

Railway Embankment Stabilisation on the Northumberland Line Using MacMat®

Northumberland



TYPE OF PROJECT Slope Protection	YEAR OF CONSTRUCTION 2023	CLIENT Morgan Sindall	CONTRACTOR Morgan Sindall	DESIGNER Morgan Sindall
PROD. RELATED MacMat (Null)				

Challenge

As part of the reintroduction of passenger services on the Northumberland Line in South East Northumberland, significant infrastructure upgrades were required to convert former freight-only routes into a reliable passenger railway. A critical section between Newsham and Seaton Delaval presented a challenging engineering scenario, where steep railway embankments required effective stabilisation.

These embankments, constructed from compacted earth and loose soils, were highly susceptible to soil erosion due to their steep gradients and continuous exposure to adverse weather conditions such as heavy rainfall and wind. Without intervention, progressive erosion could lead to slope instability, increasing the risk of landslides and track failure. This posed a serious threat to railway safety, operational reliability, and long-term maintenance costs.

Given the importance of maintaining a safe and resilient rail corridor, a robust and permanent erosion control solution was essential to protect the embankments and ensure the longevity of the infrastructure.



Solution

Maccaferri Ltd. delivered an effective slope stabilisation solution using MacMat®, a high-performance, three-dimensional erosion control geomat designed for long-term soil reinforcement on steep slopes. MacMat® provides permanent erosion protection by securing topsoil in place and preventing surface degradation caused by environmental forces.

The installation involved anchoring the MacMat® into a trench at the crest of the railway embankment before unrolling it down the slope to ensure full surface coverage. Adjacent rolls were overlapped and securely fixed using specialist pins, creating a continuous and durable protective layer across the embankment.

One of the key benefits of MacMat® is its open matrix structure, which promotes vegetation growth through the mat. As vegetation establishes, root systems integrate with the geomat, enhancing soil stability and providing additional reinforcement against erosion. This results in a natural, green finish that improves the visual integration of the railway within the surrounding environment.

By implementing MacMat®, the Northumberland Line embankments have been effectively stabilised, reducing erosion risks and minimising long-term maintenance requirements. This sustainable and engineered solution ensures ongoing railway safety, supports environmental integration, and delivers durable performance in demanding conditions.







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