

Delta Junction – Metro Extension, West Midlands



The Midland Metro Alliance is building a number of Metro extensions on behalf of Transport for West Midlands (TfWM) and have started work on the Wednesbury to Brierley Hill Metro Extension project.

This 11km extension will branch off the current West Midlands Metro line, just east of the Wednesbury Great Western Street Metro stop, before heading through Tipton and Dudley. The Delta Junction extension will boost public transport options in the Black Country and is a key part of the operator's plans. The project began in June 2021 and is due to be completed by the end of 2023.

Specifically, Bauer Technologies' scope of works was to stabilise historic granular and cohesive embankment fill material, to minimise settlements under the planned Delta Junction approach ramp. This project will see the new tram line elevated by six meters to join the existing track level. There have been a number of challenges to the

successful completion of this project. The working area was exceptionally long and narrow, making Bauer's careful planning of site logistics and column construction sequence essential. After 200 years of works, obstructions such as brick culvert and coarse foundry waste required close cooperation with the main client and contractor, to overcome and deal with these issues. The general industry shortage of Ground Granulated Blast Furnace Slag (GGBS) and Ordinary Portland Cement (OPC) constituted a major risk to project delivery. Intensive negotiations with the supply chain during the project mobilisation phase meant Bauer was able to secure the required resources and delivered the project ahead of programme.

Scope of Works

Works included a preliminary Zone Load Test, as well as regular wet grab sampling and verification coring of completed DSM

columns. The ground improvement was installed by means of Ø2000mm Deep Soil Mixing (DSM) columns, to maximum design depth of 11.50m, using a BG45 piling rig and associated grout mixing plant. Bauer Technologies commenced works on site during December 2021 and completed the works ahead of schedule, early March 2022.

This project saw the first Deep Soil Mixing (DSM) project for Bauer Technologies; knowledge and experience was successfully transferred from other Bauer subsidiaries and Bauer's head office specialists, to the UK project delivery team, allowing Bauer Technologies to provide an optimised ground improvement design tailored to the client's requirements and deliver it ahead of programme and to excellent quality.

Overall, works were completed to the full satisfaction of the client.

Client:

Transport for West Midlands

Principal Contractor:

Midland Metro Alliance

Piling Contractor:

BAUER Technologies Limited

Contract Period:

December 2021 to March 2022

Scope of Works:

- Design of ground improvement solution
- Preliminary trial columns and 250kPa Zone Load Test
- Installation of 435nos Deep Soil Mixing columns Ø2000mm to 11.50m
- Quality control by wet grab sampling & coring of DSM columns

Equipment Used

- Bauer BG45 with Ø2000mm Deep Soil Mixing tooling
- Bauer CMS45 grout mixing plant

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