Barhale

Canterbury WWTW Aeration Refurbishment and Upgrade

Client:	Southern Water
Location:	Canterbury
Value:	£640k
Duration:	28 Weeks

In Brief...

As part of Southern Water's AMP6 upgrade works, Barhale were contracted to refurbish the aeration system at Canterbury Waste Water Treatment Works (WWTW). The works included replacing 7 aeration blowers dating from 1998 with 75kW rotary lobe blowers which are complementary to new diffusers and the air main. Barhale also installed new blower and aeration control and instrumentation systems. These included high and low discharge pressure sensors and pressure transducer with a visual display or pressure gauge.

New blowers, blower house 1

New blower control panel

Customer Benefits...

The works entailed significant constraints. For example, the blowers needed to be replaced without stopping the process of the WWTW and the full works had to stay within consents agreed with the Environment Agency by Southern Water. Furthermore, some of the pre-agreed solutions presented important limitations, especially in terms of health and safety risks and weather risks to the assets during the works.

Barhale not only overcame these constraints through a series of innovative solutions, but it also finished the works ahead of programme, which saved Southern Water over £45,000 in costs, and worked to the highest standards throughout. As a result, the upgraded aeration system at Canterbury WWTW is significantly more robust and has thus greatly reduced the risk of plant failure, it meets the capacity forecasted for 2025 of 73,394 users, and it maintains an efficient and effective biological process.

Innovative Solutions...

The original programme required us to remove and install blowers 5 - 7 in blower house 2 via crane, by removing the existing GRP roof. This however, raised significant health and safety risks and it exposed the assets to weather risks. To resolve these challenges, we instead replaced the blowers by modifying the front of the building. This minimised health and safety hazards, it improved ventilation, it protected assets from the elements, and it created safe access for future maintenance.

The initial solution also specified that, in order to maintain the running of the process unaffected, which required that a minimum of 5 blowers run concurrently, blowers 1 - 4 in blower house 1 be replaced with the help of hired temporary blowers. This would have come at significant costs to the project. To bypass those costs, we instead utilised redundant, swapped-out blower units from blower house 2 as a temporary solution. Additionally, instead of hiring a generator, we fed the temporary blowers with an existing main feed which was backed up by the existing site generator.

The new blowers also raised the problem of communication between different software protocols. To enable this communication, we used Red Lion converter and thus removed the need to carry out intrusive works on the existing processor in blower house 2, which was 20 years old. This has not only resolved our immediate problem, but will continue to save costs in the future to our client, who are now updating their system to SCADA and would have needed to budget for acquiring matching software otherwise.

We also used low harmonic drives, which eliminated the need for harmonic surveys both before and after the works, and the need to fit harmonic filters in both Motor Control Centers. This saved costs, it eliminated the health and safety risks that would have been entailed by live connections on the busbar, and it reduced the working time by approximately 12 weeks.

Decommissioned blowers, blower house 1

Decommissioned blower control panel

Innovative Solutions Cont...

Finally, electrical shutdowns required by the works would have entailed over-pumping the RAS screw pumps. This presented significant limitations, however temporary pumps ran at 1500-2000 RPM to cope with the high volume of flow, which risked destroying the biomass if used for long periods of time. To avoid this, in collaboration with the client, we replaced over-pumping with short shut-down periods of an hour maximum. This has enabled us to continue using the RAS screw pumps and thus to protect the RAS sludge and the broader process.