TAMIL NADU WATER SUPPLY AND DRAINAGE BOARD

TENDER DOCUMENTS

ON TURNKEY BASIS

1.Tender Notice No **: 09/ F.Tender Notice/ DB /2023/ Dated:20.11.2023.**

2. Name of work : **Shifting of pipeline which are affected due to road widening of NH48 at Arapakkam 129/150km and VC Mottur to Vannevidu near Walajah Government Hospital in NH4 under Vellore CWSS**

3. Eligible Class of Contractor: **Class III** and above Contractor, registered in TWAD Board / any other state or Central Govt. Dept. / Undertakings.

4. Amount of E.M.D : **Rs.28000/-** in favour of the Executive Engineer, TWAD Board, Maintenance Division, Vellore–6.

5. Last date for submission of Tender : up to 3.00 PM on 06.12.2023.

6. Date and Time of opening of Tender : 3.30 PM on 06.12.2023

7. Tender should be valid for : 90 days

8. Cost of tender schedule : Rs. 1180/- (including GST @ 18%)

9. Issued to Thiru.

10. Receipt No. & Date.

Executive Engineer, TWAD Board,
Maintenance Division, Vellore–6.

Tenderer

Executive Engineer, TWAD Board.

LETTER OF CONSENT

I / We agree to abide by all the detailed specifications, terms and conditions stipulated by the TWAD Board which I / We have read and understood.

I / We agree to execute the work as per the Bill of quantities within the time limit prescribed in the Program Schedule and as per the technical specifications stipulated in the Bid.

I / We have not made any additions/alterations in any of the downloaded tender documents.

Signature of Contractor

Tenderer

Executive Engineer, TWAD Board.

TAMIL NADU WATER SUPPLY AND DRAINAGE BOARD

LETTER OF TENDER

Date :

To

The Executive Engineer,
TWAD Board,
Maintenance Division,
Vellore – 632006.

Sir,

1. I/We do hereby tender and if this tender be accepted undertake to execute the works covered by this tender as shown in the drawing and described in the specifications deposited in the office of the Executive Engineer, TWAD Board, Maintenance Division, Vellore – 6 With such variations by way of alterations or additions to and omissions from the said works and in accordance with the Detailed standard specifications and General conditions of Contract stipulated in the TWAD Board Manual for Rural Water Supply Schemes at.....% Excess / Less over the department value of Rs..... (Rupees.....

   .....)

   or such other sums as may be arrived at under the clause of the contract terms and conditions of TWAD Board relating to payment by final measurements at unit prices.

2. I/We have also quoted the tender Excess/Less percentage in the Bill of quantities (abstract of BOQ annexed) in words and figures for which I/We agree to execute the work and receive payment on measured quantities as per the General Conditions of the contract.

3. I/We do hereby distinctly and expressly declare and acknowledge that before the submission of my/our tender, I/We have carefully followed the instructions, in the tender and have read, the Tamil Nadu building practice, the general conditions to contract therein and the TWAD Board Manual for Rural Water Supply Schemes that I/We have made such examination of the contract documents and of the plan, specifications, quantities and of the location where the said work is to be done and such investigation of work required to be done and in regard to the materials

required to be furnished so as to enable me/us to thoroughly understand the intention of same and the requirements, covenants, stipulations and restrictions contained in the contract and in the said plans and specifications and distinctly agree that I/We will not thereafter make any claim or demand upon the TWAD Board upon or arising out of any alleged misunderstanding or misconception of mistake on my/our own part of the said requirements, covenants, stipulations, restrictions and conditions.

4. I/We enclose an Income Tax Verification Certificate and GST Certificate.

5. **a. I/We enclose.....the sum of Rs.....(Rupees..... .....) in the form of .....as prescribed in the Tender Notice towards Bid Security (Earnest Money Deposit) which will not carry any interest.

   ** b. I/We hereby enclose the proof of authority vide the payment of Bid Security.....exempting me/us from the payment of Bid Security.

   Note: ** to be scored out if not applicable.

6. If my/our tender is not accepted, the Bid Security shall be returned to me/us on my/our application when intimation is sent to me/us of rejection. if my/our tender is accepted I/We do hereby agree to produce the Performance Security (Security Deposit) in the manner and from prescribed under Clause 23, of the instructions to the bidders for the due fulfillment of contract. If upon intimation being given to me/us by the tender accepting authority of acceptance of tender I/We fail to make the Performance security in the prescribed form, then, I/We agree to the forfeiture of the Bid Security. Any notice, required to be served on me/us personally or forwarded to me/us by post to (Registered or ordinary) or left at my/our address given herein, such notice shall, if sent by post be deemed to have been served on me/us at the time when in due course of post it would be delivered at the address which it is sent.

7. I/we fully understand that on receipt of communication of acceptance of tender from the accepting authority, there emerges a valid contract between me/us and the TWAD Board represented by the officer accepting agreement and the TWAD Board Manual for Rural Water Supply Schemes-Detailed Standard Specifications and General conditions of contract and the Tender documents issued by the board, i.e. Tender notice, Tender with schedules, General conditions to the contract and special conditions of the tender, negotiation letters, Communication of acceptance of tenders, shall constitute the contract for this purpose and be the foundation of rights of both the parties, as defined in clause of the tender notice, provided that, it shall be open to the acceptance authority to insist on execution of any written agreement by tenderer, if administratively considered necessary or expedient

8. I/We have also have carefully examined the TWAD Board Manual for Rural Water Supply Schemes-Detailed Standard Specifications and General Conditions of contract and Tamilnadu Building practice in acknowledgement of being bound by all conditions of the clauses of the TWAD Board Manual for Rural Water Supply Schemes-Detailed Standard Specifications and General Conditions of contract and all specifications for items of works described by specification number in Bill of quantities (Schedule A).

9. In consideration of the payment of Rs..... (Rupees .....) or such other sums as may be arrived at under the clause of the General Conditions to the contract relating to payment by final measurement at unit prices. I/We agree subject to said conditions to execute and complete the works shown upon the said drawing serially from No.1. to.....Inclusive (Schedule B) and described in the Technical specification for works and Materials and to the extent of probable quantities shown (Schedule - A) with such variations by way of additions to or alterations, deductions from the said work and method of payment there after as are provided in the said conditions.

10. I/We agree that times shall be considered as the essence of this contract and commence the work as soon as this tender is accepted by the competent authority and to show progress as defined in the tabular statement (Schedule-C) "Rate of Progress" subject nevertheless to the provisions for extension of time contained in the General conditions to the contract.

11. I/We agree that upon the terms and conditions of this contract being fulfilled and performed to the satisfaction of the Executive Engineer, the security deposited by me/us as herein before recited or such portion there of as I/We may be entitled to under the said conditions be paid back to me/us provided in clause 8 of the Special conditions of contract.

12. The term Executive Engineer in the said condition shall mean the Executive Engineer, TWAD Board in charge of the Division having jurisdiction for the time being over the work, who shall be competent to exercise all the powers and privileges reserved here in favour of the TWAD Board who has been duly authorized by the TWAD Board.

13. I am/we are professionally qualified and my/our qualifications are as follows

.....

I/We in pursuance of schedule E undertake to employ the following technical staff for supervising the work and will see that one of them is always at site during working hours personally checking all items of works and paying extra attention to such work as may require special attention.

e.g. Reinforced cement concrete etc.,

Sl. No.	Name of Technical staff proposed to be employed	Qualification	Experience

14. I/We agree in the event of any dispute arising between the parties hereto respect of any of the matter comprised in this contract, the same shall be settled by a competent court having jurisdiction, over the place where the contract is awarded and agreement is concluded and by no other court.

15. I/We undertake to assume full responsibility for the stability and soundness of the works structures that will be executed by me/us as per this contract.

16. I/We undertake and agree that I/We will not withdraw this tender during the period of validity of my/our tender as indicated in my/our tender and also during such extended period as agreed to by me/us such period to date from the last date by which tenders are due to be submitted and if I/We do so withdraw. I/we agree to forfeit the Bid Security to the TWAD Board.

17. I/We understand that the Board is not bound to accept the lowest or any tender the Board may receive.

Dated this.....day of.....

Signature of the Tenderer
Address

Tenderer

Executive Engineer, TWAD Board.

INSTRUCTIONS TO BIDDERS

1. **DESCRIPTIVE OF WORKS: Execution of Shifting of pipeline which are affected due to road widening of NH48 at Arapakkam 129/150km and VC Mottur to Vannevidu near Walajah Government Hospital in NH4 under Vellore CWSS**

The tenderer is required to examine carefully all instructions, conditions, forms terms, specifications and drawings in the tender documents and in the TWAD Board Manual for Rural Water Supply Schemes-Detailed Standard Specifications and General Conditions of contract. Failure to comply with the requirements of the bid will be at tenderers own risk. Tenders which are not responsive to the requirements of the tender documents are liable to be rejected.

3. **QUALIFICATION CRITERIA**

The bidder should have registered **as class III and above** contractor in TWAD Board / Any other State / Central Government Department / Undertaking. The Bidder who is not registered in the TWAD Board should get Registered his name in the appropriate class of registration before conclusion of Agreement in the event of his tender is accepted.

4. **METHOD OF TENDERING**

If the tender is made by an individual, the tender documents shall be signed by the individual with his name and address.

If the tender is made by a registered firm, it shall be signed by the Managing Partner with full name of the firm and address.

if the tender is made by a limited company or a limited corporation, it shall be signed by a duly authorised person holding the power of attorney for signing the tender in which case a certified copy of the power of attorney shall accompany the tender. Such limited company or corporation may be required to furnish satisfactory evidence of its existence before the contract is awarded.

5. The bids from the contractors /firms shall be accompanied by an attested copy of the valid Income Tax Clearance Certificate and GST Verification Certificate as proof of having remitted the sales tax. In the case of not liable to the Sales Tax Department, a valid certificate issued by the competent authority to this effect.

6. The bidder is expected to examine carefully all instructions, conditions, forms, terms, specifications and drawing in the bidding documents. Failure to comply with the requirements of bid submission will be at bidder's own risk, Bids which are not

substantively responsive to the requirements of the bidding documents are liable to be rejected.

7. **AMENDMENT OF BIDDING DOCUMENTS**

At any time prior to the deadline for submission of bids, the Employer may, for any reason, whether at his own initiative or in response to a clarification requested by a prospective bidder, modify the bidding documents by the issuance of an Addendum / Corrigendum.

The Addendum / Corrigendum will be sent in writing or by cable to all prospective bidders who have purchased the bidding documents and will be binding upon them. Prospective bidders shall promptly acknowledge the receipt of communication there of the Employer.

In order to afford prospective bidders reasonable time in which to take an addendum / corrigendum into account in preparing their birds, the Employer may at his discretion, extend the deadline for the submission of the bids.

8. **LANGUAGE OF BID**

The Bid Prepared by bidder and all correspondence and documents relating to the bid exchanged by the bidder and the employer shall be written in English / Tamil Language.

9. **DOCUMENT COMPRISING THE BID**

The bid to be Prepared to by the bidder shall comprise the entire documents in full, say the Tender documents and Appendix there to the Bid security, The Bill of Quantities and the rates there of, the schedules of supplementary information, the information on eligibility criteria supported by relevant documentary evidence and any other material required to be completed and submitted in accordance with the instructions to Bidders embodies in these bidding documents .The forms, Bill of quantities and Schedules shall be used without exception subject to extension of the Schedule in the same format.

10. **PRICES**

The prices offered by the contractor shall remain firm for the entire project period and no variation in price shall be allowed on any account.

11. **BID VALIDITY**

The bids shall remain valid and open for acceptance for a period of 90 days after the date of opening of the bids. In exceptional circumstances prior to expiry of the original

validity period, the employer request the bidder for a specified extension of the period of validity. The request & responses there of shall be made in writing or by cable. A bidder may refuse the request without forfeiting his bid security. The bidder agreeing to the request will not be required (or) permitted to modify his bid, but will be required to extend the validity of his bid security accordingly. The provisions regarding discharge and forfeiture of bid security shall continue to apply during the extended period of bid validity.

12. **BID SECURITY (EARNEST MONEY DEPOSIT)**

- The bidder shall furnish as part of his bid, the bid Security (Earnest money Deposit) of **Rs. 28000/-** (Rupees Twenty eight thousand only) in any one of the following forms duly pledged or drawn in favour of the Executive Engineer, TWAD Board, Maintenance Division, Vellore–6.

- Demand draft drawn in a Nationalised Bank in favour of the Executive Engineer, TWAD Board, Maintenance Division, Vellore–6.

- Deposits at call receipt of scheduled banks pledged in favour of the Executive Engineer, TWAD Board, Maintenance Division, Vellore–6.

- Government Security and National Savings Certificate pledged in the favour of Executive Engineer, TWAD Board, Maintenance Division, Vellore–6. (Purchased within the state of Tamilnadu).

- Post Office savings bank Deposits pledged in favour of the Executive Engineer, TWAD Board, Maintenance Division, Vellore–6. (Purchased within the state of Tamilnadu)

- Fixed deposit receipts from scheduled bank pledged in favour of the Executive Engineer, TWAD Board, Maintenance Division, Vellore–6.

  Any bid not accompanied by an acceptable form of Bid Security will be rejected by the Engineer as non-responsive. The Bid Security of unsuccessful bidder will be returned without any interest within 15 days after a decision is taken on the tender.

13. **SIGNING OF BIDS**

The original bid shall be filled by typing or by writing in indelible ink and shall be signed by the authorised signatory to bind the bidder to the contract. Proof of authorisation shall be furnished in the form of power of Attorney duly signed/ executed and this should accompany the bid. All pages of the bid shall be signed and wherever entries of amendments as directed by the employer are made, they should be properly attested by the signatory to the bid.

The complete bid shall be free of alterations, interlineations or erasures except those that were instructed to be carried out by the Employer. In case necessity arose to correct the errors committed by the bidder, in the abstract of BOQ the same shall be properly attested by the signatory to the bid.

Each bidder is entitled to submit only one bid. No bidder will have the option of participating more than one bid for this contract.

14. **DEADLINE FOR SUBMISSION OF BIDS**

The tender shall be received by the Executive Engineer, TWAD Board, Maintenance Division, at his office at Vellore, not later than **3.00 P.M. on 06.12.2023**. The Engineer may, at his discretion, extend the deadline for submission of bids by issuing an amendment in accordance with clause 7 above, in which case all rights and obligations of the Engineer and the Bidders previously subject to the original deadline shall thereafter be subject to the new deadline as extended.

15. **MODE OF SUBMISSION OF BID DOCUMENTS**

The bid Documents are to be dropped in the Tender Box or sent by registered mail to the Executive Engineer, TWAD Board, Maintenance Division, Vellore–6, before the expiry of the deadline fixed for submission of bid documents. The Executive Engineer, under no circumstances shall be responsible for the delay or loss or damage to the Bid Documents in transit.

16. **LATE BIDS**

Any bids received by the Executive Engineer, after the deadline for submission of bids prescribed in accordance with clause 14 above, will not be considered and the same will be returned to the Bidder unopened.

17. **BID OPENING**

The tender will be opened by the Executive Engineer at 3.30 P.M. **on 06.12.2023.** in the premises of the office of the Executive Engineer, TWAD Board, Maintenance Division, Vellore–6. The bidders or their authorised representative desirous of attending opening of the bids may do so with proper authorisation to represent.

The Engineer will examine the bids to determine whether the document are complete, whether the requisite Bid security has been remitted to the required value and in the manner prescribed, whether the documents have been properly signed / attested and ascertained whether the bids are generally in order.

During the opening of bids, the Engineer will announce the names of the bidders, written notification of bid modifications if any, the compliance with reference to the remittance of Bid Security and such other details as the Employer may consider appropriate.

18. **CLARIFICATION OF BIDS**

For any clarification in the bid and for negotiations, the bidder shall attend the office of the Executive Engineer, TWAD Board, Maintenance Division, Vellore–6, Whenever he is called upon to do so.

19. **RESPONSIVENESS OF THE BIDS**

The bids shall be treated as substantively responsive based on the satisfaction of the required capacity, capability and financial resources. For this purpose the bid should conform to all terms, conditions and specification of the bidding documents without material deviation or reservation.

The Executive Engineer reserves the right to determine and evaluate the bids with regard to their response substantively.

If a bid, in the opinion of the Executive Engineer is found to be substantially not responsive, the Executive Engineer reserves the right to reject that bid and may not subsequently be made responsive by the bidder by carrying out corrections or withdrawal of the non-conforming deviation or reservation. However the decision of the employer shall be final and binding in all these matters.

20. **EVALUATION AND COMPARISON OF BIDS**

The Executive Engineer will evaluate and compare only the bids which are determined to be substantively responsive with reference to the requirements and parameters fixed for qualification.

The value based on the excess / less percentage quoted in the bid will only be taken into account for deciding the successful bidder.

21. **RIGHT TO ACCEPT OR REJECT THE BIDS**

The Executive Engineer reserves the right to accept or reject any or all the bids without assigning any reasons therefore. Under such circumstances, the Engineer will neither be under any obligation to inform the bidder or the bidders of the grounds for the action of the Engineer nor will be responsible for any liability incurred by the bidder on this account.

22. **NOTIFICATION OF AWARD**

The Engineer will promptly inform the successful bidder of the award of the contract before the expiry of the validity period and in the case of extended periods, before the expiry of the extended periods. The award of contract will be in writing in the event of award of contract being informed through cable, the same shall be confirmed through a written communication by the Engineer. The award of contract shall be in the form of work order and shall notify the total value at which the Engineer has accepted the works to be executed. The notification of the award will constitute the formation of the contract.

23. **PERFORMANCE SECURITY (SECURITY DEPOSIT) AND AGREEMENT**

The successful bidder on getting the work order from the Engineer shall remit the performance security at 2% of the value of contract in the form of NSC / Post Office Saving Deposit A/c, pledged in favour of the Executive Engineer, TWAD Board, Maintenance Division, Vellore–6 within 15 days from the date of work order and promptly enter into an agreement with the Executive Engineer in the form specified for this purpose. The agreement should be executed within 15 days from the date of work order in the non judicial stamp paper of value not less than Rs.100.00 purchased in the name of the contractor at his cost. The remittance of the required Security Deposit in the proper form and the conclusion of Agreement shall constitute the formal fulfillment of the contract.

For tenders received with any plus percentage and upto minus 5% department value, the successful tenderer should remit 2% of contract value.

For tenders received with minus 5% & up to minus 15% of department value, the successful tenderer should remit 4% of contract value.

For tenders received with more than minus 15% of departmental value, the successful tenderer should remit 5% of contract value.

24. **FORFEITURE OF BID SECURITY (EARNEST MONEY DEPOSIT)**

In the event of the successful bidder, upon receipt of work order should respond with the remittance of performance Security and execution of the Agreement within a maximum of 30 days from the date of work order, failure of which will be liable for the forfeiture of the Bid Security remitted by the bidder along with the bid documents.

25. **ADDITIONAL SECURITY DEPOSIT**

a) For the tenders received with any plus % & up to minus 5% of the departmental value, the successful tenderer should remit 2% of contract value, towards security deposit;

b) For the tenders received with minus 5% & up to minus 15% of the departmental value, the successful tenderer should remit 4% of contract value, towards security deposit;

c) For the tenders received with more than minus 15% of the departmental value, the successful tenderer should remit 5% of contract value, towards security deposit.

PRICE BID

1. Bill of quantities shall be read in conjunction with the Instructions to bidders and TWAD Board Manual for Rural Water Supply Schemes-Detailed Standard Specifications General Conditions of Contract and Drawings.

2. The quantities given in the bill of quantities are estimated and provisional and are given to provide a common basis for bidding. The basis of payment will be actual quantities of work ordered and carried out, as measured by the Engineer and agreed by the contractor and Valued at the rate and prices tendered in the priced bill of quantities, where applicable, and otherwise at such rates and price as the Engineer may fix within the terms of the contract.

3. The rates and prices tendered in the priced bill of quantities shall, except in so far as it is otherwise provided under the contract, include all constructional plant, labour supervision, materials, erection, maintenance, insurance profit, taxes and duties together with all general risks, liabilities and obligations Set out or implied in the contract.

4. All pages in the BOQ should be signed without omission.

5. All corrections / over writing should be properly attested by the bidder.

6. The total amount arrived based on the excess / less quoted on the "Abstract of BOQ" will only be taken as final value for comparison and finalisation of the Tender.

7. If there is any variation in the percentage quoted in words and figures, the lesser of the two will only be taken into consideration.

8. The percentage quoted in the bid should be up to two decimal only.

9. If the tenderer failed to score out the word either of "Excess" or "Less" the word less alone will be taken into consideration.

SCHEDULE -A

GENERAL ABSTRACT OF BOQ

Name of work: **Shifting of pipeline which are affected due to road widening of NH48 at Arapakkam 129/150km and VC Mottur to Vannevidu near Walajah Government Hospital in NH4 under Vellore CWSS**

Sl. No.	Name of Component	Ref. to. Manual	Departmental Value (Rs.)
	Enclosed Separately		

TOTAL

(Rupees.....only)

I/ WE AGREE TO EXECUTE ALL THE ABOVE COMPONENTS OF WORK AT ..... PERCENTAGE EXCESS/ LESS OVER THE DEPARTMENTAL VALUE MENTIONED ABOVE (THE PERCENTAGE SHOULD BE MENTIONED BOTH IN FIGURES AND WORDS)

Note :

(1) The percentage quoted in the bid should be upto two decimals only.

(2) If the tenderer failed to score out the word either of " Excess" or " Less", the word "Less" will be taken into consideration.

Contractor

(Seal).....

Tenderer

Executive Engineer, TWAD Board.

SCHEDULE -B

LIST OF DRAWINGS

NAME OF WORK : Shifting of pipeline which are affected due to road widening of NH48 at Arapakkam 129/150km and VC Mottur to Vannevidu near Walajah Government Hospital in NH4 under Vellore CWSS

Sl. No.	TWAD Board Manual for Rural Water Supply Reference	Description
1	As per TWAD Manual	Laying and jointing
2	As per TWAD Manual	Supply, Delivery and erection

Note : All drawings to be signed by the contractors as well as by officers entering into contract.

SCHEDULE -C
RATE OF PROGRESS

The fifteenth day from the date of issue of work order shall be reckoned as the start date of Contract Period.

The Date of acceptance of agreement .....

The Date of handling over of site .....

The entire project must be completed in all respects within **Five** Months including maintenance period of Two months.

The rate of progress for each component covered in the contract shall be as in the following schedule.

Name of Component	Completion Period	Completion in Term of % age
Shifting of pipeline which are affected due to road widening of NH48 at Arapakkam 129/150km and VC Mottur to Vannevidu near Walajah Government Hospital in NH4 under Vellore CWSS	Three Months	100%
Maintenance of the scheme at Free of cost.	Two Months	100%

SCHEDULE - D

MATERIALS

All the materials required for the work should be arranged by the contractor himself at his cost. He shall be responsible for transport of all materials to site of work, storing properly at site of work and for the safe custody of all materials including all incidental and handling charges.

The Contractor shall ensure that the materials procured conform to the relevant BIS Specification set out in the bid documents and also of good quality. If the material is not covered by BIS they should confirm to the departmental specifications and departmental requirements.

The contractor shall arrange at his cost for the inspection of the materials at the manufacturing place or at other places by the departmental officer wherever necessary. The contractor shall provide all the assistance necessary including instruments, machineries and materials that are normally required for carrying out the testing / measuring the Quality / Quantity of the materials and workmanship. Any materials rejected after testing by the Engineer -in- charge or his representative should not be used on the works.

The Engineer incharge shall have the right to order the removal of such materials which in his opinion are substandard stipulating a time limit for the removal of the same and replacement with quality material.

SUPPLY BY BOARD

If in case any of the materials required for the work are available with the board, the Executive Engineer incharge of the work shall have the discretion to issue such materials to the contractor for use in the work and such of these items under the agreement shall be treated as authorised omission from the scope of the contract.

SCHEDULE - E

TECHNICAL STAFF TO BE EMPLOYED

The contractor shall employ the following technical staff as per the prescribed rules.

Name of the member of Technical
Staff to be employed :

Qualification :

The details of value, scale and minimum qualification prescribed for the employment of technical staff, the rate of penalty for the failure on the part of the contractor to employ the technical staff for the work etc., are as follows.

SI. No.	Value of Contract	Scale & Minimum Qualification Prescribed for the employment of technical staff	Rate of Penalty
1.	Above Rs.1.00 lakh & Up to Rs. 5.00 lakhs	One Engineer with Diploma in Civil / Mech. Engg.	Rs.2000/-per Per Month
2.	Above Rs. 5.00 lakh & Up to Rs.10.00 lakhs.	One Engineer with Degree in Civil / Mech. Engg. with minimum 1 year Experience	Rs.5000/-per month
3.	Above Rs. 10.00 lakhs & Up to Rs. 25.00 lakhs.	One Engineer with Degree in Civil / Mech. Engg. with minimum 3 years experience	Rs. 6000/- per month
4.	Above Rs. 25.00 lakhs	One Engineer with Degree in Civil / Mech. Engg. with minimum 3 years experience and one engineer, Diploma in Civil / Mech. Engg.	Rs. 8000/- per Month with (Degree) Rs. 6000/- Diploma Rs. 2000/-

If the contractor fails to employ the technical staff to the departmental requirements, the contractor is liable to pay the penalty as indicated above during the period of such non employment of technical staff.

SCHEDULE -F

PAYMENT SCHEDULE

1.	INFILTRATION WELL :	
	After casting Curb	Up to 15%
	After sinking of well up to 50% of the required depth	Up to 50%
	After Completion of the entire works	Up to 95%
	After completion of the maintenance period of the scheme as a whole	Balance 5%
2.	OPEN WELL :	
	(Applicable only if the diameter of the well is at least 5 meters)	
	After completion up to average G.L.	Up to 50%
	After completion of the entire works	Up to 95%
	After completion of maintenance period of the scheme as a whole	Balance 5%
3.	PUMPING MAIN : (GRAVITY MAIN)	
	After supplying, laying, jointing and testing of Pipe line for every one km and part there of entire length whichever is less	Upto70%of the Value of work done
	After satisfactory commissioning of the entire length of main	Up to 95%
	After Completion of the maintenance period of the scheme as a whole	Balance 5%
4.	SUMP :	
	After completion up to floor slab	Upto30%
	After completion up to roof slab	Upto70%
	After completion of the entire work including pipe connections etc.,	Upto95%
	After completion of the maintenance period of the scheme as a whole	Balance 5%
5.	SERVICE RESERVOIR :	
	After completion of work up to average G.L.	Up to 25%
	After completion up to floor slab	Up to 75%
	After completion of the entire works including pipe connection etc. and issue of water tightness certificate by the Engineer -in- charge	Up to 95%
	After completion of the maintenance period of the scheme as a whole	Balance 5%

6.	DISTRIBUTION SYSTEM :	
	After supplying, laying, jointing and testing of Pipe line for every one km and part there of or entire length whichever is less	Upto70% of the Value of work done
	After satisfactory commissioning of the entire length of main	Up to 95%
	After completion of the maintenance period of the scheme as a whole	Balance 5%
7.	VALVE PITS AND PUBLIC FOUNTAINS:	
	After completion of entire works	Up to 95%
	After completion of the maintenance period of the scheme as a whole	Balance 5%
8.	PUMPING PLANT:	
	After receipt of pump, motor, valves, cable, control panel transformer at site	Up to 75%
	After erection of pump, motor and accessories	Up to 85%
	After commissioning of the pumping plant and testing	Up to 95%
	After completion of maintenance period of the scheme as a whole	Balance 5%
9.	PUMP ROOM /COMPOUND WALL /TOILET ROOMS:	
	After completion up to plinth level	Up to 35%
	After completion up to roof slab	Up to 70%
	After completion of the entire work	Up to 95%
	After completion of the maintenance period of the scheme as a whole	Balance 5%
10.	OTHER ITEMS OF WORK:	
	On completion of the entire job	Up to 95%
	After completion of maintenance period of the scheme as a whole	Balance 5%

11. EB CONNECTION AND POWER SUPPLY:

The power supply connection from the T.N.E.B. has to be obtained by the contractor himself and the charges thereon shall be borne by the contractor. However these charges shall be reimbursed to the contractor on submission of necessary receipts in original issued by EB.

12. MAINTENANCE CHARGES :

Maintenance charges	Free of cost

Note :

Maintenance of the scheme

The period of maintenance for scheme are as follows :

(i) Individual power pump schemes / mini power pump Schemes.	one Month, from the date of Commissioning
(ii) CWSS Scheme up to a value of Rs. 25 lakhs	2 Months from the date of commissioning.
(iii) CWSS Scheme of value more than Rs. 25 lakhs & up to Rs. 50 lakhs.	3 Months from the date of commissioning.

During the maintenance period if any defect either on material or work is noticed, the same should be attended to free of cost by the contract or No extra payment on this account will be made as a separate item for maintenance of the scheme for the specified period included in the Schedule A. During the maintenance period, TWAD Board will not bear the Charges such as repairs and renewals if any, consumable like oil for filling transformer, starters, alum/bleaching powder, diesel etc., have to be borne by the Contractor. During the maintenance period, the contractor, at his cost has to train the staff to be employed by the Board.

NOTE :

- The percentage of payment mentioned above are with reference to the total value of each component as per the agreement entered into by the firm/ contractor except Pumping Main and Distribution system.
- The payment shall be made for each component as per the actual measurements up to the percentage mentioned above for the stage of progress of each component.
- Payments shall become eligible only for finished items of works in all respects.

DEDUCTION FROM BILLS

- 5% of the value of every running bill shall be retained by the Board as additional performance security (WHA)

- **INCOME TAX**

  INCOME TAX At 1% the case of a individual/HUF 2% in the case details of a company/Firm (The contractor can produce the details of this certificate during the regular assessment of Income Tax to adjust the amount of TDS against the Tax payable by him)

  During the course of contract period, deduction of income tax shall be made at the prevailing rates from every payment as may be specified by the income tax department from the bills from time to time.

- **GOODS AND SERVICE TAX**

  From every payment made to the firm/contractor, deduction at source towards GST shall be made for contract as per Government of India, Ministry of Financial / Department of Revenue, New Delhi Notification No.20/2017-Central Tax(Rate) / Dt. 22.08.2017 G.O.MS No.264, Finance(Salaries) Dept., Dt.15.09.2017 & G.O. MS. No.296 / Finance(Salaries) department/dated 09.10.2017 and as amended from time to time.

- **RISK INSURANCE**

  No adding/deducting Risk insurance charge when contract CHARGE. payments would be made to the contractor. It would be appropriate to the part of the contractor to avail suitable insurance policies for the works being executed by them be paying risk insurance charged on their own.

- **FUND CONTRIBUTION FOR MANUAL WORKERS:**

  Towards contribution of fund for the benefit of Manual workers employed in the construction works an amount equivalent to one percent of total estimated cost of the construction work proposed will be paid by the employer direct to the respective welfare Board, as per G.O. Ms. No. 295 / Labour and Employment (I2) Department / Dated: 17.12.2013, subject to issue of amendments from time to time by the respective department of Government of Tamilnadu.

  (Lumpsum provision for this contribution may be appropriately made in the Estimate sanctioned for the schemes and the amount would be remitted at the end of the financial year to the Labour welfare Board, as per G.O. Ms. No. 283, MAWS Dept, Dated: 2010).

SPECIAL CONDITIONS OF CONTRACT

1. ROYALTY CHARGES :

Except where otherwise stated, the contractor shall pay all signature and other royalties, rent and other payments of compensation, if any for getting stone, sand, gravel, clay or other materials required for the work. The contractor is not eligible for any payment in this regard from the board.

2. EARTHWORK EXCAVATION :

The bidder should be carefully inspect the site to access the prevalence of differing soil classifications and quote his rate for trench excavation that are likely to been countered and no extra rate will be paid for excavation of trench on account of any variations in the classification of soil met with during actual execution.

3. PENALTY FOR THE SLOW PROGRESS :

If the contractor fails to maintain the rate of progress of the work as stipulated in schedule C, the Engineer shall have the power to impose as penalty of such amount as he may deemed fit for every day that the work remains un commenced or unfinished However total amount of penalty imposed during the stipulated period of completion of the work shall not exceed 5% of the contract value.

The programme schedule drawn for the project entrusted on turnkey basis, should be kept up by the firm/Contractor without any slippage. The Executive Engineer concerned shall monitor properly the execution on identification of any defective construction or any slippage on the programme schedule in any of the components shall issue a show cause notice either by RPAD or through slippage personal service to the firm / Contractor for rectification of the defective construction / slippage in the programme schedule giving 15days time for furnishing the reason therefore by the firm / contractor. In cases where the reasons adduced by the firm / contract are not convincing, the penalty contemplated in the agreement condition shall be invoked.

If the delay is due to reasons beyond the control of the contractor, penalty need not be levied.

The penalty levied on the firm/contractor is however subject to modification at the discretion of the next higher authority for valid reasons which are to be recorded.

4. LIQUIDATED DAMAGES:

If the contractor fails to complete the work or part there of within the stipulated completion period, he shall be liable to pay liquidated damages at Rs. 500 per day of delay for each incomplete part till the date of completion and handling over to the department. The amount of liquidated damages shall however be restricted to a maximum of 5% of the contract value. This is without prejudice to the right of the Engineer to terminate the contract treating time as essence of contract.

For imposing liquidated damages detailed show cause notice, shall be served on the defaulting firm / contractor either by RPAD or thro personal service. The first notice shall be served allowing 15 days time to the firm/contractor of furnishing the reply by them. On expiry of 15 days time, from the date of the first notice, the second notice shall be served allowing 7 days time to the firm/contractor for furnishing the reply by them. On expiry of 7days time from the date of second notice third notice shall be served allowing 3 days time to the firm /contractor for furnishing the reply by them.

On receipt of the reply, it shall be verified by the Engineer in charge and the liquidated damages clause shall be invoked by issuing an explicit speaking order to the firm/contractor. Similarly the non receipt of any reply from the firm / contractor shall attract imposition of the liquidated damages clause automatically and in the case also , the liquidated damages shall be imposed by issuing an explicit speaking order to the firm / contractor

5. EXECUTION OF WORK BY THE CONTRACTOR:

The contractor shall execute the whole and every part of the work in the most substantial and man like manner and both as regards materials and every other respect in strict accordance with specification. The contractor shall also confirm exactly fully and faithfully to the designs drawing and instructions in writing relating to the work signed by the Engineer incharge. And completion of the entire work as per the specifications, drawing, terms and conditions of the contract and to the satisfaction of the Engineer incharge, the contractor shall obtain the completion certificate from the Executive Engineer.

6. ALTERATION TO SPECIFICATION AND DESIGN :

The Engineer in charge shall have the power to make any alteration or additions to the original specification, drawing, design and instruction that may appear to him to be necessary during the progress of work and the contractor shall bound to carry out the work in accordance with the instruction in this connection which may be given to him in writing signed by the Engineer incharge and such alteration shall not invalidate the contract and such works shall be carried out by the contractor on the same condition in all respects on which he agreed to do the main work. The rates for such additional works will be fixed by the Executive Engineer as per rules in force.

7. CONTRACTOR LIABILITY

During the period of 12 months from the date of completion as certified by the Executive Engineer, the said work is found to be defective in any manner whatsoever, the contractor shall forthwith, on receipt of notice in that behalf from the Executive Engineer duly commence execution and completely carry out at his cost in every. respect all the work that may be necessary for rectifying and setting right the defect specified there in strictly in accordance and in the manner prescribed and under the supervision of the Engineer in-charge. In the event of the contractor failing or neglecting to carry out the rectification work within the period prescribed therefore, in the said notice, the Engineer Incharge will get the same executed and carried out departmentally or by any other agency at the risk and cost of the contractor. The contractor shall forth with on demand, pay to the Board the amount of such costs, charges and expenses sustained or incurred by the Board of which the certificate of the Executive Engineer shall be final and binding on the contractor. If the contractor fails to pay the same on demand, the Board shall be entitled to deduct the same from any amount which may then be payable or become payable by the Board to the contractor ,either in respect of the said work or any other work whatsoever or from the amount of security deposit.

8. WITH HELD AMOUNT IN RUNNING BILLS:

In addition to the initial security, as started above, an amount of 5% of the total value of each bill will be recovered as additional security deposit. The security deposit less any amount due to the Board and 2 ½ % out of the with held amount shall be released in final bill which shall be prepared after the work are completed in all respect and after completion of the maintenance period.

PAYMENTS AND RETENTION:

(a) In respect of pipe laying works and distribution System and for work where water tightness and soundness are not watched for more than 6 months, payments will be made to the contractor under the certificates to be issued at reasonably frequent intervals by the Engineer of a sum equal of 95% of the value of the finished work done by the contractor as so certified and the balance of 5% will be withheld and retained as security for the due fulfillment of the contract. Under the certificate to be issued by the Engineer on the completion of the entire work, the contractor will receive the final payment of all the money due or payable to him under or by virtue of contract except performance security and the retention amount equal to 2½% of the total value of work done provided there is no recovery from or forfeiture by the contractor to be made. The amount withheld from the final bill will be retained under 'Deposits' and paid to the contractor together with Security deposit after six months reckoned from the date of completion of work or as soon after the expiration of such period of six months as all defects shall have been made good according to true intent and meaning hereof whichever shall last happen. In the event the final bill remains unpaid even after the period of six months aforesaid the Engineer shall refund the security deposit and also the withheld amount on a separate bill if requested for by the contractor in writing .No certificate of Engineer shall be considered conclusive evidence as to the sufficiency of any work or materials or correctness of measurements to which it relates nor shall it relieve the contractor from his liability to make good defects as provided by the contract. The contractor when applying for a certificate shall prepare a sufficient detailed bill based on the original figures of quantities and rates in the contract schedule to the satisfaction of the Engineer to enable the Engineer to check the claims and issue the certificate. The certificate as to such of the claims mentioned in the application as are allowed by the Engineer shall be issued within (14) fourteen days of the application. No application for a certificate shall be made within (14) days of previous application. The amount to be withheld in each bill is 5%.

(b) In respect of building works RCC reservoir and other works where water tightness and soundness are to be watched for more than 6 months not withstanding the above clause, the retention amount of 2 ½% from the final bill in respect of contract for original construction or original building works, construction of RCC reservoir work etc. Will be retained by the Engineer and paid to the contractor after a period to 24months of satisfactory performance of the entire civil works, or soon after the expiry of such periods of 24 months as all defects shall

have been made good according to the true intent and the meaning hereof which ever shall be later and on production of an indemnity bond for the above amount for a further period of three years beyond the above said two years to ensure structural stability.

(c) In addition to the withheld amount, 40% of the amount of each bill of the contract shall be deducted and will be retained till the date of receipt of certificate of water tightness from the Executive Engineer, TWAD Board. The whole of the above sum together with any recovery from the payments already made to the contractor as may be assessed by the Executive Engineer shall be forfeited to the TWAD Board if the RCC reservoir develops structural defects or leaks. The above recovery shall be exclusive of the amount deposited towards security deposit. The fact of carrying out water tightness test should be recorded in M.Book. The last part bill should be passed only after above certificate is issued. Further, the certificate of structural soundness is to be issued by the Executive Engineer after 6 months from the date of water tightness certificate for settlement of final bill. However the contractor shall be permitted to execute an in dimity bond in lieu of the recovery of 40% in each bill in prescribed form in stamp paper for a value of Rs.22.50 towards water tightness and structural stability of the reservoir/water retaining structure. The period of guarantee required by the contract shall be two years from the date of completion and handling over (with filling of water up to maximum water level in the case of service reservoir/ OHT). If defects are noticed within the stipulated period of 24months of satisfactory performance, the defects should be rectified by the contractor at his own cost and the performance period again shall be reckoned from the date of completion of the rectification of defects by the contractor. In the case of service reservoir/over head tanks and other water retaining structures during this period, structure under full working head of water/shall show no sign of leakage. The test for water tightness should be arranged to be carried out and completed within 30 days from the date of intimation by the Engineer. The testing of the service reservoir/ OHT and other water retaining structures should be done by the contractor at his own cost inclusive of all necessary equipment water etc complete. The tender shall be solely responsible for the accuracy of the design and the details of the structure. The test for the water tightness of the structure as well as materials of construction used shall be conducted in conformity with the standard specification as per I.S 3370 (part 1) 1965 as amended from time to time and the other specifications as mentioned in the technical specifications schedule.

(d) Income Tax shall be deducted at two (2) percent of the gross amount of each bill or at the ruling rates fixed by the Government of India from time to time.

(e) In the event of the death or insanity or insolvency or imprisonment of the contractor or where the contractor being a partnership firm becomes dissolved or being a corporation goes into liquidation voluntary or otherwise, the contractor may at the option of the Engineer, be terminated by notice in writing posted at the site of the works and all accepted and acceptable works shall forthwith be measured up and paid for at the rates provided in the contract schedule where such apply or otherwise, by the most recent schedule of rate approved by the competent authority to the person or persons entitle to receive and give a discharge for the payment.

9. RECOVERY OF MONEY PAYABLE TO THE TWAD BOARD :

All losses, cost, damages and expenses and other money payable to the Board by the contractor under any stipulation in the contract, may be retained out of any money due or which may subsequently become due from Board to the contractor under any contract or otherwise howsoever and in case such money then due or become due to the contractor by the Board shall be insufficient to pay such losses, cost, damages and other money payable to the TWAD Board by the contractor. It shall be lawful for the Engineer without any further consent on the part of the contractor, to sell or dispose of any or all the Government promissory notes for the securities deposited in the Board by the Contractor as aforesaid and with and out of the proceeds of such sale, after payment of all expenses connected therewith or reimburse and pay to the Board all such losses, cost, damages and expenses and other money payable to the contractor, and in case such proceeds of sale of the said government promissory notes or securities shall be insufficient for such purpose then and in that case it shall be lawful for the Board to recover the residue thereof if necessary by legal proceedings and or by resorting to Revenue Recovery Act against the contractor.

10. FORECLOSURE OF WORKS

After the award of contract, if at any time the Engineer for any reason whatsoever does not require the whole or any parts of the works to be carried out, shall give notice to this effect to the contractor. The contractor shall not have any claim towards compensation or whatsoever, on account of any profit or advantage which he might have derived from the execution of such works.

11. RISK INSURANCE

The contractor may take risk insurance at his cost against loss or damages to the construction against unprecedented floods and other acts of god. The contractor will not be eligible for any payment by the Board on this account.

12. FORFEITURE OF BID SECURITY (EMD)

The Bid Security shall be forfeited on the following grounds.

- In the case of bidder withdrawing or modifying his bid during the period of validity.
- In the case of a successful bidder failing to furnish the prescribed performance security deposit within the stipulated time
- In the case of a successful bidder failing to enter into agreement within the stipulated time
- In the case of bidder severing the conditions after intimation of the acceptance of the bid.

13. FORFEITURE OF PERFORMANCE SECURITY (SECURITY DEPOSIT)

In the case of the contractor, after award of work, failing to carry out the work in accordance with the specifications, and conditions of the contract leading to termination of contract, the Performance security will be forfeited to the Board

14. JURISDICTION OF COURT

In the event of any dispute arising between parties here to in respect of any of the matter comprised in this contract, the same shall be settled by a competent court having jurisdiction over the place where contract is awarded and agreement is concluded and by no other court.

TECHNICAL SPECIFICATIONS.

I. MATERIALS

All materials required for the works shall be procured and supplied by the contractor himself. The materials shall be of good quality and conforming to relevant BIS .The materials which are classified for ISI marking should be supplied with ISI marking only.

II . CIVIL WORKS.

1. General.

1.1. Tamil Nadu Building Practice (TNBP) shall be strictly followed for carrying out different items of the work for which no standard specifications are available and no alternate specification have been given under the description of works.

1.2. Where any provision of the TNBP is repugnant to or at variance with any provision under BIS or description of work, technical specifications and conditions of contract, the provisions of the later shall be deemed to supersede the provision of the TNBP.

2. Earth work.

2.1. Specification.

Tamilnadu Detailed Building Practice (specification No.23 to the extent applicable)shall be followed for earthwork excavation.

2.2. Conveyance.

The excavated earth, blasted rubble etc., shall be conveyed and deposited in the departmental lands within 150m of plant site and as directed by the Engineer in charge.

2.3. Stacking.

Where the location of the work is such and does not permit the deposition of excavated earth while digging trenches for laying pipes, the excavated earth should be conveyed to a convenient place and deposited there temporarily, as directed by the Engineer-in-charge. Such deposited soil shall be reconvened to the site of work for the purpose of refilling of trenches, if it is suitable for refilling. The unit rate for trench work of excavated and refilling shall include the cost of such operation.

2,4. Disposal of surplus Earth.

The excavated soil which is surplus to that required for filling and after allowing for settlement will have to be removed, spread and sectioned at places shown on the site during excavation for purpose of widening or leveling the road. Sectioning is to be done as detailed in TNBP, It is to be understood that no extra payment, will be made for t his and the unit rate for trench

work of excavation and refilling shall made for this and the unit rate for trench work of excavation and refilling shall include the cost removal of surplus earth to disposal site approved by the Engineer in charge, its spreading and sectioning at the bidder's expense.

2.5. Shoring, Strutting and Baling out water.

The rate for excavation of trench work shall include charges of shoring, strutting, bailing out water wherever necessary and no extra payment will be made for any of these contingent works. While baling out water, care should be taken to see that the bailed out water is properly channelised to flow away without stagnation or inundating the adjoining road surfaces and properties.

3. Earth work Excavation (LINEAR MEASUREMENT)

The Bidder should carefully inspect the site to assess the prevalence of different soil classifications and quote the rate for trench excavation for laying pipe line taking into account of all soil classifications that are likely to be encountered and no extra rate will be paid for excavation of trench on account of any variation in the classification of soil met with during actual execution.

III. PIPE LAYING WORKS

1. General

1.1 The earthwork for the pipe laying work shall generally conform to the details given below.

Sl.No.	Dia of Pipe In millimetre	Depth of bottom of pipe below ground level in centimetre	Width of trench at bottom in centimetre
1	PVC Pipe Upto 140	105	60
2	For other Pipes Upto 150	105	75
3	200	110	80
4	250	120	80
5	300	135	80
6	350	145	90
7	400	155	90
8	450	170	100

1.2 Wherever necessary, sand cushioning for the bed shall be given as per IS Standards and as directed by the Engineer in charge. The pipe should be laid true to the alignment line and grade Wherever necessary, appropriate bends should be used. The pipes laid must be jointed properly and carefully by using approved type of jointing materials.

1.3 After the pipes are laid and jointed, the pipelines are to be subjected to hydraulic pressure test as detailed in the relevant BIS Specification for various types as indicated below.

A.C. Pressure pipes .. Clause 2 of IS 6530/1972
Cast iron Pipes .. Clause 6 of lS 3114/1985
PVC Pipes Clause of IS 7634/1975
DI pipes .. As per IS 9523/2000.

In portion of pipeline, where the pipes have developed cracks or sweating, such pipes with jointing materials shall be removed and re laid with new pipes at the contractor's cost and the pipe line shall be re tested to the entire satisfaction of the Engineer in charge. No extra payment will be made on this account. The bidder has to make his own arrangements for the procurement of the required equipments for testing of pipes which shall be subjected to such test as the Engineer-in-charge deems fit to ensure the accuracy of the gauge.

1.4 Refilling shall be done with proper compaction with excavated earth. In no case the contractor shall be allowed to refill the trenches in hard excavated portion to be refilled

by the boulders or excavated stuffs. This portion of trench shall be refilled by the soft strata from excavated struff from distance place at no extra cost. The refilling shall be done in 15 cm thick layers duly watering and compacting each layer. The refilling may be done up to a height of 20 to 30 cm than the natural ground level to allow that sinking afterwards. If the refilling gets sunk below the natural ground level at any time till the completion of the work, the contractor at his cost should make good the refilling to the required level as may be directed by the Engineer in charge.

1.5 In case of pipe trenches, the Engineer may reduce the width of trench wherever a hard strata is met with, if he feels adequate and just sufficient to lay the pipe line in order to reduce the hard rock quantity. In such case the contractor will be paid as per the actual measurement.

1.6 If the work is in a residential area, the contractor should carry out the excavation carefully to avoid collapse of any structure.

1.7 Valves shall be provided with valve pits with proper cover to bear the loads coming on it as per bid documents and departmental drawings and specification Public fountains, Fire hydrants shall be provided as per type design and specification.

1.8 Adequate protective measures should be taken against surge pressure. Zero velocity valves and air cushion valves should be provided at the appropriate places Thrust blocks and anchor blocks should be provided at all bends and appropriate places.

1.9 Water required for testing the pipeline shall be arranged by the contractor at his cost.

4 Pipes, Specials and Valves.

7.1.1. All types of pipes required for the works should be of good quality conforming to relevant BIS and should be procured from reputed manufacturer or his authorized dealer. Each pipe should bear the trade mark of the manufacturer, the nominal diameter, class, weight, batch number and the last two digits of the year of manufacture suitably and legibly marked on it. The Engineer shall have the right to conduct any test to ascertain the quality of the pipes supplied by the contractor. The contractor should make all necessary arrangements for testing the pipes. All the charges and expenses towards the testing shall be borne by the contractor. The materials which are classified for ISI marking should be supplied with ISI marking only.

7.1.2. If on examination of any sample from any portion of the supply, the material is found to be sub standard and not fully in accordance with the relevant specification, the entire consignment shall be rejected. In case of doubt whether the materials confirm to the specification or not, the decision of the Executive Engineer shall be final.

7.2. C.I.Pipes

7.2.1 CI pipes shall be procured from the reputed manufacturer and the pipe shall conform to IS 1536/1976 OR is 1537/1976. The pipes shall bear ISI mark. The test certificate furnished by the manufacturer should be produced.

7.4 PVC pipes

7.4.1. The unplasticised PVC rigid pipes shall strictly conform to IS 4985/1988 and as amended from time to time and shall early ISI marking in every pipe.

7.4.2 The contractor should procure the PVC rigid pipes from a reputed manufacturer

7.4.3. The contractor should furnish the test certificate issued by the manufacturer

7.4.4. The manufacturer's test certificate and third party inspection certificate should be produced by the contractor for the pipes used in the works.

7.4.5 In addition to third party inspection, wherever felt necessary, the Engineer shall have the power to test the PVC pipes for its quality such as specific gravity, impact strength at O'O, the internal;hydraulic pressure test, diameter, thickness etc., in TWAD Board laboratory.

7.4.6 The PVC pipes joints shall be with solvent cement of good quality, conforming to IS 14182/1994.

7.4.7 The Engineer in charge shall verify, in addition to the test certificate, whether the pipes are as per BIS, by visual examination diameter, weight wall thickness, flexibility, colour etc.

7.4.8 All the PVC specials required for use in conjunction with PVC pipes, should be got approved by the Engineer-in- charge

7.5 GI pipes

7.5.1 GI pipes should be procured by the contractor from reputed manufacturer or from their authorised dealer of reputed manufacturer and should conform to IS 1239/part 1, namely the inner and outer diameter, length and weight. The pipes which are found to be not conforming to relevant specification shall be rejected by the Engineer-in-charge.

7.6 C. I D/F pipes.

7.6.1. The CI D/F pipes procured for use in the work should conform to the relevant BIS specification and suitable for use in the work. The ductile Iron Pressure pipes shall conform to the I.S 8329/2000& specials as per IS 9523/2000

7.7. Valves.

7.7.1.The Contractor should procure reputed make of sluice valves. scour, reflux valves and air valves from the manufacturer or his authorised dealer and they should conform to the relevant BIS specification and suitable for use in the work . The valves shall bear ISI marks.

7.8 .CI/PVC/GI / DI Specials and Fittings

7.8.1 The Specials and fittings should be in conformity to the relevant BIS Specification.

7.9. Testing of Pipes

7.9.1. The manufacturer test certificate third party inspection certificate should be produced by the contractor for the pipes used in the work. The engineer shall have the right to test the pipes, wherever felt necessary for its quality. All testing charges should be borne by the contractor.

7.9.2. Testing of materials to be used in works, for the quality of finished items shall generally be done by the contractor at his own cost in the laboratory approved by the Employer by providing requisite materials transport of test specimen and other assistance required thereof.

8.0. Special Condition for Departmental supply of materials:

The Contractor should agree to utilise the available materials in TWAD Divisional Stores, which are required for this work, after ascertaining the quality of materials at the stores itself.

These quantities of materials so issued will be treated as authorised omission in the contract.

It is the responsibility of the Contractor to convey the Departmental materials to the site of work and the cost thereon will be paid as per Departmental rules in force.

IV. PUMPSETS AND ACCESSORIES

1.GENERAL.

1) All the materials used shall conform to the relevant BIS and should be delivered at site of work. The contractor is responsible for safe custody of machinery and other equipments under this contract till handing over to the employer.

2) The rates should include all the minor items of civil works, if any required for installation complete.

3) All necessary civil works for erection of all equipments and accessories offered by the contractor under this contact should be done by the contractor.

4) Test certificates for machinery and equipment should produced along with supply.

5) The bidder should enclose the performance curve duly indicating the duty point for the size of the impeller selected (Family curve should not be furnished.) The performance curve should furnish complete range of operation and the curve should be authenticated by the manufacturer or his authorised dealer. In the event of non compliance the offer shall be summarily rejected.

6) The contractor shall make necessary arrangements to get supply of electricity from TNEB for operating the machinery and equipment. Necessary vouchers in original for the payment made to the EB shall be produced to the employer by the contractor which shall be reimbursed by the employer.

7) Before supply of machinery, equipment and other accessories prior approval of the engineer should be obtained giving the name of makes and other details required.

8) Obtaining approval of electrical layout diagram for the installation of all the equipments (transformers, generators, pumpsets and other accessories) and obtaining safety certificate on completion of work from Chief Electrical Inspector to Government of Tamil Nadu should be arranged and got approved by the contractor at his cost.

9) The contractor should get the layout approval in time before execution and for the size and capacity of the equipment before the supply of the same. After execution of the Safety Certificate if any modification of alteration suggested by the Chief Electrical Inspector on the installation work done by the contractor should be carried out by the contractor at his cost.

10) All the materials should be supplied as per BOQ and should be of standard makes mentioned below:-

SL. No.	DESCRIPTION	MAKE
1	Centrifugal pump	Kirloskar, Jyothi, Best and Crompton Mather and Platt, worthington, Flow More or equivalent
2	Turbine Pumpset	Kirloskar, Jyothi, Best and Crompton Mather and Platt, worthington, Flow More or equivalent
3	Submersible pump and motar	KSB, Calama, Waterman, Atlanta or equivalent.
4	Make of motor	Jyothi NGEF, GEC, Crompton and Greaves, Siemens or equivalent
5	Make of transformer	Kirloskar, GEC indo tech, Hindustan or equivalent
6	Diesel Generator	Kirloskar, GEC of equivalent
7	Starter	L&T, Cutler Hammer, Siemens, MEI or equivalent
8	Switch fuse and circuit breakers	L&T, Cutler Hammer, Siemens, MEI or equivalent
9	Cables	Finolex, Unista, Uniflex or equivalent
10	Valves	Kirloskar, Venus, Upadyaya CALSONS or equivalent

11) The right of choosing the make among the makes offered by the contractors rest with the employer only.

12) The submersible pumps centrifugal pumps, turbine pumps submersible motors, motors for turbine and centrifugal pumpset transformer, generators, Panel Boards to be supplied by the firm will be inspected by the Inspecting Agency fixed by the Employer at the manufactures premises and test certificate will be issued. The contractor should make necessary arrangements for the inspecting staff at his own cost for testing the above pumpsets. Post installation inspection of high duty pumpsets (above 25 HP) should be done by the third party inspection agencies to ensure proper functioning of the scheme at the contractor's cost in consultation with the Superintending Engineer in charge.

All tests necessary to ensure that the plant and machinery or equipment complies with the specification and guarantees shall be carried out at site and at the contractor's cost and such test shall be carried out within one month of the completion of erection. Should the result of these test not done within the margin specified, the tests shall if reported within one month from the date of plant is ready for retest and the contractor shall repay to the Engineer all reasonable expenses to which he may be put by such test.

13 If the complete plant or any portion thereof is found to be defective the Engineer shall give the contractor a notice in writing to verify such defects. If the contractor fails to rectify the defects within the specified period the Engineer will rectify the defects at the contractor's risk and cost

2(a) SUBMERSIBLE PUMP

The pump shall be of latest standard designed to give maximum efficiency when operated under most exacting condition at speed 2880 rpm. The equipment shall confirm to the following specifications as per IS 14220 – 2002.

i) PUMP BOWL

The pump bowl shall be manufactured to offer resistance to corrosion. The bowls may be equipped with replaceable bearing.

The bowl assembly shall bear a name plate giving the following information.

a. Name of the manufacturer or trade mark

b. Serial Number of the pumpset

c. Pump type

d. Number of stages

e. Total head

f. Capacity

g. Speed

ii) IMPELLERS

The impellers shall be open or closed or semi closed type. They shall be turned and accurately finished and balanced on their own pump shaft for maximum lifting capacity without over loading the prime mover irrespective of water level fluctuations. The impeller may be of the enclosed or semi enclosed type and shall be properly balanced. Dynamic balancing is recommended. Enclosed impellers may be equipped with sealing rings on their hubs.

iii) PUMP SHAFT

The pump shaft shall be stainless steel of ample size and stiffness to transmit maximum power without strain or vibration. The pump shaft shall be guided by bearings provided below and above the impeller shaft assembly. The shaft without protecting sleeves shall have a surface finish of 0.75 micron.

iv) BEARING SLEEVE

The bearing sleeve shall be of leaded bronze

v) DISCHARGE CASING

The discharge casing shall be manufactured to offer resistance to corrosion

vi) SUCTION CASING

The suction casing shall be manufactures to offer resistance to corrosion

The opening in the suction case of the entrance shall be of proper size and shape to reduce loss.

The suction case shall be fitted with a strainer made of corrosion resistant materials.

Suitable guard shall be provided just above the suction case bearing to prevent the entry of foreign matter into the suction case.

vii) COUPLING

A suitable coupling arrangements shall be provided in case of directly coupled pumpsets.

viii) NON RETURN VALVE

Non return valve shall be provided above the pump discharge case.

9. CHARACTERISTIC CURVES;

The performance curves for the full range of operation indicating the head in metre, efficiency and BHP absorbed at the pump shaft against the output in litres per minute shall be furnished.

2(b) SUBMERSIBLE MOTORS

i) TYPE

The submersible motor shall be wet type, squirrel cage induction motor suitable for operation on 360/440 Volts. 3 phase 50 Cycles AC supply and capable of developing the required HP at a speed 2880 RPM. The motor windings and the bearing bushes of the rotor shaft shall be lubricated by pure water or oil filled in the motor before erecting the pumpsets. The motor shall confirm to IS 14220 – 2002.

The motor shall be connected by means of cable glands rubber seals etc., from inside of bore well to arrest the entry of sand and other foreign matter.

The motor shall be provided with a breathing attachment like bellows diaphragm etc., to compensate the Volumetric variation due to changes in the temperature. The motor shall be made of corrosion resisting materials or suitable treated materials to resist corrosion under normal condition.

ii) BEARINGS

The thrust bearing shall be of adequate size to withstand the weight of all rotating parts as well as the imposed hydraulic thrust. These shall be lubricated suitably. The thrust bearing housing shall be provided with a drain plug to empty the oil pure water filled into thrust bearing housing rotor.

iii) MOTOR

The motor shaft shall be provided with shaft protective sleeves having a surface finish of 0.75 micron.

iv) EARTHING ARRANGEMENT

The earthing of motor shall comply with IS;3043-1966 Code of practice for earthing provision shall be made for double earth copper connection. Two separate lead should be taken to two separate earth pits located outside the pump house.

V) TEMPERATURE RISE

The insulation should be perfect so as to limit the temperature rise in windings.

vi)OUTPUT

The motor shall be capable of developing the Mechanical output for the required conditions and shall have continuous normal rating to suit the maximum load when operated at the pump speed.

vii) TECHNICAL DATA

The motor HP shall be such that to safety take the load when the total head is reduced by the rise of water level.
The H.P.of the motor offered shall have a Margin above the H.P. absorbed by the pumpset at duty point and also above the maximum BHP absorbed by the pumpsets at duty point and also above the maximum absorbed by the pumpset offered.

ix) OVERLOAD CAPACITY

The motor shall be capable of withstanding the over load specified in the relevant condition of BIS.

x) STARTING

The motor shall give full load torque when taking 1 to 1.5 times full load current. The motor shall have a name plate giving the following information.

a. Induction motor
b. Name of manufacturer.
c. Manufacturers number & frame reference
d. Type of enclosure
e. B.H.P.
f. Rated voltage and winding connections.
g. Rated output in K.W.
h. Number of phases
i. Frequency in HZ
j. Current approximate in amperes at rates output
k. Speed in revolutions per minute at rates output

STARTERS

The Starters shall suitable for the Motor offered. This should have single phasing preventer, mounted on Ammeter, suitable capacity fuses etc., with all the standard safety devices such as no volt coil, over load releases with time lag arrangements dry running preventer suitable inter locking devices, cable entries , name plates and earthing facilities etc.,

NOTE: (a) DOL Starters are suggested upto 10 HP
(b) Air break fully automatic star delta starters are suggested for above 10HP up to 50HP except submersible pumpsets for which fully automatic ATS starters are suggested.
(c) Air break soft starters are suggested for 50HP and above.
(d) While selecting starters, the contact rating is the criteria and not the motor rating.

SWITCH BOARD

The switch board shall complete with all necessary internal connections and accessories as mentioned in the BOQ and as per latest IE Rules and CEIG regulations. This switch Board should contain all equipments house in cubiele, the bus bars should have ample current carrying capacity for connected load and painted with powder coated painting.

CABLES

The cables shall be supplied as mentioned in BOQ with ISI mark, Laying and jointing of cables shall be as per IE Rules. The cable should have current carrying capacity to withstand over load due to low voltage drop. Cable jointing should be done in such manner that there is adequate bondage strength and safety to equipments and operators.

EARTHING

Twin copper earthing of the plant and equipments shall be done as per IS 3043/1966 and IE Rules 1996 and amended from time to time. Two separate lead should be taken to two separate earth pits located outside the pumphouse.

PUMPHOUSE, WIRING AND LIGHTING

Pumphouse wiring and lighting shall be carried out, as per IE Rules with sufficient no of light points, lamps and other accessories (to be supplied by the contractor) as prescribed in the BOQ and shall be of standard make.

LAYING AND JOINTING

The items of laying and jointing of pipes, specials and valves should include the necessary clamps, supports, trenches, wherever necessary. Supporting studs, bolts, nuts, washers, necessary jointing materials together with spare bolts and nuts and jointing materials shall also be supplied free of cost.

ERECTION AND TESTING

The contractor shall provide a skilled Engineer and skilled labour for the entire execution of the work and final testing of the plants at sites.

All erection tools including spanners, die sets, etc., shall be supplied by the contractor and the contractors representatives shall have full and uninterrupted access to the site during erection.

The employer may be depute any officer under his control to visit the work at any time during the stage of erection for inspection. The plant shall be tested by employer. Post/ delivery inspection by the third party inspection agency in the presence of the firm's engineer or any other representative to ensure performance and all testing equipments as may be reasonably required shall be provided by the contractor.

Installation testing and commissioning should be in accordance with relevant ISS. The pre delivery inspection certificate for the pumpsets, panel board and other equipments and TNEB. Test certificate for transformer to be obtained by the bidder.

SPARE PARTS

Supply of spares and Tools shall be made as per the list prescribed in BOQ with index card.

TOOLS

Standard tools for the maintenance of the equipments shall be supplied as detailed.

D/E Spanners	1 set
Ring spanners	1 set
Bearing puller	1 No.
Grease gun	1 No
Hand Gloves tested for Electrical operation	1 pair
Ball Peen hammer	1 No
Screw drivers	1 set
Electrical tester	1 No
Electric megger	1 No

COMPLETION PLANS

The successful bidder shall be requested to furnish completion plans in triplicate within one month from the date of the first testing of the plants. The plan should show the entire layout of the plant executed. Two copies of plan should be supplied to the Employer and one to be framed and suspended in the head works. The contractor shall in addition to the above furnish detailed specifications of the equipment provided to the Employer. With all technical date.

MAINTENANCE MANUAL:

The periodical maintenance schedules for each equipment shall be given with reference to the hours of operation. Detailed information about the spare parts (part name, identification number etc.,) should be given. The copies of the manuals should be furnished within one month from the date of commissioning.

V. REFERENCE TO SPECIFICATIONS/CODE OF PRACTICE

Ordinary Portland Cement (33 Grade)	269-1976
43 Grade Ordinary Portland Cement	8112-1989
Pozzolona Portland Cement	1489-1991
Hydrophobic Portland Cement	8043-1978
Rapid Hardening portland Cement	8041-1990
Low Heat Portland Cement	12600-1989
Standard sand for testing of cement	650-1966
Methods of Test for Pozzolonic Materials	1727-1967
Methods of sampling and test for water & waste water (Physical & chemical)	3025-1984 (Part 1 to 37)
Methods of Sampling hydraulic Cement	3535-1986
Methods of Physical tests for hydraulic Cement	4031-1988 (1 to 14)
Methods of Chemical analysis of hydraulic cement	4032-1985
Aggregates coarse & Fine from Natural resources For concrete.	383-1970 4082/1977
Sand for Masonry Mortar	2116-1965 1542/1977
Methods of tests for aggregates for concrete	2386-1963 (Part 1 to 8)
Part 1-Particle size and shape	2386-1963 (Part-1)
Part II-Estimation of deleterious Materials & Organic impurities	2386-1963 (Part III)
Soundness	2386-1963 (Part-III)
Methods for sampling of aggregates for concrete	2430-1986
Specifications for test sieves Wire cloth test Sieves	460-1978 (Part – I)
Common Burnt clay building bricks	1077-1976
Mild Steel and Medium tensile steel bars and hard Drawn steel wire, concrete reinforcement, Part-I-Mild Steel & Medium tensile steel Bars Part-II-Hard drawn steel wire	432-1982
High Strength deformed steel bars and wires for Concrete reinforcement	1786-1985
High Tensile Steel for PSC Pipes	1784-1986 (Part-I)
Bending and flexing of bars for concrete reinforcement	2502 – 1969
Recommendations for detailing of reinforcement in reinforced concrete works	5525-1969
Method for tensile testing of steel wire	1521-1972
Method of test for determining modulus of elasticity	2854-1964
Glossary of terms relating to cement concrete	6461-1972 (Part 1 to 12)

Methods of test for strength of concrete	516-1959
Methods of sampling and analysis of concrete	1990-1959
Methods of testing bond in reinforced concrete Pull out test	2770-1967
Methods of test for permeability of cement Mortar and concrete	3085-1965
Methods of test for splitting tensile strength Of concrete cylinders	5816-1970
Methods of tests for determining setting time of Concrete by penetration resistance	8142-1976
Code of practice for construction of	2911 (Part I)
Pile foundations (concrete piles)	Sec-1-1979
Driven cast-in-situ concrete piles	Sec-2-1979
Bored cast –in-situ piles	Sec-3-1979
Driven pre-cast concrete piles	Sec-4-1984
Bored pre-cast concrete piles	
Code of practice for construction of raft foundati	2950-1981
Design Aids for reinforced concrete	SP 16-1980
Explanatory Hand Book on Codes for earth w Engineering	SP 22-1982
Explanatory Hand Book on IS Code 456-19	SP24-1983
Hand Book on causes and prevention of cracks in buildings	SP 25-1984
Hand Book on concrete reinforcement & detailing	SP 34-1987
Brick Masonry	2212-1962
Construction of Stone Masonry	1957-1967
Asbestos cement pressure pipes	1592-1989
Concrete pipes with and without reinforcement	458-1988
P.S.C Pipes (including fittings)	784-1978
Methods of tests for concrete pipes	458-1988 3597-1985
Materials for M.S. Specials	22-1976 &
Specifications for M.S. Specials for P.S.C. Pipes.	2062-1980
Specifications for Steel cylinders reinforced Concrete pipes.	1916-1989
Methods of tests of concrete pipes	3597-1985
Specials for steel cylinders reinforced concrete pipes	3597-1985
Cast iron specials for asbestos cement pressure Pipes for water, gas & sewage	5531-1988
Methods of test for asbestos cement products	5913-1989
Dimensional requirement for rubber sealing rings For CID joints in asbestos cement pipes	10292-1988
Centrifugally Cast (Spun)Iron pressure pipes for Water, gas and sewage Including fittings.	1536-1989
Specifications for Centrifugally Cast (Spun)D.I. pipes for Water, Gas and Sewage.	8329-1990
D.I.Fittings for pipes for water,gas & sewerage	9523-1980
Dimensional requirements of rubber gaskets for	12820-1986

Mechanical joints and push on joints for the use With C.I.D.I.Pipes.	
C.I.Specials for Mechanical and push on flexible joints for pressure pipe lines for water, gas &sewage	13382-1992
Horizontally cast iron double flanged pipes for water. Gas and sewage	7181-1986
Cast iron fittings for pressure pipes for water, gas And sewage	1538-1976 (Part 1 to 24)
Cast iron detachable joints for use with Asbestos Cement pressure pipes	8794-1988
Rubber rings for jointing C.I.Pipes, R.C.C.Pipes & AC Pipes.	5382-1969
Rubber rings for jointing P.S.C.Pipes	5382-1985
Rubber rings for jointing AC Pipes with AC couplings	10292-1985
Pig Lead (caulking lead)	782-1978
Hemp yarn	6587-1966
Rubber Insertion to be used in jointing CIDF pipes	638-1979
Bolts & Nuts to be used in jointing CIDF Pipes	1363-1967
Unplasticized PVC Pipes for potable water supplies	4985-1988
Injection moulded PVC socket fittings with Solvent cement joints for water supplies.	7834-1987 (Part 1 to 8)
Fabricated PVC fittings for potable water supplies	10124-1988 (Part 1 to 13)
Methods of test for unplasticized PVC pipes for potable water supplies	12235-1986 (Part 1 to 11)
Sluice valves for water works purposes (50 to 300 mm Dia size)	780-1984
Sluice valves for water works purposes (300 to 1200 ;mm Dia size)	2906-1984
Surface boxes for sluice valves	3950-1979
Manhole covers for sluice valves	1726-1974
Laying of Asbestos Cement Pressures Pipes	6530-1972
Laying of Concrete pipes	783-1985
Laying of Cast-Iron Pipes	3114-1985
Laying of PSC Pipes	126 of APSS & 783-1985
Laying of DI Pipes	12288-1987
Laying and jointing of unplasticized PVC Pipes	7634-1975 (Part 3)
Batch type concrete mixer	1791-1968
Sheep foot roller	4616-1968
Safety code for excavation works	3764-1966
Safety code for scaffolds and ladders	
Part-I Scaffolds	3696-1966 (Part I)
Part II-Ladders	3696-1966 (Part- II)

Safety code for piling and other deep foundations	5121-1969
Safety code for working with construction machinery	7293-1974
Tamil Nadu Building Practice	Volume-I Volume-II
Government of India Manual on Water Supply and Treatment	May 1999 (Revised)
Gravel for packing	4091-1967
Hard drawn Steel Wire	1785-1983 (Part I and II)
Structural Steel	226-1975
Hard rolled mils steel for concrete	1139-1966
Hard drawn Steel Wire	1566-1982
American Society for Testing of Materials	1566-1982
British Standard	2494-1955 Part I
Welding Electrodes	814-1970
Steel Sheets	225-1975
Guinitting	7322-1994
Welded Joints	3589-1966 and 2041-1962
Tensile Test	223-1950
Mechanical and Electrical Works	
Turbine Pump	1710-1972
Submersible Pump	8030-1976
Submersible Motor	9283-1979
Earthing	3043-1966
Transformer	1180-1964
Generator	22 53-4722