

OFFICE OF THE COUNCILLORS

RAMPURHAT MUNICIPALITY **RAMPURHAT , BIRBHUM**

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(2nd Call)

Memo No.525/RM/DEV/PWD

Dated:- 12.11.2021

BID NO: WBUDMAD/RM/eNIT-01(2nd Call) of 2021-22

On behalf of Board of Councilor, e-Bid is hereby invited by the **Chairperson**, Rampurhat Municipality, , Rampurhat , Birbhumi on **Turnkey Basis** (Two part System) from reliable and resourceful Companies/Firms/Contractors having experience and acumen in construction work together with the eligibility and other criteria's as depicted hereunder for participating in the Bid.

1. Name of Work: Surveying, Design, execution and commissioning for Augmentation and Rejuvenation work of Rampurhat Water Supply Scheme including Sinking of 4 (Four) No. Deep Tube Wells for extraction of minimum 8000 GPH Yield per DTW water with installation of submersible pump motor units, HSC Centrifugal Pumps Units , Valves , Specials , Fittings , pump house ,switch room, construction of pumping station with illumination works and with installation of pump motor units as to be required & construction of CWR of 400 M³ and all Civil & Electro-Mechanical works, with rising main 80 mm G.I from Tube Wells to CWR & K9 DI 300 mm from CWR to OHR as to be required for the works at Jhanjhanian site within Rampurhat Municipal area (including 3 months trial run and necessary training of maintenance staff & thereafter (subsequently) 1 (one) year operation and maintenance of the Scheme) on Turnkey Basis.
2. Location of Work: Jhanjhanian , Ward No.- 2 , P.S: Rampurhat, Dist: Birbhumi
3. Eligibility to participate in the Bid Having experience and technical acumen in Executing Civil & Electro-mechanical works of 30 % of similar nature of Works and value should not be less than less than Rs. 60.00 (eighty) Lakh during for last five financial years in any Govt. Dept. /Board/Semi Govt./Corporation/Statutory Authority/Undertaking etc.

AND

Having sufficient qualified technical personnel (to be employed under the firm for at least 2 consecutive years) with sound knowledge and experience in execution.

AND

Eligibility criteria for participation in tender:

1. **Requirement of Credentials:(Credential should satisfy both Civil & Electrical part separately)**

Intending tenderers should produce credentials of a similar nature of Completed the clear water reservoir/Overhead reservoir of capacity 120 cum minimum and electro mechanical work like installation pumping machinery and allied control panel in single contract or separate and value should not be less than Rs. 60.00 (Sixty) Lakh in combination if it is separate rate during 5 (*five*) years prior to the date of issue of the tender notice; or,

Intending tenderers should produce credentials of 2 (*two*) similar nature of completed work, clear water reservoir/Overhead reservoir of capacity 100 cum minimum and electro mechanical work like installation pumping machinery and allied control panel in single contract or separate and value should not be less than Rs. 60.00 (*sixty*) Lakh each in combination with electro mechanical during 5 (*five*) years prior to the date of issue of the tender notice; or,

Intending tenderers should produce credentials of running work of similar nature which has been completed to the extent of 75% (*eighty percent*) in single or separate contract and completed capacity of Clear water reservoir/Overhead Reservoir should not be less than 150 cum alongwith electro mechanical work like pumping machinery and allied Control panel and executed value not less than Rs. 80.00 (*eighty*) Lakh

In case of running works, only those tenderers who will submit the certificate of satisfactory running work from the concerned Executive Engineer, or equivalent competent authority will be eligible for the tender. In the required certificate it should be clearly stated that the work is in progress satisfactorily and also that no penal action has been initiated against the executed agency, i.e., the tenderer.

Annual Turn Over – Rs. 1.00 (one) crore in any of the last five Financial Year

(i.e. 2016-2017, 2017-2018, 2018-2019, 2019-2020 & 2020-2021).

Bank solvency Certificate not less than 0.75 (zero point seven five) crore and it should be issued not before 01.04.2021.

Note: Bidder intending to participate in more than one work shall have to furnish credential for summation of amount put to tender for those works of cumulative amount. The Available Turn over and Bank Solvency should also be cumulative for multiple works.

AND

Having valid electrical license with electrical Supervisor, GST, P. Tax, PAN Card Certificate etc.

Note:

b) Producing P.F & E.S.I Registration with bid proposal is mandatory however successful bidder have to produce said certificates before agreement.

4. Documents to be produced in support of Credential for Bid
- A successful performance and completion certificate supplemented with work order issued by the competent authority shall have to be furnished in support of credibility in terms with eligibility criteria depicted in this Notice (**Ref: Sl. No. 3 :Eligibility to participate in the Bid**). Besides this, following documents shall have to be furnished:
- Particulars of ownership/partnership or Board of Directors pertaining to the Organization/Company/Firm
 - Copies of valid P.Tax, PAN Card, GST, P.F & E.S.I Registration Certificates, Electrical Supervisory license Certificate with relevant part.
 - Bank solvency Certificate not less than 0.75 cores and
 - Valid documents in support of annual Turnover.
 - List of machines & electro-mechanical equipments necessary for field as well as laboratory test for all materials.
 - List of Technical Personnel employed under the organization in details with names, qualification, experience and address with contact number. Corresponding address, fax & telephone nos. Contract mobile no. & Email no. of the Organization.
- All documents in original to be produced in due course of time as & when asked by the Tender Inviting Authority**
5. Earnest Money
- 2% of the Quoted Bid price in two parts, vise
- Rs. 3,00,000.00 (Rupees Three Lakh only) as an initial Earnest Money Deposit shall accompany with Bid Proposal through on line banking by NEFT / RTGS in favour of the "Chairperson, Rampurhat Municipality," payable at **Rampurhat**.
 - Balance Earnest Money Deposit beyond Rs.3, 00,000.00 (if any) shall be deposited after acceptance of Bid Proposal.

6. Date and Time Schedule :-

Sl. No.	Particulars	Date and Time
a)	Date of uploading of N.I.T.	13/11/2021 at 9.00 A.M
b)	Documents download (Online)	13/11/2021 from 9.00 A.M
c)	Bid submission start date (On line)	13/11/2021 from 9.00 A.M
d)	Bid Submission closing (On line)	16/12/2021 at 3.00 P.M
e)	Pre bid Meeting Date at the Office of the Superintending Engineer , West Circle , Patalbazar , 3 rd . F , Purbabardhamn.	24/12/2021 at 3.00 P.M
f)	Bid opening date for Technical Proposals (Online)	18/12/2021 at 4.00 P.M
g)	Date of uploading list for Technically Qualified Tenderers (online)	To be notified Later.
h)	Date and Place for opening of Financial Proposal (Online)	To be notified during uploading of Technical Evaluation Sheet of Tenderers

i)	Authority who recommend the Prequalification of Tenderer	Tender will be checked for Pre-Qualification mentioned in point 'A(b)' of this table by the Superintending Engineer, West Circle, Municipal Engineering Directorate, Burdwan
j)	Work order issuing authority	The Chairperson, Rampurhat Municipality , Rampurhat , Birbhum.
k)	Authority for making payment to the contractor.	The Chairperson,Rampurhat Municipality , Rampurhat , Birbhum.
l)	Date of uploading of list of tenderers along with the offer rates through (on line),	To be notified Later on.
	Also if necessary for further negotiation through offline for final rate.	If required, will be notified within 48 (Forty Eight) hours after uploading the Offered rates of tenderers.

7. Time of completion. **Time of completion of the Contract is 6 (Six) months from the date of issue of Work Order.**

8. Site inspection & general information
Intending Bidders are required to inspect the site of the Project with particular reference to location and infrastructure facilities. They are to make a careful study with regard to availability of materials and their sources and all relevant factors as might affect their rates and prices. They are also acquainted with relevant IS specifications, CPHEEO manuals, Clauses & Sub Clauses of the Bid documents and to have fully acquainted with all details of work front, communications, underground utility services, seasonal weather and its variation, labours, water supply, existing & proposed site levels, position and diversion of transportation and barricading , if required, electricity and any other general information including topological condition & existing level and level pertaining to and needed for the work to be completed in time properly.

9. Bid documents
A full set of Bid documents consists of 2 Parts. These are;
I) **Part I** containing all documents in relation to the name of the firm applied for and credentials possessed by them along with all documents as depicted in Sl. No. 4

AND

- Section A: Description of the Project.
- Section B: Conditions & requirements for Bidding.
- Section C: General conditions of the Contract.
- Section D: General specification of Civil Works
- Section E: Details specification of Civil works
- Section-F: Technical specification electro-mechanical works
- Annexure
 - i. List of instruments
 - ii. List of vendors
 - iii. Drawings.

II **Part II** containing following documents;

)

a. Bid Price / Price Schedule.

10. Validity of Bid
A Bid submitted shall remain valid for a period of 365 calendar days from the date set for opening of Bids. Any extension of this validity period if required will be subject to concurrence of the Bidders.
11. Withdrawal of Bid
A Bid once submitted shall not be withdrawn within the validity period. If any Bidder/Bidders withdraw his/their Bid(s) within the validity period then Earnest Money as deposited by him/them will be forfeited.
12. Acceptance of Bid
The **Chairperson, Rampurhat Municipality** will accept the Bid. He does not bind himself to accept otherwise the lowest Bid and reserves to himself/herself the right to reject any or all of the Bids received without assigning any reason thereof.
13. Intimation
The successful Bidder will be notified in writing of the acceptance of his Bid. The Bidder then becomes the "Contractor" and he shall forthwith take steps to execute Formal Contract Agreement in appropriate Municipal Form with the **Chairperson, Rampurhat Municipality** and fulfill all his obligations as required by the Contract.
After the Bid is provisionally accepted, the Bidder shall submit detail Design, Drawing and working specifications phase wise based on existing site condition & proposed levels at site. If it is found technically correct and acceptable with proper examination by the Superintending Engineer, West Circle, M.E. Directorate, provisional approval of the submitted drawings will be accorded phase wise for execution.
14. Escalation of Cost
There will be no escalation in cost for materials or labour and the contract price mentioned in the contract stands valid till completion of the O&M of the contract.
15. Name & address of Engineer-In-Charge (EIC) of the Work
Executive Engineer, Birbhum Division, Municipal Engineering Directorate.
16. Execution of Work
The Contractor is liable to execute the whole work as per direction and instruction of the **Executive Engineer,** Birbhum Division of Municipal Engineering Directorate who is the Engineer in Charge of the work after due approval of "The Superintending Engineer, West Circle, M. E. Dte."
17. Payment
Payment will be made to the successful Bidder by the "The Chairperson / Chairman, Rampurhat Municipality" periodically only on receipt of written recommendation from the Executive Engineer, Birbhum Division of Municipal Engineering Directorate and subject to availability of pending fund.
18. Influence
Any attempt to exercise undue influence in the matter of acceptance of Bid is strictly prohibited and any Bidder who resorts to this will render his Bid liable to rejection.

Following clauses are to be adhering to by the concerned Bidder during the process of Bidding.

19. In case office faces sudden closure owing to reason beyond the scope and control of the **Chairperson, Rampurhat Municipality**, any of last date/dates as schedule in Sl. No 6 may be extended up-to/to next and following working day without issuing further and separate notice by the Chairperson , Rampurhat Municipality feel it to be necessary and exigent.
20. Persons having authenticated and having registered Power of Attorney may be considered lawfully becoming to be acting on and for behalf of the Bidder.
21. Sufficient care has been taken to avoid variance in between the contents of the listed documents in the Bid documents. However, if there is any variance between the contents of different documents, the provision of documents appearing earlier in the list shall prevail over the same provided in the contents coming later.
22. Imposition of any duty/tax/rule etc. owing to change /application in legislations/enactment shall be considered as a part of the contract and to be adhering to by the Bidder/Contractor strictly.
23. Bid Acceptance Authority is the Chairperson , Rampurhat Municipality
24. In case of any dispute arising from any clauses of similar nature between bid documents and Municipal tender form, the decision of Superintending Engineer, West Circle, M.E. Directorate, will be final and binding.
25. All usual deductions for taxes i.e. ST, IT, and Labour welfare Cess etc. as applicable will be made from the bills from time to time (please refer cl.57 of section C)
26. No conditional/ incomplete Bid shall be entertained.
27. In the event of e-Filing intending bidder may download the tender document from the website <http://wbtenders.gov.in> directly by the help of Digital Signature Certificate & necessary cost of tender document may be remitted through demand draft/ pay order issued from any nationalized bank/Scheduled bank in favour of "Chairperson, Rampurhat Municipality" payable at **Rampurhat** & same may be documented along with earnest money Deposit through e-Filling, (NEFT or scanned copy to be submitted) (Details of which has been narrated in "Instruction to Bidders").
28. Technical Bid & Financial Bid both will be submitted concurrently duly digitally signed in the Website <http://wbtenders.gov.in>. Tender document may be downloaded from website & submission of Technical Bid/Financial Bid as per Tender Schedule.
The requisite Earnest Money, as specified in this N.I.B. shall be paid through payment by net banking through ICICI bank payment gateway or through NEFT / RTGS in compliance with G.O no.3975-F(Y) dt 28.07.2016 in favour of the "**Chairperson , Rampurhat Municipality**" payable at **Rampurhat**. At the time of uploading the tender, the intending tenderer shall upload a scanned copy of such online proof document against EMD along with his/her tender. Any tender without EMD (Excepting exemption as per G.O.) shall be treated as informal and shall automatically cancel.

29. The Bidder, at the Bidder's own responsibility and risk is encouraged to visit and examine the site of works and its Surroundings and obtain all information that may be necessary for preparing the Bid and entering into a contract for the work as mentioned in the Notice inviting Tender, the cost of visiting the site shall be at the Bidder's own expense. Traffic management and execution shall be the responsibility of the Agency at his/her/their risk and cost.
30. The intending Bidders shall clearly understand that whatever may be the outcome of the present invitation of Bids, no cost of Bidding shall be reimbursable by the Govt. The Chairperson , Rampurhat Municipality reserves the right to reject any application for purchasing Bid documents and to accept or reject any or all the offered bid /bids without assigning any reason whatsoever and is not liable for any cost that might have incurred by any Bidder at any stage of Bidding.
31. Prospective applicants are advised to note carefully the minimum qualification criteria as mentioned in 'Instructions to Bidders' before bidding.
32. During scrutiny, if it is come to the notice to tender inviting authority that the credential or any other papers found incorrect/manufactured/fabricated, that tenderer will not be allowed to participate in the tender and that application will be out rightly rejected without any prejudice.
33. Before issuance of the work order, the tender inviting authority may verify the credential & other documents with the original of the lowest bidder if found necessary. After verification, if it is found that such documents submitted by the lowest bidder is either manufacture or false, in that case, L.O.A. / work order will not be issued in favour of the bidder under any circumstances.
34. If any discrepancy arises between two similar clauses on different notifications, the clause as stated in later notification will supersede former one in following sequence:
 - i) Agreement (govt, from 2911)
 - ii) NIB
 - iii) Special terms & Condition
 - iv) Technical bid
 - v) Financial bid
36. Contractor shall have to comply with the provisions of (a) the contract labour (Regulation Abolition) Act. 1970(b) Apprentice Act. 1961 and (c) minimum wages Act. 1948 of the notification thereof or any other laws relating thereto and the rules made and order issued there under from time to time.
37. Where an individual person holds a digital certificate in his own name duly issued to him against the company or the firm of which he happens to be a director or partner, such individual person shall, while uploading any tender for and on behalf of such company or firm, invariably upload a copy of registered power of attorney showing clear authorization in his favour, by the rest of the directors of such company or the partners of such firm, to upload such tender. The power of attorney shall have to be registered in accordance with the provisions of the Registration Act, 1908.

**Chairperson, Rampurhat Municipality
Rampurhat, Birbhum.**

INSTRUCTION TO TENDERERS/BIDDERS
SECTION – A

1. General guidance for e-tendering

Instructions/ Guidelines for tenderers for electronic submission of the tenders have been annexed for assisting them to participate in e-tendering.

2. Registration of Tenderer

Any tenderer willing to take part in the process of e-tendering will have to be enrolled and registered with the Government e-procurement system, through logging on to **<http://wbtenders.gov.in>**. The tenderer is to click on the link for e-tendering site as given on the web portal.

3. Digital Signature certificate (DSC)

Each tenderer is required to obtain a class-II or Class-III Digital Signature Certificate (DSC) for submission of tenders, from the service provider of the National Information's Centre (NIC) or any other bonafide service provider on payment of requisite amount. Details are available at the Web Site stated in Clause 2 of Guideline to Tenderer. DSC is given as a USB e-Token.

4. The contractor can search and download NIB and Tender Documents electronically from computer once he logs on to the website mentioned in Clause 2 using the Digital Signature Certificate. This is the only mode of collection of Tender Documents.

5. Submission of Tenders.

General process of submission, Tenders are to be submitted through online to the website stated in Cl. 2 in two folders at a time for each work, one in Technical Proposal and the other is Financial Proposal before the prescribed date and time using the Digital Signature Certificate (DSC) the documents are to be uploaded virus scanned copy duly Digitally Signed. The documents will get encrypted (transformed into non readable formats).

A. Technical proposal

The Technical proposal should contain scanned copies of the following further two covers (folders).

A-1. Statutory Cover Containing

- i. Prequalification Application (Sec-B, Form – I)
 - ii. Scanned Copy of NEFT/RTGS Document towards earnest money (EMD) as prescribed in the NIB against the work in favour of the "Chairperson , Rampurhat Municipality" payable at **Rampurhat**.
 - iii. Financial Statement (Section – B, Form – II).
 - iv. Affidavits (Ref:- format for general affidavit shown in "Y" Part "B".)
 - v. Printed Tender Form and NIB (Sl. 10; Part I) with all addenda and corrigendum
- (download and upload the same Digitally Signed, quoting rate will only encrypted in the Price Schedule under Financial Bid. In case quoting any rate in Printed Tender Form the tender will be summarily rejected).**

- vii. Special Terms, condition and specification of works.
- viii. Certificate of Bank Guarantee by any Nationalized Bank (if required).
- ix. Bank Solvency Certificate.

A-2. Non statutory Cover Containing

- i. Professional Tax (PT) deposit receipt challan (up to date), PAN Card, IT, IT Return for the Current Assessment year, VAT Registration Certificate (up to date).
- ii. Registration Certificate under Company Act. (If any).
- iii. Registered Deed of partnership Firm/ Article of Association and Memorandum
- iv. Power of Attorney (For Partnership Firm/ Private Limited Company, if any)
- v. Tax Audit Report along with Balance Sheet and Profit and Loss A/c for the Last five years (year just preceding the current Financial Year will be considered as year – I)
- vi. Clearance Certificate for the Current Year issued by the Assistant Register of Co-Op(S) (ARCS) bye laws are to be submitted by the Registered labour Co-Op(S) Engineers' Co.-Opt.(S)
- vii. List of machineries possessed by own/arranged through lease deed along with authenticated documents of lease / sub-lease / hire basis etc.
- viii. List of laboratory Instrument.
- ix. List of technical staff along with structure and organization (Section – B, Form – III).
- x. Credential: Scanned copy of Original Credential Certificate as stated in NIB (under sl. no -3).
- xi. Electrical Supervisory competency certificate (as required in NIB, SI-3) from Directorate of Electricity, Govt. of W.B. / competent authority of other Govt. as applicable.

Note: - Failure of submission of any of the above mentioned documents (as stated in A1 and A2) will render the tender liable to be summarily rejected for both statutory and non statutory cover.

B. Tender Evaluation

- i. Opening and evaluation of tender: - If any tenderer is exempted from payment of EMD, copy of relevant Government order needs to be furnished (applicable in case of Registered Labour Co-Operative Society).
- ii. Opening of Technical proposal: - Technical proposals will be opened by the Bid Inviting Authority electronically from the website using his/ her Digital Signature Certificate.
- iii. Cover (folder) of statutory documents (vide Cl. No. 5.A-1) should be opened first and if found in order, cover (Folder) for non statutory documents (vide Cl. No. – 5.A-2) will be opened. If there is any deficiency in the statutory documents the tender will summarily be rejected.

iv. Decrypted (transformed in to readable formats) documents of the non statutory cover will be downloaded and handed over to the Tender Evolution Committee. Scrutiny of technical proposal and recommendation thereafter and processing of comparative statement for acceptance etc. will be made by the Municipal Engineering Directorate, under the Dept. of Municipal Affairs, Govt. of West Bengal. Comparative Statement may be forwarded to appropriate authority depending on the value of the work as applicable as per existing norms and guidelines under UIDSSMT programme.

v. Uploading of summary list of technically qualified tenderers.

vi. Pursuant to scrutiny and decision of the screening committee the summary list of eligible tenderer and for which their proposal will be considered and uploaded in the web portals.

vii. While evaluation, the committee may summon the tenderers and seek clarification / information or additional documents or original hard copy of any of the documents already submitted and if these are not produced within the stipulated time frame, their proposals will be liable for rejection.

C. Financial proposal

As per Sl. 10, Part II. To be uploaded digitally signed by the Bidder.

6. Financial capacity of a tenderer will be judged on the basis of working capital and available bid capacity as mentioned in the N.I.T. to be derived from the information furnished in **FORM-I and II** (Section-B) i.e., Application (for Pre-qualification) and Financial Statement. If an applicant feels that his/their Working Capital beyond own resource may be insufficient, he/they may include with the application a letter of guarantee issued by a first class Bank to supplement the applicant. **This letter of guarantee should be addressed to the Tender Inviting/ Accepting Authority and should guarantee duly specifying the name of the project that in case of contract is awarded to the Tenderer; the Tenderer will be provided with a revolving line of credit.** Such revolving line of credit should be maintained until the works are taken over by the Authority.

The audited Balance sheet for the last five years, net worth bid capacity etc. are to be submitted which must demonstrate the soundness of Tenderer's financial position, showing long term profitability including an estimated financial projection of the next two years.

7. Penalty for suppression / distortion of facts

Submission of false document by tenderer is strictly prohibited and in case of such act by the tenderer the same may be referred to the appropriate authority for prosecution as per relevant IT Act with forfeiture of earnest money forthwith.

8. REJECTION OF BID

The Employer (tender inviting / accepting authority) reserves the right to accept or reject any Bid and to cancel the Bidding processes and reject all Bids at any

time prior to the award of Contract without thereby incurring any liability to the affected Tenderer or Tenderers or any obligation to inform the affected Tenderer or Tenderers of the ground for Employer's (tender inviting / accepting authority) action.

The Tenderer who's Bid has been accepted will be notified by the Tender Inviting and Accepting Authority through acceptance letter/ Letter of Acceptance.

The Letter of Acceptance will constitute the formation of the Contract.

The Agreement in Printed Tender Form will incorporate all necessary documents e.g. N.I.B., all addenda-correcting, special terms and condition (Section -C), different filled-up forms (Section -B), Price Schedule and the same will be executed between the Tender Accepting Authority and the successful Tenderer.

**Chairperson , Rampurhat Municipality
Rampurhat , Birbhum**

SECTION – B
FORM –I
PRE-QUALIFICATION APPLICATION

**To
Chairperson,
Rampurhat Municipality**

Ref: - Tender
for _____

_____ (Name of work)

N.I. B. No.:

Dear Sir,

Having examined the Statutory, Non statutory and NIT documents, I /we hereby submit all the necessary information and relevant documents for evaluation. The application is made by me / we on behalf of _____ in the capacity

_____ duly authorized to submit the order.

The necessary evidence admissible by law in respect of authority assigned to us on behalf of the group of firms for Application and for completion of the contract documents is attached herewith.

We are interested in bidding for the work(s) given in Enclosure to this letter.

We understand that:

(a) Tender Inviting and Accepting Authority/Engineer-in-Charge can amend the scope and value of _____ the contract bid under this project.

(b) Tender Inviting and Accepting Authority/Engineer-in-Charge reserves the right to reject any _____ application without assigning any reason.

Enclose: - e-Filling:-

1. Statutory Documents
2. Non Statutory Documents

Date: -
including title

Signature of applicant

application is made.

and capacity in which

SECTION – B
Form - II
FINANCIAL STATEMENT

B.1 Name of Applicant:

B.2 Summary of assets and liabilities on the basis of the audited financial statement of the last five financial years

(Attach copies of the audited financial statement of the last five financial years)

	1st Year (Rs. In lakh)	2nd Year (Rs. In lakh)	3rd Year (Rs. In lakh)	4th Year (Rs. In lakh)	5th Year (Rs. In lakh)
a) Current Assets : (It should not include investment in any other firm)					
b) Current liabilities : (It should include bank over draft)					
c) Working capital : (a) – (b)					
d) Net worth : (Proprietors Capital or Partners Capital or Paid up Capital + Reserve and surplus)					
e) Bank loan/ Guarantee : (As per clause G.2. with all sub clauses)					

B.3 Annual value of construction works undertaken :						
Work in hand i.e. Work order issued	As on 31.03.2021	As on 31.03.2020	As on 31.03.2019	As on 31.03.2018	As on 31.3.2017	As on 31.03.2016

Signed by an authorized officer of the firm

Title of the officer

Name of the Firm with Seal

Date_____

AFFIDAVIT "Y"

Declaration of the Bidder

(Affidavit to be affirmed on a Non Judicial Stamp Paper of Appropriate Value And Duly Notarized)

I, son of
....., aged about years by occupation
..... do hereby solemnly affirm and confirm as follow:

1. That, I am the Of have
duly authorized by and competent to affirm this affidavit on behalf of the said Bidder.

2. That, I have inspected the site of work covered under NIB (NIB No) circulated through Office memo bearing No -----dated ----- and have made myself fully acquainted with the site conditions existing level/proposed level and local conditions in and around the site of work. I have also carefully and meticulously gone through the Bid documents. Bid of the above named Bidder is offered and submitted upon due consideration of all factors and if the same is accepted, I on and for behalf of the aforesaid Bidder, being lawfully and duly authorized, promise to abide by all the covenants, conditions and stipulations of the Contractual documents and to carry out, complete the works to the satisfaction of the Bid accepting Authority of the Work and abide by all instructions as may given by the Engineer in Charge of the work time to time. I also hereby undertake to abide by the provisions of Law including the provisions of Contract Labour (Regulation & Abolition) Act, Apprentice Act 1961, West Bengal Sales Tax Act, VAT Act, Income Tax Act as would be applicable to the Contractor upon entering into formal Contract / agreement with the Bid Inviting/Accepting authority.

3. That I declare that, no relevant information as required to be furnished by the Bidder has been suppressed in the Bid documents.

4. That the statement above made by me is true to my knowledge.

Deponent
Solemnly affirmed by the said
.....

Before me.
.....
(1st class Judicial Magistrate / Notary Public)

SECTION - B
FORM- III
STRUCTURE AND ORGANISATION

A.1 Name of applicant:

A.2 Office Address:

Telephone No. and Cell Phone No :

Fax No. :

E mail id :

A.3 Attach an organization chart showing the structure of the company with names of Key personnel and technical staff with Bio-data :

Note: Application covers Proprietary Firm, Partnership, Limited Company or Corporation,

Signature of applicant including title

and capacity in which application is made.

FORM – IV
C. DEPLOYMENT OF MACHINERIES (in favour of owner / lessee):-

(Original document of own possession arranged through lease deed to be annexed)
(If engaged before Certificate from E.I.C. to be annexed in respect of anticipated dated of release of Machineries.)

Name of Machine / Instrument	Make	Type	Capacity	Motor / Engine No.	Machine No.	Possession Status		Date of release If Engaged
						Idle	Engaged	

For each item of equipment the application should attach copies of
(i) Document showing proof of full payment, (ii) Receipt of Delivery,
(iii) Road Challan from Factory to delivery spot, is to be furnished.

Signature of applicant including title

and capacity in which application is made.

SECTION – A

DESCRIPTION OF THE PROJECT

1.0 GENERAL

Surveying, Design, execution and commissioning for Augmentation and Rejuvenation work of Rampurhat Water Supply Scheme including Sinking of 4 (Four) No. Deep Tube Wells for extraction of minimum 8000 GPH Yield per DTW water with installation of submersible pump motor units, HSC Centrifugal Pump Units , pump house ,switch room, construction of pumping station with installation of pump motor units & construction of CWR of 400 M³ and rising main 80 mm G.I from tube wells to CWR & D.I K9 300 mm from CWR to OHR and all Civil & Elctro-Mechanical works at Jhanjhania site within Rampurhat Municipal area (including 3 months trial run and necessary training of maintenance staff & thereafter (subsequently) 1 (one) year operation and maintenance of the Plant) on Turnkey Basis.

2.0 LOCATION

The site of proposed work site is at Jhanjhania in Ward No.- 2 within Rampurhat Municipality, P.S: Rampurhat, Dist.: Birbhum.

3.0. WATER SUPPLY SYSTEM TO BE ADOPTED

The different water supply system which will in general be taken up for supply the portable water to the consumer terminal are:

- a) Sinking of 4 (Four) nos. Deep Tube well & valve with two number switch room for operating the submersible pumping units
- b) Installation of 4 nos. submersible pumping units in tube well with its control panel in switch room & valves as required.
- e) Construction of one number of Clear Water Reservoir of capacity 400 cubic meter.
- f) All Electro-Mechanical works related to CWR(4 No. HSC Centrifugal Pump motor set , Control Panel, valves, cabling etc.) & Tube Wells for water supply system.
- g) Post-Chlorination arrangement.
- h) Internal and yard lighting arrangement and lightening arrestor arrangement.
- i) Construction of 3 No. 5.4 m x 3.4 m Pumping house / station.

4.0 SCOPE OF WORK

- (i) The Bid is a **design-cum-execution Bid on Turnkey basis**. The Bidder is advised to go through the documents meticulously and submitting the cost price on the basis of the data made available. In case of any doubt about any data the Bidder may seek clarification before the Bid Inviting Authority in writing within seven (7) days from the date of issuance of the Bid documents to the Bidder. The bidder shall submit his/her queries in writing at least four working days in advance from the date of pre-bid meeting.
- (ii) The scope of work includes
 - a) For Civil Works: - Surveying, Soil testing, planning, design, drawing and construction of civil works including supply, carriage of all materials with foundation for the various units of the scheme.
 - b) For Electro-Mechanical works:- Planning, design, drawing, manufacture, supply, delivery at site, installation, fabrication and erection of all mechanical and

electrical equipment including pipes, valves, pumps, motors as per detail technical specification & vendor list that may be necessary and specified herein to make the plant complete in all respects.

- c) Commissioning & Trial Run: - The scope also includes Trial Run and testing the water supply scheme for three months after commissioning (72 Hours).
- d) Operation & Maintenance: - Operation and maintenance of the same for a period of 12 (twelve) months after the completion of specified period of Successful Trial Run, under the overall supervision of the Employer / his representative and from the date of commissioning.
- e) Training: - This also include necessary training to employ of the ULB.
- f) The successful bidder has to initiate & pursue diligently for any approval required from the Superintending Engineer (West) Burdwan.

The Bid comprises of following major works:

5.0 SINKING OF DEEP TUBE WELL

The Four No. (4) sinking of the Deep Tube Well shall have to be done as per requirement for extraction of minimum 8000 GPH per Tube well for 16 Hrs Tube well run. Necessary Electro-logging test for adequacy of water requirement should be done.

6.0

- (i) Designing, drawing and construction of Approach/other connecting road, apron and Boundary wall with Surface drains around the reservoir and pump house & other units connecting the drainage system.
- (ii) The total civil work includes the construction of clear water reservoir, pump house and pump sump and inlet connection to the reservoir from the tube well to the CWR and rising main connection from CWR to OHR.
- (iii) The design of pump house has to be made on the basis of the Static load as prescribed and dynamic loading pattern thereof, taking into account of the vibration both horizontally and vertically that will be generated due to operation of each pump motor set.
- (iv). Site clearances and leveling of the area after development of site with carried earth up-to formation ground level, as proposed earlier.
- (v) 2 nos. of overflow connections from the reservoir have to be provided in such a fashion that over flow water drains to the drain surroundings of the reservoir.
- (vi) The Bidder, whose Bid is accepted in due course will have to furnish details of the design of the pump house in all levels, sump to connect the reservoir considering all the parameters as supplied by the pump manufacturer within the dimensions of the

pumping station provided by them for housing the pumping machinery, electrical substation equipment/appliances etc.

- (vii) A tentative layout drawing showing the shape and different levels of the reservoir, pump house and other units of treatment plant is to be provided by the bidder. The Bidder has to quote his rate for construction of underground clear water reservoir having 400 cubic meter water capacity.

7.0 SWITCH ROOM FOR SUBMERSIBLE PUMPING STATION

- (i) The Bidder has to submit in due course the specific size and capacity of all machineries & equipments offered along with data related to static & dynamic loads in different operating conditions. The size of all the equipments should be so selected to match with the civil works.
- (ii) The installation of all L.T electrical equipment should be strictly as per prevailing I.E. Rules IS specification.
- (iii) The inter connection of cables from the MCC to Submersible pumping unit shall have to be done from the switch room and also receiving of power from the WBSEDCL shall have to be done in the switch room.

8.0 CLEAR WATER RESERVOIR

As per specifications attached.

9.0 Limit of Contract:

The limit of contract starts from sinking of four nos. deep tube well with installation of submersible pumping units with construction of switch room and four pumping units connected to a common manifold with four nos. valve for easy interconnection of the pumping units to the rising main. The construction of CWR and allied E&M works are within the scope of the BID.

The sources of Electric Power would be taken from the WBSEDCL supply point. Necessary arrangements to connect the cables of appropriate size with full satisfaction of Engineer in Charge are within the limit of this work. The excavation of cables trenches, laying the cables , covering the cable trenches, insert plates, cable trays etc. also includes under this contract. All restoration works of the excavation site should be done with the full satisfaction of the Engineer in Charge.

Chairperson , Rampurhat Municipality

**SPECIFICATION FOR CONSTRUCTION WITH SUPPLY OF MATERIALS FOR 400 CUM R.C.C.
CLEAR WATER RESERVOIR WITH PILE FOUNDATION.**

- 1.0 GENERAL SPECIFICATIONS & REQUIREMENTS :
- 1.1 Application of specification and item of work :
- 1.1.1 This specification forms part of the contract and shall be read in conjunction with other documents forming the contract, viz. Notice Inviting Tender (N.I.T.), General conditions and requirements of tendering, Scope of work and technical information, General & special terms and conditions of contract, Mode of submission of Tender, Drawings and annexure if any with the tender.
- 1.1.2 The accepted lump sum rates for the contract, must cover the cost of all materials , testing of materials, carriage cost, loading & unloading cost, all taxes & duties in vogue, labour, tools, machinery, plant, explosives, scaffolding, staging, shoring, props, bamboos, ropes templates, pegs, and all appliances and operations whatever necessary for efficient execution.
- 1.1.3 All works are to be executed in accordance with descriptions as enumerated in scope of work and technical information.
- 1.1.4 Manner of works not included above, should be carried out as per relevant provisions of Manual on Water Supply and Treatment published by CPHEEO, relevant I.S. specifications and code of practice.
- 1.1.5 The overall outline of works to be done by the contractor is to execute the work as per details and specifications mentioned in the Scope of works and elsewhere in the tender documents .
- 1.2 Site Condition:
The contractor is to visit the site and ascertain local conditions, traffic restrictions, nature of soil and obstructions in the area before submission of tender paper to satisfy him.
- 1.3 Setting out and leveling :
The contractor is to set out and level the works, and will be responsible for the accuracy of the same; He is to provide all instruments and proper qualified staff required for checking the work. The Verticality checking of different component of staging structure of reservoir is to be done regularly and maintained properly.
- 1.4 Safety Code:
The contractor shall have to take adequate precaution to provide complete safety for prevention of accidents on the site. Insurance corsages of works are to be provided.
- 1.5 Keeping works free from water:
The contractor shall provide and maintain at his own cost, electrically or other power driven pumps and other plant and equipment to keep the site and foundation pits and trenches free from water and continue to do so till the site is handed over to the complete satisfaction of E.I.C.
- 1.6 Clear Site:
- 1.6.1 The site during the execution of works should have sober and tidy appearance with everything necessary for the work neatly and systematically arranged.
- 1.6.2 The contractor at his own cost shall clear the site of all trees, roots and obstructions. Where excavation is required, that should be done strictly up to the required level. Any surplus earth should be spread over the low lands or used in earth filling works for development of site.
- 1.6.3 After the completion of the work, the entire site shall be cleared satisfactorily with (a) all pits, diggings and trenches properly filled up (b) all surfaces adequately dressed (c) all surplus materials, sheds, tents and all other ancillaries removed from the site at his own cost.

1.7 Bench Marks and Ground Water Gauges:

The contractor shall establish and protect surveyor's benchmarks and base line marks from damage or movement during work at his cost.

1.8 Contractor's Staff:

The contractor must provide at all times efficient staff of trustworthy, skilful and experienced assistants capable of carrying out the work in accordance with the drawings and specifications and to correct levels.

1.9 List of I.S. Code of Practices :

A list of few important Indian Standard (latest edition) is given which does not cover all the relevant codes of practices.

Wherever reference towards the Indian Standards mentioned below or otherwise appears in the specification, it shall be taken as reference to the latest version of the standard.

<u>IS NO.</u>	<u>DESCRIPTION</u>
1. General IS-1200 (Part-I to 28) construction.	Measurement of Building Works, method, materials & details of construction.
2. Cement IS-269 : 1989	Ordinary, Rapid hardening & low heat Portland cement - 33 Grade
3. IS-8112 : 1989	Ordinary, Rapid hardening & low heat Portland Cement - 43 Grade
4. IS-12269 : 1987	Ordinary, Rapid hardening & low heat Portland Cement - 53 Grade
5. IS:1489 (Part-1&2)-1991	Portland Pozzlona cement.
6. Sand IS-1542	Sand for plaster
7. IS:2116-1980	Sand for masonry mortars
8. Aggregates IS:383-1970	Aggregates coarse and fine from natural sources for concrete.
9. Aggregates IS:515-1969	Aggregates for use in Mass Concrete Natural and manufactured.
10. Bricks IS: 1077-1992	Common Burnt clay building bricks.
11. IS:2212-1991	Code of practice for brick work.
12. Soil IS:1489-1978 purpose.	Classification & Identification of Soil for General Engineering purpose.
13. IS:456/2000	
14. IS:14846/2000	
15. IS:875/last Amendment	
16. IS:1893/1984	
17. Concrete IS-456 : 2000	Code of Practice for plain & reinforced concrete (3rd revision).with Amendment No. 2
18. IS:455:1989	Portland slag cement.
19. IS:2250-1981	Preparation & use of masonry mortar.
20. IS:3370	Part-I/1965-Code of Practice for concrete structures for the storage of Liquids-General requirements.
21. IS-3370	Part-II/1965 - do - - do - reinforced concrete structures.
22. IS-3370	Part-IV/1965 - do - -do - Design Tables.
23. Test IS-1199 : 1959	Sampling & Analyzing of concrete.
24. IS-8142 : 1976	Tests for setting time of concrete.
25. IS-516 : 1959	Tests for strength of concrete.

26. IS-9013 : 1978 Tests for compressive strength.
27. IS-4031 Tests for cement.
- 28.a) Steel : Iron Work IS-1786 : 1985 High yield strength deformed bar (Grade Fe 415).
 - b) IS-1786 : 1985 Tor steel reinforcement.
 - c) IS-2751 : 1966 Welding of reinforcement.
29. IS-2502 : 1963 Bending & fixing of bars for concrete reinforcement.
30. IS-9077 : 1979 Corrosion protection of steel reinforcement in R.C.C. structure.
31. IS-2062 : 1992 Structural steel.
32. IS-2062 (Grade-A) Low Carbon structural steel.
33. IS-800 : 1984 Use of structural steel in general building construction.
34. IS-808 : 1989 Rolled Steel Beams, Channels and angles.
35. IS-1038 : 1983 Steel doors, windows & Ventilators.
36. IS-7452 : 1990 Hot rolled steel section for doors, windows and ventilators
37. IS-4021 : 1995 Timber door, window and ventilator frames
38. IS-1003 : 1991 Timber paneled and glazed door shutters.
39. IS-2202 : 1991 Wooden flush door shutters. (Solid core type).
40. IS-2571 : 1970 Laying in-situ cement concrete flooring
41. IS-780 : 1984 Sluice valves for water works purposes.
(Small dia-50 mm to 300 mm size).
42. IS-2906 : 1984 Sluice valves for water works purposes.
(Higher dia-350 mm to 1200 mm size).
43. IS-3950 : 1979 Surface boxes for sluice valves.
44. IS-13095 : 1991 Butterfly valves for general purposes.
45. IS-12969 : 1990 Method of test for quality characteristics of valves.
46. IS-12992 : 1993 Spring loaded safety relief valves.
47. IS-5312 : 1984 Swing check type reflux valves.
48. IS-1661 : 1972 Cement & Cement lime plaster finishes on walls and ceilings
49. IS-1322 : 1993 Bitumen felt for water proofing and damp proofing.
50. IS-7193 : 1994 Glass fiber base coal tar pitch and bitumen felt.
51. IS-4082 : 1996 Stacking of storage of constructional materials at site recommendations.
52. IS-3114 : 1994 Laying of C.I. Pipes.
53. IS-1536 : 1989 Centrifugally cast (spun) iron pressure pipe.
54. IS-1537 : 1976 Vertically cast iron pressure pipe.
55. IS-1538 : 1993 C.I. fittings for pressure pipe
56. IS-7181 : 1986 D.F. horizontally cast iron pressure pipe
57. IS-13382 : 1992 C.I. Special for mechanical and push-on flexible joints for pressure pipe.

- 58. IS-5382 : 1985 Rubber sealing rings for water mains.
- 59. IS-12820 : 1989 Dimensional requirements for rubber gasket for mechanical joints & push
- 60. IS-1879 : 1987 Malleable C.I. Pipe Fittings.
- 61. IS-782 : 1978 Caulking Lead.
- 62. IS-11606 : 1986 Methods for sampling of C.I. pipes & fitting.
- 63. IS-2911 : 1979 (Part-I Section 2) Design & construction of bored cast in-situ concrete piles.
- 64. IS-2911 : 1985 (Part- IV) Load test on piles.
- 65. IS-816 : 1991 Use of metal are welding for general construction in mild steel.
- 66. IS-822 : 1970 Procedure for inspection of welds.
- 67. IS-814 : 1994 Electrodes for manual metal are welding.
- 68. IS-1052 : 1983 Specification for Collapsible Gate.

2.0 APPROVAL OF MATERIALS

- 2.1 Sample of materials in sufficiently large quantity with descriptive data thereof shall be furnished by the contractor to the Engineer-in-charge well before the collection of such materials and equipments so as to permit inspection, testing and approval. The sample shall be properly marked to show the name of the materials, name of manufacturer, place of origin and item for which it is to be used. After approval, the sample shall be available for inspection at all time.
- 2.2 Structural steel materials, DISS K9 / DF Pipes and C.I. pipes, all types of valves, Specials other appurtenance to be supplied by the contractor shall conform to the requisite I.S. specification, bear ISI certification mark, properly tested and duly certified. Those are to be approved by the Engineer-in-charge before use.

3.0 MATERIALS

- 3.1 Stone Chips : These should be obtainable by the contractor from Pakur or any approved query. These should be well graded conforming to the standard specifications of P.W.D. and approved by the Engineer-in-charge.
- 3.2 Sand : Sand for construction purpose shall have to be collected either from river bed of Mayurakshi/Ajoy/Brahmani or Dwarka and should be coarse, cleaned, screened and washed & of quality conforming to the standard specification of P.W.D/ this Directorate and also to be approved by the Engineer-in-charge.
- 3.3 Cement: The cement shall conform to relevant I.S : 8112-1989 (High strength ordinary Portland cement 53 grade) of approved make (L&T, Ambuja Cement, ACC or any other brand approved by the EIC).
- 3.4 Steel : All steel shall conform to IS: 1786-1985 (High yield strength deformed bar 415 grade). Purchas of such steel shall be made from approved manufacturers (SAIL / TATA / RINL. STEEL) only.
- 3.5 Brick : Bricks shall be of first class quality, well burnt in kiln, sound hard , true to shape and of the standard dimensions, and to be got approved by the Engineer-in-charge before use.
- 3.6 Pipes, Specials, Valves, etc : All pipes, specials, valves should conform to relevant specification, bear I.S.I. certification mark, where applicable, and as per approved make.

4. EXECUTION OF WORK:

- 4.1 Excavation and Filling:
 - 4.1.1 Excavation necessary for the works may require digging and penetration through any type of soil or strata, removal of stems and roots of trees, breaking and removal of old structures, dewatering from all sources e.g. rain, seepage, leakage, subsoil, water etc. protecting the trench and well pit and adjoining structures and service lines, by timbering, shoring, propping, sheet piling etc. Excavation shall be done only up to the required level and all extra depth of excavation, if made, has to be filled in with materials and manners approved by the Engineer-in-Charge.
 - 4.1.2 All excavated materials must be carefully deposited in spoil bank allowing the access to workers and plant machinery. The toe of the spoil bank shall be set at sufficient distance and should not be less than

3 to 4 times the depth of excavation. If so ordered by the Engineer-in-Charge, the excavated materials have to be carried away and placed within a lead 75 m. Such quantity of extra materials as may be required shall be brought back to back-fill the trench with proper consolidation in layers of 150 mm thickness, properly rammed. Flooding of trench pit during back filling may be restored to if so directed by the Engineer-in-Charge.

- 4.1.3 Contractor must make good at his own cost, all damages or settlements sustained by any structure founded on the trench or adjacent to the trench.
- 4.1.4 All excavated materials will remain the property of the Government and the Contractor shall be responsible for their custody till the completion of the works or taking over by the Department.
- 4.1.5 Fill inside building below the floor etc. shall have to be done with silver sand free from any foreign material including scooping out of 0.15 m top soil layer if filling work precedes this work or as directed by the E.I.C.
- 4.1.6 In case of over-excavation below the stipulated depth the space between the foundation bottom and over-excavation shall have to be filled up with silver sand consolidated by watering and ramming. Where such consolidation is not achievable, the depth of excavation shall be filled with 1:4:8 concrete. The cost in both the cases shall be borne by the Contractor.
- 4.1.7 All excess materials obtained from any excavation required to be carried out under this contract will be utilized by the Contractor for spreading over the land uniform at his cost.
- 4.2 **Mat Concrete or Foundation Concrete:** 75 mm to 100 mm thick concrete of mix (1:3:6) with 32 mm down Jhama Khoa shall be provided beneath R.C. foundation Cap or wall footings over a layer of polythene sheet or single brick flat approved by the Engineer-in-Charge.
- 4.3 Brick Masonry :
- 4.3.1 Brickwork shall be laid in English bond with mortar in proportion (4:1) or (6:1) as directed by the EIC unless otherwise specified. Brick work shall always be carried up regularly in plumb and true to plan and lines, in level along the entire length. No brick work shall be carried up more than one scaffolding height of 1.5 metre in the stage. Bricks are to be well soaked with water before use and brick work shall be kept clean and joints raked out for subsequent pointing or plastering.
- 4.3.2 Brick work in foundation and superstructure not in contact with water shall be provided with 20 mm and 15 mm thick plaster to rough and fair faces respectively with cement sand mortar in 1:6 proportion. Brick work in contact with water shall be in cement sand mortar in 1:4 proportion 20 mm thick plaster with water proofing compound as per specification including 1.5 mm thick cement punning in the water contact face, 15 mm thick plastering in 1:6 cement sand mortar in the outer face shall be provided. Plastering for below thick wall shall be done in cement sand mortar (1:4) 15 mm thick unless specified.
- 4.4 R.C.C. Works :
- 4.4.1 The R.C.C. works for Clear Water Reservoir, Pile Caps and Pile foundation if required shall have to be done as per specification and as per required Grade of Minimum M 30 conforming to relevant IS Code (latest Version) with well graded stone chips(20 mm grade) with complete design of concrete mix in a computerized batching plant under controlled condition as per IS: 10262 & IS: 456, IS: 3370 and other relevant special publications using approved quality super Plasticizer in appropriate quantity, transporting the mix in agitated transit mixer to work site, placing the concrete in position with the help of concrete pump of suitable capacity or by any other method as approved by the Engineer-in-Charge, leveling and compacting the concrete with approved quality vibrator, curing the same as per IS-456 complete in all respect as per direction of the Engineer-in-Charge. Quantity of cement shall not be less than the quantity stipulated as per relevant I.S. Code per cubic meter of controlled concrete or as specified in the schedule of the work, but actual quantity shall be determined on the basis of preliminary test and job-mix formula to be submitted by the agency at no extra cost. Water cement ratio generally shall not exceed the desired level. For R.C.C. works in other than Clear Water Reservoir may be done with nominal mix (M20 & M25 design mix) as specified in the schedule of the work, will be used as per specification of relevant I.S. code.
- 4.4.2 Mixing and Laying: For nominal mix, all concrete work in foundation, superstructure etc. shall be properly mixed in a good quality machine mixer. In no circumstances hand mixing will be allowed. However in special condition, with the permission of the Engineer-in-Charge hand mixing may be allowed. In that case 10% extra cement shall have to be used for which no extra payment shall be made. Concrete shall be laid properly and vibrated thoroughly with the help of mechanical vibrator as per direction of the Engineer-in-Charge.
- 4.4.3 Mortar and Concrete: Contractors are particularly warned against the use of inferior materials or use of incorrect proportion of different materials in the makeup of concrete or mortar. Detection of any such practice will lead to rejection of all such works and imposition of penalty. Engineer-in-Charge has the right to reject any mortar or concrete, which does not conform to the specification. Cube test for concrete

shall have to be done as per IS: 456-1978 and other relevant codes at the cost of the Contractor.

- 4.4.4 The water cement ratio is to be determined by proper slump test or as provision of relevant I.S. Codes. In case of slump test the slump cones (300 mm dia. At bottom and 100 mm at top) are to be kept at site at the cost of the Contractor.
- 4.4.5 Finishing: If the surface of the concrete is found uneven or spongy in appearance, the Contractor shall have to rectify or reconstruct at his own cost.
- 4.4.6 All R.C.C. work, column, beam, roof, foundation etc. for service reservoir not forming the part of **water retaining structure shall be done with M30 grade of concrete as per IS: 456-1978 with cement content not less than 440 kg/cum. of concrete.** Approved quality super Plasticizer in appropriate quantity by weight of cement have to be used as per relevant I.S. Code. The water cement ratio should not exceed the desired level as per code of practice.
- 4.4.7 All R.C.C. work forming part of water retaining structure shall be done with M30 grade of concrete as per IS: 456, IS: 3370 with cement content not less than desired level. Approved quality super Plasticizer in appropriate quantity by weight of cement have to be used as per relevant I.S. Code. The water cement ratio should not exceed the desired level.

All Pile & Pile Cap Works if required should be M 30 grade C.C.

- 4.4.8 The concrete shall be cured as per IS: 456-2000.
- 4.4.9 Cement tests shall have to be carried out at Contractor's expenses as and when directed. The Contractor shall have to make arrangement with necessary equipment to carry out crushing strength of 150 cm cube concrete block for 7 days and 28 days of proper Testing procedure, sample size shall be in accordance with relevant I.S.Code.
- 4.4.10 **Aggregate:** The fine and coarse aggregates shall conform to relevant I.S. stone chip & sand for construction work shall have to be supplied as per clause 3.1 & 3.1 respectively mentioned in this specification for Civil Engineering works.
- 4.4.11 Concrete shall be sampled, analyzed and tested in accordance with IS: 456-2000.
- 4.4.12 Joints in Concrete Structure: Type of joints, spacing of joints, use of all jointing materials and other features pertaining to the provision of movement joints in liquid-retaining structures shall be as per relevant I.S. Codes.
- 4.4.13 **Water Tightness :** All the water retaining structures must be made completely water tight as per specification contained in I.S. for water retaining structure. For porous concrete resulting in leakage, this is to be rendered good by cement slurry grouting at the cost of the contractor.
- 4.4.14 Reinforcement of R.C.C. Works : The Tor reinforcement work should include cutting to sizes, bending, hooking and fabricating including the supply of 16 gauge black annealed wire and all other works according to specification, drawing or otherwise.
- 4.4.15 Clear cover, Development length, Lap length and other details to main reinforcement shall be provided as per IS: 456-2000 and SP: 24 and other relevant codes.
- 4.4.16 **Chases, Holes Recesses & Inserts:** All chases, holes, recesses for various services and other requirements shall be as per approved drawing or as directed. The Contractor shall fix all necessary insets in concrete for embedding and support of hangers for pipe and cables. Necessary ducts are to be provided by the Contractor. For any inserts sufficient space shall have to be kept for jointing/dismantling to facilitate installation and maintenance.
- 4.4.17 **Embedding of C.I./ M.S. Fittings:** The C.I. / M.S. fittings to be embedded shall be thoroughly cleaned and tar coating, if any, shall be removed completely. Such type of fittings having puddle at one end shall be placed at the center of concrete section, plumbed, aligned and leveled perfectly ensuring throat of pipe or fitting to be integrated. The surrounding of the fitting to be embedded shall be provided with diagonal reinforcement in layer/layers. The inside and outside shall be projected at least 150 mm from the finished faces of the wall.
- 4.5 **CONSTRUCTION OF CAST IN SITU BORED PILES IF REQUIRED:**
- 4.5.1 The Construction and workmanship for piles shall fully conform to and satisfy the requirements of relevant I.S. of Cast-In-Situ bored piles.

- 4.5.2 **All R.C.C. works in water retaining structure shall be done with M30 grade concrete** as per relevant Codes with cement content not less than **440 kg./cum.** of concrete. Approved quality super Plasticizer in appropriate quantity by weight of cement shall have to be used as per the relevant I.S. code. The slump of the mix shall be between 150 mm and 180 mm.
- 4.5.3 The reinforcement cage of piles should be strictly in conformity with the detail shown in approved drawing and the cage to be constructed with welding only conforming to specification of IS: 2751-1966 for welding of reinforcement.
- 4.5.4 The pile head shall be cut-off at the required level as indicated in the drawing and the exposed bars shall have to be reset inside the pile cap/capital etc.
- 4.5.5 The load test of piles shall be carried out as per IS: 2911 (part-IV)-1985 (I.S. code for load test on piles). The test shall be carried out on test piles and representative piles as approved by Engineer-in-Charge.
- 4.5.6 Lateral Load Test may be carried out as per IS: 291 I (Part-IV)-1985. The loading should be applied in increments of about 20% of the estimated safe load. The next increment should be applied after the rate of displacement is nearer to 0.1 mm per 30 minutes. The displacement shall be read adopting the procedure as laid down in the aforesaid I.S.

4.6 SHUTTERING AND STAGING

- 4.6.1 The formwork shall conform to relevant I.S. Code of practice Shuttering in form work shall be either made of steel or ply board. Surface of shuttering in contact with concrete shall be made smooth & at joints rendered smooth. In every case the joints of the shuttering are to be such as to prevent the loss of water from the concrete. All shuttering formwork must be adequately stayed and braced to the satisfaction of the Engineer-in-charge, for properly supporting the concrete during the period of hardening. Stripping of formwork shall be done as per IS:456. All form works shall be removed without shock or vibration. Before the formwork is stripped, concrete surface shall be exposed when necessary in order to ascertain that the concrete has set and hardened sufficiently.

- 4.7 **Grills :** All windows ventilators and railings where specified, shall be provided with suitable M.S. grills of approved design. The clear openings between two bars shall not exceed 100 mm. The entire grillwork including fitting, fixing shall have to be done as per specification in P.W.D. schedule. The grill shall have to be provided with 2 coats of paints of approved make and shade over a coat of priming. The grill may also be used in some doors. The M.S. flats to be used for grill shall not be less than 20 mm x 6 mm in size. The weight of the grill shall be within 12 kg/sq.m. to 14 kg/sq.m. for window openings and 16 kg/sq.m. to 18 kg/sq.m. for gates unless otherwise specified.

4.8 **M.S. Ladder:**

- 4.8.1 M.S. Ladder (Heavy Type): This type of ladder shall be of 600 mm wide. The frame of the ladder shall be made of 2 nos. ISMC I50 x 8 mm thick. Steps of ladder shall made of 150 mm wide and 8 mm thick M.S. checkered plate centrally stiffened with ISA 50 x 50 x 6 mm placed @ 300 mm c/c. The steps shall be secured with the main frame by 5 mm thick continuous filled welding. The stiffeners are also to be welded suitably with the checkered plate. The edge of the steps shall be grounded properly to have smooth finish.
- 4.8.2 This type of ladder shall be provided with both side hand railing consisting of 2 rows of 32 mm dia. G.1 pipe (TATA medium quality) run parallel through 60 mm face of 60 x 40 x 6 mm ISA post. The length of the post shall be 600 mm. placed and secured with main frame by continuous fillet welding as mentioned earlier, @ 1000 mm c/c. The ends of the G.I pipes shall be properly welded with M.S. angle support to secure its position as per drawing.
- 4.8.3 The total assembly shall be finished with two coats of high gloss synthetic enamel (I.C.I / Berger / Jonson & Nicholson make) over a coat of red lead primer (Murarka Brand or equivalent) after necessary cleaning and dressing of all the components complete as per drawing & direction of E.I.C.
- 4.8.4 The ladder shall be secured with R.C.C. floor by providing 200mm x 200mm thick M.S. base plate built in floor with four nos. 75mm long & 12mm dia holding down bolts.

- 4.8.5 M.S. Cat Ladder: The Cat ladder shall be 450 mm wide. The frame of ladder shall be made of 2 nos ISA 60 X 40 X 8 mm . Two nos. of 12 mm dia M.S round or square bar placed @ 300 mm c/c and integrated with ladder frame by suitable fillet welding shall serve as steps of the ladder. For that purpose suitable holes shall be made in the ISA post for Penetration of the 12mm dia. Bars. Minimum 5 mm thick fillet welding all round the M.S. bar shall be made conforming to the specification of relevant I.S. Code.
- 4.8.6 Where the Cat ladder is essential to be provided with handrail, it shall be in one side of the ladder as directed by E.I.C. The handrail shall be made of 32 mm dia G.I. pipe ISA posts placed @ 600 mm c/c. The post shall be secured both with the frame of the ladder and G.I. handrail by continuous fillet welding.
- 4.8.7 The ladder shall be built with landing slab either by using 200 mm x 200 mm thick base plates with 12mm dia holding down bolts or embedding itself in the concrete floor as specified by E.I.C. The ladder shall be stiff opted or tied with Necessary stays/props built in floor or adjacent wall using specified size of M.S. and where required as per direction of the E.I.C.
- 4.8.8 Finally ladder shall be finished with two coats of high gloss synthetic enamel painting over a coat of red lead primer of approved make, as stated earlier, after necessary cleaning and removing of rust and dust etc. all complete.
- 4.9 Hand Railing: All R.C.C. stairs etc. shall have to be provided with railing on the open side(s) throughout. The height of the railings shall be 1200 mm. The post of the railing shall be made of 25mm dia. G.I pipe (TATA medium quality) placed @ maximum 400 mm c/c, or as specified in the drawing and fixed with the walkway/platform/floor.
- 4.9.1 The railing shall be provided with two rows of G.I. pipe (TATA medium quality) run parallel and integrated / secured with the G.1. post by suitable welding of minimum 5mm thick at a every junction and intersection. The top row shall be provided with 32 mm dia. G.1. pipe and middle row shall be provided with 25 mm dia. G.1. pipe. The end of the GJ. railing shall be secured with the post firmly by suitable welding.
- 4.9.2 The railing shall be finished with applying two coats of high gloss synthetic enamel paints of approved make and said over a coat of red led primer.
- 4.9.3 The G.1. post shall be embedded in the floor up to a minimum depth of 80mm all welding surfaces shall be grounded to have smooth finish. Finally the total assembly shall be finished with two coats of synthetic enamel painting to all the exposed surfaces of G. I. pipes.
- 4.10. Plastering to wall, ceiling etc. :
- 4.10.1 Preparation of Mortar : The materials shall be at first mixed dry thoroughly in suitable proportion as stated in the schedule till uniform colour reaches and then shall be mixed wet adding water slowly and gradually for at least four times to give a uniform paste. The mix as prepared shall be used within 30 minutes. Wherever plasticizer is required to use, the quantity of water shall be reduced in such a proportion that required consistency is achieved.
- 4.10.2 Preparation of Surface: The surface of wall shall be brushed, cleaned, washed, watered and wetted with water before plastering. All the projections extending more than 13 mm from the general face of the masonry should be knocked off so as to maintain thinner plaster layer. All the joints in masonry should be raked for a depth of about 20 mm. In case of plastering on concrete surfaces, the face should be roughened by chipping of about 5 mm. Oily, greasy and efflorescence spots should be removed either by brushing, scrapping or both. Necessary water proofing compound of approved make (Sica/Cico) to be added as per manufacturer's specification as per usual norms.
- 4.10.3 Laying: In order to maintain uniform thickness of the plaster, the screeds are formed on the prepared wall surface before actual plastering is started. Patches of plaster 15 cm x 15 cm are first of all applied at an interval of about 2 m both horizontally and vertically over the surface. The two dots lying in vertical strips of mortar are formed between dots. Then the plastering shall be started from the top and worked towards the bottom. The whole surface shall be made flush between the screeds with wooden straight edges and rubbed thoroughly with wooden floats. Rounding of corners if desired by the Engineer-in-charge, shall be carried out in one operation.
- 4.10.4 Curing : The plastered surface shall be kept wet by sprinkling water after 12 hours for at least 7 days and shall be protected from rain or sun.
- 4.10.5 Thickness: Unless otherwise specified or desired by E.I.C. the thickness of plaster shall be as follows :-
- | | | | |
|----|-------------------------------|---|-------|
| a) | Plumbed Surface of Brick work | - | 15 mm |
| b) | Rough Surface of brickwork | - | 20 mm |

- c) Vertical concrete surface - 10 mm
- d) Ceiling of Roof, Chajja etc. - 10 mm
- 4.11 **Cement Pointing to Exposed Brick Facing :** Where shown on the approved drawings or specified in schedule of work, exposed brick faces shall be cement ruled pointed. The mortar shall be raked out of the joints to a depth of 6 mm. The dust shall be brushed out of the joints and well wetted. The pointing shall be made with cement and sand Proportion (1:3).
- 4.11.1 The joints of the plasterwork shall be neatly finished truly vertical and horizontal directed and the lines be kept wet till the cementing materials have set and become If desired after the joints have been cured the whole brick face shall be rubbed and polished with fine grade of carborundum stones to the satisfaction of the E.I.C. This rate also includes, necessary scaffolding etc, mending, good damages if any.
- 4.12 **Surface Finishing:** The rates of all the items of work under this caption includes necessary scaffolding, staging, preparing base, removing stains from the floor, skirting, woodwork, glass etc. caused during execution of the work etc., and is for the complete works in all respects .
- 4.13 Decorative exterior emulsion paint (Weather Coat / Weather Shield): Where specified, external surface shall be finished with 2 coats of two coats of Weather coat epoxy based paint as per manufacturer's specification.
- 4.14 Painting to Wood & Steel Work: Ready mixed synthetic enamel paint of approved make (I.C.I / Berger / Jenson & Nicholson make or as approved by the E.I.C.) and of approved colour and shade shall only be used. The primer shall be of Murarka's red lead primer for steel surface and white or gray wood primer of approved make for wood surface.
- 4.14.1 The steel surface to be painted shall be properly cleaned & dusted. all loose scales removed and smoothed with emery papers. Then a coat of anticorrosive priming shall be evenly applied. After this has dried-up, two successive coats of best quality ready mixed paint of approved quality and shade shall be applied to the entire satisfaction of the Engineer-in-Charge. Brushes of approved size and make shall only be used for application of paint and use of cloth is definitely prohibited.
- 4.14.2 All wood surfaces for painting shall be properly sand papered and cleaned. When necessary good quality putty shall be used to hide all holes, cracks, open joints etc. The rate for painting includes surface finishing work etc.
- 4.14.3 The rate includes cost of all operation mentioned above and is for the complete work.
- 4.15 . **Land Development and Apron:** Plinth shall be raised up to the desired level indicated in the drawing for which filling material shall be consolidated as described elsewhere. Such consolidation shall be done 1.5m around the Caracas wall of the building. Apron of 1m width including surface drain, shall be provided all around the Caracas wall 75 mm thick concrete (1:3 :6) with Stone Ballast shall be made over a single brick flat soling and top shall be finished with (1 :4) cement sand mortar plaster. The apron shall be usual slope.
- 4.16 **Laying of Pipeline:**
- 4.16.1 The laying and jointing shall be done adopting the procedures as laid down in relevant I.S. Codes with latest amendments and or W/S manual of CPHEEO.
- 4.16.2 Unloading of pipes: While unloading, pipes shall not be thrown down from the trucks on hard roads. Unloading them on timber skids with a steadying rope and thus allowing the pipe to hump hard against one another should no be allowed. In order to avoid damage the pipes and especially to the spigot end, pipe should not be dragged along concrete and similar pavements with hard surface.
- 4.16.3 Hydrostatic Test: After laying, jointing the pipe line should be subjected to pressure test at a pressure specified in the schedule of work or as per direction of E.1.C and leakage test at a pressure as specified by the E.I.C. for a duration of two hours.
- 4.16.4 The aforesaid test shall be conduct as per procedure laid down in I.S. : 3114- 1985.
- 4.16.5 Notwithstanding the provisions kept in this specification as to the laying of pipe including jointing the same, omission of any item in this regard shall strictly be accordance with the provision made for the same in the relevant I.S. code for laying.

Chairperson ,Rampurhat Municipality

SECTION- B

CONDITIONS & REQUIREMENTS FOR BIDDING

1. Submission of eBid document will not be allowed beyond the schedule time indicated in the eBidding.
2. Each Bidder shall upload his offer in envelopes (statutory and non statutory)& .xls sheet after digitally signed super scribing the name of the work, name & address of the bidder, NIB No and date of submission of the eBid.
3. Each page of the eBid documents, drawing etc. has to be digitally signed / initialed by the authorized signatory.
4. No eBid proposal will be entertained without the earnest money being submitted as indicated in the eNIB. No interest will be allowed for the said earnest money and the Bid issuing authority will hold the same till finalization of the eBid.
5. Any conditional eBid will be liable for rejection.
6. eBid will be opened in presence of the Bidder or their authorized representatives who opt to be present.
7. The Bid inviting Authority reserves the right to reserve or amend the eBid documents prior to the date notified for submission of the eBid or also to extend the time mentioned in the eNIB under intimation to the Bidders.
8. eBid once offered cannot be withdrawn within a period of 120 calendar days from the date set for opening of eBids. Any extension of this validity period if required will be subject to concurrence of the Bidders.
9. Bidders would be at liberty to point out any ambiguities, contradictions, omissions, etc. seeking clarifications thereof or interpretation of any of the conditions of the eBid documents before the Bid Inviting Authority by uploading his/her doubt within a period of seven days from the date of publishing of Bid documents. The bidder shall submit his/her queries in writing at least four working days in advance from the date of pre-bid meeting.
10. Written clarification or amendments etc. as may be issued by the Bid Inviting Authority in pursuance to the representation made by the intending Bidders under Clause 10 above shall be final and binding on the Bidders and shall form a part of the eBid documents. Bid Inviting Authority however, reserves the right to have pre Bid conference with the intending Bidders if deemed necessary.
11. Intending Bidders are required to inspect the site of the Project with particular reference to location and infrastructure facilities. They are to make a careful study with regard to availability of materials and their sources and all relevant factors as might affect their rates and prices.
12. If expenses incurred for site inspection and all activities in the preparation and uploading of the eBid shall be borne by the Bidders.
13. Extra claim or any concession on the ground of insufficient data or information and absence of knowledge of conditions prevailing at the site or situation arising during the execution of the work shall not be entertained.

14. eBid, which have been considered valid on the result of general examination (Prequalification stage) at the time of opening, shall be subjected to subsequent detail scrutiny. Notwithstanding the general examination carried out earlier, the Bid Inviting authority reserves the right of rejection of any eBid, which may be found to be defective during the detail scrutiny.
15. Bidders before uploading the eBid documents shall have to ensure that "Declaration by the Bidder" in the pro-forma set out in the eBid documents is to be filed separately with the eBid documents in the form of Affidavit to be affirmed by the same person signing the Bid documents.
16. The Bid inviting authority reserves the right to accept or reject any or all of the eBid received or to split up the work in groups or to relax any clause without assigning any reason thereof.
17. This set of Bid documents consists of:
 - a) Main Bid Documents consists of PART I & PART II (Technical) & financial (.xls sheet).

Chairperson , Rampurhat Municipality

SECTION - C

General Conditions of Contract

1.0 DEFINITIONS AND INTERPRETATION

- (1) In the Contract, as hereinafter defined, the following words and expressions shall have to be meanings hereby assigned to them, except where the context otherwise requires:
- (a) "Approved" means provisionally approved in writing, including subsequent written confirmation of previous verbal approval and "approval" means provisional approval in writing, including as aforesaid. However in spite of approval from Competent Authority contractor is solely responsible for augmentation, design-cum-execution of the whole project as it is augmented turnkey job.
 - (b) "Authority" means the Superintending Engineer (WC) or his authorized representatives.
 - (c) "Bank" means the "State Bank of India" or any other Scheduled Bank.
 - (d) "Calendar day" means a period of twenty four hours extending from midnight to midnight.
 - (e) "Cash" includes cheque, bank drafts and any other payment voucher authorizing payment from any bank or treasury.
 - (f) "Contractor" means the person or persons, firm or Corporation who have entered into the contract for the performance of the work.
 - (g) "Contract price" means the sum as stated in the Bid submitted by the contractor subject to such additions thereto or deductions therefore as may be made under the provisions of the contract documents and accepted by the Employer.
 - (h) "Constructional Plant" means all appliances or things of whatsoever nature required in or about the execution or maintenance of the works but do not include materials or other things intended to form or forming part of the permanent works.
 - (i) "District" or Suri Municipal Area means the area described as such in Schedule-I of The Act;
 - (j) "Drawings" means the drawings referred to in the Bid documents and any modification of such drawings approved in writing by the Superintending Engineer, West Circle or his representatives of Municipal Engineering Directorate from time to time or approved in writing by the Superintending(WC).
 - (k) "Employer" means the Chairperson / Chairman of Rampurhat Municipality / Superintending Engineer (West circle).
 - (l) "Engineer in Charge" means the Executive Engineer, Birbhum Division of Municipal Engineering Directorate to whom the Superintending Engineer(WC), delegate his Authority by the way of declaring him as EIC in the Bid documents.
 - (m) "Engineer's Representatives" means any Assistant Engineer or Assistant of the Engineer or any Sub-Assistant Engineer of works appointed from time to time by the Employer or the Engineer to perform the duties set forth in Clause 2 hereof, whose authority shall be notified in writing to the Contractor by the Engineer-in Charge.
 - (n) "Ground Level" means the level of the referred point of the exposed surface of the ground, road or pavement free from extraneous materials;
 - (o) "Holidays" means a public holiday for the purpose of Section 25 of the Negotiable Instruments Act, 1881 or such other day on which the office of the Authority remains closed for the day;
 - (p) "Local Authority" not only means a Municipal Corporation or Municipality or other authority legally entitled to the control or manage local funds but also includes the West Bengal State Electricity Board.
 - (q) "Month" means English calendar month;
 - (r) "Permanent Work" means the permanent works including equipment to be supplied, executed, erected and maintained in accordance with the Contract;
 - (s) "Road" shall include a street, avenue, lane, by-lane or any other access routes over which a person authorized by a Local Authority has a right of way;
 - (t) "Rupees" (or Rs. in abbreviation) shall mean Rupees in Indian Currency.
 - (u) "Site" means the land and other placed on, under in or through which the Permanent. Works or Temporary Works are to be executed and any other lands and places provided or arranged by the employer for working space or any other purpose as may be specifically designated in the Contract as forming part of the Site,
 - (v) "Specification" means the specification referred to in the Bid and any modification thereof or addition thereto as may from time to time be furnished or approved in writing by the Superintending Engineer (WC), MED.
 - (w) "Store" means such storage areas including depot, go down, stockyard, dumping yard etc. maintained by the Authority) or where supply of any material for the construction or any work has been undertaken by any authorized agent, by such agent within the District.
 - (x) "Temporary Works" means all temporary works of every kind required in or about the execution or maintenance of the Permanent Works.
 - (y) "Bid Date" means the date fixed for receipt of Bids as per Notice Inviting Bids or as extended by subsequent notification(s).
 - (z) "Bidder" means the person, or persons, firm or corporation submitting a Bid for the work contemplated either directly or through a duly authorized representative.
 - (aa) "The Act" West Bengal Municipal Act, 1975
 - (bb) "Time" expressed by hours of the clock shall be according to the Indian Standard Time.
 - (cc) "Water main" means any pipe or conduit of cast iron, DI (Ductile Iron) pipe, steel or of any other material intended to convey or distribute water;
 - (dd) "Works" shall include both Permanent Works and Temporary Works.
 - (ee) "Work" means all of the work of the project called for or shown in the Bid documents including preparation, construction improvement and cleans up.
- (2) Singular and Plural: Works importing the singular only also include the plural and vice versa where the context demands.

- (3) Headings or Notes: The headings and marginal notes in these Conditions of Contract shall be deemed to be part thereof or be taken into consideration in the interpretation or construction thereof or of the Contract.
- (4) Cost: The work "cost" shall be deemed to include overhead costs whether on or off the Site.

2.0 ENGINEERS IN CHARGE AND HIS REPRESENTATIVES

- (1) Duties and Powers of Engineer in Charge and his Representative - The Engineer shall carry out such duties in issuing decisions, certificates and orders as are specified in the Contract. Fixation and acceptance of rates for altered or substituted items of work or for additional items of work or their deletion shall however always rest with the same authority (by designation) as had accepted the original Bid.
- (2) Representative(s) shall be responsible to the EIC and his/their duties are to watch and supervise the Works and to test and examine any materials to be used or workmanship employed in connection with the works. He shall have no authority to relieve the Contractor of any of his duties or obligations under the Contract, not, accept as expressly provided hereunder or elsewhere in the Contract, to order any work involving delay or any extra payment by the Employer, nor to make any variation of or in the Works.

The Superintending Engineer (WC) may from time to time in writing delegate to the EIC any of the power and authorities vested in the engineer and shall furnish to the Contractor and to the Employer a copy of all such written delegations of Power and authorities. Any Written instructions or approval given by Engineer's representative to the contractor within the terms of such delegation, but not otherwise, shall bind the Contractor as though it had been given by the Superintending(WC). Provided always as follows:

- (a) Failure of the Engineer's Representative to disapprove any work of materials shall not prejudice the power of the Superintending Engineer(WC) thereafter to disapprove such work or materials and to order the pulling down, removal of breaking up thereof.
- (b) If the Contractor shall be dissatisfied by reason of any decision of the Engineer's Representative he shall be entitled to refer the matter to the Superintending Engineer(WC), who shall thereupon confirm, reverse or vary such decision.

ASSIGNMENT AND SUB LETTING

3.0 ASSIGNMENT

The Contractor shall not assign the Contract or any part thereof, or any benefit or interest therein or there under, otherwise than a change in the Contractor's bankers of any money due or to become due under this contract, without the prior written consent of the Superintending Engineer(WC).

4.0 SUBLETTING

The Contractor shall not sublet the whole of the Works. Except where otherwise provided by the Contract, the Contractor shall not sublet any part of the Works without the prior written consent of the Superintending(WC), which shall not be unreasonably withhold and such consent, if given, shall not relieve the Contractor from any liability or obligation under the Contract and he shall be responsible for the acts, defaults and neglects of the said sub-contractor including his agents, servants or workmen as fully as if they were the acts, defaults or neglects of the Contractor, his agents, servants or workmen, provided always that the provision' of labour on a piece-work basis shall not be deemed to be a subletting under this clause.

5.0 CONTRACT DOCUMENTS

- (1a) Language: The Contract documents shall be drawn up in the English language. All correspondence, orders, notices etc. shall also be in English.
- (1b) Law: The law of India and of the State of West Bengal shall apply to the Contract and the Contract is to be construed accordingly.
- (2) Documents Mutually Explanatory: The several documents forming the contract are to be taken as mutually explanatory of one another but in case of ambiguities or discrepancies the same shall be explained and adjusted by the Superintending Engineer(WC), who shall thereafter issue to the Contractor instructions thereon. Provided always that if, in the opinion of the Engineer, compliance with any such instructions shall involve the Contractor in any cost, which by reason of such ambiguity or discrepancy could not reasonably have been foreseen by the Contractor, the Engineer shall certify and the Superintending(WC) shall pay such additional sum as may be reasonable to cover such costs.

6.0 DRAWINGS

- (1) Custody of drawing: All the approved Drawings shall remain in the safe custody of the Executive Engineer, but one copy thereof shall be furnished to the Contractor free of charge. The Contractor shall provide and make at his own expenses any further copies required by him. At the Completion of the Contract, the Contractor shall return to the Executive Engineer, Birbhum Division, M.E.Dte all drawings as provided under the Contract.
- (2) One copy of drawings to be kept on site. One copy of the Drawings furnished by the Contractor as aforesaid, shall be kept by the Contractor on the site and the same shall at all reasonable times be available for inspection and use by the Engineer and his/municipal Representatives and by any other persons authorized by the Engineer in writing.

- (3) Disruption of progress: The Contractor shall give written notice to Superintending(WC) whenever planning or progress of the works is likely to be delayed or disrupted unless any further approval of drawing or order, including a direction instruction or approval is issued by the Superintending(WC) on recommendation of Executive Engineer within a reasonable time. The notice shall include details of the drawing or order required, and of why and by whom it is required and of any delay or disruption likely to be suffered if it is further delayed.

7.0 FURTHER DRAWINGS

The Superintending(WC) shall have full power and authority to supply to or demand from the Contractor, from time to time, during the progress of the Works, such further drawings as shall be necessary for the purpose of the proper and adequate execution and maintenance of the Works. The Contractor shall carry out and be bound by the same. Adequacy as determined by the Superintending(WC) shall be final and binding on the Contractor.

8.0 GENERAL OBLIGATION

(1) Contractor's General Responsibilities - The Contractor shall, subject to the provision of the Contract, and with due care and diligence, execute and maintain the Works and supply all labour, including the supervision thereof, materials, equipment, Constructional Plant and machinery, tools and all other things whether of a temporary or permanent nature, required for such execution and maintenance, so far as necessary for providing the same is specified in or is reasonably to be inferred from the Contract. The Contractor shall take full responsibility for the adequacy, stability and safety of all Site operations and methods of construction, erection etc.

9.0 CONTRACT AGREEMENT

The Contractor shall, when called upon to do so, enter into and execute a Contract Agreement, to be prepared and completed in the form annexed with such modification as may be necessary.

10.1 GUARANTEE

The contractor shall stand guarantee for successful operation of the plant for 12 months from the date of successful commissioning of the pump and shall within the O & M period after 3 months trial run, remove/rectify/ make good any such deficiency forthwith at his own cost. During the guarantee period (after the trial run period) the firm's representative shall visit the site once in a month and advise in writing the Superintending(WC) about the condition, state of health, and operation & maintenance procedure of the equipment.

The successful Bidder shall also give the following guarantee in respect of the equipment supplied by him.

- i) All equipment shall be free from any defects due to faulty design of the components, materials and/or workmanship
- ii) The equipment shall operate satisfactory. The performance and efficiency shall not be less than guaranteed values.
- iii) Formal acceptance of the work or equipment covered under the contract will not be made by the Superintending (WC) until all the work done by the contractor has satisfactorily passed all tests required and run for a reasonable period to his satisfaction.

If during testing of work, including equipment prior of formal acceptance, the same or the material thereof must satisfy in respect of meeting the specification guaranteed or otherwise the Contractor shall replace all such equipment etc. in a condition which will meet the guaranteed performance and be up to the specification, in both material and workmanship.

Any such work shall be carried out by the contractor at his own expense, if such work shall, in the opinion of the Engineer-in-Charge, be necessary due to the use of materials or workmanship not in accordance with the contract and/or to the neglect or failure on the part of the contractor to comply with any obligation expressed or implied on the contractor's part under the contract. If the contractor shall fail to do any such work as per aforesaid requirement of the Engineer-in-Charge, the Superintending Engineer (WC) shall be entitled to have such work carried out by its own workman, or by others hired for the purpose, and if such work is in the opinion of the Engineer-in-Charge for which the contractor should have carried out at the contractor's own cost, the department shall be entitled to recover from the contractor the supervision cost deemed fit together with the cost increased for the purpose and may deduct the same from any money due to or that may become due to the Contractor.

10.2 PERFORMANCE GUARANTEE

The contractor will have to entered into an agreement through banker to ensure performance guarantee on non-judicial stamps Rs.50/-. Suitable proforma will be supplied in due course of time.

11.0 INSPECTION OF SITE

The Superintending Engineer (WC) shall have made available to the Bidder with the Bid documents such data like its location, distance from fixed point including the layout drawing and location of the primary grid point, level drawing data, the source of filling the reservoir and the Bid shall be deemed to have been based on such data. But the Bidder shall be responsible for his own interpretation thereof. The Bidder may also undertake investigations at his own cost on such levels or any other levels prior to submission of his offer.

The Bidder shall also be deemed to have inspected and examined the site and its surroundings and information available in connection therewith and to have satisfied himself, so far as is practicable, before submitting his Bid; as to the form and nature thereof, including the sub-surface conditions, topographical level of proposed site, the hydrological and climatic conditions, the extent and nature of work and materials necessary for the completion of the Works, the means of access to the Site and the accommodation he may require and, in general shall be deemed to have obtained all necessary information, subject as above mentioned, as to risks, contingencies and all other circumstances which may influence or affect his Bid.

12.0 SUFFICIENCY OF BID AND ADVERSE PHYSICAL CONDITIONS, ARTIFICIAL OBSTRUCTIONS

The Bidder shall be deemed to have satisfied himself before Bidding as to the correctness and sufficiency of his Bid for the Works and 'of the rates and prices quoted in the Schedule of prices, which Bid rates and prices shall, except in so far as it is otherwise provided in the Contract, cover all his obligations under the Contract and all matters and things necessary for the proper execution and maintenance of the Works. If, however, during the execution of its Works the Contractor shall encounter physical conditions, other than Climatic conditions on the Site, or artificial obstructions, which conditions or obstructions could, in his opinion, not have been reasonably foreseen by an experienced contractor, the Contractor shall forthwith give written notice thereof to the Engineer and if, in the opinion of the Engineer, such conditions or artificial obstructions could not have been reasonably foreseen by an experienced contractor, then the Engineer shall certify and the Superintending(WC) shall pay the additional cost to which the Contractor shall have been put by reason of such conditions, including the proper and reasonable cost.

- a) Of complying with any instruction which the Engineer may issue to the Contractor in connection therewith, and
- b) Of any proper and reasonable measures approved by the Superintending(WC) on recommendation of Engineer in charge which the Contractor may take in the absence of specific instructions from the Superintending(WC) as a result of such conditions or obstructions encountered.

13.0 WORK TO BE TO THE SATISFACTION OF ENGINEER IN CHARGE

Save in so far as it is not legally or physically impossible, the Contractor shall execute and maintain the Works in strict accordance with the Contract to the satisfaction of the Superintending Engineer (WC) and shall comply with and adhere strictly to the Superintending Engineer (WC) instructions and directions on any matter whether mentioned in the Contract or not touching or concerning the Works.

14.0 WORK PROGRAM

- (1) Program to be furnished: Within thirty (30) calendar days, the Contractor shall, after the acceptance of his Bid, submit to the Superintending Engineer (WC) for his approval a program showing the order of procedure in which he proposes to carry out the Works. The Contractor shall, whenever required by the Superintending Engineer (WC), also provide in writing for his information, general description of the arrangements and methods, which the Contractor proposes to adopt for the execution of the Works.
- (2) If at any time it should appear to the Superintending Engineer (WC) that the actual progress of the Works does not conform to the approved program referred in sub-clause (1) of this Clause, the Contractor shall produce, at the request of the Superintending Engineer (WC), a revised program showing the modifications to the approved program necessary to ensure completion of the Works within the time for completion as defined in Clause 42 hereof.
- (3) The submission to and approval by the Superintending Engineer (WC) of such program or the furnishing of such particulars shall not relieve the Contractor of any of his duties or responsibilities under the Contract.

15.0 CONTRACTOR'S SUPERINTENDENCE

The Contractor shall give or provide all necessary superintendence during the execution of the Works and as long thereafter as the Superintending Engineer (WC) may consider necessary for the proper fulfilling of the Contractor's obligations under the Contract. The Contractor or a competent and authorized agent or representative approved of in writing by the Superintending Engineer (WC), which approval may at any time be withdrawn, is to be constantly on the Works and shall give his whole time to the Superintendence of the same. If such approval be withdrawn by the Superintending Engineer (WC), the Contractor shall, as soon as is practicable, having regard to the requirement of replacing him as hereinafter mentioned after receiving written notice of such withdraw, remove the agent from the works and shall not thereafter employ him again on the Works in any capacity and shall replace him by another agent approved by the Superintending Engineer (WC). Such authorized agent or representative shall receive, on behalf of the Contractor, direction and instruction from the Superintending Engineer (WC) or, subject to the limitations of Clause 2 hereof the Engineer's Representative. The agent or representative of the Contractor must be able to speak and communicate in English/Bengali. In the absence of the Contractor's designated agent or representative for a particular operation on any site of the works the Contractor's supervisory staff or sub-agent or leading hands shall be instructed to receive and carry out any instruction or direction issued or given by the Superintending Engineer (WC) or the EIC

16.0 EMPLOYEES

- (I) Contractor's Employees - The Contractor shall provide and employ on the Site in connection with the execution and maintenance of the Works
- a) Such technical assistants as are skilled and experienced in their respective calling and such sub-agents, foreman and leading hands as are competent to give proper supervision to the work they are required to supervise, and
- b) Such skilled, semi-skilled and unskilled labor as is necessary for the proper and timely execution and maintenance of the Works.
- c) Employees covered under (a) and (b) may have to be provided with identity cards as specified by the Superintending(WC).
- (2) The Engineer shall be at liberty to object to and require the Contractor to remove forthwith from the Work any person employed by the Contractor in or about the execution or maintenance of the Works who, in the opinion of the Superintending Engineer(WC), misconducts himself, or is incompetent or negligent in the proper performance of his duties, or whose employment is otherwise considered by the Superintending Engineer(WC) to be undesirable and such person shall not be again employed upon the Works without the written permission of the Superintending Engineer(WC). Any person so removed from the Works shall be replaced as soon as possible by a competent substitute approved by the Superintending Engineer(WC).

17.0 SETTING-OUT

The Contractor shall be responsible for the true and proper setting-out of the Works in relation to original points, lines and levels of reference given by the Engineer in writing and for the correctness, subject as above mentioned, of the position levels, dimensions and alignment of all parts of the Works and for the provision of all necessary instruments, appliances/and labor in connection therewith. If, at any time during the progress of the Works, any error shall appear or arise in the position, levels, dimensions or alignment of any part of the Works, the Contractor, on his part, required to do so by the Engineer or the Engineer's Representative, shall at his own cost, rectify such error to the satisfaction of the Engineer or the Engineer's Representative, unless such error is based on incorrect data supplied in writing by the Engineer, in which case the expense of rectifying the same shall be borne by the Employer. The checking of any setting-out or of any line or level by the Engineer or the Engineer's Representative shall not in any way relieve the Contractor of his responsibility for the correctness thereof and the Contractor shall carefully protect and reserve all bench-marks, sight trails pegs and other things used in setting out the Works.

18.0 WATCHING AND LIGHTING

The contractor shall in connection with the works provide and maintain at his own cost all lights, guards, fencing, as and when/where necessary or as required by the Superintending Engineer(WC) or the Engineer's Representative, for the protection of the works, contractor's employees, employees supervisor or for any other reason deemed fit by the Engineer.

19.0 WORKS & RISKS

19. (1) Care of Works: From the commencement of the Works until the date stated in the Certificate of Completion for the whole of the Works, pursuant to Clause 47 hereof, the Contractor shall take full responsibility for the care thereof. Provided that if the Superintending(WC) shall issue a Certificate of Completion in respect of any part of the Permanent Works, the Contractor shall cease to be liable for the care of that part of the Permanent Works (O&M not counted) from the date stated in the Certificate of Completion in respect of that part and the responsibility for the care of that part shall pass to the Superintending Engineer(WC) provided further that the Contractor shall take full responsibility for the care of any outstanding work which he shall have undertaken to finish during the period to Maintenance until such outstanding work is completed. In case any damage, loss or injury shall happen to the Works, or to any part thereof, from any cause whatsoever, save and except the expected risks as defined in sub-clause (2) of this Clause, while the Contractor shall be responsible for the care thereof the Contractor shall, at his Own cost, repair and make good the same, so that at completion the permanent Works shall be in good order and condition and in conformity in every respect with the requirements of the Contract and the Superintending(WC) instructions. In the event of any such damage, loss or injury happening from any of the excepted risks, the Contractor shall, if and to the extent required by the Superintending Engineer(WC) and subject always to the provisions of Clause 62 hereof, repair and make good the same as aforesaid at the cost of the Employer. The Contractor shall also be liable for any damage to the Works occasioned by him in the Course of any operations carried out by him for the purpose of completing any outstanding works or complying with his obligations under Clause 48 or 49 hereof.

(2) Expected Risks: The 'expected risks' are war, hostilities, invasion, act of foreign enemies, rebellion, revolution insurrection or military or usurped power, civil war or unless solely restricted to employees of the Contractor or of his sub-contractors and arising from the conduct of his workers, riot commotion or use or occupation by the Superintending Engineer (WC) of any part of the Permanent Works, or a cause solely due to the Engineer's design of the Works, or ionizing radiations or contamination by radio-activity from any nuclear fuel or from any nuclear waste from the combustion of nuclear fuel, radio-active toxic explosive, or other hazardous properties of any explosive, nuclear assembly or nuclear component thereof, pressure waves cause by aircraft or other aerial devices traveling at sonic or supersonic speeds, or any such operation of the force of nature as an

experienced contractor could not foresee, or reasonably make provision for or insure against all of which are herein collectively recurred to as "the expected risks."

20.0 INSURANCE OF WORKS, ETC.

Without limiting his obligations and responsibilities under Clause 19 hereof the Contractor shall insure in the names of the Employer and the Contractor against all loss or damage from whatever cause arising, other than the expected risks, for which he is responsible under the terms of the Contract and in such manner that the Employer and Contractor are covered for the period stipulated in Clause 19(1) hereof and are also covered during the Period of Guarantee for loss or damage arising from a cause, occurring prior to the commencement of the Period of Guarantee, and for any loss or damage occasioned by the Contractor in the course of any operations carried out by him for the purpose of complying with his obligations under Clause 48 or 49 hereof.

- a) The Works for the time being executed to the estimated current contract value thereof together with the materials for incorporation in the Works at the replacement value.
- b) The Constructional Plant and other things brought on the Site by the Contractor to the replacement value of such Constructional Plant and other things. These shall include materials belonging to the Superintending (WC) but issued to or intended to be issued to the Contractor for use in the Works. Such insurance shall be affected with an insurer and in terms approved by the Employer, which approval shall not be unreasonably withheld, and the Contractor shall whenever required, produce to the Superintending Engineer(WC)or the Engineer's Representative the policy or policies of insurance and the receipts for payment of the current premiums.

21.0 DAMAGES

- (1) Damage to persons and property: The Contractor shall, except if and so far as the Contract provides otherwise, indemnify the Superintending(WC) against all losses and claims in respect of injuries or damage to any person or material or physical damage to any property whatsoever which may arise out of or in consequence of the execution, operation and maintenance of the Works and against all claims, proceedings, damages, costs, charges and expenses whatsoever in respect of or in relation thereto except any compensation or damages for or with respect to :
 - a) The permanent use of occupation of land by the Works or any part thereof.
 - b) The right of the Superintending Engineer (WC) to execute the Works or any part thereof on over under, in or through any land.
 - c) Injuries or damage to persons or property which are the unavoidable result of the execution, operation or maintenance- of the Works in accordance with the Contract.
 - d) Injuries or damages to persons or property resulting from any act or neglect of the Employer, his agents, servants or other contractors, not being employed by the Contractor, or for or in respect of any claims, proceedings, damages, costs, charges and expenses in respect thereof or in relation thereto or where the injury or damage was contributed to by the Contractor, his servants or agents such part of the compensation as may be just and equitable having regard to the extent of the responsibility of the Superintending(WC), his servant or agents or other contractors for the damage or injury.
- (2) Indemnity of Superintending (WC): The Contractor shall indemnify the Superintending(WC) against all claims, proceedings, damages, costs charges and expenses in respect of the matters referred to the provision to sub-clause (1) of this Clause.

22.0 INSURANCE

- (1) Third Party Insurance: Before commencing the 'execution of the Works the Contractor, but without limiting his obligations and responsibilities under Clause 21 hereof, shall insure against his liability for any material or physical damage, loss or injury which may occur to any property, including that of the Superintending Engineer(WC), or to any person, including any employee of the Superintending Engineer(WC)by or arising out to the execution of the Works or in the carrying out of the Contract, otherwise than due to the matters referred to in the proviso to Clause 21 (I) hereof
- (2) Minimum Amount of third party insurance - Such insurance shall be affected with an insurer and in terms approved by the Superintending(WC), which approval shall not be unreasonably withheld, and for a least the amount started in the Appendix to the Bid. The Contractor shall, whenever required, produce to the Superintending (WC) or the Engineer's Representative the policy or policies or insurance and the receipts for payment of the current premium. However, the Bidder should insure for an amount commensurate with the risk involved subject to the minimum amount prescribed elsewhere in the Bid.
- (3) Provision to indemnify Employer - The terms shall include a provision whereby, in the event of any claim in respect of which the Contractor would be entitled to receive It1dcnJmty under the policy being brought or made against the Superintending(WC), the insurer will indemnify the Employer against such claims and any costs, charges and expenses in respect thereof.

23.0 ACCIDENT, INJURIES

- (1) Accident or injury to Workmen: The Superintending (WC) shall not be liable for or in respect of any damages or compensation payable at law in respect or in consequence of any accident or injury to any workman or other person in the employment of the Contractor or any subcontractor, save and except an accident or injury resulting from any act or default of the Superintending Engineer(WC), his agents, or servants. The Contractor shall indemnify and keep indemnified the Superintending(WC) against all such damages and compensation, save and except as aforesaid, and against all claims, proceedings, costs, charges and expenses whatsoever in respect thereof or in relation thereto.
- (2) Insurance Against Accident, etc., to workmen: The Contractor shall insure against such liability with an insurer approved by the Superintending Engineer(WC), which approval shall not be unreasonably withheld, and shall continue such insurance during the whole of the time that any person is employed by him on the works and shall, when required, produce to the Superintending Engineer(WC) or the Engineer's Representative such policy of insurance and the receipts for payment of the current premium. Provided always that, in respect of any person employed by any sub-contractor, the Contractor's obligation to insure as aforesaid under this sub-clause shall be satisfied if the sub-contractor shall have insured against the liability in respect of such persons in such manner that the Superintending Engineer(WC) is indemnified under the policy, but the Contractor shall require such sub-contractor to produce to the Superintending(WC) when required, such policy of insurance and the receipt for the payment of the current premium.
- (3) Notification to insurer: It shall be the duty of the Contractor to notify the insurers under any of the insurance referred to in Clause 20, 22 and 23 hereof any matter or count which by the terms of such insurance are required to be notified and the Contractor shall indemnify and keep indemnified the Superintending Engineer(WC) against all losses, claims, demands, proceedings, costs, charges and expenses whatsoever arising out of or resulting from any default by the Contractor in complying with the requirements of this sub-clause whether as a result of the avoidance of such insurance or otherwise.
- (4) All Insurances at Contractor's cost - The insurances referred to in Clause 21, 22 & 23 hereof shall be entirely at the cost and expenses of the Contractor and be included within his rates.

24.0 REMEDY ON CONTRACTOR'S FAILURE TO INSURE

If the Contractor shall fail to effect and keep in force the insurance referred to in Clause 20, 22 and 23 hereof, or any other insurance which he may be required to effect under the terms of the Contract, then and in any such case the Superintending(WC) may effect and keep in force any such insurance and pay such premium or premiums including fines as may be necessary for that purpose and from time to time and deduct double the amount so paid by the employer as aforesaid from any moneys due or which may become due to the Contractor or recover the same as a debt due from the Contractor.

25. (1) Giving of Notices and Payment of Fees: The Contractor shall give all notices and pay all fees required to be given or paid by any National or State Statute, ordinance, or other law, or any rules regulation, or bye-law of any local or other duly constituted authority in relation to the execution of the Works and by the rules and regulations of all public bodies and companies whose property or rights are affected or may be affected in any way by the Works.

(2) Compliance with Statutes, Regulations, etc. - The Contractor shall conform in all respects with the provisions of any such Statute, Ordinance or Law as aforesaid and the Rules, regulations or bye-laws or any local or other duly constituted authority which may be applicable to the Works and with such rules and regulations of public bodies and companies as aforesaid and shall keep the Superintending(WC) indemnified against all penalties, fines and liability of every kind for breach of any such Statute, ordinance of Law, regulation of bye law.

26.0 FOSSILS, ETC.

All fossils, coins articles of value or antiquity and structures and other remains or things of geological or archaeological interest discovered on the site of the Works shall as between the Employer and the Contractor be deemed to be the absolute property of the Employer.

27.0 PATENT RIGHTS AND ROYALTIES

The Contractor shall save harmless and indemnify the Superintending Engineer(WC) from and against all claims and proceedings for or on account of infringement of any patent, rights, design Trade mark or name or other protected right in respect of any Constructional Plant, machine works, or material used for or in connection with the Works or any of them and from and against all claims, proceedings, damages, costs, charges and expenses whatsoever in respect thereof in relation thereto. Except where otherwise specified, the Contractor shall pay all tonnage and other royalties, rent and other payments or compensations, if any, for getting stone, sand, gravel, clay or other materials or equipment required for the works or any of them.

28.0 INTERFERENCE WITH TRAFFIC AND ADJOINING PROPERTIES

All operations necessary for the execution of the Works shall, so far as compliance with the requirements of the Contract permits, be carried on so as not to interfere unnecessarily or improperly with the convenience of the existing plant workers, member of the public, or the access to use and occupation of public or private roads,

railways and footpaths to or of properties whether in the possession of the Superintending(WC) or of any other person or local authority.

29.0 TRAFFIC

- (1) **Extraordinary Traffic:** The Contractor shall use every reasonable means to prevent any of the highways, railways or bridges communicating with or on the routes to the Site from being damaged or injured by any traffic of the Contractor or any of this sub-contractors and, shall select routes, choose and use vehicles and restrict and distribute loads so that any such extraordinary traffic as will inevitably arise from the moving of plant and material from and to the Site shall be limited, as far as reasonably possible, and so that no unnecessary damage or injury may be occasioned to such highways, railways and bridges.
- (2) **Special Loads:** Should it be found necessary for the Contractor to move one or more loads of Constructional plant, machinery or pre-constructed units or parts of units of work over part of a highway, railway or bridge, the moving whereof is likely to damage any highway, railway or bridge unless special protection or strengthening is carried out, then the Contractor shall before moving the load on to such highway, railway or bridge give notice to the Superintending Engineer(WC) or Engineer's Representative or the local authority of the weight and other particulars of the load to be moved and his proposals for protecting or strengthening the said highway, railway or bridge. The Contractor at his own cost and expenses shall carry out such proposals, including any modifications thereto that the Engineer or the local authority may require.
- (3) **Settlement of Extraordinary Traffic Claims:** If during the Carrying out of the Works damage or injury to railways, railway or bridge occurs due to moving of one or more loads of Constructional Plant machinery or pre-constructed units or parts of units of work, the Employer shall conduct the necessary investigation for the purpose of determining the Contractor's liability. If the damage is due to failure on the part of the Contractor to observe and perform his obligations under sub-clause (1) and (2) of this Clause then the restoration / repair of the damaged portion of road or structure certified by the Engineer or local authority to be due to such failure shall be undertaken by or be chargeable against the Contractor.
- (4) **Water-borne Traffic:** Where the nature of the Works is such as to require the use by the Contractor of water-borne transport the foregoing provisions of this Clause shall be construed as though "highway" included a lock, dock, sea wall or other structure related to a waterway and "vehicle" included craft, and shall have effect accordingly.

30.0 RESTRICTION

- (a) **Restriction of Movements:** The work shall have to be executed within the protected area of existing water works. The existing rules and regulation related to ingress and egress of labor and material shall have to be followed strictly in consultation with and as per direction of the Superintending Engineer (WC) or the local authority as the case may be. No labor, Supervisor or Engineer of the contractor shall enter inside the treatment plant, pump house or any other existing installations without prior permission of concerned officers Superintending Engineer(WC).
- (b) **Opportunities for other contractors:**The Contractor shall in accordance with the requirements of the Superintending Engineer(WC), afford all reasonable opportunities for carrying out their work to any other contractors employed by the Employer and their workmen and to the workmen of the employer and of any other duly constituted authorities who may be employed in the execution on or near the Site of any work not included in the Contract or of any contract which the Employer may enter into in connection with or ancillary to the Works. If, however, the Contractor shall, on the written request of the Superintending Engineer(WC) or the Engineer's Representative, make available to any such other contractor, or to the Employer or any such authority, any roads or ways for the maintenance of which the Contractor is responsible, or permit the use by any such of the Contractor's scaffolding or other plant on the Site, or provide any other service of whatsoever nature, the Employer shall pay to the Contractor in respect of such use or service such sum or sums if at all as shall, in the opinion of the Engineer, be reasonable.

31.0 CONTRACTOR TO KEEP SITE CLEAR

During the progress of the Works the Contractor shall keep the site reasonable free from all necessary obstruction and shall store or dispose of any Constructional Plant and surplus materials and clear away and remove from the Site any wreckage, rubbish or Temporary Works no longer required.

32.0 CLEARANCE OF SITE ON COMPLETION

On the completion of the Works the Contractor shall clear away and remove from the site all Constructional Plant, surplus materials, rubbish and Temporary Works of every kind, and leave the whole of the Site and Works clean and in a workmanlike condition to the satisfaction of the Superintending Engineer (WC).

33.0 LABOUR

- (1) Engagement of labor: The Contractor shall make his own arrangements for the engagement of all labor, local or otherwise, and save in so far as the Contract otherwise provides, for the transport, housing, feeding and payment thereof.
- (2) Supply of water: The Contractor shall, so far as is reasonably practicable having regard to local conditions, provide on the Site, to the satisfaction of the Superintending Engineer(WC) representative, an adequate supply of drinking and other water for the use of the Contractor's staff and work people.
- (3) Alcoholic Liquor or Drugs: The Contractor or his workmen shall not consume or sale or gift or be under the influence of any drug/narcotics or Alcoholic liquor within the vicinity of the Construction site.
- (4) Arms and Ammunition: The Contractor shall not give, barter or otherwise dispose of to any person or persons, any arms or ammunition of any kind or permit or suffer the same as aforesaid.
- (5) Festivals and Religious Customs: The Contractor shall in all dealing with labor in his employment have due regard to all recognized festivals days of rest and religious or other customs.
- (6) Epidemic: In the event of any outbreak of illness of an epidemic nature, the Contractor shall comply with and carry out such regulations, orders and requirements as may be made by the Government, or the local medical or sanitary authorities for the purpose of dealing with and overcoming the same.
- (7) Disorderly Conduct etc.: The contractor shall at all times take all reasonable precautions to prevent any unlawful, riotous or disorderly conduct by or amongst his employees or workers and for the preservation of peace and protection of persons and property in the neighborhood of the Works against the same.
- (8) Compliance with Laws, regulation etc. relating to labor: In respect of the engagement, employment, transport, payment, feeding, housing and working conditions of labor and all matters connected there with the Contractor shall at all times during the continuance of the Contract, comply in all respects with and carry out all obligations imposed on him by the provisions and requirements of the following statutes.
 - (a) The Apprentices Act 1961 (Act 52 of 1961) and Rules and Regulations issued there under from time to time.
 - (b) The Contract Labor Regulation and abolition Act 1970 (Act 37 of 1970) and Rules made there under (West Bengal Contract Labor Regulation and Abolition Rules 1972) from time to time.
 - (c) The Payment of Wages Act 1936, the Minimum Wages Act 1948, the Employees Liability Act 1938, the Industrial Disputes Act 1947, the Maternity Benefits Act 1961, the Employees State Insurance Act 1948 including modifications thereto the Rules and Regulations framed there under from time to time.
 - (d) Other existing National or State Statute, Ordinance or other Law or any Regulation or Bye-law of any local or other duly constituted authority which may be applicable, including any such Law, Regulation or Order that may be passed or ordered from time to time and come into force during the tenure of the Contract.
- (9) Employees Provident Fund: The Contractor shall comply with the provisions of the relevant Employees Provident Fund Act or Rules in force in the State along with the provisions of all rules and Regulations made there under from time to time, and shall in particular be responsible for the payment of all contributions as laid down under the Act/Rules.
- (10) Trade union rights: The Contractor shall recognize the freedom of all workmen employed by him in and for performance of the Contract to be members of registered Trade Unions and shall not in any manner prevent or discourage any such workman from becoming a member of a registered Trade Union or discriminate against any workmen who is a member of a registered Trade Union.
- (11) Local Labor: As far as possible local labor shall be engaged as unskilled labor.
- (12) Fair Wages - The Contractor shall in respect of all workmen employed by him in and for the performance of the Contract pay rates of wages and observe the conditions of employment not less favorable than those provided under the relevant labor law as applicable to the State.
- (13) Medical Attendance: The Contractor shall provide, to the satisfaction of the Government or Local Authorities Concerned, adequate medical attendance for his employees and labor.
- (14) Report or Accident: The Contractor shall, within twenty four (24) hours of the occurrence of any accident at or about the site or in connection with the execution of the Work, report such an accident to the Engineer. The Contractor shall also report such accident to the competent authority whenever law requires such a report.
- (15) Report required by Labor Commissioner: The Contractor shall submit, at the request of the Labor Commissioner or of the Assistant Commissioner of the State such returns as may be called for from time to time in respect of labor employed by the Contractor and by his subcontractors in the execution of the Contract. If so required, the Contractor shall furnish the names and address of all subcontractors to the Labor Commissioner. Statutory provisions in these regards are to be also complied with.

- (16) The Contractor shall be responsible for observance by his subcontractor of all the foregoing provision of sub-clause (1) to (15) of this Clause 33.

34.0 RETURNS OF LABOR ETC.

The Contractor shall, if required by the Superintending Engineer(WC), deliver to the Superintending Engineer(WC), or at his office a return in detail in such form and at such intervals as the Superintending Engineer(WC) may prescribe showing the supervisory staff and the number of the several classes of labor from time to time employed by the Contractor on the Site and such information respecting Constructional Plant as the Superintending(WC) his Representative may require.

35.0 MATERIALS AND WORKMANSHIP

- (1) All materials and workmanship shall be of the respective kinds described in the Contract and in accordance with the Engineer's instructions and shall be subjected from time to time to such tests as the Engineer may direct at the place of manufacture or fabrication, or on the Site or at such other place or places as may be specified in the Contract, or at all or any of such places. The Contractor shall provide such assistance, instruments, machines, labor and materials as are normally required for examining, measuring and testing any work and the quality, weight or quantity of any material used and shall supply samples or materials before incorporation in the Works for testing as may be selected and required by the Superintending Engineer(WC) be it at site or at the manufacturer/Vendors premises or elsewhere.
- (2) Cost of samples: The Contractor at the cost and expense of him shall furnish all samples of materials as may be required by the Superintending Engineer (WC).
- (3) Cost of Tests: The cost of making any test shall be borne by the Contractor if such test is clearly intended by or provided for in the Contract and in the cases only of a test under load or of a test to ascertain whether the design of any furnished or partially finished work in appropriate for the purpose which it was intended to fulfill, is particularized in the Contract in sufficient detail to enable the Contractor to price or allow for the same in his Bid.
- (4) Cost of Tests not provided for, etc.: If the Superintending Engineer (WC) orders any test, which is either;
- a) Not so intended by or provided for, or
 - b) (In the cases above mentioned) is not so particularized, or
 - c) Though so intended or provided for is ordered by the Engineer to be carried out by an independent person or organization at any place other than the Site or the place of manufacture or fabrication of the materials tested, then the cost of such test shall be borne by the Contractor, if the tests shows the workmanship or materials not to be in accordance with the provisions of the Contract or the Engineer's instruction.

36.0 INSPECTION OF OPERATIONS

The Engineer and any person authorized by him shall at all times have access to the Works and to all workshops stores and places where work is being prepared or from where material manufactured articles or machinery are being obtained for the Works and the Contractor shall afford every facility for and every assistance in or in obtaining the right to such access.

37.0 EXAMINATION

- (1) Examination of work before covering up: No work shall be covered up or put out of view without the approval of the Engineer or the Engineer's Representative and the Contractor shall afford full opportunity for the Superintending Engineer (WC) or the Engineer's Representative to examine and measure any work which is about to be covered up or put out of view and to examine foundations before permanent work is placed thereon. The Contractor shall give due notice to the Engineer's Representative where any such work or foundations is or are ready or about to be ready for examinations and the Engineer's Representative shall, without unreasonable delay, unless he considers it unnecessary and advises the Contractor accordingly attend for the purpose of examining and measuring such work or of examine such foundations
- (2) Uncovering and making openings: The Contractor shall uncover any part or parts of the Works or make opening in or through the same as the Engineer may from time to time direct and shall reinstate and make good such part or parts to the satisfaction of the Engineer If any such part or parts have been recovered up or put out of view after compliance with the requirement of sub-clause (1) of this Clause and are found to be executed in accordance with the Contract, the expenses of uncovering, making openings in or through, reinstating and making good the same shall be, borne by the Employer, but in any other case all costs shall be borne by the Contractor.

38.0 REMOVAL

- (1) Removal of improper work and materials: Superintending Engineer (WC) shall during the progress of the works have power to order in writing from time to time.
- a) The removal from the Site, within such time or time as may be specified in the order, of any materials, which in the opinion of the Engineer, are not in accordance with the Contract.
 - b) The substitution of improper, substandard and unsuitable materials used in the construction.

- c) The removal and proper re-execution, notwithstanding any previous test thereof or interim payment therefore, of any work which in respect of materials or workmanship is not in the opinion of the Engineer, in accordance with the Contract
- (2) Default of Contractor in Compliance: In case of default on the part of the Contractor in carrying out such order, the Employer shall be entitled to employ and pay other persons to carry out the same and all expenses consequent thereon or incidental thereto shall be recoverable from the Contractor by the Employer, or may be deducted by the Employer from any sum due or which may become due to the Contractor.

39.0 SUSPENSION

- (1) Suspension of work: The Contractor shall, on the written order of the Engineer, suspend the progress of the works or any part thereof for such time or times and in such manner as the Engineer may consider necessary and shall during such suspension properly protect and secure the work, so far as is necessary in the opinion of the Engineer. The extra cost incurred by the Contractor in giving effect to the Engineer's instruction under this Clause shall be borne and paid by the Employer unless such suspension is
 - a) Otherwise provided for in the Contract, or
 - b) Necessary by reason of some default on the part of the Contractor, or
 - c) Necessary by reason of climatic conditions on the Site, or
 - d) Necessary for the proper execution of the work or for the safety of workmen or Works of any part thereof in so far as such necessity does not arise from any act or default by the Engineer or the Employer or from any of the expected risks defined in Clause 19 hereof provided that the Contractor shall not be entitled to recover any such extra cost unless he gives written notice of his intention to claim to the Employer within twenty-eight days of the Engineer's order. The Superintending Engineer (WC) shall settle and determine such extra payment and/or extension of time under Clause 43 hereof to be made to the Contractor in respect of such claim as shall in the opinion of the Employer be fair and reasonable.
- (2) Suspension lasting more than 90 days: If the progress of the Works or any part thereof is suspended on the written order of the Superintending Engineer(WC)and if permission to resume Work is not given by the Superintending Engineer(WC)within a period of ninety days from the date of suspension then, unless such suspension is within paragraph (a), (b), (c) or (d) of sub-clause (1) of this Clause, the Contractor may serve a written notice on the Employer requiring permission within twenty eight days from the receipt thereof to proceed with the Works, or that part thereof in regard in which progress is suspended and, if such permission is not granted within that time, the Contractor by a further written notice so served may, but is not bound to, elect or treat the suspension where it affects part only of the Works as an omission of such part under Clause 50 hereof, or where it affects the whole Works, as an abandonment of the Contract by the Employer.

40.0 COMMENCEMENT TIME AND DELAYS

Commencement of works: The Contractor shall commence the Works on Site within the period named in the Appendix to the Bid after the receipt by him of a written order to this effect from the Engineer and shall proceed with the same with due expedition and without delay, except as may be expressly sanctioned or ordered by the Engineer, or be wholly beyond the Contractors' Control.

The successful contractor shall within four weeks from the date of issue of Letter of Intent furnish one or more drawing stating and showing the following:

- 1.0 Dimensioned area requirement of the pumping station and sump showing the Details of
 - 1.1 Cut-outs at the operating platform.
 - 1.2 Layout of motors, pumps, valves and other electrical units like MCC, Capacitors, and Battery Room etc. at different flow level.
- 2.0 Vertical space requirement showing the levels of -
 - 2.1 Centerline of Pump
 - 2.2 Foundation level of pumps & valves
 - 2.3 Centerline and sizes of pump delivery pipes, bends etc.
 - 2.4 Top of the Pump casing
 - 2.5 Mono rail with chain pulley block
- 3.0 Forces and Moments developed at different locations.

- 3.1 Static and Dynamic loads of pumps, motors, valves, etc. (showing deed loads separately) & load of various electrical equipments and machinery.
- 3.2 Moments and stresses developed at different locations.
- 3.3 Vibrations at different locations expected.
- 4.0 Foundation details showing bolt sizes and extent of embedding of the foundation bolts.
- 5.0 RSJ sizes, locations and fixing arrangements for motor support, RSJ/girder requirement for fixing Mono rail as clamp-on chain pulley blocks for attending of valves etc. at the pump floor level stating the maximum load that is required to be lifted.
- 6.0 Layout of cable trenches, cable trays showing the locations and levels together without position of hooks at the under site of the operating platform stating the maximum load required to be withstood.
- 7.0 Any other data that the Bid considers relevant for construction of civil structure.
- 8.0 Any other reasonable data that may be asked for.

41.0 POSSESSION

- (1) Possession of site: Save in so far as the contract may prescribe, the extent of portions of the Site of which the Contractor is to be given possession from time to time and the order in which such portions shall be made available to him and subject to any requirement in the Contract as to the order in which the Works shall be executed, the Employer will, with the Engineer's written order to commence the Works, give to the Contractor possession of so much of the Site as may be required to enable the Contractor to commence and proceed with the execution of the Works in accordance with the Programmed referred to in Clause 14 hereof, if any, and otherwise in accordance with such reasonable proposals, of the Contractor as he shall, by written notice to the Engineer, make and will, from time to time as the Works proceed, give to the Contractor possession of such further portions of the Site as may be required to enable the Contractor to proceed with the execution of the Works with due dispatch in accordance with the said Programmed or proposals, as the case may be. If the Contractor suffers delays or incurs cost for failure on the part of the Employer to give possession in accordance with the terms of this Clause, the Employer shall grant an extension of time for the completion of the Works and certify such sum as, in his opinion, shall be fair to cover the cost incurred, which sum shall be paid by the Employer.
- (2) Way leaves etc.: The Contractor shall bear all costs and charges for special or temporary way leaves required by him in connection with access to the Site. The Contractor shall also provide at his own cost any additional accommodation outside the site required by him for the purpose of the works.

42.0 TIME

- (1) Time of Completion and progress of Works: The progress of the work shall conform to the approved Work Programmed in terms of Clauses 14 hereof, and subject to any requirement in the contract as the completion of any section of the Works before completion of the whole, the whole of the Works shall be completed, in accordance with the provisions of Clause 47 hereof, within the time stated in the Contract calculated from last days of the period named in the Appendix to the Bid as that within which the Works are to be commenced, or such extended time as may be allowed under Clause 43 hereof.
- (2) Failure in keeping to stages of work Programmed: If the Contractor does not keep to the approved program and continues at any stage to fall behind his schedule by as much as twenty percent (20%) of the said approved work programmed, within thirty (30) days from receipt by him of a written notice from the Engineer, or if in the opinion of the Engineer the delay will substantially affect operation activities or execution of a major work item and it is ascertained by the Engineer that the Contractor cannot remedy the occasion within the stipulated time, the Superintending Engineer(WC) on recommendation of Engineer shall have full authority to undertake measures to recover from such adverse condition in terms of the provisions of Clause 62 thereof.

43.0 EXTENSION OF TIME FOR COMPLETION

Should the amount of extra or additional work of any kind or any cause of delay referred to in these Conditions, or other special circumstances of any kind whatsoever which may occur, other than through a default of the Contractor, be such as fairly to entitle the Contractor to an extension of time for the completion of the works, the Superintending Engineer(WC) on recommendation of Engineer shall determine the period of such extension and shall notify the Employer and the Contractor accordingly. Provided that the Engineer is not bound to take into account any extra or additional work or other special circumstances unless the Contractor has within twenty-eight days after such work has been commenced, or such circumstances have arisen or as soon as is practicable, submitted to the Engineer full and detailed particulars of any extension of time to which he may consider himself entitled in order that such submission may be investigated at the time.

44.0 NO NIGHT OR SUNDAY WORK

Subject to any provision to the contrary contained in the Contract, none of the Permanent Works shall, save as hereinafter provided, be carried on during the night or on Sundays, if locally recognized as days of rest, or other locally recognized equivalent without the permission in writing of the Engineer, except when the works is

unavoidable or absolutely necessary for the saving of life or property or for the safety of the Works, in which case the Contractor shall immediately advise the Engineer, provided always that the provisions of the Clause shall not be applicable in the case of any work which it is customary to carry out by rotary of shifts.

45.0 RATE OF PROGRESS AND NIGHT WORK WHEN PERMITTED

If for any reason, which does not entitle the Contractor to an extension of time, the rate of progress of the Works or any section is at any time, in the opinion of the Engineer, too slow to ensure completion by the prescribed time or extended time for completion, the Superintending Engineer(WC)on recommendation of the Engineer shall so notify the Contractor in writing and the Contractor shall thereupon take such steps as are necessary and the Engineer may approve to expedite progress as to complete the Works or such section by the prescribed time or extended time. The Contractor shall not be entitled to any additional payment for taking such steps. If as a result of any notice given by the Superintending Engineer(WC)under this Clause, the Contractor shall seek the Superintending Engineer(WC) permission to do any work at night or on Sundays, If locally recognized as days of rest, or their locally recognized equivalent, such permission shall not be unreasonable refused. When work at night has to be carried out, the Contractor shall, at his own cost and expense, make adequate arrangements for lighting and provide necessary facilities for safety etc. and comply with all stipulations as may have been imposed by the Superintending Engineer(WC)in granting permission for night work.

46.0 DAMAGES FOR DELAY

- (1) Liquidated Damages for Delay: If the Contractor shall fail to achieve completion of the Works within the time prescribed by Clause 42 hereof, then the Contractor shall pay to the Employer the sum stated in the Contract as liquidated damages for such default and not as a penalty for every day of part of a day which shall elapse between the time prescribed by Clause 42 hereof and the date of certified completion of the Works, the Employer may without prejudice to any other method of recovery, deduct the amount of such damages from any money in his hands, due or which may become due to the Contractor. The payment or deduction of such damages shall not relieve the Contractor from his obligation to complete the Works, or from any other of his obligations and liabilities under the Contract.
- (2) Reduction of liquidated Damages: If, before the completion of the whole of the Works any part or section of the Works has been certified by the Engineer as completed, pursuant to Clause 47 hereof, and occupied or used by the Employer, the liquidated damages for delay shall, for any period of delay after such certificate and in the absence of alternative provision in the contract be reduced in the proportion which the value of the part or section so certified bears to the value of the whole of the Works.
- (3) Extent of Liquidated Damages: The liquidated damages referred to in sub-clause (1) for delay of each day or part thereof, shall be at the rate of one percent (1 %) or such smaller amount as the Employer may decide, or the total value of the Contract Price excluding the value of such part or section of the works as may have been covered by certificate of completion in terms of the provisions of sub-clause (2) above, Provided however that in no case shall be total amount of liquidated damages exceed ten percent (10%) of the total Contract Price for whole Works.
- (4) Liquidated Damage as Reasonable Compensation: The 'Liquidated damage' referred to in sub-clause (1) to (3) above, shall be considered as reasonable compensation to the applied to the use of the Employer without reference to the actual loss or damage sustained and whether or not any damage shall have been sustained.
- (5) No bonus for early completion:- The Contractor shall not be entitled to payment of any bonus for early completion of the Works.

47.0 CERTIFICATION OF COMPLETION OF WORK

- (1) Erection: Erection of Mechanical and electrical equipment shall be construed to have been completed where equipment in question is placed in position undergoes all necessary tests such as those for alignment, verticality, leak proofness, insulation etc. as may be specified elsewhere in the Bid documents and put to operation.
- (2) Completion: Completion is a stage when the equipment and the structure as a whole is certified by the Employer. The date shall only be indicative for the purpose of reckoning the period of Maintenance Period and shall not be co-related with the release of any payment provided that non-continuous of sporadic functioning shall not be deemed as commissioning and also provided that non-commissioning of minor works, the decision on determination of major or minor works resting with the employer, shall not multiply the act of completion for the aforesaid purpose.

An item shall be considered as minor work where its non-completion may not in the opinion of the employer, stand in the way of commencement of plant operation.

- (3) Trial Run: The Trial Run period shall be for three months including 72 hours with load operation of 8 hours at a stretch operation of all equipments as per specification and to the satisfaction of Engineer-in-Charge.

48.0 MAINTENANCE

- (1) Maintenance Period: Maintenance period shall be for a period of one year counted from the date of certified commissioning i.e. after successful trial runs of 3 months. The Contractor shall provide spare parts at his cost required during the maintenance period.
- (2) Cost of Execution of work of repair, etc.: The repair work shall be carried out by the Contractor at his own expense if the necessity thereof shall, in the opinion of the Engineer, be due to the use of materials or workmanship not in accordance with the Contract, or to neglect or failure on the part of the Contractor to comply with any obligation, expressed or implied, on the Contractor's part under the Contract. If, in the opinion of the Engineer, such necessity shall be due to any other cause, the value of such work shall be ascertained and paid for as if it was an additional work.
- (3) Remedy on contractor's failure to carry out work required: If the Contractor shall fail to do any such work as aforesaid requirement by the Engineer, the Employer shall be entitled to employ and pay other persons to carry out the same, which in the opinion of the Employer, the Contractor was liable to do at his own expense under the Contract. In the said event, all expenses consequent thereon or incidental thereto shall be recoverable from the Contractor by the Employer, or may be deducted by the Employer from any sum due or which may become due to the Contractor.

49.0 CONTRACTOR TO SEARCH

The Contractor shall, if required by the Superintending Engineer(WC)in writing, search under the directions of the Engineer, for the cause of any defect, imperfection or fault appearing during the progress of the Works or in the period of Maintenance. Unless such defect, imperfection or fault shall be one for which the contractor is liable under the contract, the cost of the work carried out by the contractor in searching as aforesaid shall be borne by the Employer. If such defect, imperfection or fault shall be one for which the contractor is liable as aforesaid, the cost of the work carried out in searching as aforesaid shall be borne by the contractor and he shall in such case repair, rectify and make good such defect, imperfection or fault at his Own expense in accordance with the provisions of Clause 48 hereof to the satisfaction of the Engineer.

50.0 ALTERATIONS, ADDITIONS AND OMISSIONS

- (1) Variations: The Employer may make any variation of the form, quality or quantity of the Works or any part thereof that may, in his opinion, be necessary and for that purpose, or if for any other reason it shall, in his opinion, be desirable, he shall have power to order the Contractor to do and the Contractor shall do any of the following:
 - a) Increase or decrease the quantity of any work included in the contract.
 - b) Omit any such work.
 - c) Change the character or quality or kind of any such work.
 - d) Change the levels, lines position and dimensions of any part of the Works and
 - e) Execute additional work of any kind necessary for the satisfactory completion of the works or for deriving satisfaction of the Employer. It is expressly provided that no such variation shall, in any way vitiate or invalidate the Contract, but the value, if any, of all such variations shall be taken into account in ascertaining the amount of the Contract Price.
- (2) Orders for variations to be in writing: The Contractor shall make no such variations without an order in writing from the Employer. Provided that no order in writing shall be required for insignificant increase or decrease in the quantity of any work where such increase or decrease is not the result of an order given under this Clause, but is the result of the quantities exceeding or being less than those stated in the Schedule of prices. Provided also that if for any reason the Employer shall consider it desirable to give any such order verbally, the Contractor shall comply with such order and any confirmation in writing of such verbal order given by the Employer whether before or after the carrying out of the order, shall be deemed to be an order in writing within the meaning of this Clause. Provided further that in the event of non-receipt of written confirmation from the Employer, the Contractor shall, within eleven working days, confirm the same from his end in writing to the Employer, and If such confirmation is not contradicted in writing within fourteen working days by the employer, it shall be deemed to be an order in writing by the Employer.

51.0 VALUATION

- (1) All components as mentioned in the E Bid is within the scope of this which required for proper completion of work.

52.0 PLANT TEMPORARY WORKS AND MATERIALS

1. Plant, etc. exclusive use for the works: All Constructional Plant, Temporary Works and materials provided by the Contractor shall, when brought to the Site be deemed to be exclusively intended for the execution of the Works and the Contractor shall not remove the same or any part thereof, except for the purpose of moving it from one part of the Site to another, without the consent, in writing, of the Engineer which shall not be unreasonably withheld.

2. Removal of plant, etc.: Upon completion of the Works the Contractor shall remove from the Site all the said Constructional Plant and Temporary Works remaining thereon and any unused material provided by the Contractor to the satisfaction in the Engineer.
3. Employer not liable for damage to plant, etc.: The employer shall not at any time be liable for the loss of or damage to any of or damage to any of the said Constructional Plant, Temporary Works or materials same as mentioned in Clause 19 and 62 hereof.
4. Octroi, Sales tax, VAT, GST , Cess and other imposts. The Contractor shall pay Octroi, Sales Tax, VAT, GST, Cess, Work Contract Tax and all other taxes, duties and charges as may be applicable from time to time in respect of materials purchased by him or plants and equipment brought to Site. No separate payment shall be made for all these and they shall be deemed to have been covered within the Contractor's rates for the finished items of work.
5. Temporary Works: At least fourteen (14) days in advance of taking up any temporary works, the contractor shall submit to the Engineer for approval complete drawings of all temporary works he may require for the execution of the Works. He shall, so required by the Engineer, submit his calculations relating to the strength of the temporary works proposed. Modifications that the Engineer may require shall be made by the Contractor at the latter's cost and expenses. At the discretion of the Engineer, a higher stress up-to a maximum of twenty five percent (25%) in excess of the stress normally allowed for permanent structures, may be permitted in the design of temporary works.

Notwithstanding the approval by the Engineer of any of the temporary works, the contractor shall remain wholly responsible for their adequacy, safety, proper maintenance and of all obligations in regard to such works specified or implied in the Contract, until the removal of such works.

53.0 APPROVAL OF MATERIAL, ETC. NOT IMPLIED

The operation of Clause 52 hereof shall not be deemed to imply any approval by the Engineer of the materials or other matters referred to therein shall not interfere with rejection of any such materials at any time by the Engineer.

54.0 MEASUREMENT

For measurement, the metric system should be used.

55.0 WORKS TO BE MEASURED

The engineer shall, except as otherwise stated, ascertain and determine by measurement the value in terms of the Contract of work done in accordance with the Contract. He shall, when he requires any part or parts of the works to be measured, give notice to the Contractor's authorized agent or representative, who shall forthwith attend or send a qualified agent to assist the Engineer or the Engineer's Representative in making such measurement, and shall furnish all particulars required by either of them. Should the Contractor not attend, or neglect or omit to send his agent on two consecutive occasions, then in the third occasion the measurement shall be made unilaterally by the Engineer, which shall be taken to be the correct measurement of the work. For the purpose of measurement such permanent work as is to be measured by records and drawings at suitable intervals of such work and the Contractor, as and when called upon to do so in writing shall, within fourteen days, attend to examine and agree upon such records and drawings, with the Engineer or Engineer's Representative and shall sign the same when so agreed. If the Contractor does not so attend to examine and agree upon such records and drawings on two consecutive occasions they shall be taken to be correct. If, after examination of such records and drawings, the Contractor does not agree with the same or does not sign the same as agreed, they shall nevertheless be taken to be correct, unless the Contractor shall, within fourteen days of such examination, lodge with the for decision by the Engineer, a notice in writing giving details of the respects in which such records and drawings are claimed by him to be incorrect together with reasons thereof.

56.0 METHOD OF MEASUREMENT

The Works shall be measured but, notwithstanding any general or local custom, except where otherwise specifically described or prescribed in the Contract.

57.0 PAYMENT

- 1a) Periodic Payment to the Contractor from works done and measured in terms of the provisions of Clause 55, shall normally be made at suitable intervals in compliance with provision of latest issued form no.2911.
- b) The valuation of the Engineer for the purpose of making periodic payments to the contractor through on account bills shall be considered as estimates only and the Engineer reserves the authority to make amendments or modifications thereto through any subsequent bill/bills.

2) a) Earnest Money, Security Deposit and other retention money

Description	Amount	State where amount payable/pledged to the Authority	Refund/Release
Earnest money	2% of quoted amount	To be deposited with the Bid documents. Rs. 3,00,000.00 initial (Rs. Three lakh) in Part I & balance amount in Part II)	To the unsuccessful Bidder after award of contract (to the successful Bidder) without any interest. Earnest Money of the successful Bidder shall be covered into Security Deposit.
Security Deposit	1%	To be deducted from the Running Account Bills.	In compliance with G.O no.5784-F(Y) dt 12.09.2017
Cess for labor Welfare	1 % of Construction cost	To be deducted from the Running Account Bills .	Deducted and send to Govt. of West Bengal, Labor Welfare Department.

- b) All payments to the Contractor shall be subject to deduction of Sales Tax/Work Contract Tax, Income Tax and any other Tax as may be prevalent at the time of payment. For each such deduction the Contractor will be furnished a Certificate to enable him to make requisite adjustment in his returns related to Income Tax/Sale Tax/Works Contract Tax or any other Tax as may be deducted. Contractors, while quoting, are to take into account all taxes, duties etc. prevalent on the date of opening. If any other taxes or duties of statutory nature are imposed during the post-Biding period, the said amount shall be reimbursed on production of documentary proof of payment. Similarly for reduction or withdrawal, a corresponding deduction shall be made. In both cases, the decision of the Employer shall be final as to the extent thereof.
- c) All payments to the Contractor shall be subject to all accounting and auditing provisions, procedures, rules, regulation, decrees, law etc. legislated, enacted or in force in India and as applicable to the State of West Bengal during the period of the Contract.
5. Final Claims: Not later than sixty calendar days after the issue of the Completion Certificate, the Contractor shall submit to the Engineer a Statement of final account with supporting documents showing in details the value of the work done in accordance with the Contract together with all further sums which the Contractor considers to be due to him under the Contract. Within thirty calendar days after receipt of the final account and of all information reasonably required for its verifications, the Engineer shall issue Final Certificate.
6. Certificate of final acceptance: The Contractor's obligations and responsibilities under the contract will be considered satisfied and the completed permanent. Works accepted when the Superintending Engineer(WC)has issued the Certificate of Final Acceptance to the Contractor.

58.0 APPROVAL ONLY BY MAINTENANCE CERTIFICATE

No Certificate other than the Maintenance Certificate referred to in Clause 59 hereof shall be deemed to constitute final approval of the Works.

59.0 MAINTENANCE CERTIFICATE

- (1) The Maintenance Certificate stating that the Works have been completed and maintained to the satisfaction of the Engineer, shall be issued by him within twenty eight days after the expiration of the period of Maintenance, or if different periods of maintenance shall become applicable to different sections or parts of the Works, the expiration of the latest such period, or as Soon thereafter as any works ordered during such period, pursuant to Clauses 4) and 48 hereof (shall have been completed to the Satisfaction of the Engineer).

With regard to defects that may arise during the Period of Maintenance, the Contractor shall be responsible to carry out restoration/rectification of damages as are attributable to defects in works carried out under this Contract. The decision of the Employer in the regard shall be final and binding on the contractors.

- 2) Cessation of Employer's liability: The Employer shall not be liable to the Contractor for any matters or thing arising out of or in connection with the Contractor for any matters or thing arising out of or in connection with the Contract or the execution of the Works, unless the Contractor shall have made a claim in writing in respect thereof before the delivery of the Maintenance Certificate under this Clause.

- 3) Unfulfilled obligations: Notwithstanding the issue of the Maintenance Certificate the Contractor and, subject to the sub-clause (2) of the Clause, the Contractor shall remain liable for the fulfillment of any obligation incurred under the provisions of the Contract prior to the issue of the Maintenance Certificate which remains imperforated at the time such Certificate is issued and for the purpose of determine the nature and extent of any such obligation, the Contract shall be deemed to remain in force between the parties hereto,

60.0 REMEDIES AND POWERS

- 1) Default of contractor: If the Contractor shall become bankrupt, or have a receiving order made against him, or shall present his petition in bankruptcy, or shall made an arrangement with or assignment in favor of his creditors, or shall age to carry out the Contract under a committee of inspection of his creditors or, being a corporation, shall go into liquidation (other than a voluntary liquidation for the purpose of amalgamation or reconstruction), or if the Contractor shall assign the Contract, without the consent in writing of the Employer first obtained, or shall have an execution levied on his goods, or if the Engineer shall certify in goods, or if the Engineer shall certify in writing to the Employer that in his opinion the Contractor :
 - a) Has abandoned the Contract, or
 - b) Without reasonable excuse has failed to commence the Works or has suspended the progress of the Works for twenty eight days after receiving from the Engineer written notice to proceed, or
 - c) Has failed to remove materials from the Site or to pull down and replace work for twenty eight days after receiving from the Engineer written notice that the said materials or work had been condemned and/or rejected by the Engineer under these conditions, or
 - d) Despite previous warnings by the Engineer, in writing, is not executing the Works in accordance with the Contract, or is persistently or flagrantly neglecting to carry out his obligation under the Contract, or
 - e) Has, to the detriment of good workmanship, or in defiance of the Engineer's instructions to the contrary, sublet any part of the Contract.

Then the Employer may, after giving fourteen day's notice in writing to the Contractor, enter upon the Site and the Works and expel the Contractor therefore without thereby avoiding the Contract, or releasing the Contractor from any of his obligations or liabilities under the Contract, or affecting the rights and powers conferred on the Employer or the Engineer by the Contract, and may himself complete the Works or may employ any other contractor or agency to complete the Works. The Employer or such other contractor may use for such completion so much of the Constructional Plant, Temporary Works and materials, which have been deemed to be reserved exclusively for the execution of the Works, under the provisions of the Contract, as he or they may think proper and the Employer may, at any time, sell any of the said Constructional Plant, Temporary Works used and unused materials and apply the proceeds of sale in or towards the satisfaction of any sums due or which may become due to him from the Contractor under the Contract.

- 2) Valuation at date of forfeiture: The Engineer shall, as soon as may be practicable after any such entry and expulsion by the Employer, fix and determine expert, or by or after reference to the parties, or after such investigation or enquiries as he may think fit to make or institute and shall certify what amount, if any, had at the time of such entry and expulsion been reasonably earned by or would reasonably accrue to the Contractor in respect of work then actually done by him under the Contract and the value of any of the said unused or partially used materials, and Constructional Plant and any Temporary Works.
- 3) Payment after forfeiture: If the Employer shall enter and expel the Contractor any money on account of the Contract until the expiration of the Period of Maintenance and thereafter until the costs of execution and maintenance, damages for delay in completion, if any and all other expenses incurred by the Employer have been ascertained and the amount thereof certified by the Engineer. The Contractor shall then be entitled to receive only such sums or sums, if any, as the Engineer may certify would have been payable to him upon due completion by him after deducting the said amount. If such amount shall exceed the sum which would have been payable to the Contractor on due completion by him, then the Contractor shall, upon demand, pay to the Employer the amount of such excess and it shall be deemed a debt due by the Contractor to the Employer and shall be recoverable accordingly.

61.0 URGENT REPAIRS

If, by reason of any accident, or failure, or other event occurring to in or in connection with the Works, or any part thereof, either during the execution of the Works, or during the period of Maintenance, any remedial or other work or repair shall, in the opinion of the Engineer or the Engineer's Representative, be urgently necessary for the safety of the Works and the Contractor in unable or unwilling at once to do such work or repair, the Employer may employ and pay other persons to carry out such work or repair as the Engineer or the Engineer's Representative may consider necessary. If the work or repair so done by the Employer is work which in the opinion of the Engineer, the Contractor was liable to do at his own expense under the Contract, all expenses properly incurred by the Employer

in so doing shall be recoverable from the Contractor by the Employer, or may be deducted by the Employer from any sums due or which may become due to the Contractor provided always that the Engineer or the Engineer's Representative, as the case may be, shall, as soon after the occurrence of any such emergency as may be reasonably practicable, notify the Contractor thereof in writing.

62.0 SPECIAL RISKS

Notwithstanding anything in the Contract contained:

- 1) No liability for war, etc., Risks- The Contractor shall be under no liability whatsoever whether by way of identity or otherwise for or in respect of destruction of or damage to the Works, same to work condemned under the provision of Clause 38 hereof prior to the occurrence of any special risk hereinafter mentioned, or to property whether of the Employer or third parties, or for or in respect of injury or loss of life which is the consequence of any special risk as hereinafter defined The employer shall indemnify and save harmless to Contractor against and from the same and against and from the same and against and from all claims, proceedings, damages, costs, charges and expenses whatsoever arising there out or in connection therewith.
- 2) Damage to works, etc., by special risks - If the Works or any materials on or near or in transit to the Site, or any other property of the Contractor used or intended to be used for the purposes of the Works, shall sustain destruction of damage by reason or any of the said special risks the Contractor shall be entitled to payment for:
 - a) Any permanent work and for any materials so destroyed or damaged and so far as may be required by the Engineer, or as may be necessary for the completion of the Works, or the basis of cost plus such profit as the Engineer may certify to be reasonable;
 - b) Replacing or making good any such destruction or damage to the Works;
 - c) Replacing or making good such materials or other property of the Contractor used or intended to be used for the purposes of the Works.
- 3) Projectile missile etc.: Destruction, damage, injury or loss of life caused by the explosion or impact whenever and wherever occurring of any mine, bomb, shell, grenade, or other projectile, missile, ammunition, or explosive of war, shall be deemed to be a consequence of the said special risks.
- 4) Increase cost arising from special risks: The Employer shall repay to the Contractor any increased cost of or incidental to the execution of the Works, other than such as may be attributable to the cost of reconstructing work condemned under the provisions of Clause 38 hereof, prior to the occurrence of any special risk, which is howsoever attributable to or consequent on or the result of or in any way whatsoever connected with the said special risks, subject however to the provisions in this Clause hereinafter contained in regard to outbreak of war, but the Contractor shall as soon as any such increase of cost shall come to his knowledge forthwith notify the Superintending Engineer(WC)thereof in writing.
- 5) Special Risks: The special risks are war, (whether war be declared or not), invasion, act of foreign enemies, the nuclear and pressure waves risk described in Clause 19(2) hereof, or in so far as it relates to the country in which the works are being or are to be executed or maintained, rebellion, revolution, insurrection, military or usurped power, civil war, or unless solely restricted to the employees of the Contractor or of his Sub-Contractor and arising from the conduct of the Works, riot, commotion or disorder.
- 6) Outbreak of war: If, during the currency of the Contract, there shall be an outbreak of war, whether war is declared or not, in any part of the world which, whether financially or otherwise, materially affects the execution of the works, the Contractor shall, unless and until the Contract is terminated under the provisions of this Clause, continue to use his best endeavors to complete the execution of the Works. Provided always that the Employer shall be entitled at any time after such outbreak of war to terminate the Contract by giving written notice to the Contractor and upon such notice being given, this Contract shall, except as to the rights of the parties under this Clause and to the operation of Clause 64 hereof, terminate but without prejudice to the rights of either party in respect of any antecedent breach thereof
- 7) Removal of plant of termination: If the Contract shall be terminated under the provisions of the last proceeding sub-clause, the Contractor shall, with all reasonable dispatch, remove from the Site all constructional Plant and shall give similar facilities to his Sub-Contractors to do so.
- 8) Payment if Contract terminated: If the Contract shall be terminated as aforesaid, the Contractor shall be paid by the Employer, in so far as such amounts or items shall not have already been covered by payments on account made to the Contractor, for all work executed prior to the date of termination at the rates and prices provided in the Contract and in addition
 - a) The amounts payable in respect of any preliminary items, so far as the work carried out or performed, and a proper proportion as certified by the Engineer of any such items, the work or service comprised in which has been partially carried out or performed.

- b) The cost of materials or goods reasonably ordered for the Works which shall have been delivered to the Contractor or of which the Contractor is legally liable to accept delivery such materials or goods becoming the property of the Employer upon such payments being made by him.
- c) A sum to be certified by the Engineer, being the amount of any expenditure reasonably incurred by the Contractor in the expectation of completing the whole of the Works in so far as such expenditure shall not have been covered by the payments in this sub-clause before mentioned.
- d) Any additional sum payable under the provisions of sub-clause (1), (2) and (4) of this Clause.

Provided always that against any payments due from the Employer under this sub-clause, the Employer shall be entitled to be credited with any outstanding balances due from the contractor for advances in respect of Constructional Plant and materials and any other sums which at the date of termination were recoverable by the Employer from the Contractor under the terms of the Contract and provided that if the termination be made in exercise of Clause C-60(1), no payment shall be released under ClauseC-62(8) (a) to (d).

63.0 FRUSTRATION

Payment in event of Frustration: A war, or other circumstances outside the control of both parties, arises after the Contract is made so that either party is prevented from fulfilling his contractual obligations, or under the law governing the Contract, the parties are released from further performance, then the sum payable by the Employer to the Contractor in respect of the work executed shall be the same as would have been payable under Clause 62 hereof if the Contract had been terminated under the provisions of Clause 62 thereof.

64.0 SETTLEMENT OF DISPUTES

Settlement of Disputes: If any dispute or difference of any kind whatsoever shall arise between the Employer and the Contractor or the Engineer and the Contractor in connection with, or arising out of the Contract, of the execution of the Works, whether during the progress of the Works or after their completion and whether before or after the termination, abandonment or breach of the Contract, it shall be settled in the court of law having jurisdiction within Bankura District, provided that such a recourse shall not be resorted to without exhausting all other reasonable avenues of redresser.

65. NOTICES

- (1) Contractor's local office and service of notices to contractor: The Contractor shall have a local office at or near the Site of Work, full address thereof shall be intimated by the Contractor or his authorized Agent to the Employer as well as to the Engineer. All Certificates notice or written orders to be given by the Employer or by the Engineer to the Contractor under the terms of the Contract shall be deemed to have been served by sending by post to or delivering the same to the Contractor's local office.
- (2) Service of notice to employer: All Notice to be given to the employer under the terms of the Contract shall be served by sending by Registered post or delivering the same to the address given below:

**Chairperson , Rampurhat Municipality
Rampurhat**

- (3) Change in Address of the Employer, the Engineer or the Contractor may change a nominated address to another address by prior written notice to the other two and in that event shall resume receiving of communication 28 days after delivery of such notice.

66.0 PRICE ADJUSTMENT

- (1) The prices to be paid to the contractor for the whole work shall remain firm during the stipulated contract period or extension thereof and no price adjustment shall be allowed.
- (2) The statutory changes in price in the form of Taxes, duties etc. shall however be taken into account. For this purpose the taxes and duties prevailing on the last date of submission of the technical bid (or revised price bid, if applicable) shall be taken as the base. Such taxes and duties for different bought out items shall be specified by the contractor, falling which the assessment of the Employer shall be final and binding. Changes in price of Petrol, Diesel Lubricants, and Electricity etc. shall not be considered.

67.0 MISCELLANEOUS

Dangerous materials: Explosive, chemicals, combustible articles and items and similar materials intended for the Works shall be conveyed, stored and used by the Contractor and his sub-contractors In accordance with all laws,

decrees, instruments, orders and regulations imposed by the Government or any of its instrumentalists. Observance of all safety provisions shall be the obligation of the Contractor and nothing herein shall release him from full responsibility for damage or injury to persons or properties resulting from his use of these dangerous materials.

68.0 CONTRACT CONFIDENTIAL

Except with the prior written approval of the Employer and to subject the such conditions as may be prescribed, the Contractor and/or any member of his organization shall not in any case communicate to any person or entity and information connected with the performance of the Services or in carrying out the Works not make public any information for the purpose of publication or advertisement. The Contractor shall treat all matters related to the Contract as private and confidential.

69.0 CONTRACTOR TO PROVIDE FACILITIES

The Contractor shall provide such labor, materials and other facilities that the Engineer or his Representative may require to assist them in carrying out normal tests and checks on materials and workmanship and in measurement of works.

70.0 INTERFERENCE WITH EXISTING FACILITIES

The Contractor shall carry out the works in such a way as to the minimum extent of interference to the use of existing facilities of any kind.

71.0 ACTS OF INFLUENCE

Neither the Contractor nor any of his Agents, Representatives, Employees or members of his organization shall commit any act which may influence the judgment or decision of the Employer or the Engineer or any their agents, representatives, employees or members of their respective organization. Any breach of this provision shall constitute a breach of Contract on the part of the Contractor and apart from penal measures against the Contractor according to the law the Employer shall have the Authority to take action for the Contractor's default in terms of the provisions of Clause 60 hereof.

72.0 INDIVIDUALS NOT PERSONALLY RESPONSIBLE

No personal liability shall be imposed on the members or the Employer or on the Engineer or their duly authorized representatives, agents or employees for acts performed or discharged in the exercise of their authorized duties or responsibilities or in carrying out their obligations by virtue of the provisions or scope of work contained in the Contract, if being understood that they are acting solely as agents and representatives of the Employer in good faith.

73.0 CONTRACT EMBODIES WHOLE ARRANGEMENT

The Contract becomes effective immediately on Issue of the letter of acceptance to the successful Bidder.

The Contract (with annexures if any) as subsequently executed embodies the whole arrangement between the parties entering into the Contract All previous correspondence, negotiations, representation, explanations statements, promises or guarantees (whether oral or written) as are not included with the Contract as executed, shall normally be excluded in the interpretation of the Contract.

74.0 COMPLETION DRAWING

Completion drawing including detailed construction drawing shall have to be submitted in original with 6 (six) copies of prints of each. The original drawings shall be drawn on thick polyester film approved by the Engineer-in-Charge. Scale and size of drawings shall also be as specified by the Engineer-in-Charge. Soft copy of drawing copied in CD/DVD should be submitted in addition. No extra payment will be made for it.

The Completion drawings are to be got approved by the Employer and shall have to be submitted before the issue

of certificate of final acceptance as in Clause C-57 (6).

75. TERMS OF PAYMENT

Terms of payment : Item wise break up			
1	Sinking of 4 nos. Deep Tube Well of safe yield 8000 GPH per DTW up to the required depth as per electro logging report to be submitted before installation of DTW with construction of Four No. DTW protecting Room of size 3.0 m x 3.0 m size as per technical specification and direction of EIC.		
	Break up :		
A	Sinking of 4 No. DTW.	50%	
B	All work up to completion of Super Structure of DTW Protection Room, Switch Room, rising main from tube wells to CWR including testing of water logging and all complete.	40%	
C	Testing, Commissioning and after successful trial run of the Scheme.	10%	
		Total =	100%
2	Construction of Clear Water Reservoir of capacity 400 cubic meter including geo-technical investigation of soil, design drawing complete as per direction with necessary pipe connections , duck foot bend , sluice valves etc as required around the head work site, lightening arrestor arrangement, and also leveling the site by earth filling as necessary with construction of one number chlorine dosing metering pumping units with room 3.0 m x 3.0 m size and with all necessary accessories supplying and fitting fixing required in this regards including electro-mechanical works pumps motors valves etc. etc. complete as per technical specification and direction of EIC.		
	Break up :		
A	All work up to completion of CWR Roof Slab.	45%	
B	All work up to completion of Pump House & Pipe connection around the CWR.	30 %	
C	Installation, fitting & fixing complete of Connecting Pipes, Duck Foot Bend, Sluice Valve , Chlorine dosing metering arrangement and any other work required to complete the item in all respect.	15 %	
D	Testing, Commissioning and after successful trial run of the Scheme.	10 %	
		Total =	100%
3	Construction of Three number 5.4 m X 3.6 m size Switch Room for accommodation of one number electrical control panel for operating submersible pumps attached with the tube wells and 2 No. CWR attached Pump house with staff staying facilities and with sanitary plumbing arrangement and receiving of WSEDCL power supply source as per technical specification and direction of EIC.		
	Break up :		
A	All work up to completion of civil structure.	40%	
B	Supply of all Electro-Mechanical equipments (LT PDB Control Panel etc.) required to complete the item.	30 %	
C	Installation of Electro-mechanical equipment and any other work required to complete the item in all respect.	20 %	
D	Testing, Commissioning and after successful trial run of the plant.	10%	
		Total =	100%
4	Supply delivery, installation of 4 nos. submersible pumping units with it's all other accessories and interconnected with the rising main after providing individual valves as per technical specification and direction of EIC.		
	Break up :		
A	Supply of Electro-Mechanical equipments (4 No. Submersible Pump) required to complete the item.	50%	
B	Installation, fitting & fixing complete of Electro-mechanical equipments (Submersible Pump) and any other work required to complete the item in all respect.	40%	

C	Testing, Commissioning and after successful trial run of the plant.	10%	
	Total =	100%	
5	Supply delivery, installation and testing commissioning of a MCC control panel in each Switch Room for operating the 4 nos. submersibles pumping units and internal & external illumination with caballing and earthing arrangement per Switch Room as per technical specification and direction of EIC.		
	Break up :		
A	Supply of all Electro-Mechanical equipments required to complete the item.	60%	
B	Installation of Electro-mechanical equipment and any other work required to complete the item in all respect.	30%	
C	Testing, Commissioning and after successful trial run of the plant.	10%	
	Total =	100%	
6.	Supply delivery installation and testing commissioning of a MCC control panel in each Switch Room for operating the 4 nos. Horizontal Split Casing Centrifugal pumping units and internal & external illumination with caballing and earthing arrangement per Switch Room as per technical specification and direction of EIC. & erection of illumination fittings fixture, aviation lamp fittings, exhaust fan. Ceiling fan , lightening arrestor with its wiring and earthing arrangement in CWR attached pumping house / station complete in all respect considering bid documents as per approval from competent authority and direction of EIC		
	Break up :		
A	Supply of all Electro-Mechanical equipments, 4 No. Horizontal Split Casing Centrifugal Pumps, Motors with design H.P, Control Panel required to complete the item.	60%	
B	Installation of Electro-mechanical equipment and any other work required to complete the item in all respect & erection of illumination fittings fixture, aviation lamp fittings, exhaust fan. Ceiling fan , lightening arrestor with its wiring and earthing arrangement in CWR attached pumping house / station complete.	30%	
C	Testing, Commissioning and after successful trial run of the plant.	10%	
	Total =	100%	
	Total =	100%	
7	Testing, Commissioning & 3 months Trial run of the whole installation as per I.E. Rules with Govt. Electrical inspector's fees as complete in all respect and as per Bid document & as per direction of EIC		
	Break up :		
A	After completion in all respect	100%	
	Total =	100%	
8	Operation and maintenance of the plant for 1 (one) year. The work includes supplying adequate number of operator personnel and skilled Labor with a provision for necessary training to the personnel appointed by the ULB including supplying all sundry materials, and replacement of all types of damaged component etc. as per Bid document and complete in all respect and as per Bid document and as per Bid document of EIC. N.B:- This item will be executed after three (3) months trial run.		
	Break up :		
A	After completion in all respect	100%	
	Total =	100%	
Note:	a) 2% of Earnest money deposited earlier will be converted into Security deposit after awarding the Contract and remaining Security Deposit amount will be recovered from each running account bill as per prevailing Govt. norms.		
	b) The Security deposit or Retention money will be returned after completion of successful operation & maintenance period for 12 months and as per WB Form No. 2911 , Cl. 17.		
	C) Payment will be made after availability of pending Fund.		

No interest will be payable by the Employer on the amount due to Contractor pending final settlement.
77. Defect liability period should be considered in compliance with G.O no.5784-PW/L&A/2M-175/2017 dt 12.09.2017.

Chairperson, Rampurhat Municipality , Rampurhat

SECTION – D

GENERAL SPECIFICATIONS OF WORKMANSHIP AND MATERIALS

FOR CIVIL WORK

1.0 GENERAL

1.1 General Materials

1.1.1 All materials used in the permanent works shall be of the best quality of the kind and to the approval of the Engineer-in-Charge. Any material not covered by these Specifications, shall comply with the relevant latest Indian Standard Specifications (Referred to as IS as revised or modified up-to the date one month prior to Tender date). British or American Standard Specifications shall be referred to in case any particular specification is not available in any of the aforesaid Specifications. For materials not specified in the aforesaid, direction of the Engineer-in-Charge shall be followed. All disputes shall be referred to the Employer, whose decision shall be final and binding.

1.1.2 Samples of materials to be supplied and used, by the Contractor in the works shall be to the prior approval of the Engineer-in-Charge. For this purpose the Contractor shall furnish in advance representative samples in quantities and in the manner as directed by the Engineer-in-Charge for his approval. Materials brought to the Site, which in the option of the Engineer-in-Charge do not conform to the approved sample and if so directed by him shall be removed by the Contractor from the Site and replaced by the materials of approved quality.

1.1.3 In spite of approval of the Engineer-in-Charge of any materials brought to the site, he may subsequently reject the same if in his opinion the materials has since deteriorated due to long or defective storage or for any reason whatsoever and is thereby considered unfit for use in the permanent works. Any material thus rejected shall be immediately removed from the Site at Contractor's cost and expense.

1.1.4 All materials brought to the Site shall be properly stored and guarded in the manner as directed by the Engineer-in-Charge and to his satisfaction.

1.1.5 The Engineer on written request of Superintending Engineer (WC) may carry out test of materials as he may decide. The Contractor shall, at his cost and expenses, for this purpose supply requisite materials and render such assistance to the Engineer-in-Charge as he may require.

1.2 Workmanship

All works are to be carried out in proper workman like manner. Items of works not covered by these Specifications or by other tender documents shall be carried out as per best practice according to the direction of the Engineer-in-Charge and to his satisfaction. The relevant IS Specifications or in case of necessity British or American Standard Specifications shall be taken as guide for the purpose.

1.3 Works Included

The rates for all items, unless specifically stated otherwise in the Contract, must cover the cost of all materials, labour, tools, machinery, plant, pumps, explosives, scaffolding, staging strong props, bamboos, ropes, templates, pages and all appliances and operations whatsoever necessary for efficient execution of work.

1.4 Ground Conditions

The Contractor is to visit the site and ascertain local conditions, traffic restrictions and obstructions in the area and allow for extra expenses likely to be incurred due to any limitations whatsoever.

1.5 Setting Out and Leveling

The Contractor is to set and level the works, and will be responsible for the accuracy for the same. He is to provide all instruments and proper qualified staff required for checking the Contractor's work.

1.6 Safety

The Contractor shall take, adequate precaution to provide complete safety for prevention of accidents on the site.

1.7 Keeping Works Free from Water

The Contractor shall provide and maintain at his own cost, electrically or other power driven pumps and other plant and equipment to keep site excavated foundation pits and trenches free from surface as well as subsoil/leakage water from any other source thereof and continue to do so to the complete satisfaction of the Engineer-in-Charge till the site is handed over. Method of dewatering shall need approval of the Engineer-in-Charge but no payment whatsoever is allowed on this count.

1.8 Rubbish

1.8.1 The Contractor shall clear all rubbish, vegetation, roots, soda etc., and dump them in the area indicated to the satisfaction of Engineer-in-Charge. No separate rate shall be allowed for the above work.

1.8.2 After the work is completed, the Contractor shall clear the area surrounding the buildings, all hutments and excess stores and remnants of building materials such brick bats, metal, sand, timber, steel etc.

1.9 Bench Marks and Ground water Gauges

The Contractor shall protect surveyor's benchmarks and ground water gauges, zero line marks and base line marks and base line marks from damage of movement during work.

1.10 Inspection

The Contractor shall inspect the Site of works and ascertain site condition and the nature of soil to be excavated.

1.11 Contractor's Staff

The Contractor must provide at all times efficient staff of trustworthy, skillful and experienced assistance capable of carrying out the work in accordance with the drawings and specification and to correct levels. The cost this establishment should be included in his rates.

1.12 Method of Measurement

Unless otherwise specified, the method of measurement for building works shall be as per IS: 1200.

1.13 Specifications Referred to

1.13.1 The specification contained herein are not exhaustive and for such items of works which may arise and which are not covered by this specifications, the provisions in the relevant Indian Standard (Latest Edition) shall apply.

1.13.2 A list of some Indian Standards is given herein.

1.13.3 Wherever reference to the Indian Standard mentioned below or otherwise appears in the specification, it shall be taken as reference to the latest version of the Standard.

IS Code No	Description
IS: 1200	Method of measurement of building and Civil Engineering works.
IS: 1542	Sand for plaster.
IS: 383	Aggregates-Coarse and fine, from natural source for Concrete.
IS: 515	Aggregates for use in Mass Concrete, natural and manufactured.
IS: 456	Code of Practice for Plain and Reinforced Concrete for General Building construction.
IS: 3370	Code of Practice for Concrete Structures for the Storage of Liquids.
IS: 12269	Specification for 53 Grade Ordinary Portland cement.
IS: 1786	Specification for High Strength Deformed bars & wires for concrete reinforcement.
IS: 1077	Common Burnt Clay Building Bricks.
IS: 1235	Flooring Tiles, Cement Concrete, Floor Finish
IS: 1443	Cement Concrete, Flooring Tiles, Laying and finishing.
IS: 1661	Cement and Cement Lime Pointing Plaster finishes on walls and Ceilings.
IS: 226	Structural Steel (Revised) Iron Work
IS: 800	Code of Practice for use of Structural Steel in General Building Construction.
IS: 1199	Workability of Concrete
IS : 1893	Seismic load

2.0 EARTH WORK IN EXCAVATION & FILLINGS

2.1 General

Applicable provisions of Conditions of contract shall govern work under this section.

2.2 Excavation for Foundation, Trenches, Pit etc.

The excavation work shall be carried out in all kinds of Soil including Sand in workman link manner without endangering the safety of the nearby Structures or works without causing any hindrance to other activities in the

area. The existence of old buildings, boundary walls, hutment, sewer lines, water lines, if any very close to the area of excavation should be given careful consideration while designing carrying out the excavation work. The excavation shall be done in such method as would technically be appropriate and befitting the site conditions subject to the approval of the Engineer-in-Charge. All foundation trenches shall be excavated to the full width and depths shown on the approved drawing or to such ordered to the Contractor.

The Contractor shall not undertake any earthwork without having obtained prior approval from the Engineer-in-Charge to the methods he proposes to employ in order to execute the work in the most efficient manner. He shall not modify such methods without the approval of the Engineer-in-Charge. This approval, however, shall not in any way make the Engineer-in-Charge responsible for any consequent loss or damage.

- 2.2.2 Should any excavation be taken down the specified levels, the Contractor shall fill in such excavation at his own cost with concrete as specified for foundations, well rammed in position until it is brought up to the specified level.
- 2.2.3 The Contractor shall notify when the excavation is completed and no concrete or masonry shall be laid until the soil for each individual footing, rafts etc. is approved.
- 2.2.4 The Contractor shall keep the site clear of water at all times. To this end he shall provide arrangements for bailing and pumping or any special arrangements as required within his quoted prices.
- 2.2.5 All foundation pits shall be refilled to the finished ground level (formation level) with approved materials, which shall be suitably consolidated in layers to the satisfaction of the Engineer-in-Charge.
- 2.2.6 Nothing extra will be paid for bailing out water collecting in excavation due to rains, ordinary springs, leakage from any other sources etc., or any other reason.
- 2.2.7 For the work of excavation the Tenderer shall include in his quotation the shoring, sheeting, bracing and sheet piling (if required). The quotation shall also include the cost of compaction of foundation sub-base, removal and storage of excavated materials and back filling.

2.3 Shoring

Timber shoring whenever required shall be closed boarded with minimum 50mm thick good and seasoned timber planks of sufficient length driven side-by-side to the required depth. The gaps between adjacent timber planks shall such would not allow any flow of soil particles, if necessary, the sides of the planks shall be planed smooth to ensure this. Sufficient number of bracing struts, walling etc. are to be provided to make the shoring rigid and non-yielding by earth pressure. Where necessary, sheet piling shall be done to ensure safety to the adjoining structures, if it is found that it is not feasible to protect the structure by timber shoring only. The Tenderer is strongly advised to inspect the site before tendering and apprise himself of the requirement of any Sheet piling in addition to the timber shoring before submitting his Quotation accordingly.

2.4 Back Filling

The space around the foundations in trenches or sites shall be cleared of all trash and loose debris and filled with approved excavated earth, all clods being broken up to the finished G.I. Filling shall be done in 200mm layers, each layer to be properly moistened and well rammed. Excavated material which is surplus or which is consolidated unsuitably for back filling is to be disposed of in spoil dumps as directed by the Engineer-in-Charge. No extra payment will be made for this.

3.0 CONCRETE

3.1 General

- 3.1.1 Applicable provisions of Conditions of Concrete shall govern work under this section.
- 3.1.2 All concrete work, plain or reinforced shall be carried out strictly in accordance with this specification and any working drawing or instructions given from time to time to the Contractor.
- 3.1.3 The Contractor's states shall allow for wastages in all materials as well as for all tests of materials and concrete.
- 3.1.4 No concrete shall be cast in the absence of the Engineer-in-Charge or any other person duly authorized by him. The Contractor's Engineer shall personally check that both the form work and reinforcement have been correctly placed and fixed, and shall satisfy himself that all work preparatory to the casting is completely ready, before informing the Engineer-in-Charge for final inspection and approval and for which purpose at least 24 hours notice shall be given by the Contractor.
- 3.1.5 The Indian Standards wherever referred to herein shall be the latest addition of such standards.

3.2 Cement

Cement shall conform for IS: 12269; 1987 Cement tests shall have to be carried out at Contractor's expense as and when directed. Cement, which has or practically set, shall not be used under any circumstances. The important

structures should be constructed with the grade of cement not below 53 (Grade-53). No extra payment will be made for using Grade-53 cement or more grades available in departmental store.

3.3 Aggregates

The fine and coarse aggregates shall conform to all provisions and test methods of IS: 383 and/or IS: 515. Samples of aggregates, proposed to be used in the work shall be submitted free of charge in sufficient quantities to the Engineer-in-Charge with sieve analysis and other physical and chemical analysis data for his approval. He will preserve approved samples for future reference. This approval will not in any way relieve the Contractor of his responsibility of producing of specified qualities.

3.3.1 Coarse Aggregates

Coarse aggregates for use all reinforced and other plain cement concrete works shall be crushed black granite trap stone obtained from approved source and shall consist of uncoated, hard, strong dense and durable pieces of crushed stone, and be free from undesirable matters, viz. Disintegrated stones soft, friable, thin, elongated or laminated pieces, dirt, salt, alkali, vegetable matter or other deleterious substances. The aggregates shall be thoroughly washed with water and cleaned before use to the satisfaction of the Engineer-in-Charge at no extra cost of the Employer.

The maximum size of coarse aggregates shall be as follows unless specified otherwise elsewhere.

Reinforced Concrete	:	20 mm
Plain Concrete	:	20 mm
Thin R. C. C. Members With very Narrow space	:	12/15 mm.
Mat/Lean Concrete	:	20/40 mm.

(The actual size to be agreed by the Engineer-in-Charge)

Grading of coarse aggregates for a particular size shall generally conform to relevant I.S Codes and shall be such as to produce a dense concrete of the specified proportions and or strength and consistency that will work readily in position without segregation.

3.3.2 Fine Aggregates

Sand shall be clear River sand brought from approved source and consist of siliceous material, having hard, strong, durable uncoated particles, free from undesirable matters viz. dust lumps, soft or flaky particles or other deleterious substances. The amount of undesirable shall not exceed the percentage limits by weights as specified in relevant IS Codes. Washing of aggregates by approved means shall be carried out, if desired by the Engineer-in-Charge, at no extra cost to the Employer.

Coarse and fine sand shall be well graded within the limits by weight as specified in relevant IS Code. Fineness Modulus shall not vary by more than plus or minus 0.20 from that of the approved sample. Fineness Modulus for sand should not be less than 2.5.

3.4 Reinforcement

3.4.1 The Contractor shall prepare and furnish to the Engineer-in-Charge, Bar Bending Schedules in considerations of the approved drawings for all R.C. C. works for review and checking by the Engineer-in-Charge well before taking up the work.

3.4.2 The High Yield Strength Deformed bar (HYSD) shall conform to IS: 1786-1990.

All steel for reinforcement shall be free from loose, oil, grease, paint or other harmful matters immediately before placing the concrete.

3.4.3 The Reinforcement shall be bent to the shapes shown on the approved drawings prior to placing and all bars must be bent cold. The Steel shall be placed in such a way that it is rigidly held in position while concrete is being cast. The correct clearance from the form shall be maintained by either pre-cast mortar blocks or by metal supporting chairs to be supplied by the Contractor free of charge.

The intersection of roads crossing one another shall be bound together with soft pliable with No. 16 to 18 SWG at every intersection so that reinforcement will not be displaced in the process of depositing concrete. The loops of binding wire should be tightened by pliers and welding of reinforcement for lapping & binding should be done if desired by E.I.C. No extra payment will be made for this purpose.

3.4.4 The work of reinforcement shall also be inclusive of stirrups distribution bars, binders, initial straightening and removing of loose rust, if necessary, cutting to requisite length, hooking and bending to correct shape, placing in proper position including supplying and binding with block annealed wire as stated in clause 3.4.3 above.

3.5 Water

The Water shall be clean and free from Alkali oil or injurious amounts of deleterious materials. As far as possible, the water is of such quality that it is potable. If any chemical analysis of water is necessary and ordered, the same shall be carried out at an approved laboratory at the Contractor's cost and expenses.

3.6 Concrete Proportioning

3.6.1 The concrete proportions shall be as indicated on the approved drawings and shall conform to IS: 456 & IS: 3370. The quality and character of concrete shall be governed by IS: 383. It should be sampled and analyzed as per IS: 1199. The concrete should stand the test specified in IS: 516.

3.6.2 The minimum cover of main reinforcement shall be as per relevant IS: Codes. Cover to any reinforcement of R.C.C. piles shall be minimum 65 mm in case in-situ and 50 mm in case of pre-cast piles. Suitable spacer blocks shall be provided at intervals not exceeding 1.2 m. throughout the length of the pile.

3.6.3 The workability shall be measured by slump. Slump for different grades of concrete shall not exceed following unless specifically permitted by the Engineer-in-Charge.

i) For M 15 concrete - 3.75 cm.

ii) For M 20 concrete - 2.50 cm.

iii) For M 25 concrete – 2.00 cm.

3.6.4 All concrete works shall be thoroughly compacted and fully worked around the reinforcement, around embedded fixtures and into comers of the form work.

The Concrete shall be thoroughly and shall be efficiently vibrated during laying. The use of mechanical vibrators shall comply with IS: 2608, IS: 2506 and IS: 4656. Whenever vibration has to be applied externally, the design of formwork and deposition of vibration shall receive special consideration to ensure efficient compaction and to avoid surface blemishes.

3.6.5 Test for Water Tightness of Structures / Pipes

For liquid retaining structures including inlet chambers etc. shall be deemed to be satisfactory water tight as per relevant clause of IS: 3370. The Contractor at his own expenses, if necessary, shall undertake approved corrective measures.

As regards the pipelines, the tests shall be performed for the Hydrostatic Pressure of 10 Kg. /Sq. cm in case of S.W.M., D.I. Pipes and 2 Kg. /Sq. cm. for P. S. C. respectively. The tests shall be carried out as per relevant IS Codes and pipes shall be considered satisfactory if the tests results satisfy the requirements of the relevant clauses of the Codes. The Contractor shall give all these Hydraulic Tests by making his own arrangements for water supply and filling and disposing the water after the tests. The Contractor shall rectify the defects noticed and carry out the tests again and repeat the testing operation till successful result is obtained and accepted by the Engineer. The rates Quoted for the work shall be considered as inclusive of cost of all Labour, materials and equipment required to give successful tests for Water tightness.

3.7 Workmanship

3.7.1 All Concreting work shall be carried out according to the IS: 456, IS: 3370, and other related codes. It should, however, be noted that for every 15 M3 of concrete placed or for every one day's volume of concrete whichever is lower, a minimum of 3 (three) Cubes shall be kept for test purpose, and tested at the Contractor's cost and expenses at a Laboratory as approved by the Authority. The number of test cubes may, however, be altered at discretion of the Engineer-in-Charge. It is compulsory to test 3 (three) cubes in each case.

3.7.2 Structural Concrete

Design mix Concrete shall be on all concrete works except in case of Mud-mat concrete lean concrete where nominal mix concrete will be allowed.

Design mix Concrete will be used in Reinforced Concrete Structures shall be in Grade of M20, for works other than water training structure & water retaining structure Grade of concrete as per latest amendment of IS:3370.

The mix shall be designed to produce the grade of concrete having required workability and a Characteristic Strength not less than appropriate values given in IS: 456 - 2000. For mix design, procedure given in Indian Standard recommendation or any other standard procedure shall be adopted. As long as the quality of materials does not change a mix design done earlier may be considered adequate for later work. Batching mixing, sampling and Strength Test of concrete shall be carried out in compliance with the relevant clause of IS: 456-2000 and all other relevant Indian Standards recommended therein.

The mix design by the Contractor shall be used for works only after obtaining written approval of the Engineer-in-Charge. Mix design shall be entirely the responsibility of the Contractor and any approval by the Engineer-in-Charge shall not relieve him of his responsibility in respect thereof.

The Contractor shall prepare all the Calculations, Tabulations, Graphs etc. pertaining to Mix Design Test result and supply copies of such Calculations, tabulations, Graphs etc. required by the Engineer-in-Charge.

On proportioning concrete, the quantity of both cement and aggregate shall be determined by weight, where the weight of cement is determined on the basis of weight per bag a reasonable number of bags be weighed periodically to check the net weight or should be either weighed or measured by volume in calibrated tanks, All measuring equipments shall be maintained in a clean serviceable condition and shall periodically checked for accuracy.

The grading of coarse and fine aggregates shall be checked frequently and frequency of testing shall be determined by the Engineer-in-Charge. Where weight batching is not possible or practicable, the quantities of coarse and fine aggregates may be determined by volume but cement in any case shall be weighed by weight only. If fine aggregate and volume batching is adopted, allowance shall be made for bulking. The bulking shall be determined in accordance with IS: 2386 (Part-III).

The Water-Cement Ratio shall be maintained to its correct value. Surface moisture content of aggregate shall be determined as per IS: 2386 (Part-III) and the amount of water to be added shall be adjusted accordingly to maintain the correct Water-cement ratio.

During the progress of work in order to ensure correct strength of concrete proper control should be exercised by the Contractor as specified in Specifications mentioned in the Clause 3.7.1 above. Test strength of every sample shall be determined in accordance with the recommendations of IS: 456-2000. If one out of ten consecutive test cubes shows a deficiency in strength up-to a maximum limit of 10%, the concrete will be deemed satisfactory. If two of the test cubes out of ten shows a deficiency in strength up to a limit of 10%, the concrete shall be deemed to be less satisfactory and a reduction of 1 % will be made on the cost of such concrete. If three out of ten test cubes show deficiency in strength up to a limit of 10%, a reduction of 5% will be made on the cost of such concrete. If more than three test cubes show a deficiency in strength up-to a limit of 10% a reduction of 10% will be made on the cost of such concrete. If more than five show a deficiency in strength up-to a limit of 10%, the concrete shall be rejected. Such rejected concrete work shall have to be dismantled and replaced to the satisfaction of the Engineer-in-Charge by the Contractor free of cost to the Employer. No payment for the dismantled concrete, the relevant formwork and reinforcement, embedded fixtures etc. wasted in the dismantled portion, shall be made. In the course of dismantling, if any, damage is done to the embedded items or adjacent structures, the same shall also be made good free of charge by the Contractor to the satisfaction of the Engineer-in-Charge.

If the deficiency in strength of one-test cubes exceeds the 10% limit, a reduction of 5%) will be made on the cost of such concrete. if the deficiency in strength to two out of ten test cubes exceeds the 10% limit, a reduction of 10% will be made on the cost of such concrete. If the deficiency in strength of three out of ten test cubes exceeds the 10% limit, a deduction of 20% on the cost of such concrete will be made.

With permission of the Engineer-in-Charge for any above mentioned grades of concrete, if the quantity of water has to be increased in special cases, cement shall also be increased proportionally to keep the ratio of water to cement same as adopted in trial mix design for each grade of concrete. No extra payment for additional cement will be made.

3.8 Pre-cast Concrete

Pre-cast Concrete items shall conform to relevant IS Specifications. Pre-cast items shall be suitably marked with the date of casting identification marks and shall show the right way up as may be required. The arrangements to be made by the Contractor for Site manufacture and handling of pre-cast items shall be done to the approval of the Engineer-In-Charge. Each pre-cast unit shall be cast in one operation and no construction joints shall be permitted. No damaged or defective units shall be built into the works and units shall be so stored that they are not over-stressed.

Pre-cast units shall be provided in places as shown in the approved drawings. The pre-cast units shall be cast at site strictly following the Specifications of Pre-cast Concrete work. Proper care shall be taken to ensure that the units are obtained from the moulds without any damage. Before erecting in position the units shall be cured adequately by keeping units immersed in water.

3.9 Form Work

3.9.1 The Form Work shall conform to IS: 456. Whenever necessary, shuttering must be provided.

The work shall also include providing all necessary staging, centering, formwork and moulds for placing concrete. Shuttering may be of approved dressed timber true to line, not less than 37 mm. thick. Surface to be in contact with concrete are to be planed smooth. Alternatively, sufficiently rigid plywood shuttering or steel shuttering may be used. In every case, joints of the shuttering are to be such as to prevent the loss of liquid from the concrete. In timber shuttering the joints shall, therefore, be either tongued or grooved or the joints must be perfectly close and lined with draft paper polythene films or other types of approved materials. In case of plywood or steel shuttering also the joints are to be similarly lined. All shuttering and framing must be adequately stayed and braced to the satisfaction of the Engineer-in-Charge for properly supporting the concrete, during concreting and the period of hardening. It shall be so constructed that it may be removed without shock or vibration to the concrete. No through bolts are allowed for holding the shuttering in water retaining structure.

3.9.2 Cleaning, Treatment and Removal of Forms

All forms shall be thoroughly cleaned of old concrete, wood shavings, saw dust, dirt and dust sticking to them before they are fixed in position. All rubbish loose concrete chippings, shavings, saw dust etc. shall be scrupulously removed from the interior of the forms before the concrete is poured. Formwork shall not be used/reused, if declared unit or unserviceable by the Engineer-in-Charge.

If directed by the Engineer-in-Charge, compressed air jet/or water jet shall be kept handy along with wire brushes, brooms etc. for the purpose of cleaning.

Before shuttering is placed in position, the form surface in contact with the concrete shall be treated with approved non-staining oil or composition. Care shall be taken that the oil or composition does not come in contact with reinforcing steel or existing concrete surface. They shall not be allowed to accumulate at the bottom of the shuttering.

Forms shall be struck in accordance with the relevant clause of IS: 456 or as directed by the Engineer-in-Charge. The Contractor shall record on the drawings or in other approved manner, the date in which the concrete is placed in each part of the work and the date on which the form work is removed there from and have this recorded checked and countersigned by the Engineer-in-Charge.

The Contractor shall be responsible for the safe removal of the formwork, but the Engineer-in-Charge may delay the time of removal if he considers it necessary. Any work showing signs of damage through premature removal of formwork or loading shall be entirely reconstructed without any extra cost to the Employer.

3.10 Protection and Curing of Concrete

Newly placed concrete shall be protected by approved means; from rain, sun and wind and extreme temperature. Concrete placed below the ground level shall be protected from failing earth during and after placing. Concrete placed in ground containing deleterious substance shall be kept free from contact with such ground or, with water draining from such ground during placing of concrete and for a period of at least 3 (three) days or as otherwise directed by the Engineer-in-Charge, the ground water around newly poured concrete shall be kept to an approved level by pumping or other approved means of drainage at the cost of the Contractor. Adequate steps shall be taken to prevent flotation or flooding. Steps, as approved by the Engineer-in-Charge, shall be taken to protect immature concrete from damage by debris, excessive loading, vibration, abrasion, mixing with earth or other deleterious materials, etc. that may impair the strength and durability of the concrete.

As soon as the concrete has hardened sufficiently for the surface to be marked it should be covered with Hessian, canvas, or similar materials and kept continuously wet for at least 7 (seven) days after final setting. This period may be extended at the discretion of the Engineer-in-Charge, up-to 14 (fourteen) days. Concrete slabs and floors shall be cured by flooding with water of minimum 25 mm depth for the period mentioned above.

Approved curing compounds may be used in lieu of moist curing with the permission of the Engineer-in-Charge. Such compound shall be applied to all exposed surface of the concrete as soon as possible after the concrete has set. No extra payment is allowed on such count.

3.11 Concrete Finish

The Concrete surface on removal of form work shall be such that no finish is necessary, If, however, the surfaces is not satisfactory the Contractor shall, if so instructed, remove unwanted, projecting parts by chipping and smoothening the surface with cement rendering at his own expenses. The shutter marks shall invariably be removed by rubbing with carborandum stone. The Contractor shall therefore take all precaution for avoiding the shutter marks.

3.12 Construction Joints

These shall be in according with IS: 337 or as directed.

3.13 Expansion Joints

Expansion joints shall be provided at position as directed and the spacing shall not exceed the limits specified in IS: 456. These shall comply strictly with the details shown on approved construction drawings. Reinforcement shall not extend across any expansion Joint and the break between the two sections must be complete.

3.14 Details of typical expansion joints and construction joints should comply with the suggestive arrangements shown in IS: 3370 (Part-I), Clause 8.1 (a)(2), Figure 2 (for expansion Joints) and Clause 8.1(a) Figure 1, Clause 8.1 (b) Figure 4 (for construction joints).

3.15 PVC Water Stops

The materials shall be durable and tough and as per approval of the Engineer-in-Charge. The minimum thickness of PVC sealing strips shall be 6 mm. and the minimum width 225-mm actual shape and size shall be as per drawings. The materials should be of good quality polyvinyl chloride highly resistant to learning abrasion and corrosion as well as to chemicals likely to come in contact with during use. The physical properties will generally be as follows:

Shore Hardness	60 A to 80 A
Tensile Strength	100 to 150 Kg./Cm ²
Minimum Safe Continuous Temperature	75 ^o C
Ultimate Elongation	Not less than 275%
Water Absorption	Not more than 5% by weight in a 7 day test.

3.16 Rubber Water Stops

The materials must be very durable and tough and as per approval of the Engineer-in-Charge. The ribs shall be sufficient to ensure proper bonding with concrete. The width shall be minimum 225 mm and thickness minimum 6 mm. The rubber water stop must be used in long lengths to avoid splicing as far as practicable. Ends shall have at least 200 Cu M overlaps and vulcanised. The materials shall be natural rubber and be resistant to corrosion tear and also to attacks from acid, alkalis and chemicals normally encountered in service. The physical properties will generally be as follows

Specific Gravity	1.1 to 1.15
Shore hardness	65 A to 75 A
Tensile Strength	250 to 300 Kg/ Cm ²
Maximum safe continuous temperature	75 ^o C
Ultimate elongation	not less than 350%
Water Absorption test.	Not more than 350% by weight in a 7 day test.

3.17 Contractor's Supervision

The Contractor shall provide constant and strict supervision of all the items of construction during progress of work, including the proportioning and mixing of the concrete and bending and placing of reinforcement. Before any important operation, such as concreting or stripping of form work adequate notice shall be given.

The cement and sand shall be thoroughly mixed dry in specified proportions. Water shall then be added just sufficient to make a stiff and workable paste. The mortar shall be used within half an hour of mixing.

4.1 The Contractor shall build all brickwork uniformly no one portion being raised more than 1 meter above another at a time. The joints shall not exceed 12 mm. in thickness and should extend the full thickness of the brickwork. All joints shall be properly raked and the surface washed down.

4.2 All the bricks shall be kept fully immersed in water at least for a minimum period of six hours till they are completely soaked and only thoroughly soaked bricks shall be used in the work.

4.3 The Contractor shall keep wet all brickwork for at least 10 (ten) days after laying. The surface of unfinished work shall be cleaned and thoroughly wetted before joining new work to it.

5.0 PLASTERING, PAINTING AND SURFACE TREATMENT

5.1 Cement Plaster

5.1.1 The plastering work shall be governed by IS: 1661. Unless otherwise specified cement plaster shall be composed of 1 part of cement and 6 parts of sand. For ceiling plaster, the composition shall be 1 part of cement and 4 parts of sand. The thickness of ceiling plaster shall be 6 mm. The thickness of plaster to the fair faces of brickwork shall be 19 mm. The thickness mentioned shall be minimum thickness. The Contractor shall allow in his rate for any rubbing out due to inequalities of brickwork.

5.1.2 The rate shall also include for forming of any molding drip course etc., and for extra thickness due to corbelling of brick work in parapet or at any other place If required, all internal angles shall be rounded off as per drawing or as directed by the Engineer-in-Charge without any extra charges.

5.1.3 Cement and sand shall be measured and mixed dry thoroughly to a uniform color on a platform specially constructed for the purpose. Care should be taken to see that no foreign matters get mixed with the mixture. Only enough water shall be mixed to make the mixture workable. The mix shall then be turned over and again to a uniform color and texture number more cement mortar shall be mixed at a time than cannot be used within thirty (30) minutes of mixing.

5.1.4 Surface to be plastered are to be brushed clean, wetted for 24 hours before the plaster is put in and the joints of the brick work raked out 12 mm. deep minimum. The concrete faces to be plastered shall be

chipped, roughened and soaked with water for achieving required bond with the plaster without any extra cost.

5.1.5 The surface of the plaster shall be finished absolutely in one plane. The Contractor shall rub down any unevenness with carborandum stones at his cost and expenses. Care shall be taken to see that no mark remains at the junction of plastering done at different times. If necessary, the junctions shall be rubbed with carborandum stones to eliminate such undesirable marks. The Contractor may be required to use normal sprinkling of thin cement slurry on the surface for satisfactory finishing of the plastering work for which no extra payment shall be made.

5.1.6 Plaster shall be protected and cured by keeping it thoroughly wet with sprinkling of water for 10 (ten) days continuously.

5.1.7 The cost of plastering work shall also include the cost of necessary scaffolding, staging etc. as would be required for the work.

6.0 SURFACE FINISHING

6.1 General

The cost of all the items of work under this section should include the cost of necessary scaffolding, staging, preparing sub base, removing stains from the floor, skirting, wood work, glass etc. caused through execution of the work.

6.2 White Washing

6.2.1 White washing shall be done with 5(five) parts of stone lime and 1 (one) part of shell lime with necessary gum (about 2 Kg per M3 of lime) using a small quantity of blue as per direction of Engineer-in-Charge. The lime shall be brought to the site unslaked and shall be slaked at site with an excess of water and allowed to remain under water for (two) days. To the mixture fresh water may be added to bring the consistency to that of a thin cream. When thoroughly mixed, the mix is to be strained through coarse cloth. The surface of the wall is to be brushed thoroughly cleaned before the white washing is applied. Each coat of white wash has to be laid on with brushes. Each coat of White Wash means one continuous strike of brush with the prepared wash from top downwards. Another similar strike bottom upward over first strike followed by another similar strike from right to left and another from left to right over the right application of brush before it dries. Each coat must be perfectly uniform when finished and free from brush mark etc.

6.2.2 Three coats of white wash will mean a minimum of 3 (three) coats to produce an opaque white surface to the entire satisfaction of the Engineer-in-Charge. If the surface is blotchy or otherwise unsatisfactory, number of coats shall be applied till the desired effect is produced to the satisfaction of the Engineer-in-Charge without any additional cost.

6.2.3 Where specified interior wall shall be finished by acrylic distemper (two coats) over interior grade acrylic primer as per manufacturer's specification.

6.3 Exterior wall Finish

6.3.1 External surface shall be finished with two coats of Protective and decorative acrylic emulsion paint of approved color, shade and manufacture over acrylic primer. The surface to be finished shall be previously cleaned down to remove loose dust or dirt by use of stiff wire brush. All inequalities to be rubbed down and defects rectified. The surface to be wetted well with water and the surface water is to be allowed to run off. The acrylic emulsion paint to be applied strictly as per manufacturer's specification. The first coat should be well brushed into the surface to form a good bond. Second coat should be applied carefully to give a good finished appearance may be applied by brushing or spraying. Each acrylic emulsion paint application shall be wetted at the end of the day with a fine water spray.

6.4 Painting to Steel Works

6.4.1 Any shop coat of paint shall not be considered as a coat of paint for the purpose of specification.

6.4.2 Ready mixed synthetic enamel paint of 'Jenson & Nicholson' 'British Paints', 'Shalimar Paints or similar other approved make and approved color and shade shall only be used. The primer shall be red oxide zinc chromate primer (1S: 2074) or any other anticorrosive primer as approved and directed by the Engineer-in-Charge. The Contractor shall furnish the details of paints to the Engineer-in-Charge for approval of paints before commencement of painting work.

6.4.3 The surface to be painted shall be properly cleaned, de-rusted, all loose scales removed and smoothed with emery papers. Then a coat of anticorrosive priming shall be evenly applied. After this has dried up, two successive coats of best quality ready mixed synthetic enamel paint shall be given to the entire satisfaction of the Engineer-in-Charge. Brushes of approved size and make shall only be used for application of paint and use of cloth is definitely prohibited.

7.0 DAMP PROOFING WORK

- 7.1 Unless otherwise specified, damp proof course shall be 25-mm thick cement concrete (1:2:4) with stone chips graded 10 mm to 3 mm with 3% Cico or similar approved water proofing compound conforming of IS: 2645 by weight of cement. The proportioning, laying etc., shall be done in conformity with specification for cement concrete work. The damp proof course shall be used for all brick walls of the building.

8.0 ROOF WATER PROOFING TREATMENT

- 8.1 Both flat and curved roofs, whether accessible or inaccessible, shall have to be provided with polyurethane based water proofing paint.

Specification for Roof Water Proof Treatment with Polyurethane based Water Proof Paint

8.2 Preparation of Surface

The top surface of the roof shall be chipped off where necessary and all loose particles, dust impurities, are to be removed by rubbing the entire roof surface with wire brush and by application of High Pressure Compressed Heated Air to have a complete dust free and moisture free surface.

The roof surface, receiving polyurethane based Water Proofing paint, shall be provided with cement punning having smooth finish. A cross slope of 1 in 300 shall be provided in the roof of Building to allow proper drainage of rainwater.

8.3 Specification of Materials

The polyurethane based paint is essentially an elastic and water proof film having a good adhesion to concrete; water and abrasion resistant properties and shall have long term weather proof characteristics. The paint / film material shall be of two components which is to be mixed and processed as per manufacturer's specification. The mixture shall be homogeneous before applications, as it has tendency to settle.

The polyurethane based water proofing system shall be manufactured by reputed manufacturers of proven recorded and shall be approved by the Central Building Research Institute (CBRI)/ National Chemical Laboratory (NCL)/ The Council of Scientific and Industrial Research/New Delhi (CSRI)/ National Test House, Kolkata or similar such Government/ Public Sector Undertakings.

The materials are to be inspected/ approved by the Engineer-in-Charge as per procedure to be mutually agreed upon the agency and in charge of the work.

- 8.4 Since the product has a very short self-life, the materials are to be used in the work shall not be older than four (4) months from the date of manufacture (i.e. the date of bottling).

Necessary Test Certificate of CBRI/NCL/CSIR/National House etc. are to be furnished by the contractor or the Department, for the materials procured for the water proofing work.

8.5 Application

The two components of polyurethane based water proofing system should be mixed as per manufacturer's specification before application. The tack coat should be applied by brushing or roller to the entire surface in normal temperature and 406 hours setting time should be allowed before application of the second coat. The record and final coat of polyurethane based mixed waterproofing sealing over the priming coat to be applied at normal temperature and curing time between 36 to 48 hours should be allowed.

The application to be made by technically trained and approved applicators duly certified by the manufacturers.

8.6 Guarantee Period

The entire waterproofing job shall be covered with a written guarantee of leak proof performance for a minimum period of 10 (ten) years.

8.7 Defects Liability Period

Ten percent (10%) of the cost of all works shall be retained by the Department for one (1) year from the date of commissioning. Any defect observed during the Defect Liability Period shall be rectified by the Contractor without any extra cost to the Department.

9.0 FLOORING

- 9.1 Patent Stone Floorings shall be 25mm. thick in M20 grade concrete with 10mm. to 6mm. stone chips laid in rectangular panel with diagonal length not exceeding 3.00M and finished smooth with neat cement punning 1.5mm thick. After finishing, the surface shall be left undisturbed for two hours and then with wet bags and after 24 hours cured by flooding with water and kept wet for at least 7 (seven) days. Required Camber or Slope should be provided in floor draining wash water, if necessary.

- 9.2 Cast-in-Situ Mosaic in floor shall be 25mm.thick (finished) laid in panels as directed with necessary underlay of cement concrete (1:2:4) with stone chips with 12mm. thick terrazzo topping finished to 9 mm. after final grinding with 0 to 10 mm. size Mosaic chips highly polished etc. - complete as per specification

of IS; 2114-1962. Cast-in-situ Mosaic in Skirting and Dedo shall be 12mm. thick. The Mosaic work shall be of approved color and to the entire satisfaction of the Engineer-in-Charge.

- 9.3 'Ferro site' or 'Ironite' Flooring shall be 50 mm. Thick to be laid in two layers. First a layer of 25mm. thick patent stone flooring shall be laid in M20 grade concrete and allowed to dry. Then the second layer of 25mm.thick flooring of M20 grade concrete with 10mm.to 6mm. stone chips using at least 1Kg./Sq.m. of floor hardening compound of approved quality and make shall be laid and cured. The flooring shall be laid in rectangular panel with diagonal length not exceeding 3.0 meters.

10.0 IRON MONGERY

- 10.1 The rain Water pipe of the materials and of size as specified shall be of approved manufacture end jointed as follow:

10.1.1 For heavy cast iron pipes with gasket and lead properly caulked.

10.1.2 Where required these are to be run in chase left out in walls, columns, slabs and to be encased in cement concrete 1:2:4 (1 Cement, 2Sand 4 washed Stone Chips 19mm. down) with metal wrapping or with M.S: loops placed at approximately 325mm center to center or as directed by the Engineer-in-Charge. All pipes encased in walls, columns or under floors must be heavy cast iron with lead caulked joints. For exposed lengths of pipes, these are to be neatly secured clear from the finished wall face with nails and bobbing in the case of cast iron pipes, nails or screwed to hard wood tapping pugs embedded in wall.

10.1.3 All cast iron rain water pipes shall be painted two coats inside with approved anticorrosive paint. The exposed cast iron pipes shall be painted outside with two coats of ready mixed Synthetic Enamel Paints of approved makes, shade and color over a coat of priming of approved make.

10.1.4 The mouth of rain water pipes shall be fixed with C.I grating and the pipe jammed in position in 1:2:4 cement concrete with stone chips and neat finish on the surface.

10.1.5 The work shall include all supply, fitting and fixture of materials cutting, making chases, encasing, painting, jointing, etc. complete in all respect. The work shall include supplying, fitting, fixing, and jointing of all the specials required for the completed work.

10.1.6 Rain water Spouts shall be of C.I pipes cut to exact length as per approved drawing or direction of the Engineer-in-Charge and laid in position in 1:2:4 cement concrete with stone chips, adjoining roof being finished in neat cement. The interior faces shall be painted two coats with anticorrosive paint and the faces shall be painted with two coats of ready mixed Synthetic Enamel paint of approved make, shade and color over a coat of priming of approved make.

10.2 Metal Casement

10.2.1 Unless specified otherwise, all doors, windows and ventilation in general should be of mild steel casement with sections as per IS: 1038. They shall be of approved make. The Contractor will submit the name and address of the manufacturer whose metal casements he intends to use for approval of the Engineer-in-Charge. The workmanship shall be of high quality and shall be up to the entire satisfaction of the Engineer-in-Charge.

10.2.2 All the steel doors and windows sashes shall be given a shop coat of Red Oxide Zinc Chromate Primer IS: 2070 after these are thoroughly cleaned off dust, dirt, scales etc., and passed after inspection by the Engineer-in-Charge.

10.2.3 Windows are to be prepared for puffy glazing from the outside and for opening outwards unless otherwise mentioned. All steel sashes shall have holes drilled at suitable places for inserting glazing clips which shall also be supplied by the Contractor All glazing shall be fixed to the shutters or frames in addition to glazing clips with quality putty of Shalimar or equivalent make. Glass must not be placed directly against the metal. A thin layer of putty must be evenly spread over the glazing rebate and the glass pressed firmly against it.

10.2.4 Ventilators shall be constructed from solid rolled universal casement section being double weathered at all points to ensure water tightness and bedded in mastic and screwed to the sashes.

10.2.5 The fitting shall be of heavy pattern bronze oxidized brass and of approved quality, side hung casement will have two point locking handle and casement fasteners. The hung windows shall have 200mm. long adjustable casement stay, arrange to lock the windows from inside horizontally at the center, hung windows shall have spring catch designed for hand cord or pole operation as approved by the Engineer-in-Charge. The fittings to be fitted either by screwing to the window sections or to steel bracket welded to the window section as approved by the Engineer-in-Charge.

10.2.6 Galvanized weather bars shall be provided to sills of all windows.

10.2.7 Metal casement is on no account to build in at the time the walls are constructed. Holes to accommodate the fixing lugs are to be left or cut and the casement fixed after all rough masonry plaster works have been finished. The lugs of the casement shall be jammed in 1:2:4 cement concrete with stone chips after holding the casement in proper position, line or level.

- 10.2.8 Glazing for windows and ventilators shall weight not less than 8.0 Kg. /Sq. m for doors, 6mm. thick wire net reinforced glazing shall be used as approved by the Engineer-in-Charge. The glasses shall be cut to size accurately to suit all openings to glaze with slight margin of about 1.50mm. on all sides or as directed. These shall be securely fixed in position in the manner described earlier. On completion of the building, the Contractor shall clean all the glass and leave the same perfectly in a tidy condition.
- 10.2.9 The cost of marginal doors, windows and ventilations shall include supplying fixing, fitting, glazing cleaning, necessary scaffolding, staging etc. and shall be for the complete work in all respects to the satisfaction of the Engineer-in-Charge.
- 10.2.10 The Contractor shall without any extra charge, submit three sets of shop drawings from the manufacture showing full details of each type of doors, windows and ventilators including section, position of all fittings and fixtures for the approval of the Engineer-in-Charge before manufacture and finally six sets of approved final drawings with notes on the method of fixing.
- 10.2.11 If specified, mosquito fly proof brass wire screen of approved gauge and mesh shall be used in combination with windows. The screen shall be fixed to the inside of the frames and the windows to be opened outside and be fitted with 'Folo operator' for opening to any position and closing. Additional intermediate members be fixed to the frames to receive the fly screen so that the clear span of the screen does not exceed 300 m or as approved by the Engineer-in-Charge.
- 10.2.12 All windows shall be provided with grills of approved design made of 25 mm x 6 rum M.S. Flats and the other clean openings not exceeding 100 mm.
- 10.2.13 The work for metal casements shall also include the cost of painting with 2 coats of ready mixed synthetic enamel paint of approved made, quality color and shade over a coat of approved anticorrosive primer.

10.3 Collapsible Gate

The M.S. collapsible gates will be obtained from manufacturer as approved by the Engineer-in-Charge. These shall be of mild bar type, out of 20 mm. channels and shall be top hung with roller bearing and shall have locking arrangement. Collapsible gates under 2.700 m height shall be with 4 sets of lattices. Guide tracks shall be to the entire satisfaction of the Engineer-in-Charge. The gates shall be fixed in position, de-rusted, discaled and painted with 2 "coats of approved ready mixed paint over a coat of approved anticorrosive primer.

10.4 Rolling Shutter

10.4.1 The M.S. roller shutter shall be obtained from manufacturer as approved by the Engineer-in-Charge. The roller shutter shall be of 18 G x 75 mm galvanized mild steel lath of convex corrugation complete with one piece construction. These shall be fitted with pressed side guides and pressed bottom rail, brackets, door suspension shafts, top rolling springs (of strong English Continental Spring Steel Wire) with a four lever concealed lock as also separate locking arrangements for padlocks, pulling hooks, handles and top cover. The roller shutters shall be fixed in position with all accessories and the workmanship shall be to the entire satisfaction of the Engineer-in-Charge. This shall be finished with two coats of approved read/ mixed paint over a coat of approved anti corrosive primer.

11.0 STRUCTURAL STEEL WORK

11.1 All Structural Steel to be used for gantry beam etc. shall be of tested quality conforming to IS: 226 and IS: 2062 latest addition.

Finished steel shall be free from cracks, lamination and other visible defects. Section shall be adequately protected from rusting and scaling. Rivets and bolts, nuts and washers shall be of mild steel and comply with requirements of relevant IS Codes. Steel used for rails shall have tensile strength of about 50-60 Kg/Sq. mm. and yield point at 26 Kg/Sq. mm. The electrodes for welding shall conform to IS: 814. All steel work shall be fabricated and erected as per IS: 800 and IS: 806. Welding shall be carried out as per IS: 814, IS: 815, IS: 816 and IS: 823, all of the latest editions.

11.2 All steel work, after preparation of surface, shall be given a coat of red oxide zinc chromate primer (IS: 2074) and finished with two coats of Synthetic enamel paint. Surface to be painted shall be thoroughly cleaned of mill scale, oil grease, rust etc. over coating and finishing paints shall be of well-known make (vise Jenson & Nicholson/ Berger Paints/ Shalimar Paints). The Contractor shall furnish details of Paints to the Engineer-in-Charge for approval of paints before commencement of painting work.

11.3 Steel work shall be hoisted and erected in position in a safe and proper manner. No riveting or permanent bolting shall be done until proper alignment has been made. For grouting, cement and clean fine sand shall be used in a proportion of 1:2 and properly mixed with water. All trapped pockets shall be fully vented for full penetration of grout. All grouting shall be cured for a minimum period of seven days.

12.0 CABLE TRENCHES

- 12.1 The cable trenches should normally be of dimension 750mm x 600 mm (D x W) with insert plates made of M.S. of dimension 100 mm x 75 mm x 12 mm (W x D x T) are to be provided on the wall side of the cable trench 600 mm apart all along.
- 12.2 The Cable Trenches shall be covered with pre-cast concrete slabs of dimension 650 x 600 adequate thickness to withstand a load of 500 Kg/m² are to be provided as covers of trench all along. For easy access of cable from room to room, the design of the tie beam and level of the rooms may be adjusted to avoid bend in the cable.
- 12.3 The cable trenches shall be absolutely free from any obstructions as to allow the cables to be lowered in the trenches from top only during laying. The space inside the trenches throughout the entire lengths shall in no case be encroached by any beam or columns.

13.0 POCKETS & HOLDING DOWN BOLTS

Provision has also to be kept for pockets and holding down bolts as per requirement of the electrical and mechanical equipments at no extra cost. The exact details of such pockets and holding down bolts will be supplied to the Contractor as per specifications of the suppliers of the equipment after award of the contract. It is contemplated that M.S. hangers shall be provided from the underside of slab/beam of the operating floor, and is to be executed in a separate contract. However, for the above arrangement suitable pockets and holding down bolts are to be left.

14.0 CHEQUERED PLATES ETC.

These shall be manufactured from structural steel conforming to IS: 226. They shall be of the specified size, thickness and pattern as per relevant drawings or as directed by the Engineer-in-Charge. Cover plates will generally be of Chequered plates with or without stiffeners as detailed in the drawings. For convenience, the Contractor shall prepare detailed floor plans of the layout of cover plates for floors and platforms so as to include all openings, cuts etc. and so as to match the patterns of adjacent cover plates/gratings. Where necessary, the floor will have to be made leak proof by properly welding cover plates. If necessary, packing shall 'be welded to the bottom of cover plates to raise the cover plates on sides, so as to provide necessary slopes as shown in the drawings or as directed by the Engineer-in-Charge in the floors and platforms to drain away any liquid falling on the floors and platform. Necessary gutters at the ends of platforms shall be provided for sloping floors and platforms as shown in the approved drawings or as directed by the Engineer-in-Charge. Krebs of flats shall be provided where necessary, around openings and cuts in order to prevent liquids falling to lower floors or platforms.

15.0 HAND RAILING

Double rows of 30 mm diameter G.I. tubular hand railing fixed in G.I. stanchions shall be provided on the edge of walkways and platforms as specified. The stanchions shall be fixed with mild steel rag bolts with chromium plated cap nuts. The stanchions shall not be less than 1000 mm. high and placed at a distance not exceeding 2500 mm. The hand railing shall be fixed true to exact line and level. G.I. stanchions and hand railing layout shall be of architectural design with pleasing appearance.

16.0 SANITARY INSTALLATIONS

- 16.1 The Urinals shall be of flat back, front lipped having a size of 46.5 cm. x 36.5 x 26.5 cm. or nearest available size. The Indian type W.C. shall be of minimum 58 cm. Complete with footrest in one piece.
- 16.2 All Sanitary works shall be of "Parry", "Neycer", or any other equivalent make. They shall be of approved quality conforming to relevant IS Codes and shall bear ISI Certification marks. All G.I. pipes shall be of ITC or equivalent make heavy quality conforming to relevant IS Code. Wheel valves and stop cocks shall be of gun metal and of "Leader" or "Annapurna" or equivalent make as approved by the Engineer-in-Charge and shall conform to relevant IS Codes.
- 16.3 Two urinals, one Indian W.C., one European W.C. (Commode) have to be provided in the toilet block.

17.0 MANHOLE COVERS

Heavy-duty plastic fiber reinforced concrete manhole covers shall be of heavy duty type conforming to IS: 1726.

18.0 TIMBER DOOR

The timber door shall be of 1st. Class CP Teak Wood for both frame (100 mm x 100 mm) and shutters (49 mm thick). All such doors shall be fully paneled. All timber shall be of best' quality, well seasoned and/or well treated for prevention and protection against decay etc. It shall be uniform in substance, straight in fibers, free from large or dead knots, sap, flaws, sub cracks, shakes, or blemishes of any kind. Any insect damage or spoils across the grain shall not be permissible. The color of the timber shall be uniform throughout, firm and shining with a silky luster when placed and shall not emit dull sound when struck. The doors shall be made as per approved drawings and as directed by the Engineer-in-Charge and the timber shall be sawn in direction of the grains and shall be straight and square. The door fittings shall be highly polished as per direction of the Engineer-in-Charge.

19.0 M.S. PIPELINES

M.S. Pipe lines in required lengths and should be spirally welded from reputed manufacturers and M.S. specials will be fabricated from the said MSSW pipe or from M.S. Plates cut to exact size and shape, bent true to curvature and welded using standard electrodes after necessary edge preparations. Both the inside and outside surfaces of the MSSW pipes and specials shall thereafter be thoroughly cleaned after de-rusting and brushing. The outside surface shall then be wrapped and coated with a protective coal tar based insulating tape of 4 mm. average thickness as approved over one coat of approved primer leaving 150 mm. on either end of pipes unwrapped. The inside-surfaces will be provided with 3 (three) coats of non-toxic paint over one coat of primer.

The pipes and specials will be lowered in trenches for laying only after testing the same with spark test by holiday detector so as to ensure that the pipes and special are free of holidays. The pipes thus lowered will then be interconnected by welding and the portions of 150 mm. width left unwrapped on either side of pipes will then be wrapped with said insulating tape.

The thickness of SWMS pipes and specials of 900 mm diameter shall be 12 mm.

20.0 P.S.C. PIPELINES / N.P.-2 CLASS PIPELINE

P.S.C./N.P.-2 Class Pipes will be laid on suitably designed 1:3:6 concrete bedding of 150 mm thickness. The pipes will join by rubber rings. Bends and specials will be of mild steel. The P.S.C./N.P.-2 Class pipes will be joined with M.S. special and machined ends will be wrapped and coated with an approved protective coal tar based insulating tape of 4 mm. average thickness over one coat of approved primer. The inside surface will be provided with 3 (three) coats of non-toxic paint over one coat of primer.

21.0 MONO RAIL WITH CHAIN PULLEY BLOCK

Provisions have to be made for a 1 M.T. capacity mono rail with chain pulley block suitable for inching operation with a lift up to motor floor level and cross travel of 12 M for handing pump, motor and other accessories. They shall be of reputed make as per vendor list and as approved by Engineer-in-Charge. Suitable type of crane rails, girders and all other accessories as necessary for installation and operation of the crane are to be designed and provided by the contractor within the Lump Sum pipe quoted. The two travels and two hoists i.e. long, cross & main Auxiliary etc. must be mechanical operation. The buffers must be spring-loaded operation. Suitable vertical clearance is to be provided over the rail level to the bottom of the roof beam.

22.0 SLUICE GATE/PEN STOCK GATE

Cast iron single faced Thimble mounted Sluice Gate/Pen Stock Gate will be designed as per IS: 13349-1992.

23.0 C.I. SLUICE VALVE

C.I. Sluice Valve conforming to IS: 2906-1869 suitable for water works purposes and as per requirements of the Clear Water Reservoir / Clear Water Pump Sump. The class of Sluice valves shall be class-I with maximum working pressure as per relevant IS standard.

24.0 C.I. COWL VENTILATOR

150 mm diameter Specially designed C.I. Cowl Ventilator shall be provided in the outer peripheral walls in between the underside of the reservoir roof and Top Water Level (T.W.L.) of the reservoir, in order to prevent breakage of the Cowl Ventilator, the same shall be encased with cement concrete of grade M 15 with nominal reinforcement as typically shown in the tender scheme drawing.

25.0 ARRANGEMENTS OR PLASTIC FIBRE REINFORCED CONCRETE MANHOLE COVER M.S. LADDER ETC.

25.1 Manhole Cover

Heavy duty plastic fiber reinforced concrete manhole covers with frame should conform to relevant IS Code. The clear opening for access to the M.S. Ladder for going inside the reservoir shall be 600 mm. and the overall dimension of the heavy Duty Manhole Cover shall be specified by the Tenderer conforming to relevant IS Code. The manhole cover with frame shall be of 'Double Seal Type'. Location of manhole covers and frames are specified in the tender scheme drawing and the Bidders are to include the cost thereof in their offer.

25.2 M.S. Ladder

M.S. Ladder for going inside of the reservoir has been typically shown in the tender scheme drawing. The width of the ladder shall be 750 mm. with G.L. hand railing with M.S. angle posts. The steps of the ladder shall be provided with M.S. chequered plates with minimum 6 mm. in thickness. The rise and treads of the steps work of the ladder shall be provided with suitable anti-corrosive paints over two coats of primer as per manufacturer's specifications to be approved by the Department. There shall be 4 (four) numbers M.S. ladder in the locations shown in the Tender drawings.

25.3 Rung Ladder

Where over specified, shall be formed out of 20 mm diameter M.S. Rods. The rods forming Rung Ladder shall be properly bonded inside the R.C.C. walls. The spacing of Rung Ladder shall not exceed 300 mm. and the size of the

rung formed shall be 300 mm wide x 150 mm deep. The rods are to be painted with anti-corrosive paint with suitable primer as per manufacturer's specification to be approved by the Department.

26.0 LEVEL INDICATOR (Manual & Remote sensing)

One (1) Manual Level indicator shall be provided at the Pump Sump so that they can be visible from inside the operator's room in Pump House Building. The level indicator shall be manual type with PVC floor, guide wire, level indicator board etc. as per requirements. The arrangement of remote indications with display from inside the operator's room shall also be made. The arrangement and details to be get approved by the department.

27.0 LIGHTNING ARRESTOR AND AVIATION LIGHT

Required sets of Lightning Arrestor and Aviation lighting arrangement shall be provided by the tenderer at the highest point or such places or of the Pump House Building conforming to the I.E. Rules specifications as per standard practice.

The job includes supplying, fixing and commissioning of sufficient no. of lightning arrestors which includes air-terminals, separate earth electrodes, grid earthing and individual earthing with approved size of air-terminals, earth electrodes, earthing strips as per IE rules/IS codes. Detail Calculations to be vetted by the department in the final design.

28.0 MOTOR FLOOR AND CONTROL ROOM

There must not be any column in the motor floor for easy movement of the HOT Crane. Similarly in the Control room cum office room, there must not be any columns in the room. The motor floor should have suitable openings at appropriate location as per requirement of the pump manufacturer for lowering and taking up of pumps, motors, valves, entry of cable etc. The motor floor shall be suitably designed to take care of the vibration generated from the motor pump assembly while in operation.

29.0 WRAPPING COATING

This work is to be completed in all S.W.M.S. pipe at ground level with 4 mm. thick coal tar based tape. Necessary 'Holiday Test' to be done to ensure perfection. This job is to be done before commencement of work of respective stretch.

30.0 TRIAL RUN

When in the opinion of the Engineer the initial performance tests as specified in Section- I are satisfactory the Contractor shall arrange for trial run of the plant at its rated capacity and also their performance tests. During such tests, the Contractor shall arrange to collect samples of effluents from the clarifier and representative. Samples minimum of SLX samples of each effluent shall be collected at intervals specified by the Engineer each day for 14 consecutive days. These samples shall be sent by the Engineer or his authorized representative to the plant laboratory or any other laboratory nominated by the Engineer, for analysis and determination of the quality of the two effluents. All costs of the sample collection, delivery to the laboratory and test shall be borne by the Contractor.

The Plant shall be deemed to be ready to be put into normal use when trial run of the plant and the quality of the clarified water and filtered water are certified satisfactory by the Engineer. The period of maintenance shall be reckoned from the date of the Engineer's certificate.

31.0 OPERATION AND MAINTENANCE

After the plant is deemed to be ready to be put into normal use the Contractor shall operate and maintain the same for a period of twelve months by his own establishment and technical experts under the overall supervision chemicals and other consumable stores required for the operation of the plant shall be provided by the contractor at his cost. The Employer shall also bear the cost of electrical energy. During the aforesaid period of operation of the plant the Contractor's supervisory staff shall train and instruct technicians and other staff deputed by the Employer about the correct method of operation and maintenance of the plant as a whole and its various mechanical and electrical components. The Training shall be such as would enable the Employer's staff to take over the plant from the Contractor for its operation and maintenance independently. The Contractor's training personnel shall give special attention to this.

During the period of operation and maintenance the Contractor shall arrange to take regular samples of the clarified and filtered effluents as directed by the Engineer and shall have such samples tested at his cost in the plant laboratory or any other laboratory nominated by the Engineer, to determine the quality of the samples and the performance of the plant. Such tests shall be continued up-to the penultimate week prior to the end of the maintenance period and the plant shall be taken over by the Employer subject to the final performance tests being certified as satisfactory by the Engineer.

The Bidders shall submit with their offer a list of technical and non-technical staff they propose to engage for operation and maintenances of the plant for twelve months.

32.0 GUARANTEE PERIOD

The Contractor shall stand guarantee for the successful operation of the plant for 12 (Twelve) months period from the date of the certified commissioning as stated in clause C-48 & 49 within which any defects and short coming

due to faulty design of the plant, defective mechanical and electrical equipment or defective construction will have to be made good without any extra cost to the Authority. During the guarantee period the Contractor shall ensure thorough checking of the plant at least once every month and arrange for immediate rectification of any defects detected during this special drive by his experts.

33.0 GUARANTEES

The Contractor shall give the following guarantees

- 33.1 Civil and Structural Works
The Contractor shall guarantee the plant against any structural failure due to faulty design, bad workmanship, substandard materials, etc. for a period of twelve months. Any defect found during the guarantee period shall be rectified by the Contractor to the satisfaction of the Engineer without any extra cost.
- 33.2 Plant and Equipment
Even when a plant or equipment has been manufactured and / or marketed by a vendor, it would be deemed to have been supplied and installed under the contractor's supervision. The Contractor shall provide back-to-back guarantee along with the vendor but shall solely be responsible for its repair/replacement. He shall not cite the vendor and claim absolved. In addition, all equipment shall be free from any defects due to faulty designs, materials and / or workmanship. The equipment shall operate satisfactorily and performances and efficiencies shall not be less than the values guaranteed by the manufacturer and endorsed by the Contractor.
Formal acceptance of the work or equipment covered under the Contract by the Engineer shall not be made until all the work done by the Contractor has satisfactorily passes all tests required by the specifications.
If, during testing of work and / or equipment prior to formal acceptance, any equipment or materials shall fail in any respect to meet the guarantees, the Contractor shall replace such equipment in a condition, which will meet the guaranteed performance. Any such work shall be carried out by the Contractor at his own cost and expenses in necessity thereof, shall in the opinion of the Engineer be due to the use of materials or workmanship not in accordance with the Contract or to neglect or failure on the part of the Contractor to comply with any obligation expressed or implied on the Contractor's part under the Contract. If in the opinion of the Engineer, such necessity shall be due to any other cause, the value of such work shall be ascertained and paid for as if it were additional work.
If the Contractor shall fail to do any such work as aforesaid, required by the Engineer, the Employer shall be entitled to carry out such work by its own workman or by others and if such work is supposed to be carried out by Contractor the cost thereof, or may deduct the same from any money due or that may become due to the Contractor.

34.0 IMPORTANT GUIDELINES AND SPECIFICATIONS

- 34.1 Unless otherwise specified elsewhere, the work shall be carried out as per the following specifications.
- 34.1.1 All civil works shall be carried out as per specifications contained in other section of these tender specifications.
- 34.1.2 All electrical works including supply of all electrical equipment shall be carried out as per specifications contained in other section of the tender specification.
- 34.1.3 All mechanical works including supply of equipment shall be carried out as per specifications contained in other section of these tender specifications.
- 34.1.4 The erection and commissioning works shall be carried out as per specifications contained in other section of these tender specifications.
- 34.2 A minimum free board of 500 mm shall be provided for all water containing structures viz., collecting well, flash mixer, stand wells, filter beds, channels, chambers, etc. unless otherwise specified elsewhere.
- 34.3 For the convenience and ready accessibility to the operating level, each unit of the treatment plant shall be so interconnected by walkways/gangways as will permit reaching one end of the treatment plant to the other by means of walkways/gangways without having any necessity to get down to the ground level.
- 34.4 Walkways and operating plant forms shall be provided with hand railings as specified in other section.
- 34.5 Roofs shall be provided with polyurethane paint.
- 34.6 All the exterior doors and windows shall be provided with R.C.C. chajja of approved design.
- 34.7 All windows and ventilators/skylights shall be provided with mild steel grills of approved design.
- 34.8 Cement should be of reputed make like Ultratech/Ambuja/ACC/Birla Gold etc as per the direction of EIC and steel should be off SAIL/TATA TISCON/RINL as per the direction of EIC.

SECTION - E

DETAILED TECHNICAL SPECIFICATIONS OF WORK

1.0 SCOPE OF WORKS

ITEMS OF WORKS

The scope of works has already been detailed in these documents. However, it is repeated below

- a) Sinking of Four (4) nos. Deep Tube well with six number DTW protecting room cum switch room of size 3.0 m x 3.0 m for each tube well for operating the submersible pumping units complete and Construction of Three number 5.4 m X 3.6 m size Pump House cum Switch Room for accommodation of electrical control panel , HSC Centrifugal Pumps for operating CWR Pumps , motors , staff staying accommodation with sanitary facilities and receiving of WDS&EDCL power supply source as per technical specification and direction of EIC. .
- b) Installation of 4 (Four) no. submersible pumping units with its control panel and 4 No. HSC Centrifugal Pump and control panel.
- e) Construction of one number of Clear Water Reservoir of capacity 400 cubic meter with Pile Foundation.
- f) All Electro-Mechanical works related to water supply system.
- g) Post-Chlorination arrangement
- h) Internal and yard lighting arrangement and lightening arrestor arrangement.

The above scope of works is to be indicative not to be exhaustive. Anything not covered in NIB but required for successful commissioning of the plant are to be provided by the Bidder.

2.0 Switching room for operating the Submersible pumping units

The switching room shall be of R.C.C. underground structure with brick panel walls in the superstructure. The floor of the switch room shall be placed at an above high flood level. Adequate skylight and windows shall be provided in the sludge pump house building to admit sufficient natural light. The total shutter area of doors windows and skylights shall not be less than 25% of the plinth area. The windows and skylights shall be provided with grills of approved design. The main entrance door shall be of 1.5 meter wide mild steel rolling shutter.

The roof of the switch room shall be provided with roof water proofing treatment with adequate arrangements for rain water drainage.

All the basic construction works and finishing works shall be carried out as per specifications of these Bid specifications.

6.0 Clear Water Reservoir:

As per detail specifications attached.

7.0 Boundary wall :- As required as per the direction of EIC.

8.0 Plant Waste Water and Solid Waste Disposal

8.1. Natural drainage

Arrangements shall be made for the disposal of wastewater from the different treatment plant units and rainwater by gravity into natural drainage system. For this purpose the disposal Point shall be suitably located at the site and the Bidders shall satisfy themselves as to the suitability of this point for natural drainage. The waste disposal system shall be designed to make the discharge of the wastewater into the outlet channel by gravity alone.

9.0 Leveling of the site

After completion of the work, the entire site all round the chemical house, filter house and annex building and other structures within the scope of this contract shall be cleared and all construction equipment shall be removed within

a period not exceeding 3(three) months from the date the plant is put into trial run. The site shall be graded and leveled to the required level.

Chairperson , Rampurhat Municipality

SECTION – F

**TECHNICAL SPECIFICATION OF
ELECTRO-MECHANICALWORKS**

1.0 Mechanical

1.1 Centrifugal Pumps in UGR/CWR cum pumping station

- 1.1.1 The Pumps shall be Horizontal Split Casing Centrifugal suitable for installing on MS Fabricated Common base Frame inside the Pump House. The pump shall be supplied with Coupling for Pump and Motor, Coupling Guard, Vent Cock, Draining Plug etc. The rpm of the Pump should be greater than 750 rpm (syn.) max. Impeller, Shaft Sleeve & Lantern Ring of Bronze and Shaft made of SS.
- 1.1.2 Rating and material of construction of the pump shall conform to the following:
- | | |
|---|----------------------------|
| Required Quantity, Nos. | 4 (2W+2S) |
| Total System Discharge, m ³ /hr. | ----- |
| Total Head, MWC | To be declared by Tenderer |
| Liquid Handled | Clear Water |
| Temperature | Ambient |
| Type of Impeller | Closed/Semi open |
| Type of Sealing | Gland Packing |
| Type of Coupling | Flexible Pin & Bush Type |
| Type of Bearing | Antifriction |
| Type of Lubrication | Grease Lubrication |
| <i>Material of Construction</i> | |
| Casing | CI IS 210 GR FG 260 |
| Impeller | Bronze |
| Shaft | SS 410 |
| Shaft Sleeves | SS 410 (H) |
| Base Plate | Fabricated MS |
- 1.1.3. The pump shall suitable for pumping the clear water from the underground reservoir. The pump shall be operated in dry pit and in horizontal execution with positive suction head. The pumping unit shall be side end suction and side end delivery type.
- 1.1.4 . The casing shall be split in such a fashion that the suction and delivery branch of the pump will be internally cast with the bottom half of the casing .The purpose being one half of the casing shall remain fixed in position with the suction and delivery line while the other half of the casing will be withdrawal so that when removed, the entire pump internal will be exposed for inspection or repairing purpose. Two halves of the casing volute will be matched with the template, so that there is no overlapping of steps in volute. This is required not only to achieve good efficacy but also be avoid operational / repair & inspection problem.
- 1.1.5. The impeller of the pump will be located centrally with the pump casing and shall be fixed in a position on the shaft with the key as well as sleeve and sleeve nuts. Sleeves and sleeves nuts will not allow the impeller its position axially along the shaft to cause mechanical damage and operational problem .In order to smooth running and freedom from vibration impeller /impellers are dynamically balanced. The impeller shall be locked rigidly on the shaft by a long threaded nut which is further locked by an eccentric screw.
- 1.1.6. A liberally designed shaft should be covered with a shaft sleeve in such a fashion to prevent frequent replacement of the shaft.
- 1.1.7. The bracket shall be provided with a bronze and two springs attached synthetic rubber seals. If the tips of the lower seal be damaged due to the abrasive action of ingredients in the effluent, the upper seal will still continue to function. This Sealing arrangement is a departure from the asbestos packing arrangement.

- 1.1.8. A rigid /flexible coupling must join the pump shaft with the motor shaft. This couplings work provides dismantling of the pumps without disturbing the motor position vice-versa.
- 1.1.9. The vibration level should be 50 microns both in horizontal & vertical direction, sound level of maximum 65 db. during running condition of pump & motor. The pump should be supplied with base plate, soleplate, grounding pad, lifting lug, eyebolts, anchor bolts, nuts etc. Reverse direction of rotation of pump must be restricted by providing non-reverse ratchet. The pump shall have provision for fixing pressure gauge, vent pipe, air release valve.
- 1.1.10. The design, manufacturing, performance of the horizontal execution pumps as specified hereinafter shall comply with the requirements of applicable codes, the latest applicable Indian/ British/ American/ DIN standards, in particular and in that order of application, the following.IS 1520 Horizontal centrifugal pump for clean, cold, freshwater.IS 9137 Code for acceptance test for centrifugal, mixed flow & axial pumps.BS 5316 Acceptance tests for centrifugal, mixed flow and axial pumps. PTC 8.2 Centrifugal pumps-Power test codes.

1.2 Technical Requirements and Calculations

- 1.2.1 The Pumping Station at Rampurhat Municipality area Four pump sets(2W+2S) will deliver the potable water of discharge of 125 CUM/Hr. each pumping unit at an lowest water level condition of the CWR sump at a system head demand to be determined by the bidder.
- 1.3 For the OHRs the tenderer has to determine the pump TDH considering the different obligatory levels given here in after taking into account the pump suction side losses, station losses for all components i.e. valves, specials, piping covered in the tender, pump internal loss, manifold & header losses etc. Similarly the tenderer shall confirm the maximum NPSHR on the total range of operation of the pump without any positive tolerance. The NPSHR of the offered pump shall have a margin of at least 0.5m with the NPSHA even working on the lowest water level condition. Calculations to prove the adequacy of the same taking atmospheric head as 10.0 MWC shall be furnished with Part-I offer in addition to the NPSHR curves.
- 1.4 Check List of Part-I (Technical Bid) Tenderer are required to furnish the following technical particulars with the Part-I of the tender without fail, in absence of which the bid may be considered as technically non responsive and rejected.
- a) Detailed system head calculations including H-Q, P-Q, Efficiency-Q, NPSH-Q etc. curves at various level conditions in solo and parallel condition superimposed on the system resistance curve, the printed family curve of the pump model offered shall be furnished along with offer. The curves shall be in proper scale drawn on graph paper.
- b) Detailed calculations showing adequacy of NPSHA having at least 0.5m margin over NPSHR even at lowest water level condition as has been asked for in the technical specifications of the pumps elsewhere.
- Note : To work out the system head on Hazen-William’s formula to arrive out the pipe frictional losses taking ‘C’ value as 100 for all MS Piping shall be considered and for C value of DI as 140. The following ‘K’ values for valves, specials shall be considered as follows
 Sluice Valve: 0.4 Non Return Valve:2.5 ButterflyValve: 0.35
 Other specials: Guideline as per CPHEEO Manual
 Note: Units used for the curves/data shall be as follows (Language shall be in English)
 Flow Rate: M3/Hr.
 Head, NPSH: MWC
 Power:KW
 Efficiency:
- 1.4.1 The following flow velocities shall be maintained for the pump suction and delivery branches:

Pipe diameter	Suction Side	Delivery Side
Upto DN 150 mm.	0.6 to 1.0 m/s	1.0 to 1.7 m/s
DN 200 mm. to DN450 mm.	0.8 to 1.2 m/s	1.7 to 1.9 m/s
DN500 mm. to DN1000 mm.	1.0 to 1.5 m/s	1.7 to 2.2 m/s

- 1.4.2 The following pipe specification shall be followed to determine frictional losses in pipelines:
- a) For sizes upto DN150, ERW black pipes to IS: 1239 Part-I (Hvy) and IS: 1239 Part-II (Hvy) fittings to be followed.
- b) For sizes DN200 to DN350, ERW black pipes to IS: 3589 having wall thickness 7.1 mm. and 7.9 mm. for sizes DN400 to DN500. Fittings shall be fabricated from parent pipes.
- 1.5 Obligatory Data & Information to the tenderer to work out the system head for feeding the three OHRs. For the purpose of working out the detailed engineering on various system requirements, the following data and information shall be applied.

For the purpose of working out the detailed engineering on various system requirements, the following data and information shall be applied.

Sl. No.	Description of item	Data to be Considered for Design Purpose
1	Average ground level of site above MSL	± 0.00 M
2	Liquid to be handled for pumping	Clear Water
3	Turbidity	Upto 5 NTU
4	Temperature	12 °C to 37 °C
5	Specific Gravity	1.0
6	No. of Pump Motor set to be installed	2 Working + 2 Stand by
7	Likely supply voltage at plant premises	415V ± 10%, 50Hz. ± 5%, 3

		phase
8	Discharge station flow at duty point	125 m3/hr. at a head to be determined by the bidder

- 1.8 While calculating the pump TDH the tenderer must explicitly specify the length and diameter of pipes and specials they have selected while taking into account the velocity considerations given earlier in this NIT. The rates quoted by the tenderer in the BOQ / Price Schedule shall be assumed to be for that particular diameter of pipes, specials & valves etc. No departure from the declared data of the tenderer shall be allowed in future. This calculation sheet along with table of pipes and specials should be given in technical part of the e-bid, without which the tender shall be summarily rejected.

The battery limit of the work is the start from receiving of electrical power and end is the outer flange of the butterfly valve on common delivery header with valve chamber and a temper proof kinetic air release valve.

2.0 Dewatering Pump

- 2.1 Submersible dewatering pump set shall have suitable operating at 220V, Single Phase power supply to drain water from CWR depressed area. The pump shall have MOC as per manufacturer's choice and shall have float operated level guard for dry running protection.

3.0 Motor

- 3.1 The equipment shall be designed and manufacture and tested in accordance with latest I.S specification and code of practice published by the Bureau of I.S whenever available. The Electrical equipment shall also conform to latest I.E Rules as regard safety,etc.
- 3.2 All motors shall conform to the latest applicable IS/BS/DIN publications. All the motors should be of ESF-1 category with an efficiency range of 96% and above.
- 3.3 Motors shall be deemed to be installed outdoor and exposed to 100% humidity constantly. The effect therefore shall be considered in the determination of the design.
- 3.4 The drive electrical motors shall be of squirrel cage induction type horizontal/Vertical axis to suit the size of the pump and shall be able to drive the pumps. The rating of the motor shall not be less than (for horizontal pumping unit 10-20 % of the pump BHP, of 415 V±10%, 3 phase,50 Hz±3 %, designed RPM (Synchronised) and also suitable for drive the pumping units
- 3.5 All the motors shall be rated for continuous Duty operation (Duty:S1 as specified in IS 325 1978).However, due to the operational schedule of the pumping station , the pump motor unit may demand for 8/10 start and stop in a day with minimum time gap of 15 minutes for one stop after prolong operation and restart the same. The motor shall also be capable of one immediate hot restart and three equi-space starts per hour. The motor shall also be suitable for long period of inactivity.
- 3.6 The motor characteristic shall match the requirements of the driven equipment so that adequate starting torque, accelerating, pull up, break down and full load torques are available for the intended service. It shall be drip and splash proof protected and well ventilated/ Totally enclosed fan cooled
- 3.7 The motors shall be capable of working satisfactorily at full load for 5 minutes without injurious heating at 75% rated voltage at motor terminals.
- 3.8 Motor shall be designed for Star-Delta starting device. Starting current shall not exceed 4 to 6 times full load current for all auxiliaries subject to tolerance (IS)
- 3.9 Motor shall be designed for Star-Delta starting device. Starting current shall not exceed 4 to 6 times full load current for all auxiliaries subject to I S tolerance.
- 3.10 The locked motor withstand time under hot condition at 110% rated voltage shall be more than motor starting time by at least 2.5 sec .
- 3.11 All motor enclosures shall be Totally enclosed fan cooled (TEFC) and conform to the degree of protection IP55
- 3.12 The stator windings shall be of class F insulation to ensure trouble free operation in an atmosphere where the relative humidity shall consistently be near to at 100%.The stator windings should have uniform machine wound single/ double layer formed coils with electrolytic grade copper conductors (99.9%)
- 3.13 The stator core is to be built up on low loss cold rolled dynamic grade laminated steel sheet insulated from one another by a thin layers of high heat resistant varnish-ventilated are to be provided to increase the cooling efficiency in the core protection.
- 3.14 Two numbers of axial fans are used and proper gap at the top and bottom of the motors for easy air exist. The motors are to be dynamically balanced with all the fans and with full key in the shaft extension, if required.
- 3.15 Motors shall be provided with antifricition bearings grease lubricated at both ends. Bearings shall be provided with seal to prevent leakage of lubricants or entrance of foreign matters like dirt water etc. in to the bearings area.
- 3.16 Grease lubricated bearings shall be pre-lubricated and shall have provisions for in service positive lubrication with drain to guard against over lubrication. Lubrication shall not detoriate under all service conditions. The lubricants shall be limited to normally available type IOC or equivalent.
- 3.17 The motors (above than 75 KW) are to be provided with 10 nos.+2 nos. platinum type resistance temperature detector PT100 type. The leads of this RTD's and BTD's are to be brought out in a separate terminal box. Over voltage fuses are to be provided for each RTD' & BTD terminals for connecting the alarm & trip connection.
- 3.18 The noise level shall not exceed 5 micron at 1.5 M away from the motor in full load condition. The peak amplitude of the vibration shall be within IS specification (IS: 11724) limit.

- 3.19 Motor terminals box shall be detachable type and located in accordance with IS. It should be suitable for terminating 2 nos. 1.1 KV grade PVC (AL) conductor armoured cable alongwith the lead cable for P.F improving capacitor may be connected, if required. No compound should be used in terminals box for easy handling. The terminals box shall be capable of withstanding maximum system fault current for duration of ¼ th Cycle. The terminal box shall be clearly identified by phase markings with corresponding direction of rotation marked on the non-driving end of the motor.
- 3.20 The motor should have provided with ratchet mechanism to prevent reverse direction of rotation.
- 3.21 The frame of (higher rating as per IS motor) Motor shall be provided with space heater suitably located for easy removal or replacement. The space heater shall be rated 240 Volt single phase 50 Hz and size to maintain the motor internal temperature above dew point when the motor is idle.
- 3.22 The frame of each motor shall be provided with separate and distinct grounding pads complete with tapped hole, GI bolts & washer. The grounding connection shall be suitable for accommodation of ground conductor 50 X 6 or 25X 3 mm GI flat.
- 3.23 Motor shall have drain plug so located that they will drain the water, resulting from the condensation or other cause from all pockets of the motor casing.
- 3.24 Motor shall be provided with eye bolts or other adequate provision of lifting.
- 3.25 The motor frame shall be designed to permit easy access for drilling holes through motor feet or mounting flange for installation of dowels pin after final alignment of the motor and driven equipment
- 3.26 The rating plate of the motor should be containing clearly output in KW, stator voltage, stator connection, stator current, frequency, RPM, at full load temperature rise, type of motor name & year of manufacturing, name of manufacture, numbers of pole, slip, and weight of the motor etc.
- 3.27 Motor including fan shall be painted with corrosion proof paint

4.0 Motor control centre

415V Motor Control Centre The sheet steel cubicle will be made of 2mm CRCA sheet, dust and vermin proof, Indoor, single front, floor mounting fixed type, compartmentalized having common bus bar chamber in front and individual cable alley at the rear side of the panel board. The bus bar will be 2" x ½" Aluminium for Phase, 1" x ½" Aluminium for Neutral and 50x10 mm. Aluminium for Earth throughout the length of the Panel Board. The Panel shall be painted with epoxy based powder coated finish both

3.1.1 Incoming Feeder :

- 1. 200A TP MCCB, 50KA with thermo-magnetic type Release for O/L & S/C protection & extended type door drive kit & spreader with 1NO + 1NC Aux. Switch & 1 No. Alarm Switch.
- 2. 200/5A Bar Primary type C.T., Class:1.0, 15KV (Tape Wound)
- 3. 0-200A AC Ammeter, 96 sq. mm. CI: 1.5, CT Sec: 5A, Auxiliary supply: 230V AC
- 4. 0-500V AC Digital Volt Meter, 96 sq. mm. CI: 1.0, CT Sec: 5A, Auxiliary supply: 230V AC
- 5. 16A, 3 position (RYB) with OFF Ammeter Selector Switch
- 6. 16A, 3 position (RY-YB-RB) with OFF Voltmeter Selector Switch
- 7. 3 phase 4 wire Digital Multifunction Meter CI: 1.0
- 8. 3 phase 4 wire Digital Frequency Meter, CI: 1.0
- 9. ON / OFF / TRIP Indication Lamp, LED type, 240V AC
- 10. R-Y-B Indication Lamp, LED type, 240V AC
- 11. 6A TPN MCB
- 12. 6A TP MCB
- 13. 6A DP MCB

4.1.2 Outgoing Feeder:

- 4 nos. outgoing MCCB of required capacity for type-II coordination
- 4 Nos. Star-Delta Starter (2 Working + 2 Stand by)
- 4 nos. 50/5A Bar Primary type C.T., Class: 1.0, 15VA (Tape Wound)
- 4 nos. 0-50A AC Ammeter, 96 sq. mm, CI: 1.5, CT Sec: 5A
- 4 nos. 16A, 3 Position (R-Y-B) with OFF Ammeter Selector Switch
- 4 nos. Electronic type Motor Protection Relay with ZCT for Over Current, Phase Loss, Phase Reversal, Locked Rotor, Ground Fault, 2 C/O output contact, Auxiliary Supply: 240V AC
- 4 nos. ON / OFF / Trip indicating Lamp (LED Type), 240V AC
- 4 nos. 440V, 3 phase, 50Hz, required capacity KVAR Power Capacitor (Type MPP)
- 2 nos. required Amp TP Contactor (AC-3 Duty), 240V AC Coil for Capacitor
- 2 nos. ON / OFF Indicating Lamp (LED type), 240V AC for Capacitor
- 1 no. 6A DP MCB
- 2 Nos. DOL Starter for Chlorinator & Dewatering Pump with MPCB of required capacity
- 2 nos. Start (green) / Stop (red) Push Button, spring return actuator type with 1 NO / 1 NC contact
- 1. 32A TPN MCCB with 32A Fuse Link for yard lighting
- 1 no. 32 Amp SPDP MCCB for internal illumination

5.0 Cable,Laying, glanding & socketing

- 5.1 All LT Cable power cable shall be 1.1 KV grade stranded aluminium conductor PVC insulated armoured and the control cable shall be of copper conductor, PVC insulated, armoured/XLPE insulated armoured. All power cable and control cable shall be laid neatly in covered masonry trench, fabricated cable trays. While selecting the cable size suitable de-rating factor shall be considered. Tenderer shall furnish a cable lamination plan giving type, size and length of the cable proposed to be used.
- 5.2 All cables within buildings shall be laid neatly on wall or on trays as the case may be and shall be readily accessible for inspection or replacement. The LT control cable shall be of 660 volt grade, PVC 1.5/2.5 sq.mm multi stranded, multi-core screened cable of electrolytic copper conductor. Two spare cores shall have to left for future provision
- 5.3 The cables shall be 1.1 KV grade for LT 3.5/3 2/1 core XLPE AL conductor cable of suitable size and length as per requirement for electrical loading. The selection of the size of the cable will be considering voltage drop, 1.5-2 times of the normal current drawl by the load and de-rate factor of the cable when laid in

ground, cable spacing and temperature of the ambient. The cable will be, if necessary laid in underground trenches dimension for trench must be 450 mm width x 760 mm average depth, with brick protection on the top of the cable with 16 nos. bricks per meter and filling up the trenches with shifted soil, levelling up and restoring the surface to the satisfaction of the Engineer-in-Charge. Where cable is laid in masonry trench/metal trays, the cable trenches (when applicable) shall be filled up with sand or covered with chequered plate/RCC slab according to the direction of Engineer-in-Charge. Where necessary cables shall be supported on clamps of approved type and shall be properly protected with G.I. conduit or other protective covering as per direction of Engineer-in-Charge. Length of each type of cable should be assessed from G.A. drawing as well as physical verification from site.

- 5.4 For weather proof entry of armoured power & control cable through plain holes on equipment gland plate (Minimum threaded length 12 mm) threaded (ET) holes on equipment body / casing heavy duty brass machine finished & tinned, double compression (as per BS 6121) thickness of plating not less than 10 mm. All washers and hard wares will be on tin plated brass. Rubber components shall be of neoprene tested quality.
- 5.5 The socket shall be Dowell (Mumbai) make solder less crimping type tubular / sockets ring / fork ring / pin type tinned copper for power cable termination. Nylon straps, aluminium cable tags, plastic ferrules (Yellow with black engraving) coloured insulation sleeves and tapes and all other necessary termination accessories, hardware's and consumable will have to be provided
- 5.6 The socketing can be done by hydraulic punching machine and gland plate hole shall have to be made by drilling machine.

6.0 Sluice Valve

- 6.1 The sluice valves shall be manufactured from closed grain Gray cast iron conforming to IS: 14846 of the year 2000. Flange ends as per IS: 1538 or as per other standards to match with other flanges. The Body shall be of CI I.S. 210 FG 200. The delivery side sluice valves shall have by-pass arrangement but suction side sluice valve the by-pass arrangement not acceptable. The seat pressure shall be 10 kg/cm² and body pressure shall be 15 kg/cm². The valves should pass through hydrostatics test for duration of 10 minutes. Materials of construction test certificate & ultrasonic test report shall be provided during supplies. The sluice valves shall be non-rising/rising-spindle type with gearing arrangement for easy manual operation for suction side.

7.0 Butterfly Valve

- 7.1 The butterfly valves shall be CIDF, long wiper type, PN 1.0, conforming to IS 13095 of 1996. The seat pressure shall be 10 kg/cm² and body pressure shall be 15 kg/cm². The valve shall operate smoothly & steadily in both directions, free from flow-induced vibrations. It should provide tight shut off closures & shall be suitable for frequent operation as well as from throttled duty conditions. The valve disk should rotate 90 from full open to full close. The valve disk shall be solid streamlined slab design, and to have minimum headless. The seat ring shall be replaceable type and to be bolted on the body. The rubber seal on the disk must be of easy replaceable type with the facility to be replaced at site. The valve at delivery side shall have suitable and adequate capacity of with hand wheel and indicating pointer.

8.0 Non Return Valve

- 8.1 The non-return valves shall be manufactured from closed grain Gray cast iron conforming to IS5312 part I & BSEN 12334. Flange ends as per IS 1538 or as per other standards to match with other flanges. The body seat shall be of CI / DI. The non-return valves shall have by-pass arrangement with single door type with quick closing type as required for trip of the pumping unit. The seat pressure shall be 10 kg/cm² and body pressure shall be 15 kg/cm². The valves should pass through hydrostatics test for duration of 10 minutes. Materials of construction test certificates & ultrasonic test report shall be provided during supplies.

9.0 DISMANTLING JOINT / RUBBER EXPANSION JOINT

One dismantling joints of diameter equal to diameter of the delivery line of each individual pumping unit shall be incorporated for easy removal of the valves etc.

10.0 PUMP DELIVERY PIPING AND COMMON DELIVERY MANIFOLD

- 10.1 The pump individual delivery/Suction side piping shall be of suitable designed diameter made from M.S. of not less than 8 mm thick plates painted both inside and outside by anticorrosive epoxy paints. The pipes shall be of welded joints and shall consist of necessary companion flanges so as to connect the piping with the DL Valves/Special of the individual pump delivery branch. The pump individual delivery side piping shall be connected to the common delivery manifold as per the layout. Necessary gaskets of suitable thickness shall have to be provided to all flange Joints complete with all necessary nuts, bolts, washers etc. The length shall be ascertained from the layout and the exact dimensions of the valves/specials. The Bidder should also provide the necessary arrangements to encounter the horizontal back thrust and the details as per the pump manufacture's recommendation shall be clearly indicated in the layout drawing.

The common delivery manifold shall be of requisite diameter and shall be of MS of not less than 6 mm thick. The common manifold shall have blank flange on both sides/one sides with adequate stiffening. The length of the manifold must be extended at least one meter on both sides after the interconnections with the delivery pipe lines from the pumps at the two extreme ends to provide a blank flange.

In the delivery line one no. Temper proof air release valve (double throat) shall have to be placed. The pipe shall be laid underground and shall be painted with anticorrosive paints at the inside and outside shall be wrapped and coated with coporate of not less than 4mm thick so as to prevent the pipes from corrosion.

11.0 Temper proof Kinetic air release valve

The temper proof kinetic air release valve valves shall be manufactured from cast iron conforming to IS: 14845 of the year 2000. The Body shall be of C I I .S. 210 FG 200. The valves shall have small orifice with bronze ball and larger ball will be made of SS and seal ring will be natural rubber arrangement. The body pressure shall be 15 kg/cm². The valves should pass through hydrostatics test for duration of 30 minutes. Materials of construction test certificate & ultrasonic test report shall be provided during supplies. No leakage of water takes place at the time of running and have to be maintenance free longer life.

12.0 Mechanical level type Level Indicator

A mechanical level indicator shall have to be placed in the UGR that operator can easily measure the depth of the water level of the UGR and also OHR.

13.0 Lighting

13.1 Complete lighting of the Pump House & peripheral areas shall have to be provided by the tenderer. The scope of lighting shall include the following areas:-

a) Outside periphery of the Pump House. b) Inside lighting of the Pump House.

13.1.1 Lighting Distribution System

Lighting power shall be taken from the MCC. One lighting distribution board with sufficient no. of feeders shall be provided for the pump house. The LDBs shall be wall mounted type.

13.1.2 Lighting of Pump House Periphery

Lighting of the outside periphery of the pump house shall be controlled by means of SPN MCB of LDB at operating floor. For external and internal illumination have to be made as per required lux level. The fittings shall be mounted on the outside wall of the pump house and shall be supported by means of GI Pipes of suitable size. Supply of G.I. pipe supports and clamps shall be included in installation rate for fittings.

13.1.3 Lighting of Pump House

Lighting of the pump house shall be done in accordance with lux level specified for the area by only LED fixtures. There shall be two Nos. 16A, 5Pin switch socket outlet shall be provided in the pump house.

13.1.4 LDB for Pump House

The lighting distribution board shall be 2mm thick CRCA sheet steel enclosed wall mounted type with maximum operating height of 2000 mm. and minimum operating height 800 mm. Lighting distribution board for the pump house will be following devices.

- a) One No. 32A TPN MCB isolator as incomer.
- b) Two Nos. 16A SPN MCB for Plug, Periphery Lighting.
- c) Ten Nos. 6A SP MCB for pump house lighting & one spare.

The LDB will have cable entry from top and bottom for which detachable gland plate shall be provided.

13.2 Ventilation of Pump House interior Pedestal & Ceiling fans with following specification shall be supplied.

- a) No. of Pedestal fan of 600 mm. – 1 No.
- b) No. of 1200 mm. Sweep ceiling fan – 2 Nos.

13.2.1 Wiring of the lighting system will be done by means of single core stranded copper conductor wire in 20 mm. dia. PVC conduit. Sub main wiring from LDB to switch box will be done by means of 2.5 sq. mm. PVC insulated stranded copper wire. Point wiring from switch box to fittings will be done by means of single core 1.5 sq. mm. stranded copper wires in 20 mm. dia. PVC conduit. Approximate point wiring length will be around 9 meter per point.

14.0 Safety Equipment

14.1 Tenderer shall include all standard safety devices and accessories pump house as per IE Rules and to the satisfaction of the Electrical Inspector including but not limited to the following items :

14.2 Safety devices and accessories for the Pump House :

- a) Four nos. 5 Kg. Dry powder type wall mounted fire extinguishers, Gas cartridge conforming to IS:2171.
- b) 3 Mtr. of rubber mat of minimum width of 600 mm. and thickness of 8 mm.
- b) Fire bucket 2(two) Nos. with stands.
- c) One first aid box complete with all accessories
- d) Shock treatment chart one each in English and Bengali.
- e) One No. caution board per panel.

15.0 Mono rail with chain pulley block

16.1 1.5 MT capacity of mono rail comprising chain pulley, gear trolley, lifting chain for lifting article from the operating platform shall be provided in the pump house. It shall be used for erection and maintenance of pump sets, valves, and other equipment. Successful tenderer shall furnish assignment drawing for fixing monorail crane as required.

16.0 Earthing

16.1 The installation shall generally be carried out in accordance with the Indian Electricity Rules 1956, as amended from time to time and in conformity with the requirement included in the Indian Standard Code of Practice for Earthing IS: 3043-1987.

16.2 All terminal connections for earthing shall be carried out by soldering earth strips / wires with suitable lugs.

16.3 Pipe electrodes for earthing shall be made of galvanized steel of class 'B' Medium quality and shall not be smaller than 50 mm. (2"). The length of the pipe electrode shall not be less than 3 Mtr. (10'). Proper sizes (50 × 6) of galvanized flat shall be connected securely on the properly cleaned surface of top end of pipe electrode suitably.

16.4 A suitable hole shall be excavated about 0.60 Mtr. (2') deep except where rock is encountered. The pipe electrode shall be driven to an average depth of 3.68 Mtr. (12') below ground surface or below as directed.

16.5 For each earthing station, a masonry inspection pit of size 450 mm. × 450 mm. with suitable sized CI cover, wire mesh, funnel etc shall be constructed / provided.

16.6 The excavated area around the electrode and the earth pit shall be backfilled and consolidated and restored properly. The site shall be left clean and tidy.

16.7 The distance between the pipe electrodes where multiple earthing is employed shall be at least not less than the length of electrodes and no two pipe electrodes shall be connected together in parallel.

16.8 All electrical equipment shall be properly earthed with two number galvanized steel flat of adequate size and other power distribution boards, branch distribution boards shall be earthed with adequate size of GI conductor.

16.9 Whatever be the method of the earthing, the value of resistance to earth shall not exceed 1(one) Ohm.

16.10 Suitable lightning protection of the pump house building will be done by 50 × 6 GI flat and connected to two different earth stations meant solely for lightning protection over the OHR.

17.0 Painting

- 17.1 The painting works, unless otherwise stated elsewhere, shall be applicable for the following items as follows:
Various equipments inclusive of electric motors, pumps, panels, control desks and accessories. All pipe works including supports, hangers.
- 17.2 All metal surfaces, after preparation of surface, shall be painted with two primer coats and two finish coats.
- 17.3 All surfaces shall be cleaned of loose substances and foreign materials, such as dirt, rust, scale, oil, grease, welding fluxes etc in order that the primary coat is rigidly anchored to the virgin metal surfaces. The prime coat shall be applied as soon as possible after the surface preparation is completed.
- 17.4 The procedure for surface preparation shall be solvent cleaning, hand tool cleaning, power tool cleaning, flame cleaning, blast cleaning, pickling or combination thereof as applicable.
- 17.5 The primer coating shall be Red oxide zinc chromate. Finish paint shall generally be applied by brushing except that spraying may be used for finish coat only where brushing may damage the prime coat. Proper brushes shall be selected for specific work pieces. The brush marks shall not be left in the applied paint as far as practicable.
- 17.6 Each coat of paint shall be allowed to dry sufficiently before application of the next coat to avoid damage such as lifting or loss of adhesion.

18 Submersible pumping units with its accessories

3 no. submersible pumping units with its column pipe of required capacity other valves such as NRV , butter-fly valves and electrical control panel shall have to be supplied by the bidder with testing commissioning etc.

19.0 Erection, Commissioning and Maintenance:

19.1 Erection:

- a) All equipment and materials covered by this specification shall be erected in accordance with good engineering practice.
- b) Erection materials and all consumables required for proper erection shall be supplied by the contractor.
- c) Civil work such as grouting of foundation bolts, valve and pipe supports has be to carried out by the successful tenderer.

19.2 Commissioning:

- a) On completion of erection, the system shall be given a pre-commissioning check and then trial run of all units of each zone to ascertain mechanical and electrical stability. b) If the trial run of each zone establishes electrical and mechanical stability, and complete the specified hours of operation, it will be deemed that the system has been commissioned successfully.

19.3 Operation and Maintenance:

- a) Operation and maintenance period of each zone will commence from the date of successful commissioning of the same.
- b) The contractor shall be responsible for operating and maintaining the project for a period of one year engaging his own personnel.
- c) If any repair or rectification is to be carried out during the maintenance period and within the guarantee period on any of the equipment installed, the same shall be done by the contractor without any cost implication.

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ANNEXURE - I

LIST OF TOOLS OF ELECTRICAL EQUIPMENT Supplied by the bidder

Double Ended Spanner (6 mm to 25 mm)	:	3 Sets
Screw Driver (6 mm to 25 mm)	:	3 Sets
Sliding Pipe Wrench		
150 mm	:	3 Nos.
250 mm	:	3 Nos.
300 mm	:	3 Nos.
350 mm	:	3 Nos.

Hand Drill (6 mm to 19 mm)		:	3 Sets
H.S. Drills (1.5 mm to 10 mm)		:	3 Nos.
Round Rough File	350 mm	:	3 Nos.
Flat Rough File	350 mm	:	3 Nos.
Steel Tape	2 Meter	:	3 Nos.
Hacksaw	300 mm	:	3 Nos.
Hammer with handle	1 kg	:	3 Nos.
	2.5 kg	:	3 Nos.
Cold Chisel	200 mm x 20 mm	:	3 Nos.
Centre Punch		:	3 Nos.
Engineering Square	200 mm	:	3 Nos.
Spirit Level		:	3 Nos.

Electrical Equipments

Multi Range Tong Tester		:	1 No.
Avo- Meter.		:	1 No.
500V Megger		:	1 No.
Multi Meter		:	1 No.

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**ANNEXURE –II
BID DRAWINGS**

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ANNEXURE - III

List of Vendors

SI No	Equipment / Instrument	Make
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(1)	(2)	(3)
1.	Pump	Kirlosker/Mather & Platt/WPIL.
2.	M.V. Motor	Kirlosker/Matharon/ABB/Crompton
3.	Control Desk/L.T. Board	Siemens/Sellwin/Positronics/RNR
4.	ACB/MCCB	L&T/Siemens/GE/ABB
5.	Switches	L&T/GE/Siemens
6.	Relays	Alsthom (Areva)/ABB /L&T
7.	Contactors	L&T/Siemens/GE
8.	Meters	AE/IMP/Enercon
9.	Cable:	
9.1	L.T. Cable/Signal Cable	Nicco / Universal / Finolex / Gloster
9.2	Control Cable	KDK / Finolex / L&T/ Gloster
10.	Control Fuses	GE/Siemens
11.	Current Transformer	Kappa/JAWS
12.	Capacitor	KAPASELS/ Unistar / Crompton /L& T /G E
13.	Valves:	
13.1	Butterfly Valves	Fluidtech / Sigmaflow / IVC/ Kirlosker
13.2	Pump Discharge Valves	Mather & Platt/Audco /Kirloskar/Fouress
13.3	Sluice Valves	Fluidtech / Sigmaflow / IVC/ Kirlosker
13.4	M.S. Dismantling Joints	Fluidtech / Sigmaflow / IVC/ Kirlosker
14.	Pressure Gauges	Bell/Taylor's/ H. Guru/Manometer India
15.	Fire Extinguishers	Surex / Minimax /Cease Fire
16.	Submersible Pump	KSB/KBL/Texmo/ MBH
17.	Lighting system	Philips/Crompton/Bajaj/K-Lite
18.	Wire	Finolex / KDK
19.	Switches	Anchor / Havells
20.	Temper proof air release valve	KB/IVCL
21.	Chlorine dosing pump	Matrix/ Positive
22.	Dewatering pump	BE/ KBL/Joythi

Chairperson ,

SCHEDULE OF WORK

Name of work - Surveying, Design, execution and commissioning for Augmentation and Rejuvenisation work of Rampurhat Water Supply Scheme including Sinking of 4 (Four) No. Deep Tube Wells for extraction of minimum 8000 GPH Yield per DTW water with installation of 4 No. submersible pump motor units, 4 No. HSC Centrifugal Pumps , construction of pump house ,switch room, construction of pumping station with illumination works and with valves units as to be required & construction of CWR of 400 M³ with all civil & elctro-mechanical works within Rampurhat Municipal area (including 3 months trial run and necessary training of maintenance staff & thereafter (subsequently) 1 (one) year operation and maintenance of the Plant) on Turnkey Basis.

Sl.	Item	Qty	Unit	Rate	Amount
1	Sinking of 4 nos. Deep Tube Well of safe yield 8000 GPH per DTW up to the required depth as per electro logging report (to be submitted before installation of DTW) with construction of Four No. DTW protecting Room of size 3.0 m x 3.0 m size as per technical specification and direction of EIC.	1 item	Each		
2.	Construction of Clear Water Reservoir of capacity 400 cubic meter including geo-technical investigation of soil, design drawing complete as per direction with necessary pipe connections, duck foot bend, puddle collar, sluice valves butterfly valves etc as required around the head work site, lightening arrestor arrangement, 1.5 MT crane and also leveling the site by earth filling as necessary with construction of one number chlorine dosing metering pumping units with room 3.0 m x 3.0 m size and with all necessary accessories supplying and fitting fixing required in this regards complete as per technical specification and direction of EIC.	1 item	Each		
3.	Construction of Three number 5.4 m X 3.6 m size Switch Room for accommodation electrical control panel with accommodation operating staff staying with sanitary facilities and receiving of WDSCL power supply source as per technical specification and direction of EIC.	1 item	Each		
4.	Supply delivery, installation of 4 nos. submersible pumping units with 6 H.P to 10 H.P as per requirement and 4 No HSC Centrifugal Pump motor sets , Valves with actuator etc. as to be required with necessary rising main 80 mm G.I from Tube Wells to CWR & DI Pipes K9 300 mm dia. from CWR to OHR with it's all other accessories and interconnected with the rising main after providing individual valves as per technical specification and direction of EIC.	1 item	Each		
5.	Supply delivery, installation and testing commissioning of a MCC Control panel in each Switch Room for operating the 4 nos. submersibles pumping units and operating CWR attached Pump House 4 No. HSC centrifugal Pumps internal & external illumination with cabling and earthing arrangement per Switch Room as per technical specification and direction of EIC.	1 item	Each		

6.	Supply delivery & erection of illumination fittings fixture, aviation lamp fittings, exhaust fan. Ceiling fan, lightening arrestor with its wiring and earthing arrangement in pumping station complete in all respect considering bid documents as per approval from competent authority and direction of EIC.	1 item	Each		
7.	Testing, Commissioning & 3 months Trial run of the whole installation as per I.E. Rules with Govt. Electrical inspector's fees as complete in all respect and as per Bid document & as per direction of EIC	1 Item	Each		
8.	Operation and maintenance of the plant for 1 (one) year. The work includes supplying adequate number of operator personnel and skilled Labor with a provision for necessary training to the personnel appointed by the ULB including supplying all sundry materials, and replacement of all types of damaged component etc. as per Bid document and complete in all respect and as per Bid document and as per direction of EIC. N.B:- This item will be executed after three (3) months trial run.	1 Item	Each		

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Rampurhat Municipality**