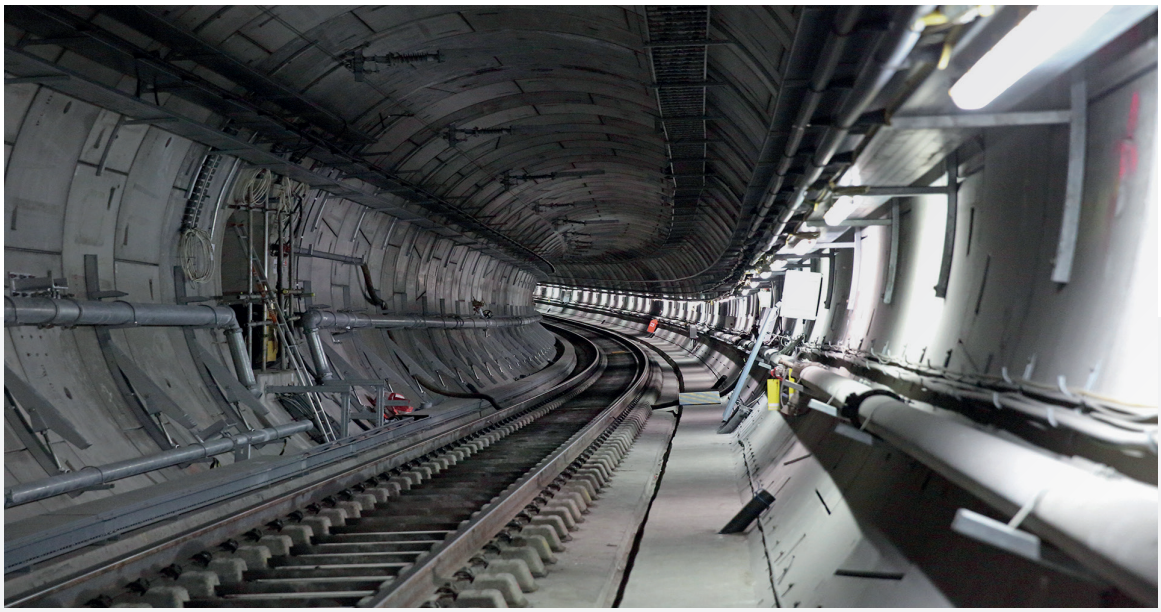
D&C Engineers

Elizabeth Line, London



“D&C Engineers were the obvious choice for this project at all locations”

Neil Spence, Major Projects and National Site Plant Manager, Hanson UK

Background

Elizabeth Line is Transport for London’s latest addition to the London Underground system. Named after Queen Elizabeth II, the new railway will soon run from Reading and Heathrow, west of London, through central tunnels to Shenfield and Abbey Wood in the east of the city. Over this 60-mile stretch it will stop at 41 accessible stations. It is being delivered by Crossrail Ltd and is expected to serve 200 million people every year.

Challenges

Alongside other world-class suppliers, D&C Engineers was heavily involved with designing and installing manufacturing plants at various sections of the Elizabeth Line. Our highly trained fitting and electrical teams had to pass medical and theory tests to work on the development. The project’s location in and around central London presented unique space and access challenges, and we worked closely with the main contractor as well as the Metropolitan Police to deliver the highest possible safety standards. To avoid disrupting traffic and other site operations, we carried out much of our installation work overnight. Mindful of cost and environmental considerations, we helped our clients re-use existing assets wherever possible.

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D&C Engineers' role

Our highly specialised teams worked at the following sites:

Royal Oak Portal

In partnership with Mobile Baustoffe GmbH, D&C Engineers designed, manufactured and installed a grout plant at Royal Oak Portal to produce grout for the railway line's tunnel sections.

Royal Oak Portal was where the tunnel boring machines began their eastward journey underground. The site was confined, with many activities going on at the same time. Directly behind the plant was the busy Great Western Railway line into Paddington, while directly in front was the site haul road.

Tottenham Court Road station

IAlongside concrete batching plant specialist SIMEM, D&C Engineers installed a bespoke concrete plant at Tottenham Court Road station for Mobil Baustoffe GmbH.

The plant had the capacity to store 600 tons of aggregate and 150 tons of cement, allowing it to operate over weekends without deliveries. Cement dosing and micro silica were required too.

We installed the plant during November and December – the busiest time of year for the station, which sits at the St Giles Circus junction with Oxford Street. This was not the only challenge. The plant was cited on a 26 square metre footprint: so small that some of the plant parts, upon delivery, were stored at the foot of the 30m-deep excavation which would later form the line platform.

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Old Oak Common

D&C Engineers installed a concrete plant at Old Oak Common for manufacturing the tunnel segments of the line. This was for Hanson UK.

We originally manufactured this plant for the tunnel segments of HS1 at Dagenham. It was relocated to the Isle of Grain in Kent for a liquefied natural gas project.

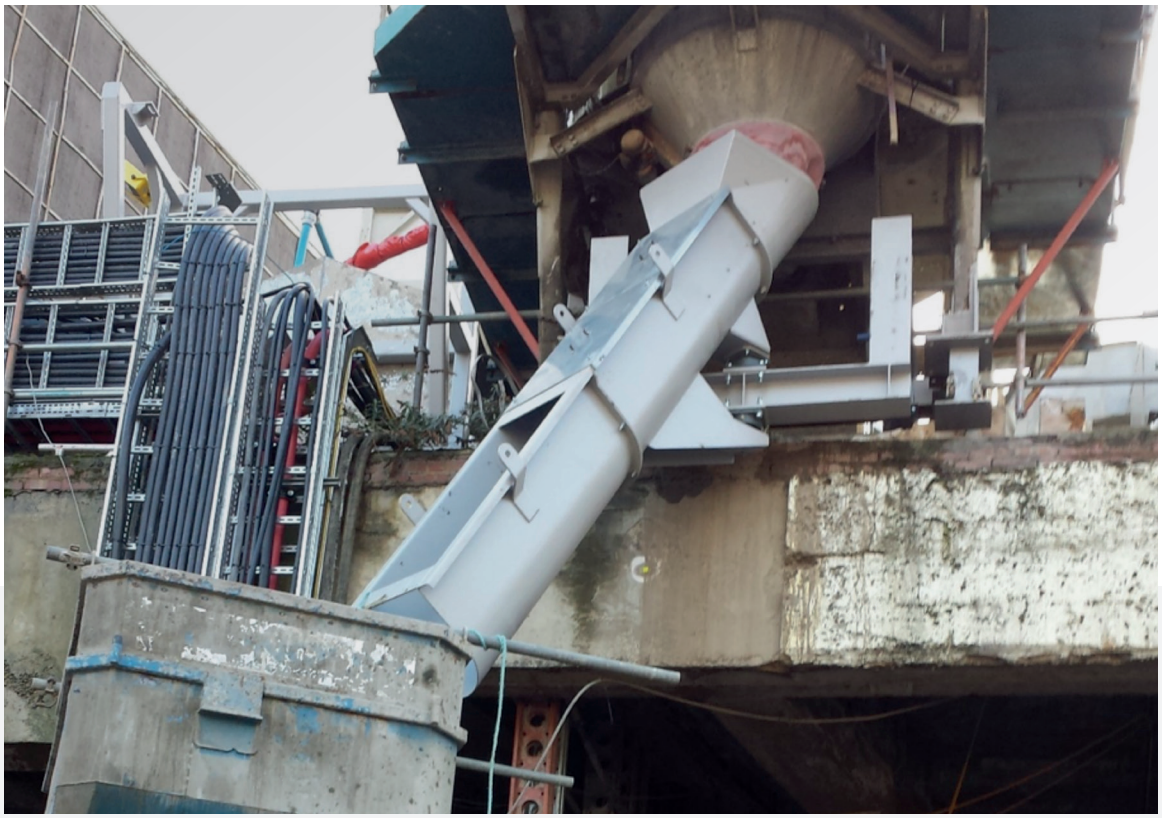
At Old Oak Common we modified the plant to produce consistent concrete with fibre additions. Steel fibres were added to the batch process via dosing machines on load cells, allowing full control and tractability.

Poly-fibres were added via a similar dosing machine on a load cell and then blown directly into the mixer.

With the addition of a Hydronix sensor system (monitoring both the aggregate material and inside the mixer) operated via a Hydro-View moisture display unit and an Alkon control system, we ensured the plant produced a consistently high-quality product throughout the project, without a single rejection.

Farringdon station

This extremely tight site – for producing conventional and sprayed concrete for the tunnel lining – had no room for the batch plant at the correct level. An existing two-storey concrete structure was chosen, with the intention that concrete would be delivered to the lower level by extended discharge into skips and a conventional truck mixer.



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When the plant was returned to our Midlands workshop for a major reconfiguration, we designed and delivered new solutions. Due to the limited space at Farringdon we stacked horizontal silos on top of one another. We re-manufactured the mixer section to have a discharge height of 1500mm. We carried out these alterations with future planning in mind, meaning the plant could be reverted to its original configuration after the project.

We also pre-wired the plant, for easier installation, and included steel fibres and micro silica.

On site, we calculated the load-bearing pressure of the plant and positioned it to suit existing support legs below the concrete flooring.

Stepney Green

The plant D&C Engineers installed at Stepney Green presented a new set of challenges. The existing asset had to be enhanced with acoustic cladding, for example, due to the location of a petting zoo next to the site.

We installed vertical silos to get around space restriction. This also increased the plant's capacity, allowing it to operate over weekends without deliveries. Steel fibres and micro silica were also required in this project.

Limmo Peninsula

The site at Limmo Peninsula, a small piece of land between the River Lea and the Docklands Light Railway, was a major intersection in the tunnelling process, with a vertical access shaft feeding the operation.

D&C Engineers heavily modified the plant to suit the requirements of this site, adding steel and poly fibres and micro silica facilities.

Testimonial

"To produce the quality and quantity of concrete required on this project in one of the busiest cities in the world was a logistical challenge.

Standard site plant would not fit many locations so our existing site assets had to be adapted and modified prior to arrive on site.

Some were then re-adapted for the next section and re-located.

D&C Engineers were the obvious choice for this project at all locations".
- Neil Spence, Major Projects and National Site Plant Manager, Hanson UK.

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