

STEWART MILNE HOMES BURNTISLAND, SCOTLAND

RETAINING STRUCTURES

Product: MacWall

Problem

A steeply sloping brown-field site, until recently a redundant bauxite processing plant, was acquired by Scottish developer, Stewart Milne Homes and will eventually provide 100 prestigious detached houses for the town of Burntisland in Fife.

Re-contouring of the site to create level building pads for the new houses and to allow maximum use of the available land meant that retaining walls were required to form bold terraces up to 6.5m in height.

As one wall was required within 9.0m of the main A921 highway, the more conventional retaining wall solutions had to be rejected in favour of the Anchor Landmark retaining wall system. It was a requirement of the Fife Council Transportation Services department that the soil retaining structures must comply with key performance criteria of strength, durability and long design life.

Solution

MacWall Landmark carries British Board of Agreement (BBA) Roads and Bridges certification making it the ideal solution in this challenging application. A variety of solutions were considered but MacWall offered the assurance of a proven system with a design life of 120 years. The Approval in Principal (Bridges and other Highway Structures) produced by Maccaferri helped convince the Local Authorities that this type of retaining wall was right for the job.

MacWall Landmark segmental retaining walls are different from many other systems because they incorporate what the industry describe as a 'positive connectivity' device that locks the two principal components together; concrete facing blocks and polymeric geogrids. Positive connectivity gives the system immense strength, preventing pullout of the



Post construction



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Client:

STEWART MILNE HOMES LTD

Main contractor:

STEWART MILNE HOMES LTD

Designer:

MACCAFERRI LTD

Product used:

MACWALL LANDMARK, ENKAGRID PRO

Construction date:

AUTUMN 2006

geogrid under load and enhancing the stability and earth retaining capability of the system.

With such a high structure at the Stewart Milne Homes site, it was essential that a proven system was selected. Reassuringly, MacWall Landmark Walls of over 20 metres in height have been constructed in the USA, where the technology was developed.

Most segmental retaining wall systems rely on the friction created by the weight of subsequent courses of concrete facing blocks to prevent pullout of the geogrid. The geogrid itself is sandwiched between the blocks and laid out horizontally between the wall, binding with layers of compacted backfill to create a stable, mass, earth retaining structure.

MacWall Landmark blocks are different in that they incorporate a lower locating flange and a corresponding receiving channel on the upper face of each facing block. During wall construction, the geogrid is placed into the receiving channel of the previously laid course of blocks and held in position by a PVC locking bar. The lower locating flange of the subsequent course fits into the channel and prevents rotation of the locking bar and pullout of the geogrid, creating the 'positive connectivity' feature which gives the system its high level of performance. The locking bar engages the whole geogrid width, offering greater efficiency and performance than a pinned positive connection system which can focus loads upon small areas of geogrid.

The Stewart Milne Homes development at Burntisland was the first significant MacWall Landmark application in the UK mainland. Over 700m² of wall were installed in a single structure, 168m long and 6.5m high at its maximum. The system's green credentials were also highlighted as exclusively site-won backfill was used to construct the wall, eliminating the need for almost 600 heavy vehicle journeys to and from the site.

Three additional MacWall retaining walls totalling over 950m² were built at the site using the Company's MacWall Vertica system.



During construction



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