RFQ No: KGEPL/PL/001 **August 20, 2024**

Open Press Ad in Newspapers
Also to be hosted on Kribhco's website

Sub: Construction of intake well, pump house and laying of approx. 5 Kms Water Pipeline and Ancillary Structures in Sarvepalli reservoir for KGEPL Bio-Ethanol Project at Nellore

KRIBHCO Green Energy Private Limited (KGEPL or Owner), a 100% SPV owned by Krishak Bharati Cooperative Limited (KRIBHCO) is setting up Grain Based Bio-Ethanol Project of 250 KLPD for Ethanol Blending Programme (EBP) of Government of India at Sarvepalli Bit-II (Village), Venkatachalam Mandal, SPSR Nellore, Andhra Pradesh. Water for the Bio-Ethanol project has to be pumped from Sarvepalli reservoir which is around 5 Kms from the project site.

KGEPL hereby invites best competitive offers for selection of contractor for construction of water intake arrangement and pipeline inter-alia consisting of:

(a) RCC Intake Well (6.0 meter inside diameter) with pump house (8 meter inside diameter), lead channel, approach bridge & other ancillary structures inside Sarvepalli reservoir

(b) Supply, installation and commissioning of three number vertical turbine pumps along-with respective motors

(c) Transformers, switchgears, MCC, instrumentation etc.

(d) Laying of 300 mm diameter (NB) Ductile Iron (DI) pipe line for approximately 5 Km long along the road/embankment

Detailed Scope of Work is given in Annexure III and Annexure IV of the RFQ.

I Contents of this RFQ

Following Annexure are integral part of this Invitation to Bid.

Annexure – I	Instructions & Bidding procedure
Annexure – II	Compliance and Bid Form summary
Annexure - III	Scope of Work and Brief Technical Description for Intake Well
Annexure – IV	Scope of Work and Brief Technical Description for Water Pipeline
Annexure - V	General and Commercial Terms & Conditions
Annexure – VI	Price Schedule
Annexure – VII	Intake well Location- Satellite Image
Annexure – VIII	Intake GA
Annexure – IX	Pipe Alignment Route
Annexure – X	List of Deviations
Annexure – XI	List of additional spares required for VT Pump

II Bid Submission Deadline

The Bid submission deadline is 17:00 hrs. on 15th September 2024. Any bid received after this deadline will be summarily rejected.

III EMD Deposit

The Bidders have to submit an EMD of Rs 5.0 lacs through a Demand Draft in favour of Kribhco Green Energy Private Limited.

IV Prequalification Criteria

Bids of only those bidders who meet the Prequalification Criteria given in Annexure 1 of the RFQ will be considered. Bidders will have to submit documentary evidence for this.

V Bid submission mode

This is two-stage bidding process consisting of Stage 1 (Pre-qualification and Unpriced Techno Commercial bid) and Stage 2 (Priced Commercial bid) as given in more detail in Annexure 1. Initially only Stage 1 bids will be opened. Stage 2 bids of only those bidders will be opened who fulfil the Prequalification Criteria and who have not taken any techno commercial deviations to the RFQ. Stage 1 and Stage 2 bids are to be submitted under two attachment on or before the bid submission deadline to below email id-

Mr. R. Venkataramanan
Chief Financial Officer
R Venkat rvenkat@kribhco.net

VI General Provisions

a) Owner reserves the right to amend or cancel the RFQ any time before the bid submission date.

b) Owner reserves the right to reject any or all or the lowest bid (in whole or as a part) without assigning any reason whatsoever.

c) Owner reserves the right to split the work amongst more than one bidder.

d) Bidders are required to go through all the documents attached with RFQ thoroughly to have full understanding of the scope of work and terms and conditions.

e) Time is of essence. The full scope of work has to be completed within a period of three months from the date of award.

f) Please acknowledge receipt of RFQ documents and confirm by return mail that you are submitting the bid. In case you are not submitting the bid, please do send a regret letter.

Thanking you,
Yours faithfully,

R. Venkataramanan

ANNEXURE-I

INSTRUCTIONS & BIDDING PROCEDURE

1 Introduction & Intent of RFQ

KRIBHCO Green Energy Private Limited (KGEPL or Owner), a 100% SPV owned by Krishak Bharati Cooperative Limited (KRIBHCO) is setting up Grain Based Bio-Ethanol Project of 250 KLPD for Ethanol Blending Programme (EBP) of Government of India at SarvepalliBit-II (Village), Venkatachalam Mandal, SPSR Nellore, Andhra Pradesh.

KGEPL intends to draw water from Sarvapalli reservoir, Sarvapalli near Nellore for its industrial and domestic demand. The daily ultimate demand is approximately 5.0 MLD. The water will be drawn through an intake arrangement inside the reservoir at Sarvapalli. The intake site shall have provision of intake well, pump house, substation and allied infrastructure. The intake site is well approached by the PWD/Canal Road. The raw water shall be transmitted to the plant site through a 300 mm diameter (NB) DI pipe line for approximately 5 Km long. The transmission line travels along the road/embankment. The water will be delivered into a reservoir at the plant site.

2 Site location and weather

The bio ethanol plant is located near Sarvapalli village, Nellore. The plant site is 12 Km from Nellore city and is accessible through SH 361. The nearest railway station is Nellore which is 12 Km and the nearest airport is Chennai 175 Km. The place is well connectedby trains & road.

The max temperature of the area is 45°C and the minimum temperature is 23°C. The average annual rain fall in the area is 800mm.

3 Site Conditions

The bidder should visit the site and satisfy himself about the field conditions, the nature & extent of work involved and for better understanding about the project. He should obtain all relevant information that might be required for preparing the offer. Ignorance about the field condition shall not be entertained subsequently. The site visits shall be at the bidders own cost. No adjustments to price in the bid shall be accepted by Owner on the grounds of insufficient knowledge or unexpected site conditions.

The bidder, before submitting its bid, shall acquaint itself and shall be deemed to have undertaken a thorough study of the proposed Work, the job site(s) involved, equipment availability, transport and communications facilities, and all other factors and facilities necessary or relevant for the preparation of the bid for the performanceof the Work including supply of materials and/or labor (wherever applicable). No increase in price or other changes to its bid shall be accepted by the Owner due to the bidder's lack of information about the Work, site, availability of facilities, etc.

4 Prequalification Criteria

Bids of only those bidders, who meet the following pre-qualification criteria shall be considered by the Owner:

a) The bidder should have an average annual turnover of Rs 5.0 Crores during last three years. The bidder shall submit copies of Audited Balance Sheet and Profit and Loss Statement for last three years
b) The bidder should have executed at least two works of similar nature in last five years. Similar nature means Intake well construction and/or other construction involving cofferdam inside water bodies. Experience certificate of similar project (Not below the rank of EE/GM)
c) The bidder should possess an electrical license or should have an associate/sub vendor/sub-contractor possessing required electrical license
d) The bidder should submit all the requisite documents in support of meeting the above qualifying criteria.

5 EMD Deposit

The bidders have to submit an EMD of Rs 5.0 lakhs through RTGS in favor of Kribhco Green Energy Pvt Ltd. If a bidder is unable to deposit the EMD, its bidwill be rejected. EMD of unsuccessful bidder will be returned.

Bank details of KGEPL are as follows:

Name of the company : KRIBHCO GREEN ENERGY PRIVATE LIMITED
CURRENT ACCOUNT NO: 6420002100001590
Bank Name : Punjab National Bank
Branch : Large Corporate Branch, Noida
IFSC code : PUNB0642000

6 Two Stage Bidding

This is two-stage bidding process consisting of Stage 1 (Prequalification and Unpriced Techno-Commercial bid) and Stage 2 (Priced Commercial bid). Initially Stage 1 bids will be opened. Stage 2 bids of only those bidders will be opened for which the Owner is satisfied.

I Stage I: Prequalification and Unpriced Techno Commercial Bid

Stage I Bid consisting of the following has to be emailed

a) EMD Deposit
b) Audited Balance Sheet and Profit and Loss Statement for last three years
c) Experience certificate of at least two similar work performed in last five years. This certificate has to be issued by the client (Not below the rank of EE/GM)
d) A letter from Bidder confirming that they accept all the terms and conditions of the RFQ unconditionally. In case it becomes necessary for bidders to take any deviations, they should clearly mention all deviations in the format given in Annexure X. Please note that Owner reserves the right to reject any Bids which have deviations to this RFQ.
e) Complete set of bid document duly signed & stamped by the bidder as prescribed in different clauses of this RFQ.
f) List of plant & equipment proposed to be deployed in the work
g) Information on Electrical License/Collaboration
h) Activity Chart /Work schedule (as proposed by bidder).
i) The list of the technical experts and experience in the relevant field.
j) Undertaking by Bidder to ensure meeting of all the requirements of Government of

Andhra Pradesh.

k) Company profile, list of similar jobs undertaken by the bidder with details and proofof relevant experience along with the copies of work orders.

l) Any other document/information required in terms of this enquiry or the bidder wishes to submit for strengthening its bid

m) Banker's name, Certificate of incorporation, PAN No and GST No.

n) The parties should furnish a declaration confirming that none of their close/distant relative(s) is / are working in KRIBHCO and in case any such persons are working, the details of them should be clearly indicated in the bid.

Please note that, each page of above documents has to besigned by authorized signatory of bidder along with stamp on all pages

II Stage II: Priced Commercial Bid

Stage II bid consisting of the following has to be emailed as a password protected pdf file:

a) Price bid with rates written in figures and words as per Price Bid Format attached as Annexure-VI.

Note: No technical or commercial terms and conditions to be mentioned in the price bid otherwise the bid can be rejected.

7 Mode of submission of bids

a) Stage I Bid (Prequalification and unpriced techno commercial): Please sign and stamp on all pages as given in Para 6(I) above and mail them.

b) Stage II Bid (Priced commercial: Please fill the prices and sign and stamp on all pages as given in Para 6(II) above and email it as a password protected pdf file. Owner will ask for the password at appropriate time.

c) Both Stage-I bid as well as stage-II bid should be submitted on or before the bid closing deadline to:
Mr. R. Venkataramanan
Email ID: rvenkat@kribhco.net

d) First stage-1 bid will be opened for all Bidders.

e) Stage 2 (Priced Commercial bid) of only those bidders will be opened who comply with the RFQ conditions (including but not limited to submission of EMD, meeting pre-qualification criteria, acceptance of project completion period, full compliance to scope of work, compliance to payment terms, credentials of the bidder etc.).

f) Any bids received after the closing of the bid submission deadline given in thecovering letter will be summarily rejected.

8 Validity of Bid

The Bid submitted by the bidders shall remain valid for acceptance for a period of 90

(Ninety) days from the due date of bid submission. The bidder shall not be entitled during the said period to revoke and/or to cancel and/or modify his bid.

9 Clarifications by the Bidders or the Owner

To help bidders to understand the RFQ, the bidders can seek any clarification from the Owner by sending email to rvenkat@kribhco.net. These clarifications can be sought up to two days before the bid submission deadline.

To assist in the examination, evaluation and comparison of bids, the OWNER may, at its discretion, ask the bidder for a clarification of his bid. All responses to a request for clarification shall be in writing, and no change in the price or substance of the bid shall be permitted unless specifically sought by OWNER.

10 Bid Evaluation Criteria

a) Owner will evaluate compliance to the RFQ conditions (including but not limited to submission of EMD, meeting pre-qualification criteria, acceptance of project completion period, full compliance to scope of work, compliance to payment terms etc.)
b) Owner reserves the right to amend this RFQ or to entirely cancel it.
c) Owner reserves the right to not consider any bids which Owner feels in its opinion are non-compliant to this RFQ.
d) Owner reserves the right to do appropriate financial loading if the bid is non- compliant.
e) Generally, the work will be awarded to the bidder who is meeting all techno commercial criteria and has quoted the lowest rates. However, the Owner reserves the right to award the work to the bidder other than the lowest bidder or to any other bidder who Owner may deem fit.
f) Owner reserves the right to split the work amongst one or more bidders.
g) Owner reserves the right to cancel this RFQ without assigning any reason.

11 Notification of Award

Notification for Award of Contract in the form of LOI will be made by letter to the selected bidder by KRIBHCO Green Energy Private Limited. The CONTRACTOR on receipt of Letter of Intent shall give his acceptance of LOI/Work Order immediately within 07 days by return letter or email followed by original copy through courier/post.

12 Work Completion Period

The time is of essence of the Contract. The entire work as given in Scope of Work shall be completed within a period of **three months** from the date of issuance of Letter of Intent (LOI). The Bidder shall submit an Activity chart and work schedule for the complete work including major mile stones with details of Activity time and total completion time.

13 Basis of Prices

a) The bidder shall set its bid in firm figures and words without qualifications or variations or additions in terms of the enquiry document.

b) The price of the work shall be firm through-out the completion period or forextended period
c) The Contractor shall bear all costs associated with the execution of the work.
d) The price shall be inclusive of GST as applicable.
e) The bidder shall quote offer as per the price schedule attached. The offer shall be inclusive of GST and all other taxes, duties and levies applicable in the area.

f) The offer shall be inclusive of all costs associated with the assignment including cost of all materials to be utilized in the work, cost of T&P, labor, consumables, infrastructure backup, overheads etc. Further it shall also include all other expenses incidental thereto for successful accomplishment of the assignment in conformity with the specification.
g) Bidder shall ensure that the rates quoted are workable and if necessary, bidder shall furnish a break-up of the quoted rates on the request of the Owner.
h) If any discrepancy is found between the rate(s) total amount given in words and figures or the total amount for the entire Work given in the bid, the following procedure shall be followed:
   - When there is a difference between the rate given in figure and word, the rate which corresponds to the total amount given in the bid shall be taken as correct.
   - When the rate given in the bid in figure and word tallies but the total amount is incorrect, the rate given in the bid shall be taken as correct.
   - In case of any totaling error, the corrected total value shall be adopted.

14 General Provisions

a) The bidder shall not be permitted to assign or subcontract the Work or any part of the awarded Work.
b) Canvassing in any manner in connection with this enquiry and/or bidding is strictly prohibited and the bids submitted by the bidders who resort to canvassing shall be liable to rejection.
c) In case the bid contains qualifying expressions e.g. subject to minimum orsubject to prior sale or any other qualifying expressions incorporated in the terms and conditions in the bid at variance with the terms and conditions incorporated in the RFQ such terms and conditions shall not be acceptable to the Owner, and the bid shall be liable to be rejected.
d) All corrections and alterations in the bid should be signed in full by the bidder/authorized signatory with date. No over writing shall be permitted.
e) The information given in this RFQ and the plans and drawings forming part thereof are merely intended as general information without undertaking on the part of the Owner as to their accuracy and without obligations relative thereto upon the Owner. The bidders shall conduct their own survey and investigation prior to submitting its bid.
f) The bid which does not fulfill any of the above conditions or incomplete in any respect are liable to be rejected. Conditional offer shall be summarily rejected.
g) At any time prior to the deadline for submission of bids, the owner/CONTRACTOR for any reason, whether at its own initiative or in response to a clarification requested by a prospective bidder, may modify the bidding documents by amendment thereto. The amendment will be notified in writing or

E-mail/ letter to all prospective bidders who have received the bidding documents and will be binding on them.

h) The Owner may, at their discretion, extend the deadline for the submission of bids by amending the bidding documents in accordance with Articles e) to g) above, in which case all rights and obligations of the Owners and bidders previously subject to the deadline will thereafter be subject to the deadline as extended

15 Performance Bank Guarantee

Successful bidder has to submit a Performance Bank Guarantee of 10% to the total contract prices (including taxes). This will have to be submitted with ten days of issuance of the LOI by the Owner. The Performance Bank Guarantee has to be given in the format acceptable to the Owner from any nationalized bank. Owner shall share the format shortly. Owner shall return the Performance Bank Guarantee after the end of defect liability period of one year from the date of successful completion of the project. In case the Contractor is not able to provide the Performance Bank Guarantee, it can also give a demand draft of equal amount.

ANNEXURE - II

COMPLIANCE AND BID FORM SUMMARY

RFQ No. _____

Sub: Construction of water intake arrangement inside the reservoir at Sarvepalli having provision of intake well, pump house, substation and allied infrastructure. And also laying of 300 mm diameter (NB) DI pipe line for approximately 5.0 Km long along the road/embankment to deliver the water from reservoir to project site as per the detailed Scope of Work of the subject RFQ. With reference to your subject Request for Quotation (RFQ), we are pleased to submit our bid as per details given below:

We hereby confirm our offer as follows:

a)	Submitted EMD of Rs 5.0 lakhs	Yes/ No
b)	Submitted document for Prequalification	Yes/ No
c)	Acceptance of full Scope of Work	Accepted/ Not Accepted
d)	Submission of all documents given in Para 6(I) of Instructions to Bidders	Yes/ No
e)	Price Bid /Offer Price	Submitted/Not Submitted
f)	Firm Prices	Accepted/ Not Accepted
g)	Acceptance of terms of payment	Accepted/ Not Accepted
h)	Guaranteed completion date of full scope of work	___months from date of issuance of LOI.
i)	Acceptance of Liquidated Damages in case of delay beyond guaranteed completion date	Yes / No
j)	Completion Schedule/Bar Chart	Submitted/Not Submitted
k)	BID Validity for carrying out the study	____days
l)	Unconditional acceptance of RFQ	Yes/ No
m)	In case of any deviation from RFQ Clause, Statement of deviation attached	Yes/No

We undertake that in the event of acceptance of our bid within the validity period as quoted, this bid as modified by our written changes/ amendments till date of notification of award shall constitute a binding contract between us until a formal contract is executed.
We understand that non submission of deviation statement shall mean acceptance of all terms and conditions of RFQ. We also understand that you are not bound to accept the lowest or any bid that you may receive.

Signature:
Name of Authorized Person:
Designation:

ANNEXURE-III

SCOPE OF WORK AND BRIEF TECHNICAL DESCRIPTION: INTAKE WELL

1 Broad Scope of Work for water intake arrangement

A. Civil Works

a) Intake Well construction including preparation of cofferdam
b) Pump House with all doors, windows & rolling Shutter
c) Construction of lead channel with boulder packing into the deep point (100m)
d) Approach Bridge to the embankment road
e) All ancillaries' items to complete the work in all respect

B. Mechanical

a) VT Pumps & Motor with complete assembly (Three 3 nos.)
b) Monorail Hoist 3MT
c) Bell mouth, column pipe complete assembly
d) Pipe, valves, manifold & Specials
e) Inlet Gates & Screens
f) Sludge Pump & delivery assembly
g) All ancillaries' items to complete the work in all respect

C. Electrical

a) 3 Phase 11KV HT transmission on DP structure (approx. 200 mts)
b) Pole mounted transformer including all switch gears (63KVA)
c) Electrical & MCC panel
d) Earthing
e) Cabling
f) Internal & External Electrification
g) All related civil works
h) All ancillaries' items to complete the work in all respect

D. Instrumentation

a) Full Bore Electromagnetic Flow Meter
b) Pressure Gauge
c) Ultrasonic Level Indicator

E. Miscellaneous Work

a) Approach Road
b) Retaining Wall
c) Stone Pitching & embankment protection
d) Site Development works
e) Glow sign board

2 Scope & Technical Specification

The intent of this Section is to specify the work items to be covered on **'Lump-Sum Turn Key'** basis in conformity with the technical specifications as enumerated in thesubsequent clauses for the work **"CONSTRUCTION OF INTAKE WELL, PUMP HOUSE, LEAD CHANNEL, APPROACH BRIDGE AND ANCILLARY STRUCTURES IN SERVAPALLI**

RESERVOIR FOR WATER SUPPLY TO KGEPL BIO-ETHANOL PLANT AT NELLORE"

Location	:	Sarvapalli Reservoir
Coordinates	:	14°17'56.89"N, 80° 0'11.48"E
Village	:	Sarvapalli
Town	:	Nellore
State	:	Andhra Pradesh
Connected to	:	SH 361
Railway Station	:	Nellore

3 CIVIL WORKS - Brief Scope

Supply, Fabrication, Construction, Erection, Testing, Trial-Run, and Commissioning of the work: -

RCC Intake Well (6.0 mtr. inside dia) with pump house, lead channel, approach bridge & other ancillary structures inside Sarvepalli reservoir.

RCC INTAKE WELL AND PUMP HOUSE:

a) The work shall be executed as per the detail construction drawing to be provided by KRIBHCO. The GA drawing is provided herewith for reference. Item not specifically mentioned in the drawing or document but required for completeness of the structure and for satisfactory functioning of the unit shall deemed to be included in the scope.
b) Preparation of cofferdam to prevent ingress of water into the construction area. Dewatering the construction area as per requirement to keep it dry to facilitate construction activity.
c) Conduct confirmatory boring at the intake location to ascertain the soil strata and the founding RL as per the drawing.
d) Excavation to required levels & construction of RCC intake well of inner Dia 6.00m. The well shall have provision for water inlet port with bar screen and gate.
e) There shall be a pump house having inner dimension of 8.0m dia. over the intake well for installation of three nos. (two working + one standby) vertical turbine pump and Electrical & MCC panel. Pump house shall be a RCC framed structure building with filler wall, having 5.5 m clear ceiling height to accommodate necessary arrangements for running of electrically operated mono rail hoist. The pump house shall be provided with rolling shutter, doors, and windows as per drawing.
f) Structural arrangement for installation of mono rail hoist of 3-ton capacity with I section & necessary arrangements in complete shape shall be provided for lifting of pump, motors and pipes etc.
g) A Lead channel of approx. 65m long is to be provided with hard granite boulder packing of 300mm thick as per the GA drawing.
h) There shall be suitable protection works to the embankment and structure based on actual field requirement.

i) A pillar structure RCC approach bridge of 3.25m wide to connect the pump house to the embankment road. The approx. length of the bridge is 50 m from the toe. The bridge shall have MSEP hand railing.
j) All other items explicitly not mention but required for achieving the full functionality is covered in the scope unless otherwise mentioned.

4 Applicable Codes

a) Cement**:** IS: 269/1989 & 455/1989
b) Steel: I.S: 432/1982 (Part-1&2) and 1786/1985
c) Vibrator: I.S: 7246/1974
d) Aggregate: I.S: 383/1970 - IS: 515/1959
e) Sand/ fine aggregate: IS: 2116/1980
f) Binding Wire: IS: 280/1978
g) Rain Water Pipe: IS: 2527/1984
h) Construction Joint: IS: 3414/1968
i) Concrete shall be with conformity to IS: 456/2000.
j) Foundation shall be with conformity to IS: 1080/1995.
k) Stone masonry (R.R.) shall be with conformity to IS: 1597/1992 (Part-I)
l) Brick masonry shall be with conformity to IS: 2212/1991.
m) Cement plastering shall be with conformity to IS: 1661/1972
n) Mortar shall be with conformity to IS: 2250/1981.
o) White washing and color washing shall be with conformity to IS: 6278/1971.
p) Cement Concrete Flooring shall be with conformity to IS: 2571/1970.
q) Painting to all surface shall be with conformity to IS: 2395/1994 (Part - I & II).

The RCC Intake Well with pump house has been designed based on the latest concepts & principles enumerated in the standard text books conforming to latest **BIS Code.** The capacity of intake well is **5.0 million Liters per Day (MLD)** for an operating period of **24 hrs.**

General:

a) Cement shall not be less than O.P.C.-43 grade of reputed manufactures confirming to relevant IS.
b) Reinforcement to confirm to Fe-500 and IS specification.
c) The steel/cement & other building materials shall be tested from each lot by client/consultant at the cost of contractor to ensure proper quality as per IS specification.
d) All work for intake well has to be executed as per drawing, specification and relevant IS code.
e) Testing of water tightness shall be conducted on structures.
f) Machine mix shall be used in concrete work for all structure. Design mix of concrete will be preferred. Vibrator of appropriate type shall be used for compaction of concrete.
g) Form work shall be of steel plates and frame, sound seasoned timber or any approved materials as decided by Engineer-in-charge to be used for the centering and shuttering of the structures.

h) Painting of all steel / MS structure to be done as per approved quality of anti- corrosive paint over a coat of primer.
i) All electrical work and earthing works including wiring of pump house, annex buildings etc., to be done as per relevant IS specification and Indian Electrical Rules. Single phase wiring shall be done for lighting purpose.
j) All the valves are to conform relevant IS specification and of reputed make.
k) The surplus earth and debris should be lifted after completion of work and proper levelling of site as directed by Engineer-in-charge without any extra claim.
l) All the work including supply of materials to be executed as per relevant IS specification and direction of Engineer-in-charge.
m) All equipment, accessories, auxiliaries, piping, electrical instruments, installations, construction, buildings etc. including all mechanical, electrical & civil works covered under the scope of work of contractor shall be subject to inspection & testing by the client for its material, quality, workmanship and the performance. The contractor shall arrange and carryout all such inspection, testing, trial run etc. and demonstratein presence of the Engineer-in-charge of the Department.
n) The cost of such inspection, testing, trial run, demonstration etc. shall be borne by the contractor. All responsibility of such inspection, testing, trial run, demonstration etc. and any damage/loss that may cause directly or indirectly shall exclusively rest with the contractor.
o) Such inspection, testing, trial run, demonstration etc. shall, however, not relieve the contractor of their liability for replacing / rectifying any defects, which may subsequently appear or be detected during erection and guarantee period.
p) All equipment, sub-assembly and components, auxiliaries and accessories shall betested at manufacturer's cost in accordance with relevant Indian Standards/International Standards. The contractor shall furnish all test certificates etc. related to the quality of all the materials to the client along with the delivery of the materials at site without which no payment shall be released. However, such test certificates, quality assurance certificate shall not relieve the contractor of its obligation to replace forth with any equipment/instrument/material found defective during tests at works / trial running period/guarantee period.
q) Testing for performance of equipment shall be carried out and be checked with the approved parameters and performance characteristic curves for the purpose of acceptance.

5 Intake well: (Refer GA & RCC drawing)

a) Well stunning shall be with M-30 grade of concrete. Adequate precaution should be taken during sinking to avoid of tilt and shift.
b) There shall be cut-outs with grating and manhole cover for accessing the well bottom.
c) There shall be provisions of SS rungs on both side of the well with RCC platforms at to facilitate operation and maintenance. A caged ladder shall be provided inside the well to access the maintenance platform.
d) There shall be provision of rectangular/ square sluice gates of designed size with arrangements for moving through slots and guides fitted on the face of the intake well with shaft & wheel arrangement for lifting of gates. The MOC of gate shall be MSEP. The screens shall be fixed type constructed out of SS 304 using 75x75x6mm

angles and 50x6mm bars with a spacing of 50 mm. Screen shall be fixed on the outer face of the port. Rungs shall be provided to access the screen for cleaning & maintenance. Caged ladder of required sizes shall be provided at intervals for accessing the sluice gates for maintenance.

e) RCC floor slab with beams at top of well shall be provided for installation of VT pump, laterals and accessories. There shall be SS grating with chequered plate for accommodating man hole accessing the cage ladder at inner face and rungs at the outer face of well.
f) Necessary arrangement shall be made in well stunning during concreting by embedding rods inside it so that same can be converted/ tied with raft slab to provide a water tight joint as far as possible.
g) The inlet port box chamber shall have grooves which shall have insert plates embedded in the concrete for fixation of guide channel.
h) A lead channel with hard granite boulder packing of 300mm thick of adequate length shall be provided which also acts as a silt chamber at front face of intake well.
i) The approach bridge shall be 3.25m wide with RCC construction. The columns shall be suitably positioned resting on footing foundation. The hand railing shall be fixed using MSEP pipe of 32mm NB post, 40mm NB handrail & 25mm tie.
j) There shall be suitable embankment protection works based on actual field requirement. This shall be done using granite boulder packing or laterite stone duly cement mortar grouted over compacted sub base. RCC M- 25 toe /guard wall to be provide which shall be 0.6 m below bed and 0.50 m above bed level to provide support to the protection work. Apart from that RCC retaining walls shall be provided on the embankment approach side of the intake.
k) In case of hard strata formation pneumatic/electric rock breakers may have to be used in hard formations wherever required. However, blasting should not be carriedout under any circumstance. The contractor should include all such costs in their offer.
l) Required coffer dam, dewatering, shoring and shuttering, scaffolding, cantering, shuttering, etc. as requited shall be undertaken to complete the work in safe and sound manner and to deliver a sound structure. All such cost shall be included in the offer
m) All other specifications shall be as per relevant IS Specification and direction of Engineer in charge.

6 PUMP HOUSE: (Refer GA & RCC Drawing)

a) Dimension: 8.0m internal diameter
b) Minimum clear height from floor top to roof bottom 5.5m.
c) RCC M- 25 frame structure building brick filler wall and RCC roof.
d) Pump house wall shall be 250/230 mm thick brick work using fly ash bricks
e) RCC floor slab with beams at top of well shall be provided for installation of VT pump, laterals and accessories. There shall be SS grating with chequered plate for accommodating man holes. Cut outs of require sizes as per pump manufacturer data sheet shall be left on floor slab for installation of VT pumps and ancillaries.
f) A MS rolling shutter / collapsible gate of 2.5m x 2.5 m shall be provided at the entrance to the pump house to facilitate movement of equipment. There shall be provision of UPVC doors & windows as specified in the drawing.

g) MS, I section beam shall be fixed to the roof beam for running of wheel of mono rail hoist.
h) Hoisting arrangements shall be provided for lifting of pumps, motors, pipes, andgates.
i) Floor shall be finished with 25mm AS flooring with mix of iron dust
j) The pump house shall be plastered with 12mm inside and 16 mm outside, 1:6 mortar on both sides. The walls shall be painted weather proof cement paint on outer faceand distemper paint to inner face
k) 600mm ht parapet on roof top shall be provided. There shall be provision for rain water pipe from the roof to the bottom
l) Industrial Exhaust fans two nos. shall be provided.
m) There shall be cable rack provided for laying of all power and control cables.
n) The scope also covers all indoor and outdoor lighting arrangements. Concealed wiring shall be provided.
o) The pump house shall be provided with lightening arrestor as per IS Specification.
p) Portable carbon-dioxide fire extinguishers 2 nos. of 6.8kg type conforming to IS:2878-1976 shall be provided. The fire buckets shall be Galvanized mild steel conforming to IS:2546-1974. The installation of fire protection equipment shall conform to IS:2190-1979
q) All finishing items and any other item specifically not mentioned but required for completeness and smooth functioning of the unit, shall be deemed to be included in the scope

7 Specification & MOC of 5 and 6

a) PCC: 1:3:6
b) Well, Stenning: RCC M-30
c) Footing, Columns & Beams: RCC M-25 (Pump House); M-30 (Bridge)
d) Wall: Brick of crushing strength not less than 75 kg/cm^2 strength in 1:6 mortar;
e) Pump house Plaster: inside 12 mm & outside 16mm thick in 1:6 mortar
f) Pump house flooring: 25 mm thk AS flooring with CC 1:2:4 mix of iron dust
g) Painting outer: Two coats of weather proof cement paint over a coat of primer
h) Painting Inner: Two coats of distemper over a coat of primer
i) Hand railings: 1000mm ht with 40 NB rail, 32 NB post, MS pipe (medium duty) with Epoxy paint
j) Chequered Plate: 6 mm thk
k) Rungs: SS 304, Dia. Of SS Bar-20mm and size: 300 x 200 (150 mm Projection of Rungs & 50mm grouted in RCC wall)
l) Bar screen: SS 304 fabricated using 75mm x 75mm x 6mm angle and 6mm x50mm flat at 50mm spacing
m) Gate: MS fabricated running on MS guide channel with epoxy paint
n) Doors & Windows: UPVC frame with 6mm thk tinted glass

8 MECHANICAL & ELECTRICAL:

8A Broad scope of work includes the followings:

1. Supply & Erection of Vertical turbine pumps with column pipes, bell mouth,

required clamps, RCC supports / thrust blocks, nuts and bolts, jointing materials, all other accessories, all labor, T&P etc. All complete – 3 units

2. Supply & Erection of 415V, 50 Hz vertical mounted TEFC squirrel cage induction motor to be coupled with above pump including all accessories, labor, T&P all complete – 3 units.
3. Supply and erection of 3 MT Mono rail hoist along with electrical panels and control system of rating 415 volt with all accessories, T&P, labor etc. all complete – 1 unit
4. Supply & Erection of silt effluent/slurry transfer submersible pump with column pipes, bell mouth, required clamps, RCC supports / thrust blocks, nuts and bolts, jointing materials, all other accessories, all labor, T&P etc. All complete – 1 unit
5. Supply & erection of PN-1.6 rating sluice valve, non-return valve and dismantling joint connected to the common header including all accessories, labor, T&P all complete – 3 sets
6. Supply, construction and erection of 3-phase power supply HT line, with GI joist pole/PSC poles of required height and suitable size AAA conductors. Each pole shall be provided with anti-climbing devices and danger boards as well as industrial earthing. The power has to be drawn from nearest HT Transmission line at a distance of approx. 200 Mtrs.
7. Supply, erection, testing and commissioning of 11/0.415 KV substation comprising of the following items
    a. All civil structures and ancillary civil works as per relevant ISS & Electricity Rule 2000. This also includes fencing work as per direction of the engineer
    b. All mounting structures for transformer, switch gears & accessories
    c. transformer with all required accessories, protections, structures, labor, T&P etc. all complete
    d. AB switch, HG Fuse, outdoor distribution panel
    e. HT Meter
    f. power control cables
    g. Earthing (5 nos.) as per IS 3043
    h. Safety protection with barbed wire fencing
8. Supply and erection of one no. of Electrical & MCC panel consisting of incoming panel & MCC panel with all required accessories, protections, all labor, T&P etc. all complete – 1 unit
9. Supply and erection of suitable rating 415-volt armored aluminum cable from Transformer to panel and from panel to motors with all accessories, jointing materials, T&P, labor etc. all complete
10. Supply of materials, labor and T&P and erection of earthing works, electrification, internal & external lighting, ventilation and other miscellaneous items required for completeness and proper functioning of the system
11. Supply and erection of instruments full bore type electromagnetic flow meter (1 unit) with all accessories, dial type Pressure gauge (3 units), ultrasonic type level indicator (1 unit), T&P, labor etc. all complete
12. Testing, trial run and commissioning of individual components and the complete system

The scope includes all such items required for completeness and full functionality of the

components/system.

8B PUMP DETAILS

Location	no. of pump sets	Discharge of each pump in m3/hr.	Head for each pump in M	Motor ratings (Kw)
Intake Pump House	3 (2 Working+1 Stand By)	105	26	As per Manufacturer

8C TECHNICAL SPECIFICATION OF PUMP-MOTOR

Description	Units	Specification
Location/ Tag No	n/a	Intake Well
Number of Pumps	Nos	3 (2 W + 1 SB)
Service Condition		
Application	n/a	Intake of untreated water
Liquid	n/a	Raw water from Reservoir
Specific Gravity of water	n/a	1.02
Ambient Temp	° C	45
Parameters of Pump		
Total Rate of Flow of pumps *(Output for Two pumps running in parallel)*	m^3 /hr.	**210**
Total dynamic head	m	**26**
Shutoff head	m	To be Provided by Pump mfg. Normally to be 80 % to 120 % of duty head.
Impeller		Semi enclosed type.
Nominal Speed preferred	RPM	1450
Critical speed of pump	RPM	Not less than 130% of normal operating speed.
Reverse rotation of pump		Pump manufacturer to specify the provision provided to avoid reverse rotation of pump
Noise level		85 dBA (max) measured at 1 m from the outline of the pump set.
Bowl efficiency at Duty point	%	80 to 85%
Pump efficiency	%	80 to 85%
Solid handling size	mm	20 mm (max)
Column lengths	m	Standard 1.5 to 3 m.

Description	Units	Specification
Type of Coupling		Flexible coupling; Pin & Bush type
No. and type of thrust bearing		Two (2); Anti-friction type
Horizontal reverse thrust		To be Provided by Pump mfg.
Min Submergence	mm	To be Provided by Pump mfg.
Bottom clearance below Suction bell	mm	To be Provided by Pump mfg.
Description of Pump		
Type of pump		Vertical Turbine pumps for wet pit installation
Installation		Indoors, on RCC floor with motor & discharge pipe in the same floor
Parallel Operation	Y/N	Yes, 2 pumps in parallel.
Altitude of Pump	m	Near sea level.
Duty		Continuous
Motor rating	KW	To be Provided by Pump mfg.
Delivery size	mm	To be Provided by Pump mfg.
Type of Stuffing box sealing		Gland packing
Line shaft bearing lubrication		Self-water lubricated
Delivery Branch Position		Flanged
Details of Motor		
Number of poles	Nos.	4
Voltage	V	415 +- 10%
Frequency	Hz	50 (+- 3 %)
Insulation	Class	F
Efficiency	Class	TEFC/ IE 2
Mounting of Motor		Vertically, flange mounted hollow shaft
Material of Construction		
Bowl		Cast Iron IS 210. Closed grain.
Impeller		SS 410
Suction case		Cast Iron IS 210. Closed grain.
Discharge case		Cast Iron IS 210. Closed grain.
Column Pipe		M.S. IS 2062. Gr B, ERW Pipe
Line shaft		ASTM A 276, Gr 410
Shaft Sleeve		ASTM A 276, Gr 410
Fasteners		High tensile steel.
Inspection & testing		As per pump QAP
Test at mfgrs works		Yes- at least 1 pump.
Scope of supply per Pump set		
Pump Installation cum O & M manual		Yes
Warranty & Test Certificates		Yes
V T Pump		Yes
Motor		Yes
Suction strainer		Yes
Gland Packing		Yes

Description	Units	Specification
Sole Plate & Motor Stool		Yes
Coupling		Yes
Foundation bolts		Yes
Pump data sheet		Yes
Pump foundation drawing		Yes
Pump performance curves		Yes

8D Sludge Pump Specification

Sl No.	Description	Specification
	PUMP	
1	Type	Submersible
2	Liquid	Sludge/slurry
3	Solid handling	25mm
4	Head	15 m
5	Discharge	350 LPM
6	Pump Casing	Cast Iron
7	Shaft	High Carbon Steel
8	Impeller	Non-Clog type
9	Misc. Provision	Cutter Fan
	DRIVE/MOTOR	
1	Type	3 phase
2	Duty	continuous
3	Protection	IP 68
4	Insulation	F Class
5	Voltage/Frequency	415+/- 10% ; 50Hz
6	Cooling	Liquid
	MOTOR CONTROL	
1	Starter	DOL
	Indicators/Display	Phase LED, Current, Voltage
2	Protection features	HRC fuse, single phasing, moisture senor, thermistor relay, overload relay, High/Low voltage protection

8E TECHNICAL SPECIFICATION OF HOIST

Description	Specification
Equipment	Mono rail Electric Hoist
Capacity	3 ton

Description	Specification
Location	Intake Pump house
Bay length	8 m bay length
Test Load	125% of Safe Working Load
Height of Lift	5 meters
Duty Class	Class-III
Speed Hoist	3.5 to 4.5 m/min.
Speed CT	Max. 15 m/min.
IS Code	IS: 807, IS: 3985; IS: 2026; IS:3815; IS: 2266; IS: 315; IS: 4460; IS: 9968
	Material of Construction
Girders	The Main girder shall be Standard 'I' Section type or plate fabricated I section construction design to sustain all stresses arising due to vertical & lateral forces with impact to which they are subjected. The maximum deflection of the main girder is limited to 1/1000th of span with live loads including the weight of the trolley or hoist.
Trolley	The trolley shall be connected with heavy side plate confirming to IS: 2026. Trolley is to be designed as per IS: 807
End Stopper	Steel end stoppers to be provided on both sides to limit the motion of the Hoist. All the buffers will employ springs for shock absorption
Steel	Steel confirming to IS-2062 or equivalent to be used in the manufacturing of the main load bearing structures
Elec. Motors	All motors used in Hoist shall be flange mounted type or foot mounted type Slip ring induction motor specially designed and manufactured as per IS 325 for crane & Hoist duty S-4 duty, slipring type motor, 40% CDF, 150 Start/hr., IP – 55 with Class F insulation.
Gearboxes	All gearboxes to be used in Hoisting & L.T. are helical spur gears totally enclosed type filled with oil, Pinions and output shaft are supported on antifriction type roller/ Ball bearings. All Gears and Pinions are of En-8 materials precision machined and teeth cutting by hobbling machine duly hardened to withstand the heavy loads (IS: 4460-1967); All gear box should have drip pan
Brakes	Fail safe type brakes to be used. Electro magnetic Disc type for hoist and hydraulic thrust brakes for CT motion. This brake is automatically released when the motor circuit is on and is applied when the motor circuit is off. Brake drum shall be forged steel. The brake capacity shall be 150% of the rating of the hoist

Description	Specification
Wire rope	Galvanized steel core; The make of wire rope to be used shall be Usha-martin and selected with 6-timefactor of safety
Rope Drum	The rope drum is of mild steel fabricated construction or cast steel having right and left-hand spiral grooves machined to suit the hoisting ropes. The drum is of such length that there is not more than one layer when rope is full wound.
Bottom Block	Bottom Block Assembly consisting of forged steel hook single shank type as per IS 3815 with spring loaded safety latch mounted on thrust Ball Bearings, with required diameter rope sheave and hook plates made out of steel.
Wheels	The wheel of the trolley will be of forged steel conforming to IS 2707 GR. II duty spin hardened to 250BHN or steel cast EN-9, material, Single flanged type for C.T. Motion fitted with antifriction type bearings mounted on section type bearing housing easy to maintenance.
Bearings	All moving parts of the hoist are supported on the anti-friction type ball/roller bearings.
Supply Voltage	415, 3ph., 50hz., Supply. A triple pole isolation switch shall be provided
Control Voltage	110V
Switch Gears	BCH, L&T, Siemens or client approved Contactors in Panel
Push Button	Pendent type with hanging chain or wire rope with inching operation; mushroom head type emergency stop button should be provided on the pendent
Elec. Cables	Rubber insulated Flexible Copper Cable with ISI mark
	of reputed make confirming to IS: 9968
Limit switches	Two numbers rush roller type limit switch of reputed make to be provided to prevent over lowering & over hoisting. Two-way Lever type Limit switches for CT shall be provided with provision for rigid stoppers.
Control panel	All power auxiliary contactors, thermal overload relay , time relays etc. should be mounted in steel cubicles with lockable hinged door of IP 55 protection
Contactors	The current rating of all contactors should be of at least 50 % higher than the respective motor full load current at the specified duty cycle.
Switch gear	AC contactors, Magnetic overload relays, Fuses for each drive to be provided

SPEC.	DESCRIPTION
Lighting	Suitable lighting arrangement should be made in the control panel
Painting	The structural parts of the hoist are thoroughly cleaned and applied with two coats of red oxide and two coats of anti-corrosive paints of approved shade

8F TECHNICAL SPECIFICATION OF SUBSTATION

SPEC.	DESCRIPTION
Type	Air cooled
Rating	11/0.4 KV,3PHASE,50C/S, 63 KVA
Spec.	Mounting: DP structure complete with all civil works; ABB switch-12KV400A; HG Fuse-200 A; lightning arrestor; insulators; outdoor LT panel MCCB, 400V, 200A CODE: REC 43/1987, 3/1971; IS:2486, 9920

8G TECHNICAL SPECIFICATION OF INCOMING PANEL

S. No	ITEM /DESCRIPTION
1	Incoming: MCCB - 415 V,250A, 50Hz, 4 pole, 25KA Braking Capacity COMPLETE WITH: operating handle and under voltage release andtrip illumination. Thermal-magnetic release: 100-125A, Icu=Ics=100%
2	3-phase copper bus bars suitable to carry a current of 250Amps; 50 KA for 3 Sec
3	96mm sq. MISC flush type Ammeter suppressed scale 0-50Amps/2000Amps CTR of 600/5 Amp with Ammeter selector switch.
4	96mm sq. MISC flush type Voltmeter scaled 0-500V
5.	40KVAR APFC with EMS

6	Outgoing - MPCB – 32A, 415 V, 3 Phase with overload & short circuit protection, thermal release range – 24-32A - MCCB -100A, 400V, 50HZ, 4 Pole, 25KA braking capacity, Thermal-magnetic release – 40-50 A, Multi-function Meter, - Soft Start / Y-D starter, 225 A contactor, 0-100 A over load relay, push button switch, indicator lamp - 100 A, 415 V, 25 KA MCCB as feeder to hoist panel - 100 A, 415 V, 25 KA MCCB for lighting & general purpose and 1 no. spare feeder with 100 A, 415 V, 25 KA MCCB - 100 A, 415 V, 25 KA MCCB as feeder to Sludge pump
7	R-Y-B phase indicating lamp of 415 V
8	Enclosure- 14-gauge MS sheet for load bearing side, 16-gauge MS sheet for non-load bearing side, floor stand, cubicle type, dust & vermin proof., IP 55 protection

8H SPECIFICATION OF CABLE

SYSTEM	415 V, 3 PHASE, 50 C/S.
Transformer to MCC panel	50 Sqmm single core armored, 3-1/2 core, 650/1100V, Al. XLPEcable as per IS 7098 including end terminal
MCC panel to Motor	10 Sqmm size 4 core armored, 1.1 KV grade aluminum cable as perIS 7098 Suitable size of control cables for connecting the starter shall be supplied.

8I SPECIFICATION OF EARTH GRID

SYSTEM	415 V, 3 PHASE, 50 C/S.
Specification	pits are to be constructed as per IE Rule, chemical earthing using 50mm GI pipe Bus Bar shall be 50mmx5mm, EC grade Copper Flat, 8 SWG copper wire (4mm), cable sockets/lugs, complete with nuts bolts. The earthing provision should be made for substation, Electrical panel and motors. IS:3043 –1966

8J SPECIFICATION FOR ILLUMINATION & VENTILATION

Yard Lighting & Bridge Lighting	Outdoor type LED on structures or MS poles of 7 m height; moisture proof; IP 54 protection
Internal Lighting	Energy Efficient luminaries; vitreous enamel reflectors; CRCA sheet steel
DB	3 Phase 4 way, VTPN type BDB, IP 55 Incoming MCB (1 no.)- 63A, 10KA; Outgoing MCB (18 Nos.)- 20A, 10KA, SP
Sockets	Die cast metal housing; 230v, 3pin; self-closing shutter

Point Wiring	Conduit shall be PVC; Junction box shall be malleable casting & concealed; switch board flush with wall; concealed wiring;
Ventilation	Industrial type exhaust fan; 24 exchanges per hr.

8K SECIFICATION OF PIPING & VALVES

MS pipe work:	
Specifications	IS 5504-1969 for spirally welded pipes, IS 3589-1991: Seamless or electrically welded steel pipes
Wall Thickness	Not less than 7 mm
In-lining & out coating	Epoxy based anti-corrosive paint
Laying	IS 5822 1986
Flange thickness	As per relevant IS specification
Pump Delivery sluice valves & scour valves.	Double flanged sluice valves, N o n Rising spindle, Rating: PN 1.6 (16 kg/sqcm) IS: 780, IS: 2906, Body: CI; Spindle: SS AISI –410
Non-return valves	Double flanged swing check type, rating: PN 1.6 (16 kg/sqcm) IS: 5312, Body: CI; Disc: CI; Spindle: SS, AISI –410.
Throttle valve/ Control valve	Butterfly valves (Rating 16 kg/c m^2) BS: 5155, AWWA : C-504, Body: CI Disc: CI, Spindle: SS AISI-410.

Technical Requirement:

a) All the valves shall conform to r relevant B I S /BS/AWWA and bear such embossed certification mark.
b) Valves, wherever required, shall be provided with extended spindle (AISI-410 material) and headstock so that hand wheels can be provided at 1.2 m level for manual operation.
c) All valves for water supply & air applications shall be CI (IS: 210, FG:220) body with 13% Chrome-steel (AISI-410) spindle and seat & seat ring made of gun metal. All valves for chemical & corrosive application shall be Teflon body & internals.
d) The valves shall be double flanged body with 'raised-face' flanges and drilling to conform **IS: 1538.**
e) RCC Valve chambers/CI surface box as required shall be provided for the valves with CI lockable manhole of standard size.
f) Suitable thrust blocks, anchor clamps & restraint joints shall be provided at bends and other locations where unbalanced forces may develop under normal operation, during power failures, during reverse flow or during testing of pipe line that tend to cause movements in the pipe line.
g) All Valves shall be installed with a dismantling joint or short-piece in the pipeline to facilitate easy replacement.

8L MAKE OF ELECTRICAL & MECHANICAL EQUIPMENT

SN	MATERIAL DESCRIPTION	MAKE OF MATERIALS
1	Pumps	Kirloskar/WILO/ Voltas/Greaves/ (WorthingtonPump India Limited (WPIL)
2	Motors	Kirloskar/ Siemens/ CGL/ Bharat Bijlee/ABB
3	Sluice & Butterfly Valves	Kirloskar/ Fouress/IVC/IVI
4	Air Valves	IVI /IVC/FOURESS
5	Liquid level indicators	Krohne/Siemens
6	CI pipes	KIW/ Electro steel/ IISCO/ Kesoram
7	DI Pipes	TATA/Kubota/Jindal SAW/BALAJI/Electro Steel
8	MS pipe	Tata / Sail / Jindal
9	GI pipes and fittings	TATA/Jindal
10	Flowmeter	Krone/ Endress Hauser
11	Gear Box	Greaves/Elicon/Radicon/EEMF
12	All furniture	Godrej
13	Glass wares	Borosil
14	Paints	Johnsons Nicholsons/ Asian Paint/Berger paints
15	Sanitary wares	Parryware/Nycer/Hindustan
16	Sanitary fitting	Jaguar/ESSESS/Hindustan
17	All Luminaries, fans & exhaust fans	Phillips/Bajaj/Crompton/Havells
18	All locks, hydraulic door closures	Godrej
19	Cable	Finolex/Havells/Polycab/KEI
20	Non-Metallic conduit & accessories	Precession/AKG/Polycab
21	Switch, socket, Holder, Ceiling Rose etc.	Anchor /Cona/Havells/Indo Asian/Legrand
22	PVC Insulated wires	Finolex/ Anchor/ L&T / Havells/ Polycab/KEI/R&R
23	Bakelite sheets	Hylam /Formica
24	PVC Insulated cables (ISI Mark only)	Finolex/ Crystal/ Fort Gloster/ Poly Cab/KEI
25	Cable lugs	Dowells/ Ismal/ Clipon
26	Cable joining Kits	M.Seal
27	Switchgears viz., Isolator Switches, SFU, Starter, change over switch, HRC fuse holder etc.	Siemens /L&T/Schneider/Legrand
28	MCB RCCB & Associated Distribution Board	HPL/ Havells/ Standard /Indo Asian/Legrand
29	MCCB	Siemens/ L&T/ ABB/ Legrand
30	Instrument viz meters etc.	AE/IMP/ Meco/ Cosmo
31	Selector Switch	Kaycee/ Saltzer
32	Timer /Time switch	L&T/ Hanger/ Legrand
33	Energy Meter	GEC/ Capital Jaipur

34	LT Distribution Board (Fabricated)	ESS/ Technocrat/ Utkal/
35	Kit Kats	BPC/ Anchor
36	HRC Fuses	Siemens/ L&T
37	CTs & PTs	AE/ Kappa/ Eastern Switchgear
38	Metal Clad plug Socket	Crompton/ Havells
39	Fluorescent Fixtures	Philips/ Crompton/ Bajaj/ PAC
40	HPSV/HPMV/LPSV Luminaries & PL/SL Lamp Luminaries /Metal Halide	Philips/ Crompton /Bajaj/ Havells
41	LED lamp Luminaries	Decon/ Philips/ Crompton/ Bajaj/Havells
42	Exhaust Fan	Calcutta/ Almonard/ Crompton/ Khaitan
43	Adhesive & Insulating Tapes	Streel grip
44	G.I Pipes	TATA/ Jindal/ Prakash
45	Transformer	Alfa/ OTPL/ OEU/ Bright/Vijay/Kirloskar/CGL
46	A.B Switch	S&S/ Motison/ Orissa Electrum /Sigma
47	H.G Fuse	S&S/ Motison/ Orissa Electrum /Sigma
48	Lightening Arrestor	Oblum/ WS/ IGE
49	Terminal Blocks	Elmex/ Connect well
50	Control fuses and link	Alsthom / S&S/ Havells

ANNEXURE-IV

SCOPE OF WORK AND BRIEF TECHNICAL DESCRIPTION: WATER PIPELINE

Conditions of Contract

Broad Scope of Work

1. Supply of Pipe of DI K-9 & MS pipe – 300mm Dia; Total: Approx 5000 Mtr
2. Transportation of pipe to laying site
3. Excavation of trench including shoring & shuttering
4. Lowering, laying levelling and jointing
5. Supply & erection of specials & fittings
6. Construction of RCC pedestal for over ground pipes
7. Supply & erection of Valves
8. Construction of Valve chamber, thrust blocks, pedestals, encasing etc.
9. Back Filling
10. Restoration of road cutting portion
11. Road crossing & canal crossing
12. All ancillaries' items as per scope & specification
13. Testing, trial run & commissioning

Quality Assurance Plan (QAP)

The implementation of the Quality System shall be through the establishment of a comprehensive Quality Assurance Plan approved by the Engineer. No work shall be taken up at site prior to the approval of the Quality Assurance Plan which will include methodology adopted for Quality Assurance and procedures for keeping records and reports.

The documented procedures shall include but not limited to:

1. Management Procedures;
2. Supply/Procurement;
3. Manufacture (where applicable);
4. Construction;
5. Putting to work/Commissioning/Reliability Trial/Performance Test;
6. Operator Training;
7. Operation and Maintenance;
8. Internal Control.

Defect liability period

The entire MS pipeline along with the appurtenances shall be under satisfactory performance for period of 12 months from the date of commissioning the pipeline

Scope & Technical Specification

The scope includes supply of pipes, all valves and specials, fittings, excavation of trenches in all kinds of soil and disintegrated rock, laying and jointing of pipes, fittingand fixing of valves and specials, pipe line testing, backfilling of trenches, construction

of RCC valve chambers, thrust blocks, pipe supports and anchor blocks wherever necessary, providing and installing surge protection devices wherever necessary etc., relocating the underground utilities wherever necessary, removal of surplus earth from site and mending good to the damages and restoring the road etc. all complete Detailed engineering of raw water rising main, water hammer / surge protection system including allied works, thrust blocks, etc. as per CPHEEO manual.

a. Excavation of trenches in all kind of soils, including shoring and shuttering, wherever required, as per the approved alignment up to the depth to maintain minimum one meter earth cover over crown of the pipe for laying of pipes and fittings, including proper stacking of excavated soil/material, backfilling and disposal of surplus material.

ii. Supply, laying & jointing of following raw water rising main pipes as per IS: 8329, Socket and Spigot joint and ISI marked rubber gasket conforming to IS: 5382 as shown in relevant drawings and detailed specifications.

Type	: Ductile Iron Class K-9
Lining Internal	: Cement lined
Lining External	: Epoxy painted or with wrapping/coating
Diameter (minimum)	: as per requirement of economical size of pipe

iii. Supply &laying of DI fittings (Tee, tail piece, bend etc.) of required sizes conforming to IS specification with latest amendment.

iv. Supply, laying & jointing Mild Steel Pipes conforming to IS: 3589 Fe410 grade pressure pipes of required diameter and quantity including food grade epoxy coating to inside and anti-corrosive epoxy coating to outside surface, for nallah and other crossing and special bends, etc. as per detailed specifications.

v. Pipeline shall be supplied and laid as per detailed specifications given in this tender document. The detail specifications for lining and coating of the pipes are given in respective section.

vi. Supply & erection of ISI marked double flanged Cast Iron sluice valves, non-return Valve, scour valves as per IS: 14486 PN 1.6 and double acting kinetic air valve as per IS: 14845 PN 1.6. as per site requirement & as per instruction of Engineer-in-Charge Minimum size of scour valve shall be 100mm. Minimum size of air valves shall be 100mm.

vii. Construction of thrust blocks of required size as per approved drawing at all bends and other necessary locations in the pipeline.

viii. Construction of valve chambers as per approved drawing for all types of valves as per site requirement & as per instruction of Engineer-in-Charge.

ix. All the trenches shall be layered with a 1–2-inch Plain Cement Concrete (PCC) after levelling and before laying of water pipeline.

x. Backfilling of the excavated trenches with selected excavated earth. Backfilling shall be done in layers of 150mm thickness and shall be watered and compacted as per detailed specifications.

xi. Making all arrangements for laying of pipes and its stability for crossing of nallah / drain / road / any other facility and their restoration with minimum disruption including making any by-pass arrangement and dismantling of all above arrangement after completion and testing of work. At every crossing over nallah the pipeline will be supported through a Structural steel truss bridge. Truss bridge shall be of suitable width and shall be approved by Engineer-in-Charge.

xii. Repair to damages caused during construction to any existing road, bridge,culvert, water supply line, sewerage line, drain, electricity cable & pole, gas pipeline and telephone line, etc. It shall be reinstated as per the original specification and satisfaction of concerned authorities / Engineer-in-Charge.

xiii. Cutting of road surface for taking of pipeline at required depth will be done with making good the damages by mending & repair to existing condition.

xiv. Testing and commissioning of raw water rising mains as per relevant IS code and to ensure minimum terminal head as per requirement.

xv. The contractor is to assess the exact length after making necessary survey at site. Details of valves to be fitted at different locations of rising mains shall be as per the drawing. The Sluice valves/Butter Fly valves should be gear operated and with bypass arrangement confirming to relevant IS specification. The Air valves should be temper proof double kinetic Air valve with Isolation valves.

xvi. Making all arrangements for laying of pipes and its stability for crossing of roads including NH & SH and small culverts/nallah / drain / road / any other facility and their restoration with minimum disruption including making any by-pass arrangement and dismantling of all above arrangement after completion and testing of work. At every crossing over, the pipeline will be supported through a suitable steel structure as per direction of Engineer-in-Charge**. The crossings could be trenchless or using trestle structure as per site requirement.**

xvii. Repair to damages caused during construction to any existing road, bridge,culvert, water supply line, sewerage line, drain, electricity cable & pole, gas pipeline and telephone line, etc. shall be reinstated to the original specification and satisfaction of concerned authorities / Engineer-in-Charge.

xviii. Cutting of road surface for taking of pipeline at required depth will be done with back filling of trenches and making good to the damages by mending & repair to existing condition. Any defect observed during the defect liability period shall repaired immediately.

1.0 Applicable Codes

- The following Indian Standard Codes, unless otherwise specified herein, shall be applicable. In all cases, the latest revision of the codes shall be referred to.

- IS 8329:2000 specification for centrifugally (spun) ductile Iron pressure pipe for water, gas & sewerage
- IS: 12288:1987 Code of practice of use and laying of ductile iron pipes
- IS: 9523:2000 Specification for ductile iron fittings for pressure pipes for water, gas and sewage
- IS: 5382:1985 Specification for rubber sealing rings for gas mains, water mainsand sewers
- IS: 3589:2001 Code of practice for steel pipe for water & sewerage
- IS: 5822:1994 Code of practice for laying of electrically welded steel pipes forwater supply
- IS: 7322:1985 Specification for Specials for steel cylinder reinforced concrete pipes

2.0 DI Pipe

2.1 Supply of Ductile Iron Pipes

Supply & laying of 300mm NB CMDI K-9 socket spigot pipe in conformity with IS 8329, to the alignment from intake to the delivery sump inside plant, including specials, fittings, valves. The pipes shall be coated with epoxy and have factory provided cement mortar lining in the inside as per the provisions of Appendix B of the IS 8329: 2000.

Lining Internal: Cement lined

Lining External: Epoxy painted or with wrapping/coating

2.2 Each pipe of the push on joint will also be supplied with a rubber EPDM/(SBR) gasket. The gaskets will confirm to the IS 5382:1985

Flanged pipes shall be used as per requirement. The flanged joints will confirm to the Clause 6.2 of IS 8329.

The pipes will be subjected to following tests for acceptance:

- Visual and dimensional check as per Clause 13 and 15 of IS 8329
- Mechanical Test as per Clause 10 of IS 8329
- Hydrostatic Test as per Clause 11 of IS 8329
- The test reports for the rubber gaskets shall be as per acceptance tests of the IS 5832 and will be in accordance to Clause 3.8

2.3 Specials for Ductile Iron Pipes

The following types of DI fittings shall be manufactured and tested in accordance with IS: 9523 or BS: 4772.

- flanged socket
- flanged spigot
- double socket bends (90^0, 45^0, 22 1/2 ^{0}, 11 1/4 ^{0})
- double socket branch flanged tee
- all socket tee
- double socket taper
- retrained joints
- All the fittings shall be of class K-9.

2.4 Laying and jointing of DI pipes and fittings:

- Pipes should be lowered into the trench with tackle suitable for the weight of pipes. For smaller sizes, up to 200 mm nominal bore, the pipe may be lowered by the use of ropes but for heavier pipes suitable mechanical equipment have to be used.

- All construction debris should be cleared from the inside of the pipe either before or just after a joint is made. This is done by passing a pull-through in the pipe, or by hand, depending on the size of the pipe. All persons should vacate any section of trench into which the pipe is being lowered.
- On gradients of 1:15 or steeper, precautions should be taken to ensure that the spigot of the pipe being laid does not move into or out of thesocket of the laid pipe during the jointing operations. As soon as the joint assembly has been completed, the pipe should be held firmly in position while the trench is back filled over the barrel of the pipe.
- The designed anchorage shall be provided to resist the thrusts developed

by internal pressure at bends, tees, etc.

- Where a pipeline crosses a watercourse, the design and method of construction should take into account the characteristics of the watercourse to ascertain the nature of bed, scour levels, maximum velocities, high flood levels, seasonal variation, etc. which affect the design and laying of pipeline.
- The assembly of the pipes shall be made as recommended by the pipe manufacturer and using the suitable tools.
- The socket and spigot end of the pipes shall be brushed and cleaned. The chamfered surface and the end of the spigot end have to be coated with a suitable lubricant recommended by the manufacturer of the pipes. Oil, petroleum bound oils, grease or other material which may damage the rubber gasket shall not be used as lubricant. The rubber gasket shall be inserted into the cleaned groove of the socket. It has to be checked for correct positioning.
- The two pipes shall be aligned properly in the pipe trench and the spigot end shall be pushed axially into the socket either manually or with a suitable tool specially designed for the assembly of pipes and as recommended by the manufacturer. The
- spigot has to be inserted up to the insertion mark on the pipe spigot. After insertion,
- the correct position of the socket has to be tested with a feeler blade.
- Deflection of the pipes -if any- shall be made only after they have fully been assembled. The deflection shall not exceed 75 % of the values indicated by the pipe manufacturer.

2.5 Pedestal for ductile iron pipes:

- In case of unstable subsoil or in case of ductile iron pipes laid above ground they shall be laid on pedestal/pillars. Each pipe is supported at the plain end and behind the socket. One pedestal (300mm x 600mm) shall support the socket end of one and the plain end of the other pipe. The pillars shallbe of RCC and shall be founded on solid soil, not subject to erosion by windor water. The foundation of the pillars shall be min. 600mm deep based on the soil conditions. The height of the pedestal above ground shall be as per field requirement.
- The top of the pillar shall form saddles for the pipe having the same radius as the pipe. The pipes shall be laid on a coat of polyethylene of 2 mm thickness, put on mortar. It has to be ensured that the spigot end of the pipe is supported by the saddle and does not unduly compress the rubber ring in the lower part. Each pipe is fixed by one adjustable galvanized steel spanner, fixed to the pillar with anchor bolts.
- In case of vertical deviations, the pipes shall be protected against uplift by additional reinforced clamps of mild steel

3.0 M.S. Pipe

3.1 Supply of MS Pipe

- MS pipe of 300mm Dia with min. 7mm wall thickness shall be used for road

crossing, canal crossing and gap closing.

- General requirement relating to supply of M.S. pipe shall confirm to I.S. 3589 steel grade 410 with beveled end for field butt welding.
- Dimension of pipe with tolerance and weight shall confirm to specifications laid in I.S. 3589.
- The pipes inside and outside shall be painted with epoxy based anti-corrosive paint.

3.2 Manufacture of M.S. Specials and fittings

- This specification covers the manufacture, supply, testing and delivery of mild steel electrically welded pipe fittings with plain ends, and flanged and plain end with in lining and out coatings. The Contractor shall supply specials required for curves, tees, branches, manholes, air valves, scour and sluice valves. Specials shall suit the outside dia. of M.S. pipe with approved in lining and out coating. The dimensions of the fittings shall conform to IS 7322 - 1973.
- MS short pipes (300 mm I.D. nominal) shall be obtained by cutting the full-length MS pipes.
- M.S, specials and fittings shall be fabricated using steel pipes. The internal diameter of the M.S, Specials and fittings shall be 300 mm (nominal).
- The manufacture of MS Specials and fittings shall be done in conformity with IS 7322 - 1973.
- The ends of MS short pipes and specials shall have beveled ends for welding.
- Ovality of the specials and fittings shall be removed before in laying is undertaken.
- The in lining and out coating of MS short pipes, specials and fittings shall be done as per specification.
- Diameter of all bolts circle of the flanges shall comply with the relevant IS: 1538 - 1976 for flanged pipes and specials. Bolts, nuts and washers shall be in accordance with IS: 1367 - 8.8 Grade.

4.0 Field Test Pressure:

Each special or fitting should be subjected to tests as per IS 7322 - 1974 or latest edition before in lining and out coating. The field test pressure shall be 16 kg/cm^2

5.0. Pipe laying and connected civil works:

5.1 Scope and the specification

5.1.1 Laying and jointing of MS Pipes shall conform generally to IS 5822 - 1986.

5.1.2 The specifications cover the work of laying, welding mild steel pipeline (underground and above ground) including Civil Works.

5.1.3 The main works covered under these specifications: -

(a) Earth work excavation including rock cutting

(i) Excavation to trenches for laying pipeline etc.

(ii) Excavation for foundation of thrust blocks, pedestals, piers, valve chambers etc.

(b) Bailing out water and dewatering by pumping wherever necessary
(c) PCC and R.C.C. in thrust blocks, pedestals, piers, etc.
(d) Brick masonry including plaster etc. for masonry valve chambers.
(e) Transporting and assembling pipes, specials, valves, appurtenances etc.
(f) Laying and jointing of 300 mm I.D. (nominal) DI/MS pipe line with necessary specials, fittings and valves.
(g) Refilling of trenches in layers, water and compacting.
(i) Transporting and disposing the surplus earth and clearing the site of alldebris.
(j) Providing sand bedding and gravel back filling wherever required.
(k) Providing in lining and out coating paints near field weld joints.
(l) Testing the pipeline hydraulically for a test pressure of 16 Kg/sqcm
(m) Maintenance of pipeline for 12 months from the date of Commissioning.

5.2 Bench Marks

Temporary bench marks, at regular interval, shall be fixed before any work is started by the contractor in any section. These bench marks shall be fixed away from the field of work so as not to be disturbed during the contract period and shall be securely fixed in concrete. No separate payment shall be paid towards fixing bench marks.

5.3 Excavation

5.3.1 General

Excavation shall be required to be done for the following works: -

(a) Excavation for underground pipelines.
(b) Excavation for foundation of piers, abutments, walls, footings, pedestals, chambers for vales etc.
(c) No separate payment shall be made for removal of shrubs, grass, large and small bushes, trees, stumps and stems of tree cut, roots, fencing including posts, gates, portion of old masonry parapet walls etc.

5.3.2 Classification

The Excavation work shall be classified into the following categories by inspection of faces of cutting.

5.3.2.1 For pipeline trenches:

(i) Loamy, clayey soils like B.C. soils, red earth, ordinary gravels and hard gravel, mixture of gravel and soft disintegrated rock, ordinary gravel, stony earth and earth mixed with fail sized boulders and hard disintegrated rock or soft rock or conglomerate rock or laterite rock removable by pick axes and crow bars.
(ii) Hard rock and bounders to be removed by benching, chiseling, wedging and barring.

5.3.2.2 For chambers, pedestals, anchor blocks etc.:

(i) Loamy, clayey soils like B.C. soils, red earth, ordinary gravels and hard gravel, mixture of gravel and soft disintegrated rock, ordinary gravel, stony earth and earth mixed with fail sized boulders and hard disintegrated rock or soft rock or conglomerate rock or laterite rock removable by pick axes and crow bars. Hard rock and bounders to be removed by benching, chiseling, wedging and barring. Excavation for laying underground pipeline and providing sand bed. For laying underground pipeline, trenches shall be done by the contractors as shown in the relevant drawings submitted by the contractor. The pipeline shall be laid to the

correct level according to the longitudinal section. It is incumbent on the contractors to follow a planned continuous procedure of work in respect of excavation, pipe-laying, fixing appurtenances and refilling the trenches so as to ensure completion of work in time and repairing of any roads excavated for this purpose by filling with suitable material to original grade in the shortest possible time. The daily progress of excavation work for preparing trenches shall match with the refilling of trenches in the completed portion as far as possible.

a. The bed of trenches shall be filled up with 15 Cm. of sand in case of laying of pipes in rock & boulder portion. Additional depth of pits and pits at welding joint shall be filled up with sand.
b. Sand used for backfill shall be natural sand (free from cinders, ashes, slag, refuse, organic materials, lumps of frozen material, boulders, rocks or stones) graded from fine to coarse.

5.3.4 Excavation of pipe trench in hard rock

a. When the excavation is in hard rock, for preparing formation or for the trenches whether carried out by power tools chiseling, and / or wedging reaches within 300 mm of the formation level, further rock excavation shallbe carried out very carefully and during blasting only small charges shall be used and the contractor shall make every effort to carry out the excavation to the correct formation levels as far as practicable.
b. In order to minimize the over break and loosening of materials at the finished surfaces, final cutting for the last 450mm to 600mm in hard rock shall be carried out with the help of pneumatic or other power tools. Unless otherwise specified, the over break shall not exceed 75 mm.
c. The width refers to the work of laying pipes will be as per the drawing. For other elements of work such as providing blocks, making cross connections, fixing appurtenances etc., the approved drawings will be referred. Similarly, if for any reason such as for crossing utilities, the Engineer orders the depth of trenches to be increased, the contractors shall do so and such excess workshall be paid if the total quantum of earthwork varies.

5.3.5 Other aspects of work covered under excavation

5.3.5.1 Surplus Excavated Materials.

Surplus excavated materials not required for refilling etc. shall be carted outside the area to be excavated under this contract, as may be directed by the Engineer-in- charge.

5.3.5.2 Dewatering of Trenches

The contractors shall provide and work at their own cost all pumps, engines and machinery required to keep the trenches, for the excavation and for pipe laying etc., clear of water, whether sub-soil water, storm water or leakage from tanks, wells, drains, sewers or pipes or due to any other source of reason so that there may be no accumulation of such water. No setting out shall be done no masonry laid, no concrete deposited, no joints made, and no measurements taken in water. The pumping shall be continued during and after execution of any portion of the workand repeated so often as the Engineer may consider necessary. The pumps used shall be of adequate capacity and if at any time, the Engineer thinks that the pumps brought by the contractors are inadequate, the contractor shall bring on site and operate more pumps of the required capacity. If, however, the contractor fails to do

so, the Engineer may make arrangements to provide and work and adequate pumpsat the cost of the contractor.

The contractor shall take every precaution to discharge the water so pumped into the nearest drain in such a way that it does not spread on the road surface under traffic or cause any nuisance. If this is not possible and the road surface under traffic has to be crossed, the contractors shall restrict the flow to a suitable size pipe laid under and across the road. The pipe shall be immediately removed on completion of the works. No extra payment shall be made for making any such arrangement.

5.3.5.3 Fencing, Watching, Lighting

The posts of the fencing shall be of timber, securely fixed in the ground not more than 2.5 m apart. They shall not be less than 10 cm in Dia, or not less than 1.25 m above the surface of ground. There shall be two rails, one near the top of the posts and the other about 0.5 m above the ground and each shall be of 5 cm to 10 cm inDia and sufficiently long to run from post to post to which they shall be bound with strong ropes. The method, of projecting rails beyond the posts and tying together where they meet will not be allowed on any account. All along the edges of the excavated trenches, a bund of earth about one meter high shall be formed where so required by the Engineer-in-charge for further protection. Proper provision shall be made for lighting at night and watchmen shall be kept to see that this is properly done and maintained. "In addition to the normal lighting arrangements, thecontractors shall provide whenever such work is in progress, battery operated blinking light (6 volts) in the beginning and end of a trench with a view to provide suitable indication to the vehicular traffic. The contractor shall also provide and display special boards printed with fluorescent paints indicating the progress of the work along the road. The contractor shall be held responsible for payment of allclaims for compensation as a result of accident or injury to any person or property due to improper fencing, inadequate lighting or non-provision of red flags. The contractor shall at his own cost provide all notice boards before opening of roads as directed by the Engineer.

Arrangements shall be made by the contractor to direct traffic whenever work in through fare is in progress.

No separate payment shall be made for this item of work.

5.3.5.4 Blasting:

Blasting for excavation shall be permitted only after the approval of the competent authority obtained by the Contractor and when proper steps are taken for the protection of person and property by the Contractor.

5.3.5.5 Supporting of and Repairs to the Damaged Service Utilities

Utilities such as water pipes, drains, sewers, cables etc. which happen to foul the alignment, shall be temporarily supported throughout the work by the contractor at his cost to the satisfaction of the Engineer-in-charge. In this connection, the contractor has to contact the concerned departments and take all precautions that are considered necessary by them. On completion of the pipe laying operation and before refilling the trenches, some of the utility may have to be supported permanently by providing either masonry or concrete as directed. The masonry or concrete supports shall be paid for separately under the respective items. If during the execution of work any utilities are damaged, the same shall be repaired either by

the contractor or through the concerned department at the risk and cost of the contractor.

5.4 Concrete

5.4.1 General

The quality of materials and method and control of manufacture and transportation of all concrete work irrespective of mix, whether reinforced or otherwise, shall conform to the applicable portions of this specification.

The Engineer-in-charge shall have the right to inspect the source/s of material/s the layout and operation of procurement and storage of materials, concrete batching and mixing equipment and the quality control system. Such an inspection shall be arranged at Engineer-in-charge's approval obtained prior to starting of concrete work.

5.4.2 Materials for standard concrete

(a) **Cement:** Cement shall conform to IS 269 - 1976.

(b) **Aggregate:** Pine aggregate shall consist of natural sand confirming to IS 383, Sand shall be clean, sharp, hard and durable, free from dust, vegetable substance, clay, alkali, organic matter, or other deleterious substance which will be injurious to the setting qualities / strength / durability of concrete.

Coarse aggregate for concrete shall confirm to IS 383. This shall be crushed hard granite stone and free from scale, flaky, laminated pieces or any deleterious matter.

(c) Water shall conform to IS 456 - 1978.

5.4.3 Form work

5.4.3.1 Material

All form work for concrete work shall be made of MS Plates. The plates shall be free from wrinkles, debts, lumps or other imperfections. Steel plates shall have sufficient thickness to withstand the construction loads and the pressure exerted by the wet concrete as well as vibration during placing of concrete. Normally the thickness shall not be less than 18 gauges for MS Plates.

5.4.3.2 Surface Treatment & Finish

When the formwork is struck, all the faces of concrete shall be smooth and sound free from voids and air holes. Any roughness or irregularity on the exposed surface shall be immediately filled up while the concrete is still green with cement grout, cement wash and / or 1:1 mortar properly toweled and finished at contractor's cost. Such patching of the concrete face shall be carried only with the permission of the Engineer-in-charge. If the concrete is found honey - combed, the honeycombed portion and whatever surrounding concrete that may be considered unsatisfactory by the Engineer-in-charge shall be dismantled and fresh concrete of proper quality shall be provided at contractor's cost.

5.5 Reinforcement

General

Reinforcement shall be either plain round mild steel bars Grade I as per IS 432 (PartI) or medium tensile steel bars as per IS 432 (Part I) or high strength deformed barsas per IS 1786. Wire mesh or fabric shall be in accordance with IS 1566. Substitutionof

reinforcement will not be permitted except upon written approval from the Engineer-in-charge.

5.6 Transport of steel, pipes, specials, valves etc.

MS pipes and specials, valves, base plates, manhole covers, appurtenances, bolts and nuts, distance pieces, flanges, saddles, collars, bye-pass arrangements etc. shall be transported by the contractors to the laying site. In lining should be done at the store site of the contractor before transporting to laying site.

5.6.1 Handling of pipes, appurtenances, valves and specials

It is essential to avoid damage to the pipes, fittings and specials, etc. or their coatings at all stages during handling. The pipes and specials shall be handled in such a manner as not do distort their circularity or cause any damage to them in lining andout coatings. Pipes shall not be thrown down from the trucks nor shall they be dragged or rolled along hard surfaces. Slings of canvas or equally non-abrasive materials of suitable width of special attachment shaped to fit the pipes ends shallbe used to lift and lower pipes so as to eliminate the risk of damage to the coating.

Great care shall be taken in handling the pipe right from the first operation until they are laid and jointed. The contractor shall be responsible for any loss or damage to the pipes, specials, or their coatings. No defective or damaged pipe or specials shall be allowed to be used in the work without rectification to the satisfaction of the Engineer-in-charge. Any damage to the pipes and specials shall be repaired by the contractor at his cost to the satisfaction of the Engineer-in-charge.

5.7 General sequence of operations for laying above ground pipeline

Before commencing the work of pipe laying, the contractor shall study the Longitudinal Section of the pipeline for the section concerned and shall also study the details of pipeline above ground and across low laying area & nallahs.

The contractor shall take up the setting out markings and prepare the detailed working plan of the section based on the survey and investigation of the actual alignment of pipe line showing the positions of the pedestals / supported structuresto be cast in the section, the formation of which is ready for laying the pipelines. Pipe laying shall generally start from the fixed points on either side, the expansion joint, if provided, last. Fixed points are at all anchor blocks and pedestals.

Supporting structures / Pedestals shall be constructed before commencing the pipe laying work in any section.

5.7.1 Laying pipe buried underground:

Laying of welded steel pipe shall confirm specification laid in I.S. 5822 with latest amendment.

(a) The contractor shall use pipes of full length as far as possible. Shorter pipes will be used only if absolutely necessary and with prior permission of the Engineer-in- charge. If any pipe of odd length is required to fill a gap, the same shall be obtained by cutting pipes supplied by client. No extra payment for cutting welding for such works shall be paid. The lining and out coating shall be paid for the length separatelyas provided in BOQ. A length of 100 mm at each end of the pipe near the joint shallbe inclined and out coated at field only after laying and field welding of the pipe joints completed.

The pipes shall be lowered at any depth into the French by removing only one or two

struts at a time. When sharing shuttering is provided for excavation without damaging or disturbing the showing. Case shall be taken during lowering and laying pipe so that the out coating of pipe is not damaged. The pipe after lowered shall be laid in correct line and level by use of sight nails, levelling instrument. The longitudinal joints of two consecutive pipes at each circumferential joint are staggered by 90^0 while assembling the pipes. The ends of pipe shall be brought close enough to leave a uniform gap not exceeding 3 mm. If necessary, a required cut may be taken to ensure a close fit of the pipe faces. No extra payment shall be made for such required cutting. There shall be no lateral displacement between the pipe facesto be jointed. If necessary, by mechanical methods shall be adopted to bring the two ends in perfect contact and alignment. In no case hammering or longitudinal skidding will be permitted. When the pipe is properly assembled and checked for correct line and level to the grade. It shall be firmly supported on wooden beamsand wedges and tack welded. Some minimum portion of the trench may be allowedfor refilling to prevent the pipe losing its alignment. The tack welded circumferential joints shall then be welded fully by trained and experienced welder confirming to specification.

5.7.2 Precautions against floatation

When pipeline laid underground or above ground in a long narrow cutting gets submerged in water collected in the trench or cutting, it is subjected to an uplift pressure due to buoyancy and is likely to float, if completely or partly empty. In the design of pipelines, provision is made to safeguard against flotation by providing sufficient overburden or by providing sufficient dead weight by means of anchor blocks.

In the case of works extending over one or more monsoon seasons, however special care and precautions are necessary during the progress of work on this account. The work of providing anchor blocks and refilling the trenches to the required level and compacting the same etc. shall always be done as soon as the pipeline has been laid. The contractor shall see that water will not be allowed to accumulate in open trenches, where work is in an incomplete stage, precautionary work such as blank- flanging the open ends of the pipeline and filling the pipeline with water etc., shallbe taken as directed by the Engineer-in-charge. Such works shall be to the contractor's account and no separate payment will be made for the same. Two meters over burden shall be maintained at all times. Where this overburden is not available, anchor blocks have to be provided as shown in the LS Plans of Specification Drawing.

Protection of pipeline against floatation during the contract period shall be the responsibility of the contractor. Should any section of the pipeline float due to their negligence etc., the entire cost of laying it again to the correct line and level shall be to his account.

6.0 Welding of Joints

6.1 Preparation of Pipe faces for welding

Before aligning, assembling and welding, the pipe faces shall be cleaned byscrapping, with wire brushes or any other method approved by the Engineer-in- charge.

6.2 Welding Joints

6.2.1 Electrodes

The Contractors shall use standard electrodes, depending on the thickness of plate and the type of joint. They shall also use standard current and arc voltage required for the machine in use as per manufacturer's directions. Welding Electrodes shall conform to IS 814 - 1967. "Specifications for covered electrodes for metal arc welding of mild

steel" (second or latest revision) Indian made or equivalent foreign make electrodes of the required quality approved by the Engineer-in-charge shall be used wherever possible.

6.2.2 Welded joints (other than gap closing)

The edge of the pipes has to be chamfered using gas cutting to obtain a V grove joint. The edges should be properly cleaned before placement for welding

Welded joints shall be of the butt-welded type with external welding of required run (not less than two) confirming to specification laid in relevant I.S. code.

All parts to be welded shall have loose scale, slag, rust, paint and other foreign matter removed by means of a wire brush and shall be left clean and dry. All scaleand slag shall be removed from each weld when it is completed.

6.2.3 The welding of pipes in the field shall comply with IS 816-1965 (code of practice for use of metal arc welding for general construction in mild steel) and Hand book of Manual Metal arc welding for welders published by Bureau of Indian Standards.

6.2.4 Testing of Welded Joints

(a) In addition to Dry Penetration test, the welded joints shall be tested in accordance with procedure laid down in IS No. 3600 of 1966: "Code of Procedure for testing of fusion welded joints and weld metals in steel". One test specimen taken from at least one field joint out of any ten shall be subjected to test.

(b) The test pieces shall be taken out from the positions pointed out by the Engineer-in-charge without any delay. They shall be machined immediately and tested in weeks' time.

(c) The shape of the test pieces removed from the pipes shall be such that it will give a specimen of the required dimensions and at the same time leave a hold in the pipewith rounded corners. This hole shall be patched up by inserting and welding suitable sized plates. Great care shall be taken in preparing these plates so as to geta good butt weld.

(d) After the jointing is completed, all protruding portions shall be chipped off and ground smooth and the in lining and out coating shall be done.

(e) The entire cost of the test including taking out test samples, machining the test pieces, transport to and from the laboratory and testing them in a laboratory, the cost of patching up the test piece hold in the pipe, payment of all testing fees, cleaning and painting the same, shall be borne by Contractor. The tests shall be carried out in some Government or semi-Government Institute approved by the Engineer-in-charge. This shall be arranged by the Engineer entirely at the Contractor's cost.

(f) The following tests shall be made: -

6.2.4.1 Tensile

The test specimen taken perpendicularly across the weld shall be shaped in accordance with IS: 223 of 1950. The specimen shall be taken from the end of the pipe or at any field joint in the pipe as directed by the Engineer-in-charge and shallbe cut with the weld approximately in the middle of the specimen. The tension test specimen shall be machined. The protruding welded portion from both inside and outside shall be removed by machining or grinding before the specimen is tested.

At least one field joint out of every ten shall be subjected to test by taking out a specimen. If a test specimen shows defective machining or develops flaws not associated with welding, it may be discarded and another specimen substituted.The welded joint shall show strength not less than the minimum tensile strengthspecified for the plate. (Please refer to IS: 226 of 1969 or latest revision)."Specifications for

structural steel (Standard Quality)".

6.2.4.2 Bend Tests:

The bend test specimen shall be. prepared in the same way as that for tensile test and tested in the presence of the Engineer-in-charge. The specimen shall stand being bent cold through 180 degrees around a pin the diameter of which is equal to 4.5 times of thickness of the plate, without developing cracks in making the bend test, the side of the specimen representing the inside of the pipe shall be placed next to the pin.

6.2.4.3 Tre-planned Plugs:

Tre-planned plugs shall be taken out from any welded portion by the Engineer-in-charge. The plugs taken out shall not show, on examination, any defects in welding such as inclusion of slag, blow holes, cavities etc. the plug shall be 12 mm in Dia and shall be taken out by means of a suitable hold saw operated electrically.

The holes shall be either filled back by inserting a steel stud and welding all rounds or by threading the hold and providing a suitable Gl Plug.

6.2.4.4 Re-Test:

If the results of the tensile or bend test of any lot do not conform to the requirements specified, results of two additional specimens from the same section shall be made; each shall conform to the required specifications. In case of failure of one or both, extensive grousing (scooping out) and repairing shall be carried out as directed by the Engineer-in-charge before the lot can be accepted.

g) The welder / operator shall be held responsible for any failure of the joint. Since factors such as current, and voltage, quality of electrodes etc. are already determined and controlled, the failure is due to carelessness and negligence of the welder. For the first failure the welder operator shall be warned and for the second failure, he shall be removed from the work and replaced by another suitable operator. The joints or a portion thereof shall be gouged and repaired to the satisfaction of the Engineer-in-charge. In order to maintain a good standard in welding, all welders shall be tested before they are entrusted with any job. They shall be periodically tested at intervals of every six months.

(h) 10% of field welded joints shall be subjected to Radiographic Tests as per IS 4853 - 1983. Payment shall be made separately per centimeter run of field welded joint. They contractor shall maintain the details of the tests as per the specification regarding class A, class B tests, type of IQ, recommended technique for making radiographs, type of industrial X-ray film intensifying screen, system of marking, etc.

(i) A complete record shall be maintained by the contractors showing the names ofwelders and operators working on each individual joint. The work shall preferably be carried out by qualified/certified welders so that by observing proper sequence, distortion can be avoided. A joint entrusted to a particular individual shall be as far as possible completed by them in all respects, including the sealing run. No helper or other unauthorized unqualified person shall be permitted to do any welding work whatsoever. In case of any infringement the person concerned shall be punished as directed by the Engineer-in-charge.

6.3 In lining and out coating of joints

After welding of joint and testing of welded joints are completed in all respects the internal lining and external out coating of the pipeline shall be completed at every joint as per approved specification.

6.4 Gas cutting

In the course of the work, the contractor may be called upon to cut steel pipes, specials, etc. on site. Gas cutting shall be adopted for preparing on site, distance pieces, straps etc. cutting out holes in the pipeline laid for manholes, scour valves, air valves and other appurtenances, holes required for blast cleaning operation, cutting of pipe faces to form links or bends, holes required for bye pass arrangement.

Gas cutting shall include chamfering for forming 'V' or square cut, cost of aligning, holding in position member etc. and shall cover thickness up to 40 mm.

After cutting, the edges shall be made smooth and even by using electrical or pneumatic grinder so as to remove all inequalities. Care shall be taken to see that the shape of the material cut is not defaced in any way at the time of cutting. The ends of the pipe shall have bevel edge to facilitate hand welding. As field welding isto be carried out from inside in the case of pipes of diameter 300 mm and above, the bevel shall be from inside. For pipes of smaller diameter, field welding has to be done from outside only, the edges of pipe cut shall have bevels to suit the above.

No separate payment shall be made for this item of work.

6.5 Flanges

Flanges shall be provided at the end of pipes or specials where sluice valves, blank flanges, tapers etc. have to be introduced. The contractors shall assemble the flanges in exact position of the sluice valve, if necessary, so as to get the desired position of the sluice valves etc. either vertical or horizontal and shall then fully weld the flanges from both sides in such a way that no part of welding protrudes beyond the face of the flanges. In case welding protrudes beyond the flanges and if the Engineer-in- charge orders that such protrusions be removed, the contractors shall either file or chip them off. If required, and when ordered by the Engineer-in-charge the contractor shall provide gusset stiffeners, welded as directed on site.

6.6 Straps

Wherever pipe laying work is done from two faces and / or has to be done in broken stretches due to any difficulty met with at site, the final connection has to be made by introducing straps to cover gaps up to 30 cm length. Straps shall also be provided as per the procedure of fixing Expansion joint. Such straps shall be fabricated in the field by cutting pipes, slitting them longitudinally and slipping them over the ends tobe connected in the form of a collar. The collar shall be in two halves and shall have its inside diameter equal to the outside diameter of the pipe to be connected. A minimum lap of 8 cm on either ends of the pipe shall be kept and fillet welds shall be run both internally and externally for circumferential joint. In case of pipes 600 mm Dia and below, internal fillet weld may not be provided if so, permitted by the Engineer-in-charge. The longitudinal joints of the collar shall be but/-welded. All fillet welds shall have a throat thickness of not less than 0.7 times the width of welding.

6.7.1 Appurtenances:

Appurtenances such as sluice valve, scour valve, N.R. valves, Air valves (supplied by client) have to be transferred by the contractor to the site of work and fix them at the approved location including supply of jointing material such as rubber packing, bolts & nuts and other required materials.

6.7.2 Transporting and handling coated pipes, specials, appurtenances etc.

Pipes, specials, valves etc. shall be handled at all times with equipment such as stout wide belt slings and wide padded skids designed to prevent damage to the coating. Bars cables, chains, hooks, metal bars or narrow skids shall not be permitted to come in contact with the coating.

In truck shipments, the pipe shall be supported in wide cradles of suitably padded timbers hollowed out on the supporting surface to fit the curvature of pipe, and all chains, cables, or other equipment used for fastening the load shall be carefully padded. For smaller diameter pipes, sand or saw-dust filled bags may be used instead of hollowed out timbers.

The Engineer-in-charge shall inspect the pipe and pipe protection on trucks at destination, and if the pipe protection is found damaged, the same shall be repaired to the satisfaction of the Engineer-in-charge by the contractor at his cost.

6.7.2 Handling coated pipe in field or at trench

Pipe shall be stored along the trench side suitably supported off the ground to avoid damage to the coating.

Pipe shall be hoisted from the trench side to the trench by means of wide belt slings. Chains, cables tongs or other equipment likely to cause damage to the coating will not be permitted, no do the dragging or skidding of the pipe. The contractor shall allow inspection of the coating on the underside of the pipe while it is suspended from the slings. Any damage shall be repaired before the pipe is lowered into the trench.

At all times during laying of the pipeline, the contractor shall use every precaution to prevent damage to protective coating on the pipe. No metal tools or heavy objectsshall be permitted to come into contact unnecessarily with the finished coating. Workmen will be permitted to work upon the coating only, when necessary, in which case they shall wear shoes with rubber or composition soles and heels. This rule shall apply to all surfaces. Any damage to the pipe or protective coating from any cause during the installation of the pipeline shall be repaired, as directed, and at the expense of the contractor.

6.9 Refilling of trenches

On completion of the pipe laying operations in any section, for a length of about 100 meters and while further work is still in progress, refilling of trenches shall be started by the contractor with a view to restrict the length of open trenches. Pipe laying shall follow closely upon the progress of Trench Excavation and the contractor shall not permit unreasonably excessive lengths of trench excavation to remain open while awaiting testing of the pipeline. If the Engineer-in-charge considers that the contractor is not complying with any of the foregoing requirements, he may prohibit further trench excavation until he is satisfied with the progress of laying and testingof pipe and refilling of trenches. Only soft earth and gravel of good quality free from stones greater than 50 mm in size free from boulders, roots, vegetable matter etc. shall be utilized after the lumps are broken. The excavated material nearest to the trench shall be used first. If sufficient quantity of excavated gravel is not availablethe trench shall be filled by borrowed gravel or material up to 30 cm above top of pipe. Care shall be taken when back fillings, not to injure or disturb the pipe or joints

of the out coating. Filling shall be carried out simultaneously on both the sides of the pipes so that unequal pressure does not occur. Walking or working on the completed pipeline shall not be permitted unless the trench has been filled to a height of at least 30 cm over the top of the pipe expect as may be necessary for tamping etc. during back filling work. Filling in shall be done in layers not exceeding 10 cm in thickness accompanied by adequate watering, ramming etc. so as to obtain good compaction up to 30 cm above the top of the pipe. Above this level, excavated earth free form boulders shall be placed in layers of 160 mm, watered and compacted by tamping. Water contents of the soil shall be as near as the optimum moisture content as possible. The trench shall be refilled so as to build up to the original ground level, keeping due allowance of 30 cm over ground level for subsequent settlement likely to take place.

The Engineer-in-charge, all times, have powers to decide which portion of the excavated material that shall be used for filling and in which portion of site and in what manner it shall be so used.

The surplus and useful material shall be removed to any site as decided by the Engineer-in-charge to a distance of 1 Kilometer of 5 Kilometers within a specified period and shall be properly spread and levelled as directed at such sites. If the contractors fail to remove the earth from site within seven days after the period specified in a written notice, the Engineer-in-charge may arrange to carry out such work at the contractor's risk and cost or may impose such fine for such omission as he may deem it.

(b) Filling in incomplete works

If the work for which an excavation is made, is not completed before the day fixed by the Engineer-in-charge for filling in any excavation on account of any special occasion or ceremony or important festivals such as Diwali, Moharram etc. the contractor shall refill such excavation and consolidate the filling at his own expense no withstanding the non-completion of the work as aforesaid. In no such case shall be contractor have any claim for payment of such excavation, in refilling or consolidation nor for any such incomplete work, but on the other hand, the contractor shall bear the cost of road repairs in respect of such excavation at such time, together with the cost of such procedure as may be adopted by the Engineer- in-charge.

(c) Subsidence in filling:

Should any subsidence take place either in the filling of the trenches or near about it during the maintenance period of first 12 months from the completion of the work, the contractor shall make good the same at their own cost, or the Engineer-in-charge may without notice to the contractor, make good the same in any way and with any material that he may think proper, at the expense of the contractor. The Engineer-in- charge may also, employ persons for making good the same, and the expenses on this account shall be charged to the contractor.

(d) Bedding for Pipes

Bedding shall be provided with 100 mm thick sand for DI/MS pipes properly consolidated.

7.0 Internal cleaning of pipeline:

When a section of pipeline has been laid and all the work inside it, has been completed to the satisfaction of the Engineer-in-charge its internal surface shall be cleared of all dirt, debris, dust or other deposit.

Cleaning shall be done to the satisfaction of the Engineer-in-charge. The section of the pipeline once cleaned to the satisfaction of the Engineer-in-charge shall not be entered into for any purpose later. Sufficient precaution shall be taken to prevent the ingress of any dirt, debris etc. just inside the section. Failing this, the section shallbe cleaned again at the discretion of the Engineer-in-charge.

No separate payment will be made for the work cleaning. The item rates quoted for laying the pipes etc. shall include the cost thereof.

In the case of above ground pipeline, the length of the section to be taken up for cleaning shall be decided in consultation with the Engineer-in-charge from the point of view of ventilation etc.

In case of buried pipeline, a section shah be taken up for cleaning after the work of back filling around and over the pipeline is completed and the spiders, etc. havebeen removed from inside.

During the pipe laying operations in the adjoining sections, the contractor shall take all precautions to prevent ingress of water, muck, debris, dirt, dust, etc. in the cleaned section, failing which the section shall be cleaned again at the discretion of the Engineer-in-charge. Where deemed necessary by the Engineer, suitable closures shall be provided at the open end or the ends of the cleaned sections. At the end ofa day's work, closure shall invariably be provided at all the open ends to protect the pipeline from ingress of sub-soil water, mud, muck, etc.

7.1 Field testing of S pipe line including specials, valves etc.

After the work of laying of pipeline is completed and before putting into commission, the pipeline shall be hydraulically tested in the field as per IS-5822.

7.1.1 Preliminaries: -

For purpose of pressure testing, the pipeline shall be divided into sections as defined by the Engineer-in-charge.

Each valve section of the pipeline shall be subjected to a hydraulic test in full length or in part as may be found necessary. For this test, the pipe shall be slowly filled with clean water as directed and all air shall be expelled from the pipeline through hydrants, air valves and blow offs fixed on the pipeline. Once the pipeline is full the pressure in the line should then be raised and built up and maintained by means of suitable approved pumps, to the specified test pressure based on the elevation of the lowest point on the line or section under test. The test pressure shall be maintained for one hour. The quantity of water added to re-establishes the pressure should not exceed 0.1 liter per mm of pipe diameter per kilometer per day for each30 M head of pressure applied.

The leaking joints noticed during testing shall be repaired. The repaired joints shall be subjected to a re-test. No section shall be accepted unless it is put in perfectly water tight condition and rested satisfactorily. The contractor shall make all arrangements for all labor, pumps, pressure gauges, equipment etc. No main valves or cross connection either on the new or the existing main shall be operated by the contractor, and only the Engineer-in-charge's Representative shall operate the same. The contractor shall arrange for labor required for operating the air valves, etc.

7.2 Chambers

All chambers shall be as per approved drawings and specifications

8. Specification for valves

8.1 Sluice Valve

The material to be supplied under this sub-section shall include but not be limited to valves & fittings including bolts, nuts, gaskets, backing rings, counter flanges, jointing material, strainers etc. as required

Cast Iron double flanged ends 150/200/300 mm (nominal) Dia sluice valve with cast iron cap / Hand wheel, PN 1.6 class to be fitted on 300 mm pipe line for Isolation purpose. The C.I. sluice valve shall confirm to specifications laid in I.S. 14846: 2000and having standard B.I.S. certification mark on the body.

Material of Construction:

(a) Body	C.I. I.S. 210 Grade F.G. 200
(b) Disc / wedge	C.I. I.S. 210 Grade F.G. 200
(c) Stem / shaft	S.S. I.S. 6003
(d) Body sealing	
Wedge facing ring	S.S. I.S. 6003

Each valve body shall have marked cast in raised letter as per I.S. 14846

8.2 Scour Valves

Cast Iron double flanged ends 150 mm Dia (Nominal) with C.I. cap / hand wheel, P.N. 1.6 class sluice valve to be fitted on branch pipe for scour purpose. The C.I. sluice valve shall confirm to specifications laid in I.S. 14846: 2000 and having standard B.I.S. mark on the body. Material of construction will be same as above. Marking cast on each valve body in raised letter shall be as per I.S. 14846: 2000.

8.3 Non-Return (Swing Check type Reflux) Valve

Cast Iron Non-return double flanged ends valve of single door swing check type class PN 1.6, 150/200 mm Dia (nominal) with bypass arrangement, confirming to I.S. 5312 and having standard B.I.S. mark on the body to be fixed on pipe line in horizontal position. The following information shall be cast on each valve body.

(a) Manufacture's name or Trade Mark.
(b) Nominal pressure of Valve (PN 1.6)
(c) Size of valve in mm
(d) Direction of flow

Material of construction

(a) Body, cover, door, bearing holders	:	Gray cast Iron I.S. 210 Gr.200
(b) Hinge pin, door pin, and door suspension pin:		S.S. I.S. 6003 12 CR 12
(c) Body seat ring, Door face ring, bearing bush:		Bronze 318 G.L.T.B 32
(d) Bolts 2 nuts	:	Carbon steel I.S. 1363 Class 4.6 and class 4.0
(e) Gasket :		Rubber I.S. 638 Type B
(f) Hinges :		C.I. I.S. 210 Gr Fg 200

8.4 Air valves

Cast Iron double kinetic air valve, small orifice fitted with rubber ball and large orifice with vulcanized ball flanged inlet tested to 16 kg/cm^2 for shell and 10 Kg/cm^2 for seat. Size 80/100 mm to be fitted on 300 mm Dia pumping main at locations as per direction of Engineer–in-charge and alignment drawing.

8.5 Flanges of valves

Dimensions of the flange and their drilling shall be in accordance with the requirements given in I.S. 1538 in general.

Annexure -V

GENERAL AND COMMERCIAL TERMS & CONDITIONS

1.0 DEFINITIONS

In the RFQ, the following words and expressions are used in the following senses, unless a contrary intention appears from the context:

1.1 ' **ACTS'/ 'CODES'** shall mean, but not limited to the following, including the latest amendments, and/or replacements, if any: -

a) Indian Electricity Act, 1905 and Rules and Regulations made there under.
b) Indian Factory Act, 1948, and Rules and Regulations made there under.
c) A.S.M.E Testing Codes (ASME-PTC).
d) A.I.E.E Test Codes
e) American Society of Testing of Materials (ASTM Codes).
f) Relevant standards of the Bureau of Indian Standards (IS Codes)
g) Arbitration and Conciliation Act, 1996, and Rules made there under.
h) Environment (Protection) Act, 1986 and Rules made there under.

1.2. **'BID'** shall mean offer/proposal/document that the bidder submits in the required and specified form in accordance with the provisions of RFQ duly signed by the bidder's legally authorized signatory under seal of his firm/company.

1.3. '**COMPLETION PERIOD'** shall mean the period by/during which the WORK shall be completed as agreed herein between the OWNER and the CONTRACTOR.

1.4 ''**CONTRACTOR/CONTRACTOR'** shall mean the firm or party on whom the Letter of Intent/Work order for faithful execution of the work mentioned herein is placed and shall include his/her/their heirs, legal representatives, successors and permitted assigns.

1.5 **'CONTRACT'** shall mean and include the LOI/WORK ORDER/Formal Agreement/RFQ document, drawings and other annexure hereto, General & commercial terms & conditions of the CONTRACT, specifications, if any and all these documents taken together shall form one document and shall be deemed to form one CONTRACT and shall be supplementary to one another. The CONTRACT shall be drafted on non- judicial stamp paper of appropriate value and shall be signed by the authorized officers of both the CONTRACTOR and the OWNER in the presence of witnesses asper format to be supplied to the successful BIDDER.

1.6. **CONTRACT VALUE'** shall mean the sum total of lump sum fees to be paid to the CONTRACTOR for the subject study.

1.7. **'DAY'** shall mean a calendar day.

1.8 '**DATE OF CONTRACT'** shall mean the calendar date on which the OWNER and the CONTRACTOR sign the 'CONTRACT'

1.9 '**DRAWINGS'**, 'PLANS' shall mean all:

a) Drawings/sketches/single line diagram etc. furnished by the OWNER as a basis for proposal.
b) Supplementary drawings furnished by the OWNER to clarify and to define in greater detail the intent of the RFQ and/ or CONTRACT.
c) Drawings submitted by the CONTRACTOR with his proposal, provided such drawings are acceptable to the OWNER:
d) Drawings furnished by the OWNER to the CONTRACTOR during the progress of the work and

e) Engineering data and drawings submitted by the CONTRACTOR during the progress of the work provided such drawings are acceptable to the OWNER.

1.10 ''**DRAFT REPORT'** shall mean the report submitted by the CONTRACTOR as per the scope of work defined in RFQ.

1.11 '**ENGINEER –IN-CHARGE'** shall mean the person designated as such by the OWNER and shall include those who are expressly authorized to act for and on his behalf for operation of the 'CONTRACT'.

1.12 '**EQUIPMENT'** shall mean any machinery, equipment, instrument or electrical items within the battery limit of Site.

1.13 '**FINAL REPORT'** shall mean the report submitted by the CONTRACTOR after incorporating changes mutually agreed during the meeting with the Owner on the Draft Report submitted by them.

1.14 '**FINAL ACCEPTANCE'** shall mean the OWNER'S written acceptance of the satisfactory execution of the work by the CONTRACTOR in accordance with WORK ORDER/CONTRACT.

1.15 '**Request for Proposal (RFQ)**' shall mean and include the present document together with such supplements and addendum which may be issued by the OWNER from time to time, detailing therein the scope of job to be undertaken and executed bythe CONTRACTOR for the proposed Study of KRIBHCO RFQ.

1.16 **LETTER OF ACCEPTANCE OF BID, LETTER OF INTENT (LOI) and/or LETTER OF AWARD OF WORK ORDER** shall mean a letter in writing sent by the OWNER by registered post to the last known private or business address or the registered office of the CONTRACTOR informing/notifying the CONTRACTOR that his Bid/Offer has been accepted, subject to conditions as stated therein.

1.17. '**SITE'** shall mean the site of proposed work i.e. proposed plant locations of KRIBHCO Green Energy Pvt. Ltd. at Hazira, Nellore and Jagtial for which work is to be performed.

1.18. '**WORK' or 'WORKS** shall mean all the services/tasks/jobs undertaken and to be executed by the CONTRACTOR pursuant to/under the CONTRACT from time to time.

1.19. ''**OWNER'** shall mean Kribhco Green Energy Pvt. Ltd (KGPEL) having its registered office at A-60, Kailash Colony New Delhi-110048

1.20 '**WRITING'** shall mean any document duly signed by a person authorized by CONTRACTOR or OWNER.

1.21. '**ZERO DATE/ EFFECTIVE DATE OF CONTRACT'** shall mean the date of issue of LETTER OF INTENT (LOI) or issue of WORK ORDER, whichever is earlier.

2.0 CONTRACTOR TO ACQUAINT HIMSELF FULLY

The CONTRACTOR shall acquaint himself fully and thoroughly with the conditions and limitations including scope, requirements and official/statutory regulations, under which, conforming to which and subject to which, services/work are to beperformed. Failure to comply with the aforesaid requirements will not relieve the CONTRACTOR of his obligations in the event of his tender being accepted nor will any claim whatsoever be entertained on the plea of ignorance or overlooking.

3.0 CONTRACT TO BE TREATED AS CONFIDENTIAL

3.1 RFQ, CONTRACTOR Bid and subsequent correspondences, Minutes of Meetings (MOMs), record notes of discussions, etc. shall be kept confidential. The reports prepared for the subject assignment under the CONTRACT shall be the property of OWNER and the contents of these RFQ/reports shall not be divulged to any outside party

without the prior written consent of OWNER.

3.2 Any information obtained in the course of the execution of the Contract by the CONTRACTOR, his employees or agents or any person so employed by him, as to any matter whatsoever, which would or might be directly or indirectly of use of the party other than KRIBHCO must be treated as 'secret' and shall not at any time be communicated to any person without prior approval/permission of the owner.

3.3 The terms and conditions of the CONTRACT shall not be disclosed by either party to any third party without prior written consent of the other party. This provision is however not applicable for disclosure to the Government / Statutory authorities of India and either party's Bankers &Members.

3.4 The CONTRACTOR shall have no objection to the OWNER disclosing information referred above at any time to KRIBHCO's Management/Board and Government of India.

4.0 CONTRACTOR TO EXECUTE WORK AS PER CONTRACT

The CONTRACTOR shall execute the Work in strict conformity with the terms and conditions as stipulated and provided for in the LOI/Work Order/CONTRACT, placed on/ entered into with the CONTRACTOR. The CONTRACTOR shall not vary or deviate from the said plans and specifications without having first obtained the prior permission in writing from the OWNER.

5.0 EFFECTIVE DATE OF CONTRACT

The date of award of contract, which is the issue date of LOI by Owner, shall be the Effective Date or Commencement Date of the Contract.

6.0 COMPLETION PERIOD/COMPLETION TIME SCHEDULE

The schedule for the entire work shall be not be more than three (03) months.

7.0 FEES FOR SUBJECT ASSIGNMENT:

The Lump Sum Turn Key (LSTK) cost of the subject work shall be as per the Price Schedule (Annexure-VI)

8.0 TERMS OF PAYMENT FOR THE CONTRACTOR

The Payment terms shall be as under for each project

a) 10% of the Contract Price on mobilization to site.
b) 70% of the Contract Price will be paid as following:

70% of the Value of Pumping Station will be paid as follows • 10% on completion of Coffer Dam • 10% on completion of intake channel • 15% on completion of well • 20% on completion of pump house • 15% on installation of three pumps and motors
70% of the value of Pipeline will be paid as follows: • 35% of the value of material as it is delivered on site

- 35% pro rata on completion of work

c) 10% of the Contract Price on mechanical completion
d) 10% of the satisfactory performance and testing of the complete work
e) Owner may frame a detailed procedure for 70% payment in its discretion.

9.0 DELAYS IN COMPLETION AND MUTUALLY AGREED DAMAGES

In the event the Contractor fails to complete the job in a period of three months from the date of EOI, the liquidated damages for delay shall be payable by the Contractor. The Liquidated damages for delay shall be equal to 1.0% of the total contract price for every week or part thereof of delay beyond the completion period or extension thereof. Maximum Liquidated Damages for delay shall be 12% of total contract price. The Contractor shall pay such Liquidated Damages within seven days of demand from the Owner otherwise the Owner shall deduct it from any amounts payable to the Contractor.

10.0 TERMINATION/ SHORT CLOSURE

Owner may terminate the Contract due to any reason including reasons due to force Majeure, regulations or ordinance of Government of India or any other reasons beyond control of the Owner. If the Owner due to reasons (s) of Force Majeure like war, hostilities, revolution, civil commotion, strike, epidemic, accident, fire, flood, earthquake, regulation or ordinance or requirement of Government of India or any sub-division thereof, or authority or representative of Government of India or any other act whatsoever, whether similar or dissimilar to those enumerated, beyond the reasonable control of the parties hereto or because of any act of GOD, beyondthe control of Owner short closes the Contract, the Owner shall pay to the CONTRACTOR, compensation for the meaningful services rendered by the CONTRACTOR on furnishing of documents and proof of services and expenditure incurred by the CONTRACTOR. No other charges will be admissible.

11.0 RIGHTS OF OWNER

11.1 A unilateral stoppage of work by the CONTRACTOR shall be considered a breach of the CONTRACT and the OWNER reserves its right to take necessary and suitable action as it may deem fit, to adequately protect his/its interest; at the risk and costof the CONTRACTOR. Any aforesaid action shall be without prejudice to any other action, rights and remedies etc. that may also be available.

11.2 In the event the CONTRACTOR fails to fulfill his obligations under the CONTRACT, the OWNER shall have the right to get the work done by any other agency, at the risk and cost of the CONTRACTOR.

12.0 WORK TO BE OPEN TO INSPECTION

All work under or in course of execution or executed in pursuance of the Contract shall at all times be open to the inspection and supervision of the Engineer -in- charge and his authorized subordinates, and the CONTRACTOR shall at all times during the usual working hours and at all other times at which reasonable notice of the intention of the Engineer -in-charge or his subordinate to visit the works shall have been given to the CONTRACTOR, either himself be present to receive order and instructions, or have a responsible agent duly accredited in writing, present for that

purpose. Order given to the CONTRACTOR's agent shall be considered to have the same force as if they had been given to the CONTRACTOR himself.

13.0 SETTLEMENT OF DISPUTES

All disputes or differences of any kind, whatsoever arising out of or in connection with the CONTRACT, whether during the progress of the work or after its completion and whether before or after short closure of the CONTRACT, shall be referred by the CONTRACTOR to the OWNER and the OWNER shall within a reasonable time after such representation, make and notify his decision(s), thereon, in writing. The decision, directions and certificates with respect to any matter, as is especially provided for by these conditions, given and made by the OWNER (which matters are hereinafter referred to as Expected matters) shall be final and binding upon the CONTRACTOR. In case the decision of OWNER is not acceptable to the CONTRACTOR, he can resort to the remedies under Arbitration as specified in Clause-20 of General& Commercial Terms & Conditions. However, if the final bill is signed by the CONTRACTOR as 'Accepted' in full and final settlement thereof, no dispute raised thereafter shall be valid.

14.0 OBSERVANCE & COMPLIANCE OF STATUTORY RULES/LAWS

14.1 The rights and obligations of the OWNER and the CONTRACTOR and provisions of the CONTRACT shall be governed and construed by and in accordance with the laws of India.

14.2 The CONTRACTOR shall be singularly responsible to secure strict compliance with all Central and State laws as well as the rules, regulations, by-laws and orders of the local authorities and statutory bodies as may be in force, from time to time.

14.3 It shall be the duty of the CONTRACTOR to pay the wages to its employees as specified by the Government from time to time. The CONTRACTOR shall have no right whatsoever to claim the escalated wages after the award of the contract from OWNER as notified by the Government from time to time. Upward revision in the minimum wages from time to time shall be deemed to have been inbuilt in the rates quoted by the CONTRACTOR.

15.0 CO-OPERATION

The CONTRACTOR and the OWNER shall cooperate with each other and make best efforts for smooth execution of the Work and co-operate with and assist all others who may be performing services for the OWNER in connection with the Work under the CONTRACT.

16.0 SUB-LETTING OF WORK

The CONTRACTOR shall not assign or sublet the Work under the CONTRACT or any part thereof or any share or interest therein without prior written consent/permission of the OWNER.

17.0 MEASUREMENT SYSTEM

Metric system will be adopted for the collection/reporting of data and in the preparation of the reports.

18.0 INDEMITY OF THE OWNER

a. The CONTRACTOR shall at all times indemnify and keep indemnified the OWNER and/ or its employees against all losses and claims for injuries or damages to any person or property whatsoever which may arise out of consequence of the execution of the works and against all claims, demands, proceedings, damages, cost, charges and expenses whatsoever in the respect of or in settlement thereto.

b. The CONTRACTOR shall at all times indemnify the Owner against any claim which may be made under Workmen's Compensation Act or any statutory modifications thereof or otherwise for or in respect of any damage or compensation payable in consequence of any accident or injury sustained by any workman or other person whether in the employment of the CONTRACTOR or not.

c. The CONTRACTOR shall at all times keep the OWNER indemnified against all claims, damages or compensation under the provisions of payment of Wages Act, 1936, Minimum Wages 1948, Employees Liability Act 1938, The Workmen Compensation Act, 1923, Equal remuneration Act-1976, Employment of Child Labor Act –1938, Abolition of bonded labor Act and the Contract Labor (Regulation and abolition) Act-1970 or any other Act regulating the employment of Labor by CONTRACTOR.

d. The CONTRACTOR shall at all times indemnify Owner against all claims which may be made in respect of the plant and machinery for infringement of any right protected by patent registration of design and trade mark. Provided always that in the event of any claim in respect of any alleged breach of patent, registered designs or trade mark made against the Owner, the same shall be notified to the CONTRACTOR and CONTRACTOR shall at his own cost either settle any such disputeor conduct any litigation that may arise there from.

19.0 FORCE MAJEURE

19.1 The terms and conditions agreed upon under the CONTRACT shall be subject to Force Majeure. Neither the CONTRACTOR nor the OWNER shall be considered in default in the performance of its obligations contained therein, if such performanceis prevented or delayed or restricted or interfered with by reasons of war, hostilities, revolution, civil commotion, strike, epidemic, accident, fire, flood, earthquake, regulation or ordinance or order of any Government or any sub-division thereof, or authority or representative of any such Government or because of any act of GOD. The party so affected shall give a notice of such occurrence to the other party in writing within 10 days from the date of occurrence the force majeure condition, furnishing therewith documentary evidence supporting the invoking of the force majeure On cessation of force majeure the party

19.2 Invoking force majeure shall inform the other party of the period for which force majeure condition continued and shall also give documentary evidence thereof to this effect. Should one or both parties be prevented from fulfilling their contractual obligation by a state of force majeure lasting continuously for a period of 30 (Thirty) days, both the parties shall meet and decide about the future course of action for implementation of the CONTRACT.

20.0 ARBITRATION

20.1 Except otherwise provided in this Contract, all matters, questions, disputes, differences whatsoever which shall at any time arise between the parties hereto,

touching the construction, meaning or operation or effect of the contract or out of matters related to the contract or breach thereof, or the respective rights or liabilities of the parties, whether during or after completion of the work or whether before or after termination shall be referred to the Arbitration in accordance with the provision of Arbitration and conciliation act, 1996.

20.2 The Arbitration proceedings shall be governed by the Indian Arbitration andConciliation Act, 1996, or any statutory modification or re-enactment thereof and the Rules made there under.

20.3 Both Parties shall continue to fulfill their respective obligations under this CONTRACT during the arbitration proceedings.

20.4 The language for all proceedings shall be English.

20.5 The venue of arbitration shall be New Delhi, India.

21.0 NOTICES AND ADDRESSES

Unless another form of notice is specified for a specific purpose under the CONTRACT, any notice or order required or permitted under this CONTRACT shall be in writing and shall be given either personally or by post or telegram or fax. In case of fax, messages should be confirmed by concurrent letters and shall be deemed to be sufficiently given if and when received by the party in normal course to be notified at the address set forth herein or if and when mailed by registered post, postage pre- paid addressed to such party at the address set out below:

In the case of OWNER, all correspondence with respect to KRIBHCO shall be given at the following addresses:

Mr. R. Venkataramanan
Chief Financial Officer
KRIBHCO Green Energy P Ltd
KRIBHCO Bhawan
A-10, Sector-1, Noida – 201 301,

22.0 JURISDICTION OF COURTS

Notwithstanding any other court or courts having jurisdiction to try any civil suit arising out of this contract, it shall be only the court of competent jurisdiction at New Delhi India to try such suits.

23.0 OBLIGATION OF THE OWNER

The obligation of the OWNER for fulfillment of the work shall be as follows:

23.1 The OWNER shall nominate Officer/Officers to represent OWNER for the purpose of the work and will notify the CONTRACTOR accordingly.

23.2 The OWNER shall supply to CONTRACTOR within reasonable time all necessary and relevant data and information as per the availability and as may be required in furtherance of the CONTRACT.

23.3 The OWNER shall review and approve all sketches, drawings, reports, recommendations and other matters referred to him for decision by the CONTRACTOR within such reasonable time as not to delay or disrupt the performance of the CONTRACT of their services, without prejudice to the

responsibility of the CONTRACTOR under the CONTRACT.

23.4 The OWNER shall pay to the CONTRACTOR for the services under the CONTRACT as per agreed terms of payment.

24.0 OBLIGATIONS OF CONTRACTOR

The obligations of the CONTRACTOR in fulfillment of the Work shall be as follows:

24.1 The CONTRACTOR shall nominate Officer/Officers to represent the CONTRACTOR for the purpose of the Work and will notify the OWNER accordingly.

24.2 The CONTRACTOR shall exercise all skill, care and diligence in the discharge of the services agreed to be performed by him, under the CONTRACT.

24.3 The CONTRACTOR shall execute the "Work" provided for and entrusted to him as per the RFQ and/or CONTRACT in a thorough and workmanlike manner and with thebest resources available with him in a professional manner in accordance with the plans, specification, terms and conditions contained herein or annexed hereto or contained in or annexed to the CONTRACT and the CONTRACTOR warrants about the workmanship of the work executed by him and of the soundness of the documentation etc. as required of him under the CONTRACT.

25.0 INSURANCE

25.1 The CONTRACTOR shall be solely responsible for any loss, damage or injury etc. caused to his personnel deputed by him for the work under the CONTRACT. Any compensation whatsoever payable on that account shall be borne and paid by the CONTRACTOR exclusively. The CONTRACTOR will arrange for necessary insurance coverage for the same at his own cost.

25.2 The CONTRACTOR shall take Insurance cover for his employees to cover his liability under workmen compensation Act. The CONTRACTOR shall also take medical cover under his insurance policy to meet medical treatment expenses of his employees in the event of accident while on duty.

25.3 The CONTRACTOR shall indemnify the OWNER and every officer and employee of the OWNER against all actions, proceedings, claims, demands, costs and expenses whatsoever arising out of or in connection with matters referred to in relevant clauses and against all actions, proceedings, claims, demands, costs and expenses which may be made against the OWNER for or in respect of or arising out of any failure by the CONTRACTOR in the performance of his obligations under the CONTRACT.

25.4 The CONTRACTOR will indemnify the OWNER from all claims for injury caused to any person, while in or upon the site of the OWNER.

26.0 TITLE OF DOCUMENTS

TITLE OF TECHNICAL DATA FURNISHED BY KRIBHCO

Title of all technical data and information furnished to the CONTRACTOR by the OWNER under the CONTRACT shall remain with the OWNER. Such data shall not be used or divulged to others by the CONTRACTOR without the prior written consent of the OWNER, as the case may be except for the use in connection with the performance of the CONTRACT.

26.1 TITLE TO TECHNICAL DOCUMENT FURNISHED BY THE CONTRACTOR

Title to all the technical documents prepared and furnished by the CONTRACTOR to the OWNER under the CONTRACT shall remain with the CONTRACTOR. However, it is understood that only know-how incorporated in such documents shall remain with such party who provides the know-how. Any of the said technical documents, prepared and furnished by the CONTRACTOR to the OWNER hereunder shall be kept by the OWNER as secret and confidential and the OWNER shall not use them for any purpose other than the intended purpose, nor disclose or divulge whole or part of these to any third party without prior written consent of the CONTRACTOR. The secrecy and confidentiality of the documents mentioned herein shall not apply toany technical documents:

i) Which at the time of disclosure, are in the public domain
ii) Which, after disclosure, become part of the public domain
iii) Which the OWNER can show were in the OWNER's possession at the time of the disclosure and were not acquired directly or indirectly from CONTRACTOR and
iv) Which have been furnished or made known to the OWNER by third party as a matter of right and without any restriction on disclosure.

26.2 EXPIRATION OF REGISTRATION

Notwithstanding the fact that the CONTRACT is short closed for any reason, whatsoever and ceases to operate and bind the parties hereto, it is declared that this clause shall remain operative until the aforesaid technical data, information or documents lose their confidential character for any reason whatsoever.

27.0 AUTHENTICITY OF DATA & CLARIFICATIONS

The CONTRACTOR shall ensure and declare in the report on Study and other documents submitted to the OWNER in pursuance of the work and in furtherance of the CONTRACT about the reliability and authenticity of the data and their sources of compilation. The OWNER reserves its right to seek any clarification on the aforesaid report and other documents in part or in whole even after the completion of the work.

28.0 ADDITIONAL SERVICES

The CONTRACTOR shall, if so, requested by the OWNER in writing, provide or take all steps to arrange for the provisions of such services, deemed necessary for the satisfactory execution of CONTRACT, which may be in addition to those specified in the RFQ/CONTRACT and as per General terms and conditions.

29.0 CONTINUED PERFORMANCE

The CONTRACTOR shall not stop work in case of any dispute pending before arbitrator/court/Tribunal in relation to the contract or otherwise unless further progress of works has been rendered impossible due to non-fulfillment of any reciprocal promise. Unilateral stoppage of work by the CONTRACTOR shall be considered a breach of CONTRACT and the OWNER shall be within its rights to take suitable and necessary action as it may deem fit to adequately protect its own interests.

30.0 TIME LIMIT FOR UNFORSEEN CLAIMS

Under no circumstances whatsoever, shall the CONTRACTOR be entitled to any compensation from OWNER on any account unless the CONTRACTOR shall have submitted a claim in writing, to the officer-in-charge within one month of the cause of such a claim occurring. CONTRACTOR shall be deemed to have waived off his right to claim the same, if the claim is not raised within one month.

31.0 PATENT INDEMNIFICATION

If CONTRACTOR's work or part thereof or any methods, designs or document furnished or specified by the CONTRACTOR under this contract infringes any patent, trademark, design or copyright, The CONTRACTOR shall hold Owner free of claims arising from any such patent infringements.

ANNEXURE VI

PRICE SCHEDULE

Enquiry No.: _____

Lump Sum Charges for for construction of water intake arrangement inside the reservoir at Sarvapalli having provision of intake well, pump house, substation and allied infrastructure. And also laying of 300 mm diameter (NB) DI pipe line for approximately 5.0 Km long alongthe road/embankment to deliver the water from reservoir to project site with Scope of Work of this RFQ are as follows:

Name of the Bidder:_____

A. Lump Sump Contract Price for the full scope of work in Annexure IV for Intake Well

The Contractor shall bear all costs associated with the execution of the work on **Lump-Sum Turnkey (LSTK) Basis**. The offer shall be inclusive of material, labor, consumables, T&P, overheads, direct, indirect & incidental cost. The offer shall also be inclusive of GST and all other taxes as applicable.

Sl. No.	Item ok Work	Basic Price	GST and taxes	Sub Total
1	Civil works as per Scope & Specification			
1 a	Intake Well			
1 b	Pump House			
1 c	Lead Channel			
1 d	Approach bridge			
1 e	Any other Civil work other than above			
2	Mechanical works as per Scope & Specification			
2a	3 VT Pumps			
2b	3 Electrical Motors for the pumps			
2c	Electric Hoist, Piping, valves & specials, Inlet Gate & Screens, Sludge Pump, etc. all complete)			
2d	Any other Mechanical work other than above			
3 a	Electrical as per Scope & Specification (Substation, Electrical Panel, MCC, Earthing, Cabling, Internal & External Electrification, lighting, all ancillaries work complete)			
3 b	Cabling - Electrical Cable for power supply shall be considering source at approx. 200 mts, any increase shall			

	be adjusted at pro-rata on each 100 mt basis. *			
4	Instrumentation & Miscellaneous Work as per Scope & Specification (EMF meter, pressure gauge, level indicator, Approach Road,Stone Pitching, Retaining wall, embankment protection & site development work, Glow Sign Board etc. all complete)			
5	Additional Spares (As per enclosed list at Annexure XI)			
	Total Amount			
Total In words:				

B. Contract Price for full scope of work given in Annexure IV for the water pipeline

The Contractor shall bear all costs associated with the execution of the work on **Item rate Basis**. The offer shall be inclusive of material, labor, consumables, T&P, overheads, direct, indirect & incidental cost. GST shall be exclusive in below prices as applicable.

S. No.	Item Description	Unit	Quantity	Rate (Rs.)	GST (Rs.)	Rate + GST Rs	Amount (Rs.)
A.	**Laying of Pipe line**						
1	Earthwork of all kind of soil in excavation by Mechanical means / Manual means including dressing of sides and ramming of bottoms, including getting out the excavated soil and disposal of surplus excavated soil as per direction of Engineer-in-charge	Cum	4435				
2	Excavation in Laterite/DI rock not requiring blasting by Mechanical means/ Manual means including dressing of sides and bottoms including getting out the excavated materials and disposal of excavated material as per direction of Engineer-in-charge	Cum	233				
3	Back Filling in foundation and plinth with excavated materials including watering and ramming as directed by the Engineer-in-charge	Cum	4056				
4	Removal of excess or surplus earth with a initial lead of 5km.	Cum	613				

S. No.	Item Description	Unit	Quantity	Rate (Rs.)	GST (Rs.)	Rate + GST Rs	Amount (Rs.)
5	Providing Sand bed below pipeline including watering and ramming	Cum	318				
6	Supply Centrifugally Cast ductile Iron pressure, socket and spigot pipes Class K-9 conforming to IS:8329 - 2000 and DI specials & fittings (IS 9523) (including all jointing material but excluding valves) of the following nominal diameter as per specification complete Diameter – 300mm	mtr	4500				
7	Laying in trenches Centrifugally Cast ductile Iron pressure, socket and spigot pipes Class K-9 conforming to IS:8329 - 2000 & DI specials & fittings (IS 9523) including all labour, T&P & jointing material of the following nominal diameter all complete .Diameter – 300mm	Cum	4500				
8	Providing push-on-joints conforming to IS:3114-1994 complete .	Each	722				
9	Providing, fixing of mechanical/ Dismantling joint conforming to IS:13382 complete .Diameter – 300mm	Each	3				
10	Supply M.S pipes conforming to IS:3589 - 2001 including fabrication of MS specials with wall thickness not less than 7mm all complete . Diameter – 300mm	mtr	205				
11	Cutting, jointing, painting & Laying in trenches to the alignment of M.S pipes conforming to IS:5822 - 1994 all complete Diameter –300mm	mtr	**205**				
12	Providing flanged joints conforming to IS:3114 1994 to flanged pipes and fittings complete. Diameter – 300mm	Each	**8**				
13	Construction of Thrust block including earthwork in excavation, backfilling in 150 mm layers, watering & consolidating, pumping & bailing out water, shoring, strutting & planking as required, complete in all respects						
A.	from 45° to 90° Bend	Each	6				
b	for 22.5° to 45° Bend	Each	6				
c	Upto 22.5° Bend	Each	1				

S. No.	Item Description	Unit	Quantity	Rate (Rs.)	GST (Rs.)	Rate + GST Rs	Amount (Rs.)
14	Supplying, fitting & fixing of DI PN1.6 Valves with approved make & quality with matching flanges, nuts, bolts & gaskets complete in all respect						
a.	Air Valve (80mm)	Each	9				
b	Sluice valve (300 mm)	Each	2				
c	Scour valve (150 mm)	Each	3				
15	Construction of VALVE Chamber as per drawing including earthwork in excavation, backfilling in 150 mm layers, watering & consolidating, pumping & bailing out water, shoring, strutting & planking as required, disposal of surplus earth, dressing the site etc complete in all respects with all labour , material & T&P as per specification & direction of Engineer In Charge						
a.	Sluice Valve	Each	2				
b	Scour Valve	Each	3				
c	Air Valve	Each	9				
16	Supplying of spring loaded pressure relief Valves flanges, nuts, bolts & gaskets complete in all respect	Each	1				
17	Misc. M20 RCC work in Pedestal, structures, footings and encasing etc for pipe line work including dewatering, shuttering, bedding, reinforcement, all material, labour, T&P etc all complete	Cum	12.5				
18	Restoration of earthen/metal road to the original condition including all labour, materials, T & P etc. complete	mtr	100				
19	Road crossing of pipeline with PCC 1:2:4 encasing and making good the road to original condition all including all material, labour, T&P complete	mtr	30				
Total							

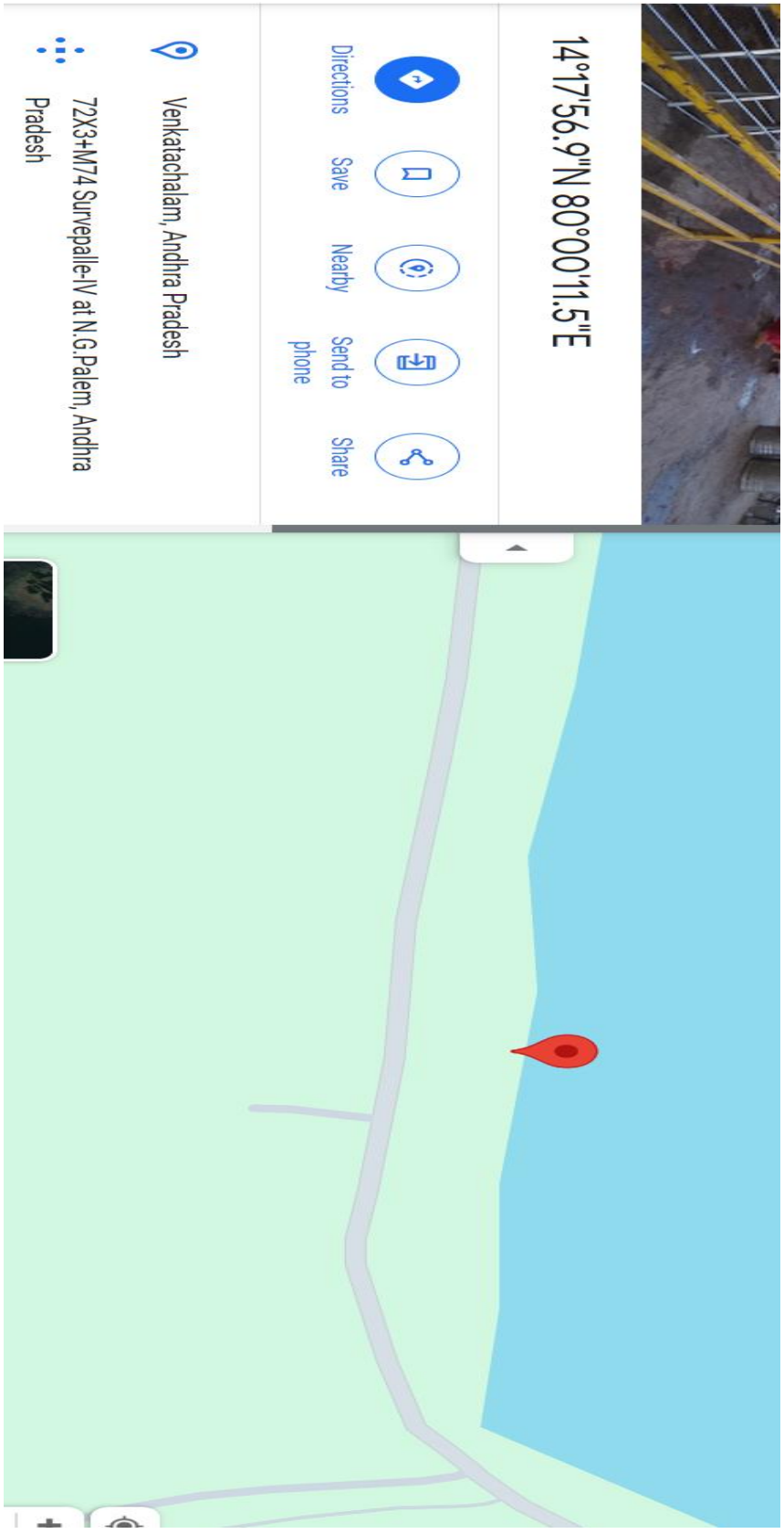
Notes of Price Bids

a) The above prices are inclusive of manpower cost, travelling cost, stay and hotel charges, charges for testing of samples at labs and any other charges. No additional amounts will be paid.

Signature:
Name of Authorized Person:
Designation:
Seal:

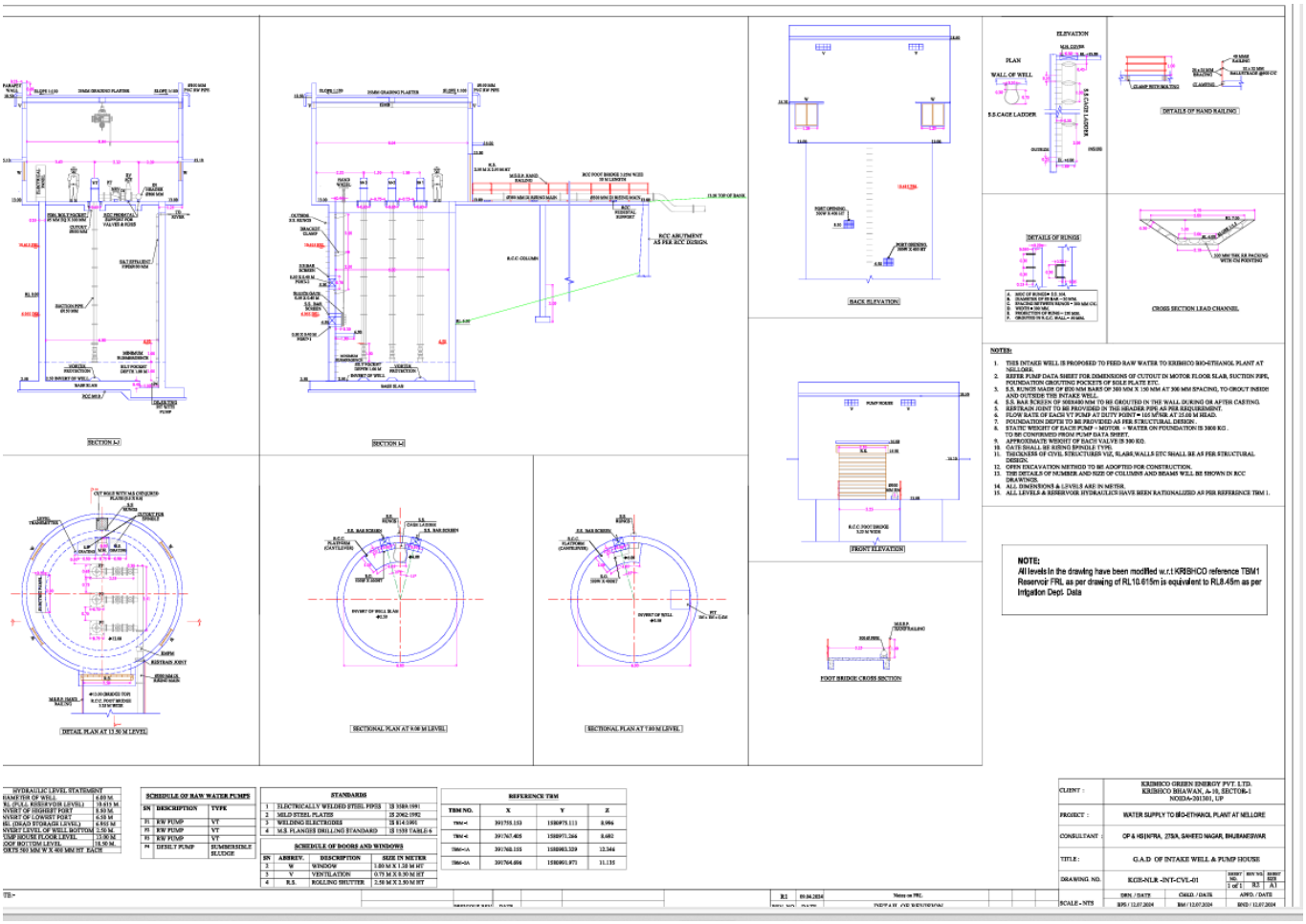
ANNEXURE VII

INTAKE WELL LOCATION- SATELLITE IMAGE



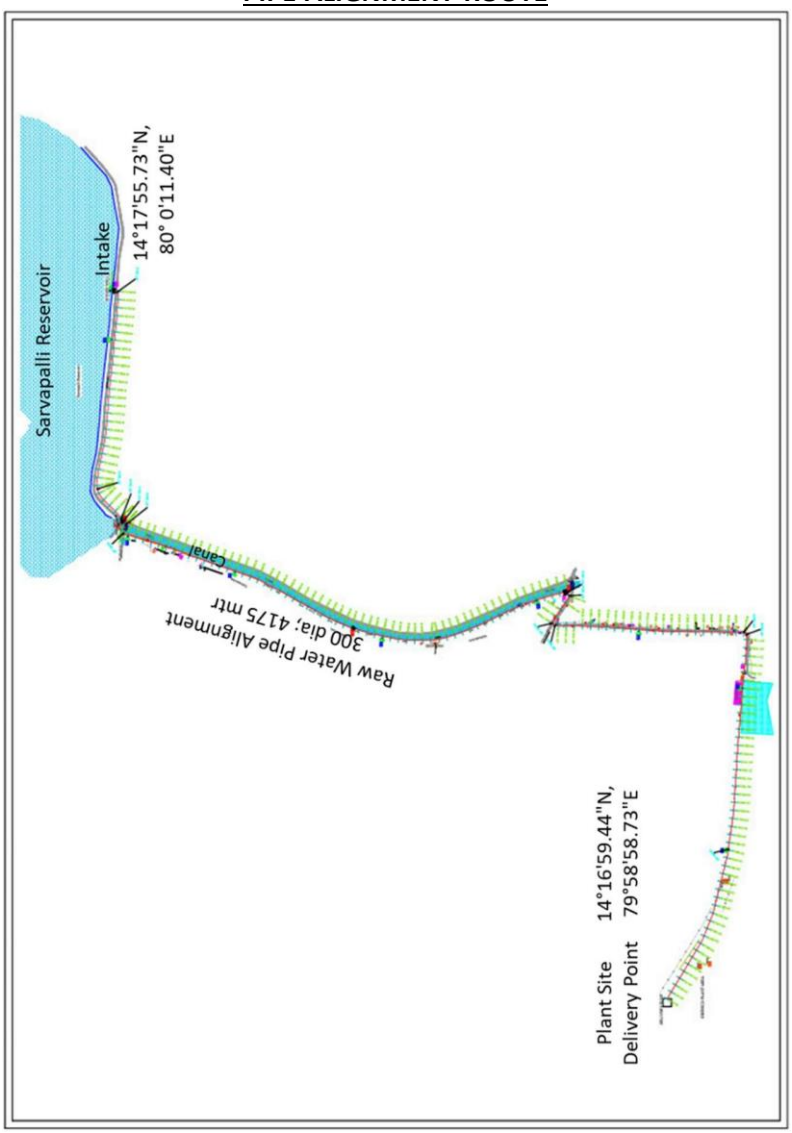
ANNEXURE VIII

IN TAKE GA



ANNEXURE IX

PIPE ALIGNMENT ROUTE



Annexure X

Construction of intake well, pump house and laying of approx. 5.0 Kms Water Pipeline and Ancillary Structures in Sarvepalli reservoir for KGEPL Bio-Ethanol Project at Nellore - List of Deviations

We_____hereby confirm that (Select any one)

(a) We unconditionally accept the above RFQ OR
(b) We have the following deviation to the RFP:

S.No	**Section No /Clause No /Page No of RFP**	**RFP Provision**	**Deviation taken by the prospective off-taker**

C Important Notes

i. The Owner discourages any deviations to the RFP.
ii. Deviations are to be taken only if they are inevitable.
iii. The bidders have to list all deviations under this Annexure.
iv. If any deviation is not given in this Annexure, the bidders shall not be allowed to take that deviation at a later date
v. Before opening of price offer of prospective bidders, the Owner will review the deviations taken by it. Owner reserves the right to reject any offer if it contains any material deviations.
vi. Decision of the Owner in this regard shall be final and binding on all bidders

(Sign and stamp of authorized signatory of bidder)

Annexure-XI

List of additional spares required for VT Pump:

S. No.	Item Description	Quantity
1.	Shaft	1 Set
2.	Impeller with lock Nut	1 Set
3.	Shaft Couplers	1 Set
4.	Wear Rings	1 Set
5.	Shaft Bushes	1 Set
6.	Gland Packing	2 Set
7.	Gland Sleeves	2 Set
8.	Flexible Coupling	1 Set

Kindly note that one set shall consists of spares required for assembly of 01 no. of pump.