

Frittenden, Kent, WwTW

£1.2m plant fabricated off-site delivered to village on five lorries

The wastewater treatment works at Frittenden, a tiny Kent village (2010 population 461) was a conventional filter bed works with primary settlement and humus tanks situated alongside storm tanks and sludge storage facilities. The works need to be upgraded to cope with an increased population, resulting in a flow increase from 2.16 l/s to 9 l/s, and to achieve the tighter consent from 60/50/-/- all year round to 40/20/10/2 (SS/BOD/Ammonia/ Phosphorus) imposed by the Environment Agency.



Fabricated plant delivered to Frittenden (Courtesy Southern Water).

Two options were considered, firstly, a new nitrifying SAFF plant with septic tanks as primary settlement with flow balancing, and secondly, a Sequencing Batch Reactor (SBR) plant. Ferric dosing and storm facilities would be provided with both options.

Although the Submerged Aerated Filtered Filter (SAFF) plant was slightly cheaper it would have struggled with the huge variation in influent flows arising from the siphon arrangement in the sewerage system. The SBR process was therefore preferred as it had an inherent balancing capability.

However, the project team considered that the SBR process posed a risk in achieving the likely ferric consent of 2mgFe/l spot sample (i.e. no failures allowed), since the suspended solids in the secondary effluent would be likely to contain a relatively high percentage of ferric (10-15%). This is because ferric would be dosed directly into the SBRs, so tertiary treatment would be necessary to reduce the solids further.

Constructing a reed bed was considered but because the existing filter would have had to be demolished to accommodate it, construction phasing would have been awkward. Establishing reed growth outside the warmer, drier months was also perceived as a potential problem. The SAFF options was, therefore, reconsidered and later chosen. Flow balancing of the influent has been achieved in two ways, in the septic tanks and the intermediate SAFF feed pumping station by using variable speed pumps.

New structures added to the site included:

- * storm tanks;

- * septic tanks;
- * intermediate pumping station;
- * SAFF units;
- * humus tanks;
- * ferric storage and dosing equipment.

Because most of the new works was package equipment fabricated off-site the challenges were not those traditionally associated with construction projects.

Challenge

Indeed, one of the biggest challenges of the project was when the submerged aerated filters and final settlement tanks were brought to the site. Planning for this movement of plant started 12 weeks in advance to ensure everything was in place.

The plant arrived on five lorries, three of which had police escorts because they were more than three metres wide. A 50 tonne crane unloaded the cargo, helped by the contractors and a tractor recovery unit. In preparation for the arrival of the convoy at this tiny village, BT had to remove low overhead wires, a temporary layer was put on the existing entrance to the field, tree boughs were cut back and a gate post temporarily removed.

Work started in August 2002 and the £1.2m works met consent by 31 March 2003. ■

Note: The editor & publishers thank Southern Water for their cooperation in producing this article.