

## Ten Surge Vessels Installed For Southern Water

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### Introduction

- One of QED's largest ever surge vessel rollouts
- Control system ensures minimum energy consumption
- Reliable surge control on each installation

Quantum Engineering Developments (QED) completed installation in February 2015 of ten surge vessels for Southern Water to replace eight vessels in the Thanet area of Kent, as well as introducing units at two new sites.

The programme of works, which was subcontracted from Morrison Utility Services, was one of largest undertaken by QED under one scheme. Installation of the new vessels, which ranged in size from 1m<sup>3</sup> to 17.8m<sup>3</sup>, began in June 2014.

Four of the sites – Martin Gorse, Dover Road, Deal Low and Flemmings A – were straightforward installations, with the existing vessels removed and the new ones lifted in and connected within two days. Other sites were more complex, requiring Morrison to carry out civils work to install new plinths, pipework and cabling.

### Lord of the Manor Installation

At one of the sites, it was more economical to build a new plinth to host the surge vessel closer to the water main and abandon the existing one altogether (Figure 1).

Southern Water's project manager, Chris Mullender, said: "Morrison constructed the new plinth in reinforced concrete along with cable ducts to connect the compressor. Pipework also had to be installed to feed water from the outgoing main to the surge vessel in its new location."

QED installed the 9.5m<sup>3</sup> surge vessel and isolation valve onto the plinth and bolted them in place. A new compressor and control panel was also installed in an adjacent building with all inter connecting cables and pipework between the associated components.

### Sterilization

The surge vessel was cleaned and sterilized before it was put into service. The access hatch was then closed and the surge vessel filled with water, which was then drained to waste.



**Figure 1:** At the Lord of the Manor site, the existing below ground surge vessel, which can be seen in the foreground, was abandoned and the new tank installed in a location nearer to the water main.

As with all surge vessel installations, sterilization was a major part of the commissioning process. Once the sterilizing solution had been completely drained and the sampling results proven satisfactory, the vessel was commissioned into service.

Trials were carried out successfully with Southern Water's booster and borehole pumps running at normal operating speed. They were also conducted to simulate failure of pumps, to ensure that the surge vessel successfully protected each pumping main from high and negative pressures.

### Wingham Installation

Another more complex installation was for two surge vessels required at Wingham, Prior to the installation, Southern Water needed to carry out major works for a permanent drinking water main bypass.

"The enabling works for the bypass took a couple of weeks," said Mullender. "We needed an alternative supply for the downstream village in the long-term to facilitate maintenance of two boreholes in addition to the surge vessel installation."

He continued, "Existing service reservoirs weren't adequate for the length of time the works required, so residents could only be taken off their usual supply when the bypass works were complete and we gave the go-ahead.

"As is often the case with drinking water supply projects, most of the works had to be undertaken outside the summer period to avoid the time when water demand is at its highest. QED met our requirements."

### Minimal Maintenance

Dry commissioning on all ten installations is complete and the first surge vessel, Martin Gorse, is planned to be wet commissioned at the end of March 2015 with the rest to follow.

Maintenance of the surge vessels is minimal. A mandatory interior and exterior certificated inspection of the vessels will be carried out by Lloyds British every two years.

QED's unique QUBE control system provides reliable surge control on each installation. It also ensures that the compressors are running on the minimum energy consumption necessary, reducing carbon footprint and optimising performance to deliver cost-efficient total capital and operating expenditure.

Mullender said: "It was a difficult project, given the number of different sites, but Morrison and QED worked closely with our team and meeting our requirements and expectations."

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