

# Holbeton Bathing Waters

*Even Cleaner Seas* - Holbeton sewage discharge reductions to Mothecombe Estuary by surface water separation and attenuation of storm flows

**H**olbeton is a considerable village in South Devon set back from the wooded shores of the River Erme estuary, nine miles east of Plymouth and one mile from Mothecombe beach. It has a population of almost 1,500, and its mixture of small thatched and stone cottages includes two pubs, a post office, a local store and a primary school. Improvements to the sewerage system in the area were identified to improve the river and bathing water quality in the tourist area of Mothecombe Bay as part of South West Water's £20m *Even Cleaner Seas* project. This follows the European revised Bathing Water Directive (rBWD), and the scheme aimed to ensure that South West Water's infrastructure did not prevent bathing waters from meeting the new sufficient classification which is approximately twice as stringent as the current mandatory standard. The extra capacity and other improvements to the sewer network will result in fewer storm discharges into the River Erme during extremely wet weather.



Checking distance of overhead cables  
Courtesy of HsO



Shroding of overhead by WPD  
Courtesy of HsO



Installation of tank  
Courtesy of HsO



Welding team on site following install  
Courtesy of HsO



New control panel  
Courtesy of HsO



Completion of garden wall  
Courtesy of HsO

## Background

The European Union's revised Bathing Water Directive came into force in March 2006 and replaces the current Bathing Water Directive. The overall objective is the protection of public health, but it also offers an opportunity to improve management practices at bathing waters and to standardise the information offered to bathers across Europe.

The directive introduces a new classification system with more stringent water quality standards and puts an emphasis on providing information to the public. The water quality standards for the new classifications are much higher than those of the original bathing waters directive.

The Government's target under the new directive will be 'sufficient', which is higher than the current good (mandatory) standard. South West Water's *Even Cleaner Seas* project was established to ensure that South West Water's infrastructure did not prevent bathing waters from meeting this standard.

## Even Cleaner Seas

A total of thirteen major improvements were identified at nine bathing waters within the region and Holbeton was one of the key sites identified. Although Holbeton is a relatively small catchment, the combined sewer received high flows in storm conditions, which caused the sewage treatment works (STW) to exceed process capacity on a regular basis and spill excess flow to the River Erme. The evaluation concluded that attenuating the storm flows and returning them to the system after the storm has passed was the best way to reduce the peak storm flow to the STW. However the required storage volume was not practical due to the high levels of surface water runoff connecting to the system.

In order to reduce the volume of required attenuation, surface water removal was undertaken and a new 500m long, 450mm diameter surface water sewer was constructed. Some new high capacity gullies were installed at the head of this sewer in an area known to collect runoff. The surface water removal significantly reduced the size of the required combined sewer storage to 65m<sup>3</sup>.





View of the Electroslide and actuated valve installation  
Courtesy of H5O



The Balfour Beatty and Courtier Utility team working together  
to install a Weholite tank - Courtesy of H5O

### Tank design

One challenge was to design a tank that would self-cleanse in a catchment where the normal flows are a small fraction of the storm flows; the dry weather flow (DWF) for the catchment is 1l/s. Even with the surface water separation upstream, the peak 1 in 30 year storm flow was predicted by the hydraulic model to be 233l/s. In addition to this the only location where the new 65m<sup>3</sup> storm tank could be installed was on a steep hill.

A more detailed hydraulic model of the area was produced so that the velocity profiles during a storm could be plotted to view how the storm tank would fill and empty throughout typical storms. From this, a twin online tank with a separate DWF sewer was proposed and constructed. The flow rate at the downstream end of the tanks is controlled to 7l/s by a Hydrok Electroslide.

When flows exceed 7l/s an actuated valve on the DWF sewer shuts and flows are diverted to the tanks. Tank 1 is fitted with a handstop

so all flow is directed down Tank 2. Tank 1 then fills from the downstream end. This setup means that at the end of the storm event all flow washes down through Tank 2 before the DWF valve re-opens.

Modelling has shown that this creates sufficient velocity to flush Tank 2. The handstop can be swapped periodically if it is found that the offline tank collects debris.

In extreme events when the tanks are full, the excess flow is passed forward and spills at the screened overflows at the STW. The BWD stipulates that the average number of spills per bathing season (May to September) should be less than three.

Holbeton was a particularly challenging and sensitive site as all the works were contained within a small village with very narrow and steep sided lanes in an Area of Outstanding Natural Beauty (AONB) and the team had to install a pipe through a classified ancient

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ElectroSlide Flow Control System  
installed at Holbeton for South West Water's Bathing Water Scheme

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orchard and avoid a key swallow nesting site. The contract was awarded to South West Water Delivery Alliance H5O.

Alongside other improvement work planned in Ermington, Modbury and Ivybridge, this represented a £7m investment in river and bathing water quality in South Devon, with up to £20m being spent in 2014/15 to improve bathing waters across Dorset, Devon and Cornwall.

### Carbon reduction

Following a pre-survey of the area, H5O immediately sourced a compound outside the village as a strategic delivery point to ensure that no HGVs would need to enter the village.

The deliveries were then transported by smaller vehicles, thus reducing carbon impact and disruption to the local community, reducing any risk with local children playing during the summer holidays and avoiding noise and dust pollution. These initiatives not only reduced the carbon footprint by greatly reducing the number of traffic movements but also meant significantly less disruption in and to the village community.

As well as this, the local team was determined to do more. They met regularly to discuss further improvements in this environmentally sensitive area, resulting in the following integrated measures to further achieve carbon reduction:

- A low carbon welfare unit with stop/start low energy generator.
- Locally sourced all materials including stock fencing and stone for walls
- Worked around swallow nesting season to ensure that the barns at Brownsell Farm were undisturbed by equipment at the appropriate times.
- Reusing over 65% of existing materials with only a small percentage (approximately 10%) going to landfill and the rest (25%) disposed of at an existing old local quarry not

used for many years.

- Mitigation of four weeks of road closures and associated reduction of 200 traffic movements by developing an alternative pipe route.
- Engagement of a local contractor which reduced the carbon footprint and contributed to the regional economy.

### Community liaison

The team went above and beyond their daily duties to make this project very successful from a customer liaison point of view. A dedicated Customer Liaison Officer was appointed who facilitated many arrangements which benefited the community.

The local primary school car park was utilised for the residents affected by the works to park in during the school holidays and access was maintained to an outdoor swimming pool which is an important source of revenue for the local school.

Excellent relations were fostered with the school through different initiatives. A poster competition took place with the school to promote South West Water's *Even Cleaner Seas* programme which awarded prizes such as a family ticket to the National Marine Aquarium and a selection of book vouchers. These were presented at a special assembly, and the children were especially excited to see their posters laminated and displayed on the site perimeter fencing in the village.

Local residents even offered to allow temporary pedestrian access through their gardens to give the site team more room to manoeuvre on site. For local residents to offer this option without being asked really demonstrates how everyone was working together as a collective group to ensure the scheme went smoothly.

The attention to detail was very high; a good example of this was a replacement of a customer's wall undertaken by a local skilled mason. This resulted in a letter from a resident thanking the team for betterment.



Awareness programme for Even Cleaner Seas - Courtesy of H5O

### Environmental protection

At scoping stage the original route of the surface water sewer necessitated a lengthy road closure and diversion route as it was located in the existing lanes. To avoid this, through careful engineering and stakeholder consultation, an alternative route through the ancient orchard was developed including careful hand digging techniques around tree roots. The route diversion saved four weeks of the road closure time, which was well-received by the local community resulting in accolades being e-mailed to South West Water.

The South West is one of the most beautiful and picturesque areas in the country and has a large number of Areas of Outstanding Natural Beauty (AONBs). The innovation, work ethic and desire of the team to make this scheme a success are already attracting interest from various partners across the region. The project was recently awarded South West Water's internal Pure Award for Environment and this publicity has helped communicate how simple measures can have a big impact.

### Completion

The sewer upgrade works in Holbeton were successfully completed in October 2014. All of the scheme initiatives achieved wider sustainable benefits exceeding expectations in protecting the environment, improving on existing best practice and supporting the local community.

In achieving this level of customer service, the team has had the opportunity for personal development and considerable job satisfaction, and working with the stakeholders makes sustainability a central part of day-to-day work.

The main purpose of the scheme, *Even Cleaner Seas* will bring direct benefits to this area which is so dependent economically on the tourist trade for its economic viability.

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