



GOVERNMENT OF BIHAR

STANDARD BIDDING DOCUMENT

URBAN WATER SUPPLY SCHEME OF AURANGABAD NAGAR PARISHAD (PHASE 2) UNDER AMRUT AND STATE PLAN

PROCUREMENT OF CIVIL WORKS

**BIHAR URBAN INFRASTRUCTURE DEVELOPMENT
CORPORATION Ltd**

STANDARD BIDDING DOCUMENT

FOR THE WORK OF

Design and Construction of drinking water supply scheme of **Aurangabad Nagar Parishad under AMRUT and state plan Scheme (Phase II)** with six months of Trial run and thereafter operation and maintenance of system for next five years.

(A) Construction of Elevated Service reservoir (ESR)/OHT-7 Nos., of different capacities ranging from 450 KL to 1350 KL having office room and toilet with water supply arrangement at ground below the tank DI/CI Distribution Network-96.68 Km, providing house service connection-1400 Nos. - **3262.683 Lakh**

(B) Construction of High Yielding Tubewell-12 Nos., Raw water Pump- 1 set, Approach road-779.90 M (for CWR, ESR), Clear Water Pipe line (CWR at Barun-20.10

Km, (600 mm dia DI K9 Pipe), Construction of Gangway-1 set (3000 m long 1 m wide), Lifting Arrangement 2 set, Chlorinator (200 L)-1 No., Construction of Chlorinator room 1 No., Stand Post-20 Nos., Master Elevated Reservoir- 1 No. (1270 KL), having office room and toilet at ground floor below tank area Intermediate Pumping Station-3 Nos., (Zone-III, Zone-V, Zone-VI), Clear water reservoir-1 No. at Barun (1340 KL), Clear water pump- 1 set, Clean water Pumping Main-630 M (250mm dia, 600mm dia), Clear water Gravity Main-12.012 Km (250mm dia, 750mm dia), DI/CI Distribution Network 77.81 Km (Zone I, III & IV), House Service connection-8340 Nos., SCADA System- 8 Nos. – **99,38.174 Lakh.**

INVITATION FOR BID (IFB)

**BIHAR URBAN INFRASTRUCTURE DEVELOPMENT
CORPORATION Ltd**

BILL OF QUANTITY

FOR

**Construction of drinking water supply scheme for Aurangabad Nagar
Parishad (Phase 2) under AMRUT and State Plan**

- | | | |
|---|---|--|
| 1 | Period for Download of Tender Document: | From 06.5.2019 to 21.05.2019 till 5.00 PM on www.eproc.bihar.gov.in |
| 2 | Date of Pre Bid Meeting: | Date- 10.05.2019 , Time- 03.00 P.M |
| 3 | Place of pre-bid meeting: | Office of the Chief Engineer,
BUIDCO Patna |
| 4 | Last date & time of receipt (upload) of Bid Document: | 2.05.2019 till 5.00 P.M.
On www.eproc.bihar.gov.in |
| 5 | Opening date & time of Technical Bid: | Date- 27.05.2019 Time- 3.00 P.M
On www.eproc.bihar.gov.in |
| 6 | Estimated Cost: | Rs. 13000.857 Lakh |
| 7 | Earnest money: | Rs. 140.009 Lakh |
| 8 | Cost of Tender Document: | Rs. 10000/- |
| 9 | Processing fee for BSEDC: | Rs. 17700/- |

Sd/-
Executive Engineer
BUIDCO, Aurangabad

GOVERNMENT OF BIHAR

BIHAR URBAN INFRASTRUCTURE DEVELOPMENT

CORPORATION Ltd

TENDER DOCUMENT

NAME OF THE WORK

Design and Construction of drinking water supply scheme of **Aurangabad Nagar Parishad under AMRUT and state plan Scheme (Phase II)** with six months of Trial run and thereafter operation and maintenance of system for next five years.

(A) Construction of Elevated Service reservoir (ESR)/OHT-7 Nos., of different capacities ranging from 450 KL to 1350 KL having office room and toilet with water supply arrangement at ground below the tank DI/CI Distribution Network-96.68 Km, providing house service connection-1400 Nos. - **3262.683 Lakh**

(B) Construction of High Yielding Tubewell-12 Nos., Raw water Pump- 1 set, Approach road-779.90 M (for CWR, ESR), Clear Water Pipe line (CWR at Barun-20.10

Km, (600 mm dia DI K9 Pipe), Construction of Gangway-1 set (3000 m long 1 m wide), Lifting Arrangement 2 set, Chlorinator (200 L)-1 No., Construction of Chlorinator room 1 No., Stand Post-20 Nos., Master Elevated Reservoir- 1 No. (1270 KL), having office room and toilet at ground floor below tank area Intermediate Pumping Station-3 Nos., (Zone-III, Zone-V, Zone-VI), Clear water reservoir-1 No. at Barun (1340 KL), Clear water pump- 1 set, Clean water Pumping Main-630 M (250mm dia, 600mm dia), Clear water Gravity Main-12.012 Km (250mm dia, 750mm dia), DI/CI Distribution Network 77.81 Km (Zone I, III & IV), House Service connection-8340 Nos., SCADA System- 8 Nos. – **99,38.174 Lakh**

Cost of Tender Document	-	Rs. 10000/-
Processing fee for BSEDC	-	Rs. 17700/-
Estimated Cost	-	Rs. 13000.857 Lakh
Earnest money	-	Rs. 140.01 lakh
Time of Completion	-	36 Months
Date and time of Pre-Bid meeting	-	10.05.19, Time-03.00 P.M

Place of Pre-Bid meeting

Place- Office of Chief Engineer, BUIDCO, Patna

Last date of receipt of tender document - 22.05.19 till 5.00 P.M

LETTER OF SUBMITTING TENDER

To,
The Chief Engineer

BIHAR URBAN INFRASTRUCTURE DEVELOPMENT CORPORATION Ltd , Patna

Subject: Submission of Tender for the work of Construction of Water Supply Scheme for Aurangabad Nagar Parishad (Phase2) under AMRUT and State Plan.

Ref.: Your tender notice No- BUIDCO/D2/WS-165/2018-19

Dear Sir,

With reference to the tender invited by you for the work "Design and Construction of drinking water supply scheme includes creation of master plan for water supply in town, creation of water sources, construction of pump house with attendant room, compound wall and approach road, supply and installation of mechanical and electrical instruments, provision of rising mains, distribution network, elevated service reservoirs, installation of chlorinator, providing house service connection etc. for **Phase 2 of Aurangabad Nagar Parishad under AMRUT and Sate Scheme** with six months of Trial run and thereafter operation and maintenance of system for next five years."

I/We have read and examined the tender documents containing condition of contract, specification, details of work and Bill of quantity.

I/We hereby tender for the execution of the works referred to in the aforesaid documents upon the terms and conditions contained or referred to therein and in accordance with all respect with the specifications, designs, drawings and other relevant details as such amount, rate, as may be fixed under the terms and conditions of the contract and within the period of completion as stipulated in the tender documents.

I/We hereby agree that I/We have made myself/ourselves, thoroughly conversant with the local conditions regarding all materials and labours on which I/We have based my/our rates for this work.

I/We agree to keep the tender open for acceptance for 120 days from the last date specified for the submission thereof and not to make any modifications in terms and conditions, which are not acceptable to the department.

I/We also agree that any terms and the conditions in the tender at variance with the above stipulation will render the tender liable for rejection.

I/We have deposited as Earnest money of Rs. _____ (Rs. _____) in shape of _____

Duly pledged in favour of Executive Engineer, BIHAR URBAN INFRASTRUCTURE DEVELOPMENT, Patna.

I/We do hereby agree that if after the tender is accepted and if I/We fail to execute the deed within 15 days of the receipt of the order, the department shall, without prejudice to any other right or remedy, be at liberty to forfeit the said earnest money absolutely.

I/We undertake to commence the work within 15 days of the date of issue of letter of work order by the department. I/We understand that you are not bound to accept the lowest of any tender that you receive.

This tender together with relevant correspondence till finalization of the contract shall constitute a part of the contract between us.

Signature of Tenderer
Postal Address

GOVERNMENT OF BIHAR



BIHAR URBAN INFRASTRUCTURE DEVELOPMENT CORPORATION Ltd

Daroga Prasad Rai Path, R Block, Patna 800001.

PHONE NO-+91-612-2506109

SHORT NOTICE INVITING TENDER

E-Bidding NIT No. –BUIDCO/D2/WS- 165 /2018-19

(Through e-procurement mode only on website www.eproc.bihar.gov.in)

1. Designation and Address of the Advertiser : - Executive Engineer, BUIDCO, Aurangabad
2. Date of issue of NIT : - **25.02.2019**
3. Period for download of Tender Document : - From **07.03.2019** to **25.03.2019** till **5.00 P.M**
On website www.eproc.bihar.gov.in
4. Date, Time and Place of Pre-Bid Meeting : - Date- **12.03.2019**, Time-**03.00 P.M**
Place- Office of Chief Engineer, BUIDCO, Patna
5. Last Date & time for uploading tender Documents by bidder : - **26.03.2019** till **5.00 P.M** on website
www.eproc.bihar.gov.in
6. Last Date, Time and Place for submission Of Original Instrument of EMD and Cost Of BOQ : - Till **3.00 P.M** on **27.03.2019**
 1. Chief Engineer (SOUTH), BUIDCO, Patna
 2. Superintending Engineer BUIDCO, Patna
 3. Executive Engineer, BUIDCO, Aurangabad.
7. Date, time & Place of opening of Technical Bid : -Date- **29.03.2019** Time- **3.00 P.M** on website www.eproc.bihar.gov.in
8. Date, time & Place of opening Rate Bid : - To be decided after finalization of Technical Bid on www.eproc.bihar.gov.in

9. Details of work -

S. No.	Name of Work	Estimated cost (In Lakh.)	Earnest Money (in Lakh)	Cost of B.O.Q (Non-Refundable (in Rs.)	Processing fee for BSED in Rs. (To be paid online in BSED A/C directly by the Tenderer)	Time of Completion
1	2	3	4	5	6	7

1	<p>Design and Construction of drinking water supply scheme of Aurangabad Nagar Parishad under AMRUT and state plan Scheme (Phase II) with six months of Trial run and thereafter operation and maintenance of system for next five years.</p> <p>(A) Construction of Elevated Service reservoir (ESR)/OHT-7 Nos., of different capacities ranging from 450 KL to 1350 KL having office room and toilet with water supply arrangement at ground below the tank DI/CI Distribution Network-96.68 Km, providing house service connection-1400 Nos. - 3262.683 Lakh</p> <p>(B) Construction of High Yielding Tubewell-12 Nos., Raw water Pump- 1 set, Approach road-779.90 M (for CWR, ESR), Clear Water Pipe line (CWR at Barun-20.10 Km, (600 mm dia DI K9 Pipe), Construction of Gangway-1 set (3000 m long 1 m wide), Lifting Arrangement 2 set, Chlorinator (200 L)-1 No., Construction of Chlorinator room 1 No., Stand Post-20 Nos., Master Elevated Reservoir- 1 No. (1270 KL), having office room and toilet at ground floor below tank area Intermediate Pumping Station-3 Nos., (Zone-III, Zone-V, Zone-VI), Clear water reservoir-1 No. at Barun (1340 KL), Clear water pump- 1 set, Clean water Pumping Main-630 M (250mm dia, 600mm dia), Clear water Gravity Main-12.012 Km (250mm dia, 750mm dia), DI/CI Distribution Network 77.81 Km (Zone I, III & IV), House Service connection-8340 Nos., SCADA System- 8 Nos. – 10733.075 Lakh</p>	13995.758	149.96	10000.00	17700.00	36 (Thirty Six months)
---	---	-----------	--------	----------	----------	----------------------------

10. Bid Validity – 120 days
11. For support related to e-tendering process, bidders may contact at following address “e- Procurement HELP DESK, First Floor, Plot No.- M/22, Road No.-25, Sri Krishna Nagar, Bank of India Compound, Patna-800001, Contact No: 0612-2523006; 7542028164”. Vendor may visit the link “Vendor Info” at www.eproc.bihar.gov.in
12. The BUIDCO reserve the right to extend or reject any tender or all tenders without assigning any reason thereof.
13. Detailed N.I.T can be seen of website- www.eproc.bihar.gov.in or www.prdbihar.gov.in
14. For participating in above tender, Tenderer must have registered in central government or any state government or any PSU. After issue letter of acceptance the tenderer will have to be registered in appropriate class of BUIDCO before entering into Agreement.
15. The bidder should not be blacklisted or debarred by centre/state Govt. or its agency/ utility/ enterprises. Scan copy of an affidavit on Rs.100+5 stamp paper of this regard must be uploaded in bid.
16. Bidder desiring to participate in this tender shall have to get registered with e-procurement on www.eproc.bihar.gov.in so that he has user ID, password and a valid digital signature. For more details contact to BSEDC help desk, M/22, Bank of India building, Road No. 25 Sri Krishna Nagar, Patna 800001.
17. “BSEDC Processing Fee is mandatory to be paid through online mode i.e. Internet Payment gateway (Credit/Debit Card), Net banking, NEFT / RTGS.”

18. "Bids along with necessary online payments must be submitted through e-Procurement portal www.eproc.bihar.gov.in before the date and time specified in the NIT. The department doesn't take any responsibility for the delay / Non Submission of Tender / Non Reconciliation of online Payment caused due to Non-availability of Internet Connection, Network Traffic / Holidays or any other reason."
19. The bidder shall have to submit cost of tender document (Cost of BOQ in form of DD of any nationalized bank in favour of **Executive Engineer, BUIDCO, Aurangabad**).
20. A scanned copy of the instrument(s) for Earnest Money and cost of tender document has to be uploaded along with the tender documents.
21. The bidders must use MS Office- 2003 version. File size should be less than 5MB and should be in M.S. word, M.S. Excel, PDF and JPEG Formats.
22. No claim shall be entertained on account of disruption of internet service being used by bidders. Bidders are advised to upload their bids well in advance to avoid last hour's technical snags.
23. The conditional tender will not be accepted.
24. The tender will be received in two bid system i.e. Part – I Technical & Part –II Financial.
25. The quantity and amount of BOQ may increase or decrease but the cost of EMD shall remain unchanged for which the tenderer will have no any claim.
26. **Corrigendum/Addendum, if any, will be published only on the website www.eproc.bihar.gov.in itself.**
27. Taxes & Cess deduction: - Taxes will be deducted from the each bill of the contractor as applicable. One percent cess will be deducted from each bill in the head of welfare of labor as per rule.
28. Regarding any information of the proposed work bidder should contact the Executive Engineer, Aurangabad / Superintending Engineer, BUIDCO TS TO CE, Water supply & Sewerage (South)/Chief Engineer BUIDCO Water supply & Sewerage (South) on any working day before submission of bid.
29. The rates quoted shall be including all prevailing taxes.
30. Letter No.- 14333 dated- 05.09.2012 of Rural Works Department, Bihar will be followed.

Sd/-

**Executive Engineer
BUIDCO, Aurangabad**

Bihar Urban Infrastructure Development Corporation Ltd., Patna

Corrigendum – 3

Revised Time Schedule of Bidding Process

NIT No. – BUIDCO/D2/WS- 165/2018-19

The dates related to the bids should be read as below;

Heads	Original	Corrigendum – 1	Corrigendum – 2	Revised
Place & Date of Pre-bid Meeting	Date 12.03.2019 Time 03:00PM	Date 08.04.2019 Time 03:00PM	Date 10.05.2019 Time 03:00PM	Date 15.05.2019 Time 03:00PM at BUIDCo Conference Hall
Date of downloading of bid Document	From 07.03.2019 to 25.03.2019 up to 05:00 PM	From 29.03.2019 to 15.04.2019 up to 05:00 PM	From 06.05.2019 to 21.05.2019 up to 05:00 PM	From 10.05.2019 to 27.05.2019 up to 05:00 PM
Last date and time for receipt of bids	Date 26.03.2019. up to 05:00 PM	Date 16.04.2019. up to 05:00 PM	Date 22.05.2019. up to 05:00 PM	Date 28.05.2019. up to 05:00 PM
Last Date and time for Submission of hard copy of bid	Date 27.03.2019 up to 03:00 PM	Date 17.04.2019 up to 03:00 PM	Date 24.05.2019 up to 03:00 PM	Date 30.05.2019 up to 03:00 PM
Date and time of opening technical bids	Date 29.03.2019 Time 03:00 PM	Date 27.04.2019 Time 03:00 PM	Date 27.05.2019 Time 03:00 PM	Date 31.05.2019 Time 03:00 PM

Sd/-
Executive Engineer
BUIDCO, Aurangabad

SECTION 1

INSTRUCTION TO BIDDERS

(ITB)

Section 1: Instructions to Bidders

Table of Clauses

A. General

1. Scope of Bid
2. Source of Funds
3. Eligible Bidders
4. Qualification of the Bidder
5. One Bid per Bidder
6. Cost of Bidding
7. Site Visit

B. Bidding Documents

8. Content of Bidding Documents
9. Clarifications of Bidding Documents
10. Amendment of Bidding Documents

C. Preparation of Bids

11. Language of Bid
12. Documents Comprising the Bid
13. Bid Prices
14. Currencies of Bid and Payment
15. Bid Validity
16. Bid Security
17. Alternative Proposals by Bidders
18. Format and Signing of Bid

D. Submission of Bids

19. Sealing and marking of Bids
20. Deadline for Submission of Bids

21. Late Bids

E. Bid Opening and Evaluation

22. Bid Opening

23. Process to be Confidential

24. Clarification of Financial Bids

25. Examination of Bids and Determination of Responsiveness

26. Correction of Errors

27. Evaluation and Comparison of Financial Bids

F. Award of Contract

28. Award Criteria

29. Employer's Right to accept any Bid

And to reject any or all Bids

30. Notification of Award and

Signing of Agreement

31. Performance Security

32. Advance Payment and Security

33. Corrupt or Fraudulent Practices

G. Appendix to I TB

H. Annexure-I

Annexure-II

A. GENERAL

1. Scope of Bid

- 1.1 The Employer (named in Appendix to ITB) invites bids for the construction of works (as defined in these documents and referred to as “the works”) detailed in the table given in IFB. The bidders may submit bids for any or all of the works detailed in the table given in IFB.
- 1.2 The successful bidder will be expected to complete the works by the intended completion date specified in the Contract data.
- 1.3 Throughout these bidding documents, the terms ‘bid’ and ‘tender’ and their derivatives (bidder / tenderer, bid / tender, bidding / tendering, etc.) are synonymous.
- 1.4 This Tender will be with six months of trial run and five years of operation and maintenance after completion of trial run.

2. Source of Funds

- 2.1 The expenditure on this project will be met by the Government.

3. Eligible Bidders

- 3.1 This Invitation for Bids is open to all bidders.
- 3.2 All bidders shall provide in Section 2, Forms of Bid and Qualification Information, a statement that the Bidder is neither associated, nor has been associated, directly or indirectly, with the Consultant; Engineer-in-Charge or any other entity that has prepared the design, specifications, and other documents for the Project or being proposed as Project Manager for the Contract or involved in supervision of the contract. A firm that has been engaged by the Employer to provide consulting services for the preparation or supervision of the works, and any of its affiliates shall not be eligible to bid.
- 3.3 Bidders shall not be under a declaration of ineligibility for delay, failure or corrupt and fraudulent practices by any of the State Govt. or Central Govt. or Public Undertaking or any Autonomous Body.

4. Qualification of the Bidder

- 4.1 All bidders shall provide in Section 2, Forms of Bid and Qualification Information, a preliminary description of the proposed work method and schedule, including drawings and charts indicating miles stones to complete the project on time.
- 4.2 All bidders shall also furnish the following information in Section 2.
 - (i) Evidence of access to or availability of credit facilities (minimum 10% of estimated cost) certified by the bankers.
 - (ii) Undertaking that bidder would be able to invest a minimum of cost upto 25% of the contract value of work, during implementation of contract.

(iii) Proposals, if any, for sub contracting of elements of work, costing more than 10% of the bid amount. (For all contracts over Rs. 5 crore)

(iv) Power of attorney, if any.

4.3 If the Employer has not undertaken prequalification of potential bidders, all bidders shall include the following information and documents with their bids in Section 2:

(a) copies of original documents defining the constitution or legal status, place of registration, and principal place of business; written power of attorney of the signatory of the Bid to commit the Bidder;

(b) Total monetary value of construction work performed for each of the last five years;

(c) experience in works of a similar nature and size for each of the last five years, and details of works underway or contractually committed; and clients who may be contacted for further information on those contracts;

(d) Major items of construction equipment proposed to carry out the Contract or evidence of arrangement; of possessing them on hire/lease/buying as defined therein;

(e) Qualifications and experience of key site management and technical personnel proposed for contract;

(f) Reports on the financial standing of the Bidder, such as profit and loss statements and auditor's reports for the past five years;

(g) Evidence of access to line(s) of credit and availability of other financial resources facilities (10% of contract value), certified by the Bankers (Not more than 3 months old);

(h) Undertaking that the bidder will be able to invest minimum cash up to 25% of contract value of work, during implementation of work.

(i) Authority to seek references from the Bidder's bankers;

(j) Information regarding any litigation, current or during the last five years, in which the bidder is involved, the parties concerned and dispute amount;

(k) Proposals for subcontracting components of the Works amounting to more than 10% of the Bid Price (for each, the qualifications and experience of the identified sub-contractor in the relevant field should be annexed);

(l) The proposed methodology and programme of construction, backed with equipment planning and deployment, duly supported with broad calculations and quality control procedures proposed to be adopted, justifying their capability of execution and completion of the work as per technical specifications within the stipulated period of completion as per milestones.

4.4 Bids from Joint ventures are acceptable.

4.4.1 Bids from joint venture are allowed for the works having estimated cost more than 10 crores. Bids submitted by a joint venture (JV) of not more than a total of three firms as partners shall comply with the following requirements:-

- (i) There shall be a JV agreement (refer Annexure I) specific for the contract package between the constituent firms indicating clearly, amongst other things, the proposed distribution of responsibilities both financial as well as technical for the execution of work amongst them. For the purpose of this clause, the most experience lead

partner will be the one defined. A copy of JV agreement in accordance with requirements mentioned in Annexure-I shall necessarily be submitted with the bid.

- (a) Alternatively, a letter of intent to execute a JV in the event of successful bid shall be signed by all partners of JV and submitted with the bid together with a copy of the proposed agreement. Pursuant to the foregoing, the JV shall include among other things, the joint venture's objectives, the proposed management structure, the contribution of each partner to joint venture operation, the commitment of the partners to joint and several liability for due performance, recourse/sanctions within the joint venture in the event of default of withdrawal of any partner and arrangements for providing the required indemnities.
- (b) The JV so formed shall also have to be registered with the concerned department after issue of LOA but before the agreement.
- (ii) The bid, and in the case of the successful bidders, the form of agreement, etc, shall be signed and/or executed in such a manner as may be required for making it legally binding on all partners (including operative parts of the ensuing contract in respect of Agreement of Arbitration, etc). On award of work, the Form of Agreement and Contract Documents shall be signed by all partners of the Joint Venture to conclude Contract Agreement.
- (iii) Lead partner shall be nominated as being partner-in-charge; and this authorization shall be evidenced by submitting a power of attorney signed by the legally authorized signatories of all the partners.
- (iv) The partner-in-charge shall be authorized to incur liabilities and to receive instruction for and on behalf of the partners of the Joint Venture, whether jointly or severally and entire execution of the Contract (including payment) shall be carried out exclusively through the partner-in-charge. A copy of the said authorization shall be furnished with the bid.
- (v) All partners of the Joint Venture shall be liable jointly and severally for the execution of the contract in accordance with contract terms, and a relevant statement to this effect shall be included in the authorization mentioned under sub clause (iii) above as well as in the Form of tender and the Form of Agreement (in case of a successful bidder).
- (vi) In the event of default, all the partners of the Joint venture will retain the full and undivided responsibility for the performance of their obligations under the contract and/or for satisfactory completion of the works.
- (vii) The bid submitted shall include all the relevant information as required under the provisions of sub-clause 4.5 of ITB and furnished separately for each partner. The requirement of key plants & equipments construction equipments as per Annexure I of SBD testing equipment for establishing field laboratory key personnel to be employed on contract work as per Annexure II of SBD shall be counted altogether for the partners it shall be less than the requirement.
- (viii) The bank guarantee/other suitable instrument in shape of bid security shall be issued in the name of JV and pledged in favour of employer.

4.4.2 Each partner of the JV must produce:

- (i) The Permanent account number (PAN) of Income Tax

- (ii) An affidavit though 1st class Executive Magistrate that the information furnished with the bid documents is correct in all respect; and
- (iii) Such other certificates as defined in the Appendix to ITB. Failure to produce the certificates shall make the bid non-responsive.

4.4.3 Each bidder must demonstrate:-

- (i) Availability for construction work, either owned, or on lease or on hire, of the key equipment stated in the Appendix to ITB including equipments required for establishing field laboratory to perform mandatory test, and those stated in the Appendix to ITB. The requirement of key plants & equipments construction equipments as per Annexure I of SBD testing equipment for establishing field laboratory key personnel to be employed on contract work as per Annexure II of SBD shall be counted altogether for the partners it shall be less than the requirement.
- (ii) Availability for construction work of technical personnel as stated in the Appendix to ITB. The requirement of key plants & equipments construction equipments as per Annexure I of SBD testing equipment for establishing field laboratory key personnel to be employed on contract work as per Annexure II of SBD shall be counted altogether for the partners it shall be less than the requirement.
- (iii) The joint venture must satisfy collectively the criteria laid down in Para 3.1 & 3.2 above.
- (iv) Liquid assets and/or credit facilities, net of other contractual commitments and exclusive of any advance payments which may be made under the Contract, of not less than the amount specified in the Appendix to ITB.
- (v) The bidder must not have in his employment.
 - (a) The near relations (defined as first blood relations, and their spouses, of the bidder or the bidder's spouse) of persons. The bidder must produce an affidavit stating that the near relations of the following departmental officers are not in his employment:
JE/AE/EE/SE/CE/E-in-C & Divisional Accountant of any works department of Bihar State.
 - (b) Without Government permission, any person who retired as gazette officer within the last two years of the rank and from the departments. The bidder must produce an affidavit stating the names of retired gazetted officer (if any) in his employment who retired within the last two years with the following ranks from the departments listed below:
JE/AE/EE/SE/CE/E-in-C & Divisional Accountant of any works department of Bihar State.

In case there is no such person in his employment, his affidavit should clearly state this fact.

- 4.4.4 To qualify for a package of contracts made up of this and other contracts for which bids are invited in the Notice Inviting Tender, the bidder must demonstrate having experience and resources sufficient to meet the aggregate of the qualifying criteria for the individual contract.
- 4.4.5 If bidder is Joint venture, the partners would be limited to three (including lead partner). Joint venture firm shall jointly and severally responsible for completion of the project. Joint venture must fulfill the following minimum qualification requirement.
- (i) The lead partner shall meet not less than 50% (fifty percent) of qualification criteria given in sub-clause 4.2, 4.5 A, 4.5 B, 4.7 & 4.8 of ITB.
 - (ii) Each of the remaining partners shall meet not less than 25% (Twenty five percent) of all the qualifying criteria given in sub-clause 4.2, 4.5 A, 4.5 B, 4.7 & 4.8 of ITB.
 - (iii) However in case one of the joint ventures partner is proposed to be included primarily to provide financial strength to the joint venture, such joint venture partner shall have to commit to provide liquidity support to the project to the extent of 10% of the value of contract.
 - (iv) The joint venture must also collectively satisfy the subject of the criteria of clause 4.2, 4.5 A, 4.5 B, 4.7 and 4.8 of ITB for this purpose the relevant figures for each of the partners shall be 100% or more.
 - (v) In the event that the Employer has caused to disqualify under clause 4.8 of ITB and the constitutions stated below all of the Joint Venture partners will be disqualified.
 - (vi) Joint venture applicants shall provide a certified copy of the Joint Venture Agreement in demonstration of the partners undertaking joint and several liabilities for the performance of any contract entered into with the bid.
 - (vii) The available bid capacity of the JV as required under clause 4.7 of ITB below will be applied for each partner to the extent of his proposed participation in the execution of the work. The total bid capacity available shall be more than estimated contract value.

The available bid capacity will be calculated as under

$$\text{Assessed Available Bid capacity} = (A \times N \times M - B)$$

Where

- | | | |
|---|---|--|
| A | = | Maximum value of civil engineering works executed in any one year during the last five years (updated to the price level of the last year at the rate of 8 percent a year) taking into account the completed as well as works in progress. |
| N | = | Number of years prescribed for completion of the works for which bids are invited. |
| M | = | 3 |
| B | = | Value, at the current price level, of existing commitments and on-going works to be completed during the period of completion of the works for which bids are invited. |

Note: The statements showing the value of existing commitments and on-going works as well as the stipulated period of completion remaining for each of the works listed should be countersigned by the Engineer in charge, not below the rank of an Executive Engineer or equivalent.

4.4.6 Sub-Contractor's (duly authorized) experience and resources shall be taken into account in determining the bidder's compliance with the qualifying criteria. The sub contractor's role may be verified by the employer.

4.4.7 Qualification of a joint venture does not necessarily qualify any of its partners individually or as a partner to any other joint venture. In case of dissolution of a joint venture, each one of the constituent firms may qualify if they meet all the qualification requirements subject to the written approval of the Employer.

4.4.8 The rescinding of contract of a joint venture on account of reasons other than non-performance, such as most experienced partner of joint venture pulling out, court direction leading to breaking up of a joint venture before the start of work, which are not attributable to the poor performance of the contractor will, however, not affect the qualification of the individual partners.

4.5 A. To qualify for award of the contract, each bidder in its name should have in the last five years as referred to in Appendix :-

(a) Achieved in any one year a minimum annual financial turnover (in all classes of civil engineering construction works only) volume of construction work of at least the amount equal to the 50% (fifty percent) estimated cost of works for which bid has been invited. The turnover will be indexed at the rate of 10% for a year.

One similar nature of work means creation of source laying of distribution system, rising main all electrical / mechanical machinery, over head reservoir, water purification all complete.

(b) Satisfactorily completed as a prime contractor at least one similar work of value not less than amount indicated in Appendix (not less than 50% (Fifty percent) of estimated value of contract),

(c) Executed in any one year, the following items of work as indicated in Appendix.

- Rising Main & Distribution Network CI/DI 100mm dia and above- 85000 Meters
- RCC Overhead Water Tower/Master Reservoir /Sump (size wise) minimum capacity of 454 KL.

(d) The contractor or his identified sub-contractor should possess required valid electrical license for executing the building electrification works and should have executed similar electrical works for a minimum amount as indicated in Appendix in any one year. **(NOT APPLICABLE)**

(e) The contractor or his identified sub-contractor should possess required valid license for executing the water supply / sanitary engineering works and should have executed similar water supply / sanitary engineering works for a minimum amount as indicated in Appendix in any one year.

B. Each bidder must demonstrate:

- (a) Availability (either owned or leased) of the following key and critical equipment for this work:

Based on the studies carried out by the Engineer the minimum suggested major equipment to attain the completion of works in accordance with the prescribed construction schedule are shown in the Annexure-I

The bidders should, however, undertake their own studies and furnish with their bid, a detailed construction planning and methodology supported with lay out and necessary drawings and broad calculations as stated in clause 4.3(I) above to allow the employer to review their proposals. The numbers, types and capacities of each plant/equipment

- (b) Availability for this work of personnel with adequate experience as required; as per Annexure-II.

- (c) Liquid assets and/or availability of credit facilities of no less than amount indicated in Appendix

(Credit lines/letter of credit/certificates from Banks for meeting the funds requirement etc.-usually the equivalent of the estimated cash flow for 3 months in peak construction period.)

C. to qualify for a package of contracts made up of this and other contracts for which bids are invited in the IFB, the bidder must demonstrate having experience and resources sufficient to meet the aggregate of the qualifying criteria for the individual contracts.

4.6 Sub-contractors' experience and resources shall not be taken into account in determining the bidder's compliance with the qualifying criteria except to the extent stated in 4.5(A) above.

4.7 Bidders who meet the minimum qualification criteria will be qualified only if their available bid capacity is more than the total bid value. The available bid capacity will be calculated as under:

Assessed Available Bid capacity = $(A \times N \times 3 - B)$

Where

A= Maximum value of civil engineering works executed in any one year during the last five years (updated to the price level of the year indicated in Appendix) taking into account the completed as well as works in progress.

N = Number of years prescribed for completion of the works for which bids are invited.

B = Value (updated to the price level of the year indicated in Appendix) of existing commitments and on-going works to be completed during the next 18 months.

Note: The statements showing the value of existing commitments and on-going works as well as the stipulated period of completion remaining for each of the works listed should be countersigned by the Engineer in charge, not below the rank of an Executive Engineer or equivalent.

4.8 Even though the bidders meet the above qualifying criteria, they are subject to be disqualified if they have:

- made misleading or false representations in the forms, statements and attachments submitted in proof of the qualification requirements; and/or
- have record of poor performance such as abandoning the works, not properly completing the contract, inordinate delays in completion, litigation history, or financial failures etc; and/or
- participated in the previous bidding for the same work and had quoted unreasonably high bid prices and could not furnish rational justification to the employer.

5. One Bid per Bidder

5.1 Each bidder shall submit only one bid for any work or one package or group. A bidder who submits or participates in more than one Bid (other than as a subcontractor or in cases of alternatives that have been permitted or requested) will cause all the proposals with the Bidder's participation to be disqualified.

6. Cost of Bidding

6.1 The bidder shall bear all costs associated with the preparation and submission of his Bid, and the Employer will in no case be responsible and liable for those costs.

In case of cancellation of tender, cost of bidding document will be charged each time.

7. Site Visit

7.1 The Bidder, at the Bidder's own responsibility and risk must visit and examine the Site of Works and its surroundings and obtain all information that may be necessary for preparing the Bid and entering into a contract for construction of the Works. The costs of visiting the Site shall be at the Bidder's own expense.

7.2 Tender documents are not transferable.

BIDDING DOCUMENTS

8. Content of Bidding Documents

8.1 The set of bidding documents comprises the documents listed below and addenda issued in accordance with Clause 10;

Section	Particulars	Volume No.
	Invitation for Bids	I
1	Instructions to Bidders	I
2	Qualifications of Bidders	I
3	Conditions of Contracts	I
4	Contract Data	I
5	Special condition of Contract	I
6	Technical Specifications	I
7	Bill of Quantities	II
8	Securities and other forms	I
9	Drawings	I
10	Documents to be furnished by bidder	I & II

8.2 One copy of each of the volumes I and II will have to download by the bidder from the website www.eproc.bihar.gov.in. Documents to be furnished by the bidder in compliance to section 2 will be prepared by him and furnished in two parts (refer clause 12).

8.3 The bidder is expected to examine carefully all instructions, conditions of contract, contract data, forms, terms, and technical specifications, bill of quantities, Forms, Annexures and drawings in the Bid Document. Failure to comply with the requirements of Bid Documents shall be at the bidder's own risk. Pursuant to clause 25 hereof, bids which are not substantially responsive to the requirements of the Bid Documents shall be rejected.

9. Clarification of Bidding Documents.

9.1 Pre-bid meeting

9.1.1 The bidder or his official representative is invited to attend a pre-bid meeting which will take place at the address, venue, time and date as indicated in appendix.

9.1.2 The purpose of the meeting will be to clarify issues and to answer questions on any matter that may be raised at that stage.

9.1.3 The bidder is requested to submit any questions in writing or by fax to reach the Employer not later than one week before the meeting.

9.1.4 Minutes of the meeting, including the text of the questions raised (without identifying the source of enquiry) and the responses given will be transmitted without delay to all purchasers of the bidding documents. Any modification of the bidding documents listed in Sub-Clause 8.1 which may become necessary as a result of the pre-bid meeting shall be made by the Employer exclusively through the issue of an Addendum pursuant to Clause 10 and not through the minutes of the pre-bid meeting. All bidders have to collect any addendum within three working day of pre-bid meeting. The bidder shall receive the minutes of the meeting on the next working day of the pre-bid meeting.

9.1.5 Non-attendance at the pre-bid meeting will not be a cause for disqualification of a bidder.

10. Amendment of Bidding Documents

10.1 Before the deadline for submission of bids, the Employer may modify the bidding documents by issuing addendum **on the website www.eproc.bihar.gov.in itself.**

10.2 Any addendum thus issued shall be part of the bidding documents and shall be downloaded by all the purchasers of the bidding documents.

10.3 To give prospective bidders reasonable time in which to take an addendum into account in preparing their bids, the Employer may, at his discretion, extend as necessary the deadline for submission of bids, in accordance with Sub-Clause 20.2 below.

C. PREPARATION OF BIDS

11. Language of Bid

11.1 All documents relating to the bid shall be in English.

12. Documents Comprising the Bid

12.1 The bid to be submitted by the bidder as according Volume I & II of the bid document (refer Clause 8.1) shall be in two separate parts;

Part I shall be name “Technical Bid” and shall comprise

- (i) Earnest money in the form specified in Section 8
- (ii) Qualification Information and supporting documents as specified in Section-2
- (iii) Certificates, undertakings, affidavits as specified in Section 2
- (iv) Any other information pursuant to Clause 4.2 of these instructions
- (v) Undertaking that the bid shall remain valid for the period specified in Clause 15.1
- (vi) An affidavit affirming the information he has furnished in the bidding document is correct to the best of his knowledge and belief.
- (vii) Documents in original duly Signed as in section 3, 5, 6.

Part II shall be named “Financial Bid” and shall comprise

- (i) Priced Bill of Quantities for items specified in Section 7
- 12.2 Each part will be separately prepared and uploaded on website www.eproc.bihar.gov.in in case of e-bidding.
- 12.3 Following documents, which are not submitted with the bid, will be deemed to be part of the bid.

Sl. No.	Particulars
1	Invitation for Bids (IFB)
2	Instructions to Bidders
3	Securities and other forms
4	Contract Data
5	Drawings

13. Bid Prices

13.1 The contractor shall bid for the whole work as described in Sub-Clause 1.1 based on the priced Bill of Quantities submitted by the Bidder.

13.1.1 The bidders is to quote one lump sum price for the entire work based on detailed price analysis of each measure component of the work including trial run for six months and a fixed rate of 2% for each 12 calendar months for O & M after trial run for five years in the Bid form. The rate will be decided on one lump sum price for the entire work including trial run for six months and there after O&M for five years in the Bid form. The price breakup under major components as given in bill of quantity will be decided by Chief Engineer with consent of bidder. Rate should be quoted both in figures and words. There may remain, however, several minor items not specifically mentioned in the break-up but shall be required to complete the job as per scope and specification of works stipulated in the tender

document, these items are deemed covered under other components which are mentioned in bill of quantity.

13.1.2 All duties, taxes and other levies payable by the contractor under the contract or for any other clause shall be included in the rates, prices and total Bid Price submitted by the Bidder.

13.2 The rates and prices quoted by the bidder are subject to adjustment during the performance of the Contract in accordance with the provisions clause 10CA of Conditions of Contract.

13.3 The rate should include the cost of all seen and unseen expenditure. No claim, whatsoever, will be entertained due to non-inclusion of any such event necessary for the completion of the item of work and the whole work.

14. Currencies of Bid and Payment

14.1 The unit's rates and the prices shall be quoted by the bidder entirely in Indian Rupees. All payments shall be made in Indian Rupees.

15. Bid Validity

15.1 Bids shall remain valid for a period of 120 days after the deadline date for bid submission specified in clause 20. A bid valid for a shorter period shall be rejected by the Employer as non-responsive. In case of discrepancy in bid validity period between that given in the undertaking pursuant to Clause 12.1 (v) and the Form of Bid submitted by the bidder, the later shall be deemed to stand corrected in accordance with the former and the bidder has to provide for any additional security that is required.

15.2 In exceptional circumstances, prior to expiry of the original time limit, the Employer may request that the bidders may extend the period of validity for a specified additional period. The request and the bidders' responses shall be made in writing or by cable. A bidder may refuse the request without forfeiting his bid security. A bidder agreeing to the request will not be required or permitted to modify his bid.

16. Earnest Money

16.1 The Bidder shall furnish, as part of his Bid, a Bid security in the amount as shown in column 4 of the table of IFB for this particular work. This bid security shall be in favour of Employer as mentioned in the Bihar Financial Rules, and shall be in any of the following forms.

a. Indian post office terms deposit 1 year/ 2 year/ 3 year; National Saving Certificate; Kisan Vikas Patra duly endorsed by the competent authority in Bihar.

31. b. Fixed deposit receipt of a Scheduled bank, fixed deposit receipt should be valid for five years after last date of receipt of tender and shall be pledged in favour **Executive Engineer, BUIDCO, Aurangabad.**

c. 5 year National Development Bond/State development loan Certificate.

32. d. Unconditional bank guarantee from any scheduled Indian bank issued within the state in the format given in Vol. I (If issued from any bank outside state will be converted to any bank within the state before executing the agreement, duly pledged in favour of the **Executive Engineer, BUIDCO, Aurangabad.**

16.2 Unconditional bank guarantees (and other instruments having fixed validity) issued as surety for the bid shall be valid for **45 days beyond the validity of the bid.**

16.3 Any bid not accompanied by an acceptable Bid Security and no secured as indicated in Sub-Clauses 16.1 and 16.2 above shall be rejected by the Employer as non-responsive.

16.4 The Earnest money of the successful bidder will be discharged when the bidder has signed the Agreement and furnished the required Performance Security.

16.5 The Earnest money may be forfeited

(a) if the Bidder withdraws the Bid after Bid opening during the period of Bid validity;

(b) if the Bidder does not accept the correction of the Bid Price, pursuant to Clause 26;
or

(c) in the case of a successful Bidder, if the Bidder fails within the specified time limit to

(i) Sign the Agreement; or

(ii) Furnish the required Performance Security.

17. Alternative Proposals by Bidder

17.1 Bidders shall submit offers that fully comply with the requirements of the bidding documents, including the conditions of contract, basic technical design as indicated in the drawing and specifications. Conditional offer or alternative offers will not be considered further in the process of tender evaluation.

17.2 Conditional tender will be rejected forthwith.

18. Format and Signing of Bid

18.1 The Bidder shall submit/upload **one set of the Technical bid and one set of financial bid** comprising of the documents as described in clause 12 of ITB.

18.2 The Bid shall be typed or written in indelible ink and shall be signed by a person or persons duly authorized to sign on behalf of the Bidder, pursuant to Sub-Clause 4.3. All pages of the bid where entries or amendments have been made shall be initialed by the person or persons signing the bid and a certificate of corrections must be given by the employer.

- 18.3 The Bid shall contain no alterations or additions, except those to comply with instructions issued by the Employer, or as necessary to correct errors made by the bidder, in which case such corrections shall be initiated by the person or persons signing the bid.

D. SUBMISSION OF BIDS

19. Sealing and Marking of Bids

- 19.1 The Bidder shall submit online the requirements under qualification criteria and Technical documents required and priced schedule/BOQ. All the documents are required to be digitally signed by the bidder. After electronic bid submission, the system generates a unique reference number which is time stamped. This shall be treated as acknowledgement of bid submission.
- 19.2 The employer or service provider is not responsible for any failure such as a bad internet connection or power failure outside of their control. The bidder is responsible to ensure they have sufficient time to submit an electronic bid prior to closing including the payment and receipt of any fees including EMD.
- 19.3 The bidder have to submit original instruments of EMD and cost of BOQ in a envelope clearly marked the name of bidder, purpose and shall be addressed to the employer.

20. Deadline for Submission of the Bids

- 20.1 Complete Bids (including Technical and Financial) must be received by the Employer online not later than the date indicated in appendix.
- 20.2 The Employer may extend the deadline for submission of bids by issuing an amendment in accordance with Clause 10, in which case all rights and obligations of the Employer and the bidders previously subject to the original deadline will then be subject to the new deadline.

21. Late Bids

- 21.1 The electronic bidding system would not allow any late submission of bids after due date and time.

E. BID OPENING AND EVALUATION

22. Bid Opening

- 22.1 The Employer or their authorized representative will open all the Bids received online on website www.eproc.bihar.gov.in. In the event of the specified date of Bid opening being declared a holiday for the Employer, the Bids will be opened on the next working day. Even in the case of absence of the bidder at the time of opening of bids, department will proceed ahead with the opening.

- 22.2 If any of the tenderers or their agents is not present at the time of opening, the employer will open the tender in their absence and prepare a statement and that will be binding on the absent tenderers.
- 22.3 The “Technical Bid” shall be opened first. The amount, form and validity of the Earnest money furnished with each bid will be scrutinized. If the bid security furnished does not confirm to the amount and validity period as specified in the invitation for Bid and has not been furnished in the form specified in Clause 16, the remaining technical bid and the financial bid will be rejected.
- 22.4 (i) Subject to confirmation of the bid security by the issuing Bank, the bids accompanied with valid security will be taken up for evaluation with respect to the Qualification Information and other information furnished in Part I of the bid pursuant to Clause 12.1.
- (ii) After receipt of confirmation of the bid security, the bidder will be asked in writing (usually within 10 days of opening of the Technical Bid) to clarify or modify his technical bid, if necessary, with respect to any rectifiable defects.
- (iii) The bidders will respond in not more than 7 days of issue of the clarification letter.
- (iv) Immediately (usually within 3 to 4 days), on receipt of these clarifications the Evaluation Committee will finalize the list of responsive bidders whose financial bids are eligible for consideration.
- 22.5. At the time of opening of "Financial Bid", the names of the bidders found responsive will be announced. The responsive Bidders' names, the Bid prices, the total amount of each bid, any discounts, Bid Modifications and withdrawals, and such other details as the Employer may consider appropriate, will be announced by the Employer at the opening. Any Bid price or discount, which is not read out and recorded, will not be taken into account in Bid Evaluation.
- 22.6 The Employer shall prepare minutes of the Bid opening, including the information disclosed to those present in accordance with Sub-Clause 22.5

23. Process to be Confidential

- 23.1 Information relating to the examination, clarification, evaluation and comparison of Bids and recommendations for the award of a contract shall not be disclosed to Bidders or any other persons not official concerned with such process until the award to the successful Bidder has been announced. Any effort by a Bidder to influence the Employer's processing of Bids or award decisions may result in the rejection of his Bid.

24. Clarification of Financial Bids

- 24.1 To assist in the examination, evaluation and comparison of Bids, the Employer may, at his discretion, ask any Bidder for clarification of his Bid, including breakdowns of unit rates. The request for clarification and the response shall be sought, offered or permitted except as required to confirm the correction of arithmetic errors discovered by the Employer in the evaluation of the Bids in accordance with Clause 26.
- 24.2 Subject to sub-clause 24.1, no Bidder shall contact the Employer on any matter relating to his bid from the time of the Bid opening to the time the contract is awarded. If the Bidder

wishes to bring additional information to the notice of the Employer, it should do so in writing.

- 24.3 Any effort by the Bidder to influence the Employer in the Employer's bid evaluation, Bid comparison or contract award decisions may result in the rejection of the Bidders' bid.

25. Examination of Bids and Determination of Responsiveness

- 25.1 During detailed evaluation of "Technical Bids", the Employer will determine whether each Bid (a) meets the eligibility criteria defined in Clause 3 and 4; (b) has been properly signed; (c) is accompanied by the required securities and; (d) is substantially responsive to the requirements of the Bidding documents. During the detailed evaluation of the "Financial Bid", the responsiveness of the Bids will be further determined with respect to the remaining bid condition, i.e., priced bill of quantities.

- 25.2 A substantially responsive "Financial Bid" is one which conforms to all the terms, conditions, and specifications of the Bidding documents, without material deviation or reservation. A material deviation or reservation is one (a) which affects in any substantial way the scope, quality or performance of the Works; (b) which limits in any substantial way, inconsistent with the Bidding documents, the Employer's rights or the Bidder's obligations under the Contract; or (c) whose rectification would affect unfairly the competitive position of other Bidders presenting substantially responsive Bids.

- 25.3 If a "Financial Bid" is not substantially responsive, it will be rejected by the Employer, and may not subsequently be made responsive by correction or withdrawal of the non-conforming deviation or reservation.

26. Correction of Errors

- 26.1 **In the online bidding system, the total bid price is worked out automatically by the system on the basis of the rates quoted online by the bidders in the BOQ and shall be considered as binding upon the Bidder. If the Bidder does not accept the corrected amount the Bid will be rejected, and the Earnest money may be forfeited in accordance with Sub-Clause 16.6(b).**

27. Evaluation and Comparison of Financial Bids

- 27.1 The Employer will evaluate and compare only the Bids determined to be substantially responsive in accordance with Sub-Clause 25.2.

- 27.2 In evaluating the Bids, the Employer will determine for each Bid the evaluated Bid Price by adjusting the Bid Price as follows:

- (a) Making any correction for errors pursuant to Clause 26; or
- (b) Making appropriate adjustments for any other acceptable variations, deviations.

- 27.3 The Employer reserves the right to accept or reject any variation or deviation. Variations and deviations and other factors, which are in excess of the requirements of the Bidding documents or otherwise result in unsolicited benefits for the Employer, shall not be taken into account in Bid evaluation.
- 27.4 If the Bid of the successful Bidder is seriously unbalanced in relation to the Engineer's estimate of the cost of work to be performed under the contract, the Employer may require the Bidder to produce detailed price analysis for any or all items of the Bill of Quantities, to demonstrate the internal consistency of those prices with the construction methods and schedule proposed. After evaluation of the price analysis, the Employer may require that the amount of the performance security set forth in Clause 31 be increased at the expense of the successful Bidder to a level sufficient to protect the Employer against financial loss in the event of default of the successful Bidder under the Contract.
- 27.5 A bid, in the opinion of employee which contains several items in the Bill of Quantities which are unrealistically priced low and which cannot be substantiated satisfactorily by the bidder, may be rejected as non-responsive.

F. AWARD OF CONTRACT

28. Award Criteria

- 28.1 Subject to Clause 29, the Employer will award the Contract to the Bidder whose Bid has been determined
- (i) To be substantially responsive to the Bidding documents and who has offered the lowest evaluated Bid Price.

29. Employer's Right to accept any Bid and to reject any or all Bids

Notwithstanding Clause 28, the Employer reserves the right to accept or reject any Bid, and to cancel the Bidding process and reject all Bids, at any time prior to the award of Contract, without thereby incurring any liability to the affected Bidder or Bidders or any obligation to inform the affected Bidder or Bidders of the ground for the Employer's action.

30. Notification of Award and Signing of Agreement

- 30.1 The Bidder whose Bid has been accepted will be notified of the award by the Employer prior to expiration of the Bid validity period by cable, telex or facsimile confirmed by letter. This letter (hereinafter and in the General Conditions of Contract called the "Letter of Acceptance") will state the sum that the Employer will pay the Contractor in consideration of the execution, completion and maintenance of the Works by the Contractor as prescribed by the Contract (hereinafter and in the Contract called the "Contract Price").
- 30.2 The notification of award will constitute the formation of the Contract, subject only to the furnishing of the performance security in accordance with the provisions of Clause 31.

- 30.3 The Agreement will incorporate all agreements between the Employer and the successful Bidder. It will be signed by the Employer and the successful Bidder, after the performance security is furnished.

31. Performance Security

- 31.1 Within 15 (Fifteen) days of receipt of the Letter of Acceptance, the successful Bidder shall deliver to the Employer a Performance Security in any of the forms given below for an amount equivalent 2% of the Contract price including earnest money plus additional security for unbalanced Bids in accordance with the Clause 29.5 of ITB and the provisions of Bihar Financial Rules.
- 31.2 If the performance security is provided by the successful Bidder in the form of a Bank Guarantee or fixed deposit receipts in the name of Employer, it shall be issued either (a) at the Bidder's option, by a Nationalized/Scheduled Indian bank within state or (b) acceptable to the Employer.
- 31.3 Failure of the successful Bidder to comply with the requirements of Sub-Clause 31.1 shall constitute sufficient grounds for cancellation of the award and forfeiture of the Bid Security.

32. Advance Payment and Security (NOT APPLICABLE)

- 32.1 The Employer will provide an Advance Payment on the Contract Price as stipulated in the General Conditions of Contract, subject to maximum amount, as stated in the Contract Data.

33. Corrupt or Fraudulent Practices

- 33.1 The Employer will reject a proposal for award if it determines that the Bidder recommended for award has engaged in corrupt or fraudulent practices in competing for the contract in question and will declare the firm ineligible, either indefinitely or for a stated period of time, to be awarded a contract with BRJP and any other agencies, if it at any time determines that the firm has engaged in corrupt or fraudulent practices in competing for the contractor, or in execution.

If at any stage it is found that Bidder had hidden material information or had submitted information which is false and fraudulent shall be debar from bidding in BUIDCO Tender for either indefinitely and for a stated period of time and EMD shall be forfeited. The matter shall also be brought to notice to the registration authority of contractor.

- 33.2 Furthermore, Bidders shall be aware of the provision stated in Sub-Clause and Sub-Clause 14 of the General Conditions of Contract.

- Rising Main & Distribution Network CI/DI 100mm dia and above- 88000 Meters
 - RCC Overhead Water Tower/Master Reservoir /Sump (size wise) minimum capacity of 454 KL
 - 6. The cost of electric work is Rs. _ (**Not applicable**) [CL 4.5A (d)]
 - 7. The cost of sanitary works is Rs. _ (**Not applicable**) [CL 4.5A (e)]
 - 8. Liquid assets are Rs. 3250.214 lakh (25%). And availability of credit facilities is Rs. 1300.0 lakh (10 %). [CL 4.5B(c)]
 - 9. Price level of the financial year 2018-19 [CL 4.7]
 - 10. The pre-bid meeting will take place in the office of Chief Engineer. BUIDCO, Patna. [CL 9.1.2]
10.05.2019 at 3:00 PM
 - 11. **The technical bid will be opened on website www.eproc.bihar.gov.in 03.04.2018 at 3:00 PM**
 - 12. Address of the Employer Chief Engineer [CL 4.5(a)]
BUIDCO, Patna
 - 13. Identification [CL 19.2(b)]
Bid for Construction of drinking water supply scheme for **Aurangabad Nagar Parishad**
Bid reference No. _____Sl.No. 1 of IFB
 - 14. Bids should be submitted only by as a whole job.
 - 15. Schedule of rate applicable for percentage Rate.
Method is _____ (Not applicable)
 - 16. The bid should be submitted latest by **24.05.2019 till 05.00 PM** [CL 20.1(a)]
 - 33. 17. The Bank Draft in favour of **Executive Engineer, BUIDCO, Aurangabad.**
- [CL 34.1]
18. Escalation factors (for the cost of works executed and financial
Figure to a common base value for works completed)

Year before	Multiply factor
One	1.1
Two	1.21
Three	1.33
Four	1.46
Five	1.61

List of Key Plant & Equipment to be deployed on PHED Works

[Reference Cl. 4.5 (B) (a)]						
Sl No.	Type of Equipment	Max *** Age as on (07-08)	Water Supply Scheme Package Size **			
			Rs. 1 – 5 Crores	Rs. 5 – 30 Crores	Rs. 30 –50 Crores	Above Rs.50 Crores
1	Concrete Mixer	5	1	2	2	3
2	Vibrator	5	2	4	4	6
3	Rotary Drilling / Reverse Rotary / DTH Rig Machine	5	1	1	2	2
4	Compressor	5	1	1	2	2
5	Crane (1.5 MT to 2.5 MT)	5	1	1	2	2
6	Truck/Tractor with trailer	5	1	1	2	3

7	Hydraulic Excavator	5	-	-	-	2
8	Digital Level Instrument ****	5	-			

* The Actual Number of equipment's to be decided by the Concerned Public Health division/circle/Zone/Department before floating the tender.

** On the basis of nature of construction work list of key plant & equipment's will be decided.

*** Life of machine minus Two Years or Five Years on 1.04.14 whichever is more.

**** Required for drainage/Sewerage Scheme

The lists are only suggestive but not binding

**List of Key Personnel to be deployed on Contract Work
[Reference Cl. 4.5 (B) (b)]**

List of Key Personnel to be deployed on Contract Work [Reference Cl. 4.5(B) (b)]									
Sl. No.	Personnel	Qualification	Contract Package Size						
			Rs.5-30 lacs	Rs30-70 Lacs	Rs70 Lacs to 2 Crores	Rs.2-10 Crores	Rs10-30 Crores	Rs30-50 Crores	More than 50 Crores
1	Project Manager	B.E. Civil + 10Years Exp. (5 years as Manager in PHED works) or retired E.E. & above of PHED	-	0	0	1	1	1	1
2	Site Engineer	B.E. Civil + 07Years Exp. (3 years as Manager in PHED works) or retired A.E. & above of PHED	-	0	1	1	2	3	4
3	Site Supervisor	B.E. Mech./Civil + 05 Years Exp. Or Dip. Mech./Civil + 07 years Exp. Or or retired J.E. & above of PHED	1	1	1	2	2	3	4
4	Surveyor	B.E. Civil + 03 Years Exp. or Dip. Civil + 05 years Exp.							3
	Total		1	1	2	4	5	7	9

The lists are only suggestive but not binding

SECTION 2

QUALIFICATION INFORMATION

(TO BE FILLED IN BY BIDDER)

QUALIFICATION INFORMATION

The Information to be filled in by the Bidder in the following pages will be used for purposes of post qualification as provided for in clause 4 of the Instructions to Bidders. This information will be incorporated in the Contract.

1. for individual Bidders
 - 1.1 Constitution or legal status of Bidder
(Attach copy)
Place of registration:
Principal place of business:
Power of attorney of signatory of Bid
(Attach)

1.2 Total value of Civil Engineering construction work performed in the last five years (In Rs. Million)

2013--2014
2014--2015
2015--2016
2016 -2017
2017--2018

1.3.1 Work performed as prime contractor, work performed in the past as a nominated sub-contractor will also be considered provided the sub-contract involved execution of all main items of work described in the bid document, provided further that all other qualification criteria are satisfied (in the same name) on works of a similar nature over the last five years.**

Project Name	Name of the Employer*	Description of work	Contract No.	Value of Contract (Rs. In Crore)	Date of issue of work order	Stipulated period of completion	Actual date of completion*	Remarks explaining reasons for delay & work completed)

* Attach certificate (s) from the Engineer (s)-in-Charge

** Immediately preceding the financial year in which bids are received.

1.3.2 Quantities of Work executed as prime contractor, work performed in the past as a nominated sub-contractor will also be considered provided the sub-contract involved execution of all main items of work described in the bid document provided further that all other qualification criteria are satisfied (in the same name and style) in the last five years :

Year	Name of the work	Name of the Employer	Quantity of work performed								Remarks (indicate contract Ref)
			Construction of High Yield Tube Well/Intake Well/ Infiltrations Well in Nos.	Treatment Plant including clarifloculators, filter beds, air blowers, sump etc. in MLD	Pump House in Nos.	Pump & Motor & Erection & Commissioning of Transformer in H.P./KVA	Chlorinator Units in Nos.	Rising Main & Distribution Network in Meter	Rcc Overhead Water Tower (sizewise) in KL	Other related works	
2012-13											
2013-14											
2014-15											
2015-16											
2016-17											

1.4 Information of Bid Capacity (works for which bids have been submitted and works which are yet to be completed) as on the date of this bid.

(A) Existing commitments and on-going:

Description of works	Place & State	Contract No.	Name & Address of Employer	Value of Contract (Rs. In Crore)	Stipulated Period of Completion	Value of works remaining to be completion (Rs. In Crore)	Anticipated completed
1	2	3	4	5	6	7	8

--	--	--	--	--	--	--	--

(B) Works for which bids already submitted :

Description of works	Place & State	Name & Address of Employer	Estimated value of works (Rs. Crore)	Stipulated date of Completion	Date when decision is expected	Remarks, if any
1	2	4	5	6	7	8

1.5 Availability of key items of Contractor's Equipment essential for carrying out the Works [Ref. Clause 4.5 (B) (A)]. The Bidder should list all the information requested below. Refer also to Sub Clause 4.3 (d) of the Instruction to Bidders.

[illegible]

1.6 Qualification and experience of key personnel required for administration and execution of the contact attachment biographical data.

Biographical data:				
Position	Name	Qualification	Type of Experience (General)	Years of experience in the proposed position
Project Manager				

Etc.				

1.7 Project sub-contracts and firms involved. [Refer ITB Clause 4.3(k)]

Section of the works	Value of Sub-contract	Sub-Contractor (Name & Address)	Experience in similar work
1	2	3	4

- 1.8 Financial reports for the last five years: balance sheets, profit and loss statements, auditors' reports (in case of companies/corporation), etc. List them below and attach copies.
- 1.9 Evidence of access to financial resources to meet the qualification requirements; cash in hand, lines of credit, etc. List them below and attach copies of support documents.
- 1.10 Name, address and telephone, telex and fax numbers of the Bidders' bankers who may provide references if contacted by the Employer.
- 1.11 Information on litigation history in which the Bidder is involved.

Other Party (ies)	Employer	Cause of Dispute	Amount involved	Remakes showing Present Status

- 1.12 Statement of compliance under the requirements of Sub Clause 3.2 of the instructions to Bidders. (Name of Consultant engaged for project preparation is **(NOT APPLICABLE)**)
- 1.13 Proposed work method and schedule. The Bidder should attach description, drawing and charts as necessary to comply with the requirements of the Bidding documents. [Refer ITB Clause 4.1 & 4.3 (1)]
- 1.14 Programme
- 1.15 Quality Assurance Programme

2. Additional Requirements

- 2.1 Bidders should provide any additional information required to fulfill the requirements of Instructions to the Bidders, if applicable.

- (i) Affidavit
- (ii) Undertaking

SAMPLE FORMAT FOR EVIDENCE OF ACCESS TO OR AVAILABILITY OF CREDIT FACILITIES

(CLAUSE 4.2 (i) OF ITB)

BANK CERTIFICATE

This is to certify that M/s _____ is a reputed company with a good financial standing.

If the contract for the work, namely _____ is awarded to the above firm, we shall be able to provide overdraft/credit facilities to the extent of Rs. _____ to meet their working capital requirements for executing to the above contract during the contract period.

(Signature)

Name of Bank

Senior Bank Manager

Address of the Bank

AFFIDAVIT

1. I, the undersigned, do hereby certify that all the statements made in the required attachments are true and correct.
2. The undersigned also hereby certifies that neither our firm M/s _____ has been blacklisted nor has abandoned any work in any government department, in India nor any contract awarded to us for such works have been res cinded, during last five years prior to the date of this bid.
3. The undersigned hereby authorizes and request(s) any bank, firm or corporation to furnish pertinent information deemed necessary and requested by the Department to verify this statement or regarding my (our) competence and general reputation.
4. The undersigned understand and agrees that further qualifying information may be requested, and agrees to furnish any such information at the request of the Department Project implementing agency.

(Signed by an Authorized Officer of the Firm)

Title of Officer

Name of Firm

DATE

UNDERTAKING

I, the undersigned do hereby undertake that our firm M/s. _____

_____ would invest minimum cash up to 25% of the value of the work during implementation of the Contract.

(Signed by an Authorized Officer of the Firm)

Title of Officer

Name of Firm

DATE

SECTION 3

GENERAL CONDITIONS OF CONTRACT

Table of Contents

Clause

Details

	General
1	Performance guarantee
1A	Recovery of Security deposit
2	Compensation for delay (Liquidated Damage)
2A	Incentive for early completion
3	When contract can be determined / rescinded
4	Contractor liable to pay compensation even if action not taken under clause 3
18	Contractor to supply tools & plants etc.
20	Min. Wages Act to be complied with
21	Work not to be sublet/ Action in case of insolvency
23	Changes in firm's constitution to be intimated
24	Approval of Engineer In charge
32	Hire of Plant & Machinery
33	Employment of Technical Staff and employees
34	Levy / Taxes payable by Contractor
37	Termination of Contract on death of contractor
38	If relation working in P.H.E.D. than contractor not allowed to tender
39	No Gazetted Engineer to work as contractor within two years of retirement
41	Release of Security Deposit
46	Safety, Security and Protection of the Environment
50	Commencement of Works

Time Control

- 5 Time and Extension for delay
- 45 Cash flow estimate to be submitted.

Cost Control

- 5A Minutes of Meeting
- 6 Measurement of work done
- 7 Payment on Intermediate certificate to be regarded as advances
- 9 Payment of final bill
- 9A Payment of contractor's Bills to Banks
- 10B Secured Advance on Non-Perishable materials/Mobilization Advance/Plant & Machinery & Shuttering material advance/Interest & Recovery.
- 10C Payment on account of increase in Prices/Wages due to Statutory order(s)
- 10CA Payment on account of increase/decrease in prices of construction Materials after receipt of tender.
- 10CC Payment due to Increase/Decrease in Prices/Wages after receipt of Tender for works (Time more than 18 eighteen months)
- 10D dismantled material government property.
- 12 Deviations/Excess item Variations/extent and pricing
- 12.2 Deviation, extra items and pricing
- 12.3 Deviation, Deviated Quantities, Pricing
- 13 Foreclosure of contract due to Abandonment or Reduction in scope of work.
- 14 Cancellation of contract in full or part
- 15 Suspension of work
- 16 Action in case work not done as per specification
- 22 Compensation
- 25 Settlement of disputes & arbitration
- 27 Lump sum Provisions in Tender
- 29 With holding and lien in respect of sums due from contractor
- 29A Lien in respect of claims in other Contracts
- 35 Condition of reimbursement of levy/taxes after receipt of the tender.
- 43 Contractor's Risks

- 44 Insurance
- 47 Cost of Samples
- 48 Cost of Tests
- 49 Cost of Tests not provided for

Finishing Control

- 8 Completion certificate and completion plan
- 8A Completion plans to be submitted by the contractor
- 17 Contractor liable for damage, defects during maintenance period.
- 40 Return of materials and recovery of excess materials issued.
- 51 Substantial Completion of Parts

Quality Control

- 10 Materials supplied by Government
- 10A Materials to be provided by the contractor
- 11 Work to be executed in accordance with specification, drawings, orders etc.
- 26 Contractor to indemnify Govt. against Patent Rights.
- 28 Action where no Specifications are specified
- 42 Responsibility of technical staff and employees

Other Condition & Control

- 18A Recovery of compensation paid to workman
- 18B Ensuring payment and amenities to workers if contractor fails
- 19 Labour laws to complied by the Contractor
- 19B Payment of wages
- 30 Unfiltered water supply
- 31 Return of Surplus materials
- 26 Contractor to indemnify govt. against patent Rights
- 28 Action where no specification are specified
- 36 Termination of Contract in case of Imprisonment of contractor
- 40 Return of materials and recovery for excess materials issued.
- 42 Responsibility of technical staff and employees

52 Force majeure

53 Recovery

CONDITIONS OF CONTRACT

Definitions:

1. The contract means the document forming the tender and acceptances there of and the formal agreement executed between the competent authority on behalf of the Governor of Bihar and the Contractor, together with the documents referred to therein including these conditions, the specifications, designs, drawings and instructions issued from time to time from one contract and shall be complementary to one another.

2. In the contract, the following expressions shall, unless the context otherwise requires have the meanings, hereby respectively assigned to them:-

i) The expression works or work shall, unless there be something either in the subject or context repugnant to such construction, be construed and taken to mean the works by or by virtue of the contract contracted to be executed whether temporary or permanent, and whether original, altered, substituted or additional.

ii) The site shall mean the land/or other places on, into or through which work is to be executed under the contract or any adjacent land, path or street through which work is to be executed under the contract or any adjacent land, path or street which may be allotted or used for the purpose of carrying out the contract.

iii) The Contractor shall mean the individual, firm or company, whether incorporate or not, undertaking the works and shall include the legal personal representative of such individual or the persons composing such firm or company, or the successors of such firm or company and the permitted assignees of such individual, firm of company.

iv) The Engineer-in-Charge means the Engineer officer who shall supervise and be in-charge of the work and who shall sign the contract on behalf of the Governor of Bihar as mentioned in Schedule 'F' hereunder.

v) Government or Government of Bihar shall mean the Governor of Bihar.

vi) Excepted Risk are risks due to riots (other than those on account of contractor employees), war (whether declared or not) invasion, act of foreign enemies, hostilities, civil war, rebellion revolution, insurrection, any act of Government, damages from aircraft, acts of God, such as earthquake, lightening and unprecedented floods, and other causes over which the contractor has no control and accepted as such by the Accepting Authority Provided that the contractor is also to show that he has taken all due precautions to avoid / minimize any adverse effect / damage from the above or causes solely due to use or occupation by Government of the part of the works in respect of which a certificate of completion has been issued or a caused solely due to Government's faulty design of works.

vii) Bill of quantity means the price and completed Bill of Quantities form forming part of the Bid.

viii) The Defect liability certificate is the certificate issued by Engineer-in-Charge after defect liability period has ended and upon correction of defects by the contractor.

ix) The defect liability period will be SIX MONTHS TRIAL RUN AFTER COMPLETION OF WHOLE SCHEME AND FIVE YEARS OPERATION AND MAINTENANCE AFTER TRIAL RUN.

x) The intended completion date is the time intended to complete the work by the contractor.

- xi) The start date is given in the contract data. It is the date when the contractor shall commence execution of the works. It does not necessarily coincide with any of the site possession date.
- xii) A sub contractor is a person or corporate body who has a contract with the contractor to carry out a part of the construction work in the contract, which includes work on the site.
- xiii) Temporary works are works designed, constructed, installed and removed by the contractor that are needed for construction or installation of the works.
- xiii) Market Rate shall be the rate as decided by the competent authority on the basis of the cost of materials and labour at the site where the work is to be executed plus the percentage mentioned in Schedule 'F' to cover, all overheads and profits.
- xiv) Schedule(s) referred to in these conditions shall mean the relevant schedule(s) annexed to the tender papers or the standard Schedule of Government mentioned in Schedule 'F' hereunder, with the amendments thereto issued up to date of receipt of the tender.
- xv) Department means any department of Government of Bihar, which invite tenders on behalf of Governor of Bihar as specified in schedule 'F'
- xvi) Specifications means the specifications followed by relevant department of the Government of India / State Government.
- xvii) Tender value means the value of the entire work as stipulated in the letter award.

Scope and Performance

- 3. Where the context so requires, words imparting the singular only also include the plural and vice versa. Any reference to masculine gender shall whenever required include feminine gender and vice versa.
- 4. Heading and Marginal notes to these General Conditions of Contract shall not be deemed to form part thereof or be taken into consideration in the interpretation or construction thereof or of the contract.
- 5. The contractor shall be furnished, free of cost one certified copy of the contract documents except standard specifications, Schedule of Rates and such other printed and published documents, together with all drawings as may be forming part of the tender papers, None of these documents shall be used for any purpose other than that of this contract.

Works to be carried out

- 6. The work to be carried out under the Contract shall, except as otherwise provided these conditions, all labour, materials, tools, plants, equipment and transport which may be required in preparation of and for and in the full and entire execution and completion of the works. The descriptions given in the Schedule of Quantities (Schedule-A) shall unless otherwise stated, be held to include wastage on materials, carriage and cartage, carrying and return of empties, hoisting, setting, fitting and fixing in position and all other labours necessary in and for the full and entire execution and completion of the work as aforesaid in accordance with good practice and recognized principles.

Sufficiency of Tender

- 7. The contractor shall be deemed to have satisfied himself before tendering as to the correctness and sufficiency of his tender for the works and of the rates and prices quoted in the Schedule of Quantities, which rates and prices shall, except as otherwise provided, cover all his obligations under the Contract and all matters and things necessary for the proper completion and maintenance of the works.

Discrepancies and adjustment of Errors

- 8. The several documents forming the contract are to be taken as mutually explanatory of one another, detailed drawings being followed in preference to small scale drawing and figured dimensions in preference to scale and special conditions in preference to General Conditions.

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

- i) Description of Schedule of Quantities.
- ii) Particular Specification and Special Condition, if any
- iii) Drawings.
- iv) PHED/ CPHEEO specification.
- v) Indian Standard Specifications of B.I.S.

8.2 If there are varying or conflicting provisions made in any one document forming part of the contract, the Accepting Authority shall be the deciding authority with regard to the intention of the document and his decision shall be final and binding on the contractor.

8.3 Any error in description, quantity or rate in Schedule of Quantities of any omission therefrom shall not vitiate the Contract or release the Contractor from the execution of the whole or any part of the works comprised therein according to drawings and specifications or from any of his obligations under the contract.

Signing of Contract

9. The successful tenderer/contractor, after submitting the performance guarantee i.e. within 7 days of receipt of letter of acceptance shall attend the office of the Engineer-in-Charge for authentication signing and completion of the contractor document and execute the agreement consisting of :-

- i) Drawings.
- ii) The notice inviting tender, all the documents including drawings, if any, forming the tender as issued at the time of invitation of tender and acceptance thereof together with any correspondence leading thereto.
- iii) Standard P.W.D. Form as mentioned in Schedule 'F' consisting of:

Various standard clauses with corrections up to the date stipulated in Schedule 'F' along with annexure thereto.

CLAUSE OF CONTRACT

CLAUSE 1

Performance Guarantee

(i) The contractor shall submit an irrevocable PERFORMANCE GUARANTEE of 2% (Two Percent) of the tendered amount including earnest money in the shape as mentioned in the Bihar Financial Rules or Bank Guarantee (for work costing more than one crore) or any other deposits mentioned for his proper performance of the contract agreement, (not withstanding and/or without prejudice to any there provisions in the contract) within period specified in scheduled 'F' from the date of issue of letter of acceptance. This period can be further extended by the Engineer-in-Charge up to a maximum period as specified in schedule 'F' on written request of the contractor stating the reason for delays in procuring the Bank Guarantee, to the satisfaction of the Engineer-in-Charge. This guarantee shall be in the form D.D. of any Scheduled Bank or State Bank of India or Bank Guarantee (for work costing more than Rupees one Crore).

(ii) The performance Guarantee shall be initially valid up to 28 days beyond the defect liability period.

(iii) The Engineer-in-Charge shall not make a claim under the Performance guarantee except for amounts to which the Governor of Bihar is entitled under the contract (notwithstanding and/or without prejudice to any other provisions in the contract agreement) in the event of:

(a) Failure by the contractor to extend the validity of the Performance Guarantee as described herein above, in which event the Engineer-in-Charge may claim the full amount of the performance guarantee.

(b) Failure by the contractor to pay Governor of Bihar any amount due, either as agreed by the contractor or determined under any of the Clauses/Conditions of the agreement within 30 days of the service of notice to this effect by Engineer-in-Charge.

(c) Failure by the contractor to rectify any defects as defined in the defect liability clause in the schedule - F of contract data to the satisfaction of the Engineer-in-Charge.

(iv) In the event of the contract being determined or rescinded under provisions of any of the clause/condition of the agreement, the performance guarantee shall stand forfeited in full and shall be absolutely at the disposal of the Governor of Bihar.

Additional Performance Guarantee

If the lowest bid of the contractor is below the estimated value of the works, then the additional performance guarantee at the following rates (on cumulative basis) will be given by the contractor.

a. Rates below 0 -5 % of the estimated value	0.25 % per percent below
b. Rates below 5 -10 % of the estimated value	0.50 % per percent below
c. Rates below more than 10% of the estimated value	1.0 % per percent below

CLAUSE 1A

Recovery of Security Deposit

The person/persons whose tender(s) may be accepted (hereinafter called the contractor) shall permit Government at the time of making any payment to him for work done under the contract to deduct a sum at 8% (eight percent) from the gross amount of each running bill till full amount of security deposit 10% (ten percent) of agreement value or value of work (whichever is higher) is reached. If value of work exceeds the agreement value, security deposit (10%) will be recovered for the exceeded work.

All compensations or the other sums of money payable by the contractor under the terms of this contract may be deducted from, or paid by the sale of a sufficient part of his security deposit or from the interest arising there from, or from any sums which may be due to or may become due to the contractor by Government on any account whatsoever and in the event of his Security Deposit being reduced by reason of any such deductions or sale as aforesaid, the contractor shall within 10 days make good in cash or fixed deposit receipt tendered by the State Bank of India or by Scheduled Banks or Government Securities (if deposited for more than 12 months) endorsed in favour of the Engineer-in-Charge, any sum or sums which may have been deducted from, or raised by sale of his security deposit or any part thereof. The security deposit shall be collected from the running bills of the contractor at the rates mentioned above and the earnest money at the time of tenders will be treated a part of the Security Deposit.

CLAUSE 2

Compensation for Delay (Liquidated Damage)

If the contractor fails to maintain the required progress in terms of clause 5 or to complete the work and clear the site on or before the contract or extended date of completion, he shall without prejudice to any other right or remedy available under the law to the Government on account of such breach, pay as agreed compensation the amount calculated at the rates stipulated below as the Superintending Engineer (whose decision in writing shall be final and binding) may decide on the amount of tendered value of the work for every completed day/month (as applicable) that the progress remains below that specified in Clause 5 or that the work remains incomplete.

This will also apply to items or group of items for which a separate period of completion has been specified.

- i) Compensation
for delay of work
@ 2 % per month of delay to be computed on per Day basis.

Provided always that the total amount of compensation for delay to be paid under this condition shall not exceed 10% of the Tendered Value of work or to the Tendered Value of the item or group of items of work for which a separate period of completion is originally given.

The amount of compensation may be adjusted or set-off against any sum payable to the Contractor under this or any other contract with the Government. In case, the contractor does not achieve a particular milestone mentioned in schedule-F, or the rescheduled milestone(s) in terms of Clause 5.4, the amount shown against that milestone shall be withheld, to be adjusted against the compensation levied at the final grant of extension of time. Withholding of the amount on failure to achieve a milestone, shall be automatic without any notice to the contractor. However, if the contractor catches up with the progress of work on the subsequent milestone(s), the withheld amount shall be released. In case the contractor fails to make up for the delay in subsequent milestone(s), amount mentioned against each milestone missed subsequently also shall be withheld. However, no interest, whatsoever, shall be payable on such withheld amount.

The Contractor is required to submit time schedule for completion of work. The milestone 1,2,3,4 will be marked for every 1/4th of completion period. It will form part of the agreement.

CLAUSE 2A

Incentive for early completion

In case, the contractor completes the work ahead of scheduled completion time, a bonus @ 1% (one percent) of the tendered value per month computed on per day basis, shall be payable to the contractor, subject to a maximum limit of 5% (five percent) of the tendered value. The amount of bonus, if payable shall be paid along with final bill after completion of work. Provided always that provision of the Clause 2A shall be applicable only when so provided in 'Schedule F'

CLAUSE 3

When Contract can be Determined/ Rescinded

Subject to the other provisions contained in this clause the Engineer-in-Charge may without prejudice to his any other rights or remedy against the contractor in respect of any delay inferior workmanship, any claims for damages and/or any other provisions of this contract or otherwise, and whether the date of completion has or has not elapsed, by notice in writing absolutely determine the contract in any of the following cases :

If the contractor having been given by the Engineer-in-Charge a notice in writing to rectify, reconstruct or replace any defective work or that the work is being performed in an inefficient or otherwise improper or unworkmanship like manner shall omit to comply with the requirement of such notice for a period of seven days thereafter.

ii) If the contractor being a company shall pass a resolution or the court shall make an order that the company shall be wind up or if a receiver or a manager on behalf of a creditor shall be appointed or if circumstances shall arise which entitle the court or the creditor to appoint a receiver or a manager or which entitle the court to make a winding up order.

iii) if the contractor has, without reasonable cause, suspended the progress of the work or has failed to proceed with the work with due diligence so that in the opinion of the Engineer-in-Charge (which shall be final and binding) he will be unable to secure completion of the work by the date of completion and continues to do so after a notice in writing of seven days from the Engineer-in-Charge.

iv) If the contractor fails to complete the work within the stipulated date or items of work with individual date of completion if any stipulated, on or before such date(s) of completion and does not complete them within the period specified in a notice given in writing in that behalf by the Engineer-in-Charge.

v) If the contractor persistently neglects to carry out his obligations under the contract and/or commits default in complying with any of the terms and conditions of the contract and does not remedy it or take effective steps to remedy it within 7 days after a notice in writing is given to him in that behalf by the Engineer-in-Charge.

vi) If the contractor commits any acts mentioned in Clause 21 hereof:

vii) If the work is not started by the contractor within 1/8th of the stipulated time subject to the maximum of 45 days.

When the contractor has made himself liable for action under any of the cases aforesaid, the Engineer-in-Charge on behalf of the Governor of Bihar shall have powers:

a) To determine or rescind the contract as aforesaid (of which termination or rescission notice in writing to the contractor under the hand of Engineer-in-Charge shall be conclusive evidence). Upon such determination or rescission the Earnest Money Deposit, Security Deposit already recovered and Performance Guarantee under the contract shall be liable to be forfeited and shall be absolutely at the disposal of the Government.

b) After giving notice to the contractor to measure up the work of the contractor and to take such whole, or the balance or part thereof as shall be un-executed out of his hands and to give it to

another contractor to complete the work. The contractor, whose contract is determined or rescinded as above, shall not be allowed to participate in the tendering process for the balance work.

In the event of above course(s) being adopted by the Engineer-in-Charge, the contractor shall have no claim to compensation for any loss sustained by him by reasons of his having purchased or procured any materials or entered into any engagements or made any advances on account or with a view to the execution of the work or the performance of the contract. And in case action is taken under any of the provision aforesaid the contractor shall not be entitled to recover or be paid any sum for any work thereof or actually performed under this contract unless and until the Engineer-in-Charge has certified in writing the performance of such work and the value payable in respect thereof and he shall only be entitled to be paid the value so certified.

CLAUSE 3A

In case, the work cannot be started due to reasons not within the control of the contractor as decided by Chief Engineer within 1/4th of the stipulated time for completion of work, either party may close the contract. In such eventuality, the Earnest Money deposit and the performance Guarantee of the contractor shall be refunded, but no payment on account of interest, loss of profit or damages etc. shall be payable at all. The reasons shall be examined by the Superintending Engineer and his decision shall be final and binding.

CLAUSE 4

Contractor liable to pay compensation even if action not taken under Clause 3

In any case in which any of the powers conferred upon the Engineer-in-Charge by Clause-3 thereof, shall have become exercisable and the same are not exercised the non-exercise thereof shall not constitute a waiver of any of the conditions hereof and such powers shall notwithstanding be exercisable in the event of any future case a default by the contractor and the liability of the contractor for compensation shall remain unaffected. In the event of the Engineer-in-Charge putting in force all or any of the powers vested in him under the preceding clause he may, if he so desires after giving a notice in writing to the contractor take possession of (or at the sole discretion of the Engineer-in-Charge which shall be final and binding on the contractor) use as on hire (the amount of the hire money being also in the final determination of the Engineer-in-Charge) all or any tools, plant, materials and stores, in or upon the works, or the site thereof belonging to the contractor, or procured by the contractor and intended to be used for the execution of the work, or any part thereof, paying or allowing for the same in account at the contract rates or, in the case of these not being applicable, at current market rates to be certified by the Engineer-in-Charge, whose certificate thereof shall be final, and binding on the contractor, clerk of the works, foreman or other authorized agent to remove such tools, plant, materials, or stores from the premises (within a time to be specified in such notice) in the event of the contractor failing to comply with any such requisition, the Engineer-in-Charge may remove them at the contractor's expense or sell them by auction or private sale on account of the contractor and his risk in all respects and the certificate of the Engineer-in-Charge as to the expenses of any such removal and the amount of the proceeds and expenses of any such sale be final and conclusive against the contractor.

CLAUSE 5

Time and Extension for delay

The time allowed for execution of the Works as specified in the Schedule 'F' or the extended time in accordance with these conditions shall be the essence of the Contract. The execution of the works shall commence from such time period as mentioned in letter of acceptance. If the Contractor commits default in commencing the execution of the work as aforesaid, Government shall without prejudice to any other right or remedy available in law, be at liberty to forfeit the security deposit absolutely.

5.1 **As soon as possible after the contract is concluded the Contractor shall submit a Time & Progress Chart for each milestone and get it approved by the Department. The Chart shall be prepared in direct relation to the time stated in the Contract documents for completion of items of the work.** It shall indicate the forecast of the dates of commencement and completion of various trades or sections of the work and

may be amended as necessary by agreement between the Engineer-in-Charge and Contractor within the limitations of time imposed in the contract documents, and further to ensure good progress during the execution of the work, the contractor shall in all cases in which the time allowed for any work, exceeds one month (save for special jobs for which a separate Programme has been agreed upon) complete the work **as per milestone given in schedule 'F'**

5.2 If the work(s) be delayed by.

- i) force majeure, or
- ii) Serious loss or damage by fire, or Civil commotion, local.
- iv) delay on the part of other contractors or tradesmen engaged by Engineer-in-Charge in executing work not forming part of the Contract, or
- v) Non-availability of stores, which are the responsibility of Government to supply, or
- vi) Non-availability or break down of tools and Plant to be supplied or supplied by Government, or
- vii) Any other cause which, in the absolute discretion of the authority mentioned in Schedule 'F' is beyond the Contractor's control.

then upon the happening of any such event causing delay, the Contractor shall immediately give notice thereof in writing to the Engineer-in-Charge but shall nevertheless use constantly his best endeavors to prevent or make good the delay and shall do all that may be reasonably required to the satisfaction of the Engineer-in-Charge to proceed with the works.

5.3 Request for the rescheduling of Milestones and extension of time, to be eligible for consideration, shall be made by the contractor in writing within fourteen days of the happening of the hindering event causing delay on the prescribed form. The Contractor may also, if practicable, indicate in such a request the period for which extension is desired.

5.4 In any such case the authority mentioned in Schedule 'F' may give a fair and reasonable extension of time and reschedule the milestones for completion of work. Such extension shall be communicated to the Contractor by the Engineer-in-Charge in writing, within 3 months of the date of receipt of such request. Non application by the contractor for extension of time shall not be a bar for giving a fair and reasonable extension by the Engineer-in-Charge and this shall be binding on the contractor.

5.5 The basic centerlines, reference points and benchmarks will be fixed by the department. The contractor shall establish at his own cost at suitable points, additional reference lines and bench marks as may be necessary and instructed by the engineer-in-charge. The contractor shall remain responsible for the sufficiency and accuracy of all the bench marks and reference lines.

CLAUSE 5A

Minutes of Meeting

The Engineer may require the contractor to attend a progress review meeting during execution of work.

The Engineer shall record the minutes of the meeting and provide a copy to the Contractor for compliance. These minutes will be a part of evidence in case of any request for extension of time or impunities action against the contractor.

CLAUSE 6

Measurement of Work Done

Engineer-in-Charge shall, except as otherwise provided, ascertain and determine measurement and the value in accordance with the contract of work done.

All measurement of all items having financial value shall be entered in Measurement Book so that a complete record is obtained of all works perform under the contract.

All measurements and levels shall be taken jointly by the Engineer-in-Charge or his authorized representative and by the contractor or his authorized representative at least once in a month during the progress of the work and such measurements shall be signed and dated by the Engineer-in-Charge and the contractor or their representatives in token their acceptance. If the contractor objects to any of the measurements recorded, a note shall be made to that effect with and signed by both the parties.

If for any reason the contractor or his authorized representative is not available and the work of recording measurements is suspended by the Engineer-in-Charge or his representative, the Engineer-in-Charge and the Department shall not entertain any claim from contractor for any loss or damages on this account. If the contractor or his authorized representative does not remain present at the time of such measurements after the contractor or his authorized representative has been given a notice in writing three (3) days in advance or fails to countersign or to record objection within a week from the date of the measurement, then such measurements recorded in his absence by the Engineer-in-Charge or his representative shall be deemed to be accepted by the Contractor.

The contractor shall, without extra charge, provide all assistance with every appliance labour and other things necessary for measurements and recording levels.

Except where any general or detailed description of the work expressly shows to the contrary, measurements shall be taken in accordance with the procedure set forth in the specifications notwithstanding any provision in the relevant Standard Method of measurement or any general or local custom. In the case of items which are not covered by specifications, measurements shall be taken in accordance with the relevant standard method of measurement issued by the Bureau of India Standards and if for any item no such standard is available then a mutually agreed method as approved by the department shall be followed.

The contractor shall give not less than seven days notice to the Engineer-in-Charge or his authorized representative in charge of the work before covering up or otherwise placing beyond the reach of measurement any work in order that the same may be measured and correct dimension thereof be taken before the same is covered up or placed beyond the reach of measurement and shall not cover up and place beyond reach of measurement any work without consent in writing of the Engineer-in-Charge or his authorized representative incharge of the work who shall within the aforesaid period of seven days inspect the work, and if any work shall be covered up or placed beyond the reach of measurement without such notice having been given or the Engineer-in-Charge's consent being obtained in writing the same shall be uncovered at the contractor's expense, or in default thereof no payment or allowance shall be made for such work or the materials with which the same was executed.

Engineer-in-Charge or his authorized representative may cause either themselves or through another officer of the department to check the measurements recorded jointly or otherwise as aforesaid and all provisions stipulated herein above shall be applicable to such checking of measurements or levels.

It is also a term of this contract that recording of measurements of any item of work in the measurement book and/or its payment in the interim, on account or final bill shall not be considered as conclusive evidence as to the sufficiency of any work or material to which it relates nor shall it relieve the contractor from liabilities from any over measurement defects noticed till completion of the defects liability period.

CLAUSE 7

Payment on intermediate Certificate to be regarded as Advances

No payment shall be made for work for **less than the estimated work of Rs. 2.5 lacs till the whole of the work shall have been completed and certificate of completion given.** For works estimated to cost over Rs. 2.5 lacs the interim or running account bill shall be submitted by the contractor for the work executed on the basis of such recorded measurements on the format of the Department in triplicate on or before the date or every month fixed for the same by the Engineer-in-Charge. The Engineer-in-Charge shall arrange to have the bill verified by taking or causing to be taken, where necessary, the requisite measurements of the work. In the event of the failure of the contractor to submit the bills, Engineer-in-Charge shall prepare or cause to be prepared such bills in which event no claims whatsoever due to delays on payment including that of interest shall be payable to the contractor. Payment on account of amount admissible shall be made by the Engineer-in-Charge certifying the sum to which the contractor is considered entitled by way of interim payment at such rates as decided by the Engineer-

in-Charge. The amount admissible shall be paid by 10th working day after the day of presentation of the bill by the Contractor to the Engineer-in-Charge or his Assistant Engineer together with the account of the material issued by the department, or dismantled materials, if any. In the case of works outside the headquarters of the Engineer-in-Charge the period of ten working days will be extended to fifteen working days.

All such interim payments shall be regarded as payment by way of advances against final payment only and shall not preclude the requiring of bad. Unsound and imperfect or unskilled work to be rejected, removed, taken away and reconstructed or re-erected. Any certificate given by the Engineer-in-Charge relating to the work done or materials delivered forming part of such payment may be modified or corrected by any subsequent such certificate(s) or by the final certificate and shall not by itself be conclusive evidence that any work or materials to which it relates is/are in accordance with the contract and specifications. Any such interim payment, or any part thereof shall not in any respect conclude, determine or affect in any way power of the Engineer-in-Charge under the contract or any of such payments be treated as final settlement and adjustment of accounts or in any way vary or affect the contract.

Pending consideration of extension of date of completion interim payments shall continue to be made as herein provided as per clause - 2, without prejudice to the right of the department to take action under the terms of this contract for delay in the completion of work, if the extension of date of completion is not granted by the competent authority.

CLAUSE 8

Completion Certificate and Completion Plans

Within ten days of the completion of the work, the contractor shall give notice of such completion to the Engineer-in-Charge and within fifteen days of the receipt of such notice the Engineer-in-Charge shall inspect the work and if there is no defect in the work shall furnish the contractor with a final certificate of completion, otherwise a provisional certificate of physical completion indicating defects (a) to be rectified by the contractor and/or (b) for which payment will be made at reduced rates, shall be issued. But no final certificate of completion shall be issued, nor shall the work be considered to be complete until the contractor shall have removed from the premises on which the work shall be executed all scaffolding, surplus materials, rubbish and all huts and sanitary arrangements required for his/their work people on the site in connection with the execution of the works as shall have been erected or constructed by the contractor(s) and cleaned off the dirt from all wood work, doors, windows, walls, floor or other parts of the building, in, upon, or about which the work is to be executed or of which he may have had possession for the purpose of execution thereof, and not until the work shall have been measured by the Engineer-in-Charge. If the contractor shall fail to comply with the requirements of this clause as to removal of scaffolding, surplus materials and rubbish and all huts and sanitary arrangements as aforesaid and cleaning off dirt on or before the date fixed for the completion of work the Engineer-in-Charge may at the expense of the contractor remove such scaffolding surplus materials and rubbish etc. and dispose of the same as he thinks fit and clean off such dirt as aforesaid, and the contractor shall have no claim in respect of the scaffolding or surplus materials aforesaid except for any sum actually released by the sale thereof.

CLAUSE 8 A

Completion plans to be submitted by the Contractor

The contractor shall submit completion plan as required vide General Specifications for Electrical works (Part-I internal) 1972 and (Par-II External) 1974 as applicable within thirty days of the completion of the work.

In case, the contractor fails to submit the completion plan as aforesaid, he shall be liable to pay a sum equivalent to 2.5% of the value of the work subject to a ceiling of Rs. 15,000 (Rs. Fifteen thousand only) as may be fixed by the Superintending Engineer concerned and in this respect the decision of the Superintending Engineer shall be final and binding on the contractor.

The Contractor is required to submit completion plan of the whole scheme after its completion.

CLAUSE 9

Payment of Final Bill

The final bill shall be submitted by the contractor in the same manner as specified in interim bills within three months of physical completion of the work or within one month of the date of the final certificate of completion furnished by the Engineer-in-Charge whichever is earlier. No further claims shall be made by the contractor after submission of the final bill and these shall be deemed to have been waived and extinguished. Payments of those items of the bill in respect of which there is no dispute and of items in dispute, for quantities and

rates as approved by Engineer-in-Charge, will, as far as possible be made within the period specified herein under, the period being reckoned from the date of receipt of the bill by the Engineer-in-Charge or his authorized Assistant Engineer, complete with account of materials issued by the Department and dismantled materials.

- i) If the Tendered value of work exceeds Rs. 1 crores : 4 months

CLAUSE 9A

Payment of Contractor's Bill to Banks

Payments due to the contractor may, if so desired by him, be made to his bank instead of direct to him provided that the contractor furnishes to the Engineer-in-Charge (1) an authorization in the form of a legally valid document such as a power of attorney conferring authority on the bank to receive payments and (2) his own acceptance of the correctness of the amount made out as being due to him by Government or his signature on the bill or other claim preferred against Government before settlement by the Engineer-in-Charge of the account or claim by payment to the bank. While the receipt given by such banks shall constitute a full and sufficient discharge for the payment, the contractor shall wherever possible present his bills duly receipted and discharges through his bankers.

Nothing herein contained shall operate to create in favour of the bank any rights or equities vis-a-vis the Governor of Bihar.

CLAUSE 10

Materials supplied by Government

No material will be supplied by the Govt.

CLAUSE 10 A

Materials to be provided by the Contractor

The contractor shall, at his own expense, provide all materials, required for the works. The contractor shall, at his own expense and without delay; supply to the Engineer-in-Charge samples of materials to be used on the work and shall get these approved in advance. All such materials to be provided by the Contractor shall be in conformity with the specifications laid down or referred to in the contract. The contractor shall, if requested by the Engineer-in-Charge furnish proof, to the satisfaction of the Engineer-in Charge that the materials so comply. The Engineer-in-Charge shall within fifteen days of supply of samples or within such further period as he may require intimate to the Contractor in writing whether sample are approved by him or not. If samples are not approved, the Contractor shall forthwith arrange to supply to the Engineer-in-Charge for his approval fresh samples complying with the specifications laid down in the contract. When materials are required to be tested in accordance with specifications, approval of the Engineer-in-Charge shall be issued after the test results are received.

The Contractor shall at his risk and cost submit the samples of materials to be tested or analyzed and shall not make use of or incorporate in the work any materials represented by the samples until the required tests or analysis have been made and materials finally accepted by the Engineer-in-Charge. The Contractor shall not be eligible for any claim or compensation either arising out of any delay in the work or due to any corrective measures required to be taken on account of and as a result of testing of materials.

The contractor shall, at his risk and cost, make all arrangements and shall provide all facilities as the Engineer-in-Charge may require for collecting, and preparing the required number of samples for such tests at such time and to such place or places as may be directed by the Engineer-in-Charge and bear all charges and cost of testing unless specifically provided for otherwise else where in the contract or specifications. The Engineer-in-Charge or his authorized representative shall at all time have access to the works and to all workshops and places where work is being prepared or from where materials, manufactured articles or machinery are being obtained for the works and the contractor shall afford every facility and every assistance in obtaining the right to such access.

The Engineer-in-Charge shall have full powers to require the removal from the premises of all materials which in his opinion are not in accordance with the specifications and in case of default the Engineer-in-Charge shall be at liberty to employ at the expense of the contractor, other persons to remove the same without being answerable or accountable for any loss for damage that may happen or arise to such materials. The Engineer-

in-Charge shall also have full powers to require other proper materials to be substituted thereof and in case of default the Engineer- In-Charge may cause the same to be supplied and all costs which they attend such removal and substitution shall borne by the Contractor.

CLAUSE 10 B (NOT APPLICABLE)

Secured Advance on Non- perishable Materials

i) The contractor, on signing an indenture in the form to be specified by the Engineer-in-Charge, shall be entitled to be paid during the progress of the execution of the work up to 75% of the assessed value of any materials which are in the opinion of the Superintending Engineer nonperishable, non-fragile and non combustible and are in accordance with the contract and on the site in connection therewith and are adequately stored and/or protected against damage by weather or other causes but which have not at the time of advance been incorporated in the works. When materials on account of which advance has been made under this sub-clause are incorporated in the work the amount of such advance shall be recovered/deducted from the next payment made under any or the clause or clauses of this contract.

Mobilization Advance

Mobilization advance not exceeding 10% of the tendered value may be given, if requested by the contractor in writing within one month of the order to commence the work. In such a case the contractor shall execute a Bank Guarantee/Bond from a Scheduled Nationalized Bank as specified by the Engineer-in-Charge for the full amount of such advance before it is released. Such advance shall be in two or more installments to be determined by the Engineer-in-Charge at his absolute discretion. The first installment of such advance before shall be released by the Engineer-in-Charge to the contractor on a request made by the contractor to the Engineer-in-Charge in this behalf. The second and subsequent installment shall be released by the Engineer-in-Charge only after the contractor furnishes a proof of the satisfactory utilization of the earlier installment to the entire satisfaction of the Engineer-in-Charge.

Plants & Machinery & Shuttering Material Advance

iii) An advance for plant machinery required for the work and brought to site by the Contractor may be given if requested by the contractor in writing within one month of bringing such plant and machinery to site. Such advance shall be given on such plant and machinery which in the opinion of the Engineer-in-Charge will add to the expeditious execution of work and improve the quality of work. The amount of advance shall be restricted to 5% of the tender value. In the case of new plant and equipment to be purchased for the work the advance shall be restricted to 85% of the price of such new plant and equipment paid by the contractor for which the contractor shall produce evidence satisfactory to the Engineer-in-Charge and approval from Engineer-in-Charge. In the case of second hand and used plants and equipment, the amount of such advance shall be limited to 50% of the depreciated value of plant and equipment as may be decided by the Engineer-in-Charge. The contractor shall, if so required by the Engineer-in-Charge, submit the statement value of such old plant and equipment duly approved by a Registered Value recognized by the Central Board of Direct Taxes under the Income-Tax Act, 1961. No such advance shall be paid on any plant and equipment of perishable nature and on the plant and equipment of a value less than Rs. 50,000/- Seventy five percent of such amount of advance shall be paid after the plant & equipment is brought to site and balance twenty five percent on successfully commissioning the same only after approval from Engineer-in-Charge.

Leasing of equipment shall be considered at par with purchase of equipment and shall be covered by tripartite agreement with the following:

1. Leasing company which gives certificate of agreeing to lease equipment to the contractor.
2. Engineer-in-Charge, and
3. The contractor.

This advance shall further be subject to the condition that such plant and equipment (a) are considered by the Engineer-in-Charge to be necessary for the works; (b) and are in and are maintained in working order; (c) hypothecated to the Government as specified by the Engineer-in-Charge before the payment of advance is released. The contractor shall not be permitted to remove from the site such hypothecated plant and equipment without the prior written permission of the Engineer-in-Charge. The contractor shall be responsible for maintaining such plant and equipment in good working order during the entire period of hypothecation falling which such advance shall be entirely recovered in lump sum. For this purpose steel scaffolding and from work shall be treated as plant and equipment.

The contractor shall insure the plant and Machinery for which mobilization advance is sought and given, for a sum sufficient to provide for their replacement at site. Any amounts not recovered from the insurer will be borne by the contractor.

Interest & Recovery

iv) The mobilization advance and plant and machinery advance in (ii) & (iii) above bear simple interest and should be equal to the prevailing rate of interest charged by the bank as mentioned in contract date schedule 'F' and shall be calculated from the date of payment to the date of recovery both days inclusive, on the outstanding amount of advance; Recovery of such sums advanced shall be made by the deduction from the contractor's bills commencing after first ten per cent of the gross value of the work is executed and paid, on pro-rate percentage basis to the gross value of the work billed beyond 10% in such a way that the entire advance is recovered by the time eighty per cent of the gross value of the contract is executed and paid together with interest due on the entire outstanding amount up to the date of the installment.

v) If the circumstances are considered reasonable by the Engineer-in-Charge, the period mentioned in (ii) and (iii) for request by the contractor in writing for grant of mobilization advance and plant and equipment advance may be extended in the discretion of the Chief Engineer.

vi) The said bank guarantee for advances shall initially be made for the full amount and valid for the contract period, and be kept renewed from time to time to cover the balance amount and likely period of complete recovery together with interest.

vii) Any materials including tools, plants, equipments etc brought to the site shall not be removed from the sites without the written permission of the Engineer-in-Charge.

CLAUSE 10 C (NOT APPLICABLE)

Payment on Account of increase in prices/ Wages due to Statutory Order(s)

If after submission of the tender the price of any material incorporated in the works (not being a material supplied from the Engineer-in-Charge's stores in accordance with clause 10 thereof) and/or wages of labour increases as a direct result of the coming into force of any fresh law, or statutory rule or order (but not due to any changes in sales tax) and such increase in the price and/or wages prevailing at the time of the last stipulated date for receipt of the tenders including extensions if any for the work, and the contractor thereupon necessarily and properly pays in respect of that material (incorporated in the works) such increased price and / or in respect of labour engaged on the execution of the work such increased wages, then the amount of the contract shall accordingly be varied and provided further that any such increase shall not be payable if such increase has become operative after the stipulated date of completion of the work in question.

If after submission of the tender, the price of any material incorporated in the works (not being a material supplied from the Engineer-in-Charge's stores in accordance with clause 10 thereof) and/or wages of labour is decreased as a direct result of the coming not force of any law or statutory rules or order (but not due to any changes in sales tax) and such decrease in the prices and/or wages prevailing at the time of receipt of the tender for the work. The government shall in respect of materials incorporated in the works (not being materials supplied from the Engineer-in-Charge's stores in accordance with Clause-10 hereof) and / or labour engaged on the execution of the work after the date of coming into force of such law statutory rule or order be entitled to deduct from the dues of the contractor such amount as shall be equivalent to the difference between the prices of the materials and/or wages as prevailed at the time of the last stipulated date for receipt of tenders including extensions if any for the work and the price of materials and/or wages of labour on the coming into force of such law, statutory rule or order.

The contractor shall, for purpose of this condition, keep such books of account and other documents as are necessary to show the amount of any increase claimed or reduction available and shall allow

inspection of the same by a duly authorized representative of the Government, and further shall, at the request of the Engineer-in-Charge may require any documents so kept and such other information as the Engineer-in-Charge may require.

The contractor shall, within a reasonable time of his becoming aware of any alteration in the price of any such material and/or wages of labour, give notice thereof to the Engineer-in-Charge stating that the same is given pursuant to this condition together with all information relating thereto which he may be in position to supply.

CLAUSE 10 CA

Payment on Account of increase/ decrease in Prices of Construction materials after receipt of tender

If after submission of the tender, the price of cement or steel reinforcement bars or CI/DI/GI/MS Pipes and Specials incorporated in the works (not being a material supplied from the Engineer-in-Charge's stores in accordance with Clause 10 thereof) increase(s) beyond the price(s) prevailing at the time of the last stipulated date for receipt of tenders (including extensions, if any) for the work, then the amount of the contract shall accordingly be varied and provided further that any such increase shall not be payable if such increase has become operative after the stipulated date of completion of work in question.

If after submission of the tender, the prices of cement and/or steel reinforcement bars or CI/DI/GI/MS Pipes and Specials incorporated in the works (not being a material stipulated from the Engineer-in-Charge's stores in accordance with the clause 10 thereof) is decreased. Government shall in respect of these materials incorporated in the works (not being materials supplied from the Engineer-in-Charge's stores in accordance with Clause 10 thereof) be entitled to deduct from the dues of the contractor such amount as shall be equivalent to the difference between the prices of Cement and/or Steel reinforcement bars as prevailed at the time of last stipulated date for receipt of tenders including extensions if any for the work.

The increase/decrease in prices shall be determined by the All India Wholesale Price Indices for Cement and Steel (bars and rods) as published by Economic Advisor to Government of India, Ministry of Commerce and Industry.

The amount of the contract shall accordingly be varied for cement or steel reinforcement bars will be worked out as per the formula given below:-

Adjustment for cement component

- (i) Price adjustment for increase or decrease in the cost of cement procured by the contractor shall be paid in accordance with the following formula:

$$V_0 = 0.85 \times P_0 / 100 \times R \times (C_1 - C_0) / C_0$$

V_0 = increase or decrease in the cost of work during the month under consideration due to changes in rates for cement.

R = Value of the work.

C_0 = The all India wholesale price index for cement on 28 days preceding the date of opening of Bids as published by the Ministry of Industrial Development, Government of India, New Delhi.

C_1 = The all India average wholesale price index for cement for the month under consideration as published by Ministry of Industrial Development, Government of India, New Delhi.

P_0 = Percentage of cement component of the work.

Adjustment for Steel Component

- (ii) Price adjustment for increase or decrease in the cost of steel procured by the Contractor shall be paid in accordance with the following formula:

$$V_s = 0.85 \times P_s / 100 \times R \times (S_1 - S_0) / S_0$$

V_s = Increase or decrease in the cost of work during the month under consideration due to changes in the rates for steel.

R = Value of the work

S_0 = The all India wholesale price index for steel (Bars and Rods) on 25 days preceding the date of opening of Bids as published by the Ministry of Industrial Development, Government of India, New Delhi.

S_1 = The all India average wholesale price index for steel (Bars and Rods) for the month under consideration as published by Ministry of Industrial Development, New Delhi.

P_s = Percentage of Steel component of the work.

Note: For the application of this clause, index of Bars and Rods has been chosen to represent steel group.

Adjustment for CI Pipes and Specials Component

$$V_s = 0.85 \times \frac{PCI}{100} \times R \times \frac{(S_1 - S_0)}{S_0}$$

V_s = Increase or decrease in cost of work during the Month under consideration due to changes in the rates of pig iron

PCI = Percentage of C.I component of the work.

R = Value of the work.

S_1 = Rate of Pig iron for the month under consideration as issued by Kudermukh iron ore Company Ltd (A GOI Undertaking)

S_0 = Basic rate of pig iron on 25 days preceding the date of opening of Bids as issued by Kudermukh iron ore Company Ltd (A GOI undertaking)

Adjustment for DI Pipes and Specials Component

$$V_s = 0.85 \times 0.65 \times \frac{P_{DI}}{100} \times R \times \frac{(S_1 - S_0)}{S_0}$$

V_s = Increase or decrease in cost of work during the Month under consideration due to changes in the rates of pig iron

P_{DI} = Percentage of D.I component of the work.

R = Value of the work.

S_1 = Rate of Pig iron for the month under consideration as issued by Kudermukh iron ore Company Ltd (A GOI Undertaking)

S_0 = Basic rate of pig iron on 25 days preceding the date of opening of Bids as issued by Kudermukh iron ore Company Ltd (A GOI undertaking)

Adjustment for M.S. /G.I. Pipes and Fittings Component

$$V_s = 0.85 \times \frac{P_{GI}}{100} \times R \times \frac{(S_1 - S_0)}{S_0}$$

V_s = Increase or decrease in cost of work during the Month under consideration due to changes in the rates of pig iron

P_{GI} = Percentage of G.I. component of the work.

R = Value of the work.

S_1 = Rate of HR Coil / plate for the month under consideration as issued by SAIL.

S_0 = Rate of HR Coil / plate on 25 days preceding the date of opening of Bids as issued by SAIL

CLAUSE 10 CC :

Payment due to increase/ decrease in Price/Wages of the receipt of tender (Time of completion more than 18 months)

(a) Contract price shall be adjusted for increase or decrease in rates and price of labour, materials, fuels and lubricants in accordance with the following principles and procedures and as per formula given in the contract data:

The price adjustment shall apply for the work done from the start date given in the contract data upto end of the initial intended completion date of extensions granted by the Engineer and shall not apply to the work carried out beyond the stipulated time for reasons attributable to the contractor.

(b) Following expressions and meanings are assigned to the work done during each month.

R = Total value of work done during the month. It would include the amount of secured advance granted, if any, during the month, less the amount of secured advance recovered, if any during the month. It will exclude value for works executed under variations for which price adjustment will be worked separately based on the terms mutually agreed.

(c) To the extent that full compensation for any rise or fall in costs to the contractor is not covered by the provisions of this or other clauses in the contract, the unit rates and prices included in the contract shall be deemed to include amounts to cover the contingency of such other rise or fall in costs.

The formulas (e) for adjustment of prices are:

Adjustment for labour component

(i) Price adjustment for increase or decrease in the cost due to labour shall be paid in accordance with the following formula.

$$V_L = 0.85 \times P_1 / 100 \times R \times (L_1 - L_0) / L_0$$

V_L = Increase or decrease in the cost of work during the month under consideration due to changes in rates for local labour.

R = Value of the work

L_0 = the consumer price index for industrial workers for the State on 28 days preceding the date of opening of Bids as published by Labour Bureau, Ministry of Labour, Government of India.

L_1 = The consumer price index for industrial workers for the State for the under consideration as published by Labour Bureau, Ministry of Labour, Government of India.

P_1 = Percentage of labour component of the work.

Adjustment for cement component

(ii) Price adjustment for increase or decrease in the cost of cement procured by the contractor shall be paid in accordance with the following formula:

$$V_C = 0.85 \times P_0 / 100 \times R \times (C_1 - C_0) / C_0$$

V_C = increase or decrease in the cost of work during the month under consideration due to changes in rates for cement.

R = Value of the work

C_0 = The all India wholesale price index for cement on 28 days preceding the date of opening of Bids as published by the Ministry of industrial Development, Government of India, New Delhi.

C_1 =	The all India average wholesale price index for cement for the month under consideration as published by Ministry of Industrial Development, Government of India, New Delhi.
P_c =	Percentage of cement component of the work.

Adjustment for Steel component

(iii)	Price adjustment for increase or decrease in the cost of steel procured by the Contractor shall be paid in accordance with the following formula:
V_s =	$0.85 \times P_s / 100 \times R \times (S_1 - S_0) / S_0$
V_s =	Increase or decrease in the cost of work during the month under consideration due to changes in the rates for steel.
R =	Value of the work
S_0 =	The all India wholesale price index for steel (Bars and Rods) on 25 days preceding the date of opening of Bids as published by the Ministry of Industrial Development, Government of India, New Delhi. The all India average wholesale price index for steel (Bars and Rods) for the month under consideration as published by Ministry of industrial Development, New Delhi.
P_1 =	Percentage of labour component of the work.
Note:	For the application of the clause, Index of Bars and Rods has been chosen to represent steel group.

Adjustment of POL (fuel and lubricant) component

(iv)	Price adjustment for increase or decrease in the cost of POL (fuel and lubricant) shall be paid in accordance with the following formula:
V_1 =	$0.85 \times P_1 / 100 \times R \times (F_1 - F_0) / F_0$
V_1 =	Increase or decrease in the cost of work during the month under consideration due to changes in rates for fuel and lubricants.
R =	Value of the work
F_0 =	The official retail price of High Speed Diesel (HSD) at the existing consumer pumps of IOC at nearest center on the day 28 days prior to the date of opening of Bids.
F_1 =	The official retail price of HSD at the existing consumer pumps of IOC at nearest center for the 15 th day of month of the under consideration.
P_1 =	Percentage of fuel and lubricants component of the

work.

Note: For the application of this clause, the price of High Speed Diesel Oil has been chosen to represent fuel and lubricants group.

Adjustment for Plant and Machinery Spares component

(v) Price adjustment for increase or decrease in the cost of plant and machinery spares procured by the Contractor shall be paid in accordance with the following formula:

$$V_p = 0.85 \times P_p / 100 \times R \times (P_1 - P_0) / P_0$$

V_p = Increase or decrease in the cost of work during the month under consideration due to changes in rates for plant and machinery spares.

R = Value of the work

P_0 = The all India wholesale price Index for heavy machinery and parts on 28 days preceding the date of opening of Bids as published by the Ministry of Industrial Development, Government of India, New Delhi.

P_1 = The all India average wholesale price index for heavy machinery and parts for the month under consideration as published by Ministry of Industrial Development, Government of India, New Delhi.

P_p = Percentage of plant and machinery spares component of the work.

Note: For the application of this clause, Index of Heavy machinery and Parts has been chosen to represent the Plant and Machinery Spares group.

Adjustment for CI Pipes and Specials Component

(vi)

$$V_s = 0.85 \times \frac{PCI}{100} \times R \times \frac{(S_1 - S_0)}{S_0}$$

V_s = Increase or decrease in cost of work during the Month under consideration due to changes in the rates of pig iron

PCI = Percentage of C.I component of the work.

R = Value of the work.

S_1 = Rate of Pig iron for the month under consideration as issued by Kudermukh iron ore Company Ltd (A GOI Undertaking)

S_0 = Basic rate of pig iron on 25 days preceding the date of opening of Bids as issued by Kudermukh iron ore Company Ltd (A GOI undertaking)

Adjustment for DI Pipes and Specials Component

(vii)

$$V_s = 0.85 \times 0.65 \times \frac{P_{DI}}{100} \times R \times \frac{(S_1 - S_0)}{S_0}$$

V_s = Increase or decrease in cost of work during the Month under consideration due to changes in the rates of pig iron

P_{DI} = Percentage of D.I component of the work.

R = Value of the work.

S_1 = Rate of Pig iron for the month under consideration as issued by Kudermukh iron ore Company Ltd (A GOI Undertaking)

S_0 = Basic rate of pig iron on 25 days preceding the date of opening of Bids as issued by Kudermukh iron ore Company Ltd (A GOI undertaking)

Adjustment for M.S./G.I. Pipes and Fittings Component

(viii)

$$V_s = 0.85 \times \frac{P_{GI}}{100} \times R \left(\frac{S_1 - S_0}{S_0} \right)$$

V_s = Increase or decrease in cost of work during the Month under consideration due to changes in the rates of pig iron

P_{GI} = Percentage of G.I. component of the work.

R = Value of the work.

S_1 = Rate of HR Coil / plate for the month under consideration as issued by SAIL.

S_0 = Rate of HR Coil / plate on 25 days preceding the date of opening of Bids as issued by SAIL

Adjustment of other materials component

(ix)

Price adjustment for Increase or decrease in cost of local materials other than cement, steel, bitumen and POL procured by the contractor shall be paid in accordance with the following formula:

$$V_m = 0.85 \times \frac{P_m}{100} \times R \times (M_1 - M_0) / M_0$$

V_m = Increase or decrease in the cost of work during the month under consideration due to changes in rates for local materials other than cement, steel, bitumen and POL.

R = Value of the work

M_0 = The all India wholesale price index (all commodities) on 28 days preceding the date of opening of Bids, as published by the Ministry of Industrial Development, Government of India, New Delhi.

M_1 = The all India wholesale price index (all commodities) for the month under consideration as published by Ministry of Industrial Development, Government of India, New Delhi.

P_1 = Percentage of local material component (other than cement, steel, bitumen and POL) of the work.

The following percentages will govern the price adjustment for the entire contract:

- | | | |
|----|----------------|---|
| 1. | Labour – P_l | % |
| 2. | Cement – P_c | % |
| 3. | Steel – P_s | % |

4.	POL – P _i	%
5.	Plant & Machinery Spares – P _p	%
6.	Other materials – P _m	%

Including pipes etc. Total – 100%

(x) In contract where clause 10CA is applicable, this clause 10CC will not be applicable and in contract where this clause 10CC is applicable previous clause 10CA will not be applicable.

CLAUSE 10 D

Dismantled Material Govt. Property

The contractor shall treat all materials obtained during dismantling of structure, excavation of the site for a work, etc. as Government's property and such materials shall be disposed off to the best advantage of Government according to the PWD codal provision.

CLAUSE 11

Work to be Executed in Accordance with Specifications, Drawings, Orders etc.

The contractor shall execute the whole and every part of the work in the most substantial and workman like manner both as regards materials and otherwise in every respect in strict accordance with the specifications. The contractor shall also conform exactly, fully and faithfully to the design, drawings and instructions in writing in respect of the work signed by the Engineer-in-Charge and the contractor shall be furnished free of charge one copy of the contract documents together with specification and drawings are not included in the standard specifications of Public Health Engineering Department specified in Schedule 'F' or in any Bureau of Indian Standard or any other, published standard or code or, Schedule of Rates or any other printed publication referred to elsewhere in the contract.

The contractor shall comply with the provisions of the contract and with the care and diligence execute and maintain the works and provide all labour and materials, tools and plants including for measurements and supervision of all works, structural plans and other things of temporary or permanent nature required for such execution and maintenance in so far as the necessity for providing these, is specified or is reasonably inferred from the contract. The Contractor shall take full responsibility for adequacy, suitability and safety of all the works and methods of construction.

CLAUSE 12

Deviation/ Variations Extent and Pricing

The Engineer-in-Charge (As per codal provision) shall have power (i) to make alteration in, omissions from, additions to, or substitutions for the original specifications, drawings designs and instructions that may appear to him to be necessary or advisable during the progress of the work, and (ii) to omit a part of the works in case of non-availability of a portion of the site or for any other reasons and the contractor shall be bound to carry out the works in accordance with any instructions given to him in writing signed by the Engineer-in-Charge after approval from competent authority and such alterations omissions additions or substitutions shall form part of the contract as if originally provided therein and any altered, additional or substituted work which the contractor may be directed to do in the manner specified above as part of the works, shall be carried out by the contractor on the same conditions in all respects including price on which he agreed to do the main work except as hereafter provided.

12.1 The time for completion of the works shall, in the event of any deviations resulting in additional cost over the tendered value sum being ordered be extended, if requested by the contractor, as follows:

i) In the proportion which the additional cost of the altered, additional or substituted work, bears to the original tendered value plus.

ii) 25% of the time calculated in (i) above or such further additional time as may be considered reasonable by the Engineer-in-Charge after approval from competent authority.

Deviation, extra items and Pricing)

12.2 In the case of extra item(s) the contractor may within fifteen days of receipt of order or occurrence of the item(s) claim rates, supported by proper analysis, for the work and the Engineer-in-Charge after approval from competent authority shall within one month of the receipt of the claims supported by analysis, after giving consideration to the analysis of the rates submitted by the contractor, determine the rates as per power delegated in PWD Code (revised) and on the basis of the market rates and the contractor shall be paid in accordance with the rates so determined.

Deviation Substituted items, Pricing

In the case of substituted items, the rate for the agreement item (to be substituted) and substituted item shall also be determined in the manner as mentioned in the aforesaid Para.

(a) If the market rate for the substituted item so determined is more than the market rate of the agreement item (to be substituted) the rate payable to the contractor for the substituted item shall be the rate for the agreement item (to be substituted) so increased to the extent of the difference between the market rates of substituted item and the agreement item (to be substituted).

b) If the market rate for the substituted item so determined is less than the market rate of the agreement item (to be substituted) the rate payable to the contractor for the substituted item shall be rate for the agreement item (to be substituted) so decreased to the extent of the difference between the market rates of substituted item and the agreement item (to be substituted).

Deviation, Deviated Quantities, Pricing

In the case of contract items, substituted items, contract cum substituted items, which exceed the limits laid down in Schedule F, the contractor may within fifteen days of receipt of order or occurrence of the excess, claim revision of the rates, supported by proper analysis, for the work in excess of the above mentioned limits, provided that if the rates so claimed are in excess of the rates specified in the schedule of quantities the Engineer-in-Charge shall within one month of receipt of the claims supported by analysis, after giving consideration to the analysis of the rates submitted by the contractor, determine the rates as per power delegated in PWD/CPHEEO Code and on the basis of the market rates and the contractor shall be paid in accordance with the rates so determined.

12.3 (NOT APPLICABLE) The provisions of the preceding paragraph shall also apply to the decrease in the rates of items for the work in excess of the limits laid down in Schedule 'F' and the Engineer-in-Charge shall after giving notice to the contractor within one month of occurrence of the excess and after taking into consideration any reply received from him within fifteen days of receipt of the notice, revise the rates as per power delegated in PWD/CPHEEO Code for the work in question within one month of expiry of the said period of fifteen days having regard to the market rates or current schedule of rate.

12.4 The contractor shall send to the Engineer-in-Charge once every three months an up to date account giving complete details of all claims for additional payments to which the contractor may consider himself entitled and of all additional work ordered by the Engineer-in-Charge after approval from competent authority which he has executed during the preceding quarter failing which the contractor shall be deemed to have waived his right.

12.5 For the purpose of operation of Schedule 'F' the following works shall treated as works relating to foundation:

- i) For buildings, compound walls plinth level or 1.2 meters (4 feet) above ground level whichever is lower excluding items of flooring and D.P.C. but including base concrete below the floors.
- ii) For abutments, piers, retaining walls of culverts and bridges, walls of water reservoirs the bed of floor level.
- iii) For retaining walls where floor level is not determinate 1.2 meters above the average ground level or bed level.
- iv) For Roads all items of excavation and filling including treatment of sub-base.

12.6 Any operation incidental to or necessary has to be in contemplation of tenderer while filing tender, or necessary for proper execution of the item included in the Schedule of quantities or in the schedule of rates mentioned above, whether or not, specifically indicated in the description of the item and the relevant specifications, shall be deemed to be included in the rates quoted by the tenderer or the rate given in the said schedule of rates, as the case may be. Nothing extra shall be admissible for such operations.

CLAUSE 13

Foreclosure of Contract due to Abandonment of Reduction in Scope of Work

If at any time after acceptance of the tender Government shall decide to abandon or reduce the scope of the works for any reason whatsoever and hence not require the whole or any part of the works to be carried out, the Engineer-in-Charge shall give notice in writing to that effect to the contractor and the contractor shall act accordingly in the matter. The contractor shall have no claim to any payment of compensation or otherwise whatsoever, on account of any profit or advantage which he might have derived from the execution of the works in full but which he did not derive in consequence of the foreclosure of the whole or part of the works .

The contractor shall be paid at contract rates for works executed at site only.

CLAUSE 14

Cancellation of contract in full or part

If the contractor:

- (i) At any time makes default in proceeding with works or any part of the work with due diligence and continues to do so after a notice in writing of 7 days from the Engineer-in-Charge; or
- ii) Commits default to comply with any of the terms and conditions of the contract and does not remedy it or take effective steps to remedy it within 7 days after a notice in writing is given to him in that behalf by the Engineer-in-Charge; or
- iii) Fails to Complete the works or items of work with individual dates of completion, on or before the date(s) of completion, and does not complete them within the period specified in a notice given in writing in that behalf by the Engineer-in-Charge; or
- iv) Shall offer or give or agree to give to any person in Government service or to any other person on his behalf any gift or consideration of any kind an inducement or reward for doing or forbearing to do or for having done or forborne to do any act in relation to the obtaining or execution of this or any other contract for Government; or
- v) Shall enter into a contract with Government in connection with which commission has been paid or agreed to be paid by him or to his knowledge, unless the particulars of any such commission and the terms of payment thereof have been previously disclosed in writing to the Accepting Authority/Engineer-in-Charge; or
- vi) Shall obtain a contract with Government as a result of wrong tendering or other non-bonafide methods of competitive tendering; or
- vii) Being an individual, or if a firm, any partner thereof shall at any time be adjudged insolvent or have a receiving order or order for administration of his estate made against him or shall take any proceedings for liquidation or composition (other than a voluntary liquidation for the purpose of amalgamation

or reconstruction) under any Insolvency Act for the time being in force or make any conveyance or assignment of his effects or composition or arrangement for the benefit of his creditors or purport so to do, or if any application be made under any Insolvency Act for the time being in force for the sequestration of his estate or if a trust deed be executed by him for benefit or his creditors; or

viii) Being a company, shall pass a resolution or the Court shall make an order for the winding up of the company, or a receiver or manager on behalf of the debenture holders or otherwise shall be appointed or circumstances shall arise which entitle the Court or debenture holders to appoint a receiver or manager; or

ix) Shall suffer an execution being levied on his goods and allow it to be continued for a period of 21 days; or

x) Assigns, transfers, sublets (engagement of labour on a piece-work basis or of labour with materials not to be incorporated in the work, shall not be deemed to be subletting) or otherwise parts with or attempts to assign, transfer, sublet or otherwise parts with the entire works or any portion thereof without the prior written approval of the Competent Authority;

The Competent Authority may, without prejudice to any other right or remedy which shall have accrued or shall accrues hereafter to Government, by a notice in writing to cancel the contract as whole or only such items of work in default from the Contract.

The Engineer-in-Charge shall on such cancellation by the Competent Authority have powers to:

(a) Take possession of the site and any materials, constructional plant, implements stores, etc, thereon; and/or

(b) Carry out the incomplete work by any means at the risk and cost of the contractor.

On cancellation of the contract in full or in part, the Engineer-in-Charge shall determine what amount, if any, is recoverable from the contractor for completion of the works or part of the works or in case the works or part of the works is not to be completed, the loss of damage suffered by Government. In determining the amount, credit shall be given to the contractor for the value of the work executed by him up to the time of cancellation, the value of contractor's materials taken over and incorporated in the work and use of plant and machinery belonging to the contractor.

Any excess expenditure incurred or to be incurred by Government in completing the works or part of the works or the excess loss or damages suffered or which may be suffered by Government as aforesaid after allowing such credit shall without prejudice to any other right or remedy available to Government in law be recovered from any moneys due to the contractor on any account, and if such moneys are not sufficient the contractor shall be called upon in writing and shall be liable to pay the same within 30 days.

If the contractor fails to pay the required sum within the aforesaid period of 30 days, the Engineer-in-Charge shall have the right to sell any or all of the contractors unused materials, constructional plant, implements, temporary buildings, etc. and apply the proceeds of sale thereof towards the satisfaction of any sums due from the contractor under the contract and if thereafter there be any balance is outstanding from the contractor, it shall be recovered in accordance with the provisions of the contract.

Any sums in excess of the amounts due to Government and unsold materials, constructional plant, etc. shall be returned to the contractor, provided always that if cost or anticipated cost of completion by Government of the works or part of the works is less than the amount which the contractor would have been paid had he completed the works or part of the works, such benefit shall not accrue to the contractor.

CLAUSE 15

Suspension of work

i) The contractor shall, on receipt of the order in writing of the Engineer-in-Charge (whose decision shall be final and binding on the contractor) suspend the progress of the works or any

part thereof for such time and in such manner as the Engineer-in-Charge may consider necessary so as not to cause any damage or injury to the work already done or endanger the safety thereof, for any of the following reasons :

- a) on account of any default on the part of the contractor or;
- b) for proper execution of the works or part thereof for reasons other than the default of the contractor; or
- c) for safety of the works or part thereof.

The contractor shall, during such suspension, properly protect and secure the works to the extent necessary and carry out the instructions given in that behalf by the Engineer-in-Charge.

ii) If the suspension is ordered for reasons (b) and (c) in sub-Para (i) above, the contractor shall be entitled to an extension of time equal to the period of every such suspension PLUS 25% for completion of the item or group of items of work for which a separate period of completion is specified in the contract and of which the suspended work forms a part, and;

CLAUSE 16

Action in case Work not done as per Specifications

All works under or in course of execution or executed in pursuance of the contract shall at all times be open and accessible to the inspection and supervision of the Engineer-in-Charge, his authorized subordinates in charge of the work and all the superior officers, officer of the Quality Control Organization of the Department and of the Cabinet (Technical) Vigilance, and the contractor shall, at all times, during the usual working hours and at all other times at which reasonable notice of the visit of such officers has been given to the contractor, either himself be present to receive orders and instructions or have a responsible agent duly accredited in writing, present for that purpose. Orders given to the Contractor's agent shall be considered to have the same force as if they had been given to the contractor himself.

If it shall appear to the Engineer-in-Charge or his higher authority or his authorized subordinates in charge of the work or to the Cabinet (Technical) Vigilance or his subordinate officers, that any work has been executed with unsound, imperfect, or unskillful workmanship, or with materials or article provided by him for the execution of the work which are unsound or of a quality inferior to that contracted or otherwise not in accordance with the contract the contractor shall, on demand in writing which shall be made within the period specified in schedule – F of contract data from the Engineer-in-Charge specify in the work, materials or articles complained of notwithstanding that the same may have been passed, certified and paid for forthwith rectify or remove and reconstruct the work so specified in whole or in part, as the case may require or as the case may be, remove the materials or articles so specified and provide other proper and suitable materials or articles at his own charge and cost. In the event of the contractor failing to do so within a period specified by the Engineer-in-Charge in his demand aforesaid, then the contractor shall be liable to pay compensation at the same rate as under clause 2 of the contract (for non-completion of the work in time) for this default.

In such case the Engineer-in-Charge may not accept the item of work at the rates applicable under the contract but may accept such items at reduced rates as the competent authority may consider reasonable during the preparation of on account bills or final bill if the item is so acceptable without detriment to the safety and utility of the item and the structure and incidental items rectified, or removed and re-executed at the risk and cost of contractor. Decision of the Engineer-in-Charge to be conveyed in writing in respect of the same will be final and binding on the contractor.

CLAUSE 17

Contractor Liable for Damages, defects during maintenance period

If the contractor or his working people or servants shall break, deface, injure or destroy any part of building in which they may be working, or any building, road, road curb, fence enclosure, water pipe, cables, drains, electric or telephone post or wired, trees, grass or grassland, or cultivated ground contiguous to the premises on which the work or any part is being executed, or if any damage shall happen to the work while in progress, from any cause whatever or if any defect, shrinkage or other faults appear in the work within defect liability period after a certificate final or otherwise of its completion shall have been given by the Engineer-in-Charge as aforesaid arising out of defect or improper materials or workmanship the contractor shall upon receipt of a notice in writing on that behalf make the same good at his own expense or in default the Engineer-in-Charge cause the same to be made good by other workmen and deduct the expense from any sums that may be due or at any time thereafter may become due to the contractor, or from his security deposit the proceeds of sale thereof or of a sufficient portion thereof. The security deposit of the contractor shall not be refunded before the expiry of defect liability period after the issue of the certificate final or otherwise, of completion of work, or till the final bill has been prepared and passed whichever is later.

CLAUSE 18

Contractor to Supply tools & Plants etc

The contractor shall provide at his own cost all materials (except such special materials, if any, as may in accordance with the contract be supplied from the Engineer-in-Charge's stores), plant, tools, appliances, implements, ladders, cordage, tackle, scaffolding and temporary works required for the proper execution of the work, whether original, altered or substituted and whether included in the specification or other document forming part of the contract or referred to in these conditions or not, or which may be necessary for the purpose of satisfying or complying with the requirements of the Engineer-in-Charge as to any matter as to which under these conditions he is entitled to be satisfied, or which he is entitled to require together with carriage therefore to and from the work. The contractor shall also supply without charge the requisite number of persons with the means and materials, necessary for the purpose of setting out works, and counting, weighting and assisting the measurement for examination at any time and from time to time of the work or materials. Failing his so doing the same may be provided by the Engineer-in-Charge at cost to the contractor, under this contract or otherwise and/or from his security deposit or the proceeds of sale thereof, or of sufficient portions thereof.

CLAUSE 18 A

Recovery of Compensation paid to Workman

In every case in which by virtue of the provisions sub-section (1) of Section 12, of the Workmen's Compensations Act, 1923, Government is obliged to pay compensation to a workman employed by the contractor, in execution of the works. Government will recover from the contractor the amount of the compensation so paid; and without prejudice to the right of the Government under sub-section (2) of section 12, of the said Act, Government shall be at liberty to recover such amount or any part thereof by deducting it from the security deposit or from any sum due by Government to the contractor whether under this contract or otherwise. Government shall not be bound to contest any claim made against it under sub-section (1) Section 12, of the said Act, except on the written request of the contractor and upon his giving to Government full security for all costs for which Government might become liable in consequence of contesting such claim.

CLAUSE 18 B

Ensuring payment and Amenities to Workers if Contractor fails

In every case in which by virtue of the provisions of the Contract Labour (Regulation and Abolition) Act, 1970, and of the Contract Labour (Regulation and Abolition) Central Rules, 1971, Government is

obliged to pay any amounts of wages to a workman employed by the contractor in execution of the works, or to incur any expenditure in providing welfare and health amenities required to be provided under the above said Act and the rules under Clause 19 H or under the P.W.D. Contractor's Labour Regulations, or under the Rules framed by Government from time to time for the protection of health and sanitary arrangements for workers employed by P.W.D. Contractors, Government will recover from the contractor the amount of wages so paid or the amount of expenditure so incurred; and without prejudice to the rights of the Government under sub-section (2) of Section 20, and sub-section (4) of Section 21, of the Contract Labour (Regulation and Abolition) Act, 1970, Government shall be at liberty to recover such amount or any part thereof by deducting it from the security deposit or from any sum due by Government to the contractor whether under this contract or otherwise Government shall not be bound to contest any claim made against it under sub-section (1) of Section 20, sub-section (4) of Section 21, of the said Act, except on the written request of the contractor and upon his giving to the Government full security for all costs for which Government might become liable in contesting such claim.

CLAUSE 19

Labour Laws to be complied by the Contractor

The contractor shall obtain a valid license under the State Labour Act, and the Contract Labour (Regulation and Abolition) Central rules 1971, before the commencement of the work, and continue to have a valid license until the completion of the work. The contractor shall also abide by the provisions of the Child Labour (Prohibition and Regulation) Act, 1986.

The contractor shall also comply with the provisions of the building and other Construction Workers (Regulation of Employment & Conditions of Service) Act, 1996 and the building and other Construction Workers Welfare Cess Act, 1996.

Any failure to fulfill these requirements shall attract the penal provisions of the contract arising out of the resultant non-execution of the work.

CLAUSE 19 A

No labour below the prescribed age shall be employed on the work.

CLAUSE 19 B

Payment of Wages

i) The contractor shall pay to labour employed by him either directly or through sub-contractors, wages no less than fair wages as defined in P.W.D. Contractor's Labour Regulations or as per the provisions of the Contract Labour (Regulation and Abolition) Act 1970 and the contract Labour (Regulation and Abolition) Central Rules, 1971 wherever applicable.

ii) The contractor shall, notwithstanding the provisions of any contract to the contrary, cause to be paid fair wage to labour indirectly engaged on the work including any labour engaged by his sub-contractors in connection with the said work, as if the labour had been immediately employed by him.

iii) In respect of all labour directly or indirectly employed in the works for performance of the contractor's part of this contract, the contractor shall comply with or cause to be complied with the Public Works Department contractor's Labour Regulations made by Government from time to time in regard to payment of wages, wage period, deductions from wages recovery of wages not paid and deductions unauthorized made, maintenance of wage books or wage slips, publication of scale of wages and other terms of employment, inspection and submission of periodical returns and all other matters of the like nature or as per the provisions of the Contract Labour (Regulation and Abolition) Act, 1970, and the Contract Labour (Regulation and Abolition) Central Rules, 1971, wherever applicable.

iv) a) The Engineer-in-Charge concerned shall have the right to deduct from the moneys due to the contractor any sum required or estimated to be required for making good the loss suffered by a worker or workers by reason of non fulfillment of the conditions of the contract for the benefit of the workers, non-payment of wages or of deductions made from his or their wages which are not justified by their terms of the contract or non-observance of the Regulations.

b) Under the provision of Minimum Wages (Central) Rules 1950, the contractor is bound to allow to the labours directly or indirectly employed in the works one day rest for 6 days continuous work and pay wages at same rate as for duty. In the event of default the Engineer-in-Charge shall have the right to deduct the sum or sums not paid on account of wages for weekly holidays to any labours and pay the same to the persons entitled thereto from any money due to the contractor by the Engineer-in-Charge concerned.

v) The contractor shall comply with the provisions of the Payment of Wages Act, 1936, Minimum Wages Act, 1948, Employees Liability Act, 1938, Workmen's Compensation Act, 1923, Industrial Disputes Act, 1947, Maternity Act, 1970, or the modifications thereof or any other laws relating thereto and the rules made there under from time to time.

vi) The contractor shall indemnify and keep indemnified Government against payments to be made under and for the observance of the laws aforesaid and the P.W.D. Contractor's Labour Regulations without prejudice to his right to claim indemnity from his sub-contractors.

vii) The laws aforesaid shall be deemed to be a part of this contract and any breach thereof shall be deemed to be a breach of this contract.

viii) Whatever is the minimum wage for the time being, or if the wage-payable higher than such wage, such wage shall be paid by the contractor to the workmen directly without the intervention of Jamadar and that Jamadar shall not be entitled to deduct or recover any amount from the minimum wage payable to the workmen as and by way of commission or otherwise.

ix) The contractor shall ensure that no amount by way of commission or otherwise is deducted or recovered by the Jamadar from the wage of workmen.

CLAUSE 19 C

In respect of all labour directly or indirectly employed in the work for the performance of the contractor's part of this contract, the contractor shall at his own expense arrange for the safety provisions as per P.W.D. Safety Code framed from time to time and shall at his own expense provide for all facilities in connection therewith. In case the contractor fails to make arrangement and provide necessary facilities as aforesaid he shall be liable to pay a penalty of Rs. 200/- for each default and in addition the Engineer-in-Charge shall be at liberty to make arrangement and provide facilities as aforesaid and recover the costs incurred in that behalf from the contractor.

CLAUSE 20

Minimum wages Act to be complied with

The contractor shall at least pay and comply with all the provisions of the Minimum wages Acts and rules framed there under other labour laws related to contract labour.

CLAUSE 21

Work not to be sublet, Action in case of insolvency

The contract shall not be assigned or sublet without the written approval of the Engineer-in-Charge. And if the contractor shall assign or sublet his contract or attempt to do so, or become insolvent or commence any insolvency proceedings or make any composition with his creditors or attempt to do so, or if any bribe, gratuity, gift, loan, perquisite, reward or advantage pecuniary or otherwise, shall either directly or indirectly, be given, promised in the employ of Government in any way relating to his office or employment, or if any such officer or person shall become in any way directly or indirectly interested in the contract, the Engineer-in-Charge on behalf of the Governor of Bihar shall have power to adopt the courses specified in Clause 3 hereof in the interest of Government and in the event of such course being adopted the consequences specified in the said Clause 3 shall ensure.

CLAUSE 22

Compensation

All sums payable by way of compensation under any of these conditions shall be considered as reasonable compensation to be applied to the use of Government without reference to the actual loss or damage sustained and whether or not any damage shall have been sustained.

CLAUSE 23

Changes in firm's Constitution to be intimated

Where the contractor is a partnership firm, the previous approval in writing of the Engineer-in-Charge shall be obtained before any change is made in the constitution of the firm. Where the contractor is an individual or a Hindu undivided family business concern such approval as aforesaid shall likewise be obtained before the contractor enters into any partnership agreement where under the partnership firm would have the right to carry out the works hereby undertaken by the contractor. If previous approval as aforesaid is not obtained, the contract shall be deemed to have been assigned in contravention of Clause 21 thereof and the same action may be taken, and the same consequences shall ensue as provided in the said Clause 21.

CLAUSE 24

Approval of Engineer in Charge

As works to be executed under the contract shall be executed under the direction and subject to the approval in all respects of the Engineer-in-Charge who shall be entitled to direct at what point or points and in what manner they are to be commenced, and from time to time carried on.

CLAUSE 25

Settlement of Disputes & Arbitration

Except where otherwise provided in the contract all questions and disputes relating to the meaning of the specifications, design, drawings and instructions here-in-before mentioned and as to the quality of workmanship or materials used on the work or as to any other question, claim right matter or thing whatsoever in any way arising out of or relating to contract, designs, drawings, specifications, estimates, instructions, orders or these conditions or otherwise concerning the works or execution or failure to execute the same whether arising during the progress of the work or after the cancellation, termination, completion or abandonment thereof shall be dealt with as mentioned hereinafter.

i) If the contractor considered any work demanded of him to be outside the requirements of the contract, or dispute any drawings, record or decision given in writing by the Engineer-in-Charge on any matter in connection with or arising out of the contract or carrying out of the contract or carrying out of the work, to be unacceptable, he shall promptly within 7 days request the Superintending Engineer in writing for written instruction of decision. Thereupon, the Superintending Engineer shall give his written instructions of decision within a period of fifteen days from the receipt of the contractor's letter. If the Superintending Engineer fails to give his instructions or decision in writing within the aforesaid period or if the contractor is dissatisfied with the instructions or decision of the Superintending Engineer, the contractor may, within 15 days of the receipt of Superintending Engineer's decision, appeal to the Chief Engineer who shall afford an opportunity to the contractor to be heard, if the later so desires, and to offer evidence in support of his appeal. The Chief Engineer shall give his decision within 30 days of receipt of contractor's appeal. If the contractor is dissatisfied with this decision, the contractor shall within a period of 30 days from receipt of the decision, give notice to the Chief Engineer for appointment of arbitrator failing which the said decision shall be final binding and conclusive and not referable to adjudication by the arbitrator.

ii) Except where the decision has become final, binding and conclusive in terms of Sub Para (i) above disputes or difference shall be referred for adjudication through arbitrator appointed by Chief Engineer or the administrative head of the said BRJP. If the arbitrator so appointed is unable or unwilling to act or resign his appointment or vacates his office due to any reason whatsoever another sole arbitrator shall be appointed in the manner aforesaid. Such person shall be entitled to proceed with the reference from the stage at which it was left by his predecessor.

It is a term of this contract that the party invoking arbitration shall give a list of disputes with amounts claimed in respect of each such dispute along with the notice for appointment of arbitrator and giving reference to the rejection by the Chief Engineer of the appeal.

It is also a term of this contract that no person other than a person appointed by such Chief Engineer or the administrative head of the department as aforesaid should act as arbitrator and if for any reason that is not possible, the matter shall not be referred to arbitrator at all. It is also a term of this contract that if the contractor does not make any demand for appointment of arbitrator in respect of any claims in writing as aforesaid within 45 days of receiving the intimation from the Engineer-in-Charge that the final bill is ready for payment, the claim of the contractor shall be deemed to have been waived and absolutely barred and the Government shall be discharged and released of all liabilities under the contract in respect of these claims.

The arbitration shall be conducted in accordance with the provisions of the Arbitration and Conciliation Act, 1996 (26 of 1996) or any statutory modifications or re-enactment thereof and the rules made there under and for the time being in force shall apply to the arbitration proceeding under this clause.

It is also a term of the contract that if any fees are payable to the arbitrator these shall be paid equally by both the parties.

It is also a term of the contract that the arbitrator shall be deemed to have entered on the reference on the date the issues notice to both the parties calling them to submit their statement of claims and counter statement of claims. The venue of the arbitration shall be such place as may be fixed by the arbitrator in his sole discretion. The fees, if any, of the arbitrator shall, if required to be paid before the award is made and published, be paid half and half by each of the parties. The cost of the reference and of the award (including the fees, if any, of the arbitrator) shall be in the discretion of the arbitrator who may direct to any by whom and in what manner such costs or any part thereof shall be paid and fix or settle the amount of costs to be so paid. All arbitration shall be held at PATNA and at no other place.

CLAUSE 26

Contractor to indemnify Govt. against Patent Rights

The contractor shall fully indemnify and keep indemnified the Governor of Bihar against any action, claim or proceeding relating to infringement or use of any patent or design or any alleged patent or design rights and shall pay any royalties which may be payable in respect of any article of part thereof included in the contract. In the event of any claims made under the action brought against Government in respect of any such matter as aforesaid the contractor shall be immediately notified thereof and the contractor shall be at liberty, at his own expense, to settle any dispute or to conduct any litigation that may arise there from, provided that the contractor shall not be liable to indemnify the Governor of Bihar if the infringement of the patent or design or any alleged patent or design right is the direct result of an order passed by the Engineer-in-Charge in this behalf.

CLAUSE 27

Lump sum Provisions in Tender

When the estimate on which a tender is made includes lump sum in respect of parts of the work, the contractor shall be entitled to payment in respect of the items of work involved or the part of the work in question at the same rates as are payable under this contract for such items, or if the part of the work in question is not, in the opinion of the Engineer-in-Charge capable of measurement, The Engineer-in-Charge may at his discretion pay the lump-sum amount entered in the estimate, and the certificate in writing of the Engineer-in-Charge shall be final and conclusive against the contractor with regard to any sum or sums payable to him under the provisions of the clause.

CLAUSE 28

Action where no specifications are specified

In the case of any class of work for which there is no such specifications as referred to in Clause 11, such work shall be carried out in accordance with the Bureau of Indian Standards Specifications, Indian Road Congress for road works and Indian Building Congress for building works or any central government agency

including CPWD specification and CPHEEO manual as per direction of E/I. In case there are no such specifications in above codes/manuals the work shall be carried out as per manufacturers specifications. In case there are no such specifications as required above, the work shall be carried out in all respects in accordance with the instructions and requirements of the Engineer-in-Charge.

CLAUSE 29

With -holding and lien in respect of sums due from contractor

i) Whenever any claim or claims for payment of a sum of money arises out of or under the contract or against the contractor, the Engineer-in-Charge or the Government shall be entitled to with hold and also have a lien to retain such sum or sums in whole or in part from the security, if any deposited by the contractor and for the purpose aforesaid, the Engineer-in-Charge of the Government shall be entitled to withhold the security deposit, if any, furnished as the case may be and also have a lien over the same pending finalization or adjudication of any such claim. In the event of the security being insufficient to cover the claimed amount or if no security has been taken from the contractor, the Engineer-in-Charge or the Government shall be entitled to withhold and have a lien to retain to the extent of payable or which may at any time thereafter become payable to the contractor under the same contract or any other contract with the Engineer-in-Charge of the Government or any contracting person through the Engineer-in-Charge pending finalization of adjudication of any such claim.

It is an agreed term of the contract that the sum of money or moneys so withheld or retained under the lien referred to above by the Engineer-in-Charge or Government will be kept withheld or retained as such by the Engineer-in-Charge or Government till the claim arising out of or under the contract is determined by the arbitrator (if the contract is governed by the arbitration clause) or by the competent court, as the case may be and that the contractor will have no claim for interest or damages whatsoever on any account in respect of such withholding or retention under the lien referred to above and duly notified as such to the contractor. For the purpose of this clause, where the contractor is a partnership firm or a limited company, the Engineer-in-Charge or the Government shall be entitled to withhold and also have a lien to retain towards such claimed amount or amounts in whole or in part from any sum found payable to any partner/limited company as the case may be, whether in his individual capacity or otherwise.

ii) Government shall have the right to cause an audit and technical examination of the works and the final bills of the contractor including all supporting vouchers, abstract etc., to be made after payment of the final bill and if as a result of such audit and technical examination any sum is found to have been overpaid in respect of any work done by the contractor under the contract or any work claimed to have been done by him under the contract and found not to have been executed, the contractor shall be liable to refund the amount of over-payment and it shall be lawful for Government to recover the same from him in the manner prescribed in sub-clause (i) of this clause or in any other manner legally permissible; and if it is found that the contractor was paid less than what was due to him under the contract in respect of any work executed by him under it, the amount of such under payment shall be duly paid by Government to the contractor, without any interest thereon whatsoever.

CLAUSE 29 A

Lien in respect of claims in other contracts

Any sum of money due and payable to the contractor (including the security deposit returnable to him) under the contract may be with held or retained by way of lien by the Engineer-in-Charge or the Government or any other contracting person or persons through Engineer-in-Charge against any claim of the Engineer-in-Charge or Government or such other person or persons in respect of payment of a sum of money arising out of or under any other contract made by the contractor with the Engineer-in-Charge of the Government or with such other person or persons.

It is an agreed term of the contract that the sum of money so withheld or retained under this clause by the Engineer-in-Charge of the Government will be kept withheld or retained as such by the Engineer-in-Charge or the Government till his claim arising out of the same contract or any other contract is either

mutually settled or determined by the arbitration clause or by the competent court, as the case may be and that the contractor shall have no claim for interest or damages whatsoever on this account or on any other ground in respect of any sum of money withheld or retained under this clause and duly notified as such to the contractor.

CLAUSE 30

Unfiltered water supply

The contractor(s) shall make his/their own arrangements for water required for the work and nothing extra will be paid for the same. This will be subject to the following conditions.

i) That the water used by the contractor(s) shall be fit for construction purposes to the satisfaction of the Engineer-in-Charge.

ii) The Engineer-in-Charge shall make alternative arrangements for supply of water at the risk and cost of contractor(s) if the arrangements made by the contractor(s) for procurement of water are in the opinion of the Engineer-in-Charge, unsatisfactory.

CLAUSE 31

Return of surplus material

Notwithstanding anything contained to the contrary in this contract, where any materials for the execution of the contract are procured with the assistance of Government either by issue from Government stocks or purchase made under orders or permits or licenses issued by Government the contractor shall hold the said materials economically and solely for the purpose of the contract and not dispose of them without the written permission of the Government and return, if required by the Engineer-in-Charge, all surplus or unserviceable materials that may be left with him after the completion of the contract or at its termination for any reason whatsoever on being paid or credited such price as the Engineer-in-Charge shall determine having due regard to the condition of the materials. The price allowed to the contractor however shall not exceed the amount charged to him excluding the element of storage charges. The decision of the Engineer-in-Charge shall be final and conclusive. In the event of breach of the aforesaid condition the contractor shall in addition to throwing himself open to action for contravention of the term of the license or permit and/or for criminal breach of trust, be liable to Government for all moneys, advantages or profits resulting or which in the usual course would have resulted to him by reason of such breach.

CLAUSE 32

Hire of Plant & Machinery

i) The contractor shall arrange at his own expense all tools, plant, machinery and equipment (hereinafter referred to as T & P) required for execution of the work except for the Plant & Machinery listed in Schedule 'C' and stipulated for issue to the contractor. If the contractor requires any item of T & P on hire from the T & P available will, if such item is available, hire it to the contractor at rates to be agreed upon between him and the Engineer-in-Charge. In such a case all the conditions hereunder for issue of T & P shall also be applicable to such T & P as is agreed to be issued.

ii) Plant and Machinery when supplied on hire charges in Schedule 'C' shall be made over and taken back at the departmental equipment yard/shed shown in Schedule 'C' and the contractor shall bear the cost of carriage from the place of issue to the site of work and back. The contractor shall be responsible to return the plant and machinery in the condition in which it was handed over to him, and he shall be responsible for all damage caused to the said plant and machinery at the site of work or elsewhere in operation and otherwise during transit including damage to or loss of plant and for all losses due to his failure to return the same soon after the

completion of the work for which it was issued. The Divisional Engineer shall be the sole judge to determine the liability of the contractor and its extent in this regard and his decision shall be final and binding on the contractor.

iii) The plant and machinery as stipulated above will be issued as and when available and if required by the contractor. The contractor shall arrange his programme of work according to the availability of the plant and machinery and no claim, whatsoever, will be entertained from him for any delay in supply by the Department.

iv) The hire charges shall be recovered at the prescribed rates from and inclusive of the date the plant and machinery made over up to and inclusive of the date of the return in good order even though the same may not have been working for any cause except major breakdown due to no fault of the contractor or faulty use requiring more than three working days continuously (excluding intervening holidays and Sundays) for bringing the plant in order. The contractor shall immediately intimate in writing to the Engineer-in-Charge when any plant or machinery gets out of order requiring major repairs as aforesaid. The Engineer-in-Charge shall record the date and time of receipt of such intimation in the log sheet of the plant or machinery. Based on this if the breakdown occurs before lunch period or major breakdown will be computed considering half a day's breakdown on the day of complaint. If the breakdown occurs in the post lunch period of major breakdown will be computed starting from the next working day. In case of any dispute under this clause the decision of the Superintending Engineer shall be final and binding on the contractor.

v) The hire charges shown above are for each day of 8 hours (inclusive of the one-hour lunch break) or part thereof.

vi) Hire charges will include service of operating staff as required and also supply of lubricating oil and stores for cleaning purposes. Power fuel of approved type, firewood, kerosene oil etc. for running the plant and machinery and also the full time chowkidar for guarding the plant and machinery against any loss or damage shall be arranged by the contractor who shall be fully responsible for the safeguard and security of plant and machinery. The contractor shall on or before the supply of plant and machinery sign an agreement indemnifying the Department against any loss or damage caused to the plant and machinery either during transit or at site of work.

vii) Ordinarily, no plant and machinery shall work for more than 8 hours a day inclusive of one hour lunch break. In case of an urgent work however, the Engineer-in-Charge may, at his discretion, allow the plant and machinery to be worked for more than normal period or 8 hours a day, in that case the hourly hire charges for overtime to charge (1/8th of the daily charges) subject to a minimum of half day's normal charges on any particular day. For working out hire charges for over time a period of half an hour and above will be charged as one hour and a period of less than half an hour will be ignored.

viii) The contractor shall release the plant and machinery every seventh day for periodical servicing and/or wash out which may take about three to four hours or more. Hire charges for full day shall be recovered from the contractor for the day of servicing/wash out irrespective of the period employed in servicing.

ix) The plant and machinery once issued to the contractor shall not be returned by him on account of lack of arrangements of labour and materials, etc. on his part, the same will be returned only when they are required for major repairs or when in the opinion of the Engineer-in-Charge the work or a portion of work for which the same was issued is completed.

x) Log Book for recording the hours of daily work for each of the plant and machinery supplied to the contractor will be maintained by the Department and will be countersigned by the contractor or his authorized agent daily. In case the contractor contests the correctness of the entries and/or fails to sign the Log Book the decision of the Engineer-in-Charge shall be final and binding on him. Hire charges will be calculated according to the entries in the Log Book and will be binding on the contractor.

xi) In the case of concrete mixers, the contractors shall arrange to get the hopper cleaned and the drum washed at the close of the work each day or each occasion.

xii) The contractor shall be responsible to return the plant and machinery in the condition in which it was handed over to him and he shall be responsible for all damage caused to the said plant and machinery at the site of work or elsewhere in operation or otherwise or during transit including damage to or loss of parts, and for all losses due to him failure to return the same soon after the completion of the work for which it was issued. The Divisional Engineer shall be the sole judge to determine the liability of the contractor and its extent in this regard and his decision shall be final and binding on the contractor.

xiii) The contractor will be exempted for levy of any hire charges for the number of days he is called upon in writing by the Engineer-in-Charge to suspend execution of the work provided Government plant and machinery in question have, in fact remained idle with the contractor because of the suspension.

xiv) In the event of the contractor not requiring any item of plant and machinery issued by Government though not stipulated for issue in Schedule 'C' any time after taking delivery at the place of issue, he may return it after two days written notice or at any time without notice if he agrees to pay hire charges for two additional days without in any way affecting the right of the Engineer-in-Charge to use the said plant and machinery during the said period of two days as he likes including hiring out to a third party.

CLAUSE 33

Employment of Technical Staff and employees

Contractors Superintendence, Supervision, Technical Staff & Employees

i) The contractor shall provide all necessary superintendence during execution of the work and as along thereafter as may be necessary for proper fulfilling of the obligations under the contract.

The contractor along with bidding of the tender, intimate in writing to the Engineer-in-Charge the name, qualifications, experience, age, address and other particulars along with certificates, of the technical representative to be in charge of the work. If there is any change then the new incumbents qualifications and experience shall not be lower than specified in Schedule in I.T.B. (Annexure-2). The Engineer-in-Charge shall within 15 days of issue of letter of acceptance intimate in writing his approval or otherwise it is deemed to be approved. Any such approval may at any time be withdrawn and in case of such withdrawal the contractor shall appoint another such representative according to the provisions of this clause. Decision of the tender accepting authority/Superintending Engineer shall be final and binding on the contractor in this respect. Technical staff shall be available at site within fifteen days of start of work.

If the contractor (or any partner in case of firm/company) himself has such qualifications, it will not be necessary for the said contractor to appoint such a principal technical representative but the contractor shall designate and appoint a responsible agent to represent him and to be present at the work whenever the contractor is not in a position to be so present. All the provisions applicable to the principal technical representative under the Clause will also be applicable in such a case to contractor or his responsible agent. The principal technical representative and/or the contractor or his responsible authorized agent shall be actually available at site at least two working days every week, these days shall be determined in advance and also during recording of measurement of works and whenever so required by the Engineer-in-Charge by a notice as aforesaid and shall also note down instructions conveyed by the Engineer-in-Charge or his designated representative in the site order book and in token of acceptance of measurements. There shall be no objection if the representative/agent looks after more than one work and not more than three works in the same station provided these details are disclosed to the Engineer-in-Charge and he shall be satisfied that the provisions and the purpose of the clause are fulfilled satisfactorily.

If the Engineer-in-Charge, whose decision in this respect is final and binding on the contractor, is convinced that no such technical representative or agent is effectively appointed or is effectively attending or fulfilling the provision of this clause, a recovery shall be effected from the contractor as specified in Schedule 'F' and the decision of the Engineer-in-Charge as recorded in the site order book and measurement recorded in Measurement Books shall be final and binding on the contractor. Further if the contractor fails to appoint a suitable technical representative or responsible agent and if such appointed persons are not effectively present or do not discharge their responsibilities satisfactorily, the Engineer-in-Charge shall have full powers to suspend the execution of the work until such date as a suitable agent is appointed and the contractor shall submit a certificate of employment of the technical representative/responsible agent along with every on account bill/fixed bill and shall produce evidence if at any time so required by the Engineer-in-Charge.

ii) The contractor shall provide and employ on the site only such technical assistants as are skilled and experienced in their respective fields and such foremen and supervisory staff as are competent to give proper supervision to the work. The contractor shall provide and employ skilled, semiskilled and unskilled labour as is necessary for proper and timely execution of the work. The Engineer-in-Charge shall be at liberty to object to and require the contractor to remove from the works any person who in his opinion misconducts himself, or is incompetent or negligent in the performance of his duties of whose employment is otherwise considered by the Engineer-in-Charge to be undesirable. Such person shall not be employed again at works site without the written permission of the Engineer-in-Charge and the persons so removed shall be replaced as soon as possible by competent substitutes.

CLAUSE 34

Levy/Taxes/Duties by Contractor

i) GST or any other taxes, duties etc. on materials in respect of this contract shall be payable by the contractor according to law in effect.

ii) The contractor shall deposit royalty and obtain necessary permit for supply of the red earth, moorum, sand chips, bajri, stone, kankar and pea gravels etc. from local authorities.

iii) If pursuant to or under any law, notification or order any royalty, cess of the hike becomes payable to the Government of India and does not at any time become payable by the contractor to the State Government / Local authorities in respect of any material used by the contractor in the works then in such a case, it shall be lawful to the Government of India and it will have the right and be entitled to recover the amount paid in the circumstances as aforesaid from the dues of the contractor.

CLAUSE 35

Conditions for reimbursement of levy / taxes if levied after receipt of tenders

i) All tendered rates shall be inclusive of all taxes/duties and levies payable under respective statutes. However, pursuant to the Constitution (46th Amendment) Act. 1982, if any further tax or levy is imposed by Statute, after the last stipulated date for the receipt of tender including extensions if any and the contractor thereupon necessarily and properly pays such taxes / levies the contractor shall be reimbursed the amount so paid, provided such payments, if any, is not, in the opinion of the Chief Engineer (whose decision shall be final and binding on the contractor) attributable to delay in execution of work within the control of the contractor.

ii) The contractor shall keep necessary books of accounts and other documents for the purpose of this condition as may be necessary and shall allow inspection of the same by a duly authorized representative of the Government and/or the Engineer-in-Charge and further shall furnish such other information/document as the Engineer-in-Charge may require from time to time.

iii) The contractor shall, within a period of 30 days of the imposition of any such further tax or levy, pursuant to the Constitution (Forty Sixth Amendment) Act 1982, give a written notice thereof to the Engineer-in-Charge that the same is given pursuant to this condition, together with all necessary information relating thereto.

CLAUSE 36

Termination of Contract in case of imprisonment of Contractor

If the contractor is imprisoned, becomes insolvent compound with his creditors, has a receiving order made against him or carries on business under a receiver for the benefit of the creditors or any of them, or being a partnership firm becomes dissolved, or being a company or corporations goes into liquidation or commences to be wound up no being a voluntary winding up for the purpose only of amalgamation or reconstitution the department shall be at liberty.

(a) To give such liquidator, receiver, or other person in whom the contract may become vested, the option of carrying out the contract or a portion thereof to be determined by the department, 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 action as provided in the relevant clauses of the contract.

CLAUSE 37

Termination of Contract on death of Contractor

Without prejudice to any of the rights or remedies under this contract if the contractor dies, the Divisional Officer on behalf of the Governor of Bihar shall have the option of terminating the contract without compensation to the contractor after the affidavit of his/ their legal heir/heirs that they are not going to be in this profession in future.

CLAUSE 38

If relative working in any work & Deptt. then the Contractor not allowed to tender

The contractor shall not be permitted to tender for works in the Concerned Division (responsible for award and execution of contracts) in which his near relative is posted as Divisional Accountant or as an officer in any capacity between the grades of the Superintending Engineer and Assistant Engineer (both inclusive). He shall also intimate the names of persons who are working with him in any capacity or are subsequently employed by him and who are near relatives to any Gazetted Officer in the Any Work & Deptt. or in the concerned department. Any breach of this condition by the contractors of this Department shall lead to blacklisting. If the contractor is registered in any other department, he shall be debarred from tendering in BRJP for any breach of this condition.

Note: By the term “near relatives” is meant wife, husband, parents and grand parents, children and grand children, brothers and sisters, uncles, aunts and cousins and their corresponding in law.

CLAUSE 39

No -Gazetted –Engineer to work as Contractor within two years of retirement

No engineer of gazetted rank or other gazetted officer employed in engineering of administrative duties in an engineering department of the Government of Bihar shall work as a contractor or employees of a contractor for a period of two years after his retirement, from government service without the previous permission of State Government in writing. This contract is liable to be cancelled if either the contractor or any of his employees is found at any time to be such a person who had not obtained said permission prior to engagement in the contractor's service, as the case may be.

CLAUSE 40 (NOT APPLICABLE)

Return of material and recovery for excess material issued

i) After completion of the work and also at any intermediate stage in the event of non reconciliation of materials issued, consumed and in balance (see Clause 10) theoretical quantity of materials issued by the Government for use in the work shall be calculated on the basis and method given hereunder.

a) Quantity of cement shall be calculated on the basis of quantity of cement required different items of work as shown in the Schedule of Rates mentioned in-Schedule 'F'. In case any item is executed for which standard constants for the consumption of cement are not available in the above mentioned schedule/statement or cannot be derived from the same shall be calculated on the basis of standard formula to be laid down by the Engineer-in-Charge.

b) Theoretical quantity of steel reinforcement of structural steel sections shall be taken as the quantity required as per design or as authorized by Engineer-in-Charge, including authorized lappages, chairs etc., plus 3% wastage due to cutting into pieces, such theoretical quantity being determined and compared with the actual issues each diameter wise, section wise and category wise separately.

c) For any other material as per actual requirements.

ii) Over the theoretical quantities of materials so computed a variation shall be allowed as specified in Schedule 'F'. The difference in the net quantities of material actually issued to the contractor and the theoretical quantities including such authorized variation, if not returned by the contractor or if not fully reconciled to the satisfaction of the Engineer-in-Charge within fifteen days of the issue of written notice by the Engineer-in-Charge to this effect shall be recovered at the rates specified in Schedule 'F' without prejudice to the provision of the relevant conditions regarding return of materials governing the contract. Decision of Engineer-in-Charge in regard to theoretical quantities of materials, which should have been actually used as per the Annexure of the standard schedule of rates and recovery at rates specified in Schedule 'F', shall be final & binding on the contractor. For non scheduled items, the decision of the Superintending Engineer regarding theoretical quantities of materials, which should have been actually used, shall be final and binding on the contractor.

iii) The said action under this clause is without prejudice to the right of the Government to take action against the contractor under any other conditions of contract for not doing the work according to the prescribed specifications.

Clause 41

Release of Security deposit

On completion of the whole of the work, half of the total amount of security shall be repaid to the contractor after six months of completion. However, the balance half of the total amount of security will be returned after completion of defect liability period and after the Engineer has certified that all defects notified by him to the contractor before the end of this period have been corrected and also after recovery of any dues.

Clause 42

Responsibilities of Technical Staff and employees

Technical officers / staff deployed by the Contractor at any construction site will also be responsible for inferior quality/poor performance of any work and his name will be circulated to all works division of the BRJP to debar from any other site, if his name is being proposed by other contractor.

Clause 43

Contractor's Risks

All risks of loss of or damage to physical property and of personal injury and death which arise during and in consequence of the performance of the Contract other than the excepted risks are the responsibility of the Contractor.

Clause 44 (NOT APPLICABLE)

Insurance

The Contractor shall provide, in the joint names of the Employer and the Contractor, insurance cover from the Start Date to the end of the Defects Liability Period, in the amounts and deductibles stated in the Contract Data for the following events which are due to the Contractor's risks:

- (a) Loss of or damage to the Works, Plant and Materials;
- (b) Loss of or damage to Equipment;

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

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.

CLAUSE 45

Cash flow Estimate to be submitted

The Contractor shall, within the time stated in special Conditions of contract after the date of the Letter of Acceptance, provide to the Engineer for his information a detailed cash flow estimate, in quarterly periods, of all payments to which the Contractor will be entitled under the Contract and the Contractor shall subsequently supply revised cash flow estimates at quarterly intervals, if required to do so by the Engineer-in-Charge.

CLAUSE 46

Safety, Security and protection of the Environment

The Contractor shall, throughout the execution and completion of the Works and the remedying of any defects therein:

- (a) Have full regard for the safety of all persons entitled to be upon the Site and keep the Site (so far as the same is under his control) and the Works (so far as the same are not completed or occupied by the Employer) in an orderly state appropriate to the avoidance of danger to such persons.
- (b) Provide and maintain at his own cost all lights, guards, fencing, warning signs and watchmen and where necessary or required by the Engineer or by any duly constituted authority, for the protection of the Works or for the safety and convenience of the public or others, and
- (c) take all reasonable steps to protect the environment on and off the Site and to avoid damage or nuisance to persons or to property of the public or others resulting from pollution, noise or other causes arising as a consequence of his methods of operation.

CLAUSE 47

Cost of Samples

All samples shall be supplied by the Contractor at his own cost if the supply thereof is clearly intended by or provided for in the Contract or not.

CLAUSE 48

Cost of Tests

The cost of making any test shall be borne by the Contractor if such test is :

- (a) Clearly intended by or provided for in the Contract, or
- (b) particularized in the Contract (in case only of a test under load or of a test to ascertain whether the design of any finished or partially finished work is appropriate for the purposes which it was intended to fulfill) in sufficient detail to enable the Contractor to price or allow for the same in his Tender.

CLAUSE 49

Cost of Tests not provided for

If any test required by the Engineer which is :

- (a) Not so intended by or provided for,
- (b) (in the cases above mentioned) not so particularized, or
- (c) (though so intended or provided for) required by the Engineer to be carried out at any place other than the Site or the place of manufacture, fabrication or preparation of the materials or Plant tested shows the materials, Plant or workmanship not to be in accordance with the provision of the Contract to the satisfaction of the Engineer, then the cost of such test shall be borne by the Contractor, but in any other case also the contractor will bear the cost.

CLAUSE 50

Commencement of works

The contractor shall commence the Works as soon as is reasonably possible after the receipt by him of a notice to this effect from the Engineer, which notice shall be issued within the time stated in the appendix to Tender after the date of the Letter of Acceptance. Thereafter, the Contractor shall proceed with the Works with due expedition and without delay.

CLAUSE 51

Substantial Completion of Parts

If any part of the Permanent Works has been substantially completed and has satisfactorily passed any Test on Completion prescribed by the Contract, the Engineer may issue a Taking - Over Certificate in respect of that part of the Permanent Works before completion of the Works and, upon the issue of such certificate, the Contractor shall be deemed to have undertaken to complete with due expedition any outstanding work in that part of the Permanent Works during the Defects Liability Period.

CLAUSE 52

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 eruption, Earthquake or other convulsion of nature and other acts such as general/partial strikes by a section of government employees/invasion, the act of foreign countries/hostilities or war like operations before or after declaration of war, rebellion/military or usurped power which prevent performance of the contract and which could not have been foreseen or avoided by a prudent person.

CLAUSE 53

Recovery

Any amount found recoverable from the contractor shall be recovered as public demand under the Bihar Public Demand Act, without prejudice to any other mode of recovery.

SECTION 4
CONTRACT DATA
(PERFORMA OF SCHEDULES)

PERFORMA OF SCHEDULES

(Operative Schedules to be downloaded from website www.eproc.bihar.gov.in by each intending tenderer)

SCHEDULE 'A'

(ATTACHED SEPERATELY AS FINANCIAL BID SHEET IN VOLUME II)

SCHEDULE 'B'- NIL.

SCHEDULE 'C'- NIL.

SCHEDULE 'D'- NIL.

SCHEDULE 'E'

Schedule of component of Cement and Steel for price escalation.

Clause 10CA

Component of Cement	P ₀ - 7 %
Expressed as percent of total value of work.	.
Component of Steel	P _s - 5 %
Expressed as percent of total value of work.	
Component of CI/DI Pipes and specials.	P _{CI} - 29.21 %

SCHEDULE 'F'

Reference to General Condition of Contract.

Name of work: **Construction of drinking water supply scheme for Phase 2 of AURANGABAD Nagar Parishad under AMRUT**

Estimated cost of work: **Rs. 6221.35 Lakh**

- | | |
|------------------------------|--|
| i) Earnest money: | 2% upto 10 Crores & 1 percent of the amount above 10 crores |
| ii) Performance Guarantee: | 2% of tendered value including earnest money, |
| iii) Security Deposit: | 8% of tendered value. |
| iv) Defect Liability period: | Six months of trial run after completion of scheme and five years of operation and maintenance after trial run |
| v) Rate of Interest: | Not Applicable |

GENERAL RULES AND: Officer inviting tender Executive Engineer, BUIDCO AURANGABAD.

DIRECTIONS

Definitions:

Engineer-in-Charge Executive Engineer

Percentage on cost of materials
And labour to cover all overheads
And profits. 15%
Standard Schedule of Rates

Department & Employer
Standard PWD Contract Form

Clause 1

i) Time allowed for submission of performance
Guarantee from the date of issue of letter of
Acceptance, in day 15 days

ii) Maximum allowable extension beyond the period
provided in i) above in days 15 days

Clause 2

Authority for fixing compensation
under clause 2. Superintending Engineer

Clause 2A

Whether Clause 2A shall be applicable
Yes

Clause 5

Number of days from the date of issue of
notice to start. 07 days

Time allowed for execution of work
Authority to give fair and reasonable
extension of time for completion of work. Twenty four Months

Chief Engineer
After approval from M.D
BIHAR URBAN INFRASTRUCTURE
DEVELOPMENT.

Clause 7

Cross work to be done together with
net payment/ adjustment of advances
for material collected, if any, since the
last such payment for being eligible to
interim payment (NOT APPLICABLE)

Clause 10CC

Clause 10CC to be applicable in
Contracts with stipulated period
of completion exceeding the period
Shown in next column **Eighteen Months**

Clause 11 Specifications to be followed for execution of work P.H.E.D., P.W.D.,
C.P.E.E.H.O., B.I.S. etc.

Clause 12 Deviation, variation
Extent and pricing. As per P.W.D. Code

Clause 13 Competent Authority for
deciding reduced rates. Superintending Engineer

- The following document also
form part of the contract All Documents concerning with Works
from tender upto defect liability period
- The law, which applies to the contact, is The Law of Union of India
- The court of jurisdiction Patna

- The Language of contract document English
- The limit of sub-contracting 25%
- The Currency of the Contract is Indian Rupees

•

SECTION 5
SPECIAL CONDITION OF CONTRACT
(CONDITION OF PARTICULAR APPLICATION)

**BIHAR URBAN INFRASTRUCTURE DEVELOPMENT
CORPORATION Ltd**

GOVERNMENT OF BIHAR

Name of work

Design and Construction of drinking water supply scheme of **Aurangabad Nagar Parishad under AMRUT and state plan Scheme (Phase II)** with six months of Trial run and thereafter operation and maintenance of system for next five years.

(A) Construction of Elevated Service reservoir (ESR)/OHT-7 Nos., of different capacities ranging from 450 KL to 1350 KL having office room and toilet with water supply arrangement at ground below the tank DI/CI Distribution Network-96.68 Km, providing house service connection-1400 Nos. - **3262.683 Lakh**

(B) Construction of High Yielding Tubewell-12 Nos., Raw water Pump- 1 set, Approach road-779.90 M (for CWR, ESR), Clear Water Pipe line (CWR at Barun-20.10

Km, (600 mm dia DI K9 Pipe), Construction of Gangway-1 set (3000 m long 1 m wide), Lifting Arrangement 2 set, Chlorinator (200 L)-1 No., Construction of Chlorinator room 1 No., Stand Post-20 Nos., Master Elevated Reservoir- 1 No. (1270 KL), having office room and toilet at ground floor below tank area Intermediate Pumping Station-3 Nos., (Zone-III, Zone-V, Zone-VI), Clear water reservoir-1 No. at Barun (1340 KL), Clear water pump- 1 set, Clean water Pumping Main-630 M (250mm dia, 600mm dia), Clear water Gravity Main-12.012 Km (250mm dia, 750mm dia), DI/CI Distribution Network 77.81 Km (Zone I, III & IV), House Service connection- 8340 Nos., SCADA System- 8 Nos. – **10733.075 Lakh**

For the general guidance and information of the prospective tenderers a brief note on the existing water supply system for Aurangabad Nagar Parishad is given below, HOWEVER THE TENDERERS MUST NOTE THAT BEFORE PARTICIPATING IN THE BID, THEY MUST VISIT THE SITE AND SATISFY THEMSELVES BY BECOMING FULLY CONVERGENT/ FAMILIAR WITH THE ENTIRE EXISTING SYSTEM AND ALL RELEVANT SITE CONDITIONS. THE RATES QUOTED MUST BE INCLUSIVE OF ALL TAXES AND DUTIES FOR ALL THE COMPONENTS.

Requirement of water: - The water requirement for AURANGABAD Nagar Parishad has been considered on the basis of 135 Lpcd.

Type of soil: - In general the soil is alluvial mixed with fine sand.

Scope of work: - The scope of work includes Design, drawing supply all material, execute the work and commissioning of the works for construction of Water Supply Scheme for zone no. 1 TO 7 of AURANGABAD Nagar Parishad.

Water Demand has been considered as 135 litres per capita per day as per CPEEHO Manual.

(A) Kind and Scope of Work

The Successful bidder is to design, build, operate and maintain a complete and fully functioning water supply system in the Water Supply Area in accordance with the Bid Documents. The obligations of the Operator shall be regulated by the Design Build and Operation & Maintenance Agreement for the Water Supply Area to which the present Technical Specifications form an integral part. The scope of work shall include the following activities:

- Carry out detailed assessment of existing utilities to be included in the Operator's operations and maintenance contract;
- Field survey and investigation with total station survey, Preparation of Maps and drawings on AutoCAD and GIS and Geo technical survey wherever required.
- Establish and confirm organic and inorganic content of the existing raw water source (Ground Water), sanitary survey of the ground water source;
- Prepare detailed design for improvements (as assessed required by the Operator for fulfilling the output requirements) of existing utilities to be included in the Operator's operations and maintenance contract;
- Prepare detailed designs of new works and processes required to fulfill the output requirements for the defined main pipes, reservoirs and distribution system (replacements and extensions);
- Supply all materials for the construction and installation of the plant and supply and install all pipes and controls required for the water facilities;
- Provide and install required mechanical and electrical equipment for full operation of the specified
- Supply and install all cabling and control panels for safe and effective operation of the plant and equipment;
- Supply and install all storage facilities, pumping requirements, distribution piping, valves, and house connections;
- Prepare operations and maintenance manuals for all installations;
- Carry out Tests on Completion and Tests after Completion and commission the works;
- Recruit and train water supply personnel in the operation and maintenance of the Works;
- Provide lubricants and tools for routine maintenance;
- Provide spare parts for all items of equipment and accessories; and
- Operate and maintain the water supply and distribution system for the period defined in the Operations and Maintenance Contract.

The design, construction, operation and maintenance of the water supply system shall be executed in compliance with international best practise and all relevant Indian legislation.

2

(B) Design and Build Specifications

The Operator shall be responsible for the provision of all relevant permits necessary for construction, the preparation of detailed design and the construction of the element as defined in the attached bid document.

The water supply system shall as a minimum include the infrastructure defined in Appendix A. The design and construction of the water supply system shall facilitate future expansion of the system as the population of the water supply area grows.

(C) Operation and Maintenance of the Site

The Operator shall be responsible for the operation and maintenance of the water supply system as described in the attached Operations and Maintenance Specifications.

The Operator shall manage, operate and maintain all plant and ancillary equipment that support the operation of the Project, including without limitation:

- High Yielding Tube well, motor pump and accessories;
- Transmission mains;
- Main piping system;
- Disinfection plant(s) with installations;
- Reservoirs with all installations;
- Distribution pipeline system with all fittings and particulars;
- Service connections;
- Any other work as defined in the Contract.

All Personnel employed by the Operator at the Project shall hold relevant qualifications and appropriate training and shall have sufficient relevant experience in the operation and management of the Works, to ensure the Project is operated and maintained in compliance with the requirements of the Contract. The Operator shall familiarise himself with the terms of the Indian legislation for Water Supply and any statutory consents for the Water Supply System and shall perform the Service in conformity with all of the conditions of these consents.

(D) Technical Documentation

The following documents shall form an integral part of the contract:

- The Design Build Operate & Maintain Agreement for the Operator in the Water Supply Area
- The Bidders Technical Proposal on Operation & Maintenance. The Operator shall have familiarized himself with;
- The Project Implementation Plan.

Works related with OPERATION AND MAINTENANCE OF ALL COMPONENTS

Deployment of manpower, supply of all chemicals, checking of status of supply in fed up area, repairing of leakages, maintaining log book at all pumping stations, submission of daily / weekly / monthly and yearly report of water quality, tested by district laboratories, replacing the damaged parts of any machinery / the machinery as a whole, annual / bi-annual maintenance of all built-up / installed civil/mechanical/electrical structures / units under the scheme, including round-the clock watch & ward for **60 calendar months** from the date of completion of trial run (excluding energy charges)

O & M cost for the first 12 calendar months	-	1 Job.
O & M cost for the Second 12 calendar months	-	1 Job.
O & M cost for the Third 12 calendar months	-	1 Job.
O & M cost for the Fourth 12 calendar months	-	1 Job.
O & M cost for the Fifth 12 calendar months	-	1 Job.

BREAK UP SCHEDULE FOR PAYMENT

Item No. 1 Transformer

- Supplying and fixing of distribution transformer of proper approved make including all accessories : 60%
- On completion of erection work : 30%
- On successful commissioning and test run to guarantee : 10%

Item No. 2 Installation of Pumping plants and other related works

- Supplying of pumping plants : 60%
- Installation of pumping plant : 30%
- Testing of pump & motor : 10%

Item No. 3 Rising and Distribution mains and other related works

- Supply of pipe at work site : 60%
- Excavating trenches ,Lowering in trenches, laying, jointing and back partly filling : 30%
- Disinfection and successful testing : 10%

Item No. 4 Chlorinators

- Supply : 60%
- Installation : 30%
- Testing : 10%

Item No. 5 High yield Tube well

- Supplying of M.S. housing pipe, blank pipe & Slotted pipe / Johnson filter 30%
- Drilling of bore for tube well : 40%
- Lowering of pipes : 10%
- Supplying of Pea gravel & Packing the same in annular Space between bore & lowered pipe : 5%
- Developing of tube well till sand free, smell free, wholesome water discharge. : 15%

Item No. 6 Construction of Pump House, Clear water reservoir staff quarter and chlorinator room.

- Foundation & brick work upto roof level with RS Joist : 55%
- RCC roof slab : 15%

- All finishing work including wood work, flooring & Painting, electrical, sanitary, sewerage, septic tank and water supply work etc. : 30%

Item No. 7 Stand Posts

- On completion of each Stand Posts with platform and drain as per approved drawing : 100%

Item No. 8 Construction of Boundary wall & its allied works

- On erecting of brick work with piling and capping beam in complete length : 65%
- Complete plaster work and painting : 35%

Item No. 9 Elevated Service reservoir (For each reservoir).

- On completion of excavation and PCC work in foundation : 10%
- Completion of RCC work in foundation : 15%
- On completion of work up to 1st half of staging Height and including casting of room roof slab : 10%
- On completion of balance staging bottom Dome circular beam head beam and Conical wall : 10%
- On completion of vertical side walls : 10%
- On completion of top dome : 10%
- On supply of C.I. pipe fittings of inlet valve : 7%
- On fitting and fixing of C.I., D/F pipes specials and sluice valve : 3%
- On supply and fixing of MS ladders, railing, lightening arrester, doors, windows and water level indicator : 5%
- On completion of brick work, wood work and steel work in Door and window in office room with toilet and its allied works : 5%
- painting, white washing, color washing etc. : 1%
- Testing of the full hydraulic structure of elevated water tank : 4%
- On successful commissioning and test run to guarantee : 10%

Item no. 10 Supply all materials and providing house connections : 100%

Item No. 11 Raw water Bus line

- Supply of Pipe at work site : 45%
- Laying jointing etc : 40%
- Disinfection and successful testing : 15%

Item No. 12 Raw water Pump, Clear water pump

- Supply of pumping plants : 60%
- Installation of pumping plants : 30%
- Testing of pump & Motor : 10%

Item No. 13 Clear water pipe line

- Supply of pipe at work site : 45%
- Lowering in trenches, laying, jointing and back party filling : 40%
- Disinfection and successful testing : 15%

Item No. 14 Gangway

- On Completion of foundation work up to GL : 30%
- Work completion from ground level to Bottom of pathway : 30%
- Completion of pathway : 30%
- Finishing work : 10%

Item No. 15 Intermediate pumping station

- Excavation and RCC in foundation : 40%
- RCC wall to upto roof level : 30%
- RCC roof slab : 20%
- All finishing work including testing all complete : 10%

Item No. 16 Supplying, Installation and testing of Chlorinator : 100%

Item No. 17 Supplying, Installation and testing of Lifting Arrangement : 100%

Item No. 18 Supplying, fixing and finishing of Main Gate : 100%

Item No. 19 Installation of MDPB, MCC Panel, APFC panel and other related work

- Supplying : 60%
- Installation : 30%
- Testing : 10%

Item No. 20 SCADA

- Supplying : 50%
- Installation : 40%
- Successful running & Testing : 10%

Item No. 21 Demolishing and Restoring of PCC

- Demolishing of PCC : 30%
- Restoring PCC : 70%

Item No. 22 Sluice valve/air valve and other related works

- Supply of valve at work site : 60%
- Laying entrenches, jointing and back partly filing : 30%
- Successful testing : 10%

In all rooms, accommodation and related works electric, water supply and sanitation facility should be provided as required and as per direction of E/I without any extra cost to the department.

All essential / minor items which have not been mentioned in schedule of quantities, but required to be completed for efficient working should be done as per direction of E/I without any extra cost. These items are deemed to be covered under different items which has been mentioned in schedule of quantities

SPECIAL CLAUSES PERTAINING TO TIME CONTROL QUALITY CONTROL AND COST CONTROL

(A) TIME CONTROL

Within the time stated in the Contract data the contractor shall submit to the Engineer in charge for approval a program showing the general methods, arrangements, order, and timing for all the activities in the works along with monthly cash flow forecast.

An update of the program shall be a program showing the actual progress achieved on each activity and the effect of the progress achieved on the timing of the remaining work including any changes to the sequence of the activities.

The contractor shall submit to the Engineer in charge, for approval, an updated program at intervals no longer than the period stated in the contract data. If the contractor does not submit an updated program within this period, the Engineer in charge may withhold the amount stated in the contract data from the next payment certificate and continue to withhold this amount until the next payment after the date on which the overdue program has been submitted.

The Engineer's approval of the program shall not alter the contractor's event occur or a variation is issued which makes it impossible for completion to be achieved by the intended completion date without the contractor taking steps to accelerate the remaining work and which would cause the contractor to incur additional cost.

(B) QUALITY CONTROL

The Engineer shall check the contractor's work and notify the contractor of any defects that are found. Such checking shall not affect the contractor's responsibilities. The Engineer in charge may instruct the contractor to search for a defect and to uncover and test any work that the Engineer in charge considers may have a defect.

If the Engineer in charge instructs the contractor to carry out a test not specified in the specification to check whether any work has a defect and the test shows that it does, the contractor shall pay for the test and any samples.

The Engineer in charge shall give notice to the contractor of any defects before the end of the defects liability period, which begins at completion and is defined in the contract data. The defects liability period shall be extended for as long as defects remain to be corrected.

Every time notice of a defect is given, the contractor shall correct the notified defect within the length of time specified by the Engineer's notice.

If the contractor has not corrected a defect within the time specified in the Engineer's notice, the Engineer in charge will assess the cost of having the defect corrected, and the contractor will pay this amount.

(C) COST CONTROL

The bill of quantities shall contain items for the construction, installation, testing, and commissioning work to be done by the contractor.

The bill of quantities is used to calculate the contract price.

CERTIFICATE OF UNDERTAKING

1. We shall replace, repair and adjust free of all charges to the Employer any part of the work which fails to comply with the specifications for, wear and tear expected until the completion.
2. All the work will be reliable. The material and equipment supplied will be as per the information given in schedule.
3. All the work will be of a type which has been proved in service to be suitable for the duty required by the specifications and will have been manufactured and tested in accordance with the appropriate standard specifications approved by the Engineer in charge.
4. We accept and abide by the clauses relating to Quality and guarantee of work.
5. All the testing of materials like Cement, Steel, M.S. plates etc. required during the execution of the contract will be got tested by me at my own cost from Government recognized Laboratory. The sampling and testing will be done as given in relevant I.S. Codes.
6. We guarantee performance of all the equipment and material complying with the figures filled in respective schedule and the same will operate satisfactorily throughout the operating range specified in the tender.
7. We will comply with all necessary rectification within total time granted for rectification without any cost to BRJP.

SECTION 6

TECHNICAL SPECIFICATION

GENERAL SPECIFICATIONS

1.1 Materials and methods of construction for all civil works shall be as per relevant Indian standard specification, part of which are incorporated in the standard specification of P.H.E.D. and P.W.D. Bihar and all will be followed during the execution of the work. The work shall be executed as per the guidelines and provisions of B.I.S. All materials shall conform to Indian standard code of practice National Building Code and CPHEEO manual to maintain quality of work.

1.2 General

All materials shall be best of their kind and shall confirm to the relevant latest Indian standard.

All materials shall be of approved quality as per samples and from origins approved by the Engineer in Charge. A set of specimen samples of all approved materials shall be kept in sealed container or otherwise at site, cost of which is to be borne by the contractor.

1.3 Bricks

Only 1st class kiln burnt bricks shall be used unless other wise specified. They shall be of a uniform deep cherry color; thoroughly burnt, regular in shape with sharp and square arris and they must emit a clear ringing sound on being struck. They must be free from cracks, chips, flaws, stones or lumps of any kind and they shall not absorb water more than one seventh of their own weight after soaking them in water for 15 minutes. The bricks shall show no sign of efflorescence either dry or subsequent to soaking in water.

1.4 Sand

The source from which sand is to be obtained shall be subject to the approval of Engineer-in-charge. The sand shall be clean, sharp and gritty to touch and be freed from soil and other impurities by washing. The sand shall be washed to such a degree that when a handful is mixed with clean water in a glass and allowed to stand for an hour the precipitate of mud over the sand shall not exceed 5%. The sand should conform to IS 382-1982 for fine and coarse aggregates from natural sources.

1.5 Coarse Sand

It is to be screened through a sieve of 64 meshes to the square inch so as to exclude large particles from the work. The fineness modulus shall not be less than 1.0

1.6 Fine sand

It is to be screened through a sieve of 64 meshes to the square inch so as to exclude large particles from the work. The fineness modulus shall not be less than 2.5

1.7 Stone chips

It shall be obtained from crushing trap quartzite or hard stones and from quarries approved by Engineer-in-charge. It shall be of approved quality and proper grade. It shall pass through $\frac{3}{4}$ "mesh and retained on $\frac{1}{4}$ "mesh. It shall be free from dirt, leaves, clay and any organic matter. The material conforming generally to IS 383-1983 for coarse and fine aggregate from natural sources or IS 515-1959 for natural and manufactured aggregates for use in mass concrete with latest revisions.

1.8 Cement

Ordinary or lowest heat Portland cement (minimum 43 grade) conforming I.S.S. 269 –1989 or Portland slag cement confirming IS 455:1989 or Portland Pozzolana cement confirming IS 1489:1991 of A.C.C./RAYMOND/TATA /LAFARGE/ULTRATECH shall be used after due approval of the Engineer-in-charge. All cement shall be fresh when delivered. Cements of different types are not to be mixed with one another. Consignments shall be used in the order of delivery. Admixture if any shall be used only after approvals of Engineer in charge.

1.9 Reinforcement

Steel reinforcement shall be of mild steel of tested quality conforming to I.S.S. – 432 -1966/ H.Y.S.D. bars conforming to ISS-1786/1779-of SAIL/TATA make.

All the reinforcement shall be clean and free from rust, mild scales, dust, paint, oil, grease, adhering soil or any other material or coating that may impair the bond between the concrete and the reinforcement, or cause corrosion of the reinforcement or disintegration of concrete. Neither the size nor length of bar or wire shall be less than the size or length described in the bar schedule or elsewhere and the length shall not be more than 50 mm in excess of the length as described.

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

Bending and overlapping, placing in position, fabrication, binding, reinforcement with wire of approved gauge shall be done as per I.S. 432 – 1960 (revised) and I.S. 1786 – 1966 and I.S. 2502 (revised). Handling and storage of materials for concrete or RCC should be followed as per I.S. 4082 –1977.

1.10 Water

The water to be used in making and curing of concrete, mortar etc. shall be free from objectionable quantities of silts, organic matter, injurious amount of oils, acids, salts and other impurities etc. as per IS-456-1978. The Engineer-in-charge or his authorized representatives will determine whether or not such quantities of impurities are objectionable. Such comparison will usually be made by comparison of compressive strength, water requirement, time of setting and other properties of concrete made with distilled or every clean water and concrete made with the water proposed for use, Permissible limit for solids when tested in accordance with I.S. 3025-1964. Shall be as tabulated below

1. Organic	Permissible limit for solids Maximum permissible limit. 200 mg/litre.
2. Inorganic	3000 mg/litre.
3. Sulphate (As So 4)	500 mg/litre.
4. Chloride (As Cl.)	2000 mg/litre for P.C.C and 1000 mg/litre for R.C.C. work
5. Suspended matter	2000 mg/litre.

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

1.11 Cement Mortar

The mortar shall consist of cement and sand mixed in proportion defined in relevant schedule item for various item of work. Only measured quantity shall be used. The sand shall be shoveled in a wooden measure of a clean masonry platform, after removing the measure box and spreading out sand if necessary, the cement (in required proportion) shall be emptied on the top of sand. The sand and cement shall be then turned over with shovels once dry and made into the form of a hollow cone; into this water can be poured and the whole shall then be turned over completely twice. The color and consistency shall at this stage be quite uniform, if not, further turning shall be done. Water shall be added by measured quantities. Only such quantities of mortar shall be mixed at one time as can be used at once before it can set. No mortar, which has once caked or begun to set, shall be used, nor shall such mortar be remixed; but it shall be removed from the site of the work immediately.

1.12 Cement concrete

The concrete shall consist of an aggregate of the proportion by volume defined in relevant schedule item or work. Only measured quantity shall be used. The aggregate shall consist of stone ballast of quality approved by Engineer-in-charge and shall consist of graded size 20 mm and downwards as per PWD specification or the size mentioned in the item description

1.13 Laying:

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

1.14 Curing:

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

1.15 Forms:

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

1.16 Brick masonry work

1.17 Materials:

The brick works shall consist of bricks and mortar in accordance with general specification and plans.

1.18 Soaking bricks:

All bricks shall be soaked in clean water in tank for a period of at least twelve hour immediately before use. The contractor shall provide at his expense tanks of sufficient capacity to admit of the simultaneous immersion of bricks for the work its normal rate of progress.

1.19 Laying:

All the best shaped uniformly coloured bricks shall be picked out and used for face work without any extra payment to the contractor. All bricks work shall be constructed in English bond and shall follow the type bond junctions etc. All courses unless other wise specified or ordered by the Engineer in charge shall be truly horizontal and the walls shall be taken up truly plumb. Mortar joints shall never exceed 10 mm in thickness and this thickness shall be uniform throughout. Vertical joints in alternate courses shall not come directly over one another. The joints shall be raked out not less than 12mm deep when the mortar is green so as to provide proper key for the plaster or pointing to be done. Each face brick shall be set with both bed and vertical joints quite full of mortar. No damaged or broken brick shall be used in any part of the work except such as may be cut to size for closing the course. Closers shall be clean out to size as indicated in English bond and shall be situated near the end of walls. The masonry shall be carried up regularly and no step shall be allowed more than 60cm. Where the masonry of one part has to be delayed, the work must be raked back at an angle not exceeding 45 ° Angles and Junctions. At all angles forming the junction of walls, the brick shall at each alternate course be carried into their respective walls so as to thoroughly unite the work with English bond. Care shall be taken that when a brick is left out to allow support for the scaffold pole on the wall face, such brick shall always be a header and that not more than one header for each pole shall be left out.

1.20 Scaffolding:

Proper scaffolding shall be provided whenever necessary having two sets of vertical supports and shall be subject to the approval of the Engineer in charge; who may order the contractor to alter or strengthen the scaffolding if he considers it necessary, without thus becoming responsible either for the safety of the work or workmen or for any additional payment. Holes shall be made good by bricks to match the face work when scaffolding is removed.

1.21 Curing of bricks:

All bricks work shall be keep well watered for 14 days after laying.

1.22 Reinforced Cement Concrete:

All R.C.C. work shall be of the grade M -15, M-20, M-25 as given in specifications. The materials will be measured when dry. The stone chips should be thoroughly washed in clean water and stacked. Vibrator will be used for all R.C.C and P.C.C work. The aggregate shall consist of stone ballast of quality approved by Engineer-in-charge and shall consist of graded size 20 mm and downwards as per PWD specification or the size mentioned in the item description.

1.23 Laying:

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

1.24 Curing:

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

1.25 Forms:

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

1.26 Reinforcement:

Steel bars for reinforcing concrete shall be of such shape to afford an approved mechanical bond with concrete to ensure intimate control between steel and concrete. Steel reinforcement shall be either mild steel of tested quality confirming to IS-432-1996 or cold worked steel high strength deformed bars as per IS-1786-1979 in strength grade Fe-415 or hot rolled high yield strength steel deformed bars with minimum yield strength of 425 N/mm^2 as per IS – 1939 –1966 (Amended 1968) Reinforcement bars will be rejected if the actual weight vary more than 5% from the standard weight. All bars must conform to the requirement of Indian standard specification. They shall be protected at all time before placed in the concrete from mechanical injury and the weather and when placed in the work, they shall be free from dirt, scales, loose or scaly rust, paint and oil. Bars which are to be embodied in concrete but remain exposed for sometime after being placed in the work shall, if directed be immediately coated with a thin grout of equal part of cement and sand. Bars shall be bending to the shape shown on the drawings and in conforming to approved templates. When bars are cut and bent on the work site the contractor shall employ competent men and provide the necessary appliances for the purpose. All steel shall be rigidly held in place with 18 gauge annealed steel wire, cement mortar (1:2) cubes. M.S. chairs and spacer shall be used in order to ensure accurate positioning of reinforcement. All joints in steel reinforcement shall be overlapped. The length of overlap for tension and compression shall be as per the requirement of Indian standard specification. In water retaining structures a clear cover of 25 mm over steel should be provided.

1.27 Construction Joints

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

1.28 Vertical Joints

At the end of any days work or run of concrete, the concrete should be finished off against temporary shutter stop, which should be vertical and securely fixed. This stop should be removed as early as weather permits.

1.29 Horizontal Joints:

Horizontal joints should be washed down two hours after a casting in the manner described above for vertical joints. If the concrete has been allowed to hard excessively, the surface shall be chipped over its whole surface to depth of at least 10 mm and there after thoroughly washed. Before fresh concrete is added on the other side of a construction joints, the surface of the old concrete will be thoroughly wetted then covered with a thin layer of cement mortar (1:2). All the construction joints in all concrete structure having contact with water or soil shall be provided with approved PVC water stops on both side with hot asphalt or approved metallic strips.

1.30 Expansion joints:

Expansion joints shall be provided wherever directed by the engineer in charge, or where necessary as per standard specification and practice. The filler to be used shall be of approved material.

1.31 Cube test:

Cube test for RCC work shall be done in lab and its compressive strength should be within the allowable limit.

1.32 Cement Plaster:

12 mm thick cement plaster in (1:4) proportion shall be applied on outside surface of all concrete works from 30cm below ground level up to top. The surface in contact with water will have 12 mm thick cement plaster of not less than (1:3) proportion with 3% water proofing compound. The concrete surface shall be properly hacked, washed, cleaned and applied with thick cement slurry before applying. All brick work unless otherwise specified will be plastered externally and internally with 12mm cement plaster (1:6) proportion. The plaster shall be protected from sun, rain and frost at the contractor's expense by such means as the Engineer in charge may approve. To protect the plaster from the sun, ordinarily the whole surface shall be covered with wet sacks. The contractor shall keep the plaster continuously waited for a period of seven days after application.

1.33 Flooring

Except where in otherwise specified flooring will have minimum 15cm thick sand filling, one brick flat soling and 150mm thick dry rammed khoa beaten up to 112mm as base in ground floor and 25mm thick patent stone flooring shall be provided over this base. In case flooring in raw water pump house 25mm patent stone flooring shall be provided directly over R.C.C. slab in strip placed in suitable manner to avoid construction cracks.

1.34 Door and Window:

All the doors and windows shall be of good quality well seasoned and well-dressed Sal wood with oxidized iron fittings. All windows shall be provided with M.S. grill of approved design.

Rolling shutter of approved make with pusher and pull operated properly fabricated with M.S. lathers including all accessories and necessary fitting of approved quality as per PWD specification will be provided in the pump house. All the doors and windows shall be painted with two coats of enamel paints over a coat of primer. The materials, the size, the shape and the fitting of doors and windows shall be approved by Engineer in Charge before put in position.

1.35 Roof and Roof treatment:

R.C.C. M. 20 grade roof slab of adequate thickness shall be provided. The roof shall be treated with 40 mm average PCC with Damp Proofing material.

1.36 Snowcem Wash:

All the building shall have two coat of snowcem wash of approved shade over a coat of cement primer including preparing the plastered surface smooth with sand paper, scaffolding, centering etc. all complete as per building specification.

1.37 Painting:

All steel or wood shall have two coats of synthetic enamel paint over a coat of primer as specified by the manufacturer of the paint. The make, shade and color of the paints shall have to be approved by the Engineer-in-charge before use.

1.38 Pipe Laying Works:

Centrifugally cast iron or ductile iron spun pipe shall be used for laying Rising and Distribution Mains as shown in drawing. Centrifugally cast iron spun pipe (LA-Class) conforming to IS 5382-1969 and ductile iron (class K-7/K-9) confirming IS 8329:2000 shall be used requisite number of CI Sluice valves and Scour valves will be provided on the mains. Necessary chambers for valves as per type design shall be constructed. Necessary CI Specials conforming to ISS:- 1538-1969 or DI specials confirming to IS 9523:2000; pig lead conforming to ISS:- 782-1978, yarn conforming to ISS:- 6587-1972 and making lead caulked joints as per IS Specification and direction Sluice valves and air valves etc. shall have ISI marking. All inlet, outlet pipe and scour pipes, which requires to be fixed in walls of water retaining structure shall have puddle collars and shall be properly fixed during the casting of concrete itself.

1.39 Excavation of Trenches:

No excavation of any trenches must be commenced until the pipes intended to be laid there in with all the necessary appliances for laying and jointing them have been arranged along its side. In the execution of all work of pipe laying no greater length of trenches that can be laid in 48 hours must be opened and should the pipe laying be delayed or stopped from any cause, the excavation of trenches must be stopped until the laying is resumed. In trenches where pipes are to be laid ground shall be excavated to the required depths and gradients and holes shall be taken out where the joints occur, so that the barrels of the pipes shall be on a solid bed throughout. The trenches shall be excavated to depths sufficient to secure a covering over the pipe of not less than one meter.

1.40 Laying:

Pipes shall be laid in straight lines, free from all sharp bends and should be in proper alignment. Each pipe before it is laid shall be examined and tested with a hammer to prove its soundness and then shall be brushed through and washed to remove all solid or dirt. Pipes shall be placed in trenches by means of chain pulley blocks taking care to see that soil does not get into the pipe.

1.41 Jointing:

Rubber gasket suitable for joints will be provided to connect cast iron spun pipe conforming to I.S. 5382-1969 (latest amendment) in tyton pipe jointing special type of rubber gasket are to be used, which will be inserted into the socket in the groove. The spigot end being lubricated with grease and slipped into the socket by means of a jack used on the other end. Flange joint will be provided to connect the C.I & DI flanged pipe. The rubber packing and nuts-bolts to be used for joining should be of approved quality.

1.42 Cleanliness:

The interior of the pipes must be carefully freed from all dust as the work proceeds, for which purpose a disc plate or brush sufficiently long to pass two or more joints from the end of pipe last laid shall be continuously drawn forward as the pipes are laid. The ends of the pipes must be securely protected during the progress of the work. The pipes laid shall not be made receptacle either for tools, hookahs, clothes or of any other matter during the progress of works. After completion of hydraulic testing, chlorination of pipelines is to be carried out before actual commissioning at his own cost.

1.43 Testing

The line of pipes after laying and jointing shall be tested to a pressure at least double that of working pressure, provided that in no case shall the pipes be tested to a less pressure than that equivalent to a head of 60 meters, of water and the pipes and joints shall be absolutely watertight. The contractor shall provide the water, appliances and labour for testing the pipes at his own expense.

1.44 Painting:

All exposed surface of pipes, specials valves, Steel doors and windows, etc, shall have two coats of synthetic enamel paint of approved shade over a coat of red oxide primer etc all complete as per approval and direction of the Engineer-in-charge

1.45 Trial Run:

The trial run shall consist of a period of six months for total complete jobs of this tender of water supply scheme for Dhaka Nagar Parishad. The contractor shall provide the skilled plant-operator/pump operators, supervisors along with other service staffs for this duration of trial run after completion of the total work on Turnkey job basis. The contractor staffs shall train the staffs/persons nominated by the Engineer in charge during this period. The contractor shall run the

plant round the clock during this period and shall maintain a logbook to ascertain the quality and quantity of treated water, consumption of power and chemicals. Any shortcomings in quality and quantity of water shall be corrected by the contractor adopting proper correction measures and as per direction of Engineer in charge. After trial run the contractor will maintain the plant for five years.

3.0 General

This part covers conditions pursuant to the contract and shall supplement the general conditions, detailed specifications and requirements.

3.1 Limits of Contract

Equipment furnished shall be complete in every respect with all mountings, fittings, fixtures and standard accessories, normally provided with such equipment and /or need for erection, completion, and safe operation of the equipment as required by applicable codes, though they may not have been specifically detailed in the technical specifications unless included in the list of exclusions. All similar standard equipment provided shall be interchangeable with one another.

3.2 Engineering Data

The contractor shall furnish complete engineering data of each set of equipment such as name of the manufacturer, the type of model of each principle item of equipment proposed to be furnished and erected. Standard catalogues, pages and other documents of the tenderer may be used in the tender to provide additional information and data as deemed necessary by the tenderer. The review of this data by an Engineer will cover only general confirmation of the data to the specifications and documents interfaced with the equipment provided under the specifications, external connection and of the dimension, which might affect plant layout. This review by the Engineer in charge may not indicate a thorough review of all the dimensions, quantities and details of the equipment, materials, any devices of the items indicated or accuracy of the information submitted. This review or approval by the Engineer in charge shall not be construed by the contractor and limiting his responsibilities and liabilities for mistakes, and deviations from the requirements specified under these specifications and documents. All engineering data submitted by the contractor after final process including review and approval by the Engineer in charge shall form part of contract documents and the entire work covered under these specifications shall be performed in the strict conformity unless otherwise expressly requested by the Engineer in charge.

3.3 Drawing

Each drawing submitted by the contractor shall be clearly marked with the name of the owner, unit designation, the specifications, number and name of the project. If standard catalogue pages are submitted the applicable items shall be marked therein. All titles, noting, markings and writings on drawing shall be in English. All dimensions shall be in metric units. All manufacturing and fabrication work in connection with the equipment prior to the approval of the drawing shall be at contractor's risk. The contractor may make any changes in the design which are necessary to make the equipment conform to provisions and intent of contract and such changes will again be subject to the approval of the Engineer in charge and shall not relieve the contractor of any of the responsibilities and liabilities under contract. Drawing shall include all installation and detailed pipe drawing wherever applicable. All pipe of 100 mm and above in

diameter shall be rounded in detail and smaller pipe shall be shown schematically or by isometric drawings. All drawings shall be fully corrected to actual 'as built' construction.

3.4 Design Improvements

The Engineer or Contractor may propose changes in the specifications of the equipment or quality thereof and if the parties agree upon any such changes the specifications shall be modified accordingly. If any such change agreed upon in such that it affects price and schedule of completion, the parties shall agree in writing as to the extent of changes in period and or schedule of completion before the contractor proceeds with the change. Following such agreements, the provisions there of shall deemed to have been amended accordingly.

3.5 Transportation

The contractor whenever applicable shall after proper painting pack and cart all equipments in such manner as to protect them from damage and deterioration in transit by road or rail, during storage at site till the time of erection. The contractor shall be held responsible for all damages due to improper packing. While packing all the materials the limitations from point of view of availability or railway wagons, size and other modes of transport should be taken into account. The packing and protection should be in conformity with the requirements of the insurance companies and transport agencies. The contractor shall prepare detailed packing list of all packages and containers, bundles and loose materials forming each and every consignment for making all necessary arrangements for loading, unloading and other handling, right from his works up to the site and also till the equipment is erected, tested and commissioned. He shall be solely responsible for proper storage and safe custody of all equipment.

All demurrage, warehouse and other expenses incurred due to delay in clearance of the material or any other reasons shall be to the account of contractor.

3.6 Protection to plant

All coated surfaces shall be protected against abrasion, impact, discoloration and any other damages. All exposed threaded portion shall be suitably protected with either metallic or non-metallic protective devices. All ends of the valves and piping and conduit equipment connections shall be properly sealed with suitable devices to protect them from exposure to weather and should also be properly treated and protected in suitable manner.

3.7 Preservative shop coating

All exposed metallic surfaces subject to corrosion shall be protected by shop application of suitable coating. All surfaces which will not be easily accessible after the shop assembly, shall before hand be treated and protected for the life of the equipment. All surfaces shall be thoroughly cleaned of all mill-scale, oxides and other coatings prepared in the shop. Surfaces that are to be finish painted after installation or require corrosion protection until installation shall be shop painted with at least two coats of primer. Transformer and other electrical equipment if included shall be shop finished with one or more coats of primer and two coats of high-grade resistance enamel. The finished color shall be as per manufacturer's specifications and standard to be selected by the Engineer in charge at a later date. Shop primer for all steel surfaces shall be selected by the contractor after obtaining specific approval of the Engineer in charge regarding the quality of the primer proposed to be applied.

3.8 Material handling and storage

All the equipment furnished under the contract and arriving at site shall be promptly received unloaded, transported and stored in a storage space by the contractor. Contractor shall be responsible for examining all the shipment and notify the Engineer in charge immediately of any damages, storage, discrepancy that is for the purpose of the Engineer's information only. The contractor shall submit to the Engineer in charge every week, report detailing all receipts during the week. However the contractor shall be solely responsible for any storage on damage in transit handling and / or in storage and erection of equipment at site. The contractor shall maintain in accurate exhaustive record detailing out the list of all equipment received by him for the purpose of erection and keep such record open for inspection of the Engineer in charge. All the equipment shall be handled carefully to prevent any damage or loss. No bars, wire ropes strings etc shall be used without specific written permission of the Engineer in charge. The equipment stored shall be properly protected to prevent damage either to the equipment or to the floor where they are stored. The equipment from stores shall be moved to the actual location at the appropriate time so as to avoid damage of such equipment at site. All electrical panels, control gears, motors and other devices shall be properly dried up by heating before they are installed and energized. Motor bearing, slip rings commutators and other exposed parts shall be protected from moisture, ingress and corrosion during storage and periodically inspected. Heavy rotating parts in assembled conditions shall be periodically rotated to prevent corrosion due to prolonged storage. All the material stored in open or dust location must be covered with suitable weatherproof and flame proof covering whichever is applicable. The contractor shall be responsible for making suitable indoor storage. Normally all electrical equipments such as motors, control gears, generators exciters and consumables like electrodes, lubricants etc. shall be stored in closed storage place. The Engineer in charge in addition may direct contractor to move certain other materials, which in his opinion will require indoor storage, and the contractor shall strictly comply with it.

3.9 Contractor's material brought to Site.

The contractor shall bring to site all equipment components, parts, materials including construction equipment tools and tackle for the purpose of the work under intimation to the Engineer in charge. All such goods shall from time of their being brought vest in the owner but may not on any account be removed or taken away by the contractor without written permission from the Engineer in charge. The contractor shall nevertheless be solely liable and responsible for any loss or destruction there of and damage there to. The owner shall have lieu on such goods for any sum or sums, which may at the time be due to owing to him by the contractor. After giving 15 days notice in writing of his intention to do so, the owner shall be at liberty to sell and dispose of any such goods in a manner as he shall think fit including public Auction or private treaty and to apply the proceeds in or towards completion of work, the contractor shall remove from the site under the directions of the Engineer in charge, the material such as construction equipment, erection tools and tackles, scaffolding etc. within 15 days of issue of a notice by the Engineer in charge to do so. Then the Engineer in charge shall have the liberty to dispose off such materials and credit the proceeds there of to the account of the contractor.

3.10 Maintenance tools and tackles

The contractor shall supply with the equipment one complete set of all special tools and tackles for the erection assembly and maintenance of the equipment. However these tools and tackles shall be separately packed and brought to site. The tenderer shall indicate all the above items in

the annexure. This set shall be for owner's use and any of the equipment out of this set shall not be used by the tenderer.

3.11 Facilities to be provided by the owner

The contractor shall advise the owner within fifteen (15) days from the date of acceptance of the letter of intent about his exact requirement of space for his office, mess, rooms, storage and toilets etc. The above requirement shall be reviewed by the Engineer in charge and the space available will be allotted to the contractor for construction of temporary structures like office, storage sheds and staff colony etc. for his own use as well as sub-contractor's use. The temporary constructions shall have to be removed entirely on completion of the job.

3.12 Cleanliness

The areas where the equipment might drip oil and cause damage to the floor surface a suitable protective cover of flame resistant oil proof sheet shall be provided to protect the floor from such damage.

3.13 Construction management

Time is the essence of the contract and the contractor shall be responsible for performance of his works in accordance with the specified construction schedule. If at any time the contractor is falling behind the schedule he shall take necessary action to make good for such delays by increasing his work force or by working over time or otherwise accelerate the progress of work to comply with the schedule and shall communicate such action in writing to the Engineer in charge satisfying that his actions will compensate for delay. The contractor shall not be allowed any extra compensation for such action.

3.14 Contractor's co-operation with the owner

In cases where the performance of the erection work by the contractor affects the operation of the system facilities of the owner, such erection work at contractor shall be scheduled to be performed only in the manner stipulated by the Engineer in charge and the same shall be acceptable at all times to the contractor. The Engineer in charge may impose such restrictions on the electricity and water etc. as he may think fit and the contractor shall strictly adhere to such restriction and cooperate with the Engineer in charge. It will be the responsibility of the contractor to provide all necessary temporary instrumentation and other measuring devices required during start up and the operation of the equipment system which are erected by him. The contractor shall also be responsible for flushing and initial filling of all the oil and lubricants for the equipment furnished by him, so as to make such equipment ready for operation. The contractor shall be responsible for supplying such flushing oil and other lubricants.

3.15 Field office records

The contractor shall maintain up to date copies of all the drawings, specifications and other contract documents and any other supplementary data complete with the latest revision thereto. The contractor shall maintain in addition continuous record of all the changes to the above contract documents, drawings, specifications, supplementary data etc affected at the field and on completion of his total assignment under the contract shall incorporate all such changes on the drawings and other Engineering data to indicate as installed conditions of the equipment

furnished and erected under contract such drawings and engineering data of equipments erected under the contract shall be submitted to the Engineer in charge in number of required copies.

3.16 Co-operation with other contractors and consulting Engineers appointed by PHED/BRJP.

The contractor shall agree to co-operate the owners other contractors and consulting Engineers and freely exchange with them such technical information as is necessary to obtain the most efficient and economical design and to avoid unnecessary duplication of errors. The contractor shall attend design co-ordination meetings at his cost whenever required.

3.17 Design Co-ordination

The contractor shall be responsible for the selection and the design for appropriate equipments to provide best-coordinated performance of entire system. The basic design requirements are detailed out in technical specifications. The design of various components, sub assemblies, assemblies, maintenance and all rotating components shall be so selected that the natural frequency of the complete unit is not critical at or close to the operating range of the unit.

3.18 Quality Assurance Program

To ensure that the equipment and services under the scope of this contract whether manufactured or performed within the contractor's premises or at the owner's site or at only other place of work are in accordance with the specifications. The contractor shall adopt suitable quality assurance programs to control such activities at all the points necessary. Such program shall be outlined by the contractor and shall be finally accepted by the Engineers after discussions before the award of contract and such agreed program shall form part of contract.

3.19 Unfavorable working conditions

The contractor shall confine all his field operations to those works which can be performed without subjecting the equipment and materials to adverse effects during inclement weather conditions like monsoon, storms etc. and during other unfavorable construction conditions. No field activities shall be performed by the contractor which might adversely affect the quality and efficiency thereof, unless special precautions or measures are taken by the contractor in a proper and satisfactory manner in the performance of such works and with the concurrence of Engineer in charge, such unfavorable conditions will in no way relieve the contractor of his responsibility to perform the works as per schedule.

3.20 Protective Guards

Suitable guards shall be provided for the protection of the personnel on all exposed rotating or moving parts. All such guards with necessary spaces and accessories shall be designed for easy installation and removal for maintenance purpose.

3.21 Welding

If the manufacturer has special requirements relating to the welding procedures for welds beyond his scope of work at the terminals of the equipment to be procured by the owner under separate specifications, the requirements shall be separately submitted to the Engineer in charge in advance of commencement of erection work.

3.22 Noise and Vibrations

The equipment supplied and erected by the tenderer will comply best design and erection practice and its working shall be within permissible noise and vibration levels.

3.23 Equipment Bases

A cast iron or welded steel base plate shall be provided for all rotating equipment, which is to be installed on a concrete base unless otherwise agreed to by the Engineer in charge. Each base plate shall support the unit and its drive assembly and shall be a neat design with pedestal anchoring the unit.

3.24 Rating plates, Nameplates and Labels

Each main, auxiliary item of plate is to have permanently attached to it in a conspicuous position a rating plate of non-corrosive metal upon which is to be engraved any identifying manufacturers name, equipment type or serial number together with details of loading conditions under which the items plant in question has been designed to operate and such diagram plates as may required by the Engineer in charge. Each items of plant is to be provided with a nameplate or label designating the service of the particular equipment. The inscriptions are to be approved by the Engineer in charge or shall be as detailed in the appropriate sections of the technical specifications. Such name plates or labels are to be white non hygroscopic material with engraved black lettering on alternatively in the cast of indoor circuit breakers etc. if transparent plastic material with suitably, coloured, lettering engraved on the back. Items of plant such as valves, which are subject to handling, are to be provided with an engraved chromium plated nameplate or label with engraving filled with enamel.

3.25 Foundation, Dressing and Grouting

The surfaces of the foundations shall be dressed to bring the top surface of the foundations to the required level prior to placement of the equipment/equipment bases on the foundations. All the equipment bases and structural steel plates shall be grouted and finished as per these specifications unless otherwise recommended by the manufacturer. The concrete foundation surfaces shall be properly prepared by chipping, grinding as required to bring the type of such foundation to the required level to provide necessary roughness for bondage and to assure enough bearing strength. All laitance and surface film shall be removed and cleaned.

3.26 Grouting Mix

The grouting mix shall be composed of Portland cement sand and water. The Portland cement to be used shall conform to IS 269. The grout proportions for flat bases where the grouting space does not exceed 35 mm shall be 50 kg bags of cement, 75kgs of sand. Only the required quantity of water shall be added so as to make the mix flow able and the mix shall not show excess water on the top when it is being put in place. For thicker grout beds up to 65 mm the amount of sand shall be increased to 105 Kg per bag of cement. Bases which are at a level 25 mm above the outside rim with mortar mix in volumetric proportions of one bag of cement and 1.5 bags of sand, 1.5 per 6 mm granite gravel, an acceptable plasticizer may be added to the grout mixer in a proportion recommended by the manufacturer. All such grouts shall be mixed thoroughly for not less than 5 minutes in an approved mechanical mixer and shall be used immediate after mixing.

3.27 Place of grout

After the base has been prepared its alignment and level has been checked and approved before actually placing the grout a low dam shall be set around the base at a distance that will permit the pouring and manipulation of grout. The height of such dam shall be at least 25 mm above the bottom of the base. Suitable size and number of chains shall be introduced under base before placing the grout so that such chains can be moved back and forth to push the grout in every part of the space. The grout shall be poured through the grout holes if provided or shall be continued until the entire space below the base is thoroughly filled and the grout stands at least 25 mm higher all around than the bottom of the base. Enough care shall be taken to avoid any air or water pockets beneath the bases.

3.28 Finishing of the Edges by grout.

The poured grout shall be allowed to stand undisturbed till it is well set. Immediately there after the dam shall be removed and grout which extends beyond the edges of the structural or equipment base plates shall be cut off, flush and removed. The edges of the grout shall then be pointed and finished with one to two cement mortar pressed firmly to bond with the body of the grout and smoothed with a tool to present smooth vertical surface. The work shall be done in a clean and scientific manner and the adjacent floor spaces, exposed edges of foundations and structural steel and equipment base plates shall be thoroughly cleaned of any spillage of grout.

3.29 Checking of equipment after grouting

After the grout is set and cleared the contractor shall check and verify the alignment of the equipment. On alignment of shafts and rotating machinery the slopes of all bearing pedestals, centering of the rotors with respect to their sealing bore coupling etc. as applicable and the like items to ensure that no displacement has taken place during grouting. The values recorded prior to grouting shall be used during such post grouting checking up and verifications. Such pre and post records of alignment details shall be suitably doweled after alignment of shaft with tapered machined dowels as per direction of the Engineer in charge.

3.30 Shaft Alignment

All the shafts of rotating equipment shall be properly aligned to those of matching equipment to as perfect and as accurately as practicable. The equipment shall be free from excessive vibration so as to avoid over heating of bearings or other conditions, which may tend to shorten the life of the equipment. All bearings, shafts and other rotating parts shall be thoroughly cleaned and suitably lubricated before starting.

3.31 Doweling

All the drive motors and other equipment shaft be suitably doweled after alignment as the shafts with tapered machined dowels as directed by the Engineer in charge.

3.32 Painting

All the exposed metal parts of equipment including piping, structures, railings etc. wherever applicable after installation unless otherwise surface protected shall be first painted with at least one coat, rust, scales greases oil and other foreign materials shall be removed by wire brushing

scraping or sand blasting and approved by the Engineer in charge for painting. Afterwards the above parts shall be finished with two coats of alloyed resin machinery enamel paints. The quality of finished paints shall be as per standards of relevant IS or equivalent and to be of the approved color by the Engineer in charge.

3.33 Color code for pipe services

All pipe services, wherever applicable are to be painted in accordance with the owner's color scheme by the contractor.

3.34 Training of owner's personnel

The contractor shall undertake to train, free of cost engineering personnel selected and sent by the owner at the works of contractor for V.T. and centrifugal pumps, starters, switch gears etc. The period and nature of training for the individual personnel shall be given special training in shops where the equipment will be manufactured by the contractor, or his collaborator's work and where possible in any other plant where the equipment is under installation or testing to enable these personnel while under going training shall be responsible to the contractor for discipline. In event of the owner for any reason failing to avail the training facilities he shall not be entitled to any rebate on this account.

3.35 Lubrication

Equipment shall be lubricated by the systems suitable for duty of equipment. Lubricant level indicators, wherever provided shall be furnished and marked to indicate proper level under both stand still and operating conditions.

3.36 First fill of consumables, oils, Lubricants.

All first fill of consumables such as oil lubricants and essential chemicals etc. which will be required to put the equipment covered under scope of specifications in successful trial operations and O&M for five years shall be furnished by the contractor.

3.37 Check out of control systems

After completion of wiring and cabling the contractor shall check out the operation of all control systems for the equipment furnished and installed under the specifications and documents.

3.38 Equipment Performance Guarantee

The performance guarantee of the equipment under contract is detailed separately in technical specifications. This guarantee shall supplement the general performance guarantee provisions covered under general terms and conditions.

3.39 Guarantee

a) In the event of an emergency wherein the judgment of the Engineer in charge, delay would cause serious loss or damage, repairs or adjustments may be made by the Engineer in charge or a third party chosen by the Engineer in charge without advance notice to the contractor and the cost of such work shall be paid by the contractor or by the surety. In the event such action is taken by the Engineer in charge, the contractor will be notified promptly and he shall assist

wherever possible in making the necessary corrections. This will not extinguish the contractor's liability under terms and condition of contract.

b) The cost of any special or general overhaul tendered necessary during the operation period due to defects in the plants or defective work carried out by the contractor, the same shall be borne by the contractor.

c) In case of those defective parts which are not repairable at site but are essential for the commercial operation of the equipment, the contractor and the Engineer shall mutually agree to a program of replacement or renewal which will minimize interruption to the maximum extent in the preparation of the equipment

d) At the end of guarantee period, the contractor's liability ceases except for latent defects in respect of goods supplied by sub-contractor to the contractor where a larger guarantee is (more than twelve months) is provided by subcontractor, the owner shall be entitled the benefit of such guarantee.

e) The provisions contained in this clause will not be applicable.

1) If the owner has not operated the equipment according to generally approved industrial practices in accordance with the conditions of operation specified and in accordance with operating manuals if any.

2) In case of normal wear and tear at the parts to be specifically mentioned by the contractor in the offer.

Pre-commissioning Trials

4.1 Start up

On completion of the erection of equipment and before start up, each item of the equipment shall be thoroughly cleaned and then inspected by the Engineer in charge and the contractor jointly for correctness and completeness of installation and acceptability for start up leading to initial pre-commissioning tests at site. The list of pre commissioning tests to be performed shall be mutually agreed and included in contractor's quality assurance Programme. The contractor's commissioning /start up engineers specially identified as far as possible shall be responsible for carrying out all pre-commissioning tests. On completion of inspection, checking and after pre-commissioning tests are satisfactorily over the complete equipment shall be placed on initial operation during which period, the complete equipment shall be operated integral with sub-system and supporting equipment complete plant.

4.2 Commissioning spares

The contractor shall make arrangements for an adequate inventory at site, of necessary commissioning spares prior to commissioning of equipments furnished and erected so that any damage or loss during these commissioning activities necessitating the requirements of spares will not come in way of timely completion of works under contract.

4.3 Registration and statutory Inspection

All the registration and statutory inspection fees if any in respect of work pursuant to this contract shall be to the account of contractor. Should any such inspection on registration need to be re-arranged due to the fault of contractor, the additional fees for such inspection shall also be borne by the contractor.

4.4 Progress Reports and Photographs

During various stages of works in pursuant of the contract the contractor shall at his own cost submit periodic progress reports as may be reasonably required by the Engineer in charge with such materials as charts, networks, photographs, test certificates etc. Such progress reports and photographs shall be in the form and size as may be required by the Engineer in charge and shall be submitted in at least three copies and shall contain the date, the name of the contractor and the title of the photographs. The report shall also indicate reasons for variance between the schedule and actual progress and the action proposed for corrective measures whatever necessary.

4.5 Work and Safety Regulations

- a) The contractor will notify the Engineer in charge of his intention to bring on to the site any equipment or any container with liquid or gaseous fuel or other substance, which may create hazards. The Engineer in charge shall have right to prescribe the condition under which such equipments or container may be handled and used during the performance works and the contractor shall strictly adhere to such instructions. The Engineer in charge shall have the right to inspect any construction plant and to forbid its use if in his opinion it is unsafe, no claim due to such prohibition shall be entertained by the owner.
- b) Where it is necessary to provide and/or store petroleum products or petroleum mixtures and explosives the contractor shall be responsible for carrying out such provision and/or storage in accordance with the rules and regulations laid down in Petroleum Act 1934 Explosive Act 1948 and petroleum and carbide of calcium manual. All such storage shall have prior approvals necessary from chief Inspector of Explosives or any Statutory Authorities. The contractor shall be responsible for obtaining the same.

4.6 Electrical Safety Regulations

- a) In no circumstances will the contractor interfere with the fuses and electrical equipment belonging to the owner or other contractor
- b) Before the contractor connects any electrical appliances to any plugs or sockets belonging to owner or other contractor he shall
 - 1) Satisfy the Engineer in charge that the appliances are in good working conditions.
 - 2) Inform the Engineer in charge of maximum current rating voltage and phases of the appliances.
 - 3) Obtain the permission of the Engineer in charge, detail the sockets to which appliances may be connected.
- c) The Engineer in charge will not grant permission to connect until he is satisfied that
 - 1) The appliance is in good condition and is fitted with suitable plug.
 - 2) The appliance is fitted with suitable cable having two earth conductors one of which shall be an earthed metal sheath surrounding the core.

d) No electric cable in use by the contractor shall be in use by the contractor/owner will be disturbed without prior permission.

No weight at any description will be imposed on any such cable and no ladder of similar equipment will rest against or to be attached to it.

e) No work will be carried out on any live equipment. The equipment must be made safe to work issued before any work is carried out.

f) The contractor shall employ the necessary number of qualified full time electricians to maintain the temporary electrical installation.

Contractor shall make necessary arrangements for the following

I) It is necessary to carry out the testing of number of equipments in the manufacturers works. This is stated in the item wise specification. However the items, which require third party inspection as tested below with brief requirement of tests.

II) The arrangements for this shall be arranged by the contractor, the cost of testing in factory payable to manufacturer (including power charges etc.) The testing fees of inspecting authorities etc. shall be arranged by the contractor without any extra cost to the department.

Whenever department Engineers will be attending the inspection and testing to and fro charges will be born by the department as per Govt. civil service rules. However all other arrangements shall be made by the contractor.

5.1 V.T. pumps

Testing

(a) Hydro static test of enclosures i. e Bowls, Suction case, Discharge case, Surface discharge head etc. and column pipes for V.T. pump.

(b) Balancing of impellers during strip test (Contractor shall furnish balancing test reports of the impellers other than the one tested during strip test)

(c) Performance test (as per IS) and as stated in detailed specifications.

Review of raw material test certificates.

(e) Dimensional check.

2) Motors

a) Routine Test

b) Review of Raw material test certificate.

c) Dimensional check

d) Routine test as per IS

3) Sluice Valve and Non Return Valves

a) Dimensional tests

b) Hydrostatic test for seat and body of all the valve

c) Review of raw material Test certificates.

d) Operation of the spindle and flap for Sluice valve.

4) L. T. Panel

- (a) Dimensional Check
- (b) Components check
- (c) Functional tests.
- (d) Components Certificates review.
- (e) H.V. Test

5) Relay and metering panel

- (a) Dimensional Check
- (b) Components check
- (c) Functional tests.
- (d) Components Certificates review.
- (f) H.V. Test

6) Air Brake fully automatic / Auto Transformer starter

- a) Dimensional check
- b) Component check
- c) Functional Check
- d) H.V. test

7) Transformer

- a) Dimensional Check
- b) Routine Testing as per IS
- c) Oil sample test

8) M.S. pipes and specials

- a) Thickness check
- b) Hydro-static testing

9) Earthing – earth resistance.

5.2 (I) Field (Site) testing

The field-testing of the pumps shall be carried out after three months period after satisfactory commissioning of the pumps. During this period the pumps shall be continuously run as required by the Engineer in charge.

Following test shall be carried out in the presence of the Engineer Incharge, third party appointed for the purpose and officers such as E.E. (Mech.) and other officers designated by the Department.

- 1 Performance test of the pump
- 2 Control circuit testing and checking.
- 3 Relay operation

4 Vibration and noise of pump-motor sets.

The performance test shall be carried out by using calibrated instruments i.e. Ammeter, Voltmeter, two watt meters for measuring power consumption, C.T.'s

The discharge of each pump shall be measured either by electronic flow meter (clamp on type \ probes inserted in the rising main etc.) calibrated by the approved agency or by volumetric method in the clarifier/Reservoir by fixing level gauge & 'U' tube out side the clarifier/Reservoir whichever approved by the Engineer in charge.

The permissible tolerances shall be applicable as per respective IS of pumps.

The power consumption shall also be measured and the efficiency of the pump shall be calculated which should be verified with guaranteed performance given in tender

The efficiency shall be considered only at duty point.

The vibration and noise of the motor shall be within limits prescribed in respective limit.

The temperature rise of the motors and bearing and also those of transformer shall be checked during the 72 hrs non-stop operation of each pump set and shall not be more than those limits prescribed against respective items.

(II) It is necessary to get approval of Electrical Inspector on such Statuary Authority to the layout plan of transformer substation and also visit to site. The contractor may require to arrange the visit of such officer and obtain written permission for charging the sub-station.

Necessary fees payable to these officers as per relevant act will be paid by the contractor. However all the arrangements regarding drawing approval, inspection and obtaining permission, submission of required documents etc. will be made by the contractor. No charges will paid, nor any claim accepted for this.

(III) Contractor shall submit the drawings, technical data specifications etc of all the equipment and shall get them approved prior to placing final supply/ fabrication order to his principle supplier/ manufacturer.

IV) All the equipment shall be of reputed makes as specified against each item. However the list of approved makes is given below for ready reference.

1) **Pumps**

V.T. pumps – Kirloskar/ Jyoti/ Worthington/ M&P/ WPIL

2) **Valves** – I.V.C./I.V.I./Kirloskar/ KISWOK/ FOURESS

3) **Air Valve** I.V.C./I.V.I./Kirloskar/ Hawa/ KISWOK

4) **Pipe works** - Reputed make.

5) **Chain pulley blocks**

Indef / Morris / Hercules / WMI/ Power lift.

6) Electric motor

Vertical

Kirloskar/ Jyoti / NGEF/BHEL

b) Horizontal

Kirloskar/Jyoti/GEC/NGEF/BHEL/Crompton/ Siemens

7) Air Brake fully automatic/ Auto Transformer starter

Contactors for A.T.S. L&T/ Siemens / Bharatiya Cuttler Hammer / Jyoti / Crompton.

8) Air Circuit Breaker L&T/EE/ABB/Voltas

9) M.C.C.B. Breaker – L & T / Crompton / EE / Voltas / ABB.

10) Earth fault & over current relays E.E./A.B.B.

11) Transformer – Kirloskar / Bharat Bijlee / Crompton / GEC ALSTHOM / Andrew Youle / NGEF / BHEL / EMCO / Trans Delta/ISI MARK if any.

12) Cables

Tropodour / Finolex / Asian / Gloster / Incab/ Universal / Polycab / NICCO.

13) Substation equipment

Outdoor equipment.

i) C.T. / P.T. Transdelta / Madhav /A.E

ii) A.B. Switches (G.O.D.) – Kiran/ Pactil / Southern switchgears / Atlas / Universal.

lii) D.O. fuse unit – Kiran/ Pactil / Southern switchgears / Atlas / Universal.

iv) Lightning arrester- Elpro / Atlas

14) Capacitors

Voltas / Crompton / Usha / Madhav / Malde / Jaivic / Hicco / Khatav junkar

15) Meters- AE/IMP/RISHABH

v) Approval of the drawings

Contractor shall get all the technical drawing and data duly approved from the Chief Engineer/ E.E. (Mech) before execution. It is presumed that the data shall be suitable and in accordance with the technical specification.

In case there are any deviations he should point out such deviations and get approval for the same.

VI) Foundation arrangement

1) For V.T. pumps

As already specified base frame shall be provided on which sole plate shall be fixed. Blue matching shall be done between the surfaces of the discharge head and the sole plate to the extent of 60%. The base frame and sole plate shall be accurately leveled by using machinists level at all the surface of the sole plate. Only then discharge head shall be mounted on the sole plate.

The components of the pump shall be generally as under

a) **Bowl assembly.** – This should have flanged bowl / bowls with machined matching faces. All the joints between the bowls, suction bell mouth discharge case, column and assembly shall be flanged.

b) **Suction bell mouth and strainer.** This shall be of M.S. construction adequately designed to reduce the entrance losses and fitted to the suction nozzle to limit to the velocity. The shape of bell shall be designed to streamline the flow to suction nozzle.

The strainer shall be in stainless steel construction. The net opening area shall not be less than three times the area of the bell mouth.

The thickness of bell mouth shall not be less than 10 mm.

c) **Impeller/s:** - Impeller/s shall be dynamically balanced so as not to cause any vibration during operation. These shall be semi open type made in one piece and securely fixed on stainless steel pump shaft. The water passages shall be hand finished to have smooth flow during the operation. The balancing by drilling holes/devices reducing hydraulic thrust shall not be provided/accepted.

Wearing rings- These shall be press fitted in the place or locked by pins and shall be renewable type. These shall be provided for both on impeller and in casing. Hardness shall be less by at least 50 BHN than that of impeller.

Pump shaft – The shaft shall be of stainless steel and finish to the close tolerance at the impeller/bearing fixing places. The shaft shall be designed by considering the critical speed of the shaft, which shall be at least 20% above or below the operation speed. The shaft shall be properly balanced so as not to cause undue vibration. The pump shaft bearings shall be of stainless steel water lubricated. Extra long bearings shall be provided to suction and discharge case. The hardness of the bearing shall be less by 50 BHN than that of the shaft.

d) **Column assembly.**

Column pipe shall be of mild steel fabricated heavy weight flanged type in length of 1.5 meters or less to facilitate the handling. The total length of column assembly, bowl assembly, Bell mouth and strainer shall not be less than 12 meters. Required matching column assembly portion shall be provided if necessary. The contractor shall check the levels in the well. No extra cost will be paid for any increase in length. The stiffeners shall be provided to all pipe flanges. Full diameter elbow shall be provided in the surface discharge head.

e) **Line shaft** – These shall be solid circular prepared from stainless steel machined and ground thoroughly and coupled with screwed or muff couplings. The shaft sections shall be provided with abrasion resisting wearing surfaces at the location of each guide bearing. Length of each shall not exceed 1.5 meters.

f) **Line shaft bearing.-** These shall be designed suitably for water lubrication/forced water lubrication to have effective lubrication. The composite design of the shaft and bearing shall be such that the entire rotating assembly is brought from stand still to full speed without any vibration and shaft deflection to ensure that first critical speed is within 80% to 120% of full speed.

g) **Shaft Cover tubes.-** These shall be designed and manufactured from seamless

M.S. tubes in 1.5m lengths and suitably connected to each other at line shaft bearing sections.

- h) **Surface discharge head** – This shall be fabricated from mild steel and shall incorporate mounting flange for motor, stuffing box with renewable gland packing, air vent, with cock connection for pressure gauge etc. This should be designed to support the entire load of pump assembly, water column and motor etc and shall withstand all static dynamic, torsional loads, hydraulic thrust imposed during operation from shut off to stipulated operating conditions and thrust due to change in direction flow without any vibrations. Discharge head with pads will not be accepted. The discharge head shall be installed on sole plate with ISMB frame, which in turn will be fixed on the pump floor suitably.

Necessary drains shall be provided to drain out the leakage water from the glands at bottom of discharge head through G.I. pipes.

Thrust bearing shall be provided in the motor and shall be suitable to take entire thrust of the rotating parts of the pump & motor in all conditions of operation and shall be suitable for rotation up to at least 150% of normal forward speed. Bearing shall be self aligned, roller or ball type preferably grease lubricated and arrangement for greasing shall be provided.

The pump motor assembly shall also be provided with non-reverse ratchet arrangement to avoid reverse rotation.

The contractor shall submit the sectional general arrangement drawings of pump and motor for approval including drawing of coupling arrangements etc.

Sole plate – Mild steel sole plate shall be provided under the discharge head for precise vertical and horizontal leveling. Thickness of sole plate shall not be less than 35-mm. Contact surface of the sole plate shall be machined for precise leveling and assured vibration free operation of the pump. Sole plate shall be independent of the base plate and integral to the discharge head.

- i) Corner plate and sole frame
- ii) Sole frame and sole plate
- iii) Sole plate and discharge head

All the joints as above between the machined contact surfaces shall be with bolts/tapped studs.

All contact surfaces shall be blue matched to the extent of 60% of the contact area minimum. The opening in the sole plate, sole frame shall be adequate to pass the bowl assembly, suction bell mouth etc. easily.

Foundation drawings shall also be designed and submitted for approval.

Necessary air release arrangement shall be provided with air cock and G.I. pipe.

Material of construction

- i) Discharge and suction case and bowls –Cast iron as per IS 210 Gr FG200
- ii) Surface discharge head, bell mouth and motor stool – Mild steel fabricated
- iii) Impeller - Stainless steel CF 8 m
- iv) Impeller shaft - High-grade carbon steel/stainless steel AISI410/416.
- v) Column pipe - ERW heavy duty with flanges.

- vi) Shaft sleeve - Stainless steel
- vii) Nuts bolts and washer stainless steel AISI 410.
- viii) Wearing rings - CF 8m.
- ix) Line Shaft bearing – Cut less rubber / Phosphor Bronze suitable for water lubrication.
- x) Line shaft cover tubes – seamless steel.

Testing

All the pumps shall be tested in the presence of Engineer In charge or his representative and third party appointed for inspection. The contractor shall arrange all test equipments at site for field-testing. The field test shall be carried out in the presence of Engineer in charge or the officer authorized by the department and third party nominated for the purpose.

A) Factory test

- a) Review of raw material
- b) Hydro Static test of Column pipes, Bowls, Bowl assembly. Discharge head etc. The test pressure shall be 1.5 times the shut off head.

c) Performance test

Performance test shall be carried out at full speed at manufacturers work for

- 1) Duty point
- 2) Two points above duty points
- 3) Two points below duty points
- 4) Shut off head

The test shall be carried out by using the motor proposed to be provided with the pump.

The test shall comply measurement of head, discharge and power consumption at rated nominal R.P.M. and performance curves drawn and submitted. Test with reduced speed will not be accepted.

d) Strip inspection

One pump after testing shall be offered for strip test randomly selected by inspecting authority. Manufacturer shall submit dimensional drawing for inspection. Following points will be checked

- 1) Condition of all components, bushes, bearings, wearing rings for undue rubbing wear etc.
- 2) Hardness of rubber bearing
- 3) Dynamic balancing of impellers flexible coupling maximum unbalance shall not exceed as per relevant IS.
- 4) Clearances and tolerances between wearing rings, impeller shaft and bearings, impeller shaft and key, Key and key way.

- 5) Finish of water passages in impeller and diffuser. Material test certificates of all components shall be submitted for review.

Field Testing

This shall be for discharge, head and power consumption at duty points and general performance at other points. The test shall be generally carried out as per IS 9137.

This test shall be carried out after 3 months regular operation of the pump including continuous operation of the pump for 72 hrs.

The testing shall be carried out by using specially calibrated pressure Gauge, flow meter or volumetric measurement decided by the Engineer in charge.

Calibrated electric measuring wattmeter's, voltmeter and ammeter.

Approved makes – Kirloskar/Jyoti/ Worthington/ Mather & Platt

2) Sluice valve

This shall be C.I. D/F water work quality, heavy duty with non rising spindle, inside screw and shall be fitted with double faced gun metal wedge made in one piece and having two machined facing rings securely fixed into machined recesses in the wedge. The guides and lugs shall be provided to guide the wedge through its full travel and lugs and guide shall be lined with bronze. The bronze lining provided on guides and lugs shall be secured by counter sunk screws or rivets of non-ferrous metal. The clearance between the lugs and the guides shall not exceed 2.5 mm.

All the valves shall be provided with gearbox at the top and below the hand wheel (similar to I.V.I./I.V.C.) to facilitate easy manual operation.

The material of the components shall be as under

- i) Body, bonnet cover wedges, stuffing box, gloves and hand wheel - grey C.I. grade FG 200 of IS 210.
- ii) Spindle as per IS 6603 stainless steel.
- iii) Edge and body hinges–Leaded tin bronze conforming to grade 2 of IS 318.
- iv) Nuts and Bolts- As per Is 1363.
- v) Wedge nut – High tensile brass confirming to alloy 3 of IS 320.

The valves shall be tested in the manufacturer's works as under

- 1) Body test - 16 Kg/Cm²
- 2) Seat test – 10 Kg /Cm²

The manufacturers test certificate for the material shall be provided at the time of the testing. Required supports to the valves in C.C. shall be provided.

The dimensional drawing shall be submitted by the contractor prior to manufacture showing all the construction details etc. of valve and gearbox for approval. The valves shall be painted after testing as directed by the Engineer in charge.

Approved makes I.V.C./I.V.I./Kirloskar

3) Non return Valve (Reflux valve) –

This shall be C.I. D/F single / multi –door type free acting, quick opening, giving rapid non-slam closure and with low head loss Characteristic when in open position. The valve shall be generally designed as per IS 5312 part I. The valve shall be suitable for following working pressures and shall be tested at manufacturer's works as under.

Seat 10 Kg/Cm²

Body 16 Kg/Cm²

The valves shall be provided with suitable by pass arrangement with Gunmetal wheel valve/ Sluice valve.

The material of construction shall be as under

i) Body, cover door and door face disc – Grey cast iron conforming to grade FG 2002 of IS 210.

ii) Hinges cast steel as per IS 1030.

iii) Hinge pin, door pins and door suspension pin- stainless steel as per IS 6603.

iv) Bearing bushes, body hinges and door faces- Gun metal conforming to grade 2 of IS 318.

Approved makes IVC/TVI/Kirloskar

4) Kinetic Air valve

Kinetic air valves of diameter 100 mm and above of approved make shall be provided and fixed. These shall be two-orifice type, the small orifice releasing air from the pipe carrying water under normal working condition while large orifice shall admit or release air when the pipe is being emptied or filled. The air valve shall be designed to operate satisfactorily at normal working pressure of 10 Kg/Cm². Kinetic air valve body shall be tested for 10 Kg/Cm². Air valve shall be provided with isolating sluice valve 100 mm diameter, which shall generally comply with above except gearbox and provided with hand wheel.

Material of construction

Float Chamber, cowl and cover – C.I. grade FG 200 of IS 210.

Small orifice float – Seasoned timber ball covered with soft rubber

Large orifice float - Seasoned timber ball covered with hard vulcanized rubber.

Orifice guides and mechanism – 12% chromium steel as per IS 1310 or stainless steel to 135970-1045 – 15

Sealing rings – moulded rubber of suitable quantity

6.1 Pipe work

M.S. pipe work shall be fabricated from M.S. plates conforming to IS 226. The fabrication pipe shall generally conform to IS 3589 pipe and specials shall be fabricated from 10 mm and 8/6 mm thick plate as per drawing. Layout of valve and pipe work shall be got approved from the department. Dished end shall be provided at the end of the common manifold and thickness of dished end shall not be less than 12 mm.

Air release arrangement shall be provided after the discharge head by using 50mm diameter G.I./ M.S. pipe and cock. Joints connecting the valves shall be flanged with flange thickness not less than 25mm joint rubber ring for these joints shall not be less than 3 mm.

The pipe work shall be subject to test pressure of 1.5 times the actual working pressure in the presence of the Engineer in charge.

All the pipes and valves shall be painted with the primer red oxide paint after the surface is cleaned and two coat of enamel paint of approved quality and shade to have finished aesthetic appearance. Cost of breaking the holes in walls and remaking the same as it was is included in this item.

6.2 Dismantling joints –

These shall be provided connected to the flange outlet or discharge head of the pump and Non Return valve. The diameter of this joint shall be same as Non Return valve. This shall be fabricated from M.S. plate designed to withstand pressure of 25 kg/cm². The plate thickness shall not be less than 10 mm. The design of the joint shall ensure that no forces are transmitted to the pump foundation and flanges of dismantling joints are held rigid during normal working. For dismantling it shall be possible to slide the flanges at one end by at least 25 mm to enable dismantling refitting, General arrangement drawing shall be got approved before actual fabrication of the joint.

7 ELECTRICAL EQUIPMENTS

I) Electric motors

There shall be vertical, hollow/solid shaft flange mounting type, to operate on 415 volts +/- 10% 3 phase 50 Hz. A.C. supply. The design of motors shall confirm to IS 325. The torque speed and current speed characteristics of motor shall be suitable for pump starting characteristics. The motor shall be designed such that there shall be minimum 10/15% reserve power over the entire head range of pump specified. H.P. of the motor. Starting time and locked rotor with stand time under hot conditions shall have suitable discrimination for proper selection of protection relays. The locked rotor withstand time under hot condition and at 85% rated voltage shall be more by at least 3 seconds than the starting time with driven equipment coupled at 85% rated voltage.

The motor shall be suitable for restricted operation at following conditions.

- (a) Accelerating the driven equipment from stand still to full speed within duration of 1 minute or less at 85% of rated voltage.
- (b) Operation on load at 75% of rated voltage for five minutes
- (c) Two starts at quick succession for cold condition
- (d) One hot restart at maximum steady state temperature over ambient temperature 45⁰c .
- (e) Three starts per hour equally spaced over the duration after attaining thermal equilibrium.
- (f) The motor shall be of continuous duty 'S-1' class. The class of insulation of motor shall be 'F' class.

Constructional features

The motor shall be vertical, hollow shaft. The motor shall be statically and dynamically balanced and critical speed shall not be in the range of 80% to 120% of motor speed R.P.M. and direction or rotation of motor shall be same as that of pump.

The motor shall be squirrel cage induction type, with S.P.D.P. construction with degree of protection confirming to IP 24. At least two drain holes shall be provided at the bottom end of the frame.

The motors shall be provided with special designed heavy duty thrust bearing anti friction grease lubricated type to take entire load of pump and motor static and dynamic type. Terminal box shall be designed suitably to accommodate armored aluminum conductor of required rating and shall be manufactured by the motor manufacturer. Suitably designed non-reverse ratchet arrangement shall be provided to the motor to stop reverse rotation.

(Note – As the V.T. pumps provided are suitable for hollow shaft motor necessary provision of special thrust bearing to take entire thrust a motor pump set shall be made along with non reverse ratchet and clutch type pump motor coupling at top as specified in the pump) as required.

Testing

The motor shall be offered for routine test to the inspecting Authorities and test certificates shall be submitted to the Engineers in charge.

Following document shall be furnished after contract is awarded.

- a) General arrangement drawing
- b) Instruction manual for erection and maintenance
- c) Test report
- d) Torque speed curve

(ii) Auto transformer starter –

Fully automatic A. T. starter motor control panel assembled locally with the contactors of approved makes sheet metal clad enclosure, floor mounting type suitable for operation on 400/440 volts 3 phase 50 cycles A.C. power supply and fitted with

1. Oil immersed Autotransformer with 40%, 50%, 65% and 80% tapings. (Winding of transformer shall be copper only) with withstand capacity for at least six starts per hour. **Transformer will be inspected by third party before dispatch.**

2 Air break contractors of suitable rating, as under of AC3 duty class shall be provided.

3. Bimetallic thermal over load relay.

4 Timer on delay OFF

5 Ammeter and voltmeter with C.T.'s and selector switch

6 No volt release

7 Single-phase current sensing relay.

The wiring on the contactors shall invariably be carried out by using solid copper conductors. The appearance and layout in the panel shall be aesthetic and specious to facilitate easy working. The enclosure shall be factory finished specious and elegant looking and provided with ISMC 75 M.S. base channels painted with best quality enamel paint or powder coated. Interlocking shall be provided so that the panel door shall not be opened when panel is on or alternately the panel should trip in case of opening of door. Contractor shall submit dimensional drawing of the starter, details of the offered components wiring diagram of panel etc. Indicating lamps for three phases On OFF and TRIP shall be

provided on the front. Special terminal boxes for incoming and outgoing shall be suitably designed and provided to facilitate easy entry of power cables.

The starter panel shall be tested in the manufacturers work for functional requirements H.V. tests etc. by the competent authorities of the department.

Approved makes of Contactors

L&T / Siemens / Bharatiya Cultter Hammer Adrew yele/Crompton.

ii) Relays L&T Crompton A.B.B.E.E., Siemens

iii) Timer – L&T, Siemens.

iv) Ammeter and Voltmeter A.E. IMP RISHABH

v) Auto Transformer approved standards make.

L.T. Panel

General

L.T. panel comprising 415-Volt switch gear and control gears shall be suitably designed for the functions as under

a) Reception of power from Transformer

b) Distribution of power for pump motors, lighting etc.

Panel Construction

The 415-grade switch gears shall be housed in a totally enclosed sheet metal clad dust and vermin proof of cubicle suitable for floor mounting and are of equal height. The panel shall incorporate the following

i) 3 ½ pole 400A Aluminum bus bars in enclosed compartment in horizontal formation C.

ii) Enclosed vertical bus bar serving the motors

iii) No of identical separate compartments for motor feeders, instruments bus bars, C.T., P.T. cable termination as required.

iv) Internal panel barriers in the bus bar Chamber shall be epoxy.

The panel shall be fabricated from 2 mm thick M.S. sheets. Hinged doors shall be provided at the front and rear with car type handles. Mechanical interlocks shall be provided to prevent the opening of front door in ON position or alternately arrangement shall be made to trip the supply in event on opening or front door. Suitable stopper shall be provided to restrict the opening of the doors to working requirements and to prevent the rubbing of the door and scratching of paint with adjoining panel structure. Cable entries and exits shall be from the bottom only. Indicating and opening devices shall preferably be at uniform levels and shall not be above 1600 mm from the floor.

The panel framework shall have minimum ISMC 75 channel for base. Angle framework shall be 40 x 40 x 5 mm size M.S. angles.

Bus bars

The bus bars shall be aluminum sections to carry 400 A rated current (minimum) continuously. The bus bar shall be covered with shear resistant P.V.C. sleeves with color code and joints shall be epoxy shrouded. The bus bars shall be supported on durable non-hygroscopic supports rigidly fixed to the framework.

Adequate clearance shall be kept between the bus bars as per relevant IS codes.

Panel cabling and terminations

Power cabling shall be done entirely with P.V.C. insulated 1.1kV grade cables of size designed in confirming with relevant I.S. and shall not be less than 2.5Sq.mm. control cables shall be 650 V grade insulated copper cable not less than 1.5 sq. mm. however the cable for current transformer shall be 2.5 sq. mm or above. Cost of power and control cables in the panel shall deemed to be included in cost of panel.

The terminal blocks shall be one piece moulded and screwed type. At least one spare terminal block shall be provided in each panel. Control cable shall neatly run over P.V.C. cable trays and shall be terminated in compression type terminal blocks. Identification codes as approved by the engineers shall be used for cable terminations. Ferrules shall be used for multi core cables.

Current transformers

The current transformer's for metering shall be wound/bar type and shall be rated for 21 KA fault level.

Painting

The panel shall be painted as under primer coat – one coat of red oxide. Intermediate Coat – Enamel paint of shade approved Final coat – Enamel paint as above.

Labels and Danger marks

Scheme of labeling shall be as under

- a) Each compartment door shall have title label. The component/ control on each compartment shall have function label.
- b) Each internal component and fuse shall have identification label with fuse current capacity where applicable.

All external labels shall be clear painted black in English all internal labels with chrome plated nuts and bolts. Size of label shall be 50 mm x 25 mm with height of letter 5 mm.

Compartments not interlocked to an insulator shall have an external danger mark as under

“DANGER, LIVE TERMINAL” with flash mark and voltages in red letter on white background.

Capacitor

All the pump motors shall be provided with suitable capacitor banks for improving power factor to 0.95 lagging at normal duty conditions. However KVAR selected shall not exceed 90% of the magnetising KVAR of the motor even if corrected P.F. is less than 0.95 lagging but not less than 90% in any case. The capacitor shall be suitable for operation at rated voltage [415 volts +/- 10%] and shall be connected in respective power circuit of the motor with isolating switch tube units.

Capacitor bank shall be complete with structure, earth wire, discharge resisters etc. The capacitor shall be low loss mixed dielectric construction of polypropylene and craft paper insulated aluminum foiled

type impregnated with non PCB non toxic non hazardous non flammable synthetic di-electrol oil and fitted with internal element fuse conforming to IS 2834/1981 revised and shall be with ISI mark separate panel shall be fabricated for housing these capacitors.

Testing

The capacitor shall be tested for routine test as specified in IS 2834 and test reports shall be furnished.

Contractor shall arrange thermal stability test on the unit in the presence of the Engineer In charge.

Cables

Power cable used in 415 Volts system shall be 1.1KV grade 3 ½ core as applicable aluminum conductor P.V.C. insulated P.V.C. sheathed flat steel armored type confirming to IS 1534.

Cable shall be of sizes rated to carry full load current at 0.85 P.F. or to withstand short circuit current 20 KA for duration at least to opening of associated breaker whichever is greater but shall not be less than the size specified in subsequent clause.

Approved make for power cables/cables schedule – Tropodour /Finolex/Asian/ Gloster / Incab / universal / poly cab Nico

Cabling methods

Cables shall be laid in ground ducts and on trays in and out of pump house through R.C.C. trenches etc. with clearance not less than 600 mm below the water mains. Every cable shall be neatly run vertically, horizontally or parallels to adjacent wall, beam or column. At both ends of terminations the cable shall be approached from a common direction and are individually terminated in all orderly and symmetrical fashion.

The cables shall be terminated in mechanical glands that shall be suitable to provide adequate support by locking on the armour and additional earth continuity. Suitable compression type copper cable lugs shall be used for cable terminations.

The point of entry, exit of cables from the building shall be sealed from out side with an approved asbestos compound followed by 40 mm thick bituminous compound with sealing.

Cable route markers of approved design shall be installed at following positions

- a) Entry and exit points of underground duct/trench
- b) Exit from building

At every 5 meters distance of straight run

Any other position to trace the route.

A metallic plastic tag bearings cable reference number indicated in cable schedule at every 4 run to part there of and at both ends shall be provided for case of identification and route tracing. The schedule shall be prepared by the contractor and submitted for approval.

The cable routes shall be such that sharp bench and kinks shall be avoided. The radius at bends for PVC insulated cables shall not be less than twice/thrice the overall diameter of the cable. Laying and

termination of 1.1 Kv grade cable shall be as per manufacturers instruction as per practices specified code electrical manual. The cable under ground shall be laid as per respective IS and practice in force and as directed by the Engineer In charge.

Loop/extra lengths shall be provided in each cable run located suitably. The loop/extra lengths shall be adequate for two straight through joints as and when needed.

Earthing

Effective earthing shall be provided to all electrical equipments and components. This shall be carried out with G.I. pipe electrode. Buried 2500 mm below ground including excavation of pit in all types of strata with charcoal salt and necessary alum etc. Strip, funnel arrangement for watering and brick masonry chamber with C.I. frame and cover etc complete as per IS3043 and as per E.I. rules amended up to date.

The electric motors, L.T. panel starter, capacity etc shall be provided using double earthing with G.I. strip of size 25 mm x 3 mm with two independent earth pits. The pipe earth electrodes of 40 mm dia 2.5 m depth shall be used.

Earth pits shall be filled with charcoal salt and alum. They shall be provided with non hole frame and cover at top and water connection for watering the pit at intervals.

The earthing shall be carried out as per IS 3040 of 1966 and amended up to date and I.E. act 1948 amended up to date.

Ground bus or section 25 x 3 mm G.I. strip shall run through out the L.T. panel and shall be bolted to the framework.

All equipment shall be provided with two independent earthing connections and connected to earth strip.

Earth G.I. wire 6 S.W.G. shall run along with the cable from L.T. panel of pure water pumps to incoming of panel for ensuring safety and provide independent earthing to cable. This wire should be connected to armor or cable and cable end boxes at starting and end points.

Illumination to the pump house.

Necessary illumination shall be provided in and out at pump house as per specification given below.

External Illumination

i) This shall be as per direction of Engineer incharge.

Internal Illumination

Internal illumination in pump house and attendant room should be done as per direction of Engineer in charge.

Internal wiring shall be carried out with suitable size copper conductors P.V.C. insulated in appropriate size; M.S. conduit wooden block shall be provided wherever required. Separate wooden board tick

wood polished shall be provided mountains the switches etc. Four power plug points with separate switches shall be provided.

8. Test Trial and operation

The plant shall be on trial operation for six months after testing during which period all necessary adjustments shall be made while operating over the full load range enabling the plant to be made ready for performance and guarantee test.

The duration of trial operation of the complete equipment shall be at least three months, out of which at least 72 hours shall be of continuous operation with full load or any other duration as may be agreed to between the Engineer in charge and the Contractor. The trial operation shall be considered successful, provided that each item of the equipment can operate continuously at the specified characteristics for the period of trial operation. Minor interruptions not exceeding four hours at a time, caused during the continuous operation shall not affect the total duration of trial operation. However, if in longer, the trial operation shall be prolonged for the period of interruption.

A trial operation report comprising observations and recordings of various parameters to be measured in respect of the above trial operation shall be prepared by the contractor. This report, besides recording details of the various observations during trials run shall also include the dates of start and finish of the trial operations and shall be signed by the representatives of both the parties. The reports shall have sheets, recording all the details of interruptions occurred, adjustments made and any major repairs done during the trial operation. Based on the observations, necessary modifications/ repairs to the plant shall be carried out by the contractor to the full satisfaction of the Engineer In charge to enable the latter to accord permission to carry out performance and guarantee test on the plant. However, minor defects which do not endanger the safe operation of the equipment shall not be considered as reasons for withholding the aforesaid permission.

Commissioning and Operation

After commissioning and testing, there will be six months trial run and thereafter five years for operation and maintenance of the plant.

During trial run and O & M period, the contractor shall depute his personnel full time to operate, maintain and repair the equipment. The personnel so deputed shall maintain log books and other records as directed by the Engineer In charge. During this period the owner's personnel shall continuously work with Contractor's personnel to take full responsibility of operating, maintaining, repairing, etc. of the equipment plant.

Civil works:

Following civil works are required to be carried out for installation transformer pole structure, fencing gates etc.

The general specifications are given below. However the general arrangement and the layout or the substation shall be as per drawing approved by the statutory authority.

a) **Transformer platforms**- Suitable size of platform shall be provided for the transformer in 1:2:4 cement concrete as shown in the layout. The height of the transformer shall be such that the live terminal of the transformer shall be at a distance of 4m above the ground level of the transformer ground or as stipulated in I.E. rules amended up to date. The concrete work shall be carried out as per regular civil Engineering practice with excellent finished work. Necessary recess shall be provided to accommodate the outgoing cables --- for L.T. side of two transformers.

Two numbers of M.S. channels shall be embedded on the top of the each plinth for resting the wheels of the transformer.

b) **Foundations for poles**: These shall be provided to each pole which will be used to receive the power supply, mounting the A.B. switches, lightening arresters, D.O. fuses etc. The size of foundation shall 60 mm x 60 mm and 180 cm deep in 1:3:6 cement concrete & 45 cm x 45 cm plinth duly plastered with necessary curing etc. in a neat manner.

Cable Trenches

Necessary cable trenches shall be constructed from each transformer to the pump house.

The trench shall be at least .7m deep and of suitable width depending upon the no of cables to be used through and layer of .2m shall be provided at the bottom on trench and bricks shall be placed on both side of the cable.

Suitably designed markers shall be provided and fixed at every 3-4 meters showing the cable path. The earth in trench shall be filled with crown form at the top.

First aid kit shall be kept in the near by room immediate half to the injured person in case of accident.

9. RISING AND DISTRIBUTION MAINS

Centrifugally cast iron or ductile iron spun pipe shall be used for laying Rising and Distribution Mains as shown in drawing. Centrifugally cast iron spun pipe (LA-Class) conforming to IS 5382-1969 and ductile iron (class K-7/K-9) confirming IS 8329:2000 shall be used requisite number of CI Sluice valves and Scour valves will be provided on the mains. Necessary chambers for valves as per type design shall be constructed. Necessary CI Specials conforming to ISS:- 1538-1969 or DI specials conforming to IS 9523:2000; pig lead conforming to ISS:- 782-1978, yarn conforming to ISS:- 6587-1972 will be supplied and fixed by the contractor and making lead caulked joints or push on joints with rubber gasket as per IS Specification and direction. Thrust blocks will also be provided at places like bends and wherever directed. **The successful tenderer will have to get pipes, pumps, motor, transformers etc inspected by DGSD/SGS/RITS/BIS before dispatch to site at their own cost and will submit inspection**

report to consignee accordingly. The materials will be accepted by the consignee after proper verification at the consignee end

The pipes shall be tyton jointed. Rubber gaskets conforming to IS 5382-1969 shall be used for tyton joints.

Laying of CI/DI pipes shall be as per IS 12288:1987. The width of trench at top and bottom, between faces of sheeting shall be such as to provide minimum 30 cms clearance on either side of the pipe for pipe diameters less than 600 mm and 45 cms for pipe diameters 600 mm and above.

Before laying of pipe the bottom of trench shall be trimmed off to present a plain surface and all irregularities shall be leveled. Where large stone or boulders or rock is met in excavation, murum or sand bedding of 10 cms thick shall be provided below pipe. All care should be taken to protect the pipe and the coating.

10. HYDRAULIC TESTING OF LINE

The test of the pipeline in the field shall be carried out after the stretch of suitable length is laid. Testing shall be carried out in the following manner.

The pipeline shall be subjected to hydraulic test in full length or in part as may be found necessary. The pipes shall be subjected to a test pressure of 1.5 times the actual working pressure expected in the pipeline as per hydraulic design in the strip under observation.

There should be drop not more than 0.5kg/cm^2 within a period of two hours after the pressure has been built up by the use of suitable pumps. In case of leak anywhere in the field joints, the same shall be repaired entirely at the cost of the contractor, which shall include cost of excavation repairs etc. The rate of pipe is inclusive of this cost.

The contractor shall provide skilled and unskilled labour free of cost for Departmental check of the work.

SPECIAL NOTE:

- I. No pipe shall be laid when; in the opinion of the Engineer-In-Charge trench conditions are unsuitable.
- II. Pipes shall be laid in reasonably dry trenches and under no circumstances on slushy murum bedding.
- III. The contractor shall use the pipes after checking and testing and he shall be held responsible for replacement of such pipes if already inadvertently fixed or joined.
- IV. Before the pipes are lowered and laid in position the contractor shall see that the invert at the support is correct and pipe is brought to uniform grade and level. This should be checked with the help of dumpy level and should be got approved in advance from the Engineer-in-Charge.
- V. Temporary benchmarks shall be provided by the contractor at a minimum distance of every 100m without any claim for extra cost. The benchmarks shall be either of stone masonry or mass concrete.

- VI. The pipes shall be laid confirming to the profile, line, level, curvature, straightness etc. as per the drawings. No variation, unless previously approved by engineer in charge, will be allowed.
- VII. The contractor shall bear the cost for wastage, breakage in pipes and specials. The length of pipe and specials will be paid as per exact length in laid condition, for both fabrication and laying job.
- VIII. All temporary supports made to the pipeline during laying and jointing shall be removed before pipeline is filled with water for hydraulic testing.
- IX. Flanged caps or plugs, casting of thrust block, the hydraulic test pump with the required piping etc. shall be arranged for testing purpose by the contractor at his own cost.
- X. The hydraulic test shall be made in the presence of Engineer-in-Charge.
- XI. When any section of a main is provided with concrete thrust blocks or anchorages, the pressure test shall not be made within 28 days of casting of the R.C.C. block.

10. Excavation in average soil, soft and hard murum, concrete boulders etc.

- a) General: The trench shall be so dug that the pipe may be laid to the required alignment, at the required grade and depth
- b) As per direction of the Engineer in charge. The depth of the trench should be sufficient to have a minimum cover of 100 cms. In cases where this is not feasible a decision in this regard shall be taken as directed by Engineer in charge. The trench shall be excavated only so far in advance of pipe laying as per the orders of the Engineer in charge. The trench shall be so braced and drained that the workmen may work there in safely and there shall be no danger to the nearby structures. If any stems and roots of trees are encountered in the excavation of trenches these will have to be cut and destroyed under the supervision and direction of Engineer in charge. If water lines, drainage lines, Electric or Telephone cables are encountered in the excavation of trenches, the work of excavation or laying of line etc. will have to be carried out without damaging the lines and cables and under the supervision of the concerned staff. Appropriate clearances shall be kept from the existing utilities as directed by Engineer in charge. Extra claim for dewatering will not be entertained.
- b) Barricades, guards and safety provisions: To protect from injury and to avoid damage to property, adequate barricades, construction signs, torches, red lanterns and guards as required shall be placed and maintained during the progress of the work and until it is safe for traffic to use the road ways. All material, pipe equipment and pipes which may serve as obstructions to traffic shall be enclosed by fences or barricades and shall be protected by proper lights when visibility is poor.
- c) Maintenance of traffic and closing streets: The work shall be carried in such a manner which will cause the least interruption to traffic, and the road street may be closed in such a manner that it causes the least interruption to the traffic. Where it is necessary for traffic to cross open trenches, suitable bridges shall be provided. Suitable signs indicating that the work is under progress or a street is closed etc. shall be placed and necessary detour signs for the proper maintenance of traffic shall be provided.

d) **Structure Protection:** Temporary support, adequate protection and maintenance of all underground and surface structure drains, sewers cables and other obstructions encountered in the progress of the work shall be furnished under the direction of Engineer in charge.

Refilling of Trenches.

a) **General:** The refilling of trenches shall be carried out immediately after the hydraulic test is over. Refilling shall be done for 25 cms above the ground level and then it shall be thoroughly wetted and properly compacted with a mechanical earth rammer so that mud etc. shall not be formed.

i) **Clearing up the site:** All surplus material and all tools and temporary structures shall be removed from the site as directed by Engineer in charge. All dirt, rubbish and excess earth from the excavation shall be hauled to a dump and the work site left clean to the satisfaction of the Engineer in charge. The item includes bailing out water manually or by dewatering pump sets. The pumped water shall be carefully disposed off in nearby nalla etc. without causing any damage or inconvenience to neighboring existing structures and property holders.

1. Excavation in soft rock, dewatering, refilling etc. as above.

2. Excavation in hard rock by chiseling, refilling etc. as above. Specifications are the same as above except that the excavation will have to be carried out in hard rock. The excavation in hard rock is to be carried out by chiseling or any other method (This includes excavation done by poclain, Splitter or any other mechanical means) to the required width and depth. Other specifications are the same as above. Blasting will not be allowed in the work. Extra claim for dewatering will not be entertained.

11. High yield Tube well

(A) The bore shall be drilled up to a depth, which provides atleast 30m of water bearing formation.

(B) The site of the Tube well will be generally approachable by the tractor from pucca road or katcha road or both in continuation. If any other then the above exists, then it has to be prepared by the contractor.

(C) The sample of strata of every 3m or part as required will be preserved in sample box at site. The box with the sample will be handed over to the authorized representative of the department after the completion of Tube well.

(D) A chart in triplicate giving full details of the strata concerned, the rate of progress of drilling should be submitted to the department after the test of the Tube well is completed to the satisfaction of Engineer in charge.

(E) All equipments and plants, consumable materials required under the contract shall be supplied by the contractor at his own cost.

(F) The housing pipe shall be vertical such that at no stage the pipe is out of plumb line.

(G) The pea gravel used for packing shall be 6 mm to 12 mm size and free from dust etc. and shall be screened and washed before use.

(H) The pipe shall be supplied confirming to ISS 6589 / 1976 and ISS 3580 / 1976 for housing pipe, blank pipe and slotted pipe.

(I) The lowering of pipe should be done only after approval of strata by Engineer in charge.

12. CHLORINATOR

Supplying Electronics type Chemical dosing system (Inject cum Booster model) of suitable pressure, dosing discharge capacity & dosing tank capacity of high class H.D.P.E for dosing of sodium hypochloride solution in water supply main for chlorination purpose including installation of electronic type chemical dosing pump including preparation of base line with necessary suitable pipe and fitting etc. for commissioning of system electrically and the tenderer will have to make arrangement for supplying fitting fixing of fully automatic control panel Board with programmable system electronic indicator with hotter transistorized voltage regulator for constant supply of voltage and making arrangement of electric supply including supplying fitting and fixing of necessary cables and M.C.B. and all allied civil work etc. and as per direction of Engineer in charge.

13. ELEVATED SERVICE RESERVOIRS

The structural design shall conform to the following standards specifications and codes of practice of I.S.I.

IS: 456 Code of practice for plain and reinforced concrete (latest edition)

IS: 875 Code of practice for structural safety of building, loading standards (latest edition)

IS: 3370 Part I to IV code of practice for concrete structures for storage of liquids (latest edition)

IS: 1893 Criteria for Earth quake resistant Design of structures (latest edition)

General

Capacity of the container of the tank shall be the volume of the water it can store between the designed full supply level and the lowest supply level. Free Board is the indication of space provided above full supply level and shall be measured at a vertical distance above F.S.L. up to soffit of beam supporting the roof slabs/Dome. The walls of container shall be designed for free board full condition. The tank foundation and other members of the structure shall also be designed for free board full condition. Parts of the tank in contact with stored water and enclosing water vapor above F.S.L. shall be in concrete M-20 or even in richer grade. The tenderer is advised to verify actual strata and safe bearing capacity before tendering and designing the structure and offer suitable design with full justification. Not with standing anything mentioned above if directed by the Engineer-in-charge the contractor shall carry out actual strata exploration as mentioned in para 0.2 of IS 1892-1979 through a Govt./ Govt. recognized laboratory and adopt bearing capacity so arrived for the design. The factor of safety shall be adopted as per clause 6.1 (a) of IS-6403-1971. If the foundation consists of individual column footing, minimum clear distance between centers of columns shall be equal to twice the width of footing and clear distance between edges of footing shall be not less than width of footing. The foundation should be checked for negative pressure on soil due to combined direct and bending stresses. Negative pressure shall not be allowed on the foundation soil. Classification of soil and characteristics of soil relevant to

S.B.C and A.B.P. shall be as per the soil investigation reports of Government institution/Government approved investigations. For the design of foundations of the solid raft type, the 'Plate Theory' shall be adopted. In normal circumstances minimum 100 mm thick plain cement concrete with 100 mm projection around in grade M 20 with coarse aggregate as metal shall be provided as leveling course. Where injurious soils or aggressive water are anticipated the leveling course shall be of grade not weaker than M 20 and if necessary Sulphate resisting or other special cement shall be used and the thickness of the leveling course shall be kept not less than 150 mm. The ground level within the foundation area of the structure shall be consolidated properly with a suitable slope to drain out rainwater outside the foundation Zone. In the vicinity of mines, collieries and blasting sites or areas which may be subjected to blast or shock, the tanks shall be designed for dynamic forces adopted to shock. Column may be assumed as fixed at the top of footing. The minimum thickness of any components of the tank container in the contact of water will be 150 mm.

LOADS

For all RCC and PCC components unit weight of concrete shall be taken as 25000 N/Cum and 24000 N/Cum respectively. Water load and snow load shall be taken as per IS 875-1964 or its latest revision. Live load on gallery all round the Elevated tank shall be considered as 5000 N/Sqm. Seismic forces shall be as per IS 1893-1975 or its latest revision.

DESIGN

Shape of the structure shall be the most economical as directed by Engineer-in-Charge and shall be selected depending upon site conditions. Design shall be based on the worst possible combination of various loads, moments, shears, and resultant stresses in the tank for the following cases.

- i) Tank Full
- ii) Tank Empty with Earth pressure if any from outside
- iii) Uplift pressure if any

Tank full means depth of water inside the container up to full height of the container including free board. Design shall be based on accepted bases and methods of design as well as the provision of IS 3370, IS 456, IS 1343 code of practice for pre-stressed concrete IS 2210. However, methods based on experimental investigation as mentioned in para 18.2 'C' in IS 456 shall not be entertained. Design of members other than those excluded by (i.e. roof, walls, floor etc. of the container) shall be based on consideration of adequate resistance to cracking as well as adequate strength. Calculation of stresses shall be as per para 3.3.2 of IS 3370 (Part II) 1965 or its latest revision.

PERMISSIBLE STRESS IN CONCRETE FOR RESISTING TO CRAKING

For calculations relating to the resistance of members to cracking the permissible stresses in tension (direct and due to bending) and shear shall conform to the values specified in Table I of IS 3370 (Part II_1965). “The permissible tensile stresses due to bending apply to the face of the member in contact with the liquid.” In members less than 225 mm thick and in contact with the liquid on one side, this permissible stress in bending apply also to the face remote from liquid.

For Strength Calculation

For strength calculation the permissible concrete stress shall be in accordance with Para-44 of IS 456-2000 where the calculated shear stress in concrete alone exceeds the permissible value reinforcement acting in conjunction with diagonal compression in the compression in the concrete shall be provided to take the whole of the shear. The maximum reinforcement shall conform to clause.

- a) 25.5.1.1.
- b) 25.5.1.2 of 456.

PERMISSIBLE STRESSES IN STEEL

For strength calculation (concrete assumed to be cracked) the permissible stresses in reinforcement shall be as per Table 2 of IS 3370 (Part II) 1965 or its latest revision. For TOR steel, the stress shall be as per IS 1986-1979 cold worked steel high strength deformed bars for concrete reinforcement or its latest revision.

The modular ratio ‘m’ for different concrete mix shall be as under:

Grade of concrete Modular ratio ‘m’

M :20	13
M : 25	11

Modulus of elasticity of concrete (E_c) shall be taken as $5700 \sqrt{E_{ck}}$ where E_c is characteristic cube strength of concrete in N/Sq.mm. as per clause 5.2.3.1 of IS 456:2000

AGE FACTOR

Age factor for increasing strength shall not be considered for the design.

UNITS

Design should be in Metric units only.

DETAILING

Minimum Reinforcement for Water Retaining Members. The minimum reinforcement in walls, floors, roofs in each of two directions at right angles shall have an area of 0.3% of the concrete section in that direction for sections up to 100 mm thick. For sections of thickness greater than 100 mm and less than 450 mm the minimum reinforcement in each of the two directions shall be linearly reduced from 0.3% for 100 mm thick section to 0.2% for 450 mm thick section. For sections of thickness greater than 450

mm minimum reinforcement in each of directions shall be kept at 0.2%. In concrete sections of thickness 225 mm or more two layers of reinforcing steel shall be placed one over each face of the section to make up the minimum reinforcement specified in this clause. The minimum reinforcement specified above may be decreased by 20% in case of high yield strength deformed bars conforming to IS 1786-1966 or IS 1139-1966.

Covers to Reinforcement

Minimum clear cover to reinforcement shall be 40 mm for durability of the structure. For members of structure in contact with water effective cover shall not be more than 60 mm, for bars subjected to bending stresses. For bars subjected to pure tension the effective cover shall not be more than 75 mm.

Spacing of Reinforcement

Spacing of reinforcement shall be as per Para 25.3 of IS 456 Spacing of lateral ties for column shall satisfy the provision of Para 25.5.3.2 'C' of IS 456-2000. Reinforcing steel which accounts for resisting moments, tension etc. i.e. other than temperature and shrinkage steel, shall comprise of minimum 8 mm dia for ribbed bars and 10 mm dia for mild steel bars. For compressive member the minimum dia of main reinforcement shall not be less than 12-mm dia.

NOTE

In case of dispute regarding interpretation of any of the above clause the decision of the owner or his representative will be final and binding on the designer and contractor. In case of any clause not included in the above criteria, the decision of the owner or his authorized representative will be final and binding on the designer and contractor.

GENERAL

Soil testing reports of the recognized institute must be submitted by the tenderer before start of the work at his own cost. The design must be on the basis of soil testing report. The design shall be in accordance with various relevant I.S. specifications (I.S. 456-2000, I.S. 875-1987, I.S. 3370-1965, I.S.432 part-1, I.S. 1786, I.S. 1139)

The design shall satisfy the stipulations as per I.S. 1893-1984 and I.S. 13920-1995 for seismic forces and I.S. 11682-1985 for RCC staging of overhead water tank.

Plain round M.S. bar grade-I conforming to I.S. 432 part –1 or high yield strength deformed bars I.S. 1786 of 1139 shall be used. Grade II M.S. bars shall not be used.

Entire structure shall be as per latest IS specifications.

19 cm thick cement plaster (1:3) with 5% water proofing compound of approved quality shall be provided over the bottom floor and inside surface of tank wall. 12 mm thick cement plaster (1:4) shall be provided over the exposed surface of columns, beams, bracings, bottom dome and tank wall outside surface etc. 12 mm thick cement plaster (1:6) shall be provided for the inside and outside surface of rooms.

Three coats of exterior painting over a coat of cement primer shall be provided in the water tower. Irrespective of the foundation proposed in the design, one set of bracing be provided at the ground level.

The scope of pipe assembly work shall be up to 5 meter beyond the out side face of the wall including the cost of pipes, valves and specials including laying and jointing.

The job includes designing the structure for uplift pressure and dewatering if required during entire execution and disposal of surplus excavated stuff within a lead of 50 meter as directed by the Engineer in charge.

C.I. D/F pipe be as per relevant I.S. standard shall be used for rising, delivery, overflow and washout main of the water tower.

R.C.C roof shall be constructed at the level of first and second bracing under which rooms shall be constructed by 250 mm thick brick masonry walls for key man and operational staff or office accommodation with Toilet including W.C. Septic tank Soak pit and necessary electrification. Sufficient number of doors and windows shall be provided in the rooms.

Provision shall be made for spiral RCC stairs from outside of staging with 25 mm G.I. pipe railing on both sides for going in the tank.

Spacing between two braces should not be more than 3m C/C.

Provision shall be made for cylindrical ventilator fitted with mosquito proof net and two manholes with M.S. frame and cover with locking arrangements of adequate size both in the roof slab as well as top dome.

Provision shall be made for lightening conductor as per I.E. rules

Provision shall be made for M.S. water level indicator with 450 mm diameter copper ball etc.

Part rate shall be payable for reinforcement concrete and plastering item of all types of water retaining structure till satisfactory hydraulic testing for water tightness test is given and till that work shall be treated as incomplete.

The Design and Drawing of the water Tower shall be vetted by NIT, Patna or any other NIT/IIT, for which no payment will be done by BRJP. The bidder has to bear the cost.

VALVES

A) Sluice Valve

The valves shall be as per IS and of standard required size

The manufacturers test certificate for the material shall be provided at the time of the testing. Required supports to the valves in C.C. shall be provided.

The dimensional drawing shall be submitted by the contractor prior to manufacture showing all the construction details etc. of valve for approval. The valves shall be painted after testing as directed by the Engineer in charge.

Kinetic Air Valve

These shall be as per IS and of standard required size. The air valve shall be designed to operate satisfactorily at normal working pressure of 10 kgf/cm². Kinetic air valve body shall be tested for 10 kg/cm². Air valve shall be provided with isolating sluice valve, which shall generally comply IS applicable to sluice valve.

C) VALVE CHAMBERS

The valve chambers should be constructed for protection of valves from traffic load to avoid damage by people. The valves should be constructed as per the type design drawings. The construction of the chamber should be in R.C.C and should be able to withstand the superimposed load due to vehicular traffic. The top of the chamber should be covered by RCC pre cast slabs. All the civil work should be as per the general specification mentioned earlier and as per applicable I.S. standards.

SUMMARY OF IPS						
TYPE	CAPACITY	UNIT	RANGE (Cum)	INTERNAL DIMENSION	COST (LAKH)	PER CUM COST (LAKH)
I	150	Cum	150-200	8.0X 8.0 X 2.5	38.68	0.25
II	250	Cum	210-260	11.0X 8.0 X 3.0	47.996	0.20
III	600	Cum	600-650	25.0X 8.0 X 3.0	92.47	0.16

ESTIMATE OF CWR (20 m x 7.5 m x 4.50 m Liquid depth and free board 0.50 m;2 nos. compartment) CUM PUMP HOUSE(10 m x 6.0 m)

Sl. No.	Ref.	Description of Item	No.	L (m)	B (m)	H(m)	Quantity	Unit
1	S.O.R of Bihar/SL-2.29	Surface dressing of the ground including removing vegetation and inequalities not exceeding 15 cm deep and disposal of rubbish, lead upto 50 m and lift upto 1.5 m						
	2.29.1	All kinds of soil	1	52	16		832	m ²
2	S.O.R of Bihar/SL-2.32	Clearing jungle including uprooting of rank vegetation ,grass, brush wood, trees and saplings of girth upto 30 cm measured at a height of 1 m above ground level and removal of rubbish upto a distance of 50 m outside the periphery of the area cleared.						
							832	
3	S.O.R of Bihar/SL-2.8	Earth Work in ordinary soil within 50met. Initial lead and 1.5met. Initial lift including rough dressing and levelling the bed including all labour T&P etc. complete as directed by the Engineer - in Charge.						
		Clear water Reservoir	1	42	8.5	2.5	892.5	m ³
		Pump House	1	10.40	6.40	2.5	166.40	m ³

2	S.O.R of Bihar/SL- 2.26 P- 75	Filling by available excavated earth (excuding rock) in trenches, plinth, sides of foundations etc. in layers not exceeding 20cm in depth, consolidating each deposited layer by ramming and watering, lead up to 50 m and lift upto 1.5 m.		0.50	1058.90	529.45	m³	
3	S.O.R of Bihar/SL- 4.1.4P- 79	Cement concrete grade M- 15 (Nominal mix) with 40 mm maximum size of stone aggregate.	1	42.00	8.50	0.1	35.70	m³
			1	10.40	6.40	0.1	6.66	m³
		Total =					42.36	
4	S.O.R of Bihar/SL- 5.33 P- 88	Providing and laying in position machine batched and machine mixed design mix M-25 grade cement concrete for reinforced cement concrete work, using cementcontent as per approved design mix, including pumping of concrete to site of laying but excluding the cost of centering, shuttering, finishing and including retard setting of concrete, improve workability without impairing strength and admixtures in recommended proportions as per IS: 9103 to accelerate,reinforcement,durability as per direction of Engineer-incharge. Note:- Cement content considered in this item is @ 330 kg/ cum. Excess or less cement used as per design mix is payable or recoverable separately. All works up to plinth level						
	(a)	Base Slab						
		Clear water Reservoir	1	42	8.5	0.5	178.50	m³
		Pump House pump foundation	1	10.40	6.40	0.5	33.28	m³
		Type-I	4	0.9	1	0.6	2.16	m³
		Type-II	4	0.9	1	0.6	2.16	m³
		Type-III	4	0.75	1	0.6	1.80	m³
		Type-IV	3	0.5	1	0.6	0.90	m³
	(b)	Wall						
		cwr long wall	1	40.00	0.315	4.5	56.70	m³
		cwr short wall	3	7.50	0.315	4.5	31.89	m³
		PH long wall	2	10.00	0.315	4.5	28.35	m³
		PH short wall	3	6.00	0.315	4.5	25.52	m³
	(C)	Peripheral Column (Length considering 0.5 of the total height of the wall)	35	0.4	0.4	1	5.60	m³
		Inside Column	4	0.4	0.4	4.5	2.88	m³
		Inside Column footing	4	1	1	0.2	0.80	m³
							370.54	
	(d)	Beam at cwr roof & ph floor						
		cwr Short	6	7.50	0.35	0.5	7.88	m³
		cwr long	3	40.00	0.35	0.5	21.00	m³
		PH long	1	10.00	0.35	0.5	1.75	m³
		ph Short	11	6.00	0.35	0.5	11.55	m³
						Total	42.18	
	(e)	Slab						

		CWR	1	7.5	40.0	0.15	45.00	m³
		PH	1	10.0	6.0	0.15	9.00	m³
		pit	1	1.7	2.4	0.1	0.41	m³
		Deductin for cut out slab	1	27.7	2.3	0.15	9.56	m³
							44.85	
	(f)	column of ph floor to roof	10	0.4	0.4	2.8	4.48	m³
	(g)	Top beam of Pump House						
		PH long	3	10.00	0.35	0.5	5.250	m³
		ph Short	5	6	0.35	0.5	5.250	m³
	h)	Top slab of Pump House	1	10.00	6	0.1	6.00	m³
	i)	Lintel	1	16.00	0.25	0.15	0.60	m³
	j)	Chajja	10	1.5	0.45	0.85	5.74	m³
		Platform Landing Slab	2	1.50	1.50	0.13	0.56	m³
		Stair Slab	2	3.00	1.50	0.13	1.13	m³
		Stairs	20	0.028			0.56	m³
		Total =					29.57	m³
5	S.O.R of Bihar/SL- 5.34 P- 88	R.C.C. work of M-30 grade with 20mm and down grade black hard granite (crusher broken) stone chips including hoisting and laying						
							370.54	m³
5	S.O.R of Bihar/SL- 5.22.7C P- 86	(A) Supplying,fitting and placing uncoated HYSD bar reinforcement complete as per drawing and technical specification. (Qty of steel = 120 kg/m³)					58456	Kg
							585	qtl
6	S.O.R of Bihar/SL- 6.1.14A+6 .3A P- 93	Brick work with bricks of class designation 100A in foundation sand plinth in :						
		Extra for Brick work in superstructure above plinth level upto floor V cum						
			1	32	0.23	2.8	20.61	m³
		Deduction for shutter & windows	10	1.2	1.5	0.23	4.14	m³
			1	3.0	2.5	0.23	1.73	m³
		Total =					14.74	m³
7	S.O.R of Bihar/SL- 5.9 P- 84	Centering and shuttering inculding shuttering, proppingetc. and removal of from for:						
(a)		R.C.C. foundation and plinth band, footings, bases of columns, mass concrete, precast slabs etc	1	33.6		0.5	16.80	m²

(b)		R.C.C. walls and fins including attached pilastes.	2	40.00		4	320.00	m ²
		cwr long wall	2	40.00		4.50	360.00	
		cwr short wall	6	7.50		4.50	202.50	
		PH long wall	4	10.00		4.50	180.00	
		PH short wall	6	6.00		4.50	162.00	
		Total =					1224.50	m ²
(c)		R.C.C. Floor roof slabs, landings, balconies, projecting sun-shades and chajjas upto 4.3m.height						
		CWR	1	7.500	40.000		300.00	m ²
		PH	1	10.000	6.000		60.00	m ²
		Pit	1	1.700	2.400		4.08	m ²
		Top slab of Pump House						
			1	10.00	6		60.00	m ²
		Deductin for cut out flab	1	27.7	2.3		63.71	m ²
		Total =					300.37	m ²
(d)		R.C.C. column, grider and bressmer, etc.	16	0.4		4.5	28.80	m ²
			40	0.4		2.8	44.80	m ²
		Total =					73.60	m ²
		Beam at cwr roof & ph floor						
		cwr Short	12	7.50	0.2		18.00	m ²
		cwr long	6	40.00	0.2		48.00	m ²
		PH long	2	10.00	0.35		7.00	m ²
		ph Short	22	6.00	0.35		46.20	m ²
		Top beam of Pump House						
		PH long	6	10.00	0.2		12.00	m ²
		ph Short	10	6	0.2		12.00	m ²
		Total =					143.20	m ²
		R.C.C. Lintels						
(f)		Lintel	2	16.00		0.15	4.80	m ²
(g)		Chajja	10	1.7	0.45		7.65	m ²
			2	1.7		0.15	0.51	m ²
		Total =					8.16	m ²
8	S.L.- 13.11.4/ P 167	12 mm cement plaster mix :1:3 (1 cement : 3 coarse sand) in wall						
(a)		Wall 1:5 (1 cement : 5 Sand)						m ²
			2	32		2.8	179.20	m ³
		Deduction for shutter & windows	10	1.2	1.5		18.00	m ³
			1	3.0	2.5		7.50	m ³
		Total =					189.70	

(b)	S.L.- 13.11.4/ P 167	Slab 1:6 (1 cement : 6 Sand)	1	7.500	40.000		300.00	m ²
			1	10.000	6.000		60.00	
			1	1.700	0.1		0.17	m ²
		Top slab of Pump House						
			1	95	0.1		9.50	m ²
		Deductin for cut out flab	1	27.7	2.3		63.71	m ²
		Total =					305.96	m ²
(c)		Column	140	0.4		1	56.00	m ²
			16	0.4		4	25.60	m ²
		Total =					81.60	m ²
(d)		Beam						m ²
		Beam at cwr roof & ph floor						m ²
		cwr Short	24	7.50		0.2	36.00	
		cwr long	12	40.00		0.2	96.00	
		PH long	4	10.00		0.35	14.00	
		ph Short	44	6		0.35	92.40	
		Top beam of Pump House						
		PH long	12	10.00		0.2	24.00	
		ph Short	20	6		0.2	24.00	
		Total =					286.40	m ²
(e)								
(f)		Chajja	10	1.5	0.45		6.75	m ²
			2	1.7		0.15	0.51	m ²
		Total =					7.26	m ²
(g)		Brick Work	2	32		2.8	179.20	m ²
		Deduction for shutter & windows	20	1.2	1.5		36.00	m ²
			2	3.0	2.5		15.00	m ²
		Total =					128.20	m ²
10	22.4 / P-213	Providing and placing in position suitable PVC water stops conforming to IS:12200 for construction /expansion joints between two RCC members and fixed to the reinforcement with binding wier before pouring of concrete (with five years service guarantee)						
		Serrated with central bulb (225 mm wide, 8-11 mm	3	33.6			100.8	RM

		thick)						
		Kickers (320 mm wide, 5mm thick)	1	33.6			33.6	RM
11		Providing , fitting & of 0.56 mtr dia CI manhole cover at dome	2				2	each
12		Providing,fitting & fixing of Stainless Steel fabricated Hand rails made of 50 mm dia , 32 mm dia & 15 mm dia stainless steel tubes to the RCC stairs (both sides) , walk way at dome & landing of stairs including all cost of materials , labour, T&P , carriage , taxes of materials etc all complete	1				100	RM
13	Market rate	Air vent 80 mm CI dia goose neck with mosquito proof netting	8				16	Each
14	13.78.1/ P-171	Finishing wall with water proofing cement paint two coats with any approved shade on old work to give on even shade excluding cost of paint.	1	33.6		4.5	151.2	m²
15	18.6/P-196 MP UDD 2012	Providing and laying water proofing treatment on roofs or slabs by applying cement slurry tuckered in groove in paarpeta all round)	1	100.5	4.50		452.25	m²

SECTION 7

BILL OF QUANTITY

(Rates to be quoted in Financial Bid Sheet attached separately)

BILL OF QUANTITIES

Preamble

1. The Bill of Quantities shall be read in conjunction with the Instructions to Bidders, Conditions of Contract, Technical Specifications 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 the actual quantities of work ordered and carried out, as measured by the Contractor and verified by the Engineer and valued at the rates and prices tendered in the priced Bill of Quantities, where applicable, and otherwise at such rates and prices as the Engineer may fix within the terms of the Contract.
3. The rates and prices tendered in the priced Bill of Quantities shall, except in so far as it is otherwise provided under the Contract, include all constructional plant, labour supervision, materials, erection, maintenance, insurance, Profit, taxes and duties, together with all general risks, liabilities and obligation set out or implied in the Contract.
4. The rates and prices shall be quoted entirely in Indian Currency.
5. The whole cost of complying with the provisions of the Contract shall be include in the items provided in the priced Bill of Quantities, and where no Items are provided the cost shall be deemed to be distributed among the rates and prices entered for the related items of work.
6. General directions and descriptions of work and materials are not necessarily repeated or summarized in the Bill of Quantities. References to the relevant section of the contract documentation shall be made before entering rates or prices against each item in the Bill of Quantities.
7. The method of measurement of completed work for payment shall be in accordance with the specification issued by the department time to time.
8. Errors will be corrected by the Employer for any arithmetic errors pursuant to Clause 29 of the Instructions to Bidders.

BIHAR URBAN INFRASTRUCTURE DEVELOPMENT

BIHAR, PATNA

BILL OF QUANTITY FOR

Construction of drinking water supply scheme for AURANGABAD Nagar Parishad

FINANCIAL BID

A. PREAMBLE TO SCHEDULE OF PRICES

Price Schedule for Work

1. The Contract is of lump sum nature on single responsibility basis for conceptualization, design, providing/manufacturing, construction, and commissioning, testing, trial run for six months after completion of scheme and operation and maintenance for five years after trial run.
2. Tenderer has to quote one lump sum price for the entire work as per the detailed scope of work and specifications including trial run for **six months** and there after fixed 2% each year for O & M **for five years** in the bid sheet. The major items envisaged in the contract are given in the scope of work and are also stipulated in the break up of schedule of price. However this lump sum rate quoted shall be adjusted for the variation in the length of pipe line.
3. The tenderer is advised to examine all instructions, forms, terms, specifications and other information in the tender documents and consider and evaluate fully the price implications therein contained before filling the Lump sum contract amount.
4. The bidder should acquaint himself with the site condition including the access to work site. The successful bidder shall have to make suitable access to work sites at his own cost.
5. The bidders is to quote one lump sum price for the entire work including trial run for six months and there after fixed 2% each year for O & M for five years in the Bid sheet. **The bidder shall fill up price breakup under major components; this will automatically works out total lump sum price for entire work. This break-up of lump sum price is only to facilitate intermediate payments.** There may remain, however, several minor items for not specifically mentioned in the break-up but shall be required to complete the job.
6. Items not specifically listed in this PRICED BREAKUP SCHEDULES but required to be executed for satisfactory working and commissioning of the system as specified, will not be separately paid

for by the Department when executed and shall be deemed to be covered by other items and rates listed in the price sheets and Lump sum prices quoted.

7. Each item is to be individually priced and no column in the Schedule of prices shall be left blank. The items shall not be priced if it is “not applicable” to the bidder’s design, in which case the bidder shall left cell blank. The wording in the item description is for subject matter guidance only. The prices shall allow for all the works covered under the bid all liabilities and contractual obligations whether separately specified or not.
8. The bidder shall be deemed to have allowed his price, provision for design, field investigation, site clearance, maintenance and final removal of all temporary works of whatsoever nature required for construction including pumping, dewatering, availability of material of required quantity etc. for the proper execution of works. The rates shall also be deemed to include all works and settings that may be required to be carried out for laying out of all the works involved.
9. In consideration of the fact that the pipes length of mentioned in the tender are based on surveys and the actual length in work may vary. It is intended that the variation in lengths observed during execution shall be suitably adjusted at the end of contract. For this purpose, the rates payable / deductible for increased / decreased lengths will be compared to those given in schedule and scope of work, shall be same as quoted for the respective pipe in schedule.
10. It will be entirely at the discretion of the BRJP to accept or reject the bidder’s proposals without giving any reasons whatsoever.
11. Tenderers should ensure that lump sum total price quoted should be same as reflected in sum total of price breakups. The rate will be decided on one lump sum price for entire work including trial sum for six months and there after O&M for five years in the Bid form. The price breakup under major component as given in bill of quantity will be decided by Chief Engineer with consent of Bidder.

NAME OF WORK -Design and Construction of drinking water supply scheme includes creation of master plan for water supply in town, creation of water sources, construction of pump house with attendant room, compound wall and approach road, supply and installation of mechanical and electrical instruments, provision of rising mains, distribution network, elevated service reservoirs, Master reservoir, Sump, installation of chlorinator, providing house service connection, chlorinator room, scada etc. for Phase 2 of Aurangabad Nagar Parishad under AMRUT & State Plan Scheme with six months of Trial run and thereafter operation and maintenance of system for next five years.						
Date of NIT :-			25/02/19			
Estimated Cost:-			13000.857lakh			
Earnest Money :-			140.009 lakh			
Time of Completion :-			36 MONTHS			
Cost of BOQ :-			Rs. 10000.00 in shape of DD as per NIT Rs. 17700.00 (Bid Processing fee for BSEDC) through Online Mode			
NAME OF THE FIRM :-						
ADDRESS OF THE FIRM :-						
SCHEDULE 'A'						
AMRUT - PART - A						
S. No.	Items of Work	Quantity	Unit	Rate quoted by Bidder		Amount
				R a t e	R a t e	
				(i n F i g u	(I n W o r d	

					r e s)	s)	
Works related with Civil , Mechanical and Electrical Portion							
1	Design, planning and preparation of master plan for augmentation of water supply scheme in town including surveying with total station instruments, establish the control point with DGPS in project area, transfer of control points at strategic locations such as tubewell, pumping plant, OHT etc, preparation of design report of distribution network with latest design softwares. submission of all survey data, and design report including all necessary maps in hardcopy as well as in softcopy in triplicate as per direction of E/I	1.0	job	Each			Rs.0.00
-	<u>Total of Item 1</u>	<u>1.0</u>	<u>job</u>	<u>Each</u>	<u>Rs</u>	<u>.0.</u>	<u>Rs.0.00</u>
2	Providing architectural detail plan, elevation, sectional elevation, structural design calculation, details drawing of reinforcement binding with dimension of each concrete work, schedule of bar bending, details of construction joints all necessary technical requirement arise during execution of work and construction of RCC elevated circular water Intze-tank or suitable type at 21 m staging which are supported by frame work consisting of rectangular column and rectangular braces with required rising delivery over flow and wash out pipes valves chambers with one attendant room with toilet etc all complete as per direction of E/I.						
	The design calculation and drawing must be signed by a qualified Engineer. The design of water tower is to be done by considering all types of possible vertical & horizontal loads as per provisions of IS: 875 (Part 1, Part 2 and Part 3) : 1987 and other relevant codes. The design must be considering with earth- quake protection as per relevant IS code. The R C C work should be conformed IS: 456-2000 and amendments 1, 2 and 3, IS: 3370- Part 1-2009, IS: 3370- Part 2-2009 and IS: 3370- Part 4 1967 with latest amendments. Structural design should must be checked and vetted from reputed Technical Institute/College i.e. NIT, IIT, Government Engineering College of state/Central University before execution. All cost related to checking/vetting shall be borne by the Contractor and is deemed to be included in the cost. However, the checking of design						

	and drawing of the consultant by Technical Institute as above shall not absolute the responsibility of the Consultant.						
	There should be provision of suitable spiral RCC stairs outside from the staging for climbing of maintenance staff from G L to top dome and MS ladder for inside tank. One meter wide walkway should be provided around the tank wall at the junction of cylindrical wall & conical hopper. The landing platform and walkway should be protected with railing consisting of 25 mm dia G I Pipe railing in three layers with R.C.C. post maximum at 1.5 M interval all around. A suitable 600x600 mm size manhole with R.C.C. cover, having double frame of 90x90x6 mm angle and suitable ventilation with wire mesh in four vertical opening should be provided in top dome. Suitable lightening conductor & water level indicator should also be provided.						
	Construction of 2 Meter wide plinth protection platform all around outside the base of water tower column having minimum average height of 40cm from GL and proper slope and brick masonry open surface drains outside the platform for proper drainage and protection of foundation etc all complete job as per standard specification & direction of Engineer-in-charge with good workmanship and doing final work of commissioning. Test of the reservoir has to be done successfully by filling it with water & doing the supply.						
	Providing water level indicator properly fixed at first bracing level on column, having level gauge suitable for depth of water in the tank, fabricated from double 50x50x5 mm angle and 4 mm thick 100 mm wide plate with suitable sliding pointer, float ball, nylon rope fixed over pulleys with anticorrosive paint on metal surface, including painting of letters etc all complete.						

	Providing and fixing suitable lighting arrestor as per provisions of IS: 2309-1989.					
	The work also includes the supplying, fitting & fixing of Cast Iron/ DI doubled flanged pipes (confirming to IS: 1536 - 1993 or IS 9523, IS 8329 with latest amendments), fittings, Bell Mouth, Duck Foot Bends, Double Flanged Bends etc (confirming to IS: 1538 - 1993 with latest amendments) and Sluice Valves (confirming to IS: 14846 - 2000 with latest amendments) for rising, delivery, overflow and washout pipes having diameter of 250 mm, 300 mm, 200 mm and 150 mm respectively from elevated Tank to ground level minimum 2 (two) meter beyond plinth protection. One sluice valve with brick masonry chamber for delivery & one for wash out will be provided at the operable place. It will include construction of suitable concrete blocks and supplying, fitting of all necessary bolts and nuts (confirming to IS: 1363 - 2002), washers (3 mm thick), packing, drilling holes in flanges if required along with expansion joints with asbestos padding, if so required etc all complete as per direction of relevant IS code and E/I.					
	double story attendant room with attached toilet (outside of Water Tower of minimum 1.2 m wide x 2.10 m long x 2.70 m high and having piled foundation and R.C.C. roof) having W/C, wash basin, water taps with floor and walls tiled with ceramic tiles up to 1.5 meter height and septic for 5 (five) user as per IS: 2470 - Part 1 & Part 2 – 1985 including soak pit should be provided below the first bracing at plinth height of 50 cm from G L with 1 st class brick work (1:6), R.C.C. roof slab, steel door (2.1 m x 1.2 m) & frame made of 40mm x 40mm x 6mm angle and 3 (three) mm thick M S sheet, fully glazed steel window (1.2 m x 0.9 m) with front Grill of 8mm square bar including painting two coats with enamel paint over a coat of primer, 25mm thick 1 st class patent stone flooring over one brick flat soling & 115mm dry rammed khoa over 115mm sand filling with both sides plastered in CM(1:6), R.C.C. lintel and chajja etc all complete as per standard specification, inside and outside cement painting etc, bituminous aspiration joints with required electrification should be provided between brick work all complete as per direction of E/I.					
2A	Complete Job OHT/Master Reservoir/Sump					
	Zone 1, 770KL STAGING HT 18	770	KL	PKL		Rs.0.00

	Zone 2, 490KL STAGING HT 15	490	KL	PKL			Rs.0.00
	Zone 3, 1020KL STAGING HT 13	1020	KL	PKL			Rs.0.00
	Zone 4, 1080KL STAGING HT 20	1080	KL	PKL			Rs.0.00
	Zone 5, 910KL STAGING HT 18	910	KL	PKL			Rs.0.00
	Zone 6, 1130KL STAGING HT 19	1130	KL	PKL			Rs.0.00
	Zone 7, 720KL STAGING HT 18	720	KL	PKL			Rs.0.00
-	<u>Total of Item 2</u>	<u>1.0</u>	<u>job</u>	<u>Each</u>	<u>Rs</u>	<u>.0.</u>	<u>Rs.0.00</u>
3	Supplying all materials including pipes, specials and valves, labors, tools and tackles etc. for laying of different types and sizes of centrifugally cast iron Class LA/DI Class K-7/ DI Class K-9 pressure pipes conforming to IS : 1536/1989 (Third revision) with amendment no 1 & 2 in standard length in trenches including earth work in excavation in all kind of soil so as to give one meter average cover over the socket of pipe with disposal of excavated earth within initial lead and lift including all types of road cutting and restoring the same and providing necessary masonry pillars of required size and shape for crossing the pipes in ditches etc, as required and cost of rubber gasket (conforming to IS: 5382/1969) and making gasket joints and providing necessary Sluice Valve of required size conforming to IS 2906-1980 and IS 780-1980 of IN 1.0 with ISI certification mark and fixing in trenches with a pair of tail pieces, including the cost of sluice valve and tail pieces, making lead caulked joints and flanged joint as per IS Specification, including supplying all jointing materials (pig lead conforming to ISS 782-1978; yarn conforming to ISS 6587-1972 nuts & bolts conforming to ISS 1364-1983) including drilling holes in flanges if required and incidental charges also providing and laying CI specials of required size conforming to IS : 9523 and suitable Air valves with its all accessories etc. whereas required all complete job as per direction of E/I including all taxes, duties and incidental charges providing necessary thrust block where as required, construction of masonry chamber for valves with cost of construction materials and earth work in back filling the trenches after laying of different types and sizes of pipe, specials and valves with earth removed during excavation within initial lead and lift etc. including						

	providing night guard, barrier and red light to safe guard against accident, testing of laid pipes against 60 M water head, disinfection of laid pipe with water containing bleaching powder @0.5gm/l etc. all complete job as per specification and direction of E/I. Rates should be quoted seperattely against outlined in subsections.						
3A	Supplying all materials including pipes, specials, labors, tools and tackles etc. for laying of different types and sizes of centrifugally cast iron Class LA/DI Class K-7/ DI Class K-9 pressure pipes conforming to IS : 1536/1989 (Third revision) with amendment no 1 & 2 in standard length in trenches including earth work in excavation in all kind of soil so as to give one meter average cover over the socket of pipe with disposal of excavated earth within initial lead and lift, filling the trenches after laying of different type and size of pipe and specials, providing thrust block where as required, testing of lead pipe, disinfection etc all complete as per direction of E/I excluding sluice valves and air valves with their chamber, trenchless piping if any and cutting of PCC road and restoring the same.						
	B. Distribution Network						
	(i) 100 mm dia CI class LA (in mtrs.)						

	Zone 2	6781	M	Per M			
	Zone 5	14393	M	Per M			
	Zone 6	13597	M	Per M			
	Zone 7	23108	M	Per M			
	Total	57879	M	Per M			Rs.0.00
	(i) 150 mm dia CI class LA (in mtrs.)						
	Zone 2	3988	M	Per M			
	Zone 5	7674	M	Per M			
	Zone 6	8034	M	Per M			
	Zone 7	4675	M	Per M			
	Total	24371	M	Per M			Rs.0.00
	(i) 200 mm dia CI class LA (in mtrs.)						
	Zone 2	1671	M	Per M			
	Zone 5	3693	M	Per M			
	Zone 6	453	M	Per M			
	Zone 7	323	M	Per M			
	Total	6140	M	Per M			Rs.0.00
	(i) 250 mm dia CI class LA (in mtrs.)						
	Zone 2	996	M	Per M			
	Zone 5	1908	M	Per M			
	Zone 6	433	M	Per M			
	Zone 7	184	M	Per M			
	Total	3521	M	Per M			Rs.0.00
	(i) 300 mm dia CI class LA (in mtrs.)						
	Zone 2	915	M	Per M			

	Zone 5	903	M	Per M			
	Zone 6	1477	M	Per M			
	Zone 7	0	M	Per M			
	Total	3295	M	Per M			Rs.0.00
	(i) 350 mm dia CI class LA (in mtrs.)						
	Zone 2	320	M	Per M			
	Zone 5	411	M	Per M			
	Zone 6	1021	M	Per M			
	Zone 7	0	M	Per M			
	Total	1752	M	Per M			Rs.0.00
	(i) 400 mm dia CI class LA (in mtrs.)						
	Zone 2	0	M	Per M			
	Zone 5	5	M	Per M			
	Zone 6	0	M	Per M			
	Zone 7	0	M	Per M			
	Total	5	M	Per M			Rs.0.00
3B	Providing and fixing CI Sluice valves (with cap) Complete with bolts, nuts, rubber insertions etc with 120x 120x100mm brick masanory chamber with cement mortar 1:4 (1 Cement:4 coarse sand) for sluice valve, with CI Surface box 100mm top diameter, 160mm bottom diameter and 180mm deep (inside)with chained lid and RCC top slab 1:2:4 mix (1 Cement :2 Coarse sand: 4 graded stone aggregate 20mm nominal size), I/C necessary excavation foundation concrete 1:5:10 (1 Cement:5 fine sand : 10 graded stone aggregate 40mm nominal size) and inside plastering with cement mortar 1:3 (1 Cement:3 Coarse sand) 12mm thick, finished with a floating coat of neat cement.						
	(i) 100 mm dia	20	No	Each			Rs.0.00
	(ii) 150 mm dia	9	No	Each			Rs.0.00

	(iii) 200 mm dia	2	No	Each		Rs.0.00
	(iv) 250 mm dia	1	No	Each		Rs.0.00
	(v) 300 mm dia	0	No	Each		Rs.0.00
	(vi) 400 mm dia	0	No	Each		Rs.0.00
3C	Providing and fixing double acting air valves of approved quality Complete with bolts, nuts, rubber insertions etc with masonry chamber 60 x 60 x 75cm inside in brick work in cement mortar 1:4 (1 Cement:4 coarse sand) for sluice valve, with CI Surface box 350x350mm top, 165mm bottom diameter and 180mm deep (inside)with chained lid and RCC top slab 1:2:4 mix (1 Cement :2 Coarse sand: 4 graded stone aggregate 20mm nominal size), I/C necessary excavation foundation concrete 1:5:10 (1 Cement:5 fine sand : 10 graded stone aggregate 40mm nominal size) and inside plastering with cement mortar 1:3 (1 Cement:3 Coars sand) 12mm thick, finished with a floating coat of neat cement complete as per standard design.					
	50mm dia	29	No	Each		Rs.0.00
	(i) 80 mm dia	1	No	Each		Rs.0.00
	(ii) 100 mm dia	0	No	Each		Rs.0.00
3D	Demolishing Cement concrete pavement manually or by mechanical means including disposal of materials within 50m lead and restoring the same with PCC (1:2:4) including all materials, labour, tools & tackle, carriage of all materials and centering shuttring etc all as per direction of E/I.	3914.486	cum	P/M ³		Rs.0.00
3E	Providing and fixing spindle fire hydrant with 65 mm outlet complete with bolts, nuts & rubber insertion etc all complete as per direction of E/I.	35	No	Each		Rs.0.00
3F	Providing and fixing Scour Valve					
	(i) 100 mm dia	20	No	Each		Rs.0.00
	(ii) 150 mm dia	9	No	Each		Rs.0.00
	(iii) 200 mm dia	2	No	Each		Rs.0.00
	(iv) 250 mm dia	1	No	Each		Rs.0.00

	(v) 300 mm dia	0	No	Each			Rs.0.00
	(vi) 400 mm dia	0	No	Each			Rs.0.00
3G	Woltman Turbine Bulk Meters: Supply of Woltan Turbine Bulk meters class as per multijet, magnetically coupled as per specifications conforming to is 770/1994, ISO 4064/1 and EEC approved, including transportation to site, storage, safety, installation, testing, commissioning, making connections with existing pipeline, including excavation at site, completion of installation as per specifications and drawings including all taxes.						
	(i) 100 mm dia	18	No	Each			Rs.0.00
	(ii) 150 mm dia	12	No	Each			Rs.0.00
	(iii) 200 mm dia	7	No	Each			Rs.0.00
	(iv) 250 mm dia	5	No	Each			Rs.0.00
	(v) 300 mm dia	6	No	Each			Rs.0.00
	(vi) 350 mm dia	6	No	Each			Rs.0.00
	(vii) 400 mm dia	0	No	Each			Rs.0.00
	<u>Total of Item 3</u>	<u>1</u>	<u>No.</u>	<u>Each</u>	<u>Rs</u>	<u>.0.</u> <u>00</u>	<u>Rs.0.00</u>
4	House service connection with 15mm dia GI pipe including water meter with HDPE box including fitting and fixing specials such as ferrul, stop cock, bib cock etc all complete as per direction of E/I.						
4A	Providing and fixing 15 mm GI pipes complete with GI fittings including trenching and refilling etc. all complete as per direction of E/I	21000	M	PerM			Rs.0.00

4B	Providing and fixing GI union, Brass ferrule, CP brass bib cock, brass stop cock, making hole in wall if any, domestic water meter with HDPE box, dry die, inferential type, Multi Jet, Magnetically coupled, class B water meter compete with tubular strainer, brass nuts and nipples conforming to IS 779:1994 standard with protection class of IP68 and marked in metric system, along with manufacturer certificate & warranty card including cost of a material and labor.	1400	No.	Each		Rs.0.00
	<u>Total of Item 4</u>	<u>1</u>	<u>No.</u>	<u>Each</u>	<u>Rs</u> <u>.0.</u> <u>00</u>	<u>Rs.0.00</u>
	Total Amount for the Complete Project in Figure					Rs. 0.00
5	WORKS RELATED WITH OPERATION AND MAINTENANCE OF ALL COMPONENT with rate of Fixed 2% of project capital cost for each 12 calendar months.					
	Deployment of manpower, supply of all chemicals, checking of status of supply in fed up area, repairing of leakages, maintaining log book at all pumping stations, submission of daily / weekly / monthly and yearly report of water quality, tested by district laboratories, replacing the damaged parts of any machinery / the machinery as a whole, annual / bi-annual maintenance of all built-up / installed civil/mechanical/electrical structures / units under the scheme , including round-the clock watch & ward for 60 calendar months from the date of completion of trial run (excluding energy charges)	sd				
	O & M cost for the first 12 calendar months	1	job	Each	Rs. 0.0 0	Rs.0.00
	O & M cost for the Second 12 calendar months	1	job	Each	Rs. 0.0 0	Rs.0.00
	O & M cost for the Third 12 calendar months	1	job	Each	Rs. 0.0 0	Rs.0.00
	O & M cost for the Fourth 12 calendar months	1	job	Each	Rs. 0.0 0	Rs.0.00
	O & M cost for the Fifth 12 calendar months	1	job	Each	Rs. 0.0 0	Rs.0.00
	Total Amount for O&M in Figure					Rs. 0.00
	Total Amount for the Complete Project in Figure					Rs. 0.00

	Total Amount for the Complete Project in Figure						
STATE PLAN - PART - B							
S. No.	Items of Work	Quantity	Unit	Rate quoted by Bidder		Amount	
				Rate (in Indian Rupees)	Rate (in Indian Rupees)		
Works related with Civil , Mechanical and Electrical Portion							
1	Design, planning and preparation of master plan for augumentation of water supply scheme in town including surveying with total station instruments, establish the control point with DGPS in project area, transfer of control points at strategic locations such as tubewell, pumping plant, OHT etc, preparation of design report of distribution network with latest design softwares. submission of all survey data, and design report including all necessary maps in hardcopy as well as in softcopy in trplicate as per direction of E/I	1.0	job	Each		Rs.0.00	

-	<u>Total of Item 1</u>	<u>1.0</u>	<u>job</u>	<u>Each</u>	<u>Rs</u> <u>.0.</u> <u>00</u>	<u>Rs.0.00</u>
2	CONSTRUCTION OF 450MM X 300MM DIA & 150M DEEP TUBE WELL					
2A	Providing all materials, labours and equipments and drilling by reverse rotary Rig machine for following diameter of bore hole in any kind of soil mixed with kankar, sand stone including providing sample box and collection strata sample at every 3 m depth of drilling for ascertaining proper aquifer for completing 457.2 x 323.9mm dia High Yielding Tube Well all complete as per IS : 2800 - 1979 & PHED specification and direction of E/I.					
	(a) 650mm dia bore from G.L. to 37.0M	37.0	M	P/M		Rs.0.00
	(b) 600mm dia bore from 37 m to 155.0M	118.0	M	P/M		Rs.0.00
2B	Supplying all materials such as following size of Seamless or Electrically welded Steel Pipe confirming to IS : 3589-1991 in standard length of 5.5m to 6.5m bitumen coated, beveled edges with socket/MS ring & strips as required and providing all equipments and labours for cutting, welding and lowering the same as per strata chart & direction of E/I...					
	(a) 450mm x 6mm thick M.S.E.R.W. housing pipe I.S.I. mark	37.0	M	P/M		Rs.0.00
	(b)300mm x 6mm thick M.S.E.R.W. blank pipe I.S.I. mark	77.0	M	P/M		Rs.0.00
2C	Supplying all materials such as following size of Electric Resistance Welded, Low Carbon Galvanized steel Cage type Trapezoidal (Vee) wire wound WELL SCREEN Pipes duly approved and confirming to IS : 8110-2000 in standard lengths with socket/MS ring & strip as required and providing all equipments and labours for welding and lowering the same as per strata chart & direction of E/I. (Johnson make or equivalent.)	36.0	M	P/M		Rs.0.00
2D	Providing all tools and labours including supplying the following fittings and fixing the following accessories for aforesaid 457.2mm x 323.9mm pipe and welding the same on process of lowering the assembly as per direction of E/I.					

	(a) 450 mm x 150 mm dia MS reducer	1	No.	Each		Rs.0.00
	(b) 450 mm dia M.S. well cap	1	No.	Each		Rs.0.00
	(c) 450mm dia M.S. Ring	6	No.	Each		Rs.0.00
	(d)300 mm dia M.S. Ring	20	Nos.	Each		Rs.0.00
	(f) 300 mm dia MS Well plug	1	No.	Each		Rs.0.00
	(g) MS Centre guide suitable for 450mm dia pipe	4	No.	Each		Rs.0.00
	(h)MS Centre guide suitable for 300mm dia pipe	6	No.	Each		Rs.0.00
	(i) 1.6m long MS Clamp for holding 450mm dia MS housing pipe	1	No.	Each		Rs.0.00
2E	Providing all materials, labours, & equipments for fixing tube well with pea gravel of Dalbhumigarh (East Singhbhumi) to size 4mm to 8mm approx. as suitable for strata including carriage washing, placing and packing the same in position around the tube well etc. all complete as per direction of E/I. (Stack measurement of clean and washed gravel shall be taken 13" as 12" in height to count voids) etc as per specification and direction of E/I.	40.0	cum	P/M ³		Rs.0.00
2F	Supplying all materials, labours & equipments with fuel & lubricants and developing and testing the tube well with air compressor for 56 hours to leave sand free clear water is discharged and providing V-notch for measuring the discharge of the tube well at various depth etc. all complete as per specification & direction of E/I.	1	No.	Each		Rs.0.00
2G	Transportation of drilling plants, developing equipments & all other required tools and M/c by and suitable mechanical means including all cost of loading, unloading, placing at work site and back after completion of work as per S/D of E/I	1	No.	Each		Rs.0.00

2H	Supplying all materials and labours for arrangement for additional water required during the drilling period for 80 Hrs & site clearance & leveling etc. And providing the soap duster etc. to staff engaged in drilling etc. all complete work as per specification & direction of E.I.	1	No.	Each			Rs.0.00
2I	Wages of 1 no welded grade 1 which is hired from local market	55	HRS	P/HRS			Rs.0.00
2J	Wages of 1 no compressor operator which is hired from local market	56	HRS	P/HRS			Rs.0.00
2K	Wages of 2 no helper for welded grade 1 & compressor operator which is hired from local market	111	HRS	P/HRS			Rs.0.00
2L	Wages of 2 no driller which is hired from local market	214	HRS	P/HRS			Rs.0.00
2M	supply & filling bentonite powder	48	bags	P/Bags			Rs.0.00
-	<u>Total of Item 2 (12+1 Trial)</u>	<u>13</u>	<u>No.</u>	<u>Each</u>	<u>Rs</u>	<u>.0.</u>	<u>Rs.0.00</u>
<u>3</u>	RAW WATER BUS LINE	-	-	-	-	-	-
<u>3A</u>	Providing, laying, jointing, welding, fabrication, testing and commissioning of MS pipe line connecting DTW & MS bus line	-	-	-	-	-	-
-	For 200mm dia pipe	520	m	P/M			Rs.0.00
-	For 300mm dia pipe	400	m	P/M			Rs.0.00
-	For 350mm dia pipe	400	m	P/M			Rs.0.00
-	For 400mm dia pipe	400	m	P/M			Rs.0.00
-	For 450mm dia pipe	400	m	P/M			Rs.0.00
-	For 500mm dia pipe	400	m	P/M			Rs.0.00
-	For 700mm dia pipe	500	m	P/M			Rs.0.00
<u>3B</u>	Providing and fixing C.I. sluice valves (with cap) complete with bolts, nuts, rubber insertions etc.(the tail pieces if required will be paid separately)	-	-	-	-	-	-
-	For 200mm dia class II	1	No	Each			Rs.0.00

-	For 300mm dia class II	1	No	Each			Rs.0.00
-	For 350mm dia class II	1	No	Each			Rs.0.00
-	For 400mm dia class II	1	No	Each			Rs.0.00
-	For 450mm dia class II	1	No	Each			Rs.0.00
-	For 500mm dia class II	1	No	Each			Rs.0.00
-	For 700mm dia class II	1	No	Each			Rs.0.00
<u>3C</u>	Providing MS fabricated Y connection in raw water line made out of MS pipe of thickness not less than 12mm including flanges all complete	-	-	-	-	-	
-	200 x 200 x 300- approx 4M long	-	-	-	-	-	
-	200 x 300 x 350- approx 4M long	1000	kg	P/Kg			Rs.0.00
-	350 x 350 x 500 - appx 2M long Tee	500	kg	P/Kg			Rs.0.00
-	<u>Total of Item 3</u>	<u>1</u>	<u>No.</u>	<u>Each</u>	<u>Rs</u>	<u>.0.</u>	<u>Rs.0.00</u>
-		-	-	-	-	-	-
<u>4</u>	RAW WATER PUMP	-	-	-	-	-	-
-	Supply, installation, testing and commissioning of Set-I 37 LPS @ 38 m head :2 nos. @ 40 HP Submersible type pumps with electrical control panel all complete.Centrifugal pumps comprising shaft, bowl, vertical hollow shaft, 4 stage water lubricated pump assembly , suction close nipple, strainer,1000 RPM with 3 phase squired cage up to site. with non returnable ratchet etc Complet with FASD Starter for each motors (make :- L & T / Jyoti / Siemens) 40 HP	1	<u>No.</u>	<u>Each</u>			Rs.0.00
	<u>Total of Item 4</u>	<u>12</u>	<u>No.</u>	<u>Each</u>	<u>Rs</u>	<u>.0.</u>	<u>Rs.0.00</u>
					<u>00</u>		

5	Construction of 4 m wide approach road by PCC M15 over brick flat soling over sand filling etc all complete as per direction of E/I.	780	Meter	Meter			Rs.0.00
	<u>Total of Item 5</u>	<u>1</u>	<u>No.</u>	<u>Each</u>	<u>Rs</u>	<u>.0.</u> <u>00</u>	<u>Rs.0.00</u>
-		-	-	-	-	-	-
<u>6</u>	CLEAR WATER PIPE LINE (CWR TO UGR)	-	-	-	-	-	-
-	Rising Main From Tube Well to Raw Water Sump	-	-	-	-	-	-
<u>6A</u>	Providing , laying and jointing of D.I. K 9 Tyton pipe.	-	-	-	-	-	-
-	For 600 mm dia (Including cutting road as well restoring, excavation in foundation trenches or drain and Filling available excavated earth)	20100	M	P/M			Rs.0.00
<u>6B</u>	Non return valve 600 mm dia	1	No.	Each			Rs.0.00
<u>6C</u>	Providing and fixing D.I. sluice valves (with cap) complete with bolts, nuts, rubber insertion etc all complete. 600 mm dia class II	7	No.	Each			Rs.0.00
<u>6D</u>	Supplying materials and labour and construction of Sluice Valve Chamber having 250 mm thick wall in cement mortar (1:4) including 12 mm cement plaster (1:3) with punning RCC cover slab with CI surface cover of 100 mm dia including earth work, B/F/soling, PCC (1:2:4) in foundation refilling etc. all complete work 3as per specification and direction of E/I. Type I for pipe dia. In 600 (1.2M x 1.2M x 1.5M deep)	7	No.	Each			Rs.0.00
	<u>Total of Item 6</u>	<u>1</u>	<u>No.</u>	<u>Each</u>	<u>Rs</u>	<u>.0.</u> <u>00</u>	<u>Rs.0.00</u>
<u>7</u>	GANGWAY	-	-	-	-	-	-

-	Estimation of Gang Way	-	-	-	-	-	-
7A	Boring, Providing and installing cast in situ single under reamed piles of specified diameter and length below pile cap in M-25 cement concrete, to carry a safe working load not less than specified, excluding the cost of steel reinforcement but including the cost of boring with bentonite solution and the length of the pile to be embedded in pile cap etc. all complete. (Length of pile for payment shall be measured upto to the bottom of pile cap) :	-	-	-	-	-	-
-	Pile (500 Dia)	50	M	P/M			Rs.0.00
7B	Earth work in excavation in foundation trenches or drains (not exceeding 1.5 m in width or 10sqm on plan) including dressing of sides and ramming of bottoms, lift upto 1.5 m . including getting out the excavated soil and disposal of surplus excavated soil as directed, within a lead of 50 m.	-	-	-	-	-	-
-	Pile Cap	5.4	cum	P/M3			Rs.0.00
7C	Providing and laying in position cement concrete of specified grade excluding the cost of centring and shuttering-all work upto plinth level. 1:2:4 (1 Cement: 2 coarse sand : 4 graded stone aggregate 40mm nominal size)	-	-	-	-	-	-
-	Pile Cap	5.4	cum	P/M3			Rs.0.00
7D	Vertical load testing of piles in accordance with IS 2911 (Part IV) including installation of loading platform and preparation of pile head or construction of test cap and dismantling of test cap after test etc. complete as per specification & the direction of Engineer in-charge.	-	-	-	-	-	-
-	Single pile upto 50 tonne capacity	-	-	-	-	-	-
-	Initial test	2	no	Each			Rs.0.00
-	Routine test	0.1	no	Each			Rs.0.00

<u>7E</u>	Providing and laying in position machine batched and machine mixed design mix M - 25 grade cement content as per approved design mix, including pumping of concrete to site of laying but excluding the cost of centering, shuttering, finishing and reinforcement, including admixtures in recommended proportions as per IS : 9103 to accelerate, retard setting of concrete, improve workability without impairing strength and durability as per direction of Engineer-in-charge. (Note :- Cement content considered in this item is @ 330 kg/m³. Excess / less cement used as per design mix is payable/ recoverable separately).	17.27	cum	P/M3			Rs.0.00
<u>7F</u>	Reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete. Thermo-Mechanically Treated bars TMTC-500-12mm dia. (Qty of steel = 100 kg/m³)	3327.4	kg	P/Kg			Rs.0.00
<u>7G</u>	Centering and shuttering including strutting, propping etc. and removal of form for:	-	-	-	-	-	
	in column	100.48	sqm	P/M2			Rs.0.00
	b) In bracing beam (long) Side	20	sqm	P/M2			Rs.0.00
	c) In bracing beam (long) Bottom	6	sqm	P/M2			Rs.0.00
	d) In beam at walk way (Long)	20	sqm	P/M2			Rs.0.00
	e) In beam at walk way (Short)	6	sqm	P/M2			Rs.0.00
	f) In Slab at walk way	20	sqm	P/M2			Rs.0.00
	In Slab at walk way (side)	4	sqm	P/M2			Rs.0.00
	h) in Railing posts	21	sqm	P/M2			Rs.0.00
<u>7H</u>	G.I. Pipe in Railing 3 layers	233.04	sqm	P/M2			Rs.0.00
<u>7I</u>	Painting	38.05	sqm	P/M2			Rs.0.00
	<u>Total of Item 7</u>	<u>1</u>	<u>No.</u>	<u>Each</u>	<u>Rs</u>	<u>.0.</u>	<u>Rs.0.00</u>

					<u>00</u>	
8	Provision for tubewell lifting arrangement(movable type tripod with hand operated lifting arrangement	1	no	Each		Rs.0.00
	<u>Total of Item 8</u>	<u>2</u>	<u>No.</u>	<u>Each</u>	<u>Rs. 0.00</u>	<u>Rs.0.00</u>
9	Cost for construction of 3.0m x 3.0m x 3.0m high Class 100A designated brick masanory Chlorinator room with Lighting arrangement inside as well outside, finishing with water proofing cement paint, providing steel glazed door and window etc. all complete as per direction of E/I.	1	Job	Each		Rs.0.00
	<u>Total of Item 9</u>	<u>1</u>	<u>No.</u>	<u>Each</u>	<u>Rs. 0.00</u>	<u>Rs.0.00</u>
10	Construction of single mouthed R.C.C (1:2:4) stand post of 150mm top & 250mm bottom dia 1.70 m long, which will 1.10 m above and 0.60 m. Below ground level, in 8mm dia 6 no 1.7 m long main reinforcement, binding with 6mm dia 13 no ring. 12mm thick cement plaster (1:2) with 1.5mm thick punning up to 0.150 m. Below ground level with earth work for pipe laying. Supplying fitting & fixing 15mm dia G.M Ferrule, 3 m G.I pipe, 1 no G.I Union Socket, 2 no G.I Elbow, 1 no G.I Nipple, 2no G.I Socket C.I Body M.S spindle bib cock of approved make etc all complete as per direction of E/I. Platform- RCC (1:2:4) 75mm thick and 75x75mm edge with 12mm cement plaster(1:3) and neat cement punning. Drain- brick masonry with 12mm cement plaster and neat cement punning	20	nos.	Each		Rs.0.00
	<u>Total of Item 10</u>	<u>1</u>	<u>No.</u>	<u>Each</u>	<u>Rs. 0.00</u>	<u>Rs.0.00</u>

11	<p>Providing architectural detail plan, elevation, sectional elevation, structural design calculation, details drawing of reinforcement binding with dimension of each concrete work, schedule of bar bending, details of construction joints all necessary technical requirement arise during execution of work and construction of RCC elevated circular water Intze-tank or suitable type at 21 m staging which are supported by frame work consisting of rectangular column and rectangular braces with required rising delivery over flow and wash out pipes valves chambers with one attendant room with toilet etc all complete as per direction of E/I.</p>					
	<p>The design calculation and drawing must be signed by a qualified Engineer. The design of water tower is to be done by considering all types of possible vertical & horizontal loads as per provisions of IS: 875 (Part 1, Part 2 and Part 3) : 1987 and other relevant codes. The design must be considering with earth- quake protection as per relevant IS code. The R C C work should be conformed IS: 456-2000 and amendments 1, 2 and 3, IS: 3370- Part 1-2009, IS: 3370- Part 2-2009 and IS: 3370- Part 4 1967 with latest amendments. Structural design should must be checked and vetted from reputed Technical Institute/College i.e. NIT, IIT, Government Engineering College of state/Central University before execution. All cost related to checking/vetting shall be borne by the Contractor and is deemed to be included in the cost. However, the checking of design and drawing of the consultant by Technical Institute as above shall not absolute the responsibility of the Consultant.</p>					
	<p>There should be provision of suitable spiral RCC stairs outside from the staging for climbing of maintenance staff from G L to top dome and MS ladder for inside tank. One meter wide walkway should be provided around the tank wall at the junction of cylindrical wall & conical hopper. The landing platform and walkway should be protected with railing consisting of 25 mm dia G I Pipe railing in three layers with R.C.C. post maximum at 1.5 M interval all around. A suitable 600x600 mm size manhole with R.C.C. cover, having double frame of 90x90x6 mm angle and suitable ventilation with wire mesh in four vertical opening should be provided in top dome. Suitable lightning conductor & water level indicator should also be provided.</p>					

	Construction of 2 Meter wide plinth protection platform all around outside the base of water tower column having minimum average height of 40cm from GL and proper slope and brick masonry open surface drains outside the platform for proper drainage and protection of foundation etc all complete job as per standard specification & direction of Engineer-in-charge with good workmanship and doing final work of commissioning. Test of the reservoir has to be done successfully by filling it with water & doing the supply.					
	Providing water level indicator properly fixed at first bracing level on column, having level gauge suitable for depth of water in the tank, fabricated from double 50x50x5 mm angle and 4 mm thick 100 mm wide plate with suitable sliding pointer, float ball, nylon rope fixed over pulleys with anticorrosive paint on metal surface, including painting of letters etc all complete.					
	Providing and fixing suitable lighting arrestor as per provisions of IS: 2309-1989.					
	The work also includes the supplying, fitting & fixing of Cast Iron/ DI doubled flanged pipes (confirming to IS: 1536 - 1993 or IS 9523, IS 8329 with latest amendments), fittings, Bell Mouth, Duck Foot Bends, Double Flanged Bends etc (confirming to IS: 1538 - 1993 with latest amendments) and Sluice Valves (confirming to IS: 14846 - 2000 with latest amendments) for rising, delivery, overflow and washout pipes having diameter of 250 mm, 300 mm, 200 mm and 150 mm respectively from elevated Tank to ground level minimum 2 (two) meter beyond plinth protection. One sluice valve with brick masonry chamber for delivery & one for wash out will be provided at the operable place. It will include construction of suitable concrete blocks and supplying, fitting of all necessary bolts and nuts (confirming to IS: 1363 - 2002), washers (3 mm thick), packing, drilling holes in flanges if required along with expansion joints with asbestos padding, if so required etc all complete as per direction of relevant IS code and E/I.					

	double story attendant room with attached toilet (outside of Water Tower of minimum 1.2 m wide x 2.10 m long x 2.70 m high and having piled foundation and R.C.C. roof) having W/C, wash basin, water taps with floor and walls tiled with ceramic tiles up to 1.5 meter height and septic for 5 (five) user as per IS: 2470 - Part 1 & Part 2 – 1985 including soak pit should be provided below the first bracing at plinth height of 50 cm from G L with 1 st class brick work (1:6), R.C.C. roof slab, steel door (2.1 m x 1.2 m) & frame made of 40mm x 40mm x 6mm angle and 3 (three) mm thick M S sheet, fully glazed steel window (1.2 m x 0.9 m) with front Grill of 8mm square bar including painting two coats with enamel paint over a coat of primer, 25mm thick 1 st class patent stone flooring over one brick flat soling & 115mm dry rammed khoa over 115mm sand filling with both sides plastered in CM(1:6), R.C.C. lintel and chajja etc all complete as per standard specification, inside and outside cement painting etc, bituminous aspiration joints with required electrification should be provided between brick work all complete as per direction of E/I.					
	Complete Job OHT/Master Reservoir/Sump					
	ESR LOCATION : Zone - I (MESR) ESR CAPACITY : 1270 KL ESR STAGING HT. : 30 m SEISMIC ZONE - III SAFE BEARING CAPACITY : 5 < SBC < 10 T/Sq.m	1270	KL	PKL		Rs.0.00
	<u>Total of Item 11</u>	<u>1</u>	<u>No.</u>	<u>Each</u>	<u>Rs</u> <u>.0.</u> <u>00</u>	<u>Rs.0.00</u>
<u>12</u>	INTERMEDIATE PUMPING STATION	-	-	-	- -	-
	ZONE-III	180				Rs.0.00
	ZONE-V	230				Rs.0.00
	ZONE-VI	210				Rs.0.00
	<u>Total of Item 12</u>	<u>1</u>	<u>No.</u>	<u>Each</u>	<u>Rs</u> <u>.0.</u> <u>00</u>	<u>Rs.0.00</u>
<u>13</u>	CLEAR WATER RESERVOIR	-	-	-	- -	-

	Construction OF CWR (20 m x 7.5 m x 4.50 m Liquid depth and free board 0.50 m;2 nos. compartment) CUM PUMP HOUSE(10 m x 6.0 m)	1	<u>No.</u>	<u>Each</u>			Rs.0.00
	<u>Total of Item 13</u>	<u>1</u>	<u>No.</u>	<u>Each</u>	<u>Rs</u>	<u>.0.</u> <u>00</u>	<u>Rs.0.00</u>
<u>14</u>	CLEAR WATER PUMP	-	-	-	-	-	-
14A	Clear water pump (CWR to UGR AT MAJURAHI)						
	Supply, installation, testing and commissioning of Set-I 665 m³/hr @ 45 m head :2 nos. @ 175 HP,Set-II 333 m³/hr @ 45 m head :2 nos. @ 100 HP capacity Centrifugal type pumps with electrical control panel all complete.Centrifugal pumps comprising shaft, bowl, vertical hollow shaft, 4 stage water lubricated pump assembly , suction close nipple, strainer,1000 RPM with 3 phase squired cage up to site. with non returnable ratchet etc Complet with FASD Starter for each motors (make :- L & T / Jyoti / Siemens)	1	<u>No.</u>	<u>Job</u>			Rs.0.00
14B	Clear water pump (UGR to MESR AT ZONE-I)						
	Supply, installation, testing and commissioning of Set-I 610 m³/hr @ 45 m head :2 nos. @ 150 HP,Set-II 305 m³/hr @ 45 m head :2 nos. @ 75 HP capacity Centrifugal type pumps with electrical control panel allcomplete.Centrifugal pumps comprising shaft, bowl,vertical hollow shaft, 4 stage water lubricated pumpassembly , suction close nipple, strainer,1000 RPM with3 phase squired cage up to site. with non returnableratchet etc Complet with FASD Starter for each motors (make :- L & T / Jyoti / Siemens)	1	<u>No.</u>	<u>Job</u>			Rs.0.00
					-	-	
<u>14C</u>	Clear water pump (IPS-I to ESR at Zone-III)	-	-	-	-	-	-

	Supply, installation, testing and commissioning of Set-I 75 m³/hr @ 26 m head :2 nos. @ 10 HP,Set-II 40 m³/hr @ 26 m head :2 nos. @ 5 HP capacity Centrifugal type pumps with electrical control panel all complete.Centrifugal pumps comprising shaft, bowl, vertical hollow shaft, 4 stage water lubricated pump assembly , suction close nipple, strainer, 1000 RPM with 3 phase squired cage up to site. with non returnable ratchet etc Complet with FASD Starter for each motors (make :- L & T / Jyoti / Siemens) 10 HP AND 5 HP	1	<u>No.</u>	<u>Job</u>			Rs.0.00
14D	Clear water pump (IPS-II to ESR at Zone-V)						
	Supply, installation, testing and commissioning of Set-I 100 m³/hr @ 28 m head :2 nos. @ 15 HP,Set-II 50 m³/hr @ 28 m head :2 nos. @ 7.5 HP capacity Centrifugal type pumps with electrical control panel all complete.Centrifugal pumps comprising shaft, bowl, vertical hollow shaft, 4 stage water lubricated pump assembly , suction close nipple, strainer, 1000 RPM with 3 phase squired cage up to site. with non returnable ratchet etc Complet with FASD Starter for each motors (make :- L & T / Jyoti / Siemens) 15 HP AND 7.5HP	1	<u>No.</u>	<u>Job</u>			Rs.0.00
14E	Clear water pump (IPS-III to ESR at Zone-VI)						
	Supply, installation, testing and commissioning of Set-I 85 m³/hr @ 28 m head :2 nos. @ 12.5 HP,Set-II 45 m³/hr @28 m head :2 nos. @ 7.5 HP capacity Centrifugal type pumps with electrical control panel all complete.Cost of Centrifugal pumps comprising shaft, bowl,vertical hollow shaft, 4 stage water lubricated pumpassembly , suction close nipple, strainer, 1000 RPM with3 phase squired cage up to site. with non returnableratchet etc Complet with FASD Starter for each motors (make :- L & T / Jyoti / Siemens)	1	<u>No.</u>	<u>Job</u>			Rs.0.00
	<u>Total of Item 14</u>	<u>1</u>	<u>No.</u>	<u>Each</u>	<u>Rs</u> <u>.0.</u> <u>00</u>		<u>Rs.0.00</u>

15	Construction of 2m height 100A designated brick masanory compound wall finished with water proofing cement paint etc. all complete as per direction of E/I. U/R Pile – 250 mm dia, 2.5 m deep at every 2.5m spacing. Capping beam- 250x150mm RCC with damp proof layer. Brick work- 100A brick work in 1:6, height 2m over capping beam. 100mm thick RCC at top including 12mm cement plaster (1:6) and water proofing painting.	1140	M	Meter			Rs.0.00
	<u>Total of Item 15</u>	<u>1</u>	<u>No.</u>	<u>Each</u>	<u>Rs</u>	<u>.0.</u> <u>00</u>	<u>Rs.0.00</u>
16	Providing and fixing steel main gate as per approved drawing and design (weight not less than 240 kg), 4m long and 1.5m height with suitable haskal and domney including locking arrangement and fixing 375mmx375mm RCC column on 300mm dia and 4m deep U/R pile with suitable reinforcement etc all complete as per direction of E/I.	1	No.	Each			Rs.0.00
	<u>Total of Item 16</u>	<u>9</u>	<u>No.</u>	<u>Each</u>	<u>Rs</u>	<u>.0.</u> <u>00</u>	<u>Rs.0.00</u>
17	Cost for construction of Staff quarter, water supply arrangement, sanitary installation, Lighting arrangement with lights and fan etc. all complete as per direction of E/I. (RATES WILL BE FILLED INCLUDING centering and shuttering, all formworks, scaffoldings and carriage of materials of each item wherever applicable. No carriage will be paid extra)						
17A	Earth work in excavation in foundation trenches or drains (not exceeding 1.5m in width or 10m ³ on plan) is including dressing of sides and ramming of bottoms, lift up to 1.5m including getting out the excavated soil and disposal of surplus excavated soil as directed, within a lead of 50m.	30.24	cum	P/M ³			Rs.0.00
17B	Providing and laying in position cement concrete of specified grade all work up to plinth level 1:5:10 (1 cement : 5 course sand : 10 graded stone aggregate)	4.03	cum	P/M ³			Rs.0.00
17C	Providing and laying in position cement concrete of specified grade excluding the cost of centering and shuttering - all work up to plinth level- 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate 40mm nominal size).	2.02	cum	P/M ³			Rs.0.00

17D	Providing and laying in position specified grade of reinforced cement concrete, excluding the cost of finishing and reinforcement:- All work up to plinth level:- 1:2:4 (1 cement : 2 coarse sand: 4 graded stone aggregate 20mm nominal size).	7.96	cum	P/M ³		Rs.0.00
17E	Reinforced cement concrete in walls (any thickness) including attached pilasters, buttresses, plinth and string course, fillets, columns, pillars, piers, abutments, posts and struts etc up to floor five level excluding cost of centering, shuttering, finishing and reinforcement:- 1:2:4 (1 cement : 2 coarse sand: 4 graded stone aggregate 20mm nominal size).	11.24	cum	P/M ³		Rs.0.00
17F	ReinforceMENT for RCC work including straightening, cutting, bending, placing in position and binding all complete:- TMT bars TMTC-500-10mm dia.	1011.6	Kg	PKg		Rs.0.00
17G	Centering and shuttering including strutting, propping etc. and removal of form for lintels, beams,plinth beams etc.	172.87	Sq m	PM ²		Rs.0.00
17H	Providing and laying damp-proof course 50mm thick with cement concrete 1:2:4 (1 cement: 2 coarse sand: 4 graded stone aggregate 20mm nominal size).	10.18	Sq m	PM ²		Rs.0.00
17I	Filling with available fly ash and earth (excluding rock) in trenches or embankment in layers (each layer should not exceed 15cm), with intermediate layer of compacted earth (soil density of 98%) after every four layers of compacted of fly ash, sides & top layer of filling shall be done with earth having total minimum compacted thickness 30cm or as decided by engineer-in-charge, including compacting each layer by rolling/ramming and watering, all complete as per drawing and direction of E/I.	18.11	cum	P/M ³		Rs.0.00
17J	Providing and laying in position cement concrete of specified grade - all work up to plinth level:- 1:3:6 (1 cement : 3 coarse sand : 6 graded stone aggregate 20mm nominal size).	4.03	cum	P/M ³		Rs.0.00
17K	Crazy ceramic tile flooring, with under layer 12mm thick cement mortar 1:4 (1 cement : 4 coarse sand), with joints not exceeding 5mm, including filling the gaps with ordinary cement mixture & mixing with synthetic polyester fiber, triangular in shape having specific gravity of 1.34 to 1.40, cross section size ranging form 10 to 40 micron & length up to 6mm, mixing fibre@125grams per 50kg of cement in cement mortar, including providing and mixing 50kg of cement in cement mortar, including providing and mixing water proofing material in mortar@ 1kg per 50kg of cement.	23.54	Sq m	PM ²		Rs.0.00

17L	Brick work with bricks of class designation 100A in foundations and plinth in:- Cement mortar 1:4 (1 Cement : 4 coarse sand).	5.12	cum	P/M ³		Rs.0.00
17M	Brick work with bricks of class designation 100A in foundations and plinth in:- Cement mortar 1:6 (1 Cement : 6 coarse sand).	26.56	cum	P/M ³		Rs.0.00
17N	12mm cement plaster of mix : from inside 1:4 (1 cement : 4 fine sand).	147.27	Sq m	PM ²		Rs.0.00
17O	12mm cement plaster of mix : outer side 1:4 (1 Cement : 4 fine sand).	91.62	Sq m	PM ²		Rs.0.00
17P	Providing and fixing paneled or paneled and glazed shutters for doors, windows and clerestory windows, including black enameled MS Butt hinges with necessary screws excluding paneling which will be paid for separately:-35mm thick.	9.63	Sq m	PM ²		Rs.0.00
17Q	Providing and fixing paneled or paneled and glazed shutters for doors, windows and clerestory windows, including black enameled MS Butt hinges with necessary screws excluding paneling which will be paid for separately:-35mm thick.	7.7	Sq m	PM ²		Rs.0.00
17R	Providing and fixing T-iron frames doors, windows and ventilators of mild steel Tee-sections, joints mitered and welded, 15x3mm lugs 10cm long embedded in cement blocks 15x10x10cm of 1:3:6 (1 cement : 3 coarse sand : 6 graded stone aggregate 20mm nominal size) or with wooden plugs and screws or raw plugs and screws or with fixing clips or with bolts and nuts as required including.	146.83	Kg	PKg		Rs.0.00
17S	Distempering with oil bound washable distemper of approved brand and manufacture to give an even shade:- New work (two or more coats) over and including priming coat with cement primer.	147.27	Sq m	PM ²		Rs.0.00
17T	finishing walls with textured exterior paint of required shade:- New work (two or more coats applied @3.28 liter/10sqm) over and including priming coat of exterior primer applied @2.20kg/10sqm.	91.62	Sq m	PM ²		Rs.0.00
17U	Providing lighting arrangement both inside & outside the Staff quarter including fitting & fixing tube lights, bulb points, fan of usha/khetan or suitable make inside as well as outside with all necessary electrical power wiring with suitable PVC sheathed copper conductor of ISI mark as per direction of E/I.	1	Job	Each		Rs.0.00
17V	Providing plumbing arrangement of Staff quarter including fitting & fixing all pan, wash basin, kitchen sink with all fixtures necessary with suitable GI pipe	1	Job	Each		Rs.0.00

	and specials of ISI mark as per direction of E/I.					
	<u>Total of Item 17</u>	<u>2</u>	<u>No.</u>	<u>Each</u>	<u>Rs</u> <u>.0.</u> <u>00</u>	<u>Rs.0.00</u>
<u>18</u>	CLEAR WATER PUMPING MAIN	-	-	-	- -	-
18A	Supplying tools and cutting road as well restoring the same as per specifications and direction of Engineer-in-charge.					
	For Bituminous Road	126	Sq m	P/M2		Rs.0.00
	For WBM Road	189	Sq m	P/M2		Rs.0.00
18B	Earthwork in excavation in foundation trenches or drain (not exceeding 1.5 m in width or 10 sq.m. on plan including dressing of sides and ramming of bottoms lift upto 1.5 m, including getting out the excavated soil and disposal of surplus excavated soil as directed, within a lead of 50 m					
		1170.07	cum	P/M ³		Rs.0.00
18C	Filling available excavated earth (excluding rocks) in trenches, plinth, sides of foundations etc. in layers not exceeding 20 cm in depth, consolidation each desposited layer by ramming and watering, lead up to 50 m and lift upto 1.5 m.					
		702.04	cum	P/M ³		Rs.0.00
18D	Supplying and Filling in plinth with local sand and under floors including, watering, ramming consolidating and dressing complete.					
		234.01	cum	P/M ³		Rs.0.00

18E	Providing and laying S&S Centrifugally Cast (Spun) / Ductile iron Pipes conforming to IS : 8329 : K-9 (Including Supplying tools and cutting road as well restoring the same, Earthwork in excavation, Filling available excavated earth						
	for 250mm	30	M	P/M			Rs.0.00
	for 600mm	600	M	P/M			Rs.0.00
	Non return valve						
	for 250mm	2	No.	Each			Rs.0.00
	for 600mm	6	No.	Each			Rs.0.00
18F	Providing and fixing C.I. sluice valves (with cap) complete with bolts, nuts, rubber insertion etc all complete.						
	for 250mm	1	No.	Each			Rs.0.00
	for 600mm	1	No.	Each			Rs.0.00
18G	Providing and fixing C.I. scour valves all complete.						
	for 250mm	1	No.	Each			Rs.0.00
	for 600mm	1	No.	Each			Rs.0.00
18H	Providing and fixing Air valves all complete.						
	80 mm dia	1	No.	Each			Rs.0.00
	100 mm dia	1	No.	Each			Rs.0.00
18I	Supplying materials and labour and construction of Sluice Valve Chamber having 250 mm thick wall in cement mortar (1:4) including 12 mm cement plaster (1:3) with punning inside, RCC cover slab with CI						

	surface cover of 100 mm dia including earth work, B/F/soling, PCC (1:2:4) in foundation refilling etc. all complete work 3as per specification and direction of E.I.						
	Type I for pipe dia. in 200 to 350 mm (	1	No.	Each			Rs.0.00
	1.2M x 1.2M x 1.2M deep)						
	Type II for pipe dia. in 400 to 600 mm (	1	No.	Each			Rs.0.00
	1.5M x 1.5M x 1.5M deep)						
18J	Woltman Turbine Bulk Meters: Supply of Woltan Turbine Bulk meters class as per multijet, magnetically coupled as per specifications conforming to is 770/1994, ISO 4064/1 and EEC approved, including transportation to site, storage, safety, installation, testing, commissioning, making connections with existing pipeline, including excavation at site, completion of installation as per specifications and drawings including all taxes.						
	600 mm pipe dia	4	No.	Each			Rs.0.00
	250 mm pipe dia	2	No.	Each			Rs.0.00
	<u>Total of Item 18</u>	<u>1</u>	<u>No.</u>	<u>Each</u>	<u>Rs</u>	<u>.0.</u>	<u>Rs.0.00</u>
					<u>00</u>		
<u>19</u>	CLEAR WATER GRAVITY MAIN	-	-	-	-	-	-
19A	Supplying tools and cutting road as well restoring the same as per specifications and direction of Engineer-in-charge.						
	For Bituminous Road	2402.4	Sq m	P/M2			Rs.0.00

	For WBM Road	2603.6	Sq m	P/M2			Rs.0.00
19B	Earthwork in excavation in foundation trenches or drain (not exceeding 1.5 m in width or 10 sq.m. on plan including dressing of sides and ramming of bottoms lift upto 1.5 m, including getting out the excavated soil and disposal of surplus excavated soil as directed, within a lead of 50 m						
		17985	cum	P/M ³			Rs.0.00
19C	Filling available excavated earth (excluding rocks) in trenches, plinth, sides of foundations etc. in layers not exceeding 20 cm in depth, consolidation each desposited layer by ramming and watering, leadup to 50 m and lift upto 1.5 m.						
		10790.85	cum	P/M ³			Rs.0.00
19D	Supplying and Filling in plinth with local sand and under floors including, watering, ramming consolidating and dressing complete.						
		3596.95	cum	P/M ³			Rs.0.00
19E	Providing and laying S&S Centrifugally Cast (Spun) / Ductile iron Pipes conforming to IS : 8329 : K-9						
	for 250mm	1608	No.	Each			Rs.0.00
	for 300mm	1590	No.	Each			Rs.0.00
	for 350mm	3997	No.	Each			Rs.0.00
	for 450mm	396	No.	Each			Rs.0.00
	for 500mm	664	No.	Each			Rs.0.00
	for 600mm	1576	No.	Each			Rs.0.00
	for 700mm	435	No.	Each			Rs.0.00
	for 750mm	1746	No.	Each			Rs.0.00

19F	Non return valve						
	for 250mm	4	No.	Each			Rs.0.00
	for 300mm	3	No.	Each			Rs.0.00
	for 350mm	3	No.	Each			Rs.0.00
	for 450mm	4	No.	Each			Rs.0.00
	for 500mm	5	No.	Each			Rs.0.00
	for 600mm	4	No.	Each			Rs.0.00
	for 700mm	5	No.	Each			Rs.0.00
	for 750mm	6	No.	Each			Rs.0.00
19G	Providing and fixing C.I. sluice valves (with cap) complete with bolts, nuts, rubber insertion etc all complete.						
	for 250mm	1	No.	Each			Rs.0.00
	for 300mm	1	No.	Each			Rs.0.00
	for 350mm	1	No.	Each			Rs.0.00
	for 450mm	1	No.	Each			Rs.0.00
	for 500mm	1	No.	Each			Rs.0.00
	for 600mm	1	No.	Each			Rs.0.00
	for 700mm	1	No.	Each			Rs.0.00
	for 750mm	1	No.	Each			Rs.0.00
19H	Providing and fixing C.I. scour valves all complete.						
	for 250mm	1	No.	Each			Rs.0.00

	for 300mm	1	No.	Each			Rs.0.00
	for 350mm	1	No.	Each			Rs.0.00
	for 450mm	1	No.	Each			Rs.0.00
	for 500mm	1	No.	Each			Rs.0.00
	for 600mm	1	No.	Each			Rs.0.00
	for 700mm	1	No.	Each			Rs.0.00
	for 750mm	1	No.	Each			Rs.0.00
19I	Providing and fixing Air valves all complete.						
	80 mm dia	2	No.	Each			Rs.0.00
	100 mm dia	2	No.	Each			Rs.0.00
	150MM DIA	3	No.	Each			Rs.0.00
19J	Supplying materials and labour and construction of Sluice Valve Chamber having 250 mm thick wall in cement mortar (1:4) including 12 mm cement plaster (1:3) with punning inside, RCC cover slab with CI surface cover of 100 mm dia including earth work, B/F/soling, PCC (1:2:4) in foundation refilling etc. all complete work 3as per specification and direction of E/I.						
	Type I for pipe dia. in 200 to 350 mm (	3	No.	Each			Rs.0.00
	1.2M x 1.2M x 1.2M deep)						
	Type II for pipe dia. in 400 to 750 mm (	5	No.	Each			Rs.0.00
	1.5M x 1.5M x 1.5M deep)						

19K	Woltman Turbine Bulk Meters: Supply of Woltan Turbine Bulk meters class as per multijet, magnetically coupled as per specifications conforming to is 770/1994, ISO 4064/1 and EEC approved, including transportation to site, storage, safety, installation, testing, commissioning, making connections with existing pipeline, including excavation at site, completion of installation as per specifications and drawings including all taxes.						
	for 250mm	6	No.	Each			Rs.0.00
	for 300mm	1	No.	Each			Rs.0.00
	for 350mm	2	No.	Each			Rs.0.00
	for 450mm	1	No.	Each			Rs.0.00
	for 500mm	2	No.	Each			Rs.0.00
	for 600mm	1	No.	Each			Rs.0.00
	for 700mm	2	No.	Each			Rs.0.00
	for 750mm	1	No.	Each			Rs.0.00
	<u>Total of Item 19</u>	<u>1</u>	<u>No.</u>	<u>Each</u>	<u>Rs</u>	<u>.0.</u> <u>00</u>	<u>Rs.0.00</u>

20	<p>Supplying all materials including pipes, specials and valves, labors, tools and tackles etc. for laying of different types and sizes of centrifugally cast iron Class LA/DI Class K-7/ DI Class K-9 pressure pipes conforming to IS : 1536/1989 (Third revision) with amendment no 1 & 2 in standard length in trenches including earth work in excavation in all kind of soil so as to give one meter average cover over the socket of pipe with disposal of excavated earth within initial lead and lift including all types of road cutting and restoring the same and providing necessary masonry pillars of required size and shape for crossing the pipes in ditches etc, as required and cost of rubber gasket (conforming to IS: 5382/1969) and making gasket joints and providing necessary Sluice Valve of required size conforming to IS 2906-1980 and IS 780-1980 of IN 1.0 with ISI certification mark and fixing in trenches with a pair of tail pieces, including the cost of sluice valve and tail pieces, making lead caulked joints and flanged joint as per IS Specification, including supplying all jointing materials (pig lead conforming to ISS 782-1978; yarn conforming to ISS 6587-1972 nuts & bolts conforming to ISS 1364-1983) including drilling holes in flanges if required and incidental charges also providing and laying CI specials of required size conforming to IS : 9523 and suitable Air valves with its all accessories etc. whereas required all complete job as per direction of E/I including all taxes, duties and incidental charges providing necessary thrust block where as required, construction of masonry chamber for valves with cost of construction materials and earth work in back filling the trenches after laying of different types and sizes of pipe, specials and valves with earth removed during excavation within initial lead and lift etc. including providing night guard, barrier and red light to safe guard against accident, testing of laid pipes against 60 M water head, disinfection of laid pipe with water containing bleaching powder @0.5gm/l etc. all complete job as per specification and direction of E/I. Rates should be quoted seperattely against outlined in subsections.</p>					
----	---	--	--	--	--	--

Supplying all materials including pipes, specials, labors, tools and tackles etc. for laying of different types and sizes of centrifugally cast iron Class LA/DI Class K-7/ DI Class K-9 pressure pipes conforming to IS : 1536/1989 (Third revision) with amendment no 1 & 2 in standard length in trenches including earth work in excavation in all kind of soil so as to give one meter average cover over the socket of pipe with disposal of excavated earth within initial lead and lift, filling the trenches after laying of different type and size of pipe and specials, providing thrust block where as required, testing of lead pipe, disinfection etc all complete as per direction of E/I excluding sluice valves and air valves with their chamber, trenchless piping if any and cutting of PCC road and restoring the same.						
B. Distribution Network						
(i) 100 mm dia CI class LA (in mtrs.)						
Zone 1	11766	M	Per M			
Zone 3	21253	M	Per M			
Zone 4	13498	M	Per M			
Total	46517	M	Per M			Rs.0.00
(i) 150 mm dia CI class LA (in mtrs.)						
Zone 1	4847	M	Per M			
Zone 3	4050	M	Per M			
Zone 4	9593	M	Per M			
Total	18490	M	Per M			Rs.0.00
(i) 200 mm dia CI class LA (in mtrs.)						
Zone 1	2192	M	Per M			
Zone 3	4190	M	Per M			
Zone 4	1269	M	Per M			
Total	7651	M	Per M			Rs.0.00
(i) 250 mm dia CI class LA (in mtrs.)						
Zone 1	1865	M	Per M			

	Zone 3	1452	M	Per M			
	Zone 4	352	M	Per M			
	Total	3669	M	Per M			Rs.0.00
	(i) 300 mm dia CI class LA (in mtrs.)						
	Zone 1	381	M	Per M			
	Zone 3	879	M	Per M			
	Zone 4	264	M	Per M			
	Total	1524	M	Per M			Rs.0.00
	(i) 350 mm dia CI class LA (in mtrs.)						
	Zone 1	264	M	Per M			
	Zone 3	0	M	Per M			
	Zone 4	0	M	Per M			
	Total	264	M	Per M			Rs.0.00
	(i) 400 mm dia CI class LA (in mtrs.)						
	Zone 1	0	M	Per M			
	Zone 3	62	M	Per M			
	Zone 4	0	M	Per M			
	Total	62	M	Per M			Rs.0.00
20B	Providing and fixing CI Sluice valves (with cap) Complete with bolts, nuts, rubber insertions etc with 120x 120x100mm brick masonry chamber with cement mortar 1:4 (1 Cement:4 coarse sand) for sluice valve, with CI Surface box 100mm top diameter, 160mm bottom diameter and 180mm deep (inside)with chained lid and RCC top slab 1:2:4 mix (1 Cement :2 Coarse sand: 4 graded stone aggregate 20mm nominal size), I/C necessary excavation foundation concrete 1:5:10 (1 Cement:5 fine sand : 10 graded stone aggregate 40mm nominal size) and inside plastering with cement mortar 1:3 (1 Cement:3 Coarse sand) 12mm thick, finished with a floating coat of neat cement.						

	(i) 100 mm dia	15	No	Each			Rs.0.00
	(ii) 150 mm dia	6	No	Each			Rs.0.00
	(iii) 200 mm dia	2	No	Each			Rs.0.00
	(iv) 250 mm dia	1	No	Each			Rs.0.00
	(v) 300 mm dia	0	No	Each			Rs.0.00
	(vi) 400 mm dia	0	No	Each			Rs.0.00
20C	Providing and fixing double acting air valves of approved quality Complete with bolts, nuts, rubber insertions etc with masonry chamber 60 x 60 x 75cm inside in brick work in cement mortar 1:4 (1 Cement:4 coarse sand) for sluice valve, with CI Surface box 350x350mm top, 165mm bottom diameter and 180mm deep (inside)with chained lid and RCC top slab 1:2:4 mix (1 Cement :2 Coarse sand: 4 graded stone aggregate 20mm nominal size), I/C necessary excavation foundation concrete 1:5:10 (1 Cement:5 fine sand : 10 graded stone aggregate 40mm nominal size) and inside plastering with cement mortar 1:3 (1 Cement:3 Coars sand) 12mm thick, finished with a floating coat of neat cement complete as per standard design.						
	50 mm dia	24					
	(i) 80 mm dia	1	No	Each			Rs.0.00
	(ii) 100 mm dia	0	No	Each			Rs.0.00
20D	Demolishing Cement concrete pavement manually or by mechanical means including disposal of materials within 50m lead and restoring the same with PCC (1:2:4) including all materials, labour, tools & tackle, carriage of all materials and centering shuttring etc all as per direction of E/I.	3135.67	cum	P/M ³			Rs.0.00
20E	Providing and fixing spindle fire hydrant with 65 mm outlet complete with bolts, nuts & rubber insertion etc all complete as per direction of E/I.	30	No	Each			Rs.0.00
20F	Providing and fixing Scour Valve						
	(i) 100 mm dia	15	No	Each			Rs.0.00
	(ii) 150 mm dia	6	No	Each			Rs.0.00
	(iii) 200 mm dia	2	No	Each			Rs.0.00
	(iv) 250 mm dia	1	No	Each			Rs.0.00
	(v) 300 mm dia	0	No	Each			Rs.0.00
	(vi) 400 mm dia	0	No	Each			Rs.0.00

20G	Woltman Turbine Bulk Meters: Supply of Woltan Turbine Bulk meters class as per multijet, magnetically coupled as per specifications conforming to is 770/1994, ISO 4064/1 and EEC approved, including transportation to site, storage, safety, installation, testing, commissioning, making connections with existing pipeline, including excavation at site, completion of installation as per specifications and drawings including all taxes.					
	(i) 100 mm dia	16	No	Each		Rs.0.00
	(ii) 150 mm dia	12	No	Each		Rs.0.00
	(iii) 200 mm dia	11	No	Each		Rs.0.00
	(iv) 250 mm dia	7	No	Each		Rs.0.00
	(v) 300 mm dia	6	No	Each		Rs.0.00
	350 mm dia	2				Rs.0.00
	(vi) 400 mm dia	1	No	Each		Rs.0.00
	<u>Total of Item 20</u>	<u>1</u>	<u>No.</u>	<u>Each</u>	<u>Rs</u> <u>.0.</u> <u>00</u>	<u>Rs.0.00</u>
21	House service connection with 15mm dia GI pipe including water meter with HDPE box including fitting and fixing specials such as ferrul, stop cock, bib cock etc all complete as per direction of E/I.					
21A	Providing and fixing 15 mm GI pipes complete with GI fittings including trenching and refilling etc. all complete as per direction of E/I	125100	M	PerM		Rs.0.00
21B	Providing and fixing GI union, Brass ferrule, CP brass bib cock, brass stop cock, making hole in wall if any, domestic water meter with HDPE box, dry die, inferential type, Multi Jet, Magnetically coupled, class B water meter compete with tubular strainer, brass nuts and nipples conforming to IS 779:1994 standard with protection class of IP68 and marked in metric system, along with manufacturer certificate & warranty card including cost of a material and labor.	8340	No.	Each		Rs.0.00
	<u>Total of Item 21</u>	<u>1</u>	<u>No.</u>	<u>Each</u>	<u>Rs</u> <u>.0.</u> <u>00</u>	<u>Rs.0.00</u>
22	<u>ELECTRO MECHANICAL WORK</u>	-	-	-	-	-

	Supplying and installation of 63 KVA -11000/433 Volt transformer Continuously rated for 3 phase, 50 Hz, full load and temperature rise not exceeding 450C by thermometer in oil and 500C by the resistance in winding after continuous run at full load rating, the transformer should have oil immersed winding having vector group-DY 11, HT side connected in delta and LT side connected in star with neutral brought out connected to provide separate earthing. The transformer shall have Power Terminal arrangement; bushing out HT side and cable end box suitable to connect specific cables on LT side with standard fitting 2 nos. of channels with stoppers shall be provided and fixed on the Plinth or on pole for mounting of Transformers, AB Switch, DP structure, insulator, earthing, cabling, cost of supplying cable and providing electric HT line connection up to proposed transformer including cost paid to BSPDCL excluding supervision and security charge of BSPDCL etc. all complete as per direction of E/I.					
	DTW 500 kVA	2	Set	Each		Rs.0.00
	CLEAR WATER PUMP 500 KVA	2	Set	Each		Rs.0.00
	CLEAR WATER PUMP 200 KVA	4	Set	Each		Rs.0.00
	IPS - I 63 kVA	2	Set	Each		Rs.0.00
	IPS - II 63 kVA	2	Set	Each		Rs.0.00
	IPS - III 63 KVA	2	Set	Each		Rs.0.00
	<u>Total of Item 22</u>	<u>8</u>	<u>Set</u>	<u>Set</u>	<u>Rs</u> <u>.0.</u> <u>00</u>	<u>Rs.0.00</u>
23	Design and building of scada system for water supply scheme including supply and installation of all electromegnetic flow meter ,ultrasonic level measuring device ,hydrastatic level measuring device,necessery software and computer system all complete as per direction of E/I	1	Set.	Set		Rs.0.00
	<u>Total of Item 23</u>	<u>8</u>	<u>Set</u>	<u>Set</u>	<u>Rs</u> <u>.0.</u> <u>00</u>	<u>Rs.0.00</u>

24	Site development including providing local sand filling as required and brick flat soling within all premises etc all complete job as per direction of E/I	7200	M ²	P/M ²			Rs.0.00
	<u>Total of Item 24</u>	<u>1</u>	<u>No.</u>	<u>Each</u>	<u>Rs</u>	<u>.0.</u> <u>00</u>	<u>Rs.0.00</u>
25	Supplying fitting and fixing D/F Pipes, short pieces & specials conforming to IS 7181:1986 at site with all taxes, carriage including earth work in excavation up to required depth, including all types of road cutting & re-storing the same after laying etc all complete as per direction of E/I	25000	kg	Pkg			Rs.0.00
	<u>Total of Item 25</u>	<u>1</u>	<u>No.</u>	<u>Each</u>	<u>Rs</u>	<u>.0.</u> <u>00</u>	<u>Rs.0.00</u>
26	Installation of Electronically Regulated Doser type chlorinator using Sodium Hypochlorite (Naocl) 200ltr	1	kg	Pkg			Rs.0.00
	<u>Total of Item 26</u>	<u>1</u>	<u>No.</u>	<u>Each</u>	<u>Rs</u>	<u>.0.</u> <u>00</u>	<u>Rs.0.00</u>
Total for project capital cost (in Figure)							Rs.0.00
26	WORKS RELATED WITH OPERATION AND MAINTENANCE OF ALL COMPONENT with rate of Fixed 2% of project capital cost for each 12 calendar months.						
	Deployment of manpower, supply of all chemicals, checking of status of supply in fed up area, repairing of leakages, maintaining log book at all pumping stations, submission of daily / weekly / monthly and yearly report of water quality, tested by district laboratories, replacing the damaged parts of any machinery / the machinery as a whole, annual / bi-annual maintenance of all built-up / installed civil/mechanical/electrical structures / units under the scheme , including round-the clock watch & ward for 60 calendar months from the date of completion of trial run (excluding energy charges)						
	O & M cost for the first 12 calendar months	1	job	Each	Rs.	0.0 0	Rs.0.00
	O & M cost for the Second 12 calendar months	1	job	Each	Rs.	0.0 0	Rs.0.00
	O & M cost for the Third 12 calendar months	1	job	Each	Rs.	0.0 0	Rs.0.00

	O & M cost for the Fourth 12 calendar months	1	job	Each	Rs. 0.0 0	Rs.0.00
	O & M cost for the Fifth 12 calendar months	1	job	Each	Rs. 0.0 0	Rs.0.00
Total Amount for O&M in Figure						Rs. 0.00
	Total Amount for the Complete Project in Figure					Rs. 0.00
	Total Amount for the Complete Project in Figure					

B. BID FORM

(Bidders are required to fill the rates in the Financial Bid Sheet attached separately in volume II)

SECTION 8

SECURITIES AND OTHER FORMS

(TO BE FILLED BY BIDDER/EMPLOYER)

BID SECURITY (BANK GUARANTEE UNCONDITIONAL)

WHEREAS, _____ [name of Bidder] (hereinafter called "the Bidder") has submitted his Bid dated _____ [date] for the construction of _____ [name of Contract hereinafter called "the Bid"].

KNOW ALL PEOPLE by these presents that We

[name of Bank] of _____ [name of country] having our registered office at

_____ (hereinafter called "the Bank") are bound unto _____ [name of Employer] (hereinafter called "the Employer") in the sum of _____ *for which payment well and truly to be made to the said Employer by the Bank itself, his successors and assigns by these presents.

Sealed with the Common seal of the said Bank this _____ day of _____ 20 _____

THE CONDITIONS of the obligation are:

(1) If after Bid opening the Bidder withdraws his bid during the period of Bid validity specified in the Form of Bid;

OR

(2) If the Bidder having been notified to the acceptance of his bid by the Employer during the period of Bid validity:

- (a) fails or refuses to execute the Form of Agreement in accordance with the Instructions to Bidders, if required or
- (b) fails or refuses to furnish the Performance Security in accordance with the Instruction to Bidders: or
- (c) does not accept the corrections of the Bid Price pursuant to Concerned Clause

We undertake to pay to the Employer up to the above amount upon receipt of his first written demand, without the Employer having to substantiate his demand, provided that in his demand the Employer will note that the amount claimed by him as due to him owing to the occurrence of one or any of the three conditions, (specifying the occurred condition or conditions).

This Guarantee will remain in force up to and including the date _____**days after the deadline for submission of Bids as such deadline is stated in the Instructions to Bidders or as it may be extended by the Employer, notice of which extension(s) to the Bank is hereby waived. Any demand in respect of this guarantee should reach the Bank not later than the above date.

DATE_____

SIGNATURE_____

WITNESS _____

SEAL_____

[Signature, name and address]

* The Bidder should insert the amount of the guarantee in words and figures denominated in Indian Rupees . This figure should be the same as shown in Concerned Clause of the Instructions to Bidders.

** 45 days after the end of the validity period of the Bid. Date should be inserted by the Employer before the Bidding documents are issued.

PERFORMANCE BANK GUARANTEE

To

_____ [name of Employer]

_____ [address of Employer]

WHEREAS _____ [name and address of Contractor]

(here after called the Contractor'') has undertaken, in pursuance of Contract No. _____ dated _____ to execute _____ [name of Contract and brief description of Works] (hereinafter called "the Contract").

AND WHEREAS it has been stipulated by you in the said Contract that the Contractor shall furnish you with a Bank Guarantee by a recognized bank for the sum specified therein as security for compliance with his obligation in accordance with the Contract;

AND WHEREAS we have agreed to give the Contractor such a Bank Guarantee:

NOW THEREFORE we have hereby affirm that we are the Guarantor and responsible to you on behalf of the Contractor, up to a total of _____ [amount of guarantee]* _____ (in words), such sum being payable in the types and proportions of currencies in which the Contract Price is payable, and we undertake to pay you, upon your first written demand and without cavil or argument, any sum or sums within the limits of _____ [amount of guarantee] as aforesaid without your needing to prove or to show grounds or reasons for your demand for the sum specified therein.

We hereby waive the necessity of your demanding the said debt from the contractor before presentation us with the demand.

We further agree that no change or addition to or other modification of the terms of the Contract or of the Works to be performed there under or of any of the Contract documents which may be made between you and the Contractor shall in any way release us from any liability under this guarantee, and we hereby waive notice of any such change, addition or modification.

This guarantee shall be valid until 28 days from the date of expiry of the Defect Liability Period.

Signature and Seal of the guarantor _____

Name of Bank _____

Address _____

Date _____

* An amount shall be inserted by the Guarantor, representing the percentage the Contract Price specified in the Contract including additional security for unbalanced Bids, if any and denominated in India Rupees.

LETTER OF ACCEPTANCE

(Letterhead paper of the Employer)

_____(Date)

To

[Name and address of the Contractor]

Dear Sirs,

This is to notify you that your Bid dated _____ for execution of the _____ (name of the contractor and identification number, as given in the Instructions to Bidders) for the Contract Price of Rupees _____ (_____) (amount in words and figures), as corrected and modified in accordance with the Instructions to Bidders is hereby accepted by our agency.

You are hereby requested to furnish Performance Security, in the form detailed in Para 34.1 of ITB for an amount equivalent to Rs. _____ within 21 days of the receipt of this letter of acceptance valid up to 28 days from the date of expiry of defects Liability Period i.e. up to _____ and sign the contract, failing which action as stated in Para 34.3 of ITB will be taken.

Yours faithfully

Authorized Signature
Name and title of Signatory
Name of Agency

ISSUE OF NOTICE TO PROCEED WITH THE WORK

(Letterhead of the Employer)

_____(Date)

To

_____(Name and address of the Contractor)

Dear Sirs,

Pursuant to your furnishing the requisite security as stipulated in ITB Clause 34.1 and signing of the
Contract for the construction of

_____ at a Bid Price of

Rs. _____

You are hereby instructed to proceed with the execution of the said works in accordance with the contract documents.

Yours faithfully,

(Signature, name and title of signatory authorized

To sign on behalf of Employer)

AGREEMENT FORM

Agreement

This agreement, made the _____ day of _____ between _____ (name and address of Employer) [hereinafter called “the (name and address of contractor) hereinafter called “ the Contractor” of the other part.]

Whereas the Employer is desirous that the Contractor execute

_____ (name and identification number of Contract) (Hereinafter called “the Works”) and the Employer has accepted the Bid by the Contractor for the execution and completion of such works and the remedying of _____ any _____ defects therein, at a cost of Rs. _____

NOW THIS AGREEMENT WITNESSETH as follows:

1. In this Agreement, words and expression shall have the same meanings as are respectively assigned to them in the conditions of contract hereinafter referred to and they shall be deemed to from and be read and construed as part of this Agreement.

2. In consideration of the payments to be made by the Employer to the Contractor as hereinafter mentioned, the Contractor hereby covenants with the Employer to execute and complete the works and remedy any defects therein in conformity in all aspects with the provisions of the contract.

3. The Employer hereby covenants to pay the Contractor in consideration of the Execution and completion of the Works and the remedying the defects wherein Contract Price or such other sum as may become payable under the provisions of the Contract at the times and in the manner prescribed by the Contract.

4. The following documents shall be deemed to form and be ready and construed as part of this Agreement viz.

- (i) Letter of Acceptance
- (ii) Notice to proceed with the works
- (iii) Contractor’s Bid
- (iv) Condition of Contract: General and Special
- (v) Contract Data
- (vi) Additional condition
- (vii) Drawings
- (viii) Bill of Quantities and
- (ix) Any other documents listed in the Contract Data as forming part of the Contract.

In witnessed whereof the parties there to have caused this Agreement to be executed the day and year first before written.

The _____ Common _____ Seal
of _____ was
hereunto affixed in the presence of :
Signed, _____ Sealed _____ and _____ Delivered _____ by _____ the _____ said

_____ in the presence of :
Binding _____ Signature _____ of _____ Employer

Binding _____ Signature _____ of _____ Contractor

Undertaking

I, the undersigned do hereby undertake that our firm M/s _____ agree to abide by this bid for a period _____ days for the date fixed for receiving the same and it shall be binding on us and may be accepted at any time before the expiration of that period.

(Signed by an Authorised Officer of the Firm)

Title of Officer _____

Name of Firm

Date

SECTION 9 DRAWINGS

SECTION 10
(DOCUMENTS TO BE FURNISHED BY BIDDER)