

Operation Clean and Clear Taunton

modernising ageing water mains in Taunton and surrounding areas

by Matthew Bridge, Phil Luxton & Martin Gans

Operation Clean and Clear is Wessex Water's £16m scheme to upgrade ageing water mains in Taunton to improve water quality and provide enhanced resilience. Some parts of Taunton had started to receive unacceptable levels of discoloured water due to the deterioration of the internal condition of a number of old iron pipes. In addition, some parts of the town could only be supplied from one source of water, with no back-up supply in case of emergencies. Following a complete review of the water supply network in Taunton a strategy was developed to replace or rehabilitate around 50km of water mains to resolve both these issues. This involved tackling some strategic trunk mains running through the centre of the town with the potential for significant disruption to customer's water supply and the traffic flow through the town. The scope of the project required sensitivity and collaborative working with all agencies to put together a three year programme of work with minimal impact on the people who live and work in Taunton.



Taunton Town Centre - Courtesy of Wessex Water

Technical engineering excellence and ingenuity

Engineers from Mouchel used geographical information system (GIS) software analytics to correlate customer contacts for discoloured water and unlined metallic mains within the network to identify which pipes were the main causes of the discolouration problems. In some cases customer contacts came from areas where distribution mains had been rehabilitated previously, so the cause of the discolouration could be attributed to upstream trunk mains.

Extensive pipe sampling was used to validate the GIS analysis and confirmed that some pipes had significant levels of internal and external corrosion.

Taunton is supplied from two sources, one to the north and one to the south. However deficiencies within the pipe network relating to both the hydraulic capacity and the poor internal condition of the mains limited the ability to feed some areas from both sources.

Extensive hydraulic modelling was used to identify viable options to resolve this issue and a wide range of stakeholder involvement took place to determine the preferred solution and operating strategy which required a new booster station and automated control valves located across the network so that the system could be kept in readiness at all times though an automatic sweetening regime.



The extent of the corrosion in an ageing iron main
Courtesy of Wessex Water



Lewis Civil Engineering lining a 100 year-old water main
Courtesy of Wessex Water



Typical valve and hydrant arrangement - Courtesy of Wessex Water

The prediction of discolouration in distribution systems (PODDS) collaborative research lead by the University of Sheffield was used to assess the impact of increased flows through the network to assist in the design of the main scheme works as well as the commissioning and development of the operating strategy.

Programme and budget

The Taunton supply area has a population of 100,000 people. The objective of the scheme was to reduce discolouration contacts within the town by at least 50% as part of a wider programme of work agreed by the Drinking Water Inspectorate (DWI) and the financial regulator Ofwat as part of the five year Asset Management Plan (AMP) period known as AMP5 (2010 to 2015).

Activity schedules were implemented to plan design target costs and programmes for each work package. Progress was tracked using delivery plan risk registers on a weekly basis with lead design engineers to ensure effective delivery. The project developed a well-defined approval process that included the following stages:

- Technique reviews with the core project team (principal contractor (PC), client and designer) once site investigation results had been received and reviewed to agree the most suitable design solution
- Buildability reviews to confirm arrangements based on line plans of the proposed work with key stakeholders (PC, client, designer, operations, highways, sub-contractor)
- Detailed design and safety reviews to gain client approval of the design (wider client technical and compliance as well as the above and CDM-C and environmental teams)
- Pre-commencement meetings (PC, subcontractor, designer, client, operations)
- Handover of construction packs containing the approved design to the contractor

This approval process saw stakeholders being brought in at critical points and ensured that abortive work was minimised. It also gave much better process control which increased financial forecasting certainty.

Different phases throughout the town and surrounding areas were prioritised allowing construction work to begin on earlier phases while the designs for upcoming phases were still ongoing. This helped to shorten the critical path while ensuring the project was delivered on programme.

Sustainability and environmental commitments

Environmental constraints were identified and managed using Wessex Water's environmental and third party management plans at all of the project stages. In addition to this, liaison with critical stakeholders was undertaken, for example, liaising with the Environment Agency to ensure flood risk was managed and English Heritage to protect Scheduled Ancient Monuments.

To promote sustainable best practice, waste management plans were used which recommended recycling excavated material to backfill excavations.

The most efficient designs were used to minimise the use of materials, fittings and fixtures. To minimise the environmental impact of the project, rehabilitation of mains through use of polyurethane spray lining by a specialist contractor was maximised. This technique embodied sustainability principles by re-using existing mains where possible.

The technique not only reduced the amount of material required but also minimised the number of excavations as predominantly 'no dig' techniques were used. Disruption to local people, businesses and motorists was also reduced and the no dig techniques allowed for the work to be completed quicker and in a more cost effective

The image displays two screenshots of the Wessex Water website. The left screenshot shows the dedicated 'Operation Clean and Clear Taunton' website. It features a navigation menu with categories like Customers, Services, Environment, Education, Developers, Leisure, and Careers. The main content area is titled 'Operation Clean and Clear Taunton' and includes sections for 'What the scheme involves', 'Popular questions', and 'Related Video'. A video player is visible, showing a scene with people at a table. The right screenshot shows the 'Latest news: Operation Clean and Clear Taunton' page. It features a map of the project area in Taunton, highlighting 'Section 2' (17 April - 11 May) and 'Section 3' (11 May - 8 June). The map shows streets like Corporation Street, Park Street, High St, and Upperpath St. A 'Related Information' link is also present.

(Left) The dedicated Operation Clean and Clear website and (Right) Latest news for the scheme on the Wessex Water website - Courtesy of Wessex Water

way. Where this technique could not be used, alternatives such as open-cut replacement, directional drilling and pipe bursting methods were implemented.

Community engagement

An important part of the environment is the community formed by the people who live in it. So while the project aims were predominantly to improve infrastructure and network resilience, it was also vital to the team undertook stakeholder engagement programmes to ensure people knew why the work was required and what impact it would have on their daily lives so that disruption could be minimised as much as possible.

Throughout the programme Operation Clean and Clear staff have worked and formed close working relationships with the following NGOs, businesses and groups:

Public and community relations were managed in-house by Wessex Water’s public relations team whose priority was to make sure that customers were kept up to date and understood why the work was essential, what the benefits would be and to ensure that Wessex Water’s presence in the town was favourable. This required consistent transparency, working with Taunton town centre teams, updating councillors and building working relationships with Somerset Highways as well as local media.

The advertisement for Lewis Civil Engineering features a large blue and white logo on the left. To the right is a collage of images showing various construction and water treatment projects, including large pipes being installed, a water treatment plant, and a construction site with heavy machinery. Below the collage, the text reads: 'Lewis Civil Engineering is committed to the highest possible standards in Civil Engineering. Our aim is to utilise our extensive experience and professional approach to the benefit of our Clients whether large or small.' At the bottom, it says 'For any enquiries or for further details of our services visit our website: www.lewis-ltd.co.uk' with the Lewis logo to the right. A 'renew' logo is also present in the bottom left corner.

Before the work started radio interviews were carried out and reporters were briefed. Static signs were erected around the town to provide as much information as possible about the work. Leaflets and business cards were also produced and handed out to customers and businesses and face to face visits to shops and offices were conducted.

To keep people informed throughout the scheme, a dedicated website was set up and messages were also posted through the WessexWater Twitter site, encouraging people to use #traveltaunton so that queries could be answered and dealt with.

Drop-in sessions were also organised to provide information to stakeholders so that they could better understand the work and the traffic management that would be in place.

Presentations were given at the Highways Authority Utility Coordination (HAUC) meetings so that conflicts could be avoided and synergies between various other utilities could be identified.

As a result of this, the programme has seen a number of service providers working under Wessex Water's traffic management systems and this method of collaborative working has enabled the project team to help minimise the disruption caused to both residents and road users alike in jointly utilising the road space within a busy network.

As the project proceeded through different areas of the town, letters were distributed to local residents affected by the work and notifications of water shut-offs were provided. In most areas letters could be hand delivered and staff were able to speak to residents and businesses face-to face to ensure any queries or concerns were resolved.

Work in the town centre affected significantly more businesses and so drop-in sessions were arranged before and after working hours, allowing business owners to come together and take information and literature away with them.

When work was due to start in areas of the town that required heavy traffic management or work along A-roads, advertorials were placed in the Somerset County Gazette to help people plan their journeys in advance and give them enough warning.

Where road closures or one-way systems were set up on traffic sensitive roads, Variable Message Signs (VMS) signs were used to update road users and it was also arranged with the Highways Agency to use the overhead gantry signs on the M5 motorway.

Conclusion

The result of this extensive PR campaign has seen a significant reduction in the number of complaints received and has seen honest and transparent relationships built between Wessex Water and people of Taunton.

The scope of the project required sensitivity and collaborative working with all agencies to put together a three year programme of work with minimal impact on the people who live and work in Taunton. The project started in 2011 and is now on schedule to be completed mid-September, under budget.

The Editor & Publishers would like to thank the following for providing the above article for publication: Matthew Bridge, Programme Manager and Phil Luxton, Project Manager, both with Wessex Engineering & Construction Services, Wessex Water, and Martin Gans, Water Distribution Planning Manager with Wessex Water.

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