

Case Study: 004

CONTRACT DETAILS

Geosynthetic Installer:
Foster Contracting Ltd.

Main Contractor:
Ennstone Johnston Ltd.

Client:
May Gurney

BACKGROUND:

Marine Parade, Great Yarmouth runs north to south and is the main route along the seaside town's historic promenade. With the carriageway's proximity to the sea, it presents a harsh environment with very high water tables that constantly vary throughout the tidal cycle. The harshness of this environment, coupled with the rigours of modern day traffic loading had caused the road surface to deteriorate, leading to brittle cracking of the Thin Surface Course and also reflective cracking from overlain service trenches, patches and tram rails.

The town centre was already undergoing a major regeneration as part of the EU funded 'InteGREAT' scheme to improve lighting, restore historic buildings, undertake highway improvements, install CCTV, provide hi-tech tourist information, and create landscaped areas. Coupled with marketing initiatives, the scheme would encourage economic development into the area. As part of this scheme, the decision was taken to carry out essential carriageway repairs to Marine Parade, with Phase 1 running between Euston Road to the north and St. Peter's Road to the south. As part of the works the width of the road was to be decreased to allow for the construction of a safe, separate lane for horse and carriage rides for holiday makers and create a more pedestrian friendly environment. 'Build outs' would also be constructed in the road to address the problems of speeding traffic.



Two views of the reinstated carriageway

SOLUTION:

Core samples taken in October 2006 confirmed the existing road construction comprised a thin pavement with a maximum of 125mm of asphalt overlaying sand and gravel. Drawings confirmed the existence of old tram lines, power cables and a gas main, all at a shallow depth beneath the road surface. In order to prolong the life of the new road construction, 100kN/m x 100kN/m geosynthetic was installed with the following objectives:

- To retard the formation of reflection cracks in the bituminous inlay
- To seal the cracks in the underlying layers and prevent penetration by water and oxygen
- To reinforce the asphalt layers of the carriageway
- To prolong the life of the carriageway

INSTALLATION

Prior to the installation of the 100kN/m geosynthetic, main contractor Ennstone Johnston planed the carriageway to a depth of 40mm, cleaned the exposed surface, and filled exposed cracks greater than 4mm width. This process ensures a 100% bond between the planed surface and the paving fabric.

Specialist installation contractor, Foster Contracting Ltd, then used their calibrated tanker to spray a bond coat of 160/220 pen bitumen at a rate of 1.1 litre/m² and a temperature of 185°C onto the planed surface. Foster Contracting then used their bespoke laying machine to install the geosynthetic under tension onto the hot bond coat. In order to ensure that the works were complete before the busy summer season, the speed of installation were key measures of success.

The geosynthetic used does not need to be installed over a bituminous regulating layer nor does it require additional fixing. Together these factors reduce the risk of potential problems such as inadequate fixings becoming dislodged. Finally, Ennstone Johnston overlaid the geosynthetic with 40mm of a Polymer modified proprietary overlay. A total of 7,000m² of road refurbishment was successfully completed over a 7 day period.



Installation of the geosynthetic



Installation of the Polymer modified surface course

PRODUCT DETAILS

The paving geosynthetic was a mechanically bonded continuous filament non woven Geotextile made from 100% polypropylene and reinforced with high modulus glass filaments. The product is characterised by its uniform bonding, optimum bitumen storage capacity and efficient load uptake at very low strains of less than 3% thereby providing the ideal solution for highway maintenance. In addition, construction plant can traffic the geocomposite during the surfacing operation without damage or picking up.

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