

Bray Pipeline

new water main between Bray WTW & Surrey Hill Reservoir

by
Gordon Percy & Charlie Sirs

This new water main, extending to more than 17kms in length, will enable the immediate transfer of an extra 23 million litres of water each day and will help South East Water provide drinking water supplies to the 300,000 houses in its supply area - as well as to new homes that are planned for the future. Water is extracted from the Bray Gravels and the River Thames and is then processed at Bray Water Treatment Works before being pumped to the Surrey Hill Reservoir near Bracknell and the Crowthorne Reservoir. Water is then distributed to customers from these reservoirs.



Bray Pipeline - Work in progress

courtesy South East Water

Extending to more than 17kms in length, the main pipeline runs North to South from Bray with 2kms of smaller branch pipeline running from Penny Hill to Crowthorne Reservoir. Most of the pipeline runs through open fields with 2.3km within public roads and 4.kms running through Crown Estate woodland.

Resources

Considerable resources have been required to undertake environmental assessment and mitigation works with much of the site being of significant environmental importance. During survey works Great Crested Newts were found in three areas as well as Horseshoe Bats, Wood Larks and Nightjars. Consequently, the project has required a retained team of specialist consultants to advise on environmental, ecological arboricultural as well as archaeological issues.

Pipelaying

The majority of the work consists of laying 1200mm diameter pipe to augment the existing 700mm diameter pipe. Most of this is laid using standard cut and cover techniques with a minimum cover of 1.2m The branch pipeline is 300mm diameter.

The main pipework is externally welded, spigot and socket steel

construction with an internal mortar lining installed to facilitate the required chlorination process. The branch pipeline is constructed from ductile iron. Early in the programme unforeseen storage restrictions at Rotterdam Docks meant that all of the steel pipe - more than 300 articulated lorry loads - had to be delivered to special pipe storage facilities near the site.

Ground conditions have been varied and difficult, ranging from bog to running sands. Six specially manufactured trench boxes have been used to ensure adequate earth stabilisation and safe working. Consequently, much of the pipework has been laid as "double-enders" with no more than 30m-40m of trench open at any one time. Owing to the sensitive nature of much of the surrounding areas the main easement has been restricted to 30m, reducing to only 15m in particularly constrained or environmentally sensitive sections.

One benefit of the ground conditions has been the opportunity to reuse as-dug sand as suitable pipe bedding surround. To improve sustainability of the project further significant effort has been made to recycle surplus trench arisings. Working closely with the Crown Estate some of this material is being spread in the Swinley Forest to improve sections of forest rides used by horses, bikers and walkers.



Bray Pipeline: Work in progress

photo courtesy South East Water

Close proximity to residential housing in certain areas has required a restricted hours policy to ensure that works within 100m of residential buildings only take place after 9 a.m. and before 5.00pm. Certain sections of work can only be undertaken during school holidays and Holleran has also worked closely with the contractor responsible for the construction of a new theatre in the area. Further working restrictions have also resulted from Royal Ascot Week and the close proximity of Legoland. Consequently, the project has required very good communications with many individuals and organisations affected by the works.

The overall programme, which was shortened by nearly four months due to planning delays, has required Holleran to operate on up to five work sections simultaneously to achieve the original completion date.

The most time critical sections were through the wooded area within, the European Designated Special Protection Area, because of the need to complete the works before the bird nesting season started at the end of February. This section consisted of 2kms of 300mm diameter pipe and 2.2kms of 1200mm diameter pipe. The original programme for this section was twenty working weeks and this had to be reduced to only eight weeks to meet this restriction.

Although most of the work is open cut and cover, there is a requirement for no-dig techniques in three areas. The no-dig method used, which is to the contractors design, is by pipe jacking 1500mm diameter concrete sleeves between launch and reception shafts.

The most important section is the twin crossing required under the Waterloo to Reading mainline railway. In these 60m long sections the pipe diameters have been reduced from 1200mm to 900mm with additional concrete surround. The works are required to be at least 4m below the rails with zero settlement permitted.

Although the line has not been closed at any time, speed restrictions have necessitated that compensation payments be made to Network Rail for the slower train speeds required whilst the works are under construction. There will be constant supervision and monitoring by Network Rail with their staff in attendance all the times. This work will be undertaken over a four week period in Summer 2008.

The other major no-dig section beneath A322 Bracknell Road has been completed. This is a four lane traffic sensitive dual carriageway with a full central reservation which requires a 125 metre length to be installed. This tunnelling work is 5.5m below existing ground level and a very small mini digger was used to undertake the excavation. The work was completed within two weeks through the use of 24 hour shift working.

Overall, the Bray Pipeline contract is a major undertaking by South East Water and Holleran with many different challenges including the significantly shortened programme, major environmental issues and the sensitivities of working in residential areas. However, the strong team led by Project Manager Gordon Percy and Charlie Sirs expects to meet completion date and progress so far is encouraging.

Key Facts

- Project Name:** New Water Main Bray Pipeline (Bray WTW) to Surrey Hill Reservoir)
- Client:** South East Water
- Capital Value:** £17m.
- Start Date:** 7th January 2008
- Completion date:** Planned for December 2008

Note: The editor and publishers thank Gordon Percy, Engineering Manager for South East Water and Charlie Sirs, Project Manager for M. Holleran Ltd for providing the above article for publication. ■

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