

## Working Platform: Crossrail C310, North Woolwich, London, UK - 2012

### Working platform for piling and diaphragm wall rigs over alluvium using a Tensar MSL (Mechanically Stabilised Layer)



*Rigs operating over the working platform stabilised with Tensar TriAx<sup>®</sup> geogrids*

#### BENEFITS TO CLIENT

Principal benefit was the provision of a safe working area over very weak foundation soils. In addition, the client benefitted from reduced time and construction costs by avoiding the need for a reinforced concrete slab with "boxouts" for piles and walls panels which would need to be subsequently demolished, removed and disposed of.

#### THE PROBLEM

Hochtief Murphy JV needed to construct a temporary working platform for a variety of heavy, tracked and diaphragm piling rigs operating over soft alluvium (estimated undrained shear strength of 15kPa) for the construction of the north portal of the Thames tunnel.

#### THE SOLUTION

Tensar provided a full design solution, resulting a safe and economical working platform.

The scope provided in BR470 for alternative methods of platform assessment allowed the adoption of a Tensar MSL (Mechanically Stabilised Layer), incorporating Tensar TriAx geogrids, to act as the working platform.

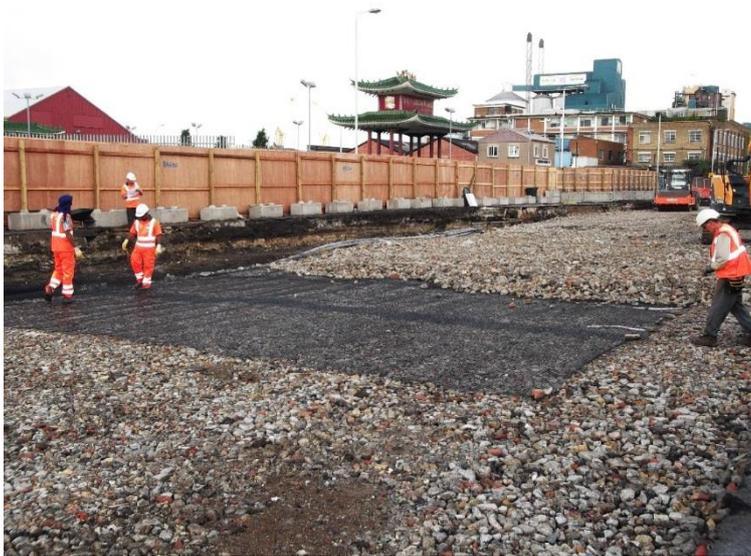
## PROJECT DESCRIPTION

Crossrail is currently the largest single civil engineering project under construction in Europe. Contract C310 is the only Crossrail contract to feature a twin bore tunnel below the Thames. The site investigation for the tunnel's North Woolwich portal, located south of London City airport, indicated the likelihood of a very thin crust of 'made ground' (either granular or cohesive) overlying considerable and variable thicknesses of alluvial clay and peat with an undrained shear strength ( $S_u$ ) of only 15kPa for the formation.

Such weak ground ( $S_u < 20\text{kPa}$ ) is beyond the scope of a working platform assessment based on the guidance in the BR 470 document "Working Platforms for Tracked Plant". The joint venture contractor, Hochtief Murphy (HMJV) approached Tensar International for a solution, using recycled 6F5 granular capping material.

Tensar's extensive research background and years of experience in similar conditions meant that an alternative to the BR470 analysis method could be adopted. Load distribution through the Tensar MSL has been established as an acceptable method of assessment and so, in this case, Tensar designed approximately 3,000 m<sup>2</sup> of platform to provide adequate factors of safety for the rotary bored tension and secant piling rigs and also diaphragm walling rigs. These rigs induced high track loads including a Load Case 2 equivalent UDL pressure of 355kPa. The upper

300mm of the platform was formed from roller-compacted concrete at the client's request. The design was checked by HMJV and approved by the overall project Crossrail Client.



The Tensar MSL with layers of Tensar TriAx geogrids was proposed and constructed using the available recycled granular fill. In this instance, site conditions dictated that the Tensar MSL layer incorporated a non-woven geotextile separator placed directly below the bottom layer of TriAx geogrid on the formation to provide the additional function of separation, to control any upward migration of fines.

Despite these very low strength soils, HM JV's Project Manager, Daniele Santiago reported the Tensar platform was extremely stable and performed as required.

*An upper layer of TriAx geogrid installed within the 6F5 fill*

## CONTRACT DETAILS

Client: Crossrail

Contractor: Hochtief Murphy JV

**Tensar**<sup>®</sup>

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