

Hoplands Farm WTW

contact tank replacement

the benefits of contractor early engagement

by John Sanders

Hoplands Farm WTW is a South East Water treatment plant serving the local towns of Herne Bay and Canterbury. Raw water is pumped via submersible borehole pumps from two chalk boreholes located within the works. The total flow from these boreholes is a maximum of 79l/s. The raw flows are super-chlorinated and then passed through 2 (No.) parallel Sulzer mixers for aeration. The water is then piped to above ground contact tanks where disinfection takes place. Following the requisite contact time the flows are de-chlorinated with sulphur dioxide and the water is pumped via high-lift pumps to the distribution network.



First contact tank being lowered into position - Courtesy of Ensica Browne

Project drivers

The contact tank on the site was an aging segmented GRP tank and in need of repair. Leaks had been reported and the tank was nearing the end of its operational life-span. The rectification works were considered urgent and formed a key output under South East Water's non-infrastructure asset upgrade programme at the start of AMP6. Furthermore, South East Water was keen to take the opportunity to modify the control system for automatic control of the chlorination, aeration and de-chlorination processes, operable via the local HMI and visible on South East Water's SCADA system.

In addition, verification of the discharge consent license serving Hoplands Farm was required. Raw water is discharged from the on-site boreholes at pump start-up such that heavily turbid water is pumped to wash-out for a settable time period. The wash-out pipework directs these flows to the nearby tidal lake off the Great Stour river.

Undertakings

South East Water Engineering department was tasked with addressing these issues, and subsequently engaged with Ensica


Browne under their Lot B Engineering Non-Infrastructure Capital Works Framework Contract.

Early engagement

Fundamental to the Framework delivery model was early engagement. South East Water and Ensica Browne are co-located at the Snodland, Kent head office, with the project delivery teams and design teams working within same office area. On receipt of the Hoplands Farm project brief, the client/contractor teams discussed and reviewed the challenges and set about developing high-level options.

Key considerations at this stage were:

- Ensuring DWI compliance.
- Aligning scope and construction methods to timescale and budget constraints as set out by South East Water.
- Ensuring all stakeholders had genuine buy-in to the design, the construction methods and the timescales.
- TOTEX was given full consideration and was central to design decision-making.



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Temporary works in place during flow meter chamber construction
Courtesy of Enisca Browne



Internal view of tank section - Courtesy of Enisca Browne



New contact tanks commissioned and in service
Courtesy of Enisca Browne



Contact tanks housed in secure compound - Courtesy of Enisca Browne

Refining the project scope

The process of early engagement with South East Water provided the opportunity to understand these key project drivers and use them to guide the scope development. This allowed cost saving measures and efficiencies to be captured at concept stage. As such, the detailed scope was refined and agreed by all parties prior to contract engagement. Some of these early refinements included the following:

- The initial project brief was to repair the existing tank. Following a whole-life cost analysis it became clear that the best-value solution for South East Water was to replace, not repair.
- Following the decision to replace, the initial assumption was to replace on a like-for-like basis i.e. a GRP tank. However following investigation and contact with the supply chain questions arose regarding the DWI approval of GRP tanks for this particular application. As a result steel was selected as the chosen material.
- The tank had been retrofitted with external piping loops to provide an extended flow path. This was a non-standard configuration and further justified replacement rather than repair.
- Discussion with SEW Production raised the benefits of having two smaller tanks operating duty/duty, rather than a single tank. Hoplands Farm WTW is a critical site and the local network is extremely sensitive to outages. The periodic inspections and cleans of the contact tanks are made far more achievable with two tanks i.e. during an inspection/clean taking one tank out of service and running the site on reduced output is the most effective solution.
- The new tanks were positioned in a different part of the site so that interaction with below ground services was minimised. This also had the benefit that the existing tank could be retained until the commissioning phase when a brief changeover could be carried out to configure the pipework to change from the old to the new arrangement.

An Engineering and Construction Contract (NEC 3 form of contract) was drafted, issued for pricing, then awarded to Enisca Browne. In late 2016 Enisca Browne assumed responsibility for the design and construction of this scheme as principal contractor and principal designer. Following contract award, further refinements were made during the detailed design phase including:

- All instrumentation on the new tanks was installed at ground level which negated the need for roof access and the associated need for permanent access steelwork.
- The existing static mixer was retained following confirmation from the site team that it was suitable for re-use.
- The original intention was to install a V-notch chamber to measure the discharge flows and meet MCERTS requirements as this was the standard approach. However, given the topography of the site and the volume of flows, an electromagnetic flowmeter installation was designed and installed. Following construction completion this was confirmed as being MCERTS compliant for a flow monitoring system.

TOTEX savings

In total Enisca Browne recorded significant TOTEX savings on the original budget for this project; this represented a 33% saving for South East Water. Early engagement and a collaborative approach to scope development was absolutely key in this achievement.

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