

Tamil Nadu Water Supply And Drainage Board

MAINTENANCE DIVISION ,TIRUNELVELI



TENDER DOCUMENT

**NAME OF : Replacement of Existing 90HP Vertical Turbine pumpset
WORK in Pathamadaai Headworks Due to less efficiency of the
Existing VT Pump of CWSS to Nanguneri-Thisayanvilai
Town Panchayats and 297 habitations of Tirunelveli
District under JJM/TWAD funds.**

Last date of submission: Up to 3.00pm on 07.06.2022

Total No of sheets: Sheets

CONTRACTOR

Sd/-EXECUTIVE ENGINEER (TWAD)

1	Tender Notice No.	Tender Notice NO. F. Efficiency of P'sets/JDO/2022/DT.20.05.2022
2	Name of work	Replacement of Existing 90HP Vertical Turbine pumpset in Pathamadai Headworks Due to less efficiency of the Existing VT Pump of CWSS to Nanguneri-Thisayanvilai Town Panchayats and 297 habitations of Tirunelveli District under JJM/TWAD funds.
3	Eligible class of contractor	Class III and above Contractors Registered in TWAD Board
4	Validity of tender	90 days from the date of opening of tender
5	Cost of Tender Schedule	Rs. 1180/- (Rs.1000 + GST)
6	Earnest Money Deposit	Rs.16,000/-
7	Details of remittance of cost of tender schedule, Furnish whether by cash or demand draft receipt No. and date	
8	To whom issued	Issued to Thiru

CONTRACTOR

Sd/-EXECUTIVE ENGINEER (TWAD)



**TAMIL NADU WATER SUPPLY AND DRAINAGE BOARD
FORM OF CONTRACT: PERCENTAGE TENDER SYSTEM**

TENDER CALL NO. / F. Efficiency of psets /JDO/2022/DT.20.05.2022

For and on behalf of Tamil Nadu Water Supply and Drainage Board, sealed Tenders on LS contract "Percentage Tender System" are invited by the Executive Engineer, TWAD Board, Maintenance Division, Integrated office complex, Seevalaperi Road, Shanthinagar, Tirunelveli - 627002 for the following work at the date and time noted below. Tenders will be opened in the presence of the tenderers or their authorized representative who choose at the time of opening of tender.

SI No	Details of Work	Value of Tender (Rs. In lakh)	Eligible Class	Period of sale & contact person	Bid Security (Rs.)EMD	Cost of Tender Document (Rs.)
1.	REPLACEMENT OF EXISTING 90 HP VERTICAL TURBINE PUMP IN PATHAMADAI HEADWORKS DUE TO LESS EFFICIENCY OF THE EXISTING VT PUMP OF CWSS TO NANGUNERI-THISAYANVILAI TOWN PANCHAYATS AND 297 HABITATIONS IN TIRUNELVELI DISTRICT UNDER JJM/TWAD FUNDS.	15.61	Class – III & above.	From 23.05.2022 to 06.06.2022 Executive Engineer, TWAD Board, Maintenance Division Tirunelveli	16000/-	1000+ GST (Rs.1180/-)

General details:

1. Tender inviting Authority: Executive Engineer, TWAD Board, Maintenance Division, Tirunelveli
2. Last date for submission of Tender on **07.06.2022 up to 3.00 P.M**
3. The tender will be opened at 3.30 PM on **07.06.2022**
4. The Amount of EMD should be in the approved form prescribed in the tender document in favour of the Executive Engineer Concerned.
5. Contractors those who had executed the similar nature of work for the value **mentioned against the Work** only eligible to tender for this work. Contractors registered in other Departments and Undertakings of the Central or State Government who have executed similar nature of works of the same or higher magnitude are also eligible to tender for this work.
6. Tender documents in English may be purchased by interested tenderers on submission of written application either by remitting cash or accompanied with a separate Demand Draft for the said work from any Nationalized /Scheduled bank drawn in favour of the concerned Executive Engineer for each work.
7. The eligibility criteria and other terms and conditions as per bid document will be followed strictly. The undersigned reserves the right to reject any or all the bids without assigning any reasons there for.
8. Further details about the work can be had from the office of the Executive Engineer, TWAD Board, Maintenance Division, Tirunelveli for the work.

The bid documents can be freely downloaded from the website www.tenders.tn.gov.in

Please visit the website www.tenders.tn.gov.in for further details

Sd/- A.Mohamed Ali Jinnah.,20.05.2022
Executive Engineer, TWAD Board,
Maintenance Division,Tirunelveli

To
All Registered contractors
Copy submitted to the Chief Engineer, TWAD Board, Madurai
Copy submitted to the Superintending Engineer TWAD Board T.T.K Circle, Tirunelveli
Copy to the District Collector, Tirunelveli
Copy to all the Executive Engineers of T.T,K Circle for publicity
Copy to all Assistant Executive Engineers of this Division
Copy to EE's table

CONTRACTOR

Sd/-EXECUTIVE ENGINEER (TWAD)

LETTER OF CONSENT

I agree to abide by all the detailed specifications, terms and conditions stipulated in the TWAD Board Manual for Rural Water Supply Schemes – which I have read and understood.

Certificate

I/We do hereby certify to the effect that no correction/alteration on the bid document as found in the web site was made by me/ we and I/we shall abide by all the terms, conditions and specification contained in the bid document.

Signature of Contractor

CONTRACTOR

Sd/-EXECUTIVE ENGINEER (TWAD)

TAMILNADU WATER SUPPLY AND DRAINAGE BOARD

LETTER OF TENDER

Date :

To
The Executive Engineer,
TWAD Board,
Maintenance Division,
Tirunelveli – 627 002.

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 Tirunelveli With such variations by way of alterations or additions to and omission 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.

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 Tamilnadu 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 the work required to be done and in regard to the materials required to be furnished 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 Sales Tax Clearance Certificate.

5. ** a. I/We enclose the sum of

CONTRACTOR

Sd/-EXECUTIVE ENGINEER (TWAD)

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 form 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 hereunder shall be sufficient service on me/us if delivered to 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 to 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 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 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

CONTRACTOR

Sd/-EXECUTIVE ENGINEER (TWAD)

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 addition 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 time 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 clause 55 of 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 authorised by the TWAD Board.
- 13 I am / we are professionally qualified and my/our qualifications are 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
1			
2			
3			

- 14 I / We agree in the event of any dispute arising between the parties hereto 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 the contracts 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.

Signature of the Tenderer

INSTRUCTIONS TO BIDDERS

A. General

This is a “Turnkey Contract” and the contractor is responsible for the execution of the water supply and sewerage works including the supply and installation of all materials, machineries, equipments etc in accordance with the specifications stipulated in the Bid Document and in conformity with the Quality Parameters laid down in the relevant BIS, TNBP, Bid Documents etc and completing the entire works in all respects satisfactorily and commissioning within the stipulated period and maintaining the scheme for the specified period

1. Description of works

Replacement of Existing 90HP Vertical Turbine pumpset in Pathamadai Headworks Due to less efficiency of the Existing VT Pump of CWSS to Nanguneri-Thisayanvilai Town Panchayats and 297 habitations of Tirunelveli District under JJM/TWAD funds.. The tender is required to examine

carefully all instructions, conditions, forms terms, specifications and drawing 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 bid will be at tenderers own risk. Tenders which are not responsive to the requirements of the tender documents are liable to be rejected.

2. 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.

3. 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 award

4. The bids from the contractors / firms shall be accompanied by an attested copy of the valid Income Tax Clearance Certificate and latest Sales Tax verification Certificate. If the firm/Contractor is not liable to the Sales Tax Department, the firm/Contractor should produce a valid certificate issued by the competent authority to this effect

5. 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 responsible to the requirements of the bidding documents are liable to be rejected.

6. 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 the communication thereof to the Employer.

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

7. Language of Bid

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

8. Document comprising the Bid

The bid to be prepared 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 thereof, 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 embodied in these bidding documents. The forms, Bill of quantities and Schedules shall be used without exception subject to extension of the Schedules in the same format.

9. 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.

10. 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 thereto 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 nor 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.

11. Bid Security (Earnest Money Deposit)

The bidder shall furnish as part of his bid, the Bid Security(Earnest Money Deposit) of Rs.16,000/- (**Rupees Sixteen thousand only**) in any one of the following forms duly pledged or drawn in favour of the Executive Engineer, TWAD Board, Maintenance Division, Tirunelveli.

1. Demand draft drawn in a Nationalised Bank in favour of the Executive Engineer concerned.
2. Deposits at call receipt of scheduled banks pledged in favour of the Executive Engineer concerned.
3. Government Security and National Savings Certificate pledged in favour of the Executive Engineer concerned (purchased within the state of Tamilnadu)
4. Post office savings Bank Deposits pledged in favour of the Executive Engineer concerned (purchased within the State of Tamilnadu).
5. Fixed deposit receipts from scheduled bank pledged in favour of the Executive Engineer concerned.

Any bid not accompanied by an acceptable form of Bid Security will be rejected by the Engineers as non responsive.

The Bid Security of unsuccessful bidders will be returned without any interest within 15 days after a decision is taken on the tender.

12. 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 or 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.

13. Deadline for submission of Bids

The tender shall be received by the Executive Engineer TWAD Board Maintenance Division Integrated Office , Building Complex Seevalaperi Road, Shanthi Nagar, Tirunelveli at his office at not later than 3 p.m. **on 07.06.2022** 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.

14. Mode of submission of Bid Documents

The Bid Documents are to be dropped in the Tender Box or sent by registered mail in the following address before the expiry of the deadline fixed for submission of bid documents.

The Executive Engineer, TWAD Board, Maintenance Division, Integrated Office , Building Complex Seevalaperi Road, Shanthi Nagar, Tirunelveli. Under no circumstance shall be responsible for the delay or loss or damage to the Bid Documents in transit.

15. 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.

16. Bid Opening

The tender will be opened by the Executive Engineer at 3.30 p.m. on **07.06.2022** in the premises of the office of the Executive Engineer, TWAD Board, Maintenance Division, Integrated Office , Building Complex Seevalaperi Road, Shanthi Nagar, Tirunelveli .The bidders or their authorised representative desirous of attending opening of the bids may do so with proper authorisation to represent.

The Executive Engineer will examine the bids to determine whether the documents 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 Executive 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.

Classification of Bids

For any clarifications in the bid and for negotiations the bidder shall attend the office of the Executive Engineer, TWAD Board, Maintenance Division, Tirunelveli whenever he is called upon to do so.

17. 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 with drawal of the non-conforming deviation or reservation. However, the decision of the employer shall be final and binding in all these matters.

18. 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.

19. 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 therefor. 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.

20. Notification of Award

The Executive 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 and 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.

21. Performance Security (Security Deposit) and Agreement

The successful bidder on getting the work order from the Executive Engineer shall remit the Performance Security at 2% of the value of contract in the form of NSC/Post Office savings Deposit A/C. pledged in favour of the Executive Engineer, TWAD Board, Maintenance Division, Tirunelveli 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 /- 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 minus 5 % & upto minus 15 % of Department Value, the successful tenderer should remit 4 % of the Contract Value as security deposit.

For tenders received with more than minus 15 % of Department Value, the successful tenderer should remit 5 % of the Contract Value as security deposit (BP MS No 3/ COM Wing / Dated 28.01.2015)

22. 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 15 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.

PRICE BID

1. Bill of quantities shall be read in conjunction with the instructions to bidders and Detailed Standard Specifications and 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 insofar 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 – B

LIST OF DRAWINGS

Name of work: **Replacement of Existing 90HP Vertical Turbine pumpset in Pathamadaai Headworks Due to less efficiency of the Existing VT Pump of CWSS to Nanguneri-Thisayanvilai Town Panchayats and 297 habitations of Tirunelveli District under JJM/TWAD funds.**

Sl. No.	Drawing No.	Description

NOTE:

All drawings to be signed by the contractors as well as by Officers entering into contract.

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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 handing over of site :

The entire project must be completed in all } : Two Months
respects within

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

Sl. No	Quantity	Name of Component	Period from commencement	completion in term of %
1		All works as per Schedule	2 months	100%

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Sd/-EXECUTIVE ENGINEER (TWAD)

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 materials is not covered by BIS they should conform 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 in charge shall have the right to order the removal of such materials which in his opinion are substandard stipulating a time 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:

Sl. No.	Value of contract	Scale & minimum qualification prescribed for the employment of technical staff	Rate of penalty
1	Above Rs.1.00 Lakh & upto Rs.5.00 lakhs	One LCE/DCE/LSE or retired JE/LSE (Civil) of TWAD or other Engineering Department	Rs.2000/- per month
2	Above Rs.5.00 Lakhs & upto Rs.10.00 Lakhs	One B.E. (Civil) or equivalent engineering degree holder with atleast one year experience or retired AEE of TWAD or other Engg.Department	Rs.4000/- per month
3	Above Rs.10.00 Lakhs and upto Rs.25.00 Lakhs	One B.E. (Civil) or equivalent engineering degree holder with atleast three years experience or retired AEE of TWAD or other Engg.Department in addition to one LCE/DCE/LSE holder	Rs.6000/- per month (Degree holder) + Rs.2000 per month (Diploma holder)
4	Above Rs.25.00 Lakhs	One B.E. (Civil) or equivalent engineering degree holder with atleast three years experience or retired AEE of TWAD or other Engg.Department in addition to one LCE/DCE/LSE holder	Rs.6000/- per month (Degree holder) + Rs.4000 per month (Rs.2000 per month for Diploma holder)

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.

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

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Sd/-EXECUTIVE ENGINEER (TWAD)

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
1			TECH.ASST. 3 YEARS EXPERIENCE
2			
3			

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Sd/-EXECUTIVE ENGINEER (TWAD)

SCHEDULE – F

PAYMENT SCHEDULE

Payment shall be made in stage for each component as envisaged hereunder

1.	For pump sets (up to 25 HP)	
	After receipt of material at site	upto 75%
	After erection ,	15%
	After commissioning	5%
	After completion of Maintenance period	5%
2.	For pump sets (above 25 HP)	
	After receipt of material at site	upto 75%
	After erection , commission and post installation	
	Inspection by Third Party Agency	20%
	After completion of Maintenance period	5%
3.	Infiltration Well	
	After casting curb	Upto 15%
	After sinking of well upto 50% of the required depth	Upto 50%
	After Completion of entire works	Upto 95%
	After Completion of the maintenance period of the scheme as a whole.	Balance 5%
4.	Open well	
	(Applicable only if the diameter of the well is atleast 5 metres)	
	After completion upto average G.L.	Upto 50%
	After completion of the entire works	Upto 95%
	After completion of the maintenance period of the scheme as a whole	Balance 5%
5.	Pumping Main	
	After supplying, laying, jointing and testing of pipe line for every one KM and part thereof or entire length whichever is less	Upto 70% of the value of work done
	After satisfactory commissioning of the entire length of main.	Upto 95%
	After completion of the maintenance period of the scheme as a whole	Balance 5%
6.	Sump	
	After completion upto floor slab	Upto 35%
	After completion upto roof slab	Upto 70%
	After completion of the entire work including pipe connections etc.	Upto 95%
	After completion of the maintenance period of the scheme as a whole	Balance 5%
7.	Service Reservoir	
	After completion of work upto average G.L.	Upto 25%
	After completion floor slab	Upto 75%
	After completion of the entire works including pipe connection etc. and issued of water tightness certificate by the Engineer in charge	} Upto 95%
	After completion of the maintenance period of the scheme as a whole+	
		Balance 5%

8. Distribution System.

After supplying, laying, jointing and testing of pipe line for every one KM and part thereof or entire length whichever is less	Upto 70% of the value of work done
After satisfactory commissioning of the entire length of main	
After completion of the maintenance period of the scheme as a whole	Balance 5%

9. Valve pits and Public Fountains.

After completion of the entire work	Upto 95%
After completion of the maintenance period of the scheme as a whole	Balance 5%

10. Pumping Plant

After receipt of Pump, motor, valves, cable, control Panel Transformer at site	Upto 75%
After erection of pump, motor and accessories	Upto 85%
After commissioning of the Pumping Plant & testing	Upto 95%
After completion of the maintenance period of the scheme as a whole	Balance 5%

9. Pumproom

After completion upto plinth level	Upto 35%
After completion upto roof slab	Upto 70%
After completion of the entire work	Upto 95%
After completion of the maintenance period of the scheme as a whole	Balance 5%

10. Other items of work

On completion of entire job	Upto 95%
After completion of the maintenance period of the scheme as a whole	Balance 5%

1. 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 E.B.

2. Maintenance charges

After satisfactory maintenance of the Project 50% of the stipulated period	40%
After satisfactory maintenance of the Project for the entire stipulated period	60%

Note:**Maintenance of the Scheme**

The period of maintenance for scheme are as follows:

- | | | |
|-----|-------------------------------|---|
| (i) | Individual Power Pump Schemes | One month, from the date of commissioning |
|-----|-------------------------------|---|

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(ii)	CWSS Schemes upto a value of Rs.25.00 Lakhs	2 Months from the date of commissioning
(iii)	CWSS Schemes of value more than Rs.25 Lakhs & upto Rs.50 Lakhs	3 months from the date of commissioning

During the maintenance period if any defect either or material or work is noticed, the same should be attended to free of cost by the contractor. 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 bear the Electricity charges. 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
- ❖ No Payment shall be made for the supply of Materials except.....Unit work

Deduction from Bills:

- ❖ 5% of the value of every running bill shall be retained by the TWAD Board as additional performance security (WHA)
- ❖ Deduction of income tax shall be made at the prevailing rates as may be specified by the Income tax department from the bills from time to time.
- ❖ Deduction at source towards GST at 12% (CGST at 6% + SGST at 6%).As per Notification No 31/2017 Central tax (Rate) Dated 13th October 2017.

SPECIAL CONDITIONS OF CONTRACT

1. Royalty Charges

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

2. Earthwork Excavation

The bidder should carefully inspect the site to access the prevalence of differing soil classifications and quote his rate for trench excavations that are likely to be encountered 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 uncommenced 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 of the work with reference to the programme schedule stipulated. The Executive Engineer 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 personal service to the firm/Contractor for rectification of the defective construction/slippage in the programme schedule giving 15 days time for furnishing the reasons therefor by the firm/contractor. In cases where the reasons adduced by the firm/contractor 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 handing 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 for furnishing the reply by them. On expiry of 15 days time, from the date of first notice, the second notice shall be served allowing 7 days time to the firm/contract for furnishing the reply by them. On expiry of 7 days 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

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firm/contractor. Similarly the non receipt of any reply from the firm/contractor shall attract imposition of the liquidated damages clause automatically and in this 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 work 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 instruction 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 incharge 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 carryout 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 carryout at his cost in every respect all the work that may be necessary for rectifying and setting right the defect specified therein 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 reglecting to carry out the rectification work within the period prescribed therefor, 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 anyother work whatsoever or from the amount of security deposit

8. With held amount in Running Bills

In addition to the initial security, 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 2½% out of the with held amount shall be released in final bill which shall be prepared after the works are completed in all respect and after completion of the maintenance period.

PAYMENTS AND RETENTION:

- (a) In respect of pipe laying works 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 to 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 fulfilment of the contract. Under the certificate to be issued by the Engineer on the

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completion of 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) fourteen days of a 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 notwithstanding the above clause, the retention amount of 2½ % 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 of 24 months 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 indemnity 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 handing over (with filling of water upto maximum water level in the case of service reservoir/OHT). If defects are noticed within the stipulated period of 24 months 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 tenderer shall be solely responsible for the accuracy of the design and the details of the structure. The test for 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 I) 1965 as amended from time to time and the other specification 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 person entitled to receive and give a discharge for the payment.

9. Recovery of money payable to the TWAD Board

All losses, costs, 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 the Board to the contractor under any contract otherwise howsoever and in case such money then due or to become due to the contractor by the Board shall be insufficient to pay such losses, costs, 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. Income Tax

During the course of the 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

11. GST

From every payment made to the firm/contractor, deduction at source towards GST shall be made for civil works contract subject to issue of amendments from time to time.

12. Excise duty

Deleted

13. 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 part 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.

14. 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

15. 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 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.

16. Forfeiture of performance security (Security Deposit)

In the case of the contractor, after award of work, failing to carryout the work in accordance with the specifications, terms and conditions of the contract leading to termination of contract, the Performance Security will be forfeited to the Board.

16.1 GST: From every payment made to the firm/contractor, deduction at source towards GST shall be made for works contract subject to issue of amendments from time to time.

17. Jurisdiction of Court

In the event of any dispute arising between parties hereto 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

18. Programme Schedule/Rate of Progress/ Milestone

- 18.1 The Contractor, within seven days from the date of signing of the agreement, shall submit to the Engineer for approval a Programme showing the general methods, arrangements, order, and timing for all the activities in the works.
- 18.2 An update of the Programme shall be a Programme showing the actual progress achieved on each activity and the progress to be achieved on the remaining work including any changes to the sequence of activities. The Contractor shall submit to the Engineer in charge, for approval, an updated Programme. The Employer reserves the right to approve or reject the updated programme without prejudice to levying of penalty for slow progress

19. Penalty for Defective Construction

- 19.1 If any defect is noticed by the Employer in the construction of any portion of work/ component, the Employer shall levy penalty upto 10% of the total value of the defective work as assessed by the Engineer in charge in addition to the rectification of works at his cost.

20. Penalty for Slow Progress

- 20.1 Provided the firm/ contractor fails to maintain the required rate of progress/ mile stones stipulated for the project as a whole or in any of the component or in the case of works not commenced, the engineer in charge shall have the right to impose penalty of such an amount as he may deem fit for every day of

delay caused in the progress of the project as a whole or in part as well as for the portion of the work remaining not commenced, subject to the condition that the total penalty imposed shall not exceed 5% of the total contract value. The penalty levied on the firm/ contractor is however subject to modification at the discretion of the Chief Engineer for valid reasons which are to be recorded.

21. Procedure for Levying of Penalty

21.1 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 of the work with reference to the programme schedule stipulated.

The Executive Engineer, on identification of any defective construction or any slippage in the programme schedule in any of the component, shall issue a show cause notice either by RPAD or through personal service to the firm/ contractor, giving 15 days time for furnishing the reasons therefore by the firm/ contractor. In cases, where the reason adduced by the firm/ contractor are not convincing, the penalty contemplated in the agreement conditions shall be invoked.

21.2 Provided the firm/ contractor fails to complete the work as a whole or part thereof within the stipulated period, the firm/ contractor shall be liable to pay liquidated damages at 0.10% of the value of the unfinished works per week of delay till the completion of the work in full in all respects and handing over to the department. The amount recoverable towards liquidated damages shall however be restricted to 5% of the total contract value. The imposition of the liquidated damages clause will be without prejudice to the rights of the Employer to terminate the contract as time barred.

21.3 For imposing liquidated damages, detailed show cause notice shall be served on the defaulting firm/ contractor either by RPAD or through personal service. The first notice shall be served allowing 15 days time to the firm/ contractor for furnishing the reply by them. In the of non receipt of reply on expiry of 15 days time from the date of first notice, the second notice shall be served allowing 7 days of time to the firm/ contractor for furnishing the reply by them. Again in case of non receipt of reply on expiry of 7 days time from the date of second notice, the third notice shall be served allowing 3 days of 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 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 imposing the liquidated damages clause automatically and in this case also, the liquidated damages shall be imposed by issuing an explicit speaking order to the firm/ contractor.

22. Foreclosure of Works

22.1 The Employer shall have the right to issue notice to the firm/ contractor, for any reason whatsoever does not require the whole or part of the works to be carried out after the award of the contract. 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. For the works executed which could not be utilised in view of the foreclosure, the firm/ contractor shall be paid an eligible amount as certified by the Engineer in charge.

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.

1. Cement and Steel

1.1. The entire quantity of cement and steel required for the work will be procured by the contractor. The contractor is responsible for all transport and storage of the materials and shall bear all related cost. The Employer shall be entitled at any reasonable time to examine the cement and steel supplied by the contractor.

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1.2. The cement procured by the contractor shall comply with requirements of IS 269/1976 with the latest revision thereof for ordinary portland cement. It shall be of the best normal setting quality unless specially rapid hardening or quick setting quality if expressly instructed by the Engineer to be supplied. Each bag shall bear ISI Certification mark and as per specification no. 10 of TNBP Volume I.

1.3 The steel bars shall comply with the requirements set forth in the IS 432 Part I, IS 1139, IS 1786 as the case may be with the latest revision thereof and the test as described for ultimate tensile strength, bond test and elongation tests.

All reinforcing steel shall be clean and free from oil, grease, loose scales or rust or other coatings of any character which would reduce or destroy the bond. Each band containing the bars shall bear the ISI Certification mark.

1.4 The cement/steel shall be tested in nearby laboratories of Polytechnic or Engineering College by the Employer. Two samples should be taken by the Engineer in charge in the presence of the contractor or his authorised representatives or the technical personnel employed by the Contractor as in the agreement. The contractor shall without extra cost provide samples and cooperate in the testing of the cement/steel. One sample shall be got tested and the other sample shall be retained by making clear identification in the sample by the Engineer in charge so as to identify at a later date. The cost of such test shall be borne by the contractor.

1.5 All cement shall be procured in bags and shall be stored in a dry place for which the contractor shall be responsible. Consignment of bagged cement shall be properly stacked in a manner which will permit easy access for inspection and definite identification. Cement shall be used in approximately in the chronological order in which it is received, but cement that has been stored for a period longer than 4 months from the date of initial sampling shall not be used unless it has been retested at the expenses of the contractor and passed by the Engineer in charge as good quality on the retest. Cement aged more than 180 days from the date of initial sampling shall be rejected.

1.6 Cement which has become caked or perished shall on no account be used on the works and shall be rejected. Although the Engineer may have passed any consignment, he shall however have the power at the subsequent time to reject such consignment if he finds that any deterioration in the quality thereon has taken place.

1.7 A record of the quantity cement /steel procured with the name of dealer, bill number and date shall be maintained by the contractor. This should be produced for examination by the Engineer in charge at any time. The age of the cement shall be reckoned from the date of manufacture and it shall be verified by the Engineer in charge.

1.8 The rejected consignment of cement and steel should be removed from the site within two days.

2. Aggregates

2.1 Sand for use in masonry and plaster works shall conform to relevant specification in TNBP (specification No.7) and I.S. 2116/1985, I.S.1542/1977.

2.2. The coarse and fine aggregates for concrete shall conform to I.S. 383 /1970 and as specified in the relevant clauses of I.S. 456/ 1978 . Other aggregates free from deleterious materials shall be used at the concurrence and approval of the Engineer after sufficient tests have been carried out at the contractor's cost

2.3. The maximum quantities of deleterious materials in the aggregates, as determined in accordance with I.S 2386(Part II) /1963 shall not be exceed the limits given in table I of I.S. 383. Unless otherwise specified all coarse aggregate in RCC shall be graded aggregate of 20 mm. nominal size. All aggregates shall be stored in hard impervious surface to ensure exclusion of all foreign materials and as per IS 4082/1977 and specification No.5 of TNBP volume I.

3. Water required for Construction

3.1 The water used in the construction shall be of potable quality and shall be tested the contractor' cost. The contractor has make his own arrangements at his cost for water required for construction, testing, filling etc. either from local bodies or from elsewhere, by paying the charges directly and arranging tanker etc., as per necessity. No claim for extra payment on account of non availability of water nearby or extra lead for bringing water shall be entertained. All required piping arrangements and pumping if required for water shall be made by the contractor at his cost. Water for mortar, mixing and curing of concrete shall be free from harmful matter or other substances that may be deleterious to concrete or steel and taken from a source approved by the Engineer. Ground water for mixing and curing shall conform to the provisions in the class 4.3 of IS 456/1978.

4. Admixures.

Only where a beneficial effect is produced shall any admixture be used and that too after test has been carried out to convince the Engineer that no harmful effect will be produced by the use of such admixture and after approved by the Engineer. The admixture shall conform to IS 9103/1972.

5. Form Work and Centering

5.1 Steel/wooden form centering shall be used. If wooden form work is used, it shall consist of planks not less than 40 mm thick and strong props. This shall be providing complying with clause 10 of IS 456 /1978 and specification no. 30.8 of TNBP The timber of form works shall be best hard wood and got approved by the Engineer in charge. This shall be deemed to be included in the items of contract even otherwise specified.

6. Separator (Cover Block)

6.1 For bottom cover of beams, slabs etc., separators of pre cast cement motor blocks of suitable size with wire embodiment as directed shall be used and tied to the reinforcement. Between layers of

reinforcements, separators consisting of pieces of bars of suitable diameter shall be used. The required cover shall be provided as per clause 24-4 of IS 456/1978

Pipes, Specials and Valves.

General.

All types of pipes required for the works should be good quality conforming to relevant BIS and should be procured from reputed manufacturer or his authorised 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.

If on examination of any sample from any portion of the supply, the materials 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 conform to the specification or not, the decision of the Executive Engineer shall be final

C.I PIPES.

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.

PVC pipes.

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

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

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

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

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 specification gravity, impact strength at 00C internal hydraulic pressure test, diameter, thickness etc. in TWAD Board laboratory.

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

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.

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

GI pipes

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 I, 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 CI D/F Pipes

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.

7.7 Valves

7.7.1 The contractor should procure reputed make of sluice valves, scour valves, 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 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.

II. CIVIL WORKS

1.General

1.1 Tamilnadu 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 latter shall be deemed to supercede the provision of the TNBP.

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2. Earth work

Specification.

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

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.

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 reconveyed to the site of the 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

Disposal of surplus Earth

The excavated soil which is surplus to that required for refilling and after allowing for settlement will have to be removed, spread and sectioned at places shown on the site during execution 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 this and the unit rate for trench work of excavation and refilling shall include the cost of removal of surplus earth to disposal site approved by the Engineer-in-charge, its spreading and sectioning at the bidder's expense.

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 bailing 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. Concrete

Specification

Concrete for use in the works shall generally comply with TNBP (specification No.30) and the relevant BIS. The concrete mix shall be specified proportions satisfying the maximum aggregate size, water cement ratio and required cube strength and workability as per IS 456-1978. Such concrete must be adequately vibrated to form solid mass without voids. The entire concreting works should be done only with the prior approval and in the presence of Engineer in charge.

Mixing of Concrete

The concrete shall be proportioned as far as cement and aggregates are considered by volume. The amount of water required being measured either by weight or volume the adjustments must be made to frequent intervals at the discretion of the Engineer or his assistant to account for the moisture content of the aggregates. The mixing operation shall be performed only a mechanical concrete mixer and shall continue until the whole batch of uniform consistency and colour. The mixing of concrete shall be done in accordance with clause 8 and 9 of IS 456-1978.

Transporting, Placing and Compacting Concrete

Transportation, placing and compaction of concrete mix by mechanical vibrators shall be done in accordance with clause 12 of IS 456-1978. It is imperative that all concreting operations be done rapidly and efficiently with minimum re handling and adequate manpower shall therefore be employed to ensure this.

The forms shall be first cleaned and moistened before placing concrete.

The mix should be dropped from such a height as it may cause segregation and air entrainment. When the mix is placed in position, no further water shall be added to provide easier workability.

No concrete mix shall be used for the work if it has been left for a period exceeding its initial setting time before being deposited and vibrated into its final position in the member.

While one concrete is being placed in position it shall be immediately spreaded and ramped sufficiently and suitable to attain dense and complete filling of all spaces between and around the reinforcement and in to the corners of form work for ensuring a solid mass entirely free from voids.

Construction joints required in any of the structural members shall be provided generally complying with clause 12.4 of IS 456-1978 and as directed by the Engineer in charge. The efficiency of tempering and consolidation will be judge by complete absence of air pockets, voids and honey combing after removal of form works.

Curing

Curing shall be done to avoid excess shrinkage or harmful effort to the members generally complying with clause 12.5 of IS 456-1978.

The method adopted shall be effective and any special method used must be approved by the Engineer and be subject to complete supervision.

Any deficiency in concreting such as cracking, excessive honeycombing, exposure of reinforcement or other fault which entail replacement of the defective part by fresh concrete and whatsoever remedy reasonable required without hampering the structural safety and architectural concept, all at the cost of contractor.

Removal of Form Work

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Removal of form work shall be done as per TNBP and BIS and as directly by the engineer in such a manner that no damage is caused to the structures. The stripping time shall not be less than that indicated in clause 10.3 of IS 456-1978.

Testing of Concrete

During the course of construction works, preparation of test specimens, curing and casting of concrete shall be done in accordance with IS 1199 and IS 516 to ascertain the strength requirements and acceptance criteria indicated in IS 456-1978. The contractor shall provide all apparatus, labour and arrange to test the cubes at his own cost at the test laboratory decided by the Employer.

In addition to the above tests, any other test which may if desired by the Engineer in charge be carried out from time to time as per relevant specifications at the cost of contractor. In case the concrete does not meet the strength required. All corrective measures shall be taken at once at the contractor's cost.

The inspection and testing of structures shall be done in accordance with clause 16 of IS 456-1978

Masonry

All masonry works such as Random Rubble /Coarsed Rubber/Brick work must be done as per TNBP Specification and Bid schedule specification.

Curing and watering shall be done as directed and plaster shall be in alignment and level. Any substandard work is liable to be rejected and shall have to be re-done at contractor's cost. Sand to be used shall be of approved quality only. Cost of all scaffolding shall be included in the rates quoted in the BOQ.

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 stuff from distance place at no extra cost. The refilling shall be done in 15cm thick layers duly waiting 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 there filling to the required level as may be directed by the Engineer in charge.

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.

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

Valves shall be provided with valves 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.

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

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

Laying of Cast Iron/DI Pipes

The laying and jointing of cast iron pipes shall be carried out as follows.

Before laying the pipes, the contractor shall carefully brush then to remove any soil, stones or other materials which may be therein. An even and regular bed having been prepared and joint pit excavated to form a recess under the socket of each pipe of no greater depth and width than to enable the pipe jointing to be properly done. Each pipe shall then be carefully lowered and placed

singly in the trench and shall rest in the solid ground for a distance of not less than two thirds of its entire length. In places where the soil is not hard, cement concrete bed blocks or timber piles have to be provided under the pipes if directed by the Engineer in charge.

Pipes not Truly Laid

Any pipe or pipes laid, which on inspection are found to diverge from the true lines and levels shall be removed and re-laid to the true lines and levels and the old jointing properly cleared off the pipes and fresh joints made by the contractor at his expense. Any pipes damaged in removal shall be replaced by the contractor at his cost.

Cutting of C.I./DI Pipes.

Where necessary and as ordered by the Engineer in charge, the Contractor shall cut the pipes and fix and joint common collars for jointing spigot ends. The cut ends of the pipe shall be made truly at right angles with the axis of the pipe.

Covering up Open Ends.

The Contractor shall take particular care to ensure that the apertures and open ends of pipes are carefully covered whenever the workmen are not actually employed therein.

Jointing of C.I./DI Pipes.

The trench must be kept quite dry during jointing unless in any particular case the Engineer permits laying of the pipe in wet conditions. Plain spigot and socket pipes shall be joined as follows.

Lead joints

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Generally lead joints shall be used for all sizes. In the case of 100 mm pipes, cement joints may be used if specified in which case for every ten cement joints, one lead joint shall be used. Provision of lead joints shall also be made at street crossings, at closing joints and for all specials and as determined by the Engineer depending upon the site condition.

The spigot of the pipe must be forced well home into its socket and must be centered, so that the joint may be of even thickness all round. As many laps of white hemp spun yarn as may be needed to leave the space required for the lead shall be driven to the bottom of the socket without being forced through the joint into the pipe but carefully driven home with a caulking tool. The proper depth of each joint shall be tested before running the lead by passing completely round it a wooden gauge, notched out to the correct depth of lead, the notch being lead close against the face of the socket. The joints shall then be run with molten lead in sufficient quantity so that after being caulked solid, the lead may project 3mm beyond the face of the socket against the outside of the spigot but must be flush with the outside edge of the socket.

For pouring lead in the joints, a ring of hemp rope covered with clay shall be wrapped around the pipe at the end of the socket leaving an opening at the top of the socket into which the lead can be poured. The hemp rope shall be supported by clay packing so as to withstand the operation of lead pouring.

The lead used shall be carefully skimmed of all scale, when melted in a cast iron pot or patent melting machine. Sufficient lead shall then be taken by a ladle and run hot into the joint, and the joint filled at one running. The joint shall then be caulked when cool by a suitable caulking tool and a 2 kg. hammer and the joint left neat and smooth.

Fixing Sluice Valve

The sluice valves to be fixed on the pipelines shall be examined, cleaned and placed in the positions as shown in the drawings. The valves shall be placed on the pipe line and valve chambers constructed according to drawings. The depth at which the valve is to be laid and the dimensions of concrete and masonry shall be varied when necessary under the orders of the Engineer.

As the pipes in some instances may be required to be fixed at a less depth than will permit the top of the valve spindle being below the level of the road (but this may only be in cases where the position of the valve is to one side the metalled road) the walls of the valve chamber shall in such cases be carried up to such height as may be ordered, and the chamber shall have such covering as the Engineer may direct.

The valve shall be supported in the valve chamber so that no stress or strain occurs in the flange or other joints of the valve.

The valve shall be carefully protected from slime or dust by a suitable mat or gunny covering and the pit itself shall be cleared of all unwanted material.

Fixing Scour Valve

Scour valves shall be fixed at places shown in the drawings or as directed by the Engineer, and the scour connections from the main shall be carried out completely as per drawings.

Fixing Air Valve.

Air valves shall be fixed at the summits of pipe lines or at places as may be directed by the Engineer. The air valve connections etc., shall be carried out as per drawing.

Interconnection work

The Inter connection work between the existing main to the existing main to be laid under this contract shall proceed from the new main to the existing main. Before actually proceeding with the interconnection work, the Contractor shall make ready necessary tools and plants required for the work at site, such as pump sets, shoring materials etc. He shall also keep ready at site necessary pipes, specials, valves if any required for the work. The Contractor shall keep necessary skilled workmen of sufficient strength at site and once the work is commenced, the entire interconnection work shall proceed without interruption by engaging labour for carrying out the work on a continuous basis both day and night till the work is completed.

The work shall be executed as per programme drawn up by the Engineer and shall be completed within the time ordered by the Engineer, for each individual interconnection. The work shall be carried out under the direction of the Engineer from the beginning to end.

Laying of Specials, valves (except straight pipes from the branch of the new main to the connecting point in the existing main) including conveying specials etc., from the stores or site of stacking, excavation, timbering, pumping, out water from the trenches, lowering, aligning, jointing specials and valves cutting the existing mains, baling out water, inserting the necessary branches, jointing, testing refilling etc., shall comprise as one unit of work and will be paid at the lump sum rate quoted in the schedule for inter connection.

Works to be left Water tight

The Contractor shall construct the pipes chambers and all other works so that they shall be water tight. Should any leakage appear, it shall be made good by him at his expense by removing and reconstructing the portions of the Work so affected or by other method which will render the Work thoroughly water tight to the satisfaction of the Engineer.

Cleaning of Mains

During the execution of the work the Contractor shall keep the interior surface of the mains free from cement, brick, soil or other superfluous matter and shall hand over the mains perfectly clean and free from deposit on completion.

2.12 Masonry Chambers

Chambers for sluice valves, inspection, scour valves, air valves shall be constructed on the pipes in the

positions as shown in the drawings or in such positions as the Engineer may direct. The work shall be done strictly in accordance with the detailed drawings or as ordered by the Engineer. The excavation shall not be made lower than necessary to admit of the earth being properly timbered. The bottom of the excavation shall be properly leveled, rammed and a bed of concrete laid thereon. When the concrete has sufficiently set the building of the brick walls shall then be proceeded with and all iron work fixed in as the building proceeds. The inside of all chambers shall be plastered with cement mortar 20mm thick and the outside with cement mortar 12 mm thick. The chamber shall be topped with pre-cast R.C.C. Slabs 1:2:4 or cast iron surface box of valve cover as ordered by the Engineer. The surface box or valve cover shall be fixed on the top of the R.C.C. slab by a layer of cement mortar and sides of the surface box or valve cover covered over with cement concrete.

Where pipes pass through walls of chambers relieving arches shall be turned neatly over the upper half of the pipes or R.C.C. lintels shall be provided to avoid load of the walls transmitted to the pipes.

Cast Iron steps shall be built in each chamber as the work proceeds one being inserted to every 4 courses of brick work, horizontal distance center to center of each row being 30 cms.

The Contractor shall include in risk rate for brick work cost for fixing steps, frame, cover etc., for completing all chambers in accordance with the drawings and with the above specifications.

2.13 Testing of Main-Hydrostatic Test

After laying and jointing the pipes and specials, the pipe lines shall be tested for hydrostatic pressure in such length as may be specified by the Engineer. The test pressure shall be equal to 50% or such other higher percent as may be specified in excess of the pressure the pipe will have to withstand subsequently subject to a minimum test pressure of 7 kg./ sq.cm. in the case of lead joints. However in the case of cement joints, the joints may be tested to a minimum test pressure 3.5 kg./sq.cm.

If cement joint show seepage or slight leakage, such joints shall be cut out and replaced as directed the Engineer and the test repeated.

The Contractor shall make his own arrangements to procure, necessary equipments, apparatus etc., required for testing and shall provide necessary labour for filling with water the length of pipes to be tested, fixing all apparatus and for carrying on the testing operations until the length of pipes, specials and connections are finally passed by the Engineer.

The length to be tested shall be provided with two blank flanges fastened on in the usual manner by collar bands and bolts to the end pipes or if the length to be tested shall have a sluice valve at each end, such blank flanges may be dispensed with. The length of pipes to be tested shall first be filled in with water from a higher section of pipes already laid or with clean water shall be arranged at the contractor's expense with the approval of the Engineer.

Before the actual testing pressure is applied any air which has lodged in the length of pipes to be tested shall be got rid of, by screwing on at the highest part of the length of pipes or temporary air valve, or, by opening a temporary stop-cock or by other mean as the Engineer may direct.

The test pressure shall then be applied to the length of pipes under test by a hand or powered hydraulic test pump. The connection of the test pump to the length of pipes shall either be at the union connection provided at a blank flange or shall be at a temporary stop cock or fountain connection as the Engineer may in the circumstances direct.

The actual test shall be made by pumping water into the length of pipes under test, until the test pressure as specified as specified above has been reached on the pressure gauge.

The test pressure shall be maintained for one hour or for such other period of time as may set by the Engineer and each joint will be inspected. While the pressure is on, the pipes should be struck smartly with a 2kg hammer. When a flange joint is found to be leaking, care shall be taken that while tightening up the flanges, the neighboring joints are not affected.

If the length of pipe line under test in is found to be satisfactory and on leaks or sweatiness are found at the pipe joints or at the joints of specials and connections then this length of pipe line will be passed by the Engineer.

But should any pipe, joint, special or connection be found to sweat or leak, the contractor shall make good at his cost defective joint and the length of pipe line shall be retested by the Engineer until all pipes, joints, specials and connection are found to be satisfactory.

If any pipe or special leaks or bursts, the damaged portion shall be removed and new pipes or specials shall be laid and jointed at the contractor's cost.

Restoring Road Surface

The surface of the road or ground shall be finished off to the proper level with the same kind of material as the surface consisted of before the excavation commenced, except in the case of superior roads and tarred roads in which case the surfaces should be finished off with water bound macadam surface. Should any settlement occur after refilling is completed, and upto the end of the period of maintenance, it shall be made good at once and the surface restored to the satisfaction of the authority under whose jurisdiction such road or ground may be, all at cost of the contractor.

Collection or Rubbish

The Contractor shall, at his cost, on the completion of the work remove all water and all materials or rubbish of every description which may have been collected in the works and find a deposit thereof and anything which may have collected within the works, during the period of maintenance shall also be removed before the works are finally accepted by the Employer.

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3. Laying and Jointing PVC Pipes

a) PVC Pipes

The PVC Pressure pipes for water supply and distribution shall conform to IS 4985/1988.

b) Laying of PVC Pipes (IS 7634/1975)

The trench bottom should be carefully examined and should be free from hard objects, such as flints, rock projections or tree roots etc. The bedding for the pipes should be brought to an even finish providing uniform support for the pipes over their length and pipes laid directly on the trench bottom. In other case the trench should be cut correspondingly deeper and the pipes laid on a prepared under bedding which may be drawn from the excavated material if suitable. As a rule trenching should not be carried out too far ahead of pipe laying. The trench should be kept as narrow as practicable but must allow adequate room for jointing pipes and placing and compacting the back fill. Mains should be laid with a cover of not less than 1 m measured from the top pipes to the surface of the ground. Mains which might be brought under roadways by future widening schemes should be so laid that the eventual will not be less than 1 m.

c) Jointing of PVC Pipes

The jointing of PVC pipes are done either by using Solvent Cement Joint or rubber ring joint. The solvent cement used for jointing should be of the quality as specified in IS 14182/1994. The spigot and socket ends of the pipes should be cleaned and roughened with emery paper. If the ends are grossly contaminated, they should be cleaned with Acetones or Methyl Alcohol. The solvent cement should be thickly applied on the spigot end and thinly in the socket. For larger sizes the first coat should be allowed to dry and a second coat applied. The spigot is then pushed into the socket and the excess cement wiped off at once with a piece of cloth or rag. The joint should not be disturbed for at least 5 minutes. The pipes should not be subjected working pressure for 24 hours after jointing.

ii) Rubber Ring Joint

The pipes for rubber ring joints are supplied with both ends chamfered. A mark should be made at a distance from the pipe end equal to half the length of the coupler. The inner side of the coupler ring and the chamfered end of the pipe should be clean and dry. The 'O' ring is then slipped into the coupler. The ring and the chamfered end of the pipe are lubricated with a Lubricant. The coupler and the pipe should be carefully aligned and should be truly coaxial. The coupler is then pushed home into the pipe or the pipe is pushed into the coupler to make the joint.

The Engineer shall have the right to test the pipes for the quality wherever felt necessary. All charges incurred in testing the pipes shall be borne by the contractor.

3.1 Laying and jointing of Ductile Iron Pipes

a) Ductile Iron pipes

The Ductile Iron pressure pipes shall conform to the I.S. 12288/1987

b) Laying Ductile Iron Pipes

The pipe should be lowered into the trench with tackle suitable for the weight of pipes. For smaller sizes upto 250 mm nominal bore, the pipe may be lowered by the use of ropes but for heavier pipes either a well designed set of shear legs or mobile crane should be used. When lifting gear is used the positioning of the sling to ensure a proper balance, should be checked when the pipe is just clear of the ground. If sheathed pipes are being laid, suitable wide slings or scissor dogs should be used.

All construction debris should be cleared from the inside of the pipe either before or just after a joint is made. This is done by passing a pull through in the pipe, or by hand, depending on the size of the pipe. When laying is not in progress a temporary end closer should be securely fitted to the open end of the pipe line. This may make the pipe buoyant in the event of the trench becoming flooded, in which case the pipe should be held down either by partial refilling of the trench or by temporary strutting. All persons should vacate any section of trench into which the pipe is being lowered.

b.1. On gradient of 1:15 or steeper, precautions should be taken to ensure that the spigot of the pipe being laid does not move into or out of the socket of the laid pipe during the jointing operations. As soon as the joint assembly has been completed, the pipe should be held firmly in position while the trench is back filled over the barrel of the pipe. The back fill should be well compacted.

c). Jointing of Ductile Iron Pipes

Two main types of joints are used with Ductile Iron pipes and fittings.

i. Socket and spigot flexible joints.

1. Push on joints.

2. Mechanical joints.

ii. Rigid flanged joints.

Flexible Joints:

The spigot and socket flexible joint should be designed to permit angular deflection in direction and axial movement to compensate for ground movement and thermal expansion and contraction. They incorporate gasket of electrometric materials and the joints may be of the simple push-on-type or the type where the seal is effected by the compression of a rubber gasket between a seating on the inside of the socket and the external surface of spigot. Joints of the latter type are referred to as mechanical joints. Both push-in and mechanical joints are flexible joints. Flexible joints require to be externally anchored at all changes in direction such as at bends, etc., and at blank end to resist the thrust created by internal pressure and to prevent the withdrawal of spigots.

Flanged Joints:

Flanged joints are made on pipes having a machined flange at each end of pipe. The seal is usually effected by means of a flat rubber gasket compressed between two flanges by means of bolts which also serve to connect the pipe rigidly. Gaskets of other materials, both metallic and non-metallic are used for special applications.

Jointing procedure:

Procedure for jointing will vary according to the type of joint being used. Basic requirements for all types are:

Cleanliness of all parts

Correct location of components

Centralisation of spigot within socket and

Strict compliance with manufacturer's jointing instructions.

Ductile Iron pipe

Ductile Iron pipe shall be procured from the reputed manufacturers and the pipes shall confirm to IS 8329/2000. The pipes diameter given in schedule is the clear inner diameter. The pipe and specials should be supplied with inside lining with a cement mortar of standard thickness and specifications and outside coating of Metallic Zinc as per I.S. specifications. The pipes should be with ISI marking. The test certificate furnished by the manufacturers should be produced.

GENERAL CONDITIONS OF CONTRACT

1. DEFINITIONS

In the Contract (as hereinafter defined) the following words and expressions shall have its meanings hereby assigned to them, except where the context otherwise requires.

"Board" means the Tamil Nadu Water Supply and Drainage Board, a statutory body constituted under the Tamil Nadu Water Supply and Drainage Board Act 1971 having its office at No. 31, Kamarajar Salai, Chepauk, Chennai – 600 005 and any officer authorised to act on its behalf

"Employer" means the Tamil Nadu Water Supply and Drainage Board and shall include the officers duly authorised to act on its behalf

"Contractor" means the person or persons, firm or company whose tender has been accepted by the Employer and includes the authorised representatives, successors, heirs, executors, administrators

"Subcontractor" means any person or persons, firm or company named in the Contract as a Subcontractor for a part of the Works or any person or persons, firm or company to whom a part of the Works has been subcontracted with the consent of the Engineer and includes the authorised representatives, successors, heirs, executors, administrators of such Subcontractors

"Engineer" means the Executive Engineer or any other Engineer appointed from time to time by the Employer to act as Engineer for the purposes of the works brought under this contract

"Engineer in charges" means the Executive Engineer or any other Engineer authorised by him.

"Engineer's representative" means any Resident Engineer or assistant of the Engineer or any clerk of works appointed from time to time by the Employer or/the Engineer to perform the duties set forth in respect of this Contract.

"Contract" means the Invitation for Bids and amendment made thereof, Letter of Acceptance, the formal Agreement executed between the Employer and the Contractor together with the documents referred to therein, General Conditions of the Contract, Special Conditions, Specifications, Minutes of the pre Bid conference, Design, Drawings, Schedule of Rates and Prices, Bill of quantities, Rate of Progress etc., All these documents taken together shall be deemed to form one contract and shall be complementary to one another

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“Turnkey Contract” means execution of the water supply and sewerage works including the supply and installation of all materials, machineries, equipments etc in accordance with specifications stipulated in the Bid Document and in conformity with the quality parameters laid down in relevant BIS, TNBP, Bid Documents etc and completing the entire works in all respects satisfactorily and commissioning within the stipulated period and maintaining the scheme for the specified period.

“Contract Price” means the sum stated in the Letter of Acceptance as payable to the contractor for the execution, completion and maintenance of the works, subject to such additions thereto or deductions therefrom as may be provided under this Contract and the remedying of any defects therein in accordance with the provisions of the contract.

“Constructional Plant” means all appliances or things of whatsoever nature required in or about the execution, completion or maintenance of the works but does not include materials or other things included to form or forming part of the permanent works.

“Works” shall include both permanent works and temporary works. “Permanent works” means the works of permanent nature to be executed, completed and maintained (including Plant) in accordance with the contract. “Temporary works” means all temporary works of every kind required in or about the execution, completion or maintenance of the works and remedying of the defects therein

“Specification” means the schedules, detailed designs, technical data, performance Characteristics and all such particulars referred to in the bid/contract and any modification thereof or addition thereto as may from time to time be furnished or approved by the Employer.

“Drawings” means the drawings, calculations and technical information referred to in specification and any modification of such drawings approved in writing by the Engineer and such other drawings, calculations and technical information as may from time to time be furnished or approved in writing by the Engineer.

“Site” means the land and other places on, under, in or through which the Permanent works and/or Temporary Works are to be executed and any other lands and places provided by the Employer for working space or any other purpose as may be specifically designated in the Contract as forming part of the site.

Approved means approval in writing including subsequent written confirmation of previous verbal approval

“Test” means such test or tests as are prescribed in the specifications or considered necessary by the Engineer

“ISS” means Indian Standard Specifications

“BIS” means Bureau of Indian Standards

“TNBP” means Tamil Nadu Building Practice

“Day” means a Calendar day from midnight to midnight)

“Week” means seven consecutive days.

“Month” means from the beginning date of a given date of a calendar month to the end the preceding date of the next calendar month

“Quarter” means a period of three months reckoning from the 1st date of January April, July and October and counted to the last date of March, June, September and December respectively.

Rupees means Rupees in Indian Currency

“Bill of Quantities” means the priced and completed bill of quantities forming part of the tender

“Tender” means the Contractor’s priced offer to the Employer for the execution, completion and maintenance of the Works and the remedying of any defects therein in accordance with the provisions of the Contract, as accepted by the Letter of acceptance

“Letter of Acceptance” means the formal acceptance by the Employer of the Tender

“Contractor Agreement” means the contract agreement referred to in clause(..)

“Appendix to Tender” means the appendix comprised in the form of Tender annexed in these conditions.

“Commencement Date” means the date of signing the agreement or the date of handing over the site to the

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successful firm/contractor, whichever is earlier and this shall be reckoned as the start date of the project.

“Time of Completion” means the time for completing the execution of and passing the Tests on Completion of the Works of any section or part thereof as stated in the Contract (or as extended under Clause...) calculated from the Commencement Date

“Maintenance” means the successful maintenance of the completed and commissioned project as a whole or in parts as the case may be for the stipulated period

“Joint Venture” means two or more firms/contractors aspiring to take up the contract jointly with the lead partner and other partner/partners possessing the required qualifications.

2. INTERPRETATION

In interpretation of these Conditions of Contract, headings shall not be deemed part thereof or be taken into consideration. Words importing persons or parties shall include firms and corporations and any organisation having legal capacity. Words importing the singular only also include plural and vice versa where the context requires.

The Employer will provide instructions clarifying the queries about the contract

3. Authority of Engineer in Charge

It shall be accepted that the authority of the Engineer in charge shall be an integral part of the contract in all matters regarding the quality of materials, workmanship, removal of improper work, interpretation of the contract drawings and specifications, mode and procedure of carrying out the works where the decision of the Engineer in charge shall be final and binding on the contractor. The Engineer in charge shall have absolute authority on all technical matters and payment considerations.

4. Sufficiency of Bid

The Contractor shall be deemed to have satisfied himself as to the correctness and sufficiency of the bid and of the rates and prices stated in the Bill of Quantities, all of which shall, except insofar as it is otherwise provided in the contract, cover all his obligations under the Contract (including those in respect of the supply of goods, materials, Plant or services or of contingencies for which there is a Provisional Sum) and all matters and things necessary for the proper execution and completion of the Works and the remedying of any defects therein.

5. Priority of Contract Documents

The several, documents forming the Contract are to be taken as mutually explanatory of one another, but in case of ambiguities or discrepancies the same shall be explained and adjusted by the Engineer who shall thereupon issue to the Contractor instructions thereon and in such event, unless otherwise provided in the Contract. The priority of the documents forming the Contract shall be as follows:

- The Contract Agreement
- The Letter of Acceptance
- The Tender
- Conditions of the Contract
- Technical specifications
- Any other document forming part of the Contract

6. Secrecy of the contract document

The Contractor shall treat all documents, correspondence, direction and orders concerning the contract as confidential and restricted in nature by the contractor and shall not divulge or allow access to these matters to any unauthorised person.

7. Instruction in Writing

Instructions given by the Engineer or Engineer's Representative shall be in writing, provided that if for any reason, the Engineer or the Engineer's Representative considers it necessary to give any such instruction orally, the Contractor shall comply with such instruction. Confirmation in writing of such oral instruction given by the Engineer or Engineer's Representative, whether before or after the carrying out of the instructions given by the Engineer or Engineer's Representative, shall be deemed to be an instruction.

8. Commencement of Works

The Contractor shall commence preliminary works after the receipt by him of the LOA to this effect from the Engineer in charge. Thereafter, the contractor shall proceed with the Works with due expedition and without delay and in accordance with the programme schedule set out in the Contract.

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9.Reference Marks

The basic centre lines, reference points and bench marks shall be fixed by the Engineer in charge of the works.

The contractor shall establish additional reference points and bench marks as may be necessary at his cost. The contractor shall remain responsible for the accuracy and sufficiency of the reference and bench marks. The contractor shall take proper precautionary steps to ensure that the reference lines and bench marks established for the works are not disturbed and shall make good any damages caused.

10. Supervision

The Contractor shall provide all necessary superintendence during the execution of the works and thereafter as may be necessary for the proper fulfillment of the obligations under this contract. The contractor shall arrange for the deployment of proper qualified personnel at the site of work constantly, such supervising staff, apart from those separately set out as the requirements of the contract, shall be skilled and experienced technical assistants, foremen and others competent enough to produce proper supervision.

The Contractor shall employ the technical staff as per the prescribed rules. 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

Sl. No	Value of Contract	Scale and minimum qualification prescribed for the employment of technical staff	Rate of Penalty
1)	Above Rs. 1.00 Lakh and upto Rs.5.00 Lakhs	One Engineer with Diploma in Civil/Mech. Engg.	Rs. 2,000/- per month
2)	Above Rs. 5.00 Lakhs and upto Rs.10.00 Lakhs	One Engineer with Degree in Civil/Mech. Engg. with minimum 1 year experience.	Rs. 5,000/- per month
3)	Above Rs. 10.00 Lakhs and upto Rs.25.00 Lakhs	One B.E(Civil) or equivalent engineering degree holder with atleast three years experience or retired AEE of TWAD Board or other Engg. Dept. in addition to one LCE/DCE/LSE holder	Rs.7,000/- per month
4)	Above Rs.25.00 Lakhs	One B.E(Civil) or equivalent Engineering degree holder with atleast three year experience or retired AEE of TWAD or other Engineering Department in addition to two LCE/DCE/LSE holder.	Rs.5000/- + Rs.4000/-per month.(Rs.2000 per month for each Diploma holder)

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.

In the event of any staff of the contractor being non co-operative, negligent, incompetent or misconduct, the Engineer in charge shall have the liberty to object to the placement of such staff at the site or other place of works and will promptly issue notice in writing to the contractor for the removal of such staff members. It will be obligatory on the part of the contractor to remove/change such persons in the larger interests of the works.

11. Subletting of Contract

Assignment of the contract is not permissible

Transfer of the contract is not permissible on any grounds

The contractor shall sublet any portion of the contract only with the written consent of the Engineer in charge. It should be clearly understood that any subletting shall in no way absolve the contractor of his responsibilities and obligations under this contract

12. Specifications and Checks

Stated dimensions in the drawings are to be taken for consideration and no measurements based on scaling of the drawings shall be considered. In case of discrepancy between the description of items in the schedule of quantities and the specifications, the later shall prevail. In case of the description, any work having not fully described or doubts prevail, the contractor shall forthwith write to the Engineer in charge and clarify himself before executing that portion of the work. However, this cannot be a cause for any delay in the progress and the contractor should take advance action in this regard ensuring timely completion of the works.

Before commencement of the work, it will be obligatory on the part of the contractor to furnish a detailed plan of action along with layouts showing the position of the construction plants and other facilities required and proposed to be provided for this contract.

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The contractor shall execute the works true to alignment, grade and levels as set out in the drawings and as directed by the Engineer in charge from time to time. The Engineer in charge or his representative is at liberty to check the correctness of the works, the suitability of the materials used, design mix etc.,. The contractor will raise no objections for such checks and shall provide necessary labour and instruments to carry out such check to the Engineer in charge as well as his representative and co-operate in the checks. However, such checks will

not absolve the contractor of his responsibility of maintaining the accuracy of the work.

13. Custody and Supply of Drawings and documents

The drawings shall remain in the sole custody of the Engineer in charge, but two copies thereof shall be provided to the contractor free of charge. The contractor shall make at his own cost any further copies required by him. Unless it is strictly necessary for the purposes of the contract, the drawings specifications and other documents provided by the Employer or the Engineer in charge shall not, without the consent of the Engineer in charge, be used or communicated to a third party by the contractor. One copy of the Drawings, provided to or supplied to the Contractor as aforesaid, shall be kept by the Contractor at the site and the same shall be made available for inspection and use by the Engineer and by any other person authorised by the Engineer.

14. Bill of Quantities

The Bill of quantities shall contain items for the construction, installation, testing, commissioning and maintenance of the Works to be carried out by the Contractor. The Bill of Quantities will be used to calculate the Contract Price. The contractor shall be paid for the quantum of work done at the rate mentioned for each item in the Bill of quantities

15. Change in the Quantities

If the final quantity of the work done differs from the quantity in the Bill of Quantities for the particular item/items, the rates as in the agreement for the relevant items shall be paid as per the actual quantity.

16. Additional items

If additional items that are not contemplated in the contract are to be executed, the Engineer in charge will execute the works either through the main contractor/firm or through any other agency. Payment for such works shall be made based on the rates derived by the Engineer in charge as per rules in force.

17. Order Book

An order book will be kept by the Officer in charge of the site (Junior Engineer/Assistant Engineer) of the particular component of the works. Orders entered in this book by the Engineer in charge or any higher authority shall be held to have been formally communicated to

the contractor/firm. The Officer in charge of the site will sign each order as it is entered and will hand over the duplicate to the contractor/firm or his agent, who shall sign the original in acknowledgement of having received the order.

18. Independent Inspection

The Engineer shall delegate inspection and testing of materials or Plant to an independent inspector/Agency. Any such delegation shall be considered as prerogative of the Engineer. In addition to third party inspection, wherever felt necessary, the engineer shall be empowered to test the PVC Pipes for its quality such as specific gravity, diameter, thickness etc in the TWAD Board laboratory. The inspection charges/fees shall be payable by the contractor.

19. Covering and Opening of Works.

No work shall be covered or put out of view without the approval of the engineer in charge. The contractor shall give due notice to the Engineer in charge whenever such works are ready for examination and the Engineer in charge within a reasonable period, arrange for the inspection and measuring of the work as may be necessary. No portions of the work shall be covered up without the consent of the Engineer in charge. The cost of opening any portion of the works that was covered without the consent of the Engineer in charge and the cost of covering thereafter shall be borne by the contractor.

The contractor shall open the covered portion of the works for inspection by the Engineer in charge on a request and the inspection or examination shall be carried out promptly by the Engineer in charge. In the case of defects notified by the Engineer in charge, the contractor shall rectify the same as may be instructed by the Engineer in charge. All costs of opening, covering and rectification shall be on to the account of the contractor. Should the contractor refuse to open such portions of works the Engineer in charge shall open such portions with other persons and inspect the part of the works as he may feel necessary. On inspection, the works being not in accordance with the requirements of the contract documents, the Engineer in charge shall carry out necessary rectification and the entire cost of opening, rectification and closing shall be on to the contractor's account.

20. Watching and Lighting

The Contractor/firm shall at his expense shall provide at the site of works sufficient fencing, barricading,

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watching and lighting during day and night. The contractor/firm shall in every respect conform to the police regulations in these matters and shall free and relieve the Board on all such matters. Should the contractor/firm fail/neglect to do these arrangements, the same shall be carried out by the Engineer in charge and the costs thereof shall be recovered from the contractor/firm.

21. Measurement of Work

The work will be measured by the site engineer (Junior Engineer/Assistant Engineer) and recorded in the measurement book. The contractor/firm will be at liberty to accompany the site engineer in order that they may agree on the measurements but should they neglect to do so, the measurements as recorded by the site engineer shall be taken as final and conclusive. The measurements of works will be recorded as prescribed in the TNBP and as amended from time to time.

22. Tools and Plants

All tools, plants and equipments required for this contract will be arranged by the Contractor at his own expense. The Contractor shall erect necessary construction plant as may be necessary and shall use such methods and appliances for the proper performance of all the operations connected with the work brought under the contract ensuring satisfactory quality of work and maintenance of the programme schedule. The non availability of any tool, plant or equipment shall not be relied upon as a reason for non functioning or slow progress.

23. Information and Data

The information and data made available to the contractor in respect of the works and site conditions are only general and the contractor is advised to get himself fully acquainted with the nature of the location of the works and the surroundings, quarries, local conditions and such other aspects that are relevant to the works.

24. Coexistence with other Contractors.

Where two or more contractors are engaged on work in the same vicinity, they shall work together harmoniously with the spirit of cooperation and accommodation. The contractor shall not disrupt or disturb the works or labour arrangements of the neighboring contractors. In case of disputes and difficulties arising between the contractors in the execution of the respective works, the Engineer in charge shall interfere and give directions for the smooth functioning of the entire works and it shall be the bounden duty of the contractors to abide by these instructions.

25. General Responsibilities and Obligations of the Contractor

The contractor shall, subject to the provisions of the contract, execute and maintain the works with proper care and diligence and provide all labour including the supervision thereof, materials, constructional plant and all other things, whether of a temporary or permanent nature required for such execution and maintenance.

The contractor shall take full responsibility for the adequacy, stability and safety of all site operation and methods of construction.

The contractor shall promptly inform the Employer and the Engineer in charge if any error omission, fault and other defects in the specification or design of the works which are identified at the time of reviewing the contract documents or during the execution for proper rectification thereof.

All notices, certificates connected with the work served by the employer relating to the contract shall be sent by post or by hand to the contractor's principal place of business as mentioned in the document or at other places as may be nominated by the contractor in writing for this purpose. Any change in the address of the contractor should be promptly intimated to the Employer in writing then and there.

The contractor shall visit the spots of work and ascertain the site conditions. The contractor shall satisfy himself of the conditions prevailing in the spots where the work is actually to be executed and its environs and the precise offered by him shall be treated as those which were worked out taking fully into consideration the prevailing site conditions, hydrological conditions, extent and nature of work to be executed, the material availability, etc., Any claim on this ground at a later date shall be summarily rejected.

However during the execution of the works, if the contractor has to encounter artificial obstructions, which in his opinion could not have been reasonably foreseen, then the contractor shall write forthwith to the Engineer in charge of such obstruction and remedial measures needed. The Engineer in charge, if opined that the conditions cannot be possibly foreseen by an experienced contractor, he shall extend possible assistance to the contractor to overcome such obstructions. The opinion of the Engineer in charge shall be final and binding and the contractor is not entitled to advance these as reasons for any delay that may be caused to the completion of the project.

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The contractor shall execute and maintain all works in accordance with the specification and to the satisfaction of the Employer. The contractor shall strictly adhere to the instructions and directions of the engineer in charge, whether included in the contract agreement or not but concerning the safe and proper execution of the works.

26. Labour

The contractor shall not employ any person who has not completed fifteen years of age in connection with the works under this contract.

The contractor shall furnish the information on various categories of labour employed by him to the Engineer in charge in the form prescribed for this purpose

The contractor shall in respect of labour employed by him comply with or cause to be complied with the provisions of various labour laws, rules and regulations as applicable to them in regard to all matters provided therein and shall indemnify the Employer in respect of all claims that may be made against the Employer for non compliance thereof by the contractor.

Now withstanding anything contained herein, the Employer reserves the right to take such action as may be deemed fit and proper for the compliance of various labour laws and recover the costs thereof from the contractor.

27. Restriction of Working Hours

Subject to any provisions contained in the Contract, none of the works shall, save as hereinafter provided, be carried on during the night or on locally recognised days of rest without the consent of the Engineer, except when work is unavoidable or absolutely necessary for the saving of life or property or for the safety of the Works, in which case the Contractor shall immediately advise the Engineer, Provided that the provisions of this clause shall not be applicable in the case of any work which is customary to carry out by multiple shifts

28. Right of Way and Facilities

The Contractor shall bear all costs and charges for special or temporary rights of way required by him in connection with access to site. The Contractor shall also provide at his own cost any additional facilities outside the Site required by him for the purposes of the Works

29. Removal of Improper Work, Material and Plant

The contractor shall make his own arrangements for the procurement, supply and use of the construction materials and shall ensure that the materials either procured within the country or abroad conform to the relevant specifications set out in the bid documents. In case of alternatives being used, they should be of equal or higher quality than those specified subject to the review and written approval of the Engineer in charge. Differences between the standards specified and the proposed alternatives must be described in writing to the Engineer in charge at least 30 days in advance from the date on which the approval of the Engineer in charge is needed. The disapproval of the proposal by the Engineer in charge shall result in the contractor confining to the standards set forth in the contract documents. The contractor shall arrange for the inspection of the material at the manufacturing place or other places by the department personnel All materials and workmanship shall be in accordance with the specifications set out in the contract document and as directed by the Engineer in charge and shall be subjected to tests by the Engineer in charge or his representative at the place of manufacture or at the site of work or places wherever felt necessary. The contractor shall provide all the assistance necessary including instruments, machines and materials that are normally required for carrying out the testing/measuring the quality/quantity of the materials and workmanship. Any material rejected after testing by the Engineer in charge or his representative will not be used on the works. The contractor shall without claiming any extra cost, shall arrange for the testing of materials and supervision of the works. The Engineer in charge or his authorised representative will have access at all times to the places of manufacture, storage to ascertain as to whether the manufacturing process wherever mentioned is in accordance with the drawings and specifications

The Engineer in charge 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 Notwithstanding the previous tests of the materials by the Engineer in charge or his representative, if any portion of the work, in the opinion of the Engineer in charge is not in order, the contractor shall redo such work to the satisfaction of the Employer at no extra cost. In case of default on the part of the contractor in carrying out such orders, then the Employer shall have the right to carry out such works through some other persons and the expenses thereon or incidental thereto shall be recoverable from the contractor.

30. Default of Contractor in Compliance

In case of default on the part of the Contractor in carrying out such instruction within the time specified therein, if none, within a reasonable time, the Employer shall be entitled to employ and pay other persons to carry out the same and all costs consequent thereon or incidental thereto shall after due consultation with the Employer and the Contractor, be determined by

the Engineer and shall be recoverable from the Contractor by the Employer, and shall be deducted by the Employer from any monies due or to become due to the Contractor and the Engineer shall notify the Contractor accordingly, with a copy to the Employer

31. Default by Contractor

If the contractor shall become bankrupt or have a receiving order made against him or shall present his petition in bankruptcy or shall make an arrangement with or assignment in favour of his creditors or shall agree to carry out the contract under a committee of inspection of his creditors, or being a corporation shall go into liquidation (other than a voluntary liquidation for the purpose of amalgamation or reconstruction), or if the contractor shall assign the contract, without the consent in writing of the employer first obtained, or shall have an execution levied on his goods, or if the engineer in charge shall certify in writing to the employer that in his opinion, the contractor.

- a) Has abandoned the contractor or
- b) Without reasonable excuse has failed to commence the works or has suspended the
- c) Has failed to remove materials from the site or to pull down and replace work for twenty eight days after receiving the written notice from the engineer in charge stating that the said materials or work stands condemned and rejected under these conditions or
- d) Despite previous warnings in writing by the Engineer in charge, not executing the works and achieving the progress as stipulated in the programmed schedule drawn for the contractor is persistently or flagrantly neglecting to carryout the obligations under this contractor
- e) Has, to the detriment of good workmanship, or in defiance of the instructions of the Engineer in charge or in contrary sublet any part of the contract, then the Employer, may at his option, after giving two weeks notice in writing to the contractor, enter upon the site and the works and expel the contractor therefrom without thereby voiding.
- f) The contract, or releasing the contractor from any of his obligation or liabilities under this contract, and may himself complete the works or may employ any other contractor to complete the work. The employer or such other contractor may use the construction plant, temporary works and materials which have been deemed to be reserved exclusively for the execution of the works under the provisions of the contract as may be thought fit and proper for the completion of the work. The employer may, at anytime, sell any of the said constructional plant, temporary works and materials which have been deemed to be reserved exclusively for the execution of the works under the provisions of the contract as may be thought fit and proper for the completion of the work. The employer may, at any time, sell any of the said constructional plant, temporary works and unused materials and apply the proceeds of sale in or towards the satisfaction of any sums due or which may become due to him from the contractor under this contract.
- g) has carried out the work in a defective manner.
- h) has not made payment of labour dues.
- i) has become eligible for maximum compensation under the "Liquidated damages clause" leading to Termination of the contract.

The Engineer in charge shall as soon as may be practicable after any such entry or expulsion by the employer, fix and determine expert or by after reference to the parties, or after such investigation or enquires as maybe thought fit to make or institute, and shall clarify what amount, if any had at the time of such entry and expulsion been reasonably occurred to the contractor in respect of work then actually done by him under this contract and the value of any of the said unused or partially used materials, any constructional plant and any temporary woks.

If the employer shall enter and expel the contractor under this clause, the employer shall not be liable to pay to the contractor any money on account of the contract until the expiration of the period of maintenance and thereafter until the costs of execution and maintenance, damages for delay in completion, if any and all other expenses incurred by the Employer have been ascertained and the amount thereof certified by the engineer. The contractor shall then be entitled to receive only such sum or sums, if any as the engineer in charge may certify would have payable to him upon due completion by him after deducting the said amount. If such amount shall exceed the sum which would have been payable to the contractor on due completion by him, then the contractor shall, upon demand, pay to the employer the amount of such excess and it shall be deemed a debt due by the contractor to the Employer and shall be recoverable accordingly.

If, by reason of any accident, or failure, or other event occurring to or in connection with the work, or any part thereof, either during the execution of the works, or during the period of maintenance, any remedial or other work or repair shall in the opinion of the Engineer in charge or his authorized representative, be urgently

necessary for the safety of the works and the contractor is unable or unwilling at once to do such work or repair as the Engineer in charge or his representative may consider necessary, such works shall be carried out by the Engineer in charge. If the work or repair so done, which in the opinion of the Engineer in charge, liable to have been done by the contractor at his expense under this contract, all expenses incurred by the Employer in carrying out such works shall be recoverable from the contractor or shall be deducted by the Employer from the money due to the contractor. Provided always that the Engineer in charge or his representative, as the case may be, shall as soon after the occurrence of any such emergency as may be reasonably practicable, notify the contractor thereof in writing.

32. Power to vary work

The description of the works required to be executed by the contractor/firm are set out in the specifications, schedules and drawings, but the Engineer in charge reserves the power to vary, extend or diminish the quantities of work, to alter the line, level or position of any work, to increase, change or decrease the size, quality, description, character or kind of any work, to order the contractor/firm to execute the works or any part thereof, by day or night work, or to add or take from the work Included in the contract as he may deem fit and proper without

violating the contract and the contractor/firm shall not have any claim upon the Employer for any such variation, extension, diminution, alteration, increase, change or decrease other than for the work actually done, calculated according to the prices tendered and accepted in this contract.

33. Extra for Varied Works

Any unforeseen additional work that may become necessary and is accordingly carried out under this contract based on proper written orders shall be measured and valued by the Engineer in charge at the rates contained in the contractor's/firm's original bill of quantities. If these rates do not apply to the additional works ordered to be carried out, then prior to execution of the additional work, a rate for such work shall ordinarily be agreed upon and entered in a supplemental schedule and signed by both the Engineer in charge and the contractor/firm.

34. Omissions

In the event of anything reasonably necessary or proper to the due and complete performance of the work (Engineer in charge will be the sole judge on these things) being omitted to be shown or described in the drawings, specifications and schedules, the contractor/firm shall notwithstanding execute and provide at the rates noted in the bill of quantities all such omitted works and things as if they have been severally shown and described and the execution should be according to the directions of the Engineer in charge and to his satisfaction.

35. Notices Regarding Shoring etc.,

Wherever shoring or other works for the protection or security of the buildings/structures are necessary, the contractor/firm shall within a reasonable period before the execution of such works, shall serve notices upon the occupiers of the buildings/structures to be shored up or otherwise secured and upon all other parties entitled to notice, apprising them respectively that such works are necessary, that the contractor/ firm about to execute the same and will, at a time to be specified in such notice, enter upon the premises for the purpose of executing such works.

36. Cost of Repairs

Loss or damage to the Works or materials to be incorporated in the works between the Start Date and the end of the Defects Liability periods shall be remedied by the Contractor at the Contractor's cost if the loss or damage arises from the Contractor's acts or omissions

37. Suspension of Work

The Contractor shall, on the instructions of the engineer, suspend the progress of the Works or any part thereof for such time and in such manner as the Engineer may consider necessary and shall, during such suspension, properly protect and secure the Works or such part thereof so far as is necessary in the opinion of the Engineer in charge.

38. Suspension of Progress

The contractor/firm shall, without recompense, claim or demand, delay or suspend the progress of works as a whole or any part thereof, if and when or so often as directed by the Engineer in charge and for such time or times, as may be in the judgement of the Engineer in charge be necessary for the purposes or advantages of the undertaking. Upon all such occasions, whether directed or not, the contractor/firm at his/their expense, properly cover down and secure so much of the work as may be liable to sustain damage from whether or any other cause and shall at all times and forthwith when

required properly make good all the damage or injury which such works or any part thereof may have sustained and these should be done to the entire satisfaction of the Engineer in charge.

39. Termination

The Employer may terminate the Contract for any reason that is regarded as breach of the Contract.

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If the contract is terminated, the contractor shall stop work immediately, make the site safe and secure and leave the site as soon as reasonably possible

On termination of the contract, the Engineer shall issue a certificate for the value of work done less payments received up to the date of the issue of certificates, less other recoveries due in terms of the contract, less taxes due to be deducted at source as per applicable law and less the percentage to apply to the work not completed. If the total amount due to the Employer exceeds any payment due to the Contractor the difference shall be treated as debt payable to the Employer and can be recovered from any amount due or may become due to the contractor.

In the case of termination, works that are pending for the proper completion of the project, shall be carried out by the Employer either by themselves or through any other agency. Any additional expenditure over the value finalised in the contract for any component or for the whole project, incurred by the Employer by the Employer due to such termination, shall become recoverable from the contractor/firm whose contract stands terminated, from the money due or may become due to him/them

All materials on the Site, Plant, Equipment, Temporary Works and Works are deemed to be the property of the Employer, if the Contract is terminated because of Contractor's default

40. Plant etc not to be removed

The plant, tools and materials provided by the contractor/firm shall, from the time they are brought to the site of the works, during the construction and until the satisfactory completion of the contract, shall become and continue to be the property intended for the proper fulfillment of the contract and the contractor/firm shall not remove the same or part thereof without the consent of the Engineer in charge in writing.

41. Contractor not to occupy Land etc

In no case shall the contractor/firm continue to use or occupy or allow to be used or occupied any land or property either for the deposit of materials or plant or for any purpose whatever, after written notice from the Engineer in charge served on the contractor/ firm to the effect requiring the contractor/firm to remove or cause to be removed all such materials from any such land or property as aforesaid and to give vacant possession of such land or property to the Engineer in charge. All such notices shall be served through post office or other modes of delivery to the contractor/firm at his/their usual or last known place of business, It is enough for the Engineer in charge to send the notice through any mode of delivery as he may prefer and implement this clause irrespective of the receipt of the notice by the contractor/firm. Should any materials or plant remain upon any such property or land or should any such land or property continue to be occupied or be used after such notice for any purpose whatsoever as aforesaid, then and in every such case and as often as the same shall happen, the contractor/firm shall forfeit and on demand pay to the Employer the charges fixed by the Engineer in charge as and for liquidated and ascertained damages for each and every day during which the said lands or property are so used and occupied as aforesaid from the time of such notice shall have been served.

42. Completion and Delivery of the Works

The completion and delivery of the works shall be deemed to be full, complete and sufficient only when the Engineer in charge accepts the same and issues a certificate in writing viz. "Certificate of Completion" under the hand of the Engineer in charge to the effect that all the works contracted for and directed to be executed have been completed and are in a sound, water tight, workmanlike and complete and usable condition and the contractor has in the opinion of the Engineer in charge reasonably fulfilled and completed his contract and undertaking except so far as it relates to the maintenance of the works as hereinafter provided. Provided always and notwithstanding anything contained in the contract, it shall be lawful for the Employer to undertaker and execute either departmentally or through other parties at any period during the continuance of this contract, any kind of work, matter or thing whatsoever, which they may consider necessary or proper to be performed and executed for the purpose of any in connection with any or all of the works under this contract and that without in any way relieving the contractor/firm from any of his/their liabilities and responsibilities under this contract or in any way vitiating or voiding this contract.

43. Final Certificate

When the works covered under this contract are completed in all respects, the contractor/firm shall submit a request to the Engineer in charge to make a final measurement of the works and take over the whole of the works on behalf of the Employer and issue a final certificate to enable him/them to submit a final bill for payment. The Engineer in charge shall thereupon, unless he records reasons in writing to the contrary, make a final measurement of the works and take them over on behalf of the Employer and sign a certificate purporting to be a last certificate. Nothing in this clause or in the agreement shall prohibit the Employer taking over and using any portion of the works which may be completed prior to the completion of the whole works of this contract.

44. Completion Certificate

The Contractor shall request the Engineer to issue a certificate of Completion of the Works and the Engineer shall issue certificate of completion after satisfactory completion of the works in all respects

45. Taking Over

The Employer shall takeover the Site with the works within thirty days after satisfactory completion of the maintenance of the entire project for the stipulated period as contemplated in this contract.

46. Maintenance of the Project

The contractor/firm shall successfully maintain the project for the stipulated period from the successful commissioning of the project. During the period of maintenance, all costs towards labour, spares, consumables, chemicals, repairs and renewals shall be borne by the firm/contractor. The electrical energy charges payable to the TNEB during the maintenance period shall be borne by the Employer.

47. Operating and Maintenance Manual

"As built" drawings and operating and maintenance manuals shall be supplied by the contractor/firm at the time of handing over the completed works at his/their cost

48. Work on Private Property

The contractor/firm shall not commence any work in or upon, under, across of through any land, house building, shed, yard, area, roadway, ground, garden or any other place being private property until authorised in writing by the Engineer in charge to do so.

49. Protection

It will be the responsibility of the contractor to take adequate precautions and protect the adjoining sites against structural, decorative and other damages. The contractor shall be responsible for the safety of the public properties wherever the works are executed. Whenever damages are caused to the adjoining structures, roads, bridges etc due to the execution of this contract, it will be the responsibility of the contractor to restore them to their original level at his cost.

50. Accident or Injury to Workmen

The Employer shall not be liable for or in respect of any damages or compensation payable to any workman or other person in the employment of the Contractor or any Subcontractor. The Contractor shall indemnify and keep indemnified the Employer against all such damages and compensation and against all claims, proceedings, damages, costs, charges and expenses whatsoever in respect thereof or in relation thereto

51. Risk Insurance

The firm/Contractor shall provide risk insurance at their/his cost against loss or damages to the construction to cover from the start date to the end of the Defects Liability Period, for the following events

- Loss of or damage to the Works, Plant and Materials
- Loss of or damage to Equipment
- Loss of or damage of property (except the Works, Plant, Materials and Equipment) in connection with the Contract and
- Personal injury or death

Policies and certificates for insurance shall be delivered by the Contractor to the Engineer for the Engineer's approval before the Start Date. All such insurance shall provide for compensation to be payable in the types and proportions of currencies required to rectify the loss or damage incurred. The contractor will not be eligible for any payment on this account.

If the Contractor does not provide any of the policies and certificates required, the Employer shall effect the insurance which the Contractor should have provided and recover the premiums the Employer has paid from payments otherwise due to the Contractor or, if no payment is due, the payment of the premiums shall be a debt due

Alterations to the terms of an insurance shall not be made without the approval of the Engineer.

52. Care and Risk

From the date of commencement to the date of completion of the work and during the period of maintenance, the contractor shall take full responsibility and care thereof for the safety of the installation connected with the works. Any damage or loss are to be made good at the risk and cost of the contractor and shall ensure conformity in every respect with the requirements of the contract. The contractor shall be liable for any damage to the works occasioned by him in the course of any operation carried out by him for the purpose of completing any outstanding work and the damage so occurred shall be rectified at the cost of the contractor.

53. Safety Provisions

The contractor shall arrange for the safety provisions in his operation as required including the provisions in the safety manual published by the central water and power commission. New Delhi (January 1962 edition). In case the contractor fails to make such arrangements the Engineer in charge shall be entitled to cause them to be provided and to recover the cost thereof from the contractor.

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For failure to comply with the provision of Safety Manual, the contractor shall without prejudice to any other liability, pay the Employer a sum for each day of default at the rates that will be fixed by the Employer.

54. Provision of Health and Sanitary Arrangements

The contractor/firm, shall provide at his/their own expenses, first aid appliances and medicines including an adequate supply of sterilised dressing and sterilised cotton wool kept in good order under the charge of a responsible person who shall be readily available during working hours.

Water of good quality fit for drinking purposes shall be provided for the work people on a scale of not less than 15 litres per head per day. Each water supply storage shall be at a distance of not less than 15 metres from any latrine, drain or other source of pollution. Where water has to be drawn from an existing well which is within such proximity of latrine, drain or other sources of pollution, the well shall be properly chlorinated before water is drawn from it for drinking.

Adequate washing and bathing places shall be provided separately for men and women and such places shall be kept in clean and drained condition. Latrines and urinals shall be provided within the precincts of work place and the accommodation separately for each of them shall be at the rate of 2 seats upto 50 persons, 3 seats above 50 persons but not exceeding 100 persons, and 3 seats for every additional 100 persons. The contractor/firm shall employ adequate number of scavengers and conservancy staff to maintain the latrines and urinals in a clean condition.

Two sheds one for meals and the other for rest shall be provided separately for the use of men and women workers and properly maintained.

All the above amenities shall be provided at the contractor's/firm's own expenses besides providing sheds for his/their workmen.

55. Patent Rights

The Contractor shall save harmless and indemnify the Employer from and against all claims and proceedings for or on account of infringement of any patent rights, design trademark or name or other protected rights in respect of any Contractor's Equipment, material or Plant used for or in connection with or for incorporation in the Works and from and against all damages, costs, charges and expenses whatsoever in respect thereof or in relation thereto

56. Royalties

Except where otherwise stated, the Contractor shall pay all seignorage and other royalties, rent and other payments or compensation, if any, for getting stone, sand, gravel, clay or other materials required for the Works.

57. Old Curiosities

All old curiosities, relics, coins, minerals and any other item of archeological importance found at the site shall be the property of the Government and shall be handed over to the Engineer in charge for depositing to the Government exchequer. Should any structure be uncovered, the instruction of the Engineer in charge shall be provided before demolition or removal of the structure.

58. Contractor Dying, becoming Insolvent or Insane

In the event of death or insanity of the contractor, the contract may be terminated by notice in writing, pasted at the site and advertised in the issue of the local newspaper. All acceptable works shall thereafter, be paid at appropriate rates after recovering all the contractor's dues to Employer, to the persons entitled to receive and give a discharge for such payments.

In the contractor is imprisoned because insolvent compound with his creditors has a receiving order made against him or carriers on business under receiver for the benefit of the creditors of any of them or being a corporation goes into liquidation or commences to be wound up not being a voluntary winding up for the purpose only of amalgamation or reconstruction, the employer shall be at liberty.

a) To give such liquidator, receiver or other persons in whom the contract may become vested the option of carrying out the contract or a portion thereof to be determined by the employer, subject to his providing an appropriate guarantee for the performance of such contractor.

b) To terminate the contract forthwith by notice in writing to the contractor the liquidator, the receiver or person in whom the contract may become vested and take further actions as provided in the clause pertaining to default by contractor, treating as if this termination is ordered under the respective clause.

59. Force Majeure

Neither party shall be liable to the other for any loss or damage occasioned by or arising out of Acts of God such as unprecedented flood, volcanic eruptions, earthquake or other special risks referred above which

prevent the performance of the contract and which could not have been foreseen or prevented by the prudent person.

If a Force Majeure situation arises, the contractor shall promptly notify the Employer in writing of such condition and the cause thereof, Unless otherwise directed by the Employer in writing, the contractor shall continue to perform the obligations as far as it is reasonably practical and shall seek all reasonable alternative means for performing those not prevented by Force Majeure.

60. Payment out of Public Funds

The payments to the contractor/firm shall be made out of the funds under the control of the Employer in their public capacity and no member or officer of the Employer shall be personally responsible to the contractor/firm.

61. Bribery and Collusion

In the event of the contractor offering or giving any official of the employer, any gift or consideration of any kind as an inducement or regard for doing, or for bearing to do, any action in relation to obtaining or in the execution of the contract or any other contract with the employer, or for showing favour to any person in relation to the contract or any other contract with the employer, or if any of the such acts shall have been done by any person employed by the contractor or acting on his behalf, either with the knowledge of the contractor or not which are all grounds for the employer to terminate the contract awarded to the contractor. Similarly if the contractor colludes with another contractor or number of contractors whereby an agreed quotation or estimate shall be offered as a bid, that will also form the basis for the employer to terminate the contract.

62. Technical audit

It is a term of this contract that department shall have the right to carry out post payment audit and technical Audit by the Engineers of Technical audit cell (or by an approved consultant of repute). The Technical audit officer shall have the powers to inspect the work or supply running account bill, final bill and other vouchers, measurement books, test reports and other documents either during progress of work or after completion of the same and order recoveries from the contractor for recorded reasons even though the contractor might have been paid earlier. These recoveries are enforceable against the contractor from any amount due to him, from performance security or withheld amounts or any amounts due to the contractor or may become due to him from the department in any work or supply.

63. Jurisdiction of Court

In the event of any dispute arising between the parties hereto in respect of any matter comprised in the 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.

64. Reservation of Right

The Employer reserves the right to accept or reject any or all the bids and to annul the entire process of bidding at any time. Under such circumstances, the Employer will neither be under any obligation to inform the bidders of the grounds for the action of the Employer nor the Employer will be responsible for any liability incurred by the bidder on this account.

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.

VIII. Pump sets 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 condition of all equipments and accessories offered by the contractor under this contract should be done by the contractor.
- 4) Test certificates for machinery and equipments 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 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, equipments 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 (transformer, generators, pump sets and other accessories) and obtaining safety certificate on completion of work from Chief Electrical Inspector to Government of Tamil Nadu 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 equipments before the supply of the same. After execution of the Safety Certificate if any modification or 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, Inorthington, Flow More or equivalent
2)	Turbine Pump	Kirloskar, Jyothi Best and Crompton Mather and Platt, Inorthington, Flow more Fair Banks Morse or equivalent.
3)	Submersible pump and motor	KSB, Calama, Waterman, Atlanta or equivalent
4)	Make of motor	Jyothi NGEF, GEC, Crompton and Greeves, Siemens or equivalent
5)	Make of transformer	Kirloskar, GEC Indo TECH, Hindustan or equivalent
6)	Diesel Generator	Kirloskar, GEC or 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

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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 manufacturers 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 pump sets.

All tests necessary to ensure that the plan and machinery or equipments 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 completion of erection. Should the result of these test not done within the margin specified, the test shall 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 completed 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.
- 14) To ensure that BEE 3 star rated pumpset for the following types of pumpsetss are excuted in the schemes.
 - a) Borewell submersible pumpsets
 - b) openwell submersible pumpsets
 - c) Monoblock pumpsets

Performance Guarantee

The period of guarantee for the Pumpset shall be 12 months from the date of completion and commissioning of the Pumpset to the satisfaction of the Engineer incharge of the work. This will include the maintenance of the pumpset by the firm/contractor for a period of 6 months. If defects are noticed during the guarantee period, the firm/contractor shall rectify/replace wherever necessary at its/his own cost within 30 days of such intimation. If the contractor/firm fails to carry out rectification within the stipulated time, the rectification works shall be carried out by the Employer at the risk and cost of the contractor/firm and contractor/firm will become ineligible for the payment of the retention amount for the said purpose

6. Pipes, Specials and Valves.

7.1 General.

7.1.1 All types of pipes required for the works should be good quality conforming to relevant BIS and should be procured from reputed manufacturer or his authorised dealer. Each pipe should bear the trademark 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.

8 FUND CONTRIBUTION FOR MANUAL WORKERS:

9 Towards contribution of fund for the benefit of manual workers employed in the construction works an amount equivalent to 1.0 % of estimate amount will be paid by the employer direct to the Workers welfare board as per G.O.Ms.No.80/ Labour and Employment Department / dated. 05.06.1997, G.O.Ms. No.95/Labour and Employment Department/dated. 02.07.1997 and G.O.Ms. No.283/MAWS/dt.11.11.2010