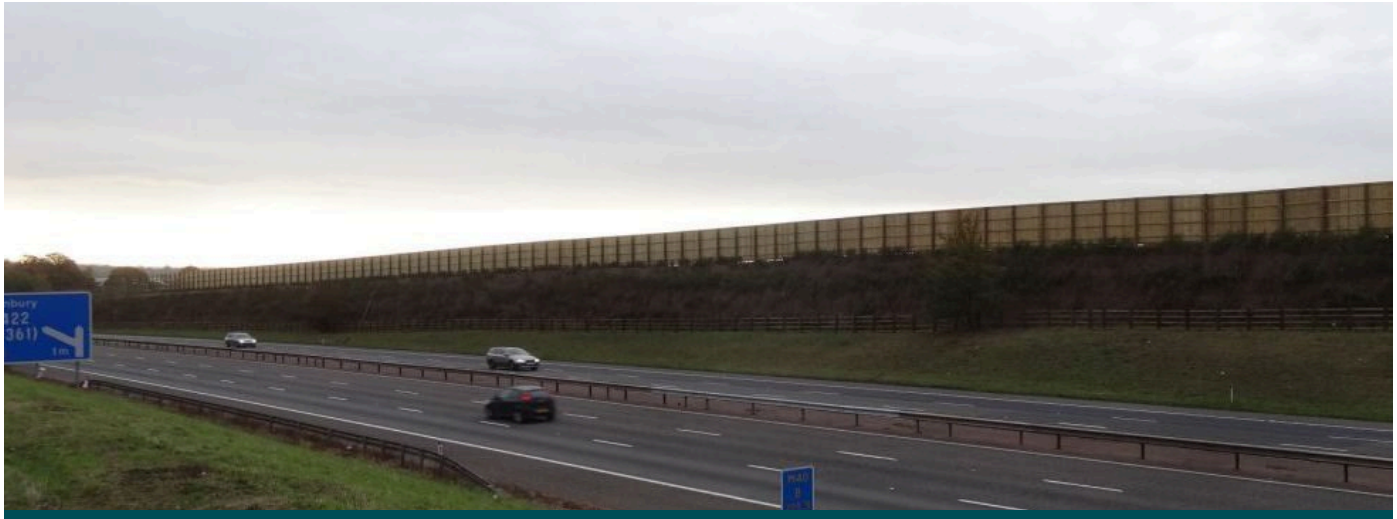
M40 Noise Bund Reinforced Earth Acoustic Barrier for Residential Development

Banbury, Oxfordshire



TYPE OF PROJECT	YEAR OF CONSTRUCTION	CLIENT	CONTRACTOR	DESIGNER
Reinforced Soil Walls And Slope Reinforcement	**2016**	**Bellway Homes**	**M Lambe**	**Hydrock And M-EC**

PROD. RELATED
TerraMesh ()

Challenge

Noise modelling for the proposed residential development identified that sound levels across a large portion of the site exceeded the thresholds set out in the planning conditions. This was primarily due to the site's close proximity to the M40 motorway, which runs along the northeast boundary.

As the masterplan evolved, iterative acoustic modelling was undertaken to assess the extent of motorway noise impact and to explore viable mitigation strategies. These studies confirmed that without intervention, the development would not meet required environmental noise standards for residential use.

A key mitigation measure identified was the construction of a continuous acoustic barrier along the motorway boundary. The proposed solution involved a large-scale earth bund combined with an acoustic fence. However, the project faced a significant engineering challenge: the available on-site fill material was of marginal quality. Conventional solutions would have required either costly off-site disposal to landfill or chemical stabilisation using lime, both of which would increase project costs and environmental impact.



View of the site in April 2016 - M40 just metres away



Site won-fill material stockpiled - view of the site in April 2016

Solution

To deliver a cost-effective and sustainable solution, Maccaferri collaborated with Bellway Homes to maximise the reuse of site-won materials. Instead of disposing of unsuitable fill or relying on lime stabilisation, Maccaferri introduced a geogrid-reinforced soil solution using Paradrain.

The combined Green Terramesh and Paradrain system enabled the use of marginal fill material while maintaining structural integrity and long-term performance. This approach significantly reduced waste, eliminated the need for landfill disposal, and lowered overall construction costs.

The engineered noise bund extends approximately 1,300 metres along the motorway boundary, with heights ranging from 2 metres up to 9 metres above existing ground level. The design features a steep 70-degree reinforced slope on the motorway-facing side to minimise land take, and a 1:3 gradient on the residential side for stability and integration with the housing development. A 2-metre-wide crest supports a close-boarded acoustic fence, further enhancing noise attenuation.

Construction of Phase 1, approximately 550 metres in length, was completed between April and September 2016. The design was approved by Highways England and developed using advanced geotechnical software (MacStars W, Release 4.0) for slope stability analysis. Hydraulic performance and pore water pressure dissipation were assessed using the Giroud et al. (2014) design methodology.

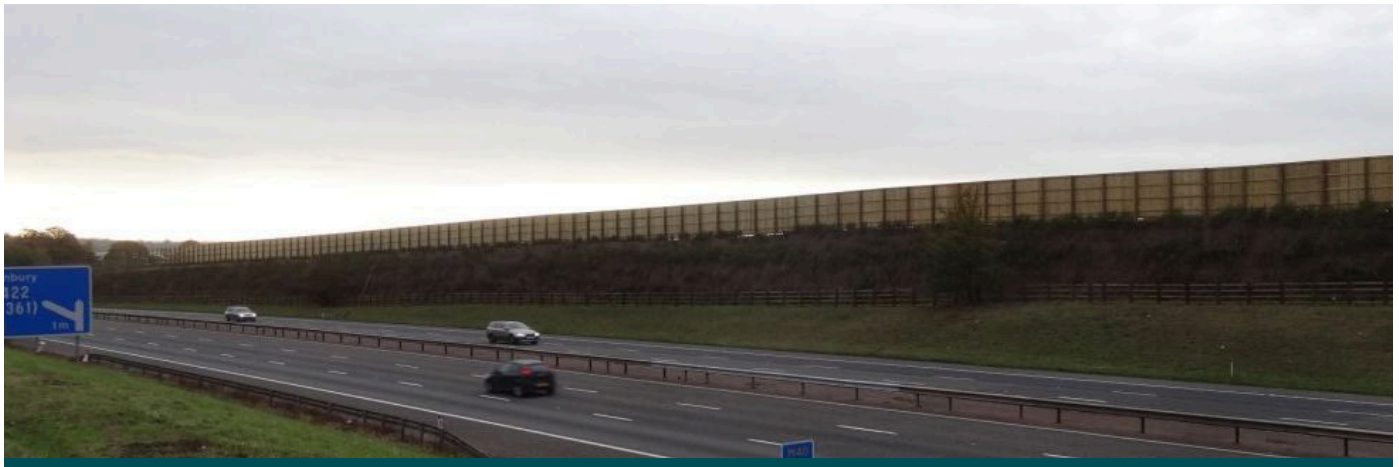
This reinforced earth solution not only met stringent planning noise requirements but also delivered a sustainable, efficient, and technically robust acoustic barrier for the development.



Green Terramesh, Paradrain and Macdrain - initial phases



Rear of the bund with 1:3 slope allowing landscaping



View of the acoustic barrier facing the M40 - October 2016

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