Bridge Approach Embankments Using Macwall and Paralink in Bursledon

Southampton, Hampshire



TYPE OF PROJECT	YEAR OF CONSTRUCTION	CLIENT	CONTRACTOR	DESIGNER
Mass Gravity Retaining Walls	**2018**	**Hampshire County Council**	**Breheny Civil Engineering**	**GDGEO/OPUS-WSP/SMA**

PROD. RELATED
MACWALL ()

Challenge

A major residential development in Bursledon, near the M3–M27 interchange, required critical infrastructure upgrades to support the construction of 1,350 new homes on a former golf course at Boorley. The developer consortium, Bovis Homes, Bloor Homes, and Linden Homes, needed a new bypass connecting Pylands Lane to Heath House Lane to accommodate increased traffic and improve local transport links.

A key component of this infrastructure project was a 20m single-span concrete bridge. To support the bridge, high-performance approach embankments were required. Maccaferri Construction, appointed by Breheny Civil Engineering, was tasked with delivering these structures.

The project faced several engineering challenges, including poor ground conditions, high load requirements, and restricted working space. The solution needed to safely support both permanent traffic loads and temporary construction loads, including crane operations used to install bridge elements. Additionally, the site was environmentally sensitive, requiring careful consideration to protect local wildlife and maintain natural habitat connectivity.



Initial earthworks towards the end of 2017



Work started on the Macwall - Jan 2018

Solution

To overcome these challenges, a combination of Macwall mechanically stabilised earth (MSE) walls and Paralink high-strength geogrids was implemented. The Macwall system, BBA-certified and widely used in reinforced soil structures, was selected for the bridge approach embankments due to its ability to perform in challenging ground conditions and support heavy loads.

The MSE walls were constructed on piled foundations, with Paralink geogrids installed as a load transfer platform. This system ensured efficient load distribution and enhanced stability across the structure. The design also accounted for significant temporary construction loads, including crane operations, with pressures of up to 198 kPa safely transferred through steel bearing plates onto the reinforced soil system.

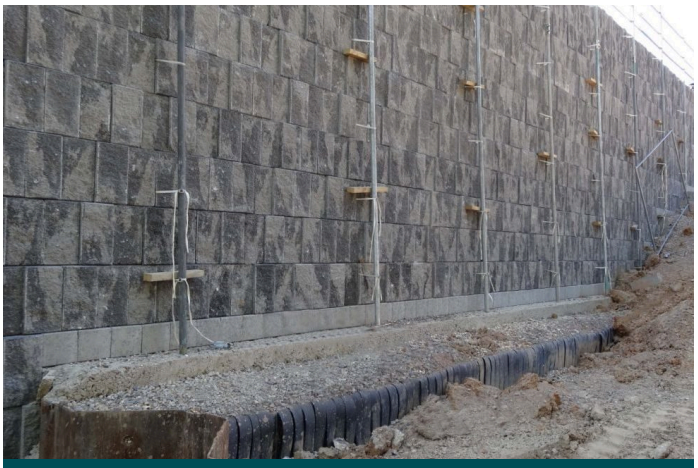
The Macwall bridge approaches reached heights of up to 11 metres and extended approximately 100 metres in length. The MSE abutment walls were designed by specialist geotechnical engineers Gavin and Doherty Geosolutions Ltd (GDG), working closely with principal designers SMA and OPUS to ensure compliance with structural and geotechnical standards.

Sustainability and environmental protection were key considerations throughout the project. The bridge was designed to allow wildlife to pass through the valley, preserving natural movement corridors and minimising ecological disruption.

Despite the complexities of confined working conditions, two-tier construction platforms, and stringent health and safety requirements, the combined Macwall and Paralink solution delivered a robust, cost-effective, and sustainable outcome. This project highlights the effectiveness of reinforced soil wall systems and geogrid technology in modern infrastructure and bridge construction.



ParaLink 350 & 1100 being rolled out in a piled embankment



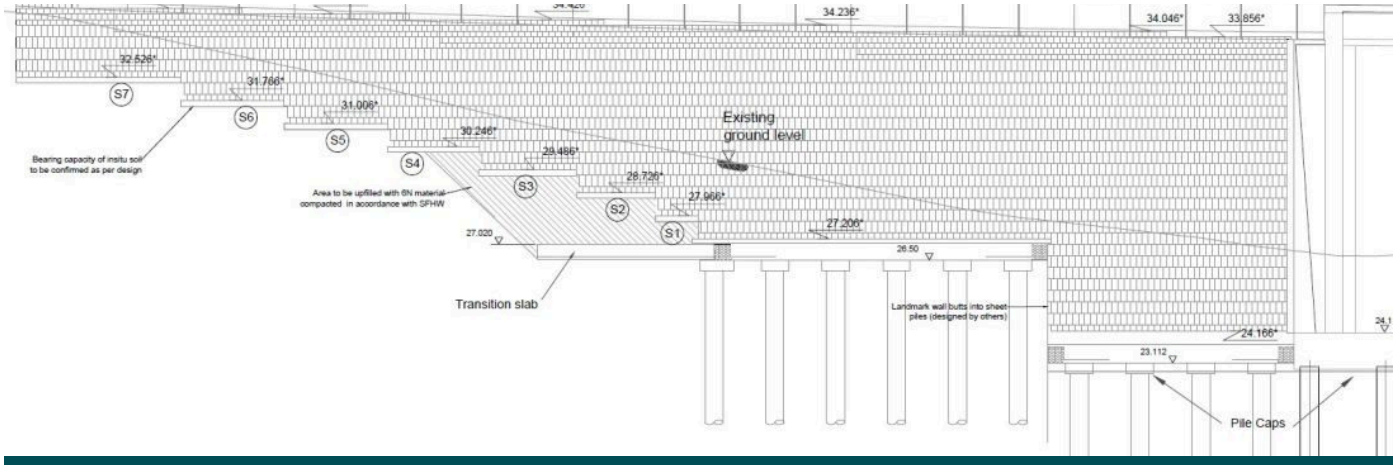
Paralink was wrapped back and covered as per BS8006



Macwall structure installed over the Paralink LTP platform



Macwall MSEW structure completed in Autumn 2018



Wing wall typical elevation. A two tier piled foundation platform with Paralink

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