



Filton Four Tracks Bristol

Client
Network Rail

Contractor
Taylor Woodrow

Consultant
ARUP

Works Completed
2017



Reinforced Earth Co. Ltd (RECo) was employed to design and supply the components for Muller Road Reinforced Earth retaining wall, as part of Network Rail's upgrade plan to increase the rail capacity from two tracks to four tracks between Dr Day's junction to Filton Abbey Wood, to the north of Bristol.

The wall was designed using GeoStrap soil reinforcement connected to precast concrete facing panels with a lightly textured finish. GeoStrap soil reinforcing strips consist of discrete channels of closely packed, high tenacity polyester fibres encased in a polyethylene sheet. GeoStrap reinforcing strips are compatible with all applications where the backfill pH is under 9, and they do not impose any limitation on salt concentration within the backfill.

Muller Road Retaining Wall supports an access ramp adjacent to the railway line. The retaining wall is approximately 130m long in total. The wall is at finished ground level at the entrance to the ramp, and rises to approximately 6m at the other end.

The design was complicated by the poor bearing capacity of the ground beneath the Reinforced Earth structure, so a lightweight aggregate was used in a proportion of the retaining wall as structural backfill to reduce the bearing pressure exerted on the foundation soil. Without the use of this fill, more expensive ground improvement options would have to be considered.

From the founding level of the wall to approximately midway up the height of the wall, a selected granular backfill material (type 6I) was placed and compacted. A geotextile separation layer was placed over the 6I material before lightweight expanded clay aggregate was placed and compacted to the full height of the wall. The lightweight aggregate ranged from 10 to 20mm of rounded particles, and has a compacted density of 3.8 kN/m³.

Lightweight and recycled aggregates can be used in conjunction with RECo's range of polymeric reinforcing strips, which allow a broad range of acceptable criteria for electrochemical properties. The strips are highly durable with a HAPAS certificate giving a design life of 120 years.

RECo can select from its product portfolio to suit site constraints in this way, the use of recycled and lightweight backfill materials is being constantly researched by our experts worldwide.