



Deephams Sewage Treatment Works PHPS Upgrade Works

Careful Planning and Implementation

End User: Thames Water

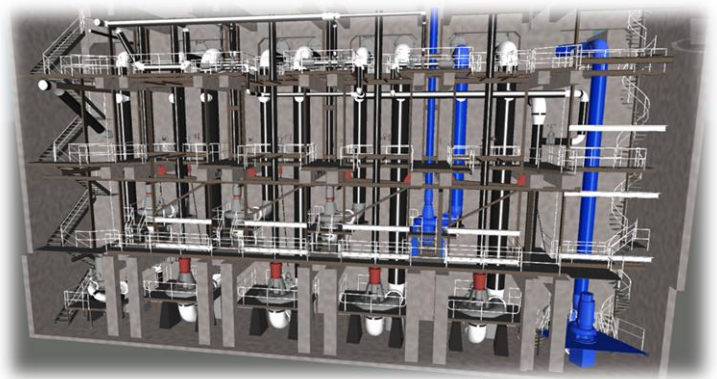
Client: Thames Water

Project Value: 1.5 Million

Length of contract: 9 months

Scope:

Deephams STW powerhouse pumping station consisted of 6 DWF pumps and 4 storm pumps, the DWF pumps were motor and shaft driven Hydrostal pumps, 3 of the storm pumps are driven by diesel engines and the 4th is driven by an electric motor. The DWF pumps were earmarked to be replaced as they weren't performing and were only delivery 700 l/s at 100% and regularly ragging up and requiring a lot of maintenance, All 10 double gated NRV valves were to be replaced with a single gate NRV valve as they were also ragging up and not closing properly as well as replacing all 10 air release valves too.



Proposed solution:

Gel Engineering took on the project as Principle Contractor and Principle Designer working closely with Thames Water to design and deliver the optimum solution for the pumping station. It was noted at an early stage of design that the existing monorail and pump gantry cranes were undersized for the new pumps which introduced another complexity to the project

Gel Engineering had a full 3D model of the dry well completed to facilitate with the full design of the PHPS **Gel Engineering** then modeled the new location of the pumps, suction and discharge pipework, NRV & ARV valves and access steelwork.

Upon inspection of the wet well it was also noted that the concrete ceiling was in poor condition and badly deteriorated from constant exposure to H₂S, this was of great concern as the NRV & ARV valves were supported from the roof of the wet well, core samples of the concrete were taken and analyzed to check the extent of deterioration so the correct solution/action could be taken to reinforce the wet well roof.

New electrical panels were manufactured and installed at the top of the dry well that housed the connections of the new Flygt pumps and inbuilt control equipment and a new local E-stop was installed at the location of the pumps.

The Equipment:

- Pumps – Flygt 8531 215Kw with a larger 620mm impeller which will deliver 966 l/s at 100% with 16m head including full monitoring protection by way of MAS unit integrated with the existing variable frequency drives and panel controls.
- NRV Valves – 600mm/800mm Valmatic sewage gate valve
- ARV Vales – 100mm/150mm full bore triple function rapid fill prevention with snorkel





The Stats:

The old Hydrostal pumps delivered 700 l/s at 100% operation with 16m head. The new Flygt 8531 pumps were designed to deliver 966 l/s at 100% operation with 16m head (once the Flygt pumps were installed and commissioned the actual flow output was **1020 l/s** at 100% operation with 16m of head).



Challenges experienced and how these have been resolved:

Gel Engineering feeds on innovation and challenges, combined they result in magnificent project delivery. Deephams PHPS upgrade had many challenges some of which are outlined here:

- **Lifting Arrangements** – The existing lifting arrangements were undersized for the new pumps; this included a monorail and 4 pump gantry cranes. New 5t monorail lifting beams and hangars were designed and installed along with chain hoists to allow for the maintainability of the pumps.
- **Asbestos** – It was noted in the Asbestos register that there were gaskets on the pipework, NRV and ARV valves that contained asbestos, **Gel Engineering** arranged & managed an approved asbestos removing contractor to safely remove all the gaskets and dispose of them accordingly.
- **Constricted Areas** – The dry well of the pumping station had very limited space to accommodate the removal of the existing pumps along with the old pipework, this required some innovative solutions to safely remove the redundant equipment. One such solution was the design & installation of a further gantry crane system to facilitate the removal of the pipework from the dry well.
- **Isolations** – The project had to be split into three stages to allow the pumping station to operate whilst the project progressed, careful planning achieved double isolations on all the lines that were out of service. In doing this the other lines were able to be operated. All isolations were the responsibility of the client although there were issues with achieving isolations on the reception chambers (outfall of the pumps) dam boards needed modifying and the amount of grit and silt in the chamber didn't allow the chamber to be fully emptied. **Gel Engineering** stepped in and helped Thames water overcome these issues to allow the project to move forward at the required planned programme.



Client engagement:

Gel Engineering engaged with Thames Water regularly throughout the lift of the project building strong relationships that ensure the project's success. From presentations, design stage, operator and maintainability to completion we engaged with the client to make sure that all their requirements were fulfilled. This resulted in a more efficient and reliable pumping station.





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Why this reference is comparable:

The Deephams PHPS Upgrade Project is, we believe, a fantastic example of the diverse range of ability within our business to provide the full CDM package. Minimising the stress and hassle from the client and giving them the confidence that problems will be resolved, forward thinking and innovation will be implemented at every instance as that is who we are at **Gel Engineering**. We are more than capable of reacting, innovating and delivering this type of work. It shows how **Gel Engineering's** ethos, culture, and decision-making activities follow the vision of Thames Water – Innovating for life in a changing environment.



The essence of **Gel Engineering** Imagine, Innovate, Implement was captured on this project.

