

Abbotsbury Mains Replacement Scheme

a challenging water mains replacement project due to narrow streets with listed buildings close to the roadside

by Alan Marler & Paul Turner

Wessex Water is the regional water and sewerage business serving 2.7m customers across the south west of England including Dorset, Somerset, Bristol, most of Wiltshire and parts of Gloucestershire and Hampshire. The region's landscape is varied, ranging from the Mendip Hills and the levels of Somerset to the cliffs of Dorset and Wiltshire's Salisbury Plain. In Dorset, the village of Abbotsbury is located between the popular tourist destination of Weymouth and Bridport along the main south coast road. In the 2011 census the civil parish had a population of 481. The coastline within Abbotsbury parish includes a section of Chesil Beach, a 29km barrier beach which is part of the Jurassic Coast, a World Heritage Site.



Background to Abbotsbury

Abbotsbury is known for its swannery, subtropical gardens and surviving abbey buildings, including St Catherine's Chapel, a 14th-century pilgrimage chapel that stands on a hill between the village and the coast.

The Ilchester Estate owns 61km² of land in Dorset including Chesil Beach, the swannery and subtropical gardens. The village is popular with visitors; something Wessex Water was mindful of when embarking on a water mains replacement project to provide a more reliable water supply for residents and businesses.

Mains replacement - what was involved?

The Abbotsbury mains replacement scheme was required due to the excessive number of bursts on the 3" and 4" AC mains increasing

the instances of supply interruptions and customer complaints. Around 1.2km of 3" and 4" AC mains were replaced with new 90mm and 125mm PE pipe by pipe-bursting in West Street, Market Street and Rodden Row, Abbotsbury.

The existing mains were situated in the roads that were the only route through the village. The roads were narrow with listed buildings close to the roadside. In order to carry out the work safely for both the road user and Wessex Water operatives a road closure/diversion was arranged with Dorset County Council (DCC). The road closure/diversion resulted in a 45 mile diversion.

With the main roads through the village closed, the bus providers cancelled their services and were unable to provide an alternative service. So the project team arranged for Dorset Community



Installation of new sluice valves and wash-outs
Courtesy of Wessex Water



Rods emerging in the reception pit
Courtesy of Wessex Water

Transport to provide a bus shuttle service through the village for the duration of the scheme.

Due to the sensitivity of the work, meetings were held with Dorset County Council, Ilchester Estates, the Parish Council and a public meeting for the residents of Abbotsbury and the surrounding villages. The local MP Oliver Letwin was also informed of the work.

Local residents and road users were kept informed of the work by regular news updates in newspapers and on radio stations. Residents directly affected were also regularly sent letters so they knew how work was progressing. Businesses were personally visited and site staff helped with deliveries.

Construction

Before the scheme started a diversion and road closure were put in to place so the team could work in the road safely. All operational shutdowns were carried out at night to reduce inconvenience to

the local residents. All other underground utilities were traced by scanning, plans or by trial holing to make sure it was safe to burst the existing host pipe prior to replacing with a new main.

Pipe bursting method: In order to maintain supply to customers properties an overland supply pipe is laid so the existing main can be isolated. The technique used involved the following process:

- After making the excavation suitable, the bursting rig was lowered in.
- The face of the excavation was protected with a metal plate and railway sleepers due to the movement of the bursting rig which can pull the equivalent of 40 tonnes pulling into the ground.
- One metre rods loaded on to the rig by operative one at time linking them as loaded.
- Controller using remote control to work the hydraulics to push them forward.



Splitter connected to the rods - Courtesy of Wessex Water



Towing head inserted into new pipe - Courtesy of Wessex Water



Splitter cracks old pipe allowing new pipe to be pulled in its place - Courtesy of Wessex Water



New pipe being pulled through old
Courtesy of Wessex Water

- When the rods reached the reception pit, the splitter and towing head with pipe was attached.
- The new pipe was then pulled up through the existing pipe from a reel on a trailer until it reached the original reception pit cracking and splitting the old out of the way.

Obstructions:

- Two-way radio and mobile phone were used to collectively control the driving and pulling of the pipe.
- Where an obstruction was reached, the rig controller stopped the operation. Constant power was applied to the rods within the safe limit to drive/pull past the obstruction.
- Where the rig could not pass, the area was excavated to locate and remove the obstruction.

Connections:

- Connection to existing main after chlorinated swabs have been inserted and blown through the new pipe, which has been flushed and water sample taken for analysis.
- Connections were then made to the household services returning supply.

Post-connection works:

- Excavations were backfilled with foam concrete and the Wessex Water reinstatement team was on site to permanently reinstate where necessary as we went along. This gave access to residents with no further disruption once we had passed them.
- The burst process is repeated until finished, moving the traffic management along as it proceeds.

The result

This project is part of Wessex Water's 5-year replacement programme of approximately 250km of water mains, all being

delivered by Wessex Water's in-house mains replacement team. No-dig technology (pipe-bursting or slip-lining) accounts for 89% of this completed work.

Despite the scheme being extremely challenging and staff working in atrocious weather conditions, it was completed in just two months; a month earlier than planned. In all 1,170m of new 90mm and 125mm PE water mains were installed virtually on budget; the target cost being £451k and the out-turn cost was £463k.

Local residents were delighted with how the scheme was planned to minimise disruption and were appreciative that Wessex Water arranged for a transport link after operators of public bus services terminated their regular route.

Businesses were particularly grateful that Wessex Water programmed for work to be carried out at a quieter time of year, even though this was when severe weather was most likely which could have affected scheme duration.

Residents were delighted with the end result and presented a cake to say thank you to the workforce. There were also complementary comments on social media. Recognising that Wessex Water averted huge disruption to the village, Local MP Oliver Letwin wrote a letter of thanks as did the chairman of the parish council and numerous residents.

To find out more about the scheme, visit the Wessex Water channel on YouTube and search 'Abbotsbury'.

The editor and publishers would like to thank Alan Marler, Design Engineer, and Paul Turner, Site Manager, both with WECS (Wessex Engineering & Construction Services), for providing the above article for publication.

