforcement for RCC work including straightening, cutting, bending etc. all complete.				
	b)	Thermo-Mechanically Treated bars of grade Fe-500 or more.				
		16mm Ø	3280.51	kg	101.60	4,48,454.90
		8mm Ø	1123.10	kg	101.60	1,53,530.91
		10mm Ø	4499.46	kg	101.60	6,15,088.78
		12mm Ø	1575.55	kg	101.60	2,15,382.37

10	6.06	7.5 cm thick brick masonry with first class brick in superstructure above plinth level upto floor two level including curing, etc.	316.95	m ²	1044.40	4,45,390.88
11	20.11	Plaster: 15mm cement plaster 1 : 3 (1 cement : 3 fine sand).	1293.3	m ²	333.90	5,81,049.10
11	5.10	Centering and shuttering including strutting, propping etc. and removal of form for all heights :				
	c)	Columns, pillars, piers etc.	111.54	m ²	618.40	92,807.66
	b)	Wall	51.84	m ²	512.00	35,712.37
	d)	Lintels, beams, plinth beams etc.	103.53	m ²	480.10	66,877.75
		Suspended floors, roofs etc.	194.85	m ²	673.30	1,76,519.52
12	11.01	Providing and fixing anodised aluminium work for doors etc. all complete including fixing of glasses but excluding cost of				
	c)	Powder coated	5.40	m ²	5,638.20	40,965.47
13	11.02	Supplying of glass panes at site.				
	b)	4mm thick plate sheet glass.	5.40	m ²	654.80	4,757.58
14	20.74	Wall painting with water and weather proof paint (Latex Emulsion base) o on new work (two or more coats) to give an	1293.3	m ²	152.90	2,66,074.89
15	Basic rate	River sand for filter media	33.81	m ³	4000.00	1,81,965.42
Total						43,91,478.53
Adding 6% GST from Base amount						2,35,257.79
Adding valve and Piping works for drain, backwash, manifold, trough etc.						4,00,000.00
Adding Electrification (LS)						1,00,000.00
Adding carriage of material LS						2,50,000.00
G.Total						53,76,736.33
Say						53,76,000.00
(Rupees fifty three lakh seventy six thousand) only						

G. Bill of Quantities for construction of Back Wash Tank for Thingsai WSS

Sl. No.	SoR No.	Particulars	Qty.	Unit	Rate (Rs.)	Amount including cost index (Rs.)
1	2.06	Earthwork in excavation over areas including disposal of excavated earth,				
	a)	Ordinary Soil & hard soil	13.44	m ³	411.50	7,441.37
2	2.07	Earthwork in excavation in foundation trenches or drains etc. including dressing of sides and ramming of bottoms etc. complete				
	a)	Ordinary soil	4.49	m ³	419.90	2,536.74
3	4.02	Providing and laying in position cement concrete of specified grade excluding cost of centering and shuttering etc.in all works upto plinth level				
	a)	1:2:4	3.09	m ³	8324.6	34,610.32
4	5.02	Providing and laying in position cement concrete of specified grade excluding cost of centering and shuttering etc.in all works upto plinth level				
	a)	1:2:4	7.85	m ³	8633.0	91,183.26
5	5.28	Providing and laying in position machine batched, machine mixed and machine vibrated design mix M-20 grade reinforced cement concrete				
	a)	All works upto plinth level	7.33	m ³	10,678.70	1,05,318.84
	b)	All works above plinth level	25.97	m ³	11,443.00	3,99,848.57
6	5.30	Extra for providing richer or leaner mixes respectively at all floor levels				
	b)	Providing M-30 grade concrete instead of M-20 grade	29.94	m ³	244.00	9,829.36
7	5.18	Steel reinforcement for RCC work including straightening, cutting, bending,placing in position and binding all complete.				
	b)	Thermo-mechanically treated bars of grade fe-500 or more				
		10mm Ø	2592.7	kg	101.60	3,54,432.36
		12mm Ø	139.82		101.60	19,113.51
8	5.10	Centering and shuttering including strutting, propping etc and removal of form work in-				
	a)	Foundations, footings	5.1	m ²	359.10	2,464.16
	b)	Wall	180.84	m ²	373.10	90,782.77
	c)	Slab, beam & column	35.85	m ²	673.30	32,477.42
9	20.12	15mm cement plaster 1 : 4	242.34	m ²	309.70	1,00,983.41
10	20.50	Applying one coat of water thinnable cement primer of approved brand and manufacture on wall surface.	89.67	m ²	80.50	9,712.40

11	20.74	Wall painting with water and weather proof paint (Latex Emulsion base) two or more coats) to give an even shade .	89.67	m ²	152.90	18,447.54
Total						12,79,182.02
Adding 6% GST from Base amount						68,527.61
Total A						13,47,709.63
Piping Work						
1	PHED SOR	Providing and fitting Copper Alloy (Bronze/Gunmetal) Globe valves conforming to IS 778 2010 -80mm	2	No	14,740.00	29,480.00
2	PHED SOR	Fitting Copper Alloy (Bronze/Gunmetal) Globe valves conforming to IS 778 2010 -80mm	1	No	1,601.00	1,601.00
		Providing Ladder for inside & outside	LS			12,000.00
		Adding Carriage of material	LS			50,000.00
Total B						93,081.00
Total A+B						14,40,790.63
Say						14,41,000.00
(Rupees fourteen lakh fourty one thousand) only						

**H. BILL OF QUANTITIES FOR CONSTRUCTION OF RCC RESERVOIR
(1 LAKH LITER CAPACITY)**

Sl. No.	SoR No.	Particulars	Qty.	Unit	Rate (Rs.)	Amount with cost index (Rs.)
1	2.18	Earth work in excavation by mechanical means (Hydraulic excavator)/manual means over areas (exceeding 30 cm in depth, 1.5 m in width as well as 10 sqm on plan) including getting out and disposal of excavated earth lead upto 50 m and lift upto 1.5 m. (a)All kinds of soil (excluding ordinary & hard rock)	179.56	m ³	244.30	59,022.39
2	2.08	Earthwork in excavation in foundation trenches etc. not exceeding 2 meters depth including dressing of bottom and sides of trenches and subsequent filling and compaction in 15cm layers as in column foundations, fence posts, etc. and disposal of all surplus soil as directed within a lead of 30 metres.				
		(a)ordinary and hard soil	0.56	m ³	411.50	310.06
3	7.14	Dry stone pitching 22.50 cm thick including supply of stones and preparing surface complete.	52.30	m ²	560.60	39,449.23
4	4.02	Providing and laying in position cement concrete of specified grade excluding cost of centering and shuttering - All work upto plinth level:				
		(a)1:2:4 (1 cement : 2 Course sand : 4 stone aggregate 40mm nominal size)	5.23	m ³	8,324.60	58,579.92
		PCC floor around reservoir	1.27	m ³	8,324.60	14,224.95
		Stair column foundation	0.06	m ³	8,324.60	672.04
5	5.10	Centering and shuttering including strutting, propping etc. and removal of form for all heights : Walls including attached pillasters, buttresses, string courses, etc. (Outside & Inside)	137.16	m ³	512.00	94,488.98
		Roof Slab	47.27	m ³	673.30	42,823.08
		Column	3.00	m ³	618.40	2,496.17
		Beam	13.40	m ³	480.10	8,656.06
		Stair Column	2.00	m ³	618.40	1,664.11
		Stair Beam	0.70	m ³	480.10	452.18
		Stair waist slab	5.82	m ³	673.30	5,272.48
6	5.18	Steel reinforcement for RCC work including straightening, cutting, bending, placing in position and binding all complete.				
		Thermo-Mechanically Treated bars of grade Fe-500 or more.	3420.14	kg	101.60	4,67,542.85
7	5.28	Providing and laying in position machine batched, machine batched and machine mixed design mix-20 grade cement concrete for reinforced cement concrete work, using cement content as per approved design mix, including pumping of concrete to site of laying but excluding the cost of centering, finishing and reinforcement				
		Floor/haunch	15.59	m ³	10678.70	2,23,928.99
		Wall/slab/column/beam/stair beam/stair waste slab/stair column foundation	26.81	m ³	11443.00	4,12,781.68
8	5.30	Extra for providing richer or leaner mixes respectively at all floor levels. (Providing M-30 grade concrete instead of M-20 grade BMC/ RMC)				
		Floor & Wall	34.79	m ³	244.00	11,420.57

9	20.21	15mm cement plaster 1 : 3 (1 cement : 3 fine sand) finished with a floating coat of neat cement	254.11	m ²	415.00	1,41,890.69
10	19.19	Extra for providing and mixing water proofing chemical (latex or equivalent chemical)	104.41	m ³	333.00	46,778.82
11	20.50	Applying one coat of water thinnable cement primer of approved brand and manufacture on wall surface :	133.31	m ²	80.50	14,438.65
12	20.74	Wall painting with water and weather proof paint (Latex Emulsion base) on cement works of approved brand and manufacture (ISI/ISO certified) of required shade on new work (two or more coats) to give an even shade.	133.31	m ²	152.90	27,424.47
13	10.09	Supplying and fixing M.S. decorative railing consisting of top and bottom rails of 40mmx40mm square. The base of balusters at 560mm apart welded with base plate of 60mmx3mm thick and fixed with cement grouting firmly to concrete section including steel priming and steel painting complete etc.	28.03	m ²	2903.60	1,09,507.43
14	10.15	Providing and fixing 1mm thick M.S. sheet door with frame of 40x40x6 mm angle iron and 3 mm M.S. gusset plates at the junctions and corners, all necessary fittings complete, including applying a priming coat of approved steel primer. Using flats(30x6) mm for diagonal braces and central cross piece.	1.00	m ²	5153.50	6,934.03
						17,90,759.83
Adding 6% GST from base amount						95,932.58
Total						18,86,692.41
Say						18,87,000.00
For 2 Nos. of Reservoirs						37,74,000.00
(Rupees thirty seven lakh seventy four thousand) only						

I. BILL OF QUANTITIES FOR CONSTRUCTION OF CHEMICAL HOUSE

Sl. No.	SoR No.	Particulars	Qty.	Unit	Rate (Rs.)	Amount with cost index (Rs.)
1	2.18	Earth work in excavation by mechanical means (Hydraulic excavator)/manual means over areas (exceeding 30 cm in depth, 1.5 m in width as well as 10 sqm on plan) including getting out and disposal of excavated earth lead upto 50 m and lift upto 1.5 m. (a) All kinds of soil (excluding ordinary & hard rock)	6.00	m ³	244.30	1,972.23
2	2.06	Earthwork in excavation over areas (exceeding 30cm in depth,1.5m in width as well as 10sqm on plan) including disposal of excavated earth, lead upto 50m and lift upto 1.5m, disposed earth to be levelled and neatly dressed. Ordinary and Hard Soil	6.00	m ³	411.50	3,322.04
3	4.01	Providing and laying in position cement concrete of specified grade excluding cost of centering and shuttering - All work upto plinth level: (a)1:1.5:3 (1 cement :1.5 course sand :3 stone aggregate 20mm nominal size) F1 PCC	0.40	m ³	9108.20	4,902.03
4	5.01	Providing and laying in position reinforced cement concrete excluding cost of centering and shuttering , finishing and reinforcement in - (a) 1:1.5:3 (1 cement :1.5 course sand :3 stone aggregate 20mm nominal size) F1	1.4	m ³	9405.20	17,716.58
5	5.02 (a)	Providing and laying in position reinforced cement concrete excluding cost of centering and shuttering , finishing and reinforcement in - 1:1.5:3 (1 cement : 1.5 coarse sand : 3 graded stone aggregate 20mm nominal size) All Work upto plinth level				
		Columns				
		C1	0.29	m ³	9405.20	3,669.86
		Beams				
		B	1.84	m ³	9405.20	23,284.64
6	5.02 (a)	Reinforced cement concrete work in walls including attached pillasters, columns, pillars, posts, piers, abutments, return walls, retaining walls, struts, buttresses, string or lacing courses, fillets etc. upto floor five level excluding cost of centering, shuttering, etc complete.				
	5.03 (a)	All work above plinth level upto floor V level				
		Columns				
		C1	1.50	m ³	10666.70	21,528.07
		Beams	0.67	m ³	9811.30	8,844.74
		slab	2.02	m ³	9811.30	26,666.23
7	5.18	Steel reinforcement for RCC work including straightening, cutting, bending, placing in position and binding all complete. (b)Thermo-Mechanically Treated bars of grade Fe-500 or more.	1240.7	kg	101.60	1,69,611.27
8	6.06	7.5 cm thick brick masonry with first class brick in superstructure above plinth level upto floor two level including curing, etc. complete . (b)in cement mortar 1 : 3 (1 cement : 3 coarse sand)				
		wall	28.32	m ²	1044.40	39,796.40

9	20.11	Plaster: 15mm cement plaster 1 : 3 (1 cement : 3 fine sand).	123.43	m ²	333.90	55,452.46
10	5.10	Centering and shuttering including strutting, propping etc. and removal of form for all heights				
		<i>Columns</i>	28.8	m ²	618.40	23,963.25
		<i>Beams</i>	9.52	m ²	480.10	6,149.68
		<i>Slab</i>	7.84		618.40	6,523.33
11	9.06	<i>Providing 1st class local wood dressed in frames of chaukat for doors, windows, clerestory windows fixed in position.</i>	0.06	m ³	51,372.80	4,147.33
12	9.11	<i>Providing and fixing 1st class local wood panelled shutters for doors etc. including M.S. butt hinges with necessary screws, etc. complete.</i>	1.62	m ³	3,076.70	6,706.31
13	11.01	Providing and fixing anodised aluminium work for doors, windows, ventilators and partitions with extruded built up standard sections/ other sections of approved make conforming to IS : 733 and IS : 1285 fixing with dash fasteners of required dia and size, including necessary filling up of gaps at junctions, at top, bottom and sides with required PVC/ neoprene gaskets etc. Aluminium sections shall be smooth, rust free, straight, mitred and jointed mechanically wherever required including cleat angle, aluminium snap beading for glazing /panelling, CP brass /stainless steel screws all complete including fixing of glasses but excluding cost of glasses. ((b)Powder coated) (i) 2 - track sliding windows/ventilators.	2.16	m ²	5,638.20	16,386.19
14	11.02	<i>4mm thick plate sheet glass.</i>	2.16	m ²	654.80	1,903.03
15	20.74	Wall painting with water and weather proof paint (Latex Emulsion base) on cement works of approved brand and manufacture (ISI/ISO certified) of required shade on new work (two or more coats) to give an even shade .	123.43	m ²	152.90	25,392.88
Total						4,67,938.55
Adding 6% GST from base amount						25,068.12
G. Total						4,93,006.67
Say						4,93,000.00
(Rupees four lakh ninety three thousand) only						

J. Bill of Quantities for construction of Clear Water Pump House for Thingsai WSS

Sl. No.	SoR No.	Particulars	Qty.	Unit	Rate (Rs.)	Amount (Rs.)	Amount including cost index (Rs.)
1	2.18	Earth work in excavation by mechanical means all complete as directed by Engineer-in-charge.					
	a)	All kinds of soil	144.0	m ³	244.30	35,179.20	47,333.61
2	2.06	Earthwork in excavation over areas including disposal of excavated earth, lead upto 50m and lift upto 1.5m, disposed earth to be levelled and neatly dressed.					
		Ordinary and Hard Soil	19.58	m ³	411.50	8,057.17	10,840.92
3	4.01	Providing and laying in position cement concrete of specified grade excluding cost of centering and shuttering - All work upto plinth level:					
	a)	(a)1:1.5:3	1.15	m ³	9,108.20	10,474.43	14,093.35
4	5.01	Providing and laying in position reinforced cement concrete					
	a)	1:1.5:3 for Foundation	3.46	m ³	9,405.20	32,541.99	43,785.25
5	5.01	Providing and laying in position reinforced cement concrete excluding cost of centering and shuttering , finishing and reinforcement in - 1:1.5:3					
		Columns, Beam, Slab	10.91	m ³	9,405.20	1,02,610.73	1,38,062.74
6	5.02	RCCwork in walls including attached pillars, columns etc. upto floor five level excluding cost of centering shuttering etc complete.					
		All Work above plinth level upto floor V level					
	a)	Columns	4.32	m ³	10,666.70	46,080.14	62,000.83
	5.03/a	Beams	3.60	m ³	9,811.30	35,320.68	47,523.97
7	5.18	Steel reinforcement for RCC work including straightening etc. placing in position and binding all complete.					
	b)	Thermo-Mechanically Treated bars of grade Fe-500 or more.					
		16 mm dia	1394.5	kg	101.60	1,41,681.20	1,90,632.05
		10mm dia	300.76	kg	101.60	30,557.22	41,114.73
		8mm dia	628.11	kg	101.60	63,815.98	85,864.40
8	6.09	7.5 cm thick brick masonry with first class brick in superstructure above plinth level etc. complete .					
	a)	in cement mortar 1:3	91.9	m ²	1,044.40	95,980.36	1,29,141.57
9	20.1	Plaster: 15mm cement plaster 1 : 3	328.54	m ²	333.90	1,09,699.51	1,47,600.69
10	5.10	Centering and shuttering including strutting, propping etc. and removal of form					
	c)	Columns, pillars, etc	73.92	m ²	618.40	45,712.13	61,505.67
	d)	Beams etc.	26.4	m ²	480.10	12,674.64	17,053.73
		Suspended floors, roofs, landings, shelves and their support, balconies and chajjaj,etc.	36	m ²	618.40	22,262.40	29,954.06

11	11.01	Providing and fixing anodised aluminium work for doors, windows,etc. all complete including fixing of glasses but excluding cost of glasses.					
	b)	Anodise for doors and windows	18.00	m ²	4,725.10	85,051.80	1,14,437.20
12	11.02	Supplying of glass panes at site.					
	b)	4mm thick plate sheet glass.	18.00	m ²	654.80	11,786.40	15,858.60
13	20.74	Wall painting with water and weather proof paint of approved brand and manufacture of required shade two or more coats	292.54	m ²	152.90	44,729.37	60,183.36
14	10.01	Supplying and fixing steel rolling shutter of approved make all complete	6.74	m ²	4,846.30	32,664.06	43,949.50
15	16.11	Providing Trapezoidal Polyester Coated Galvanised Steel Sheets Roofing including fitting and fixing ridging with self drilling etc. all complete	39.69	m ²	1,291.60	51,263.60	68,975.18
16	16.12	Providing and fixing of Polyester Coated Galvanised Steel Sheets of any colour ridges	9.45	m ²	628.60	5,940.27	7,992.63
17	10.08	Steel work in built up tubular (round, square or rectangular hollow tubes etc.)trusses etc., including cutting, h etc.	456.67	kg	176.40	80,556.59	1,08,388.89
Total						11,04,639.86	14,86,292.94
Adding 6% GST from Base amount						79622.82914	79622.82914
						11,84,262.69	15,65,915.77
Adding Electrification(Internal & external) (LS)						60,000.00	60,000.00
						12,44,262.69	16,25,915.77
G. Total						12,44,300.00	16,26,000.00
For 2 nos of Cler water pump house						24,88,600.00	32,52,000.00
(Rupees thirty two lakh fifty two thousand) only							

**K. Bill of quantities for Clear Water Pump Foundation for 1st and 2nd Stage
of Thingsai WSS**

Sl. No.	SoR No.	Particulars	Qty.	Unit	Rate (Rs.)	Amount (Rs.)	Amount including cost index (Rs.)
1	2.06	Earthwork in excavation over areas (exceeding 30cm in depth, 1.5m in width as well as 10sqm on plan) including disposal of excavated earth, lead upto 50m and lift upto 1.5m, disposed earth to be levelled and neatly dressed.	0.72	m ³	411.5	296.28	398.64
2	5.01	Providing and laying in position reinforced cement concrete excluding cost of centering and shuttering, finishing and reinforcement in -					-
		(a) 1:1.5:3	1.8	m ³	9405.2	16,929.36	22,778.45
3	5.18	Steel reinforcement for RCC work including straightening, cutting, bending, placing in position and binding all complete.					-
	b)	Thermo-Mechanically Treated bars of grade Fe-500 or more.	125.85	kg	101.6	12,786.36	17,204.05
4	20.1	Plaster: 15mm cement plaster 1 : 3 (1 cement : 3 fine sand).	3.6	sqm	333.9	1,202.04	1,617.34
5	5.10	Centering and shuttering including strutting, propping etc. and removal of form for all heights :					-
	a)	Foundations, footings, bases of columns etc. for mass concrete	3.9	sqm	618.4	2,411.76	3,245.02
Total						33,625.80	45,243.51
Adding 6% GST from Base amount						2,423.75	2423.75
						36,049.55	47,667.26
Adding carriage of material LS						2,500.00	2500
G.Total						38,549.55	50,167.26
Say						50,000.00	50,000.00
For four numbers						2,00,000.00	2,00,000.00
(Rupees two lakh) only							

L. Bill of Quantities for construction of Duty Quarter for Thingsai WSS						
Sl. No.	SoR No.	Particulars	Qty.	Unit	Rate (Rs.)	Amount including cost index (Rs.)
1	2.18	Earth work in excavation by mechanical means as directed by Engineer-in-charge.				
	a)	All kinds of soil for site preparation	112.0	m ³	244.30	36,815.03
2	2.06	Earthwork in excavation over areas including disposal of excavated earth, lead upto 50m and lift upto 1.5m, disposed earth to be levelled and neatly dressed.				
		Ordinary and Hard Soil for foundation	12.0	m ³	411.50	6,644.08
3	4.01	Providing and laying in position cement concrete of specified grade excluding cost of centering and shuttering - All work upto plinth level:				
	a)	1:1.5:3 for Foundation	0.8	m ³	9,108.20	9,804.07
4	5.01	Providing and laying in position reinforced cement concrete excluding cost of centering and shuttering etc.				
		1:1.5:3 for Foundation	2.4	m ³	9,405.20	30,371.27
5	5.02	Providing and laying in position reinforced cement concrete excluding cost of centering and shuttering, finishing and reinforcement in - 1:1.5:3				
		Columns	0.6	m ³	9,405.20	7,592.82
		Beams	1.62	m ³	9,405.20	20,500.61
6	5.02	Reinforced cement concrete work in walls including attached pillars, columns, etc. upto floor five level excluding cost of centering, shuttering, etc complete.				
	a)	Columns	1.5	m ³	10,666.70	21,528.07
	5.03	a) Beams and slabs	10.25	m ³	9,811.30	1,35,311.32
		Kitchen counter	0.14	m ³	9,811.30	1,848.15
7	5.18	Steel reinforcement for RCC work including straightening etc. placing in position and binding all complete.				
	b)	Thermo-Mechanically Treated bars of grade Fe-500 or more.				
		12mm dia	668.2	kg	101.60	91,346.23
		8mm dia	396.3	kg	101.60	54,176.34
		10mm dia	878.7	kg	101.60	1,20,122.80
8	6.09	7.5 cm thick brick masonry with first class brick in superstructure above plinth level upto floor two level including curing, etc.				
	a)	in cement mortar 1:3	68.35	m ²	1,044.40	96,048.17
9	20.11	Plaster: 15mm cement plaster 1 : 3 (1 cement : 3 fine sand).	299	m ²	333.90	1,34,315.99
10	5.10	Centering and shuttering including strutting, propping etc. and removal of form for all heights :				
	c)	Columns, pillars, piers, etc	36.0	m ²	618.40	29,954.06
	d)	Lintels, beams etc.	20.98	m ²	480.10	13,552.55
11	9.06	Providing Ist class local wood dressed in frames of chaukat for doors, windows, etc. fixed in position.	0.12	m ³	51,372.80	8,294.65

12	9.11	Providing and fixing 1st class local wood panelled shutters for doors etc. including M.S. butt hinges with necessary screws. etc.	3.43	m ³	3,076.70	14,195.03
13	9.55	Providing and fixing factory made PVC door frame as direction of Engineer-in-charge. (Sintex, Plasopan or equivalent)	5	Rm	225.80	1,488.69
14	9.56	Factory made PVC door shutters made of styles and rails of a uPVC hollow section as direction of Engineer-in-charge.	1	m ²	2,219.80	3,315.28
15	11.01	Providing and fixing anodised aluminium work for doors, windows, ventilators and partitions all complete including fixing of glasses but excluding cost of glasses.	8.60	m ²	5,638.20	65,203.37
16	11.02	Supplying of glass panes at site.	8.60	m ²	654.80	7,572.48
17	20.74	Wall painting with water and weather proof paint (Latex Emulsion base) on cement works of approved brand and manufacture, two or more coats to give an even shade .	264.5	m ²	152.90	54,404.49
Septic tank & Soak Pit						
18	2.06	Earthwork in excavation over areas including disposal of excavated earth, lead upto 50m and lift upto 1.5m, disposed earth to be levelled and neatly dressed.	4.60	m ³	411.50	2,546.90
19	4.01	Providing and laying in position cement concrete of specified grade excluding cost of centering and shuttering - All work upto plinth level:				
	a)	1:1.5:3	0.2	m ³	9,108.20	2,451.02
20	5.01	Providing and laying in position reinforced cement concrete excluding cost of centering and shuttering , finishing and reinforcement				
	a)	1:1.5:3				
		Septic tank floor & roof, Soak pit roof	0.7	m ³	9,405.20	8,858.29
21	5.18	Steel reinforcement for RCC work including straightening etc. placing in position and binding all complete.				
	b)	Thermo-Mechanically Treated bars	37.8	kg	101.60	5,167.37
22	6.05	Half brick masonry with first class brick in foundation and plinth in:				
	b)	in cement mortar 1:4	9.86	m ²	1,541.60	20,451.84
23	6.08	Honey-comb half brick masonry with first class brick in foundation upto one storey above and below ground level including curing, etc. complete.				
	b)	in cement mortar 1 : 4	4.8	m ²	965.00	6,232.36
Total						10,10,113.32
Adding 6% GST from Base amount						54111.90
Total						10,64,225.21
24		Adding Kitchen cabinet with smoke exhaust, internal water supply & Sanitary item with installation with water storage of 2000 liter	LS			1,00,000.00
25		Adding Electrification(Internal & external)	LS			50,000.00
G. Total						12,14,225.21
Say						12,14,000.00
For 2 nos of Duty Quarters						24,28,000.00
(Rupees twenty four lakh twenty eight thousand) only						

M. Bill of Quantity for Electro-mechanical and allied works			
Description of Work	Qty.	Unit	Tendered Amount (Rs)
1. Raw water submersible pumps with discharge of 26.4 cum/hr at a static head of 25 m with a pumping main pipeline of GI pipe 80mm dia. (M) of length 200m (approx.) including electric motor, control panel, cables, etc. complete.	2	Sets	12,00,000.00
2. Clear water horizontal multistage centrifugal pumps for Stage – I with discharge of 22.30 cum/hr at a static head of 585m with a pumping main pipeline of GI pipe 100mm dia. (H) of length 5500m including electric motor, control panel, cable, etc. complete.	2	Sets	1,58,00,000.00
3. Clear water horizontal multistage centrifugal pumps for Stage – II with discharge of 22.30 cum/hr at a static head of 581m with a pumping main pipeline of GI pipe 100mm dia. (H) of length 6500m including electric motor, control panel, cable, etc. complete.	2	Sets	1,58,00,000.00
4. SITC of back wash Pump complete with all standard fittings, pipes, valves, etc.	1	Set	4,50,000.00
5. SITC of air blower for rapid sand filter (appropriate capacity) complete with all standard fittings, pipes, valves, etc.	1	Set	5,00,000.00
6. SITC of Electro-Chlorinator Mac-50 including controls and cables to be installed at main reservoir, Thingsai.	1	Sets	6,50,000.00
7. HOT crane 2 metric ton capacity, span 0-6m, with all accessories complete like trolley, girder, rail, base plate, etc. 1 set each at both clear water pumping stations.	2	Sets	9,00,000.00
Total			3,53,00,000.00

A. SCHEDULE OF QUANTITIES FOR CONSTRUCTION OF INTAKE JACKWELL CUM RAW WATER PUMP HOUSE

Sl. No.	SoR No.	Particulars	Qty.	Unit	Quoted Rate (Rs.)	Quoted Rate (in words)	Quoted Amount (Rs.)
1	2.18	Earth work in excavation by mechanical means (Hydraulic excavator)/manual means over areas (exceeding 30 cm in depth, 1.5 m in width as well as 10 sqm on plan) including getting out and disposal of excavated earth lead upto 50 m and lift upto 1.5 m	321.00	m ³			
2	2.08	Earthwork in excavation in foundation trenches etc. not exceeding 2 meters depth including dressing of bottom and sides of trenches.					
		(b) Hard Soil (pick work)	10.37	m ³			
3	4.01	Providing and laying in position cement concrete of specified grade excluding cost of centering and shuttering - All work upto plinth level:					
		(a) 1:1.5:3 (1 cement :1.5 course sand :3 stone aggregate 20mm nominal size)	1.87	m ³			
4	5.01	Providing and laying in position reinforced cement concrete excluding cost of centering and shuttering , finishing and reinforcement in -					
		1:1.5:3 (1 cement :1.5 course sand :3 stone aggregate 20mm nominal size)	1.73	m ³			
5	5.02	Providing and laying in position reinforced cement concrete excluding cost of centering and shuttering , finishing and reinforcement in -					
		1:1.5:3 (1 cement : 1.5 coarse sand : 3 graded stone aggregate 20mm nominal size)					
		Column	3.78				
		Beam	2.7				
		RCC stairs	2.34				
6	5.03	Reinforced cement concrete work in walls including attached pillasters, columns, pillars, posts, piers, abutments, return walls, retaining walls, struts, buttresses, string All Work above plinth level upto floor V level					
		Column	1.08	m ³			
		Beam	0.9	m ³			
		Slab	5.6	m ³			
		Wall	32.4	m ³			
7	5.18	Steel reinforcement for RCC work including straightening, cutting, bending, placing in position and binding all complete.					
		Thermo-Mechanically Treated bars of grade Fe-500 or more.	3008.75	Rm			
8	6.06	7.5 cm thick brick masonry with first class brick in superstructure above plinth level upto floor two level including curing, etc. complete.					
		(a) in cement mortar 1:3 (1 cement : 3 coarse sand)	39.42	m ²			
9	20.11	Plaster: 15mm cement plaster 1 : 3 (1 cement : 3 fine sand).	885.60	m ²			

10	5.10	Centering and shuttering including strutting, propping etc. and removal of form for all heights :					
		(a) Columns, pillars, piers, abutments, posts and struts.	50.40	m ²			
		(b) Walls including attached pillasters, buttresses, string courses, etc.	259.2	m ²			
		(a) Lintels, beams, plinth beams, girders, bressumers and cantilevers, etc.	21.6	m ²			
		Suspended floors, roofs, landings, shelves and their support, balconies and chajja, etc.	25.92	m ²			
11	9.06	Providing 1st class local wood dressed in frames of chaukat for doors, windows, clerestory windows fixed in position	0.06	m ³			
12	9.11	Providing and fixing 1st class local wood panelled shutters for doors etc. including					
		M.S. butt hinges with necessary screws, etc. complete.	1.62	m ²			
13	11.01	Providing and fixing anodised aluminium work for doors, windows, ventilators and partitions with extruded built up standard sections/ other sections of approved make conforming to IS : 733 and IS : 1285 fixing with dash fasteners of required dia and size, including necessary filling up of gaps at junctions, at top, bottom and sides with required PVC/ neoprene gaskets etc. Aluminium sections shall be smooth, rust free, straight, mitred and jointed mechanically wherever required including cleat angle, aluminium snap beading for glazing /panelling, CP brass /stainless steel screws all complete including fixing of glasses but excluding cost of glasses.					
		(b) Powder coated					
		(i) 2 - track sliding windows/ventilators.	2.16	m ²			
14	11.02	Supplying of glass panes at site.					
		(b) 4mm thick plate sheet glass.	2.16	m ²			
15	20.7	Wall painting with water and weather proof paint (Latex Emulsion base) on cement works of approved brand and manufacture (ISI/ISO certified) of required shade on new work (two or more coats) to give an even shade.					
		(a) in cement mortar 1:3 (1 cement : 3 coarse sand)	108.54	m ²			
16	PHED SoR	Inlet Valve- Copper Alloy Bronze/Gunmetal) Globe valves conforming to IS 778 2010 along with appropriate length of rising spindle for different water level (100mm)	3	Nos.			
17	PHED SoR	Fixing following copper alloy valves (gate and globe) in G.I. pipe line including cutting and threading the pipe and making long screws etc. complete (threaded connection)	3	Nos.			
Total							
Total A+B							
Say							

B. SCHEDULE OF QUANTITIES FOR SITE DEVELOPMENT WORKS FOR THINGSAI WSS

Sl. No.	SoR No.	Particulars	Qnty.	Unit	Quoted Rate (Rs.)	Quoted Rate (in words)	Quoted Amount (Rs.)
1	1.02	Clearing and grubbing road land including uprooting rank vegetation, grass, brush shrubs, saplings and trees of girth upto 300 mm, removal of stumps, disposal of unserviceable material and stacking of serviceable material upto 100 metres from road boundary.	11310	m ²			
2	2.18	Earth work in excavation by mechanical means (Hydraulic excavator)/manual means over areas (exceeding 30 cm in depth, 1.5 m in width as well as 10 sqm on plan) including getting out and disposal of excavated earth lead upto 50 m and lift upto 1.5 m, as directed by Engineer-in-charge.	260	m ³			
Total							

C. SCHEDULE OF QUANTITIES FOR CONSTRUCTION OF CASCADE AERATOR

Sl. No.	SoR No.	Particulars	Qnty.	Unit	Quoted Rate (Rs.)	Quoted Rate in words	Quoted Amount (Rs.)
1	2.07	Earthwork in excavation in foundation trenches or drains etc. (not exceeding 1.5m in width or 10sqm on plan) including dressing of sides and ramming of bottoms, lift upto 1.5m including getting out excavated soil and disposal of surplus excavated soil as directed within a lead of 50 metres. Ordinary and Hard Soil	2.16	cum			
2	4.01	Providing and laying in position cement concrete of specified grade excluding cost of centering and shuttering - All work upto plinth level: (a) 1:1.5:3 (1 cement :1.5 course sand :3 stone aggregate 20mm nominal size)	0.14	cum			
3	5.01	Providing and laying in position reinforced cement concrete excluding cost of centering and shuttering , finishing and reinforcement in -					
		(a) 1:1.5:3 (1 cement :1.5 course sand :3 stone aggregate 20mm nominal size)					
		F1	0.5	cum			
			0.85	cum			
4	5.02	Providing and laying in position reinforced cement concrete excluding cost of centering and shuttering , finishing and reinforcement in - 1:1.5:3 (1 cement : 1.5 coarse sand : 3 graded stone aggregate 20mm nominal size)					
		All Work upto plinth level					
		Columns					
		C1	0.18	cum			
5	5.02 (a)	Reinforced cement concrete work in walls including attached pillasters, columns, pillars, posts, piers, abutments, return walls, retaining walls, struts, buttresses, string or lacing courses, fillets etc. upto floor five level excluding cost of centering shuttering etc complete.					
	5.03 (a)	All Work above plinth level upto floor V level					
		Columns					
		C1	0.48	cum			
		Beams					
		slab	2.79	cum			
		Wall					
		perimeter	0.64	cum			
6	5.18	Steel reinforcement for RCC work including straightening, cutting, bending, placing in position and binding all complete.					
		(b)Thermo-Mechanically Treated bars of grade Fe-500 or more.					
		foundation	539.62	kg			
			59.803	kg			
		slab	181.44	kg			
		wall	88.868	kg			

7	6.06	Half brick masonry with first class brick in superstructure above plinth level upto floor V level.					
		(b)in cement mortar 1 : 4 (1 cement : 4 coarse sand)					
		wall	6.03	sqm			
8	20.2	Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. in layers not exceeding 20cm in depth, consolidating each deposited layer by ramming and watering, lead up to 50 m and lift upto 1.5 m.					
		RCC wall	11.3	cum			
9	20.1	Plaster: 15mm cement plaster 1 : 3 (1 cement : 3 fine sand).	81.52	sqm			
10	5.10	Centering and shuttering including strutting, propping etc. and removal of form for all heights :					
		(c) Columns, pillars, piers, abutments, posts and struts.					
		All Work above plinth level upto floor V level					
		Columns					
		C1	3.6	sqm			
		(d) Lintels, beams, plinth beams, girders, bressumers and cantilevers, etc.					
		Beams					
		B1a	5.1	sqm			
		Suspended floors, roofs, landings, shelves and their support, balconies and chajjaj,etc.	7.07	sqm			
11	20.7	Wall painting with water and weather proof paint (Latex Emulsion base) on cement works of approved brand and manufacture (ISI/ISO certified) of required shade on new work (two or more coats) to give an even shade .	81.52	sqm			
Total							
G. Total							
Say							

D. Schedule of Quantities for construction of Flash Mixer for Thingsai WSS

Sl. No.	SoR No.	Particulars	Qty.	Unit	Quoted Rate (Rs.)	Quoted Rate (in words)	Quoted Amount (Rs.)
1	4.02	Providing and laying in position cement concrete of specified grade excluding cost of centering and shuttering etc.in all works upto plinth level					
	a)	1:02:04	0.1	m ³			
2	5.28	Providing and laying in position machine batched, machine mixed and machine vibrated design mix M-20 grade reinforced cement concrete excluding cost of centering and shuttering and reinforcement in -					
	a)	All works upto plinth level	0.64	m ³			
	b)	All works above plinth level	2.02	m ³			
3	5.3	Extra for providing richer or leaner mixes respectively at all floor levels					
	b)	Providing M-30 grade concrete	2.66	m ³			
4	5.18	Steel reinforcement for RCC work including straightening, cutting, bending,placing in position and binding all complete.					
	b)	Thermo-mechanically treated bars of grade fe-500 or more	279.7	kg			
5	5.1	Centering and shuttering including strutting, propping etc and removal of form work in-					
		(a)Foundations, etc. for mass concrete.	1.12	m ²			
		b)Wall	20.2	m ²			
6	20.1	15mm cement plaster 1 : 4	22.12	m ²			
7	20.5	Applying one coat of water thinnable cement primer of approved brand and manufacture on wall surface.	10.1	m ²			
8	20.8	Wall painting with water and weather proof paint (Latex Emulsion base) on cement works of approved brand and manufacture	10.08	m ²			
PIPING WORKS			-	-	-	-	-
1	PHE, SOR	Providing Copper Alloy (Bronze/Gunmetal) Globe valves conforming to IS 778 2010 -80mm	1	No			
2	PHE, SOR	Fitting Copper Alloy (Bronze/Gunmetal) Globe valves conforming to IS 778 2010 -80mm	1	No			
3		Providing Ladder for inside		LS			
4		Adding Carriage of material		LS			
5		Adding for SITC of mixer motor with impeller, etc		LS			
Total							

E. SCHEDULE OF QUANTITIES FOR CONSTRUCTION OF PLAIN SEDIMENTATION TANK

Sl. No.	SoR No.	Particulars	Qnty.	Unit	Quoted Rate (Rs.)	Quoted Rate (in words)	Quoted Amount (Rs.)
1	2.06	Earthwork in excavation over areas including disposal of excavated earth etc. (a) Ordinary Soil & hard soil	24.37	m ³			
2	2.07	Earthwork in excavation in foundation trenches or drains etc. including dressing of sides and ramming of bottoms, lift upto 1.5m including getting out excavated soil and disposal of surplus excavated soil as directed within a lead of 50 metres. (a) Ordinary soil	15.00	m ³			
3	4.02	Providing and laying in position cement concrete of specified grade excluding cost of centering and shuttering - All work upto plinth level: (a) 1:2:4 (1 cement :2 course sand :4 stone aggregate 20mm nominal size)	1.00	m ³			
4	5.02	Providing and laying in position reinforced cement concrete excluding cost of centering and shuttering, finishing and reinforcement in - (a) 1:2:4 (1 cement :2 course sand :4 stone aggregate 20mm nominal size)	5.51	m ³			
5	5.28	Providing and laying in position machine batched, machine mixed and machine vibrated design mix M-20 grade reinforced cement concrete excluding cost of centering and shuttering and reinforcement in - a) All works upto plinth level					
			13.67	m ³			
			28.93	m ³			
6	5.30	Extra for providing richer or leaner mixes respectively at all floor levels b) Providing M-30 grade concrete instead of M-20 grade BMC/RMC.	36.15	m ³			
7	5.18	Steel reinforcement for RCC work including straightening, cutting, bending, placing in position and binding all complete.					
		(b)Thermo-Mechanically Treated bars of grade Fe-500 or more.	5046	kg			
8	5.10	Centering and shuttering including strutting, propping etc and removal of form work in-					
		Foundations, footings, bases of columns etc.	7.42	m ²			
		Wall	204.4	m ²			
		Slab, beam & column	144.90	m ²			
9	20.12	15mm cement plaster 1 : 4 (1 cement : 4 fine sand).	404.53	m ²			
10	20.50	Applying one coat of water thinnable cement primer of approved brand and manufacture on wall surface.	112.2	m ²			

11	20.74	Wall painting with water and weather proof paint (Latex Emulsion base) on cement works of approved brand and manufacture (ISI/ISO certified) of required shade on new work (two or more coats) to give an even shade .	112.20	m ²			
12		Providing inside ladder		LS			
Total							

**F. Schedule of Quantities for construction of Rapid Sand Filter and Filter House
for Thingsai WSS**

Sl. No.	SoR No.	Particulars	Qty.	Unit	Quoted Rate (Rs.)	Quoted Rate in words	Quoted Amount (Rs.)
1	2.18	Earth work in excavation by mechanical means including getting out and disposal of excavated earth lead upto 50 m and lift upto 1.5 m, as directed by Engineer-in-charge.					
	a)	All kinds of soil	121	m ³			
2	2.06	Earthwork in excavation over areas including disposal of excavated earth, lead upto 50m and lift upto 1.5m, disposed earth to be levelled and neatly dressed.	28.51	m ³			
3	4.01	Providing and laying in position cement concrete of specified grade excluding cost of centering and shuttering - All work upto plinth level:					
	a)	1:1.5:3	4.8	m ³			
4	5.01	Providing and laying in position reinforced cement concrete excluding cost of centering and shuttering , finishing and reinforcement in - upto plint level					
	a)	1:1.5:3	18.63	m ³			
5	5.02	Reinforced cement concrete work in walls including attached pillasters, columns, pillars, posts, etc. upto floor five level excluding cost of centering shuttering etc complete. 1:1.5:3					
		All Work above plinth level upto floor V level	6.93	m ³			
6	5.28	Providing and laying in position machine batched and machine mixed design mix M-20 grade cement concrete for reinforced cement concrete work etc.					
		Filter wall	11.41	m ³			
7	5.30	Extra for providing richer or leaner mixes respectively at all floor levels .					
		Providing M-30 grade concrete instead of M-20 grade	11.41	m ³			
8	5.03	Reinforced cement concrete work in beams, suspended floors, roofs having slope up to 15° landings, balconie etc. complete..					
	a)	All Work above plinth level upto floor V level	33.17	m ³			
9	5.18	Steel reinforcement for RCC work including straightening, cutting, bending etc. all complete.					
	b)	Thermo-Mechanically Treated bars of grade Fe-500 or more.					
		16mm Ø	3280.51	kg			
		8mm Ø	1123.10	kg			
		10mm Ø	4499.46	kg			
		12mm Ø	1575.55	kg			

10	6.06	7.5 cm thick brick masonry with first class brick in superstructure above plinth level upto floor two level including curing, etc. complete .	316.95	m ²			
11	20.11	Plaster: 15mm cement plaster 1 : 3 (1 cement : 3 fine sand).	1293.3	m ²			
11	5.10	Centering and shuttering including strutting, propping etc. and removal of form for all heights :					
	c)	Columns, pillars, piers etc.	111.54	m ²			
	b)	Wall	51.84	m ²			
	d)	Lintels, beams, plinth beams etc.	103.53	m ²			
		Suspended floors, roofs etc.	194.85	m ²			
12	11.01	Providing and fixing anodised aluminium work for doors etc. all complete including fixing of glasses but excluding cost of glasses.					
	c)	Powder coated	5.40	m ²			
13	11.02	Supplying of glass panes at site.					
	b)	4mm thick plate sheet glass.	5.40	m ²			
14	20.74	Wall painting with water and weather proof paint (Latex Emulsion base) o on new work (two or more coats) to give an even shade .	1293.3	m ²			
15	Basic rate	River sand for filter media	33.81	m ³			
Adding valve and Piping works for drain, backwash, manifold, trough etc.							
Adding Electrification (LS)							
Adding carriage of material LS							
Total							

G. Schedule of Quantities for construction of Back Wash Tank for Thingsai WSS

Sl. No.	SoR No.	Particulars	Qty.	Unit	Quoted Rate (Rs.)	Quoted Rate (in words)	Quoted Amount (Rs.)
1	2.06	Earthwork in excavation over areas including disposal of excavated earth, etc.					
	a)	Ordinary Soil & hard soil	13.44	m ³			
2	2.07	Earthwork in excavation in foundation trenches or drains etc. including dressing of sides and ramming of bottoms etc. complete					
	a)	Ordinary soil	4.49	m ³			
3	4.02	Providing and laying in position cement concrete of specified grade excluding cost of centering and shuttering etc.in all works upto plinth level					
	a)	1:2:4	3.09	m ³			
4	5.02	Providing and laying in position cement concrete of specified grade excluding cost of centering and shuttering etc.in all works upto plinth level					
	a)	1:2:4	7.85	m ³			
5	5.28	Providing and laying in position machine batched, machine mixed and machine vibrated design mix M-20 grade reinforced cement concrete					
	a)	All works upto plinth level	7.33	m ³			
	b)	All works above plinth level	25.97	m ³			
6	5.30	Extra for providing richer or leaner mixes respectively at all floor levels					
	b)	Providing M-30 grade concrete instead of M-20 grade	29.94	m ³			
7	5.18	Steel reinforcement for RCC work including straightening, cutting, bending,placing in position and binding all complete.					
	b)	Thermo-mechanically treated bars of grade fe-500 or more					
		10mm Ø	2592.7	kg			
		12mm Ø	139.82				
8	5.10	Centering and shuttering including strutting, propping etc and removal of form work in-					
	a)	Foundations, footings	5.1	m ²			
	b)	Wall	180.84	m ²			
	c)	Slab, beam & column	35.85	m ²			
9	20.12	15mm cement plaster 1 : 4	242.34	m ²			
10	20.50	Applying one coat of water thinnable cement primer of approved brand and manufacture on wall surface.	89.67	m ²			

11	20.74	Wall painting with water and weather proof paint (Latex Emulsion base) two or more coats) to give an even shade .	89.67	m ²			
Total A							
Piping Work							
1	PHED SOR	Providing and fitting Copper Alloy (Bronze/Gunmetal) Globe valves conforming to IS 778 2010 -80mm	2	No			
2	PHED SOR	Fitting Copper Alloy (Bronze/Gunmetal) Globe valves conforming to IS 778 2010 -80mm	1	No			
		Providing Ladder for inside & outside	LS				
		Adding Carriage of material	LS				
Total B							
Total A+B							

H. SCHEDULE OF QUANTITIES FOR CONSTRUCTION OF RCC RESERVOIR (1 LAKH LITER CAPACITY)

Sl. No.	SoR No.	Particulars	Qty.	Unit	Quoted Rate (Rs.)	Quoted Rate (in words)	Quoted Amount (Rs.)
1	2.18	Earth work in excavation by mechanical means (Hydraulic excavator)/manual means over areas (exceeding 30 cm in depth, 1.5 m in width as well as 10 sqm on plan) including getting out and disposal of excavated earth lead upto 50 m and lift upto 1.5 m. (a)All kinds of soil (excluding ordinary & hard rock)	179.56	m ³			
2	2.08	Earthwork in excavation in foundation trenches etc. not exceeding 2 meters depth including dressing of bottom and sides of trenches and subsequent filling and compaction in 15cm layers as in column foundations, fence posts, etc. and disposal of all surplus soil as directed within a lead of 30 metres.					
		(a)ordinary and hard soil	0.56	m ³			
3	7.14	Dry stone pitching 22.50 cm thick including supply of stones and preparing surface complete.	52.30	m ²			
4	4.02	Providing and laying in position cement concrete of specified grade excluding cost of centering and shuttering - All work upto plinth level:					
		(a)1:2:4 (1 cement : 2 Course sand : 4 stone aggregate 40mm nominal size)	5.23	m ³			
		PCC floor around reservoir	1.27	m ³			
		Stair column foundation	0.06	m ³			
5	5.10	Centering and shuttering including strutting, propping etc. and removal of form for all heights :					
		Walls including attached pillars, buttresses, string courses, etc. (Outside & Inside)	137.16	m ³			
		Roof Slab	47.27	m ³			
		Column	3.00	m ³			
		Beam	13.40	m ³			
		Stair Column	2.00	m ³			
		Stair Beam	0.70	m ³			
		Stair waist slab	5.82	m ³			
6	5.18	Steel reinforcement for RCC work including straightening, cutting, bending, placing in position and binding all complete.					
		Thermo-Mechanically Treated bars of grade Fe-500 or more.	3420.14	kg			
7	5.28	Providing and laying in position machine batched, machine batched and machine mixed design mix-20 grade cement concrete for reinforced cement concrete work, using cement content as per approved design mix, including pumping of concrete to site of laying but excluding the cost of centering, finishing and reinforcement					
		Floor/haunch	15.59	m ³			
		Wall/slab/column/beam/stair beam/stair waste slab/stair column foundation	26.81	m ³			

8	5.30	Extra for providing richer or leaner mixes respectively at all floor levels. (Providing M-30 grade concrete instead of M-20 grade BMC/ RMC)					
		Floor & Wall	34.79	m ³			
9	20.21	15mm cement plaster 1 : 3 (1 cement : 3 fine sand) finished with a floating coat of neat cement	254.11	m ²			
10	19.19	Extra for providing and mixing water proofing chemical (latex or equivalent chemical)	104.41	m ³			
11	20.50	Applying one coat of water thinnable cement primer of approved brand and manufacture on wall surface :	133.31	m ²			
12	20.74	Wall painting with water and weather proof paint (Latex Emulsion base) on cement works of approved brand and manufacture (ISI/ISO certified) of required shade on new work (two or more coats) to give an even shade.	133.31	m ²			
13	10.09	Supplying and fixing M.S. decorative railing consisting of top and bottom rails of 40mmx40mm square. The base of balusters at 560mm apart welded with base plate of 60mmx3mm thick and fixed with cement grouting firmly to concrete section including steel priming and steel painting complete etc.	28.03	m ²			
14	10.15	Providing and fixing 1mm thick M.S. sheet door with frame of 40x40x6 mm angle iron and 3 mm M.S. gusset plates at the junctions and corners, all necessary fittings complete, including applying a priming coat of approved steel primer. Using flats(30x6) mm for diagonal braces and central cross piece.	1.00	m ²			
Total							
Total							
For 2 Nos. of Reservoirs							

I. SCHEDULE OF QUANTITIES FOR CONSTRUCTION OF CHEMICAL HOUSE

Sl. No.	SoR No.	Particulars	Qnty.	Unit	Qouted Rate (Rs.)	Qouted Rate (in words)	Quoted Amount (Rs.)
1	2.18	Earth work in excavation by mechanical means (Hydraulic excavator)/manual means over areas (exceeding 30 cm in depth, 1.5 m in width as well as 10 sqm on plan) including getting out and disposal of excavated earth lead upto 50 m and lift upto 1.5 m. (a) All kinds of soil (excluding ordinary & hard rock)	6.00	m ³			
2	2.06	Earthwork in excavation over areas (exceeding 30cm in depth, 1.5m in width as well as 10sqm on plan) including disposal of excavated earth, lead upto 50m and lift upto 1.5m, disposed earth to be levelled and neatly dressed. Ordinary and Hard Soil	6.00	m ³			
3	4.01	Providing and laying in position cement concrete of specified grade excluding cost of centering and shuttering - All work upto plinth level: (a) 1:1.5:3 (1 cement : 1.5 course sand : 3 stone aggregate 20mm nominal size) F1 PCC	0.40	m ³			
4	5.01	Providing and laying in position reinforced cement concrete excluding cost of centering and shuttering , finishing and reinforcement in - (a) 1:1.5:3 (1 cement : 1.5 course sand : 3 stone aggregate 20mm nominal size) F1	1.4	m ³			
5	5.02 (a)	Providing and laying in position reinforced cement concrete excluding cost of centering and shuttering , finishing and reinforcement in - 1:1.5:3 (1 cement : 1.5 coarse sand : 3 graded stone aggregate 20mm nominal size)					
		All Work upto plinth level					
		Columns					
		C1	0.29	m ³			
		Beams					
		B	1.84	m ³			
6	5.02 (a)	Reinforced cement concrete work in walls including attached pillasters, columns, pillars, posts, piers, abutments, return walls, retaining walls, struts, buttresses, string or lacing courses, fillets etc. upto floor five level excluding cost of centering, shuttering, etc complete.					
	5.03 (a)	All work above plinth level upto floor V level					
		Columns					
		C1	1.50	m ³			
		Beams	0.67	m ³			
		slab	2.02	m ³			

7	5.18	Steel reinforcement for RCC work including straightening, cutting, bending, placing in position and binding all complete.					
		(b)Thermo-Mechanically Treated bars of grade Fe-500 or more.	1240.7	kg			
8	6.06	7.5 cm thick brick masonry with first class brick in superstructure above plinth level upto floor two level including curing, etc. complete .					
		(b)in cement mortar 1 : 3 (1 cement : 3 coarse sand)					
		wall	28.32	m ²			
9	20.11	Plaster: 15mm cement plaster 1 : 3 (1 cement : 3 fine sand).	123.43	m ²			
10	5.10	Centering and shuttering including strutting, propping etc. and removal of form for all heights :					
		Columns	28.8	m ²			
		Beams	9.52	m ²			
		Slab	7.84				
11	9.06	Providing 1st class local wood dressed in frames of chaukat for doors, windows, clerestory windows fixed in position.	0.06	m ³			
12	9.11	Providing and fixing 1st class local wood panelled shutters for doors etc. including M.S. butt hinges with necessary screws, etc. complete.	1.62	m ³			
13	11.01	Providing and fixing anodised aluminium work for doors, windows, ventilators and partitions with extruded built up standard sections/ other sections of approved make conforming to IS : 733 and IS : 1285 fixing with dash fasteners of required dia and size, including necessary filling up of gaps at junctions, at top, bottom and sides with required PVC/ neoprene gaskets etc. Aluminium sections shall be smooth, rust free, straight, mitred and jointed mechanically wherever required including cleat angle, aluminium snap beading for glazing /panelling, CP brass /stainless steel screws all complete including fixing of glasses but excluding cost of glasses. ((b)Powder coated) (i) 2 - track sliding windows/ventilators.	2.16	m ²			
14	11.02	4mm thick plate sheet glass.	2.16	m ²			
15	20.74	Wall painting with water and weather proof paint (Latex Emulsion base) on cement works of approved brand and manufacture (ISI/ISO certified) of required shade on new work (two or more coats) to give an even shade .	123.43	m ²			
Total							

J. Schedule of Quantities for construction of Clear Water Pump House for Thingsai WSS

Sl. No.	SoR No.	Particulars	Qnty.	Unit	Quoted Rate (Rs.)	Quoted Rate in words	Quoted Amount (Rs.)
1	2.18	Earth work in excavation by mechanical means all complete as directed by Engineer-in-charge.					
	a)	All kinds of soil	144.0	m ³			
2	2.06	Earthwork in excavation over areas including disposal of excavated earth, lead upto 50m and lift upto 1.5m, disposed earth to be levelled and neatly dressed.					
		Ordinary and Hard Soil	19.58	m ³			
3	4.01	Providing and laying in position cement concrete of specified grade excluding cost of centering and shuttering - All work upto plinth level:					
	a)	(a)1:1.5:3	1.15	m ³			
4	5.01	Providing and laying in position reinforced cement concrete					
	a)	1:1.5:3 for Foundation	3.46	m ³			
5	5.01	Providing and laying in position reinforced cement concrete excluding cost of centering and shuttering , finishing and reinforcement in - 1:1.5:3					
		Columns, Beam, Slab	10.91	m ³			
6	5.02	RCCwork in walls including attached pillasters, columns etc. upto floor five level excluding cost of centering shuttering etc complete.					
		All Work above plinth level upto floor V level					
	a)	Columns	4.32	m ³			
	5.03/a	Beams	3.60	m ³			
7	5.18	Steel reinforcement for RCC work including straightening etc. placing in position and binding all complete.					
	b)	Thermo-Mechanically Treated bars of grade Fe-500 or more.					
		16 mm dia	1394.5	kg			
		10mm dia	300.76	kg			
		8mm dia	628.11	kg			
8	6.09	7.5 cm thick brick masonry with first class brick in superstructure above plinth level etc. complete .					
	a)	in cement mortar 1:3	91.9	m ²			
9	20.11	Plaster: 15mm cement plaster 1 : 3	328.54	m ²			
10	5.10	Centering and shuttering including strutting, propping etc. and removal of form for all heights :					
	c)	Columns, pillars, etc	73.92	m ²			
	d)	Beams etc.	26.4	m ²			
		Suspended floors, roofs, landings, shelves and their support, balconies and chajjaj,etc.	36	m ²			

11	11.01	Providing and fixing anodised aluminium work for doors, windows, etc. all complete including fixing of glasses but excluding cost of glasses.					
	b)	Anodise for doors and windows	18.00	m ²			
12	11.02	Supplying of glass panes at site.					
	b)	4mm thick plate sheet glass.	18.00	m ²			
13	20.74	Wall painting with water and weather proof paint of approved brand and manufacture of required shade two or more coats	292.54	m ²			
14	10.01	Supplying and fixing steel rolling shutter of approved make all complete	6.74	m ²			
15	16.11	Providing Trapezoidal Polyester Coated Galvanised Steel Sheets Roofing including fitting and fixing ridging with self drilling etc. all complete	39.69	m ²			
16	16.12	Providing and fixing of Polyester Coated Galvanised Steel Sheets of any colour ridges	9.45	m ²			
17	10.08	Steel work in built up tubular (round, square or rectangular hollow tubes etc.) trusses etc., including cutting, h etc. complete.	456.67	kg			
Total							
Adding Electrification (Internal & external) (LS)							
G. Total							
For 2 nos of Clear water pump house							

K. Schedule of quantities for Clear Water Pump Foundation for 1st and 2nd Stage of Thingsai WSS

Sl. No.	SoR No.	Particulars	Qty.	Unit	Quoted Rate (Rs.)	Quoted Rate (in words)	Quoted Amount (Rs.)
1	2.06	Earthwork in excavation over areas (exceeding 30cm in depth, 1.5m in width as well as 10sqm on plan) including disposal of excavated earth, lead upto 50m and lift upto 1.5m, disposed earth to be levelled and neatly dressed.	0.72	m ³			
2	5.01	Providing and laying in position reinforced cement concrete excluding cost of centering and shuttering, finishing and reinforcement in -					
		(a) 1:1.5:3	1.8	m ³			
3	5.18	Steel reinforcement for RCC work including straightening, cutting, bending, placing in position and binding all complete.					
	b)	Thermo-Mechanically Treated bars of grade Fe-500 or more.	125.85	kg			
4	20.1	Plaster: 15mm cement plaster 1 : 3 (1 cement : 3 fine sand).	3.6	sqm			
5	5.10	Centering and shuttering including strutting, propping etc. and removal of form for all heights :					
	a)	Foundations, footings, bases of columns etc. for mass concrete	3.9	sqm			
Total							
Total for 4 Nos.							

L. Schedule of Quantities for construction of Duty Quarter for Thingsai WSS

Sl. No.	SoR No.	Particulars	Qty.	Unit	Quoted Rate (Rs.)	Quoted Rate (in words)	Quoted Amount (Rs.)
1	2.18	Earth work in excavation by mechanical means as directed by Engineer-in-charge.					
	a)	All kinds of soil for site preparation	112.0	m ³			
2	2.06	Earthwork in excavation over areas including disposal of excavated earth, lead upto 50m and lift upto 1.5m, disposed earth to be levelled and neatly dressed.					
		Ordinary and Hard Soil for foundation	12.0	m ³			
3	4.01	Providing and laying in position cement concrete of specified grade excluding cost of centering and shuttering - All work upto plinth level:					
	a)	1:1.5:3 for Foundation	0.8	m ³			
4	5.01	Providing and laying in position reinforced cement concrete excluding cost of centering and shuttering etc.					
		1:1.5:3 for Foundation	2.4	m ³			
5	5.02	Providing and laying in position reinforced cement concrete excluding cost of centering and shuttering, finishing and reinforcement in - 1:1.5:3					
		Columns	0.6	m ³			
		Beams	1.62	m ³			
6	5.02	Reinforced cement concrete work in walls including attached pillasters, columns, etc. upto floor five level excluding cost of centering, shuttering, etc complete.					
	a)	Columns	1.5	m ³			
	5.03	a) Beams and slabs	10.25	m ³			
		Kitchen counter	0.14	m ³			
7	5.18	Steel reinforcement for RCC work including straightening etc. placing in position and binding all complete.					
	b)	Thermo-Mechanically Treated bars of grade Fe-500 or more.					
		12mm dia	668.2	kg			
		8mm dia	396.3	kg			
		10mm dia	878.7	kg			
8	6.09	7.5 cm thick brick masonry with first class brick in superstructure above plinth level upto floor two level including curing, etc. complete .					
	a)	in cement mortar 1:3	68.35	m ²			
9	20.11	Plaster: 15mm cement plaster 1 : 3 (1 cement : 3 fine sand).	299	m ²			
10	5.10	Centering and shuttering including strutting, propping etc. and removal of form for all heights :					
	c)	Columns, pillars, piers, etc	36.0	m ²			
	d)	Lintels, beams etc.	20.98	m ²			

11	9.06	Providing 1st class local wood dressed in frames of chaukat for doors, windows, etc. fixed in position.	0.12	m ³			
12	9.11	Providing and fixing 1st class local wood panelled shutters for doors etc. including M.S. butt hinges with necessary screws, etc. complete.	3.43	m ³			
13	9.55	Providing and fixing factory made PVC door frame as direction of Engineer-in-charge. (Sintex, Plasopan or equivalent)	5	Rm			
14	9.56	Factory made PVC door shutters made of styles and rails of a uPVC hollow section as direction of Engineer-in-charge.	1	m ²			
15	11.01	Providing and fixing anodised aluminium work for doors, windows, ventilators and partitions all complete including fixing of glasses but excluding cost of glasses.	8.60	m ²			
16	11.02	Supplying of glass panes at site.	8.60	m ²			
17	20.74	Wall painting with water and weather proof paint (Latex Emulsion base) on cement works of approved brand and manufacture, two or more coats to give an even shade .	264.5	m ²			
Septic tank & Soak Pit							
18	2.06	Earthwork in excavation over areas including disposal of excavated earth, lead upto 50m and lift upto 1.5m, disposed earth to be levelled and neatly dressed.	4.60	m ³			
19	4.01	Providing and laying in position cement concrete of specified grade excluding cost of centering and shuttering - All work upto plinth level: (a)1:1.5:3 (1 cement :1.5 course sand :3 stone aggregate 20mm nominal size)					
	a)	1:1.5:3	0.2	m ³			
20	5.01	Providing and laying in position reinforced cement concrete excluding cost of centering and shuttering , finishing and reinforcement in -					
	a)	1:1.5:3					
		Septic tank floor & roof,Soak pit roof	0.7	m ³			
21	5.18	Steel reinforcement for RCC work including straightening etc. placing in position and binding all complete.					
	b)	Thermo-Mechanically Treated bars	37.8	kg			
22	6.05	Half brick masonry with first class brick in foundation and plinth in:					
	b)	in cement mortar 1:4	9.86	m ²			
23	6.08	Honey-comb half brick masonry with first class brick in foundation upto one storey above and below ground level including curing, etc. complete.					
	b)	in cement mortar 1 : 4	4.8	m ²			
24		Adding Kitchen cabinet with smoke exhaust, internal water supply & Sanitary item with installation with water storage of 2000 liter	LS				
25		Adding Electrification(Internal & external)	LS				
Total							
For 2 nos of Duty Quarters							

M. Schedule of Quantity for Electro-mechanical and allied works					
Description of Work	Qnty.	Unit	Quoted Rate (in Rs.)	Quoted Rate (in words)	Quoted Amount (Rs)
1. Raw water submersible pumps with discharge of 26.4 cum/hr at a static head of 25 m with a pumping main pipeline of GI pipe 80mm dia. (M) of length 200m (approx.) including electric motor, control panel, cables, etc. complete.	2	Sets			
2. Clear water horizontal multistage centrifugal pumps for Stage – I with discharge of 22.30 cum/hr at a static head of 585m with a pumping main pipeline of GI pipe 100mm dia. (H) of length 5500m including electric motor, control panel, cable, etc. complete.	2	Sets			
3. Clear water horizontal multistage centrifugal pumps for Stage – II with discharge of 22.30 cum/hr at a static head of 581m with a pumping main pipeline of GI pipe 100mm dia. (H) of length 6500m including electric motor, control panel, cable, etc. complete.	2	Sets			
4. SITC of back wash Pump complete with all standard fittings, pipes, valves, etc.	1	Set			
5. SITC of air blower for rapid sand filter (appropriate capacity) complete with all standard fittings, pipes, valves, etc.	1	Set			
6. SITC of Electro-Chlorinator Mac-50 including controls and cables to be installed at main reservoir, Thingsai.	1	Sets			
7. HOT crane 2 metric ton capacity, span 0-6m, with all accessories complete like trolley, girder, rail, base plate, etc. 1 set each at both clear water pumping stations.	2	Sets			
Total					

Grand Total: Rupees(in words)..... only

QUALIFICATION INFORMATION

The information to be filled in by the bidder in the following pages will be used for purposes of post qualification. This information will not be incorporated in the contract.

1 Qualification Information of the Bidder

Constitution or legal status of bidder :

[If any attach copy]

Place of registration :

Principal place of business :

Power of attorney of signatory of bid :

[Attach copy]

2 Experience in works of similar nature

Work performed as prime contractor and work performed in the past as a nominated subcontractor will also be considered provided the sub-contract was involved in execution of all main items of work described in the bid document, provided further that all other qualification criteria are satisfied (in the same name) on works of similar nature **of at least 3 (three) schemes of value not less than 40% of the estimated cost put to tender.** Authenticated Completion Certificate from competent authority may be enclosed for reference.

Project name	Name of employer	Description of work	Contract No	Value of contract (Rs in lakh)	Date of issue of work order	Stipulated period of completion	Actual date of completion	Remarks explaining reasons for delay

3 Availability of key contractor's equipment essential for carrying out the works. The bidder should list all the information requested below.

Item of equipment	Requirement		Availability proposal	Remarks
	No	Capacity	Owned/leased	Supporting documents

- 4 Qualification and experience of key personnel for administration and execution of contract work and also for maintenance.

Name	Contact number	Qualification	Year of experience in general work	Year of experience in similar work with supporting documents

- 5 Proposed sub-contracts and firms involved.

Sanction of the work	Value of sub-contract	Sub-contractor (Name & address)	Experience in similar works

- 6 Financial reports for the last 3 (three) years : Balance sheets, profit and loss statements, auditors reports, etc. List them below and attach copies

Financial Information	Historical information for the last 3 years from _____ to _____			
	Yr 1	Yr 2	Yr 3	Average
Total assets				
Total liabilities				
Net worth				
Current asset				
Current liabilities				

7 Information on litigation history in which the bidder is involved

Other parties	Employer	Cause of dispute	Amount involved	Remarks (present status)

8 Proposed work method and schedule. The bidder should attach design, drawings and charts as necessary to comply with the requirements of bidding documents.

POWER OF ATTORNEY FOR SIGNING OF BID

Know all men by these presents, We..... (name of the Bidder/Firm and address of the registered office) do hereby irrevocably constitute, nominate, appoint and authorize Mr./ Ms (name), ... son/daughter/wife of..... and presently residing at....., who is presently employed with us as our true and lawful attorney (hereinafter referred to as the "Attorney") to do in our name and on our behalf, all such acts, deeds and things as are necessary or required in connection with or incidental to submission of our BID(s) for the _____ [name of Work] proposed by the _____ (name of Department) including but not limited to signing and submission of all BIDs, and other documents and writings, participate in conferences/ meetings and providing information/ responses to the Authority, representing us in all matters before the Authority, signing and execution of all contracts and undertakings consequent to acceptance of our bid[s], and generally dealing with the Authority in all matters in connection with or relating to or arising out of our bid for the said Work[s] and/ or upon award thereof to us and/or till the entering into of the contract with the Authority.

AND we hereby agree to ratify and confirm and do hereby ratify and confirm all acts, deeds and things lawfully done or caused to be done by our said Attorney pursuant to and in exercise of the powers conferred by this Power of Attorney and that all acts, deeds and things done by our said Attorney in exercise of the powers hereby conferred shall and shall always be deemed to have been done by us.

In witness whereof we,....., the above named principal have executed this power of attorney on this day of... 2

For

(Signature)

(Name, Title and Address)

Witnesses:

- 1.
- 2.

.....

(Signature)

(Name, Title and Address of the Attorney)

(Notarised)

Person identified by me/ personally appeared before me/
signed before me/ Attested/ Authenticated*

(*Notary to specify as applicable)

(Signature, Name and Address of the

Notary) Seal of the Notary

Registration Number of the Notary

Date: _____

Notes: 1. The mode of execution of the Power of Attorney should be in accordance with the procedure, if any, laid down by the applicable law and the charter documents of the executant(s) and when it is so required, the same should be under common seal affixed in accordance with the required procedure.

1. Also, wherever required, the BIDDER should submit for verification the extract of the charter documents and documents such as a resolution/ power of attorney in favour of the person executing this Power of Attorney for the delegation of power hereunder on behalf of the BIDDER.

BID SECURITY DECLARATION FORM

(The Bidder shall complete in this form in accordance with the instructions indicated)

Date..... (insert date as day, month and year) of bid submission

Tender No.....

To:

We/I, the undersigned, declare that:-

- 1 We/I understand that, according to your conditions, bids must be supported by a Bid Security Declaration.
- 2 We/I accept that we will automatically be suspended from being eligible for bidding in any contract under your department for a period of 2 (two) years upon receipt of your blacklisting order, if i/we are in breach of our obligation(s) under the bid conditions, because i/we:-
 - a) withdraw our bid during the period of bid validity specified or
 - b) having been notified of the acceptance of our bid by the purchaser during the period of bid validity,
 - i) fail or refuse to execute the contract, if required, or
 - ii) fail or refuse to furnish the performance guarantee
- 3 I/we understand that this Bid Security Declaration shall expire if we are not the successful bidder, upon the earlier of
 - i) our receipt of a copy of your notification of the name of successful bidder, or
 - ii) twenty-eight days after the expiration of our tender

Signed:

Name:

Date :

(To be written in the Company's Letterhead)

CERTIFICATE OF UNDERSTANDING

Bid No. ----- :

Name of work : -----WSS

To:

.....(Employer)

.....(Address)

Dear Sir,

We, <Name of manufacturer>, are official manufacturer/dealer of <Name of Product> having factories at..... The machinery tendered by <name of Bidder> is manufactured by us and is within our range of production.

We further affirm that we are willing to sell our product to <name of bidder> and shall extend support in installation, testing and commissioning at site including supports in after sales services as deemed necessary.

Signed

Name.....

Designation.....

Seal.....

Form of Performance Security (Guarantee)

Bank Guarantee Bond

In consideration of the President of India (hereinafter called "The Government") having offered to accept the terms and conditions of the proposed agreement between.....and (hereinafter called "the said Contractor(s)") for the work(hereinafter called "the said agreement") having agreed to production of an irrevocable Bank Guarantee for Rs. (Rupees only) as a security/guarantee from the contractor(s) for compliance of his obligations in accordance with the terms and conditions in the said agreement.

1. We, ... (here in after referred to as "the Bank") hereby undertake to pay to the Government an amount not exceeding Rs. (Rupees..... Only) on demand by the Government.
2. We,(indicate the name of the Bank) do hereby undertake to pay the amounts due and payable under this guarantee without any demure, merely on a demand from the Government stating that the amount claimed as required to meet the recoveries due or likely to be due from the said contractor(s). Any such demand made on the bank shall be conclusive as regards the amount due and payable by the bank under this Guarantee. However, our liability under this guarantee shall be restricted to an amount not exceeding Rs.(Rupees..... only)
3. We, the said bank further undertake to pay the Government any money so demanded notwithstanding any dispute or disputes raised by the contractor(s) in any suit or proceeding pending before any court or Tribunal relating thereto, our liability under this present being absolute and unequivocal. The payment so made by us under this bond shall be a valid discharge of our liability for payment thereunder and the Contractor(s) shall have no claim against us for making such payment.
4. We, ... (indicate the name of the Bank) further agree that the guarantee herein contained shall remain in full force and effect during the period that would be taken for the performance of the said agreement and that it shall continue to be enforceable till all the dues of the Government under or by virtue of the said agreement have been fully paid and its claims satisfied or discharged or till Engineer-in-Charge on behalf of the Government certified that the terms and conditions of the said agreement have been fully and properly carried out by the said Contractor(s) and accordingly discharges this guarantee.
5. We, ...(indicate the name of the Bank) further agree with the Government that the Government shall have the fullest liberty without our consent and without affecting in any manner our obligation hereunder to vary any of the terms and conditions of the said agreement or to extend time of performance by the said Contractor(s) from time to time or to postpone for any time or from time to time any of the powers exercisable by the Government against the said contractor(s) and to forbear or enforce any of the terms and conditions relating to the said agreement and we shall not be relieved from our liability by reason of any such variation, or extension being granted to the said Contractor(s) or for any forbearance, act of omission on the part of the Government or any indulgence by the Government to the said Contractor(s) or by any such matter or thing whatsoever which under the law relating to sureties would, but for this provision, have effect of so relieving us.
6. This guarantee will not be discharged due to the change in the constitution of the Bank or the Contractor(s).
7. We, (indicate the name of the Bank) lastly undertake not to revoke this guarantee except with the previous consent of the Government in writing.

This guarantee shall be valid up to unless extended on demand by the Government. Notwithstanding anything mentioned above, our liability against this guarantee is restricted to Rs. (Rupees) and unless a claim in writing is lodged with us within six months of the date of expiry or the extended date of expiry of this guarantee all our liabilities under this guarantee shall stand discharged. Dated the day of for..... (indicate the name of the Bank)