C Barhale

Wyke Gardens Dual Manhole Study

Client:	Thames Water
Location:	Ealing, West London
Value:	£4.5m
Duration:	18 Months



The newly constructed on-line storage pipeline with invert and benching



In Brief...

Through their expert tunnelling experience and customer care, the Barhale team at Wyke Gardens, Ealing, were able to greatly reduce long standing flooding in to the River Brent, whilst maintaining traffic flows and customer relations in a densely populated area of west London.

The Wyke Gardens storm water network in west London had a history of regular flooding and discharges into the River Brent. These discharges were polluted with foul water flows from 40-50 illegal or misconnections to the storm water network.

Barhale was selected by Thames Water to:

- Construct a new CSO chamber and online storage tank to reduce the discharge events
- (...and) provide a new static screen to remove the solids from any overflows

The works were based in and around the busy A406 (North Circular Road), leading to and from the Hanger Lane Gyratory System – one of the busiest junctions in London, which incorporates 10,000 vehicles an hour.

Customer Benefits...

While some essential work took place on the A406, the majority of the works were carried out in quiet residential areas where appropriate measures and traffic management were put in place to minimise disturbances. Footpaths around the site were kept open and debris netting was used to protect the public. Dust suppression measures were also carried out three times a day to reduce air pollution. All survey works associated with the A406 was undertaken at night to minimise disruption to traffic and locals. Furthermore, continuous noise monitoring was carried out and several sound dampening measures were put in place to reduce noise pollution.

Barhale worked closely with Ealing Council and the local residents during the three road closures required for the works, with regular drop in sessions held to keep the residents informed on the works progress. Due to the size of the excavations required on Inglis Rd for the 1800mm diameter storage tank, the carriageway required full width reinstatement along a 150m section, providing a brand new road surface for the residents. The team also replaced pre-existing damaged slabs on the footpath as a sign of goodwill to the local community.

During the excavation works, an adjacent cast iron water main had burst several times. To prevent any further failures of the main and resultant delays to the programmes, Thames Water issued an instruction to renew 160m of the main and all 25 service connections to the properties, using a mixture of open cut and pipe bursting techniques. Barhale worked closely with Thames Water to minimise disruption and keep the local residents updated during the main renewal works





Technical Features...

The solution involved:

- The construction of a 6m deep CSO chamber, complete with a static screen
- Construction of 130m of 1800mm diameter online storage pipeline with a dry weather flow channel to maintain the cleansing of the existing system during dry spells
- Several key connections to existing sewers
- 2no 600mm diameter Iseki Micro Tunnels (one beneath the A406)
- A 1.2m square timber heading beneath the A406 to connect to the existing foul water network

In addition to the installation of 130m of 1800mm diameter live storage tank; the project involved a 25m, 600mm lseki tunnel drive underneath the A406, which posed several challenges to the team. The team carried out detailed pre-drive surveys and discovered that the proposed drive design would clash with an existing sewer on the A406. To mitigate this, the tunnel was re-designed and constructed 1.5m lower than originally planned to clear the existing manhole, and the new CSO chamber was re-designed to suit.

The team also mitigated the risk of loose ground behind the drive eye to provide a solid face for the TBM to be launched through. Before the drive began, a baseline was taken for settlement monitoring and subsequent checks were completed twice a day throughout the works. No settlement was encountered during the works.

The caisson shaft for the micro-tunnel was re-designed from 3.6m diameter to 3m, because of the dense population of services in the area, and to mitigate lane closure costs on the A406. Due to the tight nature of the 3m shaft the headwalls were incorporated into the high level benching to provide full and safe access around the shaft base.

To save on lane costs along the A406, (which could have equated to over £150,000), an 8m long timber heading was hand-dug to connect the new system on Inglis road, into the existing foul water network within the A406.

Environmental Solutions...

Soil tests revealed that the first 1.5m of made ground were contaminated with lead. To deal with these contaminants, segregated muck storage areas were setup on site to store the inert and hazardous muck separately for correct waste transfer and disposal. The site risk assessments were updated with additional controls to reduce the risk of working with lead and all site personnel were subject to monthly health screenings to ensure the lead exposure limits were never reached.

The team engaged Lynch plant hire as the site muck away haulier due to their pioneering 'Rail Hub' facility; where excavated spoil is transported across a small distance on muck away waggons to Lynch's purpose built depot in Willesden, north-west London. Once there, the stockpiled spoil is loaded on to rail freight containers and transported out of London – allowing vast amounts of spoil to be transported on one train as opposed to dozens of Lorries. This resulted in a 70% reduction of carbon emissions and a saving of 9000 road miles.