



भारत हेवी इलेक्ट्रिकल्स लिमिटेड

(भारत सरकार का उपक्रम)

BHARAT HEAVY ELECTRICALS LIMITED

(A Govt. of India Undertaking)

TCN – 01

Ref: PSER:SCT:KLN-C1785:TCN-01

Date: 06-12-2016

| | | |
|-----|---|--|
| Sub | Tender change notice (TCN) 01 | |
| Job | Design, Engineering, procurement, supply, construction, erection, commissioning of construction water system (20 cum / hour) & potable water system (1 cum / hour) on EPC basis and construction of reservoir as per technical specification for 2x660 mw maitree super thermal power project at moidara village, rampalupazila, bagerhat district, Bangladesh. | |
| Ref | 1.0 | Tender No. PSER:SCT:KLN-C1785:16. |
| | 2.0 | BHEL's NIT, vide reference no PSER:SCT:KLN-C1785:5303 , dated 22-11-2016 |
| | 3.0 | All other pertinent issues till date. |

With reference to above, following points/ documents, relevant to tender, may please be noted and complied with while submitting offer.

- 1.0 Revised Price Schedule, VOLUME-III-R-01 attached superseding PRICE SCHEDULE VOLUME-III-R-00 issued earlier along with NIT. Bidder shall quote as per this revised Volume-III, Rev-01 only. Bidders are also requested to submit a declaration in techno - commercial offer that they have submitted their price bid as per REVISED price schedule format (VOLUME-III- PRICE SCHEDULE, REV-01).
- 2.0 The clarifications to bidders queries are attached at Annexure-A.
- 3.0 Modification of Clause of SCC, Volume-IC&ID is attached at Annexure-B.
- 4.0 Introduction of Water Storage Tank Drawing, Site Plan & additional Technical specification.
- 5.0 Extension of due date of submission of offer from 06-12-2016 to **16-12-2016** (15:00 hrs).
- 6.0 Revised 'No deviation certificate' as per enclosed Annexure-2. Bidder shall submit no deviation certificate as per enclosed format only.
- 7.0 All other terms & conditions shall remain unchanged.

Thanking you,

Yours faithfully,
for BHARAT HEAVY ELECTRICALS LTD

Sr. ENGR (SCT)

Encl

1.0 As above.

पावर सेक्टर पूर्वी क्षेत्र (मुख्यालय)

POWER SECTOR EASTERN REGION, DJ-9/1, SECTOR-II, SALT LAKE CITY, KOLKATA - 700 091

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**VOLUME-III
PRICE SCHEDULE, REV-01**

Design, Engineering, procurement, supply, construction, erection, commissioning of construction water system (20 cum / hour) & potable water system (1 cum / hour) on EPC basis and construction of reservoir as per technical specification for 2x660 mw maitree super thermal power project at moidara village, rampalupazila, bagerhat district, Bangladesh.

TENDER NO - PSER:SCT:KLN-C1785:16

| SL NO | PREAMBLE |
|-------|--|
| 1 | This preamble forms part of tender document and schedule of items. The tenderer should read this preamble carefully before filling in rates for various items. Clauses under this preamble shall be read in conjunction with various volumes of tender and other tender sections as applicable and shall have precedence over any contrary statement mentioned any where in this document. |
| 2 | The work shall be carried out strictly as per specifications, description of the items in these schedule and / or engineer's instructions. Drawings enclosed with the tender are only preliminary and for tender purposes and giving some idea of the work involved. The work is to be executed as per drawings & documents, which shall be furnished during execution. |
| 3 | Items of work provided in this schedule but not covered in this specification shall be executed strictly as per instruction of the engineer. |
| 4 | Unless specifically mentioned otherwise in the tender document, the tenderer shall quote for the finished items and shall provide for the complete cost towards power, fuel, tools, tackles, equipment, constructional plants, temporary works, labour, dismantling of all temporary piping, structures, valves, pumps, tanks & other misc. equipment, strengthening of roads/culverts/bridges etc. including arranging all clearances etc. required for carrying out different activities & tests, materials, levies, taxes(except service tax), transport, layout, repairs, rectification, maintenance till handing over, supervisions, colonies, shops, establishments, overheads, profits and all incidental items not specifically mentioned but reasonably implied and necessary to complete the work according to the complete tender document and this schedule. |
| 5 | The quantities of the various items mentioned in this schedule of items are approximate, based on very preliminary information and may vary to any extent or be deleted altogether. The quoted rates of each item will remain firm throughout the period of execution including extension, for reasons whatsoever, as long as variation in the total value of work executed under any part of this contract including extra items, if any but excluding any price variation remains, within fifteen percent ($\pm 15\%$) of the awarded price as per LOI . |
| 6 | Prior written approval of BHEL shall be sought by the contractor in case quantity variation of any item crosses +50% (plus fifty percent) limit during execution and approval to be obtained before execution of further quantity for this item. |
| 7 | In case Sealed /Paper Price Bids are opened for finalisation of the tender, for any Item Rate/BOQ based contract, possibility of variation of quantity/ addition/deletion of items can not be ruled out. Under such circumstances, after execution of work, if it is observed that standing as L-1 is changed based on actual quantity executed, the bidder shall give suitable rebate to maintain your standing as L-1. Since this aspect can be assessed at the end of execution, necessary adjustment will be effected at the end of execution in final bill.This condition shall not be applicable where the tender is finalised through Reverse Auction. |
| 8 | BHEL reserve the right to rationalize the rates, quoted by L-1 bidder against unit rate items and/ or other optional items with respect to item-wise lowest rates (amongst the participating bidders), before placement of order. |
| 9 | The rates quoted shall be inclusive of cleaning of site of any vegetation, dressing , clearing of old structures and leveling etc. including fixing of grid pillars, benchmarks etc. required for commencement of site activities. No separate payment will be made towards the same.However, if separate rate for such item is available in the rate schedule, the same shall be considered. |
| 10 | Rates shall be quoted in figures and in words in clear legible writing. No overwriting is allowed. All scoring and cancellations should be countersigned and in case of illegibility the interpretation of engineer shall be final. All entries shall be in English language. |
| 11 | All works item wise shall be measured upon completion and paid for at the rates quoted and accepted as per BHEL approved payment schedule/billing break-up. |
| 12 | The tender shall be deemed to have visited site and made himself aware of all the site conditions, studied the specifications and details of work to be done within the time schedule attached and to have acquainted himself of the conditions prevailing at site. |
| 13 | No splitting of the job is envisaged. Decision of BHEL in this regard shall be final and binding to the bidders. |
| 14 | Bidders are not allowed to alter the Price Schedule format including item description,quantity etc. and the offer is liable for rejection if the bidders submit their prices in Price Schedules modified by them.BHEL reserves the right to reject the offers of bidders who submit offers in Price Formats which are modified/alterd by them. Also putting any comments instead of rates/price in the designated column of the rate schedule shall make the offer liable for rejection. |
| 15 | Bidders to note that for Civil &/Structural packages, against a particular item against a ST No. appearing in more than one schedule of the BOQ, same rate must be quoted in all schedules for that particular items with same descriptions. If by error, different rates are quoted in different schedules for same ST No.(i.e. item with same description), then the higher of the rates shall be considered for evaluation but awarding shall be done with the lower rate ,if the bidder becomes L-1." |

**VOLUME-III
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| SL NO | PREAMBLE |
|--------------|--|
| 16 | For Lumpsum Service Contract : The items/components indicated in the tender is indicative and may vary to any extent. No compensation shall be payable in case of any variation in the items/components listed in the bill of quantities if the executed weight remains within the variation limit. However, in case of deletion of any item or addition of new items over and above the items listed or variation of existing quantity beyond variation limit specified, adjustment (i.e. Payment or recovery as the case may be) shall be done on pro-rata basis based on the Rate per MT worked out from the quoted lump-sum Price and the total weight of components listed /indicated in price schedule plus 15% weight variation limit. |
| 17 | Engineer's decision shall be final and binding on the contractor regarding clarification of items in the schedule with respect to the other sections/volumes of the contract. |
| 18 | In case of tender for Civil and/or Structural works, if the Non-schedule items are not quoted by the bidder, it will be treated at par with rate of corresponding item of CPWD/PWD/DSR schedule as prescribed in the tender/BOQ cum Rate Schedule. |
| 19 | No interest, whatsoever, shall be payable by BHEL on the security deposit, any bank guarantee submitted or any amount due to successful bidder/contractor. |
| 20 | Size and weights of various items are mentioned in the attached BOQ cum rate/price schedule for reference purpose only & these shall not be taken into consideration for quoting/calculating amount in the rate schedule. These shall be utilised as per relevant sections of tender. Bidders shall quote for each item in the rate column, taking unit as mentioned in the quantity column. Rates shall be filled in both figures and words. Amount shall be calculated based upon these rates multiplied by the mentioned quantity for the respective items. |
| 21 | Bidder's Total price will be shall be considered for evaluation unless stated otherwise. |
| 22 | In case of BOP packages, if Bidder does not quote/indicate the price for freight chages against indicated rate schedule, the same shall be considered as 2% of basic price and adjusted with the total quoated price against each item keeping the total quoted price unaltered. |

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SCH-1 : TOTAL PRICE

| SL NO | DESCRIPTION | PRICE SCHEDULE REF | TOTAL QUOTED PRICE (Rs) |
|-------------|--|--|--|
| 1.0 | Total prices for supply part, service part, Operation & together as Specified, Comprising design, engineering, procurement, inspection & Testing at manufacturers works, duly packed for transportation, delivery to site, including freight, unloading, storage & handling at site, civil construction, erection & commissioning, etc., Operation and maintenance of complete Construction & Potable Water system for 2x660 MW MAITREE RAMPAL PROJECT | SCH 2 - BREAK UP OF TOTAL PRICE | IN FIGURES:- IN WORDS:- |
| 2.0 | NON-SCHEDULE ITEM Quote % above or % below or at par for items not covered as above of this schedule. The rate shall be derived from Schedule of Rates 2014, PWD, Govt. of Bangladesh | | |
| 1a) | Rate of complete item | _____ % above / _____ % below / At par BPWD Rate Schedule 2014 | |
| 1b) | Rate of supply of material at site only | _____ % above / _____ % below / At par BPWD Rate Schedule 2014 | |
| 1c) | Rate for execution complete excluding supply of materials. | _____ % above / _____ % below / At par BPWD Rate Schedule 2014 | |
| NOTE | | | |
| 1.0 | Bidder shall quote total price for total price of SCH-1- Part only at sl no 1 above. All other amounts/ rates of each item of works in respective schedules/ parts will be derived based on allocated percentages. As such, any uncalled figure/ amount noted at any other place/ schedule of Volume-III will not be reckoned & will stand null & void. | | |
| 2.0 | Bidder to note that total price at sl no 1.0 above shall be considered for evaluation & awarding. As such grand total price should be complete in all respect for the full scope defined and considering all terms and conditions. | | |
| 3.0 | Bidder to note that SCH-3 covers Supply of respective items, unless specified otherwise in the description of items. | | |
| 4.0 | Bidder to note that SCH-4 covers service of respective items, unless specified otherwise in the description of items. | | |
| 4.0 | Bidder to note that SCH-5 covers O&M of respective items, unless specified otherwise in the description of items. | | |
| 5.0 | Bidder's quoted total price of SCH-3, SCH-4 & SCH-5 and at Sl. no 1 above respectively shall be apportioned into amount of various items of works based on allocated percentages against respective item, in respective schedules/ parts. As such, bidder shall not indicate/ quote any amount/ rate in these schedules/ parts and any amount/ rate quoted against any item shall not be taken into cognizance/ account and offer may be liable for rejection. | | |
| 6.0 | Based on the itemwise percentage allocations, the amount for the individual items of the Bill of Quantity shall be arrived at. The rates of individual items shall be derived from the amount against each items after rounded off. | | |
| 7.0 | Bidders to note that this is an item rate contract. Payment shall be made for the actual quantities of work executed at the unit rate arrived at as per Sl No.5 above. | | |
| 8.0 | Unit rates of each item of works of respective schedules/ parts will be derived by dividing derived amount by corresponding quantities. In deriving the unit rates of each item in this manner, figures only upto 9 decimal places will be taken into account. Any adjustment, if required, due to such methodology, will be effected in final bill. | | |
| 9.0 | Successful bidder shall draw a schedule of quantities of various items of work of SCH-3 and obtain BHEL's approval/ clearance in writing before procurement, supply, etc. | | |
| 10.0 | Any item as per scope of work, if not included in the price quoted above and shown separately will not be taken cognizance of and the offer shall be liable for rejection. | | |
| 11.0 | Price format shall not be changed by bidder in any case and it may lead to cancellation of their offer. | | |
| 12.0 | The quoted price shall be inclusive of all taxes & duties including freight on FOR site basis. | | |
| 13.0 | The quantity of items may vary during execution mainly due to actual requirement etc. The unit rates work out from the overall amount quoted & accepted by BHEL shall be considered and no separate unit rates shall be allowed. Unit rates shall be valid throughout the contract period. | | |
| 14.0 | For payment of non schedule items, the rate shall be derived from Schedule of Rates 2014, PWD, Govt. of Bangladesh and payment shall be made equivalent to INR (Indian Rupees) conversion rate as declared by SBI TT selling rate on the date of submission of bid. | | |

**VOLUME-III
PRICE SCHEDULE, REV-01**

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SCH-2 : BREAK UP OF TOTAL PRICE OF SCH- 1

| SL NO | DESCRIPTION | <u>PRICE SCHEDULE REF</u> | WEIGHTAGE FOR AMOUNT OF EACH ITEM(Nearest to the 9 decimal points) W.R.T THE TOTAL OF VENDOR QUOTED PRICE IN SCH-1 |
|------------|--|---------------------------|---|
| 1.0 | DESIGN, ENGINEERING, PROCUREMENT, SUPPLY, CONSTRUCTION, ERECTION, INSTALLATION, COMMISSIONING ETC , OPERATION AND MAINTENANCE OF CONSTRUCTION(20 CUM/HOUR) & POTABLE WATER SYSTEM(1 CUM/HOUR) ON EPC BASIS AND CONSTRUCTION OF RESERVOIR FOR CONSTRUCTION WATER AS PER TECHNICAL SPECIFICATION FOR 2x660 MW MAITREE RAMPAL PROJECT | | |
| a | Supply Part | SCH 3 - SUPPLY | 0.608754559 |
| b | Service Part | SCH 4 - SERVICE | 0.272103994 |
| c | O&M Part | SCH 5 - O & M | 0.119141447 |
| 2.0 | GRAND TOTAL(1a + 1b + 1c) | | 1.000000000 |

| VOLUME-III PRICE SCHEDULE, REV-01 | | | | |
|--|---|------|----------|---|
| Design, Engineering, procurement, supply, construction, erection, commissioning of construction water system (20 cum / hour) & potable water system (1 cum / hour) on EPC basis and construction of reservoir as per technical specification for 2x660 mw maitree super thermal power project at moidara village, rampalupazila, bagerhat district, Bangladesh. | | | | |
| TENDER NO - PSER:SCT:KLN-C1785:16 | | | | |
| SCH-3: SUPPLY | | | | |
| SL NO | DESCRIPTION OF EQUIPMENT/ ITEM | UNIT | QUANTITY | WEIGHTAGE FOR AMOUNT OF EACH ITEM(Nearest to the 9 decimal points) W.R.T THE TOTAL AMOUNT OF SUPPLY PART(SCH-1). |
| 1 | 2 | 3 | 4 | 5 |
| A | Supply Part(Price shall exclude supplies required for Operation & Maintenance) | | | |
| 1.0 | Total lumpsum price for supply part of design, engineering, procurement, inspection, testing, painting, supply / delivery duly packed at project site including freight, etc in line with drawings / documents / test procedures approved by BHEL / customer, for the total scope defined in the tender and terms & conditions of tender, taking into account all amendment / addendum, clarifications, confirmations and agreements till date of Construction Water system & Potable Water system (EPC basis) | | | |
| a | Construction water : 20 Cum/Hr. | LS | 1 | 0.563685541 |
| b | Potable RO water :1000 ltr./hr (1 cum/hr.) | LS | 1 | 0.023713668 |
| B | Supply Part (Distribution of Construction Water & Potable Water from Reservoir Only .) | | | |
| 2.0 | Providing DP- High Pressure Multistage inline Flooded Suction Vertical Centrifugal Pump motor set manufactured according to DIN / NEMA / IEC / BS / VDE / ASTM / BIS & ISO 9001 standard of following capacity for operation at single / three phase, 400 / 230V+/- 5% , 50 Hz AC having insulation class F and Protection IP 44 (minimum) with Pressure switch. | | | |
| a | Motor 5.5 KW , Discharge (1.2 - 6.6) litr / sec at dynamic head 70 - 44 metre, suction & delivery : 50mm x 50mm | NO | 1 | 0.005413313 |
| b | Motor 7.5 KW , Discharge (1.2 - 6.6) litr / sec at dynamic head 113 - 70 metre, suction & delivery : 50mm x 50mm | NO | 2 | 0.013578729 |
| 3.0 | Providing Single Stage 2800 - 2900 RPM Centrifugal water Pump Motor Set monobloc type manufactured to DIN / NEMA / IEC / BS / VDE / ASTM / BIS & ISO 9001 standard of following capacity suitable for operation at single phase ,230V+/- 5% , 50 Hz AC having insulation class F and Protection IP 44 (minimum) with Pressure switch. | | | |
| a | 2 HP Centrifugal Pump Motor Set, Discharge : 50 - 200 liter / Min, Head 32.5 - 18 metre, suction delivery: 40mm x 40mm | NO | 1 | 0.000601507 |
| 4.0 | Providing Single Stage 2800 - 2900 RPM Centrifugal water Pump Motor Set monobloc type manufactured to DIN / NEMA / IEC / BS / VDE / ASTM / BIS & ISO 9001 standard of following capacity suitable for operation at Three phase ,400V+/- 5% , 50 Hz AC having insulation class F and Protection IP 44 (minimum) with Pressure switch. | | | |
| a | 3 HP Centrifugal Pump Motor Set, Discharge : 400 - 100 liter / Min, Head 32.5 - 18 metre, suction delivery: 40mm x 40mm | NO | 2 | 0.001761801 |
| TOTAL WEIGHTAGE | | | | 0.608754559 |

**VOLUME-III
PRICE SCHEDULE, REV-01**

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SCH-4:SERVICE

| SL NO | DESCRIPTION OF EQUIPMENT/ ITEM | UNIT | QTY | WEIGHTAGE FOR AMOUNT OF EACH ITEM(Nearest to the 9 decimal points) W.R.T THE TOTAL OF VENDOR QUOTED PRICE IN SCH-1 |
|----------|---|------|------|---|
| A | Service Part (Construction Water system & Potable Water system up to 750 CUM storage Reservoir , Cost of 750 CUM Reservoir shall be paid in SL No. B) | | | |
| 1.0 | Total lumpsum price for service part of Civil, Structural, Erection, Installation etc for production of Construction & Potable water from raw water (Source Pasur River) in line with drawings / documents / test procedures approved by BHEL / customer, for the total scope defined in the tender and terms & conditions of tender, taking into account all amendment / addendum, clarifications, confirmations and agreements till date of Construction Water system & Potable Water system (EPC basis) | | | |
| a | Construction water : 20 Cum/Hr. | LS | 1 | 0.078138479 |
| b | Potable RO water :1000 ltr.(1 cum/hr.) | LS | 1 | 0.007774973 |
| B | Service Part (Construction Water & Potable Water Distribution from 750 CUM RCC storage Reservoir to Site) | | | |
| 2.0 | Installation, Testing and commissioning of the following capacity centrifugal water pump-motor set on 304.8mm (1'0") high (152.4 mm below and 152.4 mm above floor) C.C (1:2:4) base of required size with 12.7mm (1/2") thick (1:4) cement plastering and neat cement finishing over the exposed C.C surface, providing and fixing necessary bolts, nuts, vibration isolator with making all electricals and pipe connection as required as per direction of the engineers. | | | |
| a | upto to 7.5 HP | Each | 4 | 0.000523094 |
| a | 10 HP to 20 HP | Each | 2 | 0.000358551 |
| 3.0 | Earth work in excavation in all types of soil including ash which can be excavated by any means including setting out, levelling, dewatering (but excluding special type of dewatering viz. well point method), shoring & strutting (wherever required), dressing the sides & bottom, all lifts, ramming / compacting the excavated bottom, stacking, disposal of surplus excavated materials within a lead upto 500 m, spreading / levelling of disposed materials etc all complete for following depths below ground level. | | | |
| 3.1 | Depth from ground level but not exceeding 2 m | CUM | 1650 | 0.002662070 |
| 3.2 | Depth exceeding 2 m but not exceeding 4 m | CUM | 300 | 0.000373226 |
| 4.0 | Back filling upto any depth below ground level around foundations, plinths, trenches, drains etc to proper grade and level in layers not exceeding 250 mm compacted thickness using/with selected approved materials from compulsorily excavated soil available within a lead upto 500m and compacted as specified including re-excavation of stacked earth, watering, ramming/compaction by manual/mechanical means, dressing etc all complete.for the following. | | | |
| 4.1 | Each layer compacted so as to achieve at least 85% relative density as per ASTM D-4253 & ASTM D-4254 | CUM | 390 | 0.000864224 |
| 5.0 | Mass concrete (1:3:6) with cement,Jhama chips & sand | CUM | 65 | 0.007983632 |

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TENDER NO - PSER:SCT:KLN-C1785:16

SCH-4:SERVICE

| SL NO | DESCRIPTION OF EQUIPMENT/ ITEM | UNIT | QTY | WEIGHTAGE FOR AMOUNT OF EACH ITEM(Nearest to the 9 decimal points) W.R.T THE TOTAL OF VENDOR QUOTED PRICE IN SCH-1 |
|-------|--|------|-----|---|
| 6.0 | Providing and laying Design Mix cement concrete conforming to BS EN-206 and BS 8500 or equivalent international standard for reinforced concrete works with coarse sand and graded hard stone aggregate of 20mm nominal size in foundations / substructure, grade slab, paving, drains, under floors, superstructure etc. at any level below finished floor level, any shape, position or thickness etc. complete including use of plasticizer / superplasticizer conforming to BS EN 934 (latest) or equivalent international standard to achieve required slump in concrete all complete as per specification & drawing for the following. | | | |
| 6.1 | Grade C20/25 | CUM | 10 | 0.001582525 |
| 6.2 | Grade C25/30 | CUM | 155 | 0.034041966 |
| 7.0 | Providing, fixing and removing formwork at any elevations for all structures, as per specifications and including all labour, material, scaffoldings and centering complete including pockets etc. complete as per drawing, specifications, relevant laws of Bangladesh, relevant BS Standards or Equivalent International standards approved by BIFPCL / BHEL and as per direction of engineer in charge for the following. | | | |
| 7.1 | Fairface form work with good quality water proof ply wood (Plywood lining for form shall be of timber, which is resin bonded and water repellent) of required thickness, shape and smooth surface below finished ground floor level for foundations, footings, base of columns, walls, columns, pilasters, beams, mass concrete, trenches etc including providing 25mm x 25mm chamfer at all exterior corners. | SQM | 816 | 0.006058918 |
| 7.2 | Fairface form work with good quality water proof ply wood (Plywood lining for form shall be of timber, which is resin bonded and water repellent) of required thickness, shape and smooth surface above finished ground floor level for columns, beams, suspended floors, roofs, lintels, cantilevers, staircases, landings, balconies, domes, arches, circular overhead tanks etc. for all heights including rubbing the concrete surface with carborundum stone to make smooth finish and providing 25mm x 25mm chamfer at all exterior corners. | SQM | 130 | 0.001258373 |
| 8.0 | Providing, straightening, cutting, bending, placing in position at any level, binding in position of steel reinforcements of grade B500B conforming to BS 4449:2005 + A:2009 including cost of binding wire, labour, scaffolding, transportation to & from stores etc complete all as per specifications, drawings and as directed by Engineer. | MT | 14 | 0.023130545 |

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TENDER NO - PSER:SCT:KLN-C1785:16

SCH-4:SERVICE

| SL NO | DESCRIPTION OF EQUIPMENT/ ITEM | UNIT | QTY | WEIGHTAGE FOR AMOUNT OF EACH ITEM(Nearest to the 9 decimal points) W.R.T THE TOTAL OF VENDOR QUOTED PRICE IN SCH-1 |
|------------------------|--|------|------|---|
| 9.0 | Supplying ,fitting and fixing 12BWG barbed wire (2 ply, 4points) in fencing work @ 150mm c/c in both horizontally and vertically , supported by 38 x 38 x 6mm MS Angle post (300mm embeded in RCC or in Brick work with a cement concrete base 75x75x300mm) 600 mm vertical and 450mm inclined or as per requirement @ 2.4m c/c including straightening, binding the joints with 18BWG wire making holes in the angles etc. including supplying of all necessary materials complete in all respect and accepted by the Engineer.(Rate of RCC / Brick work / CC which is to be paid relevant item of BOQ) | SQM | 150 | 0.002215867 |
| 10.0 | Supplying ,fitting and fixing of G.I pipe conforming to standard BS 1387 & BDS 1031 having chemical composition (in %) carbon 0.17-0.25, Manganese 0.95 -1.2 sulphur 0.060 max, Phosphorous 0.060 max, Tensile properties: minimum yield strength 188 Mpa, minimum Tensile Strength 313 MPa and Marking for Manufacturer, Material, wall thickness, Nominal outside dia, Intended use etc on the body of the pipe with all special fitting, such as bends, elbow, socket, reducing sockets, tee, union , gate valve, jam-nuts including cutting trenches where necessary and fitting the same with earth duly rammed and fixing in walls with holder bats and making hole in floors, walls and consequent mending good the damages, excavation of soil upto maximum 1m (where necessary) etc all complete in all respect approved and accepted by the Engineer. | | | |
| 10.1 | 50mm dia G.I pipe with wall thickness 3.65mm, outside diameter min 59.7mm weight 3.83kg/m, can withstand min 50kh/sqcm hydraulic pressure. | RM | 4000 | 0.084203232 |
| 10.2 | 25mm dia G.I pipe with wall thickness 3.25mm, outside diameter min 33.3mm weight 2.59kg/m, can withstand min 50kh/sqcm hydraulic pressure. | RM | 2000 | 0.019748340 |
| 10.3 | 15mm dia G.I pipe with wall thickness 2.65 mm, outside diameter min 21mm weight 1.31kg/m, can withstand min 50kh/sqcm hydraulic pressure. | RM | 100 | 0.000585069 |
| 11.0 | Brick work with first class bricks in cement sand mortar(1:6) in foundation and plinth , filling the joints fully with mortar, racking out the joints ,cleaning and socking the bricks at least 24 hrs. before use and curing at least for 7 days etc. allcomplete including cost of water, electricity and other charges and accepted by the Engineer. | CUM | 5 | 0.000517716 |
| 11.0 | Minimum 12mm thick cement sand (1:4) plaster including washing of sand cleaning the surface, scaffolding and curing atleast for 7 days all complete including cost of water, electricity and other charges and accepted by the Engineer | SQM | 20 | 0.000083194 |
| TOTAL WEIGHTAGE | | | | 0.272103994 |

| VOLUME-III PRICE SCHEDULE, REV-1 | | | | |
|--|---|-------------|-----------------|--|
| Design, Engineering, procurement, supply, construction, erection, commissioning of construction water system (20 cum / hour) & potable water system (1 cum / hour) on EPC basis and construction of reservoir as per technical specification for 2x660 mw maitree super thermal power project at moidara village, rampalupazila, bagerhat district, Bangladesh. | | | | |
| TENDER NO - PSER:SCT:KLN-C1785:16 | | | | |
| SCH 5: O&M | | | | |
| SL NO | DESCRIPTION OF ITEM | UNIT | QUANTITY | WEIGHTAGE FOR AMOUNT OF EACH ITEM(Nearest to the 9 decimal points) W.R.T THE TOTAL OF VENDOR QUOTED PRICE IN SCH-1 |
| C | O&M | | | |
| 1.0 | Lumpsum price for operation & maintenance of entire construction Water system & Portable Water system including distribution line, supply of two skilled Trained manpower & supply of additional manpower as when as basis, replace of filter, cleaning / replace of Membrane etc,Testing of water sample and submit the test result to BHEL / BIFCL as per Technical specification and as per direction of BHEL. (No seperate payment will be made for Water sample testing, supply of Manpower, maintenance for any pump, pipe line or any other equipment during the Maintenance period). | MONTHS | 24 | 0.05467361 |
| 2.0 | Lumpsum price for Supply & Dosing of Chemical (like alum etc.) dosing for production of clarified water from river water as per Technical specification and as per direction of BHEL. | HRS | 4992 | 0.027362929 |
| 3.0 | Lumpsum price for Supply & Dosing of Chemical for production of construction Water from Clarified water as per Technical specification and as per direction of BHEL. | HRS | 4992 | 0.036483905 |
| 4.0 | Lumpsum price for Supply & Dosing of Chemical etc for production of Portable Water from Filtered / Construction water as per Technical specification and as per direction of BHEL. | HRS | 4992 | 0.000621003 |
| TOTAL WEIGHTAGE | | | | 0.119141447 |

Annexure A to TCN-01

| | |
|------------------|--|
| JOB | Design, Engineering, procurement, supply, construction, erection, commissioning of construction water system (20 cum/hr) & potable water system (1 cm/hr) on EPC basis and construction of reservoir as per technical specification for 2x660 mw maître super thermal power project at Moidara village, Rampalupazila, Bagerhat district, Bangladesh |
| TENDER NO | PSER-SCT:KLN-C1785 :16 |

| SI No | Reference clause of tender document | Existing provision | Bidder' s query | BHEL's Reply |
|-------|-------------------------------------|--------------------|---|---|
| 1.0 | Volume -II | | Detail technical specifications of said construction water treatment plant, mentioned in process flow diagram and scope of work for the same were not found in volume II. | Construction water treatment plant will be done by bidder on EPC basis. Detail engineering will be under the scope of bidder. However, for tendering purpose a Technical specification will be issued along with this clarification vide TCN-01. |
| 2.0 | Volume -II | | Exact location of water intake system for this project are not marked in the POLT PLAN drawing. | Location of Intake system, Treatment plant, Reservoir marked in Plot Plan will be issued along with this clarification vide TCN-01. |
| 3.0 | Volume -II | | Existing /New bore well are not marked/located in the PLOT PLAN drawing. | Boring of new bore well is not a part of this tender. For connection of the existing Bore well or new bore well to the Terminal point of the Treatment plant will be paid under service part serial No. B in Schedule 4 of Price Schedule, Vol-III,R-01. Vendor should mention the Terminal point in Technical offer of the contract. |
| 4.0 | Volume-II | | Location of construction water tank of capacity-750.0m3 are not marked/ located in the PLOT PLAN drawing. | Refer Reply at SI. No. 2.0. |
| 5.0 | Volume-II | | Site/ Place for construction water system are not marked/ allocated in the PLOT PLAN drawings | Refer Reply at SI. No. 2.0 . |

TECHNICAL SPECIFICATION

DESIGN, ENGINEERING, PROCUREMENT, SUPPLY, CONSTRUCTION, ERECTION, INSTALLATION, COMMISSIONING ETC. FOR CONSTRUCTION (20 CUM/HOUR) & POTABLE WATER SYSTEM (1 CUM/HOUR) ON EPC FOR 2x660 MW MAITREE RAMPAL PROJECT

DESIGN INFORMATION

| | | |
|---|---|-----------------------|
| No. of Desalination unit | : | 02 Units. |
| Capacity of each desalination unit | : | 10 m ³ /h. |
| Raw water input of each desalination unit | : | Vendor to furnish |
| Total raw water requirement | : | Vendor to furnish |
| Total power requirement | : | Vendor to furnish |

| A. River Water Intake Pump: | | |
|------------------------------------|-------------------------------|--|
| SI | Parameter | Specification |
| 1. | Type | Submersible sewage Pump for turbid, Corrosive, Saline river Water. |
| 2. | Flow (Q) in m ³ | 50 m ³ /h |
| 3. | Head (H) in meter | 27 meter |
| 4. | Model no | Vendor to furnish |
| 5. | Brand | Vendor to furnish |
| 6. | Country of manufacturing | Vendor to furnish |
| 7. | Material of construction | Vendor to furnish |
| 8. | RPM | Vendor to furnish |
| 9. | Discharge diameter in mm | Vendor to furnish |
| 10. | Power requirement of motor | Vendor to furnish |
| 11. | Quantity | (1 working + 1 standby) |
| 12. | River water delivery pipeline | |
| a. | Flexible pipeline | Diameter 4 inch, specification : Vendor to |

| | | |
|----|---------------|--|
| | | furnish |
| b. | HDPE pipeline | Diameter 4 inch, specification : Vendor to furnish |

| B. Floating structure for intake pump: | | |
|---|--------------------------|---|
| SI | Parameter | Specification |
| 1. | Type | Floating and movable |
| 2. | Utility | Will be used to house 2 nos submersible river water intake pumps |
| 3. | Material of construction | Mild steel epoxy painted/non corrosive pipe/appropriate materials |
| 4. | Dimension & drawing | Vendor to furnish |

| C. HYPO (NaOCl) DOSING SYSTEM | | |
|--------------------------------------|--------------------------|---|
| a. Dosing pump | | |
| SL | Parameter | Specification |
| 1. | Type | Solenoid |
| 2. | Flow (Q) in liter/hour | 5 |
| 3. | Max. pressure in bar | 7 |
| 4. | Model no. | Vendor to furnish |
| 5. | Brand | Vendor to furnish |
| 6. | Country of manufacturing | Vendor to furnish |
| 7. | Material of construction | Pump head PTFE, ball valve ceramic, valve seal PTEE, valve cover PTFE |
| 8. | Power requirement | Vendor to furnish |
| 9. | Qty of dosing pump | 2 pcs (1W+1S) |
| 10. | Type of installation | Installation on mild steel frame |
| b. Dosing tank | | |

| | | |
|-----|-------------------------|----------|
| 11. | Capacity of Dosing Tank | 80 Liter |
| 12. | MOC of Tank | HDPE |
| 13. | Qty of dosing tank | 1 pc |

| D. STATIC SCREEN FOR RIVER WATER: | | |
|--|------------------------------------|-----------------------|
| SI | Parameter | Specification |
| 1. | Type | Basket type |
| 2. | Maximum Flow (Q) in m ³ | 100 m ³ /h |
| 3. | No of coarse screen | 01 pc |
| 4. | No of fine scree | 01 pc |
| 5. | Material of construction | SS-304/PVC |

| E. EQUALIZATION TANK/STILLING TANK | | |
|---|--------------------------|----------------------|
| SL | Parameter | Specification |
| 1. | Type | Vertical |
| 2. | Capacity in liter | 5000 |
| 3. | Brand | Vendor to furnish |
| 4. | Country of manufacturing | Vendor to furnish |
| 5. | Quantity | 02 unit |
| 6. | Drain valve | 1 pc for each tank |

| F. Dewatering sump pump in stilling tank: | | |
|--|----------------------------|----------------------------------|
| SI | Parameter | Specification |
| 1. | Type | Non clog Submersible sewage pump |
| 2. | Flow (Q) in m ³ | 10.8 |
| 3. | Head (H) in meter | 8 |
| 4. | Model no | Vendor to furnish |
| 5. | Brand | Vendor to furnish |
| 6. | Country of manufacturing | Vendor to furnish |

| | | |
|-----|----------------------------|----------------------|
| 7. | Material of construction | SS-316 |
| 8. | RPM | 2850 |
| 9. | Discharge diameter in mm | 50 mm |
| 10. | Power requirement of motor | 1 HP (0.75 KW) |
| 11. | Electric connection | Single phase, 50 Hz. |
| 12. | Quantity | 01 no |

| G. Air blower for stilling tank: | | |
|---|----------------------------|-------------------------|
| Sl | Parameter | Specification |
| 1. | Type | Tri lobe |
| 2. | Flow (Q) in m ³ | 60 m ³ /h |
| 3. | Head (H) in meter | 2000 mm Aq |
| 4. | Model no | Vendor to furnish |
| 5. | Brand | Vendor to furnish |
| 6. | Country of manufacturing | Vendor to furnish |
| 7. | RPM of blower & motor | Vendor to furnish |
| 8. | Discharge diameter in mm | Vendor to furnish |
| 9. | Power requirement of motor | Vendor to furnish |
| 10. | Electric connection | Vendor to furnish |
| 11. | Quantity | (1 working + 1 Standby) |

| H. Clarifier feed Pump: | | |
|--------------------------------|----------------------------|--|
| SI | Parameter | Specification |
| 1. | Type | Submersible sewage Pump for turbid, Corrosive, Saline river Water. |
| 2. | Flow (Q) in m ³ | 50 m ³ /h |
| 3. | Head (H) in meter | 10 meter |
| 4. | Model no | Vendor to furnish |
| 5. | Brand | Vendor to furnish |
| 6. | Country of manufacturing | Vendor to furnish |
| 7. | Material of construction | SS-316 |
| 8. | RPM | Vendor to furnish |
| 9. | Discharge diameter in mm | Vendor to furnish |
| 10. | Power requirement of motor | Vendor to furnish |
| 11. | Quantity | (1 working + 1 standby) |

| I. Parshall flume: | | |
|---------------------------|--------------------------|-----------------------------------|
| SI | Parameter | Specification |
| 1. | Capacity | Suitable for 50 m ³ /h |
| 2. | Material of construction | Mild steel epoxy coated |
| 3. | Sheet thickness | 6 mm |
| 4. | Quantity | 01 unit |

| J. Ferric chloride/Alum dosing system | | |
|--|--------------------------|---|
| c. Dosing pump | | |
| SL | Parameter | Specification |
| 1. | Type | Mechanical actuated diaphragm type with adjustable stroke |
| 2. | Flow (Q) in liter/hour | 200 |
| 3. | Max. pressure in bar | 7 |
| 4. | Model no. | Vendor to furnish |
| 5. | Brand | Vendor to furnish |
| 6. | Country of manufacturing | Vendor to furnish |
| 7. | Material of construction | Pump head PTFE, ball valve ceramic, valve seal PTEE, valve cover PTFE |
| 8. | Power requirement | Vendor to furnish |
| 9. | Qty of dosing pump | 2 pcs (1W+1S) |
| 10. | Type of installation | Installation on mild steel frame |
| 11. Dosing tank | | |
| 12. | Capacity of Dosing Tank | Minimum 500 Liter |
| 13. | MOC of Tank | HDPE |
| 14. | Qty of dosing tank | 1 pc |
| 15. | Chemical mixing system | Agitator with gear head motor (1.5 KW) |
| 16. | Drain valve | 01 pc |

| K. Lime dosing system | | |
|------------------------------|------------------|---|
| a. Dosing pump | | |
| SL | Parameter | Specification |
| 1. | Type | Non clog sewage submersible pump (Cutter type) |
| 2. | Flow (Q) | 9 m ³ /h@ 5 meter head (a portion of the output will be recycled to dosing tank for lime mixing) |

| | | |
|------------------------|--------------------------|-------------------|
| | | & agitation) |
| 3. | Maximum Head | 7.5 meter |
| 4. | Model no. | Vendor to furnish |
| 5. | Brand | Vendor to furnish |
| 6. | Country of manufacturing | Vendor to furnish |
| 7. | Material of construction | SS-316 |
| 8. | Power requirement | Vendor to furnish |
| 9. | Qty of pump | 2 pcs (1W+1S) |
| 10. Dosing tank | | |
| 11. | Capacity of Dosing Tank | Minimum 500 Liter |
| 12. | MOC of Tank | HDPE |
| 13. | Qty of dosing tank | 1 pc |
| 14. | Drain valve | 01 pc |

| | | |
|-------------------------------|--------------------------|--------------------------------------|
| L. Flash mixing system | | |
| b. Mixing tank | | |
| SL | Parameter | Specification |
| 1. | Volume of tank | Vendor to furnish |
| 2. | MOC of tank | Mild steel epoxy coated, 5 mm sheet. |
| 3. | Qty of tank | 01 unit |
| a. Mixing system | | |
| 4. | Type | Mixing propeller with gearhead motor |
| 5. | MOC of propeller & shaft | SS-316 |
| 6. | Qty of propeller | 1 unit |
| 7. | Electric connection | 3 phase, 2.2 KW |

| M. Flocculent dosing system | | |
|------------------------------------|--------------------------|---|
| a. Dosing pump | | |
| SL | Parameter | Specification |
| 1. | Type | Solenoid |
| 2. | Flow (Q) in liter/hour | 5 |
| 3. | Max. pressure in bar | 7 |
| 4. | Model no. | Vendor to furnish |
| 5. | Brand | Vendor to furnish |
| 6. | Country of manufacturing | Vendor to furnish |
| 7. | Material of construction | Pump head PTFE, ball valve ceramic, valve seal PTEE, valve cover PTFE |
| 8. | Power requirement | Vendor to furnish |
| 9. | Qty of dosing pump | 2 pcs (1W+1S) |
| 10. | Type of installation | Installation on mild steel frame |
| Dosing tank | | |
| 11. | Capacity of Dosing Tank | Vendor to furnish |
| 12. | MOC of Tank | HDPE |
| 13. | Qty of dosing tank | 1 pc |
| 14. | Chemical mixing system | Agitator with gear head motor (1.5 KW) |
| 15. | Drain valve | 01 pc |

| N. Flocculation tank | | |
|-----------------------------|-------------------|---|
| a. Mixing tank | | |
| SL | Parameter | Specification |
| 1. | MOC of tank | Mild steel epoxy coated, 6 mm sheet. |
| 2. | Dimension of tank | Diameter :2.2 meter , height :6.6 meter |

| | | |
|----|-------------|---------|
| 3. | Qty of tank | 01 unit |
| 4. | Drain valve | 01 pc |

O. Clarifier with tube settler

| SL | Parameter | Specification |
|-----------|----------------------------------|--|
| 1. | MOC of tank | Mild steel epoxy coated, 6 mm sheet. |
| 2. | Dimension of tank | Length 5.7 meter, width : 3.6 meter, height :6.5 meter |
| 3. | Qty of clarifier tank | 01 unit |
| 4. | Quantity of tube settler | 01 lot |
| 5. | Drain valve for sludge drain out | 01 pc |

P. Sludge transfer pump:

| SI | Parameter | Specification |
|-----------|----------------------------|----------------------------------|
| 1. | Type | Non clog Submersible sewage pump |
| 2. | Flow (Q) in m ³ | 10.8 |
| 3. | Head (H) in meter | 8 |
| 4. | Model no | Vendor to furnish |
| 5. | Brand | Vendor to furnish |
| 6. | Country of manufacturing | Vendor to furnish |
| 7. | Material of construction | SS-316 |
| 8. | RPM | Vendor to furnish |
| 9. | Discharge diameter in mm | Vendor to furnish |
| 10. | Power requirement of motor | Vendor to furnish |
| 11. | Quantity | 02 nos (1 W + 1S) |

Q. Clarified water reservoir

| SL | Parameter | Specification |
|-----------|------------------|----------------------------|
| 1. | Volume of tank | 10 m ³ X 02 nos |
| 2. | MOC of tank | HDPE vertical tanks |
| 3. | Origin | Vendor to furnish |
| 4. | Drain valve | 1 pc for each tank |

**Technical specification of 21 m³/h (10.5 m³/h X 2 unit) RO plant
RO plant recovery: minimum 60%**

| R. Filter feed Pump: | | |
|-----------------------------|----------------------------|--|
| Sl | Parameter | Specification |
| 1. | Type | Horizontal single stage centrifugal pump |
| 2. | Flow (Q) in m ³ | 20 m ³ /h |
| 3. | Head (H) in meter | 34 meter |
| 4. | Model no | Vendor to furnish |
| 5. | Brand | Vendor to furnish |
| 6. | Country of manufacturing | Vendor to furnish |
| 7. | Material of construction | SS-316 |
| 8. | RPM | Vendor to furnish |
| 9. | Discharge diameter in mm | Vendor to furnish |
| 10. | Power requirement of motor | Vendor to furnish |
| 11. | Quantity | 03 nos (2 working + 1 standby) |

| S. Dual media filter | | |
|-----------------------------|----------------------------------|---|
| SL | Parameter | Specification |
| 1. | Quantity | 02 unit |
| 2. | MOC of Vessel | Fiber Reinforced Plastic (FRP) |
| 3. | Diameter of vessel | Minimum 58 inch (To be selected as water loading rate 5 gallon/minute/Ft ²) |
| 4. | Total height of vessel with base | Vendor to furnish |
| 5. | Brand name of vessel | Vendor to furnish |
| 6. | Country of Manufacturer | Vendor to furnish |
| 7. | Type of Media | Quartz Sand, Gravel, Anthracite |

| | | |
|-----|-------------------------------|------------------------|
| 8. | Origin of quartz sand | Vendor to furnish |
| 9. | Origin of gravel | Vendor to furnish |
| 10. | Origin of Anthracite | Vendor to furnish |
| 11. | MOC of Frontal Pipe Network | Upvc |
| 12. | Diameter of frontal pipe work | Vendor to furnish |
| 13. | Type of valve | PVC Butterfly |
| 14. | Origin of pipe & fittings | Vendor to furnish |
| 15. | Service of frontal pipe work | Backwash-Rinse-Service |

| T. SMBS DOSING SYSTEM | | |
|------------------------------|--------------------------|---|
| a. Dosing pump | | |
| SL | Parameter | Specification |
| 1. | Type | Solenoid |
| 2. | Flow (Q) in liter/hour | 5 |
| 3. | Max. pressure in bar | 7 |
| 4. | Model no. | Vendor to furnish |
| 5. | Brand | Vendor to furnish |
| 6. | Country of manufacturing | Vendor to furnish |
| 7. | Material of construction | Pump head PTFE, ball valve ceramic, valve seal PTEE, valve cover PTFE |
| 8. | Power requirement | Vendor to furnish |
| 9. | Qty of dosing pump | 4 pcs (2W+2S) |
| 10. | Type of installation | Installation on mild steel frame |
| 11. Dosing tank | | |
| 12. | Capacity of Dosing Tank | 80 Liter |
| 13. | MOC of Tank | HDPE |

| | | |
|-----|--------------------|------|
| 14. | Qty of dosing tank | 1 pc |
|-----|--------------------|------|

| U. Activated carbon filter | | |
|-----------------------------------|----------------------------------|---|
| SL | Parameter | Specification |
| 1. | Quantity | 02 unit |
| 2. | MOC of Vessel | Fiber Reinforced Plastic (FRP) |
| 3. | Diameter of vessel | Minimum 58 inch (To be selected as water loading rate 5 gallon/minute/Ft ²) |
| 4. | Total height of vessel with base | Vendor to furnish |
| 5. | Brand name of vessel | Vendor to furnish |
| 6. | Country of Manufacturer | Vendor to furnish |
| 7. | Type of Media | Gravel, Activated carbon (Iodine value : minimum 1000) |
| 8. | Origin of Activated carbon | Vendor to furnish |
| 9. | MOC of Frontal Pipe Network | Upvc |
| 10. | Diameter of frontal pipe work | Vendor to furnish |
| 11. | Type of valve | PVC Butterfly |
| 12. | Origin of pipe & fittings | Vendor to furnish |
| 13. | Service of frontal pipe work | Backwash-Rinse-Service |

| V. Bag filter unit | | |
|---------------------------|-------------------------------------|----------------------|
| SL | Parameter | Specification |
| 1. | Quantity | 02 unit |
| 2. | No. of bag filter in housing | 01 unit |
| 3. | Material of construction of housing | PVC/SS-316 |
| 4. | Material of filter bag | PP |

| W. ANTISCALANT DOSING SYSTEM | | |
|-------------------------------------|--------------------------|---|
| a. Dosing pump | | |
| SL | Parameter | Specification |
| 1. | Type | Solenoid |
| 2. | Flow (Q) in liter/hour | 5 |
| 3. | Max. pressure in bar | 7 |
| 4. | Model no. | Vendor to furnish |
| 5. | Brand | Vendor to furnish |
| 6. | Country of manufacturing | Vendor to furnish |
| 7. | Material of construction | Pump head PTFE, ball valve ceramic, valve seal PTEE, valve cover PTFE |
| 8. | Power requirement | Vendor to furnish |
| 9. | Qty of dosing pump | 4 pcs (2W+2S) |
| 10. | Type of installation | Installation on mild steel frame |
| 11. Dosing tank | | |
| 12. | Capacity of Dosing Tank | 80 Liter |
| 13. | MOC of Tank | HDPE |
| 14. | Qty of dosing tank | 1 pc |
| 15. | Qty of static mixture | 02 unit |

| Y. Cartridge filter unit | | |
|---------------------------------|-------------------------------------|----------------------|
| Sl | Parameter | Specification |
| 1. | Quantity | 02 unit |
| 2. | No. of micro-filter in housing | 09 unit |
| 3. | Length of filter | 1000 mm |
| 4. | Material of construction of housing | PVC |
| 5. | Material of cartridge filter | PP |

| Z. DESALINATION HIGH PRESURE PUMP | | |
|--|----------------------------|---|
| SL | Parameter | Specification |
| 1. | Type | Vertical/horizontal multistage High pressure pump |
| 2. | Flow (Q) in m ³ | 18 m ³ /h |
| 3. | Head (H) in meter | 380 m |
| 4. | Model no | Vendor to furnish |
| 5. | Brand | Vendor to furnish |
| 6. | Country of manufacturing | Vendor to furnish |
| 7. | RPM | Vendor to furnish |
| 8. | Power requirement of motor | Vendor to furnish |
| 9. | Quantity | 03 set (2 working + 1 Standby) |
| 10. | VFD | Suitable VFD have to offer to save electricity. |

(Note : The required pressure of the RO plant varies with the variation of river water TDS and same pump will be operated at variable pressure by VFD.)

| A1.REVERESE OSMOSIS (RO) PRESSURE VESSEL | | |
|---|--|--------------------------------|
| SL | Parameter | Specification |
| 1. | Brand | Vendor to furnish |
| 2. | Manufacture country | Vendor to furnish |
| 3. | Max Pressure | Minimum 600 psi |
| 4. | Operating pH Range | 3 – 11 |
| 5. | O-Ring | EPDM |
| 6. | Adaptor | ABS |
| 7. | Sealing Plate | PVC / ABS |
| 8. | Permeate Port Locknut | ABS |
| 9. | Securing Ring | Plastic |
| 10. | Certification | NFS approved |
| 11. | Diameter of RO housing | 8.0 inch |
| 12. | Quantity of RO housing | Vendor to furnish |
| 13. | No. of element of RO housing | Vendor to furnish |
| 14. | Connection system of RO housing | Side port |
| 15. | Material of construction of RO housing | Fiber reinforced plastic (FRP) |

| B1.REVERESE OSMOSIS (RO) MEMBRANE | | |
|--|---------------------------|----------------------|
| SL | Parameter | Specification |
| 1. | Type of membrane | Sea water membrane |
| 2. | Brand name of RO membrane | Vendor to furnish |
| 3. | Diameter of membrane | 8 inch |
| 4. | Total length of membrane | 40.0 inch |
| 5. | Quantity of RO membrane | Vendor to furnish |

| C1. pH adjustment system | | |
|---------------------------------|--------------------------|---|
| a. Dosing pump | | |
| SL | Parameter | Specification |
| 1. | Type | Solenoid |
| 2. | Flow (Q) in liter/hour | 5 |
| 3. | Max. pressure in bar | 7 |
| 4. | Model no. | Vendor to furnish |
| 5. | Brand | Vendor to furnish |
| 6. | Country of manufacturing | Vendor to furnish |
| 7. | Material of construction | Pump head PTFE, ball valve ceramic, valve seal PTEE, valve cover PTFE |
| 8. | Power requirement | Vendor to furnish |
| 9. | Qty of dosing pump | 2 pcs (1W+1S) |
| 10. | Type of installation | Installation on mild steel frame |
| 11. Dosing tank | | |
| 12. | Capacity of Dosing Tank | 80 Liter |
| 13. | MOC of Tank | HDPE |
| 14. | Qty of dosing tank | 1 pc |

| D1.ELECTROMAGNETIC EQUIPMENT | | |
|-------------------------------------|-------------------------------------|--|
| SL | Parameter | Specification |
| 1. | Electro Magnetic Equipment | Electro Magnetic Equipment consist of Flow Meter, Pressure Gauge, Pressure Switch, Magnetic Conductor, Overload Relay, Timer-auto flush, Automatic Star Delta Starting System, VFD, Indicator Lamp and necessary equipment to run the plant efficiently, water quality monitor etc. |
| 2. | Brand of electric control equipment | Vendor to furnish |

| E1. PIPE FITTINGS AND VALVE | | |
|------------------------------------|--------------------|--|
| SL | Parameter | Specification |
| 1. | High Pressure Line | Construction material, pipe fittings and Valve will be AISI 316 materials. |
| 2. | Low Pressure Line | Construction material pipe fittings and Valve will be 40 Schedule uPVC |

| F1. SKID FOR DESALINATION PLANT | | |
|--|------------------------|----------------------|
| SL | Parameter | Specification |
| 1. | Skid Materials | Vendor to furnish |
| 2. | Type of skid materials | Vendor to furnish |

| G1. CIP (Cleaning in Place) pump | | |
|---|----------------------------|---|
| SL | Parameter | Specification |
| 1. | Type | Multistage Centrifugal Pump suitable for handling highly corrosive liquid at high pressure. |
| 2. | Flow (Q) in m ³ | 24 m ³ /h |
| 3. | Head (H) in meter | 40 m |
| 4. | Model no | Vendor to furnish |
| 5. | Brand | Vendor to furnish |

| | | |
|-----|----------------------------|-------------------|
| 6. | Country of manufacturing | Vendor to furnish |
| 7. | RPM | Vendor to furnish |
| 8. | Suction diameter in mm | Vendor to furnish |
| 9. | Discharge diameter in mm | Vendor to furnish |
| 10. | Power requirement of motor | Vendor to furnish |
| 11. | Electric connection | Vendor to furnish |
| 12. | Quantity | 01 nos |

H1. CIP tank

| SL | Parameter | Specification |
|----|-----------------|---------------------|
| 1. | Volume of tank | Minimum 1000 liter |
| 2. | MOC of tank | HDPE vertical tanks |
| 3. | Origin | Vendor to furnish |
| 4. | Drain valve | 1 pc |
| 5. | Electric heater | 02 pc X 10 KW |

I1. Biocide dosing system

a. Dosing pump

| SL | Parameter | Specification |
|----|------------------------|-------------------|
| 1. | Type | Solenoid |
| 2. | Flow (Q) in liter/hour | 5 |
| 3. | Max. pressure in bar | 7 |
| 4. | Model no. | Vendor to furnish |

| | | |
|------------------------|--------------------------|---|
| 5. | Brand | Vendor to furnish |
| 6. | Country of manufacturing | Vendor to furnish |
| 7. | Material of construction | Pump head PTFE, ball valve ceramic, valve seal PTEE, valve cover PTFE |
| 8. | Power requirement | Vendor to furnish |
| 9. | Qty of dosing pump | 1 pc |
| 10. | Type of installation | Installation on mild steel frame |
| 11. Dosing tank | | |
| 12. | Capacity of Dosing Tank | 80 Liter |
| 13. | MOC of Tank | HDPE |
| 14. | Qty of dosing tank | 1 pc |

| J1. Cartridge filter unit | | |
|----------------------------------|-------------------------------------|----------------------|
| Sl | Parameter | Specification |
| 1. | Quantity | 01 unit |
| 2. | No. of micro-filter in housing | 09 unit |
| 3. | Length of filter | 1000 mm |
| 4. | Material of construction of housing | PVC |
| 5. | Material of cartridge filter | PP |

TECHNICAL SPECIFICATION

Potable Water plant Capacity: 1000LPH

Pretreatment capacity: 2000LPH

Raw water source: Deep tube well/river water

Maximum raw water TDS : 1072

01 FEED PUMP

Quantity : 02 unit (1 W + 1S)
Capacity : 2 m³/h
Head : 28 m
Type : Centrifugal /Jet
Brand : Vendor to furnish
Origin : Vendor to furnish
Power : 0.75 KW, 220V, 50Hz
:

02 MULTI-GRADE FILTER

Quantity : 1 Unit
Mode of Construction : Fiber Reinforced Plastic (FRP)
Shell Height of Vessel : 65 Inch
Diameter of Vessel : 18 Inch
Feature of FRP Vessel : Non Corrosive, Maintenance free
Operating Pressure : 150 psi

FILTER MEDIA ON MULTI-GRADE FILTER

Type of Filter : Quartz Sand, Gravel, Anthracite
Origin of anthracite : Vendor to furnish

03 IRON REMOVAL FILTER

Quantity : 1 Unit
Mode of Construction : Fiber Reinforced Plastic (FRP)
Shell Height of Vessel : 65 Inch
Diameter of Vessel : 18 Inch

FILTER MEDIA FOR IRON REMOVAL FILTER

Type of media : Gravel, birm

04 GRANULAR ACTIVATED CARBON FILTER

Quantity : 1 Unit
Mode of Construction : Fiber Reinforced Plastic (FRP)
Shell Height of Vessel : 65 Inch
Diameter of Vessel : 18 Inch
Feature of FRP Vessel : Non Corrosive, Maintenance free
Operating Pressure : 150 psi

FILTER MEDIA ON ACTIVATED CARBON FILTER

Type of Filter : Gravel, Granular Activated Carbon
Origin of Activated Carbon : Vendor to furnish

05 REVERSE OSMOSIS UNIT

a) **BASIC INFORMATION**

| | |
|-------------------------|-----------------------|
| Quantity | : 01 Set |
| Brand | : Heron |
| Pure Water Capacity | : 1000 Liter Per Hour |
| Purification Technology | : Reverse Osmosis |
| Model Number | : RO-6000 |

b) **ANTI-SCALANT DOSING**

| | |
|------------------|-----------------|
| Quantity | : 01 units |
| Capacity | : 0.47 LPH |
| Maximum Pressure | : 7 Bar |
| Power | : 9.20 W |
| Connection Size | : 1/2 Inch Male |
| Pump Head | : PVC |
| Valve Set | : Viton |
| Diaphragm | : Viton |
| Valve Ball | : Ceramic |

Description of Tank

| | |
|-----------|--------|
| Quantity | 1 unit |
| Capacity | 60 Ltr |
| Materials | HDPE |

c) **CARTRIDGE FILTER HOUSING**

| | |
|------------------------|---------------------|
| Quantity | : 01 Unit |
| Type of Housing | : 20 Inch |
| Mode of Construction | : HDPE |
| Length of Filter | : 20 |
| Diameter of Filter | : 4 Inch |
| Brand of Micron Filter | : Vendor to furnish |
| MOC of Micron Filter | : PP |

d) **HIGH PRESSURE PUMP**

| | |
|-----------------------|------------------------------|
| Quantity | : 01 unit |
| Brand of Pump | : Vendor to furnish |
| Origin of Pump | : Vendor to furnish |
| MOC of Pump | : AISI304 |
| Power | : 2.2KW, 220V, 50Hz, 1-Phase |
| Consumption | |
| Duty | : 2 m3/h@165 meter head |
| Shaft | : Stainless Steel |

| | | | |
|----|--------------------------------------|---|--|
| | Impeller | : | Stainless Steel |
| | Cylinder | : | Stainless Steel |
| | Coupling | : | Carbon Steel |
| | Pump Head | : | Stainless Steel |
| | Quantity | : | 4 Units |
| | Brand of Housing | : | Vendor to furnish |
| | Origin of Housing | : | Vendor to furnish |
| | MOC of Housing | : | FRP |
| | Type of Housing | : | 4040 |
| | End Cap of RO Housing | : | PA66+30% GF |
| | O-Ring of RO Housing | : | EPDM |
| | Dia of RO Housing | : | 4 Inch |
| | Feature of Housing | : | Non Corrosive and Maintenance free |
| e) | RO MEMBRANE HOUSING | | |
| | Quantity | : | 04 Units |
| | Brand of RO Membrane | : | Vendor to furnish |
| | Type of Membrane | : | 4040 |
| f) | REVERSE OSMOSIS (RO) MEMBRANE | | |
| | Quantity | : | 2 Units |
| | Range of Measurement | : | Up to 100 and 300 PSI |
| g) | PRESSURE METER | | |
| | Quantity | : | 2 Units |
| | Range of Measurement | : | 10 GPM or as per require |
| h) | FLOW METER | | |
| | Quantity | : | 1 Units |
| | Brand | : | Vendor to furnish |
| | Origin | : | Vendor to furnish |
| | Type of Conductivity | : | Online |
| | Operating Temp | : | 0 ~ 50°C |
| | Installation Mode | : | Panel Mounted |
| | Display | : | 3-1/2 Bit LED |
| | Usage | : | It can measure the pure water quality |
| i) | CONDUCTIVITY MONITOR | | |
| | Quantity | : | 2 Units |
| | Type | : | AC |
| | Power | : | 220V |
| j) | SOLENOID VALVE | | |
| k) | FLUSHING SYSTEM | | Flushing will be automatically and time is adjustable. Qty : 01 set |

I) SKID / FRAME

It will be made of 1.5 Inch Stainless Steel Box, Grade: AISI304 which is Non Corrosive

m) MAJOR ITEMS OF ELECTRIC CONTROL PANEL

- Circuit Breaker : 01 Unit
- Magnetic Contact : 02 Units
- Thermal Overload : 02 Units
- Timer & Relay with Base : 01 Set
- Indicator Lamp : 08 Units
- Selector Switch : 04 Units

- MOC of panel box : SS-304

06. PIPE AND FITTINGS

- Quantity : 1 Lot
- Origin : Vendor to furnish
- Color : White / Gray
- Brand : ERA
- Materials : Food Grade, uPVC

07. Potable water storage tank

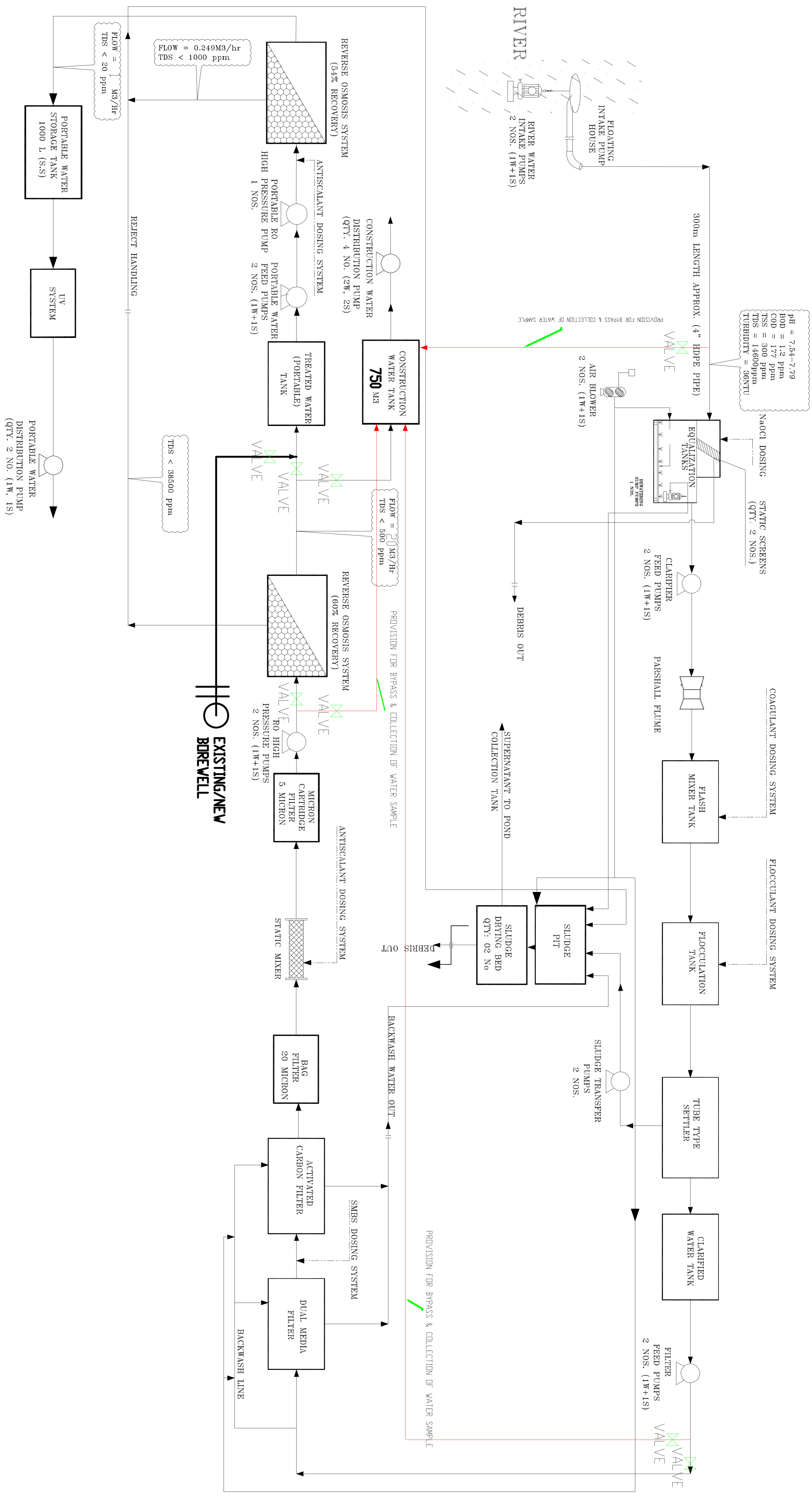
- Quantity : 1 Lot
- Origin : Vendor to furnish
- Capacity : 1000 liter
- MOC : ss-304

08. Ultraviolet system

- Quantity : 1 set
- Capacity : 10 GPM
- MOC : ss-304

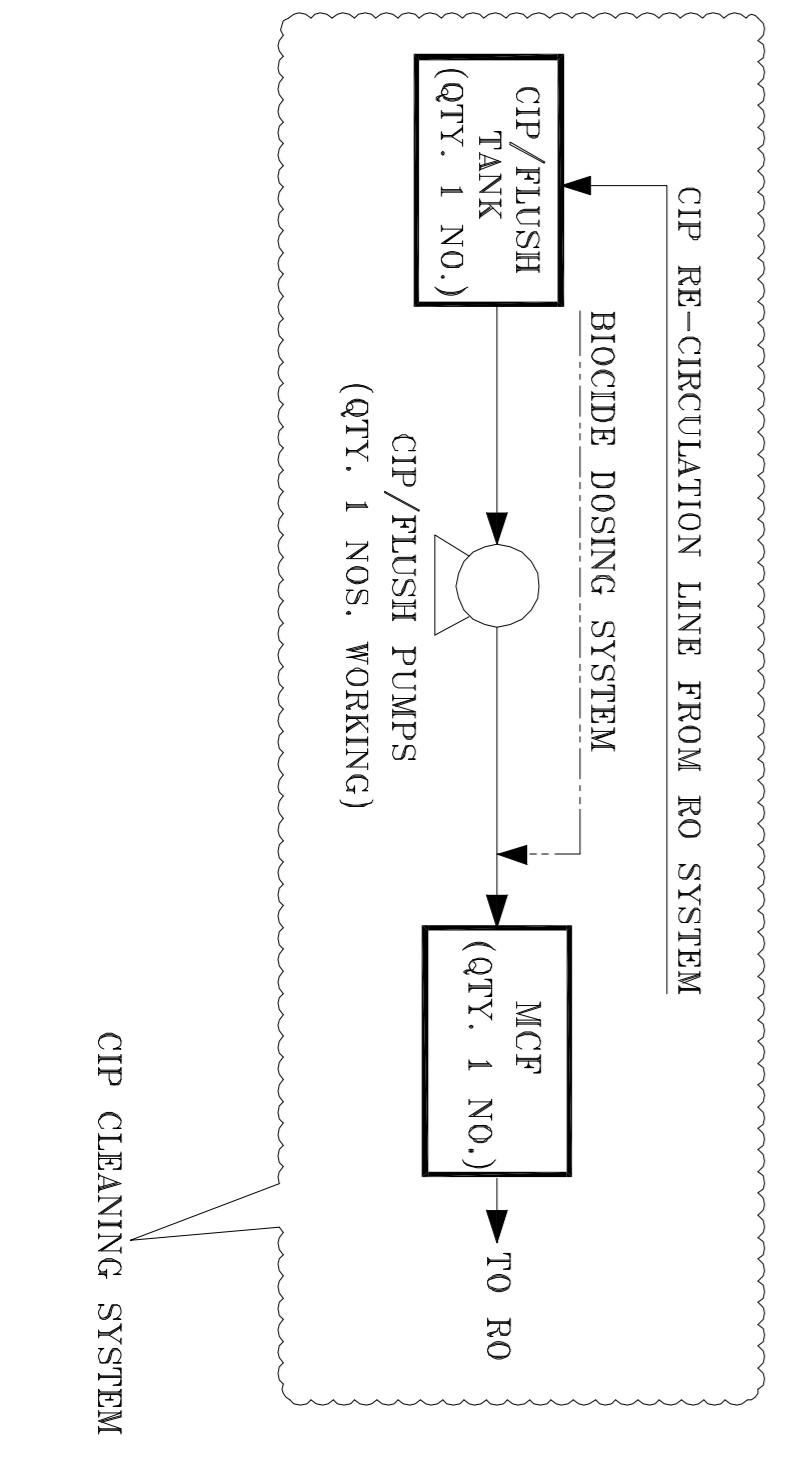
LIST OF THE TENTATIVE CIVIL WORK FOR WATER TREATMENT PACKAGE

| SL. NO | Description | Size | Qty | MOC |
|---------------|--|--|-------------|---------------------|
| 1. | RO plant Shed by Pre Engineered Structural Building over foundation (as per design of soil investigation report) , one Gate, One Canopy, four window with one layer brick soling and 5” thickness RCC casting on floor. | As per requirement | 1 | MS, Brick, PCC,RCC. |
| 2. | Civil base for pumps, RO skid etc. | AS required | AS required | RCC |
| 3. | Equalization Tank | As per requirement | AS required | RCC EP |
| 4. | Tube Type Clarifier (Twin Compartment) | As per requirement | AS required | RCC EP |
| 5. | Clarified Water Storage Tank | As per requirement | AS required | RCC EP |
| 6. | Sludge Pit | As per requirement | AS required | RCC |
| 7. | Sludge Dry Bed | As per requirement | AS required | RCC |
| 8. | Supplying and erecting in position 2.4 m high PVC coated gavanised chain linked fencing of minimum 8 gauge (including PVC coating) of mesh size 75 mm and galvanised concertina. The diameter of the steel wire for chain link fencing excluding PVC coating shall not be less than 12 gauge. GI barbed wire fencing at top of chain link fencing shall be provided with 4 stands of height of 600 mm including civil works & all accessories as per specification . | Required size for protection of water treatment plant and Water storage Tank | AS required | As described |
| 9. | Supply, fabrication and installing in position and testing galvanised MS Gates out of channels, joists, angles, flats, plates, pipes & sheets including stiffners, bracings, fabricated hinges, MS Aldrops with locking arrangement, tempered steel pivot, guide track of MS Tee, ball bearing arrangements, castor wheels, anti corrosive synthetic enamel painting over two coats of primer etc. all complete as per drawing, specification and as directed by Engineer-in-charge with 600mm high GI barbed wire fencing at top all complete. | 4 M wide | 1 | As described |



pH = 7.54-7.79
 BOD = 1.2 ppm
 COD = 177 ppm
 TSS = 300 ppm
 TDS = 14600ppm
 TURBIDITY = 38NTU

EXISTING/NEW
BIREWELL



FOR TENDER PURPOSE ONLY

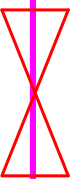
| | |
|---|--------------------|
| BHARAT HEAVY ELECTRICALS LTD (BHEL) INDIA | |
| PROJECT: CONSTRUCTION & PORTABLE RO WATER TREATMENT PLANT (CAPACITY -20 M3/hr & 1 m3/hr) | |
| DRG. TITLE: PROCESS FLOW DIAGRAM | SHT. 1 OF 1 |
| PROJ. NO. _____ | DRAWING NO. _____ |
| BHEL/RAMPAL/CONSTRUCTION WATER:01 | |
| REV. 00 | DATE 21.10.16 S.S. |
| DRAWN BY _____ | CHECKED BY _____ |
| REVIEWED BY _____ | APPROVED BY _____ |
| SCALE _____ | _____ |

**WATER
TREATMENT
PLANT**

**WATER
STORAGE
RCC TANK**

(CONSTRUCTION OF RCC STORAGE
TANK IS NOT A PART EPC CONTRACT . IT
WILL BE PAID ON THE ITEM RATE BASIS
AS PER SERVICE PART OF PRICE
SCHEDULE)

2.4M WIDE
SECURITY
FENCING UNDER
SCOPE OF
WATER
TREATMENT PKG



4M WIDE MS
GATE WITH
PAINTED

TENDER PURPOSE ONLY

2X660MW MAITREE RAMPAL
PROJECT

JOB:- CONSTRUCTION OF
CONSTRUCTION WATER & POTABLE
WATER TREATMENT PLANT & RCC
STORAGE TANK

DRAWING TITLE:- LAYOUT OF
WATER TREATMENT PLANT AND
RCC STORAGE TANK

Basic parameters for construction water

A. Permissible limit of Solids in construction water are:-

Organic- 200mg/L

Inorganic-3000mg/L

Sulphates(as SO₃)-400mg/L

Chlorides(As Cl)- 500mg/L

Suspended Matter -2000mg/L

Ph Value of water shall not be less than 6(ideal 7)

Quantity of 0.02 Nominal NaOH to Neutralize 100ml sample of water using Phenolphthalein as an indicator- Less than 5 ml

Quantity of 0.02 Nominal H₂SO₄ to Neutralize 100ml sample of water using mixed indicator- Less than 25 ml

B. Permissible limit of Solids in drinking/potable RO water are:-

As per international /Bangladesh Standard

- Maximum annual average temperature (in the shade) 27.3°C
- Maximum design temperature of the electrical equipment installed indoors in air conditioned rooms 40°C
- Maximum design temperature of the electrical equipment installed indoors non in air conditioned rooms 45°C
- Minimum design temperature 0°C

Marine conditions

Two tides (e.g. flood and ebb) are regularly observed in the Passur River, which enters into the project site through numerous connected creeks.

The tidal range varies between 1.2 and 3.1 meters. The mean water level (CD) is about 0.87 meters (PWD=CD -1.17 meters). The mean high water level varies due to spring-neap tide conditions between +1.60 m and +2.6m PWD. The Highest High Water Level (HHW) is about +3.1m PWD and the Lowest Low Water Level (LLW) is about -1.4m PWD.

The marine conditions are detailed in **Section B11**, with details about:

- water levels
- waves
- currents
- river bathymetry, topography.

The salinity of the Passur River system varies with the amount of fresh water entering the system which is highly seasonal dependent. The surface water temperature ranges between 22.9°C and 33.0°C and the different water quality parameters are tabulated in **Part C Annexes**.

The marine conditions as recorded at Mongla Port Gauge Station (approx. 14 km south-east to the site) are as follows:

- Highest High Water Level (HHW) + 2.642 MSL
- Lowest Low Water Level (LWL) - 1.858 MSL

The Power Plant shall be designed for 100 years flood condition based on data provided by relevant Organization in Bangladesh and taking into account the Highest Astronomical Tide (HAT), the maximum wave conditions (including storm surges) and the potential event of Cyclone. The Contractor is responsible to verify the worst conditions.

These reference data are with respect to LAT, which corresponds to the Chart Datum (CD). The site land data is however with respect to the Bangladesh Land Survey Datum (BLSD), which corresponds to approx. +1.55 m CD (hence the MLSD corresponds to MSL).

Design Wave Height 2.0 m
 Design Wave Period 6.0 sec
 Sedimentation and Siltation: Soft to stiff clay and alternations of very sandy and stiff clay.

The results of bathymetric investigations of the Passur River can be found in **Part C Annexes.**

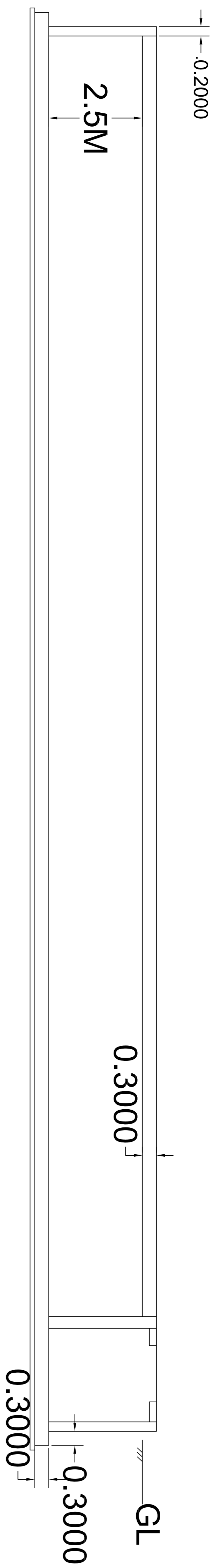
A water analysis from the area adjacent to the site giving salinity and water quality is shown below:

| loc ation | Date | Tem p. | pH | EC | Cl | T. Alkal inity | Turbid ity | T S | TDS | SS | DO | BOD | COD | Sal inity |
|-----------|--------|--------|------|-------|--------|----------------|------------|-------|-------|------|------|------|------|-----------|
| | | °C | | µS/cm | mg/l | mg/l | NTU | mg/l | mg/l | mg/l | mg/l | mg/l | mg/l | mg/l |
| 1 | 7-Jan | 27.4 | 7.74 | 3010 | 879 | 36 | 68.7 | 1565 | 1510 | 55 | 5.1 | 0.8 | 55 | 1.6 |
| 2 | 7-Jan | 27.1 | 7.72 | 3020 | 878.8 | 36 | 68.5 | 1570 | 1510 | 60 | 5.1 | 0.8 | 55 | 1.6 |
| 3 | 7-Jan | 27.8 | 7.71 | 3030 | 879 | 36 | 68.8 | 1565 | 1510 | 55 | 5.1 | 0.8 | 55 | 1.6 |
| 1 | 11-Feb | 29.8 | 7.66 | 4380 | 1262 | 36 | 182 | 2390 | 2180 | 210 | 4.7 | 1 | 76 | 2.3 |
| 2 | 11-Feb | 29.2 | 7.63 | 4380 | 1268 | 36 | 178 | 2390 | 2190 | 200 | 4.7 | 1 | 76 | 2.3 |
| 3 | 11-Feb | 29.1 | 7.65 | 4380 | 1263 | 36 | 179 | 2380 | 2180 | 200 | 4.7 | 1 | 76 | 2.3 |
| 1 | 9-Mar | 32.6 | 7.56 | 11780 | 2944.4 | 38 | 176 | 6080 | 5890 | 190 | 4.7 | 1.2 | 76 | 6.7 |
| 2 | 9-Mar | 32.6 | 7.57 | 11780 | 2945.2 | 38 | 178 | 6080 | 5890 | 190 | 4.7 | 1.2 | 76 | 6.7 |
| 3 | 9-Mar | 32.1 | 7.55 | 11780 | 2946.4 | 38 | 177 | 6090 | 5890 | 200 | 4.7 | 1.2 | 76 | 6.7 |
| 1 | 17-Apr | 32.6 | 7.59 | 25300 | 8273 | 36 | 185.6 | 12950 | 12700 | 250 | 4.6 | 0.7 | 136 | 15.5 |
| 2 | 17-Apr | 32.6 | 7.59 | 25300 | 8273 | 36 | 186.2 | 12950 | 12700 | 250 | 4.6 | 0.7 | 138 | 15.5 |
| 3 | 17-Apr | 32.6 | 7.59 | 25300 | 8273 | 36 | 184.8 | 12950 | 12700 | 250 | 4.6 | 0.7 | 136 | 15.5 |
| 1 | 5-May | 32.6 | 7.59 | 29200 | 9480 | 36 | 198.6 | 14900 | 14600 | 300 | 4.5 | 1.2 | 177 | 17.6 |
| 2 | 5-May | 32.9 | 7.54 | 29200 | 9470 | 36 | 198.6 | 14900 | 14600 | 300 | 4.4 | 1.2 | 177 | 17.6 |

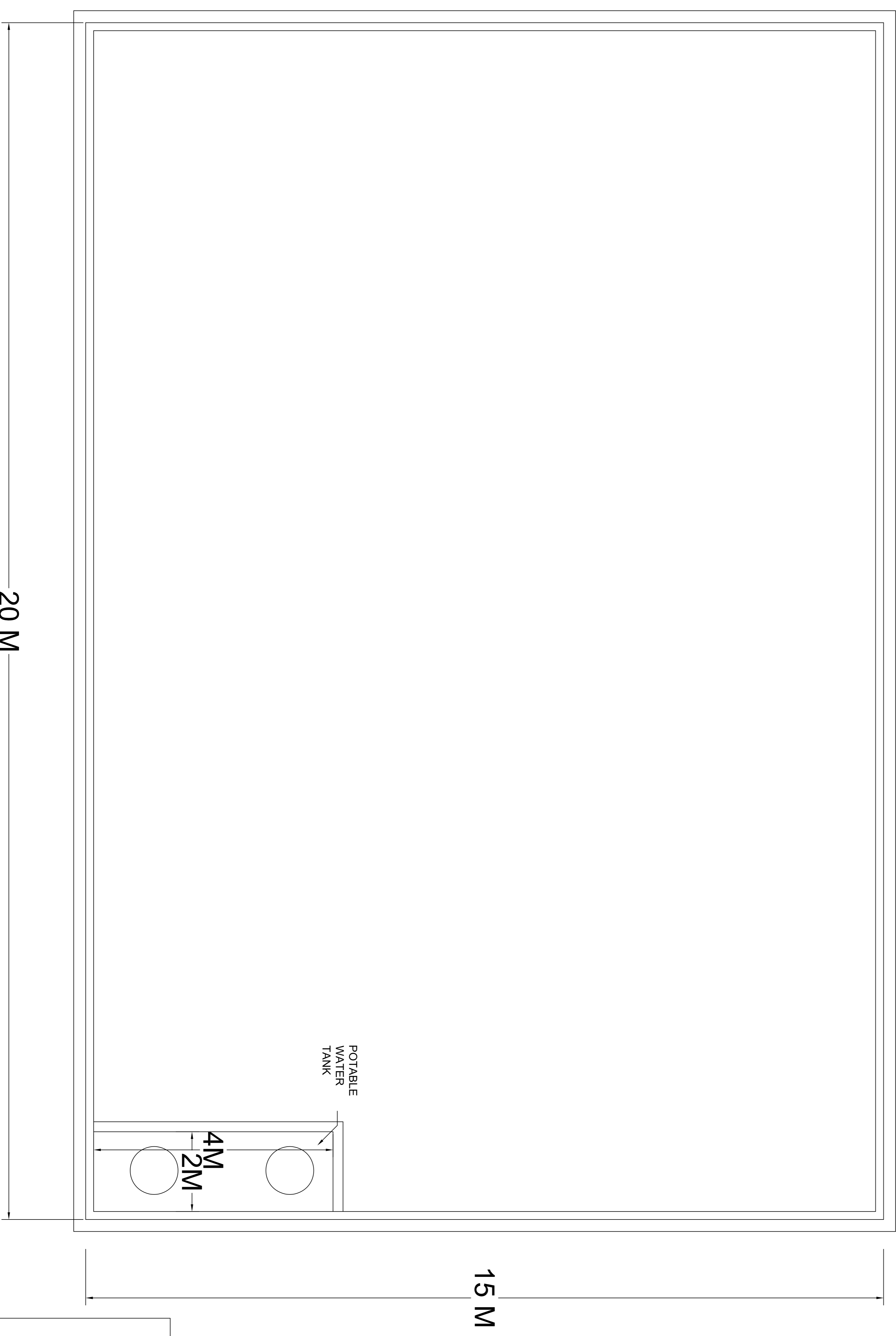
**Figure 1 Water quality of the Passur River at Mongla point
 (Source: EIA-Report)**

| loc ati on | Date | Tem p. | pH | EC | Cl | T. Alkal inity | Turbid ity | T S | TDS | SS | DO | BOD | COD | Sal inity |
|------------------|--------|-----------|------|-------|------|----------------------|---------------|-------|-------|------|------|------|------|--------------|
| | | °C | | µS/cm | mg/l | mg/l | NTU | mg/l | mg/l | mg/l | mg/l | mg/l | mg/l | mg/l |
| 3 | 5-May | 33.2 | 7.57 | 29200 | 9470 | 36 | 199.6 | 14900 | 14600 | 300 | 4.5 | 1.2 | 177 | 17.6 |
| 1 | 13-Jun | 31.6 | 7.69 | 18000 | 5820 | 36 | 112.6 | 9200 | 9000 | 200 | 4.7 | 1.1 | 97 | 10.8 |
| 2 | 13-Jun | 31.6 | 7.69 | 18000 | 5800 | 36 | 113.2 | 9200 | 9000 | 200 | 4.7 | 1.1 | 97 | 10.8 |
| 3 | 13-Jun | 31.6 | 7.69 | 18000 | 5810 | 36 | 112.4 | 9200 | 9000 | 200 | 4.7 | 1.1 | 97 | 10.8 |
| 1 | 1-Jul | 31.6 | 7.69 | 440 | 32.6 | 36 | 76.6 | 285 | 220 | 65 | 5.2 | 0.8 | 26 | - |
| 2 | 1-Jul | 31.6 | 7.69 | 440 | 32.6 | 36 | 76.6 | 285 | 220 | 65 | 5.2 | 0.8 | 26 | - |
| 3 | 1-Jul | 31.6 | 7.69 | 440 | 32.6 | 36 | 76.6 | 285 | 220 | 65 | 5.2 | 0.8 | 26 | - |
| 1 | 5-Aug | 31.6 | 7.69 | 275 | 16.6 | 36 | 68.6 | 192 | 137 | 55 | 5.3 | 0.7 | 22 | - |
| 2 | 5-Aug | 31.6 | 7.69 | 275 | 16.6 | 36 | 68.6 | 192 | 137 | 55 | 5.3 | 0.7 | 22 | - |
| 3 | 5-Aug | 31.6 | 7.69 | 275 | 16.6 | 36 | 68.6 | 192 | 137 | 55 | 5.3 | 0.7 | 22 | - |
| 1 | 8-Sep | 31.6 | 7.74 | 270 | 15.6 | 36 | 65.6 | 180 | 135 | 45 | 5.5 | 0.7 | 22 | - |
| 2 | 8-Sep | 31.6 | 7.76 | 270 | 15.6 | 36 | 65.6 | 180 | 135 | 45 | 5.5 | 0.7 | 22 | - |
| 3 | 8-Sep | 31.6 | 7.74 | 270 | 15.6 | 36 | 65.6 | 180 | 135 | 45 | 5.5 | 0.7 | 22 | - |
| 1 | 12-Oct | 30.6 | 7.79 | 290 | 26.6 | 36 | 62.6 | 192 | 145 | 47 | 5.6 | 0.7 | 22 | - |
| 2 | 12-Oct | 30.6 | 7.78 | 290 | 26.6 | 36 | 62.6 | 192 | 145 | 47 | 5.6 | 0.7 | 22 | - |
| 3 | 12-Oct | 30.6 | 7.78 | 290 | 25.6 | 36 | 62.6 | 192 | 145 | 47 | 5.6 | 0.7 | 22 | - |
| 1 | 5-Nov | 24.6 | 7.79 | 340 | 38.6 | 36 | 56.6 | 210 | 170 | 40 | 5.6 | 0.7 | 22 | - |
| 2 | 5-Nov | 26.6 | 7.79 | 340 | 38.6 | 36 | 56.6 | 210 | 170 | 40 | 5.6 | 0.7 | 22 | - |
| 3 | 5-Nov | 25.6 | 7.79 | 340 | 38.6 | 36 | 56.6 | 210 | 170 | 40 | 5.6 | 0.7 | 22 | - |
| 1 | 12-Dec | 21.5 | 7.72 | 520 | 62.6 | 36 | 72.6 | 320 | 260 | 60 | 5.1 | 0.9 | 25 | 0.4 |
| 2 | 12-Dec | 20.9 | 7.71 | 520 | 62.6 | 36 | 73.6 | 320 | 260 | 60 | 5.1 | 0.9 | 25 | 0.4 |
| 3 | 12-Dec | 21.1 | 7.72 | 520 | 62.6 | 36 | 71.6 | 320 | 260 | 60 | 5.1 | 0.9 | 25 | 0.4 |

**Figure 2 Water quality of the Passur River at Mongla point
(Source: EIA-Report)**



ELEVATION



- NOTE:-
1. RCC GRADE M25, PCC M10
 2. 8 MM DIA STEEL BOTHWAY (DOUBLE LAYER) IN RAFT, WALL AND SLAB OVER POTABLE WATER TANK

2X660MW MAITREE RAMPAL
PROJECT
JOB:- CONSTRUCTION OF
CONSTRUCTION WATER & POTABLE
WATER TANK
DRAWING TITLE:- PLAN AND
ELEVATION OF CONSTRUCTION &
POTABLE WATER RCC TANK

REVISIONS

PLAN

TENDER PURPOSE ONLY

ANNEXURE B TO TCN-01

DESIGN, ENGINEERING, PROCUREMENT, SUPPLY, CONSTRUCTION, ERECTION, INSTALLATION, COMMISSIONING ETC , OPERATION AND MAINTENANCE OF CONSTRUCTION(20 CUM/HOUR) & POTABLE WATER SYSTEM(1 CUM/HOUR) ON EPC BASIS AND CONSTRUCTION OF RESERVOIR FOR CONSTRUCTION WATER AS PER TECHNICAL SPECIFICATION FOR 2x660 MW MAITREE RAMPAL PROJECT

TENDER NO : PSER:SCT:KLN-C1785:16

REVISION OF CLAUSES OF VOLUME-IC & ID

| Sl. no. | Clause No. | Existing clause | Revised clause |
|---------|---|--|--|
| 1 | Clause No.2.2,1C & ID Special Condions of Contract(Supply & Service) | Bidder is also responsible to complete the following works: | Bidder is also responsible to complete the following works on item rate basis |
| 2 | Clause No.2.2.1,1C & ID-Special Condions of Contract(Supply & Service) | Providing and installation of different capacity of Pumps including civil works. | Providing and installation of different capacity of Pumps for construction water & potable water distribution from Reservoir including civil works. Supplying, fitting and fixing of G.I pipe of required diameter with all special fitting, such as bends, elbow, socket, reducing sockets, tee, union , gate valve (at the interval of 100m throughout the pipe line of Construction water & Potable water pipe line and end of the pipe line) , jam-nuts including cutting trenches where necessary and fitting the same with earth duly rammed and fixing in walls with holder bats and making hole in floors, walls and consequent mending good the damages, excavation of soil upto maximum 1m (where necessary) etc all complete in all respect approved and accepted by the Engineer. |
| 3 | Clause No.2.3,1C & ID Special Condions of Contract(Supply & Service) | The contractor shall submit the drawings and BOQs to BHEL for approval within 20 days from the date of LOI. Subsequently drawings will be approved by BHEL within 30 days from date of LOI | The contractor shall submit all the details Mechanical, Electricals, Instrumentation, Civil etc. drawings and BOQ/BOM (for Serial No. A in Supply Part Schedule 3 & Service part Schedule 4 of Volume III of Price Schedule) to BHEL for approval within 20 days from the date of LOI. Subsequently drawings will be approved by BHEL within 30 days from date of LOI. |

FORMAT FOR NO DEVIATION CERTIFICATE
(To be submitted in the bidder's letter head)

BHARAT HEAVY ELECTRICALS LIMITED,
 Power Sector - Eastern Region,
 Plot no 9/1, DJ Block, Sector – II, Salt Lake City,
 Kolkata – 700 091

| | | |
|------------|---|---|
| Sub | No Deviation Certificate. | |
| Job | Design, Engineering, procurement, supply, construction, erection, commissioning of construction water system (20 cum / hour) & potable water system (1 cum / hour) on EPC basis and construction of reservoir as per technical specification for 2x660 mw maitree super thermal power project at moidara village, rampalupazila, bagerhat district, Bangladesh. | |
| Ref | 01 | Tender No. PSER:SCT:KLN-C1785:16. |
| | 02 | BHEL's NIT, vide reference no PSER:SCT:KLN-C1785:5303 , dated 22-11-2016 |
| | 03 | BHEL's TCN-01, vide reference no PSER:SCT:KLN-C1785:TCN-01, dated 06-12-2016. |
| | 04 | All other pertinent issues till date. |

Dear Sirs,

With reference to above, this is to confirm that as per tender conditions, we have visited site before submission of our offer and noted the job content & site conditions etc. We also confirm that we have not changed/ modified the tender documents as appeared in the website/ issued by you and in case of such observance at any stage, it shall be treated as null and void.

We hereby confirm that we have not taken any deviation from tender clauses together with other references as enumerated in the above referred NIT. We hereby confirm our unqualified acceptance to all terms & conditions, unqualified compliance to technical specification, integrity pact (if applicable) and acceptance to reverse auctioning process.

In the event of observance of any deviation in any part of our offer at a later date whether implicit or explicit, the deviations shall stand null & void.

We confirm to have submitted offer in accordance with tender instructions and as per aforesaid references.

Thanking you,

Yours faithfully,

(Signature, date & seal of authorized representative of the bidder)

पावर सेक्टर पूर्वी क्षेत्र (मुख्यालय)

POWER SECTOR EASTERN REGION DJ-9/1, SECTOR-II, SALTLAKE CITY, KOLKATA - 700 091

फैक्स/Fax : (033) 23211960

फोन/Phone : बोर्ड/EPABX : 23211691, 23211798, 23211796