

## Brief Scope of Work

**Tender: T/2445913/2022**

# **Design, Supply & Installation of Drum Screen Control System at Al Ansab STP**

### **SUMMARY of SCOPE of WORK:**

1. Equipment furnished and installed under this section shall be fabricated, assembled, erected and placed in proper operating condition in full conformity with drawings, specifications, engineering data, instructions, and recommendations furnished by the equipment manufacturer unless exceptions are noted by the Engineer.
  - The contractor shall gather all the necessary process/operation details from available drawings and site visits. The contractor is to ensure the newly built control PLC software suitable to all the control philosophy requirement and the various equipment shall function as normal using the newly provided PLC and the Electrical MCC panel.
  - The contractor shall gather all the necessary Electrical and Instrument hardwiring information for Power and field instruments associated with the equipment. This is to be done using the available drawings and site visits. Accordingly, vendor to plan necessary panel design which shall include necessary termination for all the power and field instruments. Any required electrical contractors/breakers shall be considered with appropriate power ratings.
  - The contractor shall also plan and provide the requirement for the new cable laying for Power and field instrument from the new panel to the existing field equipment. Signal/Power/communication cables shall be documented in the field cable schedule design document necessarily.
  - Appropriate cable routing shall be done by the contractor using covered cable ducts or trays.
  - All field cables for Power/Instrument/communication/Fiber supplied as part of this project shall be with industrial armored type.
2. The Control system & Electrical MCC panels shall be fabricated and assembled by a vendor who is fully experienced, reputable, and qualified vendor specialized in Electrical & Control System solution provider.
3. All equipment shall be suitable for continuous outdoor exposure and temperature rating (0 C to +70 C). Contractor to use "Carbon Activated panel Filters" for the ventilation purpose for the control panel e.g. PERMATRON. The contractor shall ensure the proposed carbon activated panel air filters are supporting to reduce the effect of H<sub>2</sub>S air contamination. Contractor can propose options for the filter in their proposal document.
4. The panel enclosure shall be suitable for outdoor unit as per OWWSC specification. The panel enclosure cooling and air circulation shall fit the site condition.

5. All panels to be utilized Roxtec Cable transit system or equivalent in order to reduce gas ingress inside the panels.
6. Supply and installation of Power and field instrument cables (industrial shielded and armored) from the new panel to the existing field equipment through pipes in concrete cased (mesh) duct bank at all road crossings from the termination box to the PLC Control Panel with GI trays and covers, supports, spacers, installed, connected, terminated, marked, tested and commissioned according to OWWSC water standards and specifications.
7. Dual Hot redundancy in automated systems provides for switchover of functionality to a backup component in case of failure of a primary component. The switchover is considered automatic if no operator intervention is required. Redundancy applies to both hardware and software and implies no loss of continuity during the transfer of control between primary (active) and redundant (backup) components. Redundant systems reduce single points of failure, preventing loss of functionality and data acquisition.
8. The PLC shall be quoted (outdoor type) to withstand the H<sub>2</sub>S gas and moisture from corrosion.
9. The HMI shall be quoted (outdoor type) to withstand the H<sub>2</sub>S gas and moisture from corrosion and 12 inch in size required or equivalent.
10. Graphics design by the contractor and original backup to be provided.
11. The approved Control Philosophy and O&M manuals shall consider and part of the scope of the contractor.
12. The equipment shall be arranged to permit maintenance of all components from the operating floor.
13. Ensure that the design of control system in such a way that Remote/Auto, Remote/Manual, Local/Auto, and Local/Manual for continuous operation of system, if communication or DCS fail. If PLC fail the local manual mode operation can operate the system.
14. The protection shall be hardwired at all times and indicate the failure in the PLC and DCS.
15. The contractor shall consider the full system control philosophy and all equipment related to the Drum Screen units, Screw conveyers' units, grit washer units, wash pumps and other related units.
16. The contractor shall provide up to date new release software version and hardware equipment (Electrical & Instrument) under this scope. The contractor is not allowed to use any of the existing
17. The contractor scope shall include the complete mapping list with slave address to be provided to DCS vendor before starting integration. The contractor PLC engineer service support required for loop checking for all Profibus mapping tags.
18. The Programming, Engineering and commissioning shall be done with equipment OEM (Drum Screen, Grit Washer, and Screw Conveyer) with OWWSC presence and engagement. Its under the contractor responsibility to involve the field equipment OEM for engineering and commissioning of this project. Skip and Penstock Valve OEM are excluded and the Local Operating Panel design and operation philosophy by component and certified contractor.
19. The PLC program shall be written in the Ladder diagram format, clearly described each

function in English.

20. Hard and soft documents shall be provided in English (3 copies). System passwords shall be provided in Hard and soft copy. Original software and graphics backup shall be provided. License shall be provided to OWWSC Water and valid.
21. The control philosophy shall be provided in Hard and Soft copy for review in the initial stage.
22. Power Surge and lighting protection shall be provided and installed as per specification. Including UPS provision and installation for the PLC panel, which OWWSC shall provide and handed over to the contractor once mobilized.
23. The Contractor is responsible for the protection of the working and surrounding areas, facilities, utilities and equipment.
24. The contractor shall provide tagging for panel, equipment, termination box/panel and Emergency switch as per OWWSC Water standard specification.
25. Execute the works in strict accordance with the terms and conditions of this Contract and to the satisfaction of OWWSC and shall comply with and adhere strictly to all pertinent Code of Practice, Standards, Technical Specifications, applicable rules and regulations as defined within the latest issue of OWWSC Water Reference Documents and all other statutory requirements as may be issued from time to time.
26. The Contractor shall be deemed to have fully allowed for complying with all requirements of OWWSC Water's Safety Reference Documents.
27. Contractor must notify OWWSC in writing for any work that falls under the category of additional services and do not commence without written approval of OWWSC except as specifically provided for within this Contract.