The 5,000m² piling mat was needed to provide a safe working area at ground level, so bored piles through the underlying weak ground.

Tensar®

ROADS AND PLATFORMS

T-Value saves time and money

Tensar's T-Value design method delivered a piling mat that was 33% thinner than the original design, cutting construction time and costs, with less environmental impact.

Marketfield Way

Roads and platforms
Piling Mat

Redhill, UK

CLIENT'S CHALLENGE

Vinci Construction UK needed to install a 5,000m2 piling mat for a development in Redhill town centre. The original design required excavating the underlying peat and weak clays to 1.2m and replacing them with recycled engineering fill, to create a safe working area at ground level. However, after attending a T-Value design method workshop, Vinci asked Tensar to see if savings could be made.

TENSAR SOLUTION

The T-Value design method analysed the full benefits of a Tensar mechanically stabilised layer using locally available demolition granular material designed to take project specific ground conditions and loading into account to provide a safe working platform for site operations. Tensar's proposal reduced fill volumes and excavation quantities, cutting installation costs by around 20%, the construction programme by approximately 18%. It also reduced the evironmental impact by reducing carbon emissions by around 240t CO_2e.

BENEFITS

33% thinner
piling mat

20% savings
in construction cost

18% reduction
in construction programme

Reduced carbon emission
by around 240t CO_2e

REF TEN414

Incorporating stabilising geogrid in the piling mat's granular material meant it could be 33% thinner, without a loss in bearing capacity or load transfer efficiency.

PROJECT BACKGROUND

Vinci Construction UK was awarded the contract to build a new, mixed-used development on Marketfield Way, in Redhill town centre, on behalf of Reigate & Banstead Borough Council. The scheme, part of wider regeneration plans for the town, includes a seven-screen cinema, shops and 150, one and two-bedroom homes.

The site was underlain by peat and soft clays, with undrained shear strengths of about 10kPa, which meant installing a piling mat to create a safe working area for the rigs installing bored piles for the development.

Vinci designed the 5,000m^2 piling mat to cater for the BR470 load cases from the piling rigs (and support cranes) and the improved ground conditions, which involved excavating down 1.2m and placing recycled demolition material to form the mat at ground level. However, after attending a workshop on Tensar's T-Value design method, Vinci approached Tensar to see if savings could be made.

The T-Value design method analyses the full benefits of stabilising geogrids in granular piling mats, to assess whether a thinner platform stabilised with geogrid can be used, without impacting on bearing capacity or load transfer efficiency.

Tensar's analysis showed the piling mat could be 400mm thinner if stabilising geogrids were used. Reducing the excavation depth by a third meant less material had to be removed from site and less recycled engineering fill was needed, making piling mat construction quicker (by about 18%) and more economical, with an estimated 20% cost saving. Additionally, Tensar's approach saved an estimated 240t of CO_2e, through reduced materials use and fewer lorry movements.

Main contractor:
Vinci Construction UK

Client:
Reigate & Banstead Borough Council

"VCUK approached Tensar for the Marketfield Way project and worked with our Temporary Works department to come up with a cost effective solution for the project. The site had extremley soft ground and a large Victorian oval sewer through the site. Despite very large piling rigs and heavy plant movements, the Tensar design proved extremely effective and the piling mat needed no further maintance once installed."

Richard Etherington
Senior Project Manager
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