Barhale

Mandeville Road Water Diversion

Client: Affinity Water

Location: Northolt

Duration: 12 Months

In Brief...

As part of Barhale's framework with Affinity Water to divert and protect the latter's assets along the HS2 route, Barhale were contracted to replace and reinforce sections of an existing strategic 12" main between the Affinity Water Northolt Booster site and Greenford Park Estate. The reinforcement of the strategic main will ensure sufficient water supply to two maintenance shafts that will be built by HS2's main works contractor in the area. The works on site started in September 2019, and they are due to finish towards the end of 2020.

Piecing up the bend - work in progress

Work compound along Carr Road

Technical Features...

The full scope of works, which were split between two sites (Mandeville Road and Greenford Road), entailed the following:

Mandeville Road

- Slip-line 152m of existing 12" CI/SI main
- Open cut installation of approximately 65m of 125mm HPPE, and undertaking two new connections to 250mm HPPE main
- Open-cut installation of 376m of new 250mm HPPE SDR17 main running along Carr Road
- Open-cut installation of 50m of new 250mm main HPPE SDR17 main along the top of Network Rail cutting, and connection to existing 12" ST main

To carry out the slip lining works, a launch pit (L 11m x W 2m x D 1.6m) and reception pit (L 2.5m x W 1.5m x D 1.7m) were excavated over the existing 12" water main. The launching and butt fusion of the pipe was done from the entrance to Carr Road, while the pipe was received into a pit near the crossing between Badminton Close and Mandeville Road.

To isolate the flow of water while minimising the disruption to the area, a temporary water diversion to supply Badminton Close was required. Once the diversion was completed, a linestop was installed inside the launch pit, using under-pressure drilling. To restrict the movement of the CI after the linestop was activated, a concrete thrust block was constructed inside the launch pit. The isolation of the water main was completed by closing a boundary sluice valve west of Mandeville Road.

Next, the team ensured that the 12" main was suitable for slip lining. A CCTV survey was carried out to confirm that there was no significant damage on the CI main which could damage the 250mm HPPE pipe during the push. The survey also confirmed that there were no unknown branches with the CI pipe that could remain unconnected after slip-lining.

To facilitate the push of the pipe and remove unnecessary metal fittings from the ground, two pits were excavated and tee connections were removed in advance. One of the excavations was also used to reconnect a 180mm HPPE branch crossing Mandeville Road.

Just before the push, a pull-through scrapper was dragged through the main several times to remove dirt, blockages and any lips that could damage the new HPPE pipe. This was followed by a second CCTV survey. In addition, a test pull was carried out using a 6m long proving piece to confirm that the route was feasible and that the HPPE plastic pipe didn't suffer any significant damage on the walls.

To facilitate the push of the pipe, a towing head was attached to the first pipe. This was also connected to a 4T winch set up in the reception pit in case additional pulling was necessary.

Technical Features Cont...

After slip lining, the new 250mm HPPE pipe was cut inside the launch and reception pits to the required lengths to facilitate the connection of metal fittings onto the existing CI main. This included a tee connection towards Carr Road and a connection to an existing 125mm HPPE pipe along Mandeville Road.

The new 250mm HPPE water main along Carr Road was constructed in sections of between 50m and 100m. This aimed to minimise the disruption to the local residents. Where possible, a section was progressed to the natural joints on the line that were next required, for example, fire hydrants, air valves, or other specific constrains on the route.

Greenford Road

- Open cut installation of 646m of new 315mm HPPE SDR17 main along Greenford Road
- Connection with the existing 300mm DI at Western Avenue roundabout
- Connection with the existing 12" CI/SI at Rockware Avenue junction
- Middle connection for testing and commissioning purposes (to be undertaken through pressure testing and de-chlorination when works are finalised)

To complete the southern connection safely and have a controlled flushing of the section of pipe that was isolated, Barhale installed an under-pressure tapping. The under-pressure tapping was done on existing 300mm DI and it allowed Barhale to install a gate valve on top of the existing main and use it for a controlled discharge. Once Affinity Water confirmed the isolation, the existing main was drained by partially opening the valve and controlling the flow of the discharged water to ensure it did not exceed pumping capacity. This allowed the team to keep the connection pit clear of any water excess, and thus conduct the works safely.

Afterwards, the team cut the main, and started installing the pipework together with the required fittings (valves, washout and thrust-blocks). The pipe was installed inside a pit (L 6m x W 2.5m x D 2.1m) supported by temporary works (sheets and frames). The team needed to also go under medium pressure gass, which involved digging another 7m long pit similar in detail to the first one.

The remaining sections of the pipe were installed in sections ranging in length from 20m to 60m, to accommodate existing road traffic conditions and residential access. Along the way, some sections of the pipe had to be laid between a low pressure gas main, existing BT ducts and the kerb line. To ensure that this was done safely, despite the narrow, congested area, the team only used hand digging and supported existing services where necessary.

Site hoarding competition

Launch pit after reinstatement – Ready to be reopened to live traffic

Excellent Customer Interface...

All the works take place in congested residential and commercial areas. Hence, successfully delivering these requires effective stakeholder management throughout. Barhale regularly and effectively informed residents and business owners about the progress of works. Adjustments were also made to accommodate their needs without compromising the quality or implementation of works. Barhale achieved this delicate balance by appointing a dedicated Stakeholder Liaison Manager to oversee the management of customer experience and expectations in the area. The Liaison Manager worked in close collaboration with Affinity Water to understand the customer profile in the works areas, and designed a programme of communication and proactive customer involvement in the works. This included organising an environmentally themed drawing competition with pupils from the local William Perkin Church of England High School, and displaying large posters of the winning drawings on the site hoarding. Barhale also arranged for students from the school to visit the site and engage in informal, friendly conversations about civil engineering and its positive impact on society.

Barhale robustly minimised the disruption caused by the works to local customers. This is well illustrated by its approach to the planned five-month closure of a local footpath, that would have required its regular users to walk a 1.5 mile diversion instead. To avoid such a lengthy full closure, Barhale rearranged its works by amending the methodology using the conveyors to enable a five week full closure and a two-week partial opening to the public. This reduced the closure time of the footpath by two thirds. Barhale also adapted speedily to the uncertainties generated by COVID-19. We swiftly implemented safeguarding measures to protect our teams, clients and the general public. This included additional PPE, social distancing, heightened hygiene (persnal/site) and information signage. It addressed the council's need for reduced traffic volumes by adapting the works programme to bring in extra resources and enable access areas that had previously been limited due to traffic. This lessened the works' overall impact on the area.