Barhale

Crossrail Farringdon Station Upgrade

Client:	Bam Ferrovial Kier (BFK JV)
Location:	London
Value:	£2m
Duration:	24 Months

In Brief...

As part of upgrades carried out at Crossrail Farringdon Station, Barhale were engaged by Bam Ferrovial Kier (BFK JV) to carry out trial holes, organise and excavate for the installation of bollards at both ends of Cowcross Street. This is located in the heart of London, in an area frequented by thousands of visitors on a daily basis and in the midst of busy traffic and local businesses. Moreover, the trial holes and excavations took place in areas congested with live services, owned by a diversity of utilities companies (BT, Virgin Media, Vodafone, UKPN, Thames Water, Cadent Gas).

To address these challenges, Barhale took a proactive approach that emphasised exemplary collaboration and stakeholder management. As a result, Barhale provided several design solutions to overcome numerous site restrictions. Barhale also ensured that third party assets were successfully diverted following a strict delivery programme. Finally, hand-digging and non-obtrusive techniques ensured that the excavations were carried out with zero accidents and cable strikes, despite the heavy presence of live services.

Construction of lighting column reinforced concrete foundation

Existing services

Exemplary Collaboration...

One of the most challenging aspects pertaining to the project stemmed from the need to coordinate the diverse utility owners whose assets required diversions. This occurred in the second phase of the project, after Barhale had carried out the trial holes, and re-designed the bollards, taking into account the actual location of the underground services. On the basis of this information and with the help of Premier Energy, a specialist partner, Barhale were able to confirm with individual asset owners the costs of diversions (to be undertaken by each of them). With active input from both utility owners and BFK, Barhale planned and coordinated the diversions into one master programme.

The planning hinged substantively on effective collaboration throughout with all the stakeholders involved. Barhale organised regular meetings with BFK, as well as the asset owners and their planning teams to specify their individual scope of works and to identify the availability of their teams to carry out the diversions. Based on the outcomes of these meetings, Barhale developed a master programme that prioritised diversions and illustrated critical paths. The master programme was circulated to the asset owners and to BFK for their final comments and acceptance. Subsequently, Barhale mobilised and started the enabling works for the diversions. These included setting up site and excavations.

After the diversions started, Barhale held weekly progress meetings to monitor progress on site against the baseline provided by the master programme. This approach helped coordinate the works, mitigate potential risks and provide early warnings to the client based on asset owners' performance. Coupled with effective daily communication, this ensured that all the assets were diverted successfully, and within cost and programme.

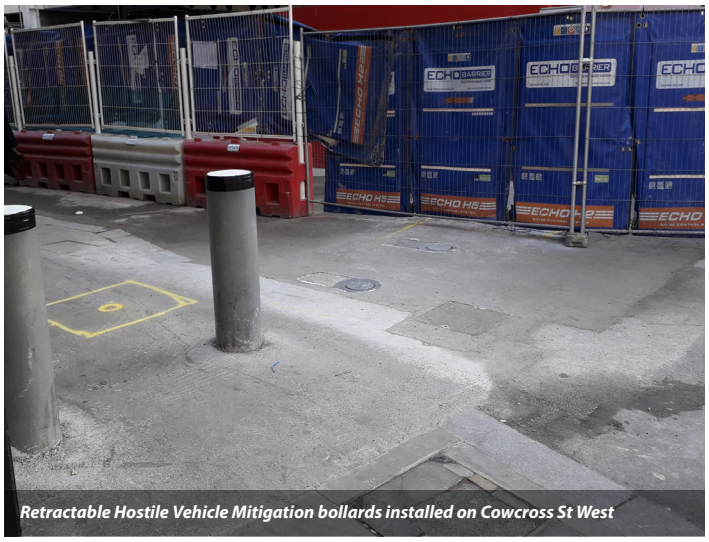
Coordination and Buildability of Design...

The trial holes were conducted on the basis of BFK's preliminary design for the installation of the bollards, which had been done using the utility services drawings provided by the asset owners. The as-built information was then used to re-design the bollards, taking into account the actual location of the underground services.

After utility owners diverted their respective services according to the indications in the new design, final reviews to the design were conducted on the basis of previously unavailable information, such as the location of electrical connections, and additional ducting and connection chambers.

By being involved throughout, Barhale were able to make key suggestions for the thorough buildability of the final design. The team's suggestions included reducing the number of ducts that connect the bollards to the station, to avoid the limitations entailed by the congestion of services in the area; revised locations for the ducting connection chambers, on the basis of a master drawing that combined all the diversion information and the permanent works design; and a revised final location for the bollards themselves. The latter achievement was particularly significant since it avoided the diversion of Thames Water and Cadent Gas assets (which would have run the risk of overrunning the programme), and it facilitated the buildability of different packages of works in the congested area outside Farringdon Station. These included connections of lighting columns, CCTV cameras and offsite control of the retractable bollards.

After the final design was approved, Barhale conducted the enabling works for the installation of the bollards (undertaken by another one of BFK's partners). Of these, some were retractable to allow maintenance vehicles through if and when required. Barhale excavated at 1.7m throughout, and, post-installation, backfilled for the non-tractable excavations, while the retractable ones are cast in concrete and have their own drainage systems.



Retractable Hostile Vehicle Mitigation bollards installed on Cowcross St West

Retractable Hostile Vehicle Mitigation bollards installed on Cowcross St East