

Sequencing Batch Reactor



Compact Sanitation Plant for a Fast Growing Population

Project: Town of Hisar, India

Located in the province of Haryana near India's capital city of New Delhi, the ancient town of Hisar has seen rapid population growth in recent years as families and businesses choose the city as an alternative to larger centers. With a current population of 300,000, Hisar, known as "The City of Steel", is India's largest galvanized iron manufacturing city thanks to the presence of a large steel manufacturing industry, including one of India's leading conglomerates, the B.C. Jindal Group.

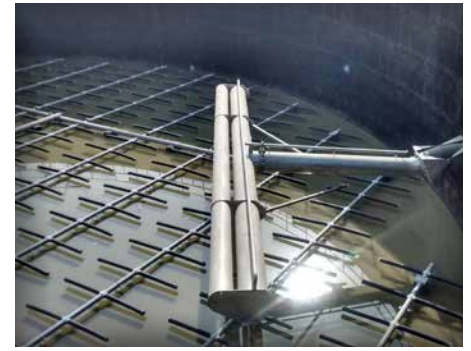
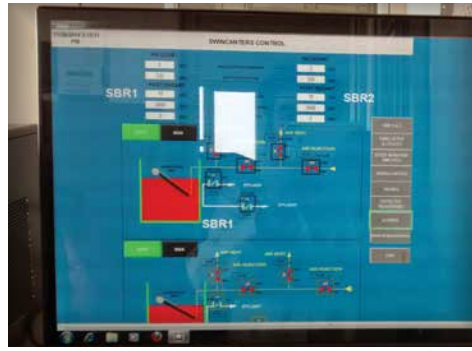
In 2012, the Haryana Public Health Engineering Department (PHED) announced the construction of a 15 km sewage pipeline, 25 MLD pumping station and 15 MLD sewage treatment project. After the evaluation of all bids submitted and a pre-approval from governmental technical teams of all engineering and designs, Balaji Construction was awarded the contract to build and operate an Ecoprocess™ SBR municipal biological sewage treatment plant designed by Premier Tech Aqua (PTA) – an international leader in decentralized wastewater treatment with over 25 years of expertise in SBR technology.

Challenges

As a government tender, Balaji Construction was expected to meet all specifications and deliver a cost-effective design fully completed on budget and on time. The PHED requested a high-performance and fully automated SBR wastewater treatment plant, offered as a turnkey solution for both operation and maintenance for the initial 12-month defect and liability phase and 5 years thereafter.

Effluent quality needed to meet strict governmental discharge standards and offer the client the possibility of reusing the treated water (gardening, flushing, etc.). Land use had to be optimized and the final footprint of the system be as compact as possible, even for such large flows. The system had to be highly energy-efficient and offer the flexibility of growing as the city developed.





Solution

Premier Tech Aqua designed an Ecoprocess™ SBR Treatment Plant and provided most of the process equipment, including the Supervisory Control and Data Acquisition (SCADA) control system for automation of the complete treatment chain and pre- and post-treatment units.

The solution consists of a primary treatment followed by two circular tanks integrating the SBR reactors designed to treat 15 MLD and handle typical municipal sewage with a BOD of 350 mg/L. The pre-treatment integrates a receiving chamber, coarse screening and grit removal units and is followed by the gradual fill-semi true batch SBR. Phosphorus abatement is achieved partly by the biological process and completed by an addition of chemicals. At the heart of the treatment is the SwingCanter™, a PTA-designed and non-mechanical, low-maintenance solid-exclusion floating decanter equipped with an integrated scum control system (SCS). The SwingCanter™ removes water from the surface of the basins and drains it by gravity into a receiving stream.

Energy requirements were minimized by using gravity flow whenever possible and by integrating reliable and highly efficient equipment such as aeration with membrane fine bubble diffusers. Space requirements were kept to a minimum by providing aeration and settling in the same tank for an up to 30-40% space saving capacity compared to conventional plants requiring an activated sludge return process (CAS). PTA provided a more flexible scope of supply to Balaji Construction, allowing the contractor to purchase equipment from a greater number of local Indian suppliers and further reduce the overall cost of the project. Finally, PTA provided a month-long onsite technical support and training for the operators, and continues to monitor, trouble-shoot and solve any operating system issues remotely thanks to a modern telemetry module designed by PTA.

The dimension of the complete treatment chain, including primary treatment, secondary and sludge management is 2,200 square meters. The control area housing the SCADA system is a small, one-room, 13 square meters building.

Results

Wastewater characteristics and effluent quality from Ecoprocess™ SBR

Parameters	Influent	Effluent	Parameters	Influent	Effluent
Average Flow (design daily flow)	15 MLD	—	COD	≤600 mg/L	≤100
Peak Flow	33 MLD	—	Total Nitrogen	≤45 mg/L	≤10
BOD₅	≤250 MLD	≤10	Total Phosphorus	≤5 mg/L	≤1
TSS	≤400 mg/L	≤10	Oil and grease	≤50 mg/L	—
			pH	6.5-7.5	6.5-8.5

The Town of Hisar's new Ecoprocess™ SBR system was commissioned in 2015 and continually treats up to 15 MLD with high efficiency today.

The PTA Advantage

- Versatile technology ensuring proven performances and low-cost, simple operations.
- High-performance system offering an effluent of such exceptional quality that water can be reused.
- Integrated, operator-friendly control/monitoring PLC-based automation program resistant to all plant conditions.
- Experienced team of Process Engineers and local Indian technical advisors from PTA providing exceptional support and expert advice throughout the project – before, during and after the start-up of the treatment plant

“Premier Tech Aqua Systems India Pvt. Ltd. and Balaji Construction were awarded the work of design, engineering, supply, erection and commissioning of a 15 MLD Sewage Treatment Plant based on SBR Technology. For over a year now, the plant has been delivering satisfactory results characteristics of treated sewage. The performances of our STP is within parameters as specified in the tender.”

Balwant Punia

Executive Engineer
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