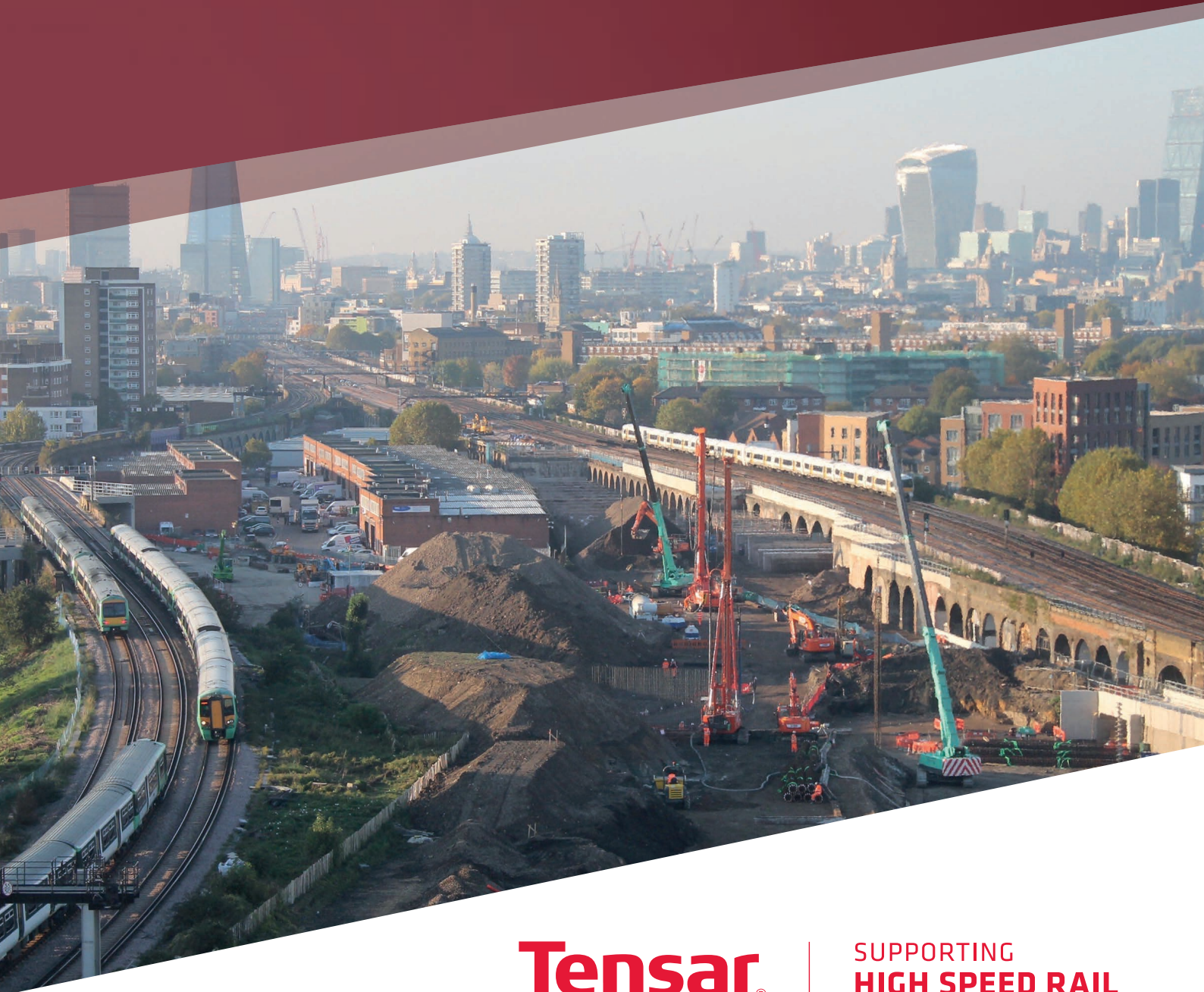


TEMPORARY WORKS SOLUTIONS



# FAST, ECONOMICAL AND PROVEN SOLUTIONS FOR HIGH SPEED RAIL PROJECTS

REDUCING CONSTRUCTION TIME  
AND COST OF TEMPORARY WORKS



**Tensar**<sup>®</sup>

SUPPORTING  
**HIGH SPEED RAIL**



Delivering successful temporary works

Tensar systems have been used successfully on infrastructure projects around the world for 35 years, helping to deliver temporary and permanent works quickly, economically and safely.



Tensar TriAx® geogrids are used to mechanically stabilise granular materials in access roads, site compounds and working platforms, while our range of systems for soil retaining walls, bridge abutments and reinforced slopes can help maximise construction areas for both temporary and permanent applications.

Our solutions allow marginal fill to be used, including selected site won material, reducing the import of aggregates and removal of excavated material and cutting CO<sub>2</sub> emissions by up to half.

**Tensar TriAx geogrids**

TriAx geogrids have delivered benefits to thousands of projects around the world, in many different climates and ground conditions.



**Unpaved roads, site compounds and working platforms**

Unpaved temporary access roads, compounds and working platforms are a critical aspect of temporary works for major high speed rail projects. While supporting extremely heavy loads, these often have to be built on weak or variable ground.

Tensar TriAx geogrids create mechanically stabilised layers, improving the performance of granular materials, saving contractors time and money, without compromising on safety.

**THE BENEFITS**

**Increased bearing capacity**

Mechanically stabilised layers create a safer and more reliable base for heavy plant and high traffic areas.

**Reduced layer thickness**

Granular layers incorporating TriAx can be up to 50% thinner, with no loss of performance.

**Saving time and money**

Less aggregate is needed and excavation and disposal is reduced, so construction is faster and costs are lower.



**Retaining walls, bridge abutments and steep slopes**

Practicality and economy take priority over aesthetics when it comes to temporary retaining walls and bridge abutments. Our TensarTech Systems can be used to build temporary and permanent reinforced soil retaining walls, wing walls, bridge abutments and steep slopes, which can be constructed quickly and economically.

**THE BENEFITS**

**Rapid construction**

Most systems can be built without formwork, temporary propping or crane lifts and are ready for use immediately.

**Simple to build**

Conventional earth embankment construction techniques can be used, often without the need for specialist skills. Temporary systems are dismantled easily, or can be backfilled against, at the end of a project.

**Temporary structures at a fraction of the cost**

Tensar systems can be built at a fraction of the cost of conventional methods – with up to 75% cost savings.







+ TEMPORARY STRUCTURES

+ WORKING PLATFORMS

+ TEMPORARY WORKING AREAS

+ ACCESS ROADS



# TriAx<sup>®</sup>

## Tensar TriAx geogrid

Launched in 2007, Tensar TriAx geogrids maximises aggregate confinement, creating stiff mechanically stabilised layers through 'interlocking': as load is applied, granular particles partially penetrate and project through the geogrid's apertures, resulting in their confinement and lateral restraint and therefore increasing stiffness and reducing deformation of the aggregates.

### TriAx geogrids can be used in:

- Temporary Working Areas*
- Working Platforms*
- Access Roads*
- Construction Compounds*

# TENSARTECH<sup>™</sup> TR2 WALL

## TensarTech TR2

The TensarTech TR2 system comprises steel mesh face panels, lined with a durable heavy duty geotextile, securely connected to uniaxial geogrids (via a highly effective bodkin connection joint), to reinforce the fill behind. No formwork is needed as the steel mesh face is braced internally and held in place by the geogrid and fill during construction.

## TensarTech Steepened Slopes

TensarTech steepened slopes can provide a platform for supporting temporary works to create additional room on site for other construction activities. TensarTech slopes are built up to 70° with a suitable erosion geotextile at the face, if required.

### TensarTech TR2 and Steepened Slopes can be used for:

- Temporary Bridge Abutments*
- Piling Platforms*
- Temporary Working Areas*
- Areas where levels need to be raised*





Bermondsey Dive Under - Working Platforms

A thinner, stronger working platform

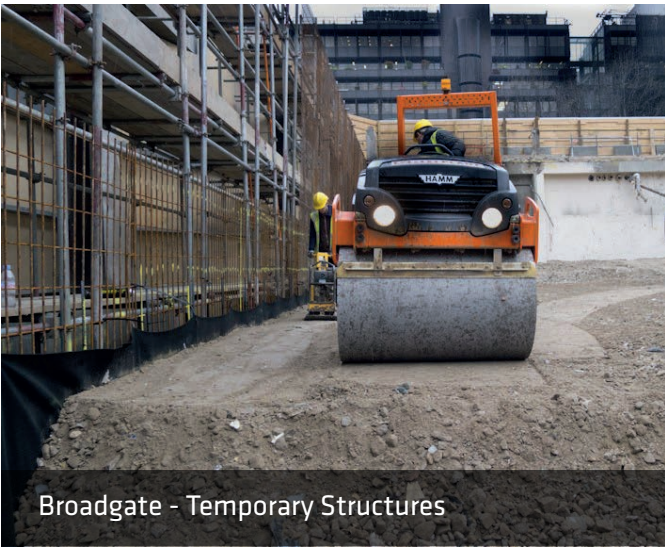
A working platform built using site-won granular fill, mechanically stabilised with TriAx, was key to successful enabling works on the Bermondsey Dive Under, a major new rail junction on the Thameslink project in south east London. Using TriAx allowed the platform to be as thin as possible, while being able to support piling rigs and crawler cranes.

**£40,000**  
material cost savings

**Reduced**  
carbon footprint

**400mm**  
reduction in working  
platform thickness

**20 days**  
cut from enabling works  
programme



Broadgate - Temporary Structures

High-performance temporary structures

Constructing a 6.6m high, vertical temporary wall using the TensarTech TR2 System ensured that a 100t piling rig installing foundations could work just 1m from the existing wall face on a congested central London development.

**Low cost and robust**  
solution using recycled  
granular fill

**Simple to build**  
using the contractor's  
own team

**Maximising**  
the working area on  
a small site



Glenchamber Wind Farm - Access Roads

Site access over difficult ground

Using TriAx to mechanically stabilise site-won aggregate ensured access roads could be built across deep and very soft peat deposits quickly and economically, to carry heavy construction plant and materials to the site of the Glenchamber wind farm in Scotland. TriAx was also used in the widening of public roads near the site.

**Economical**  
road design over deep,  
soft peaty ground

**Maximising**  
the use of site-won  
aggregate but minimising  
excavation

**Ensuring on-time**  
delivery of construction  
materials and equipment

Minimising the import of aggregates

High speed rail projects could have targets for reusing up to 80% of on-site materials. Tensar systems offer opportunities to minimise aggregate import and material exports and associated lorry movements, cutting time and cost from enabling works.

TENSAR APPLICATION					
Material	Access roads and compounds	Working platforms	Embankment foundations	Reinforced soil slopes	Reinforced soil walls
Site-won cohesive			✓	✓	
Recycled cohesive			✓	✓	
Site-won granular	✓	✓	✓	✓	✓
Recycled granular	✓	✓	✓	✓	✓

Supporting your project, from concept to completion

*Tensar's professional engineering teams have deep experience in the use of our products and systems on a wide range of infrastructure projects across the UK.*

Our products are manufactured in the UK, placing us in a unique position to deliver exactly what is needed, when it's needed, saving time and money. And, as our 'geogrid miles' are lower, we can help reduce the carbon footprint of projects.

We provide a comprehensive range of design and advisory services, tailored to clients' needs, including project-specific support on concepts, design and installation advice, to help them develop the most cost-effective subgrade stabilisation and retaining structure solutions.



TensarTech temporary rail structure



# PLEASE GET IN TOUCH

FOR ANY FURTHER INFORMATION

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