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Case Study Wastewater Treatment Works Upgrade Twin Lamella Unit

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CASE STUDY

Hampshire — Wastewater Treatment Works Upgrade to handle increased flows while complying with permit flow conditions

Background

The Clients Wastewater Treatment Works, constructed in the 1960s, serves a population equivalent of 2,164 in the UK. The facility processes sewage collected through gravity sewers and discharged via the pumping station. The site had seen minimal investment since the addition of a humus tank and sludge storage tanks in the 1980s and 1990s.

Challenge

The primary driver for the upgrade was the need to enable the works to handle increased flows while complying with permit flow conditions. The facility needed to maintain strict effluent discharge permits, including BOD of 25 mg/l, TSS of 45 mg/l, COD of 125 mg/l, with a Daily Water Flow (DWF) of 750m³/day and Full Flow to Treatment (FFT) of 26 l/s.

Solution & Delivery

The core of the solution centred on the installation of two 40m² ATAC Lamella units with auto-de-sludge systems, operating in parallel with existing primary settlement tanks. An automated sludge removal system was installed to enhance operational efficiency.

The comprehensive site upgrade encompassed several key areas. The pumping system was enhanced through the installation of duty/standby Xylem dry well submersible pumps, featuring variable speed operation to manage flow rates effectively. An automated control system with an exercise regime was implemented to prevent sewage stagnation.

The filter system underwent modernisation with the replacement of existing filter bed distributors with

Jacopa Syphonic type units, complemented by the installation of a new dosing syphon and Copa sac chamber. The control systems were upgraded with a new Local Control Panel featuring PLC and HMI interface, automated de-sludging sequences, and comprehensive flow monitoring and control systems.

The system operates through a sophisticated dual-flow approach. Flows up to 15 l/s are handled through gravity via the existing flume and primary tanks. When incoming flow exceeds 15 l/s, additional flow is pumped to the Lamella tanks. The automated de-sludging system includes fail-safe mechanisms, while maintaining manual override capabilities for maintenance purposes.

Safety was prioritised through the installation of designated walkways for safe access to equipment, along with fail-safe valve systems for power failure scenarios.

Results

The upgrade has delivered significant improvements across multiple areas. Treatment capacity has been substantially increased, while flow management has been optimised through the new control systems. The enhanced automation and improved sludge handling capabilities have resulted in more efficient operations, supported by modern control systems that enable precise monitoring and adjustment of treatment processes.

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