

# HS2 C1 SOUTH PORTAL HERTFORDSHIRE

Combined Soil Stabilisation Ltd (CSSL) have undertaken the treatment of over 400,000m<sup>3</sup> of soil treatment on the HS2 C1 construction contract. CSSL working as a subcontractor to Roadbridge UK who in turn are providing the earthworks for the Align JV.

CLIENT  
**ALIGN JV**

PROCESS  
**MODIFICATION & STABILISATION**

DURATION  
**12 MONTHS PLUS**

HS2 C1 consists of 21.6km of high-speed rail infrastructure. This will include a 3.37km viaduct, 16.04km twin-bored tunnel and five vent shafts handling both intervention and tunnel ventilation facilities.

In order to start the two tunnel boring machines the earthworks for the launch pad required excavation of over 160,000m<sup>3</sup> of material and this volume along with other cuttings on the main line have been placed and treated to provide working platforms for precast concrete batching and storage, tunnel spoil handling, soil nailing operations as well as offices and parking. Stabilisation has also been used as a capping replacement, reducing the need for imported stone which benefits the environment through fewer lorry movements.

In addition to the working platforms, the chalk and head materials have been placed and engineered in below ground treatments and rail embankment fill, all in accordance with the detailed HS2 Earthworks specification to achieve a high quality robust embankment. Soil treatment has been used to ensure the treated material meets the specification both in the short and long term life of the embankment. CSSL's first involvement was for the embankment trial in August 2019 and our technical expertise and experience was used to assist the development of the project.

At the peak of the works CSSL had four Wirtgen mixers working on the project. The mixers used were the Wirtgen WR240i S-Pack Machines all meeting the HS2 emissions standards. These were supported by a mixture of self-propelled and tractor towed binder spreader units with capacities ranging from 10 to 19 cubic metres. The binders used for the treatment of the soil were a combination of lime only or lime and cement. In addition to the mixing of the binder into the soil, CSSL also undertook the compaction of the material and during the course of the project were the first company in the UK to use the Bomag Bomap Continuous Compaction control software on the rollers. The cloud based Bomap data system provides detailed compaction information for analysis as well as real time data on the rollers performance.

The success of the works resulted from the collaborative attitude throughout the supply chain, with all involved from Designers to Subcontractors working together to achieve the quality required first time.

