

WICKLOW PORT ACCESS Co. WICKLOW, IRELAND

RETAINING STRUCTURES

Product: Green Terramesh, MacWall, Gabions

Problem

The Wicklow Port Access and Town Relief Road Scheme had two main objectives;

- Relieve traffic congestion in Wicklow Town Centre by providing an alternative route for both port traffic and through traffic
- Service the lands on the outskirts of the town, which have been identified for development in the future.

Solution

Two very different reinforced soil embankment solutions have allowed engineers to solve complex challenges of building the road over poor underlying ground conditions in one area, and in another, through a heavily congested industrial zone where space was a premium. The reinforced earth structures are integral parts of the 2.7 mile long Port Access road and the 1.8km long, Town Relief road which are being built at the port of Wicklow, some 45 miles south of Dublin.

The first structure is sited on a link section between the two roads where it crosses the Dublin to Wicklow rail line to the north of the town. Here, a 8.6m high **Green Terramesh** reinforced embankment, approximately 550m in length has been formed to raise the road as it approaches the new railway over-bridge. The embankment sits on layers of soft peats and the contractors took a novel approach to the exercise.

The system was chosen in preference to a reinforced concrete or piled structure as it offered significant cost saving advantages in speed of construction, flexibility and its ability to utilise large volumes of materials claimed from other areas of the site.

The Green Terramesh solution allowed gradual build up of the embankment levels and some four months of surcharging was used across the whole embankment width to accommodate the worst of the settlement expected during construction.

Client:

WICKLOW COUNTY COUNCIL

Main contractor name:

COFFEY CONSTRUCTION, Co GALWAY

Consulting Engineer:

OVE ARUP AND PARTNERS, DUBLIN

Product used:

GREEN TERRAMESH, MACWALL, PARAGRID

Construction date:

JANUARY 2008



Green Terramesh unit (note factory fitted lost shutter, bracing angles and coir blanket) ready to receive backfill



Green Terramesh reinforced slope under construction



MacWall during construction

Green Terramesh units comprise 2.0m long x 600mm high, double twist steel fascia units into which compacted site won backfill is placed. Courses of these facing units are tied into the compacted backfill using Paragrid 80-15 polyester geogrid, also from Maccaferri.

Green Terramesh units feature a factory fitted “lost shutter” system, which supports the face at the designated angle without the need for any external formwork or shuttering. This, and the crisp face produced with Green Terramesh, are further advantages over traditional wrapped-face geogrid structures and also make Green Terramesh far quicker to install.

The **MacWall** system was used on the second reinforced soil retaining wall. This solution consists of pre-cast concrete block facing units in combination with polymeric geogrid soil reinforcement. The MacWall used Anchor Landmark blocks in this application. The geogrids are sandwiched between courses of the concrete facing blocks and extend horizontally towards/into the slope to be retained. Structural backfill is then compacted upon the geogrids. This reinforced soil block acts to retain the ground above the wall.

A third retaining wall was also supplied by Maccaferri. This was a welded mesh gabion structure and when filled with stone, gabions become large, flexible building blocks from which a broad range of structures can be built. The welded gabions were PVC coated 3mm units.

Hydrostatic pressure does not build up behind the units because of their permeable nature. This ability to combine drainage and retention functions makes them ideal structures for slope stabilisation.

The Port Access and Town Relief roads have been designed as single carriageway with a 2m verge, a 3m cycleway and a 1.8m footpath in each direction.

Although not a major port, the ships trading through Wicklow – mainly carrying timber, building materials and bulk grain - can generate significant volumes of articulated vehicle traffic which have been the cause of severe congestion in the narrow streets of the town.

Maccaferri’s experience and support on this project will help to alleviate these traffic issues within the town.



Installing Enkagrid PRO geogrid reinforcement to wall



During construction of MacWall



Gabion retaining wall on project

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