



SCOPE OF WORK

Scope of work includes complete design, manufacture, inspection, testing, supply, transportation to site, unloading, storage, construction, installation, hydro testing, trial run, commissioning, performance tests and turnover for intake cum pump house, the pumps, electrical and instrumentation facilities in pump house and Cross country piping system includes pipes, specials, valves and other necessary pits, chambers, etc., starting from intake well to plant reservoir.

Design

- Basic Engineering of the complete Raw Water Intake System
- Detailed design and drawings for all the equipment and system including civil, mechanical, electrical and instrumentation.
- Providing Engineering drawings, design data, inspection, test certificate, installation and commissioning of the pumping system, Operation & Maintenance / Instruction Manual, as built drawings and other information for review and approval.

Mechanical

- Complete pumping system
- Complete piping from raw water pump discharge to Plant reservoir including pipe supports, pipe fittings valves and thrust blocks.
- Surge/transient analysis steady for raw water pumping system and provision for surge chambers, air release cum vacuum breaker valves, vents, drains as required
- Material handling facilities for the system

Control & Instrumentation

- Complete independent control and instrumentation system for the safe, efficient and reliable operation of the Raw Water Intake System.
 - All control system equipment including the PLC-based control system, HMI equipment consisting of 1 nos. operator-cum-engineering PC-based workstation with 21" LCD/TFT display, keyboard, mouse and other accessories, 132 column dot matrix printer and all associated networking equipment including cables, control desk and interfaces with electrical systems.
 - Vibration Monitoring System (VMS) for the Raw Water Supply pumps.
 - Hardwired back-up control panel for the manual operation of the Raw Water Supply pumps and discharge valves, complete with indicating lamp push buttons (ILPBs), hardwired annunciator and local/remote selection switch.
 - All necessary field instrumentation including level switches, HART compatible process transmitters for pressure, flow etc., conforming to applicable standards on hazardous area classifications and rated for installation in dusty environments.
 - Complete supply and installation of junction boxes, cable trays, cable glands, lugs, cable ties, pneumatic and process hook up hardware, instrumentation, control and special cables, data cables, vibration sensors with transmitters and other erection hardware and accessories integral to the control system.
 - Testing and inspection of the offered control system and all its components in line with approved FAT and SAT procedures.
 - Supply of necessary maintenance and calibration equipment.
 - Supply of all recommended, mandatory and commissioning spares.
 - Training of EMPLOYER's personnel on the engineering of the hardware and software components as well as maintenance of the control system.
 - The minimum instrumentation requirement for the Raw Water Intake System shall be as per the bid flow diagram. However, for completeness of the Raw water Intake System and its associated equipment, Bidder shall also provide all the necessary instruments even if it is not specifically indicated in the flow diagram.
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- The instrumentation, operation and control philosophy proposed is specific to the plant design. Any improvement over the proposed typical control & instrumentation scheme shall be accepted so long as it does not deviate from the basic intent and general philosophy enumerated herein and elsewhere in this specification.

Civil

Complete civil works for Raw Water Intake System including but not limited to the following

- Intake well and pump house with indoor / outdoor transformer and substation
- Inspection chambers, valve pits, anchor blocks and thrust blocks
- Trenches / culverts
- Excavation & refilling along the cross country piping from intake well to plant raw water reservoir including dewatering, shoring and strutting, disposal of surplus earth crossing all type of water bodies/rivers/canal/nalla/etc., and all type of roads/railway tracks/culverts/etc.,
- Service Quarters at Intake location of around 4000 sq-ft carpet area,(Minimum 4 units) Gate house, security house, compound wall, Internal roads ,drainages , sanitary system, landscape.(Including the conceptual drawing as per EMPLOYER requirements)
- Laying of cables through overhead /underground from Raw Water Pump House to Plant Reservoir. Along with associated Civil/Mechanical works to ensure completeness of the system.

Some of the major activities identified during execution stage are listed below:

- Establish site office
 - Establish fabrication yard
 - Establish material storage yard
 - Providing necessary support to EMPLOYER in local liaising to obtain permission from all relevant agencies to lay raw water pumping main (Refer paragraph no 14 that describes the status of approval)
 - Prepare complete engineering drawings and obtain necessary approvals
 - Conduct route survey, Physical mark up route & obstructions
 - Establish Safety & environmental requirements
 - Prepare work plan including time schedule and obtain approvals
 - While working within the plant area the successful bidder will work along with main EPC bidder (M/s. Cethar vessels) to coordinate and get site access and schedule of activities.
 - Prepare field notes for conducting site modifications, testing, repairs and seek approval
 - Establish pipe coating bidder work methods
 - Plan excavation/ firm up disposal locations and seek approval
 - Identify sources for filling materials, test and seek approval
 - Measure and report material status, safety & environmental status, engineering status,
 - construction status on a planned VS actual basis on a weekly basis and attend status review meetings(Primavera s/w should be used for scheduling)
 - Supply electrode and welding consumables
 - Supply LPT kits and testing aids
 - Supply filling materials
 - Provide all tools & tackles and measuring instruments
 - Provide DG sets and DG welding sets
 - Provide transporting equipments, cranes and transporting/handling/compacting/dislodging equipment
 - Supply safety equipment
 - Provide erection support facilities such as ventilation equipment, rain covers, dewatering etc.
 - Qualify welding procedures
 - Qualify welders
 - Unload, receive, transport as necessary to storage yard and account free issue materials
 - Transport materials to fabrication yard / erection site
 - Conduct prefabrication
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Adopt safety and environmental requirements

- Supply welders, fitters, riggers, erection support crew personnel and civil construction personnel
Conduct LPT and other tests
- Establish dump locations
- Conduct excavation
- Receive and store filling materials
- Transport filling materials to erection site
- Conduct filling and compacting of materials
- Measure filling compaction
- Erect, align, measure and weld/fit- pipe
- Erect, align, measure and weld/fit -pipe fittings
- Erect, align, measure and weld/fit -valves
- Erect, align, measure and weld/fit –specials
- Proper stacking arrangement for DI pipes (If applicable) consumables such as titon rubber rings, flanges.
- Procurement and ready availability of DI pipes / Mild steel pipes specials and fittings.
- Supply, erection and testing of pump sets
- Conduct site modification, testing, repairs as necessary
- Construct valve pits
- Construct manhole pits
- Construct anchorage blocks
- Conduct hydraulic pressure test as per specification or relevant IS Codes
- Complete refilling and dispose surplus earth.
- Restore the damaged roads/drains/land/area to its original condition.
- All electrical and mechanical installations should strictly adhere to the rules and regulations described by CEA / Mandatory authorities. Necessary drawings as required by mandatory authorities shall be prepared and got approved.
- Preparation and submission of As Build Drawings
- Preparation and submission of O&M manual
- Operation and maintenance of the entire raw water pumping main to the full defect liability period (Defect liability period is 1 year from the date of completion of work). The completion certificate will be issued after the completion of work in all respects.

Electrical

The scope of work will cover in general, but not limited to the following terms of work:

- 33/6.9 kV Power Transformers & 6.6/0.433 kV Distribution Transformers at RWIS
 - 33 kV AB Switch in sheet steel enclosure.
 - Double pole structure with AB switch, drop out fuse, Lightning Arrester etc.
 - 6.6 kV Switchgear at RWIS
 - 415V Switchgear at RWIS
 - HT capacitor banks
 - HT & LT Motors
 - Soft starter for 6.6 kV motors (if required)
 - Local push button stations.
 - Electrical Actuators.
 - 220 V DC Battery, Charger & DCDB.
 - 240 V AC redundant UPS, Lead Acid Plante Battery & ACDB.
 - Power supply
Two (2) Nos. of 33 kV feeder will be provided from 33 kV kiosk at the Plant terminals by the EMPLOYER. Bidder shall derive this supply and transmit through 33 kV double circuit transmission lines or UG Power Cables for a distance of 44km, from Plant area to raw water supply pump house area.
 - 33 kV double circuit Transmission lines and/or UG cables with complete accessories
 - 33kV & 6.6 kV cable termination kit for terminating the cables and conductors
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- Installation of all the interconnecting cables (HT, LT & Control cables) between the equipments supplied by the Bidder.
- HT & LT Power Cables
- Control Cables.
- Termination Kits
- Illumination system complete with Lighting panels, Lighting fixtures, lighting poles, receptacles, conduits, wires, switch boxes etc.
- Cabling system complete with cable trays, supports, conduits, glands, lugs etc.
- Installation of all the interconnecting cables (HT, LT & Control cables) between the equipments supplied by the Bidder.
- Fire sealing system for cable penetrations.
- Earthing system including buried earth mat and above ground earthing.
- Lightning protection system.
- Lightning Arrestor with complete accessories for Transformer
- Electricals for EOT Crane.
- Rubber mats, First aid box, Danger plate, etc.
- Erection components, Tools, Tackles, hardware, etc.
- Erection & Commissioning spares
- O&M spares.
- Necessary Earthing Switches shall be provided wherever required

Any other electrical equipment and accessories required to complete the River water intake System.

TERMINAL POINTS

Mechanical

- Intake well
- Raw Water reservoir inlet at the Project Site

Civil

Electrical

- 2 numbers 33 kV incoming feeders at the Power plant boundary 33kV kiosk

EXCLUSIONS FROM BIDDER'S SCOPE OF WORK

Civil

- Raw water reservoir at Power plant area
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