



# Tensar®

**SPECTRA®**  
PAVEMENT OPTIMISATION SYSTEM

Ground conditions were highly variable, with the weakest soils having insufficient bearing capacity to carry the anticipated traffic loads.

## Taming highly variable ground

TriAx® geogrids, used to mechanically stabilise aggregate layers of construction roads over weak and variable ground, also provided a stable foundation for permanent roads on the Orchard Place housing scheme in King's Lynn, Norfolk.

### CLIENT'S CHALLENGE

The Borough Council of King's Lynn and West Norfolk and housing developer Lovell needed to mitigate the risk of differential settlement of temporary access roads and 11,000m<sup>2</sup> of paved areas over weak and variable ground on a residential scheme in King's Lynn, while minimising the import of engineered fill.

### TENSAR SOLUTION

TriAx incorporated in unbound granular layers delivered access roads capable of carrying construction traffic. It helped to mitigate differential settlement, reduced the volume of imported fill by a third and cut construction costs by £5.80/m<sup>2</sup> (a total of £64,000). These layers provided a stable foundation for permanent roads and parking areas, designed using Tensar's Spectra Pavement Optimisation system. The main road through the development was adopted by Norfolk County Council under a Section 38 agreement.

## Orchard Place housing scheme

Pavement Optimisation

📍 King's Lynn, UK

### BENEFITS

**33%**

Reduction in volume of imported fill

**£64,000**

Saved on flexible pavement construction

**Mitigating risk**

of differential settlement

REF TEN385



TriAx geogrid mitigated the risk of differential settlement and eliminated the need to import fill to provide a stable founding layers.

## PROJECT BACKGROUND

Orchard Place is a residential development of 130, two, three and four bedroom houses at Marsh Lane, North East of central King's Lynn. The homes were built by a partnership of the Borough Council of King's Lynn and West Norfolk and developer Lovell.

Ground conditions varied across the site, including areas of very weak soils with CBRs of between 1% and 3%, presenting a real risk of differential settlement in the scheme's temporary and permanent roads.

Tensar worked with scheme designer Richard Jackson Engineering to develop designs for the temporary access roads. Tensar proposed using TriAx geogrid incorporated into the roads' unbound aggregate sub-base, creating mechanically stabilised layers. Mechanical stabilisation is achieved through 'interlocking': when load is applied, the granular particles partially penetrate through the geogrid's apertures, confining and restraining them from moving both vertically and laterally.

As well as delivering roads capable of carrying heavy construction traffic, Tensar's approach also mitigated the risk of differential settlement and avoided the need to dig and excavate the weakest ground and the need to import engineered fill.

Tensar's Spectra Pavement Optimisation system was then used to design 11,000m<sup>2</sup> of asphalt surfaced and block paved driveways, car parking and roads on the scheme, including the main road running through the estate, that was to be adopted by Norfolk County Council under a Section 38 agreement. The design incorporated the access roads' mechanically stabilised subgrade layers, which provided a stable platform for the permanent roads and increased the flexural rigidity of the entire pavement structure.

Pavement construction was carried out by subcontractor Bowie Construction. Lovell was main contractor for the scheme.

Client:

**Borough Council of King's Lynn and West Norfolk and Lovell**

Main Contractor  
**Lovell**

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*"The poor ground conditions on this scheme made constructing solid platforms a real challenge. Tensar's various products have proved to be trustworthy and reliable in practice. Also, with the assistance of the Tensar technical team, we were able to offer the client a considerable saving against the original design."*

**Andy Bowie**  
Managing Director  
Bowie Construction Ltd

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