

Pitscottie WwTW

underground SAF solves rural WwTW problem

Pitscottie WwTW, situated adjacent to the picturesque Ceres Burn in Pitscottie, Fife was originally constructed in 1974 and consisted of a raw sewage pumping station that pumped macerated sewage to two septic tanks. Little was done to this system since that date until the recent extension. The septic tanks were originally situated outside the village boundary but, as housing developments expanded, the village perimeters spread out, resulting in the septic tanks being sandwiched between two properties, one less than three metres and the other five metres away. Access to the tanks is down a steep stoned single track. The area about the works was overgrown and this prohibited the public from using the Ceres Burn corridor in this region for recreational purposes. SEPA targeted a number of works along the length of the Ceres Burn, requiring the quality of the final effluent discharging into the burn to be improved - including Pitscottie.



Pitscottie WwTW: Underground SAF being constructed

courtesy Scottish Water Solutions

Design & Planning

The original works only consisted of primary treatment discharging into the burn and the previous SEPA consent reflected this. The only quality parameter in the consent was a suspended solids content not exceeding 150 mg/l. However, this limited level of treatment was deemed unacceptable and the consent was revised, with compliance of the Urban Wastewater Treatment Directive (UWWTD) requiring biological treatment to be in place by 31st December 2005.

The revised consent established tighter quality parameters, including the introduction of Biological Oxygen Demand (BOD) and Ammonia (NH₃) standards. In addition, an alarm and telemetry system was to be introduced to the works and pumping station.

The choice of secondary treatment process was determined using the Scottish Water Solutions process selection matrix. From this, a packaged Submerged Aerated Filter (SAF) plant and final humus settlement tank were chosen. Although screenings were not a requirement of the consent, COPA sacks were introduced to protect the SAF.

Following flow and load surveys, the capacity of each element of plant was determined. Discussions were held at an early stage with the local planning authority. It was evident that a planning application for a standard above ground SAF would be problematic, with likely objections from neighbours and the community council. Based on

experience of other works in the area where there were objections, it was felt that an alternative strategy had to be adopted in order for the works to be delivered by December 2005.

Following presentations and schematic of the final scheme, it was agreed that if the works were situated underground and the impact to the local environment was minimised, then they could progress as permitted development.

This development required the designers to broaden their horizons and introduce an underground SAF. This is the only known case of such a system in Scotland.

Construction

Purac Leslie began construction during April 2005.

Due to the close proximity of the adjoining properties and the works being situated within a cul-de-sac, it was agreed with the local community certain construction parameters. Working hours and timing of deliveries to and from the site were determined in order to minimise impacts on the community and school buses.

The footprint of the site was small, with houses encapsulating two of the three sides. The Ceres Burn provided the other physical boundary. Space was, therefore, at a premium and some activities such as earthworks, sequence of work operations, storage of materials etc were difficult and required careful planning.

Site investigations showed that rock was approximately 2m below ground level. The conical humus tank required a separation of 5m deep. Rock could only be removed with the use of excavation mounted rock breakers. Again, this was discussed with the local community and an action plan was put into place.

Works progressed well with little delay and were completed in September. A period of seven weeks was required in order for the the SAF to “seed” and build up its bacterial bio-mass.

Following commissioning, the works were handed over to the Client, Scottish Water, in November, ahead of programme and within budget.

Summary

The project at Pitscottie was completed and within budget. The needs of the Client were fulfilled and the enhanced effluent will, together with the other improvement schemes in the area, help to improve the quality of water in the Ceres Burn. The project delivered a robust and reliable treatment process.

A number of factors helped make this project a success, including involvement of the planning authority at the earliest opportunity. Planning permission issues can often be a major cause of delay on a project, but in this instance, working closely with the local planners and evolving a solution that met their needs and was sympathetic with the surroundings, helped to ensure that the work commenced smoothly.

The close involvement of the local community was one of the successes of the project. Keeping them abreast of planned works at regular intervals and involving them in the decision making process helped immensely.

It was agreed not to enclose the works with a secure fence, which would have had an impact on the surrounding area, but to make all the covers lockable. A safe path was also established at the side of the works linking to an existing path downstream of the works, allowing the community to enjoy the beauty of Ceres Burn. Landscaping was introduced, using native species of trees sympathetic with the surrounding area, which will further enhance the locale. ■



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