

Iburndale Beck Riverbank Repair – Flex MSE® Vegetated Wall System, 2006-16

Case Study: Iburndale Beck, Iburndale Lane, Sleights, North Yorks, UK

In 2006, the construction of a series of 4-5 luxury bedroom houses in the village of Sleights, North Yorkshire necessitated the reinforcement of a riverbank on Iburndale Beck, a tributary of the River Esk. Planning permission called for a long-term erosion protection system to be installed along the riverbank, running the entire length of the housing development.

After careful consideration, the Flex MSE® Geomodular Block & Interlocking Plate System was specified as opposed to less environmentally friendly & costly solutions (i.e. gabion baskets). Flex MSE® was chosen to provide a sustainable, permanent, green solution to the project.



Flex MSE's® engineered geomodular system was chosen as a flexible, simple to install solution that would provide high & low-level protection against scour, erosion & flood events.

All the Flex MSE® GTX Bags & patented Interlocking Plates were filled with a 66:34 sand & compost mix, and installed by hand in a fraction of the time it would take to install traditional systems. The GTX bags below the water line were filled with 20mm free-draining gravel. The proprietary fill medium allows for flexibility over time, promotes vegetation growth whilst still being free-draining and does not compact over time.

The system was vegetated via hydroseeding, with a basic native seed mix. Approximately 12 months post-installation, the Flex MSE® installation was fully covered in vegetation. Once fully covered, Flex MSE® was able to blend in with its natural environment, maintain native biodiversity as well as offer permanent integrity (120-year design life).

The Flex MSE® GTX bags are both water & root permeable, and UV-stabilised, acting as a scour protection at the face, withstanding high flow-rates during flood events.

In the 10 years since installation, the Flex MSE® vegetated Wall System has remained stable with the GTX bags remaining intact showing no signs of degradation. A wide range of native vegetation has increased and continues to provide a sustainable green erosion control solution with biodiversity and environmental benefits.

Flex MSE® is a direct alternative to concrete, gabion baskets and timber revetment systems due to ease of installation, 120-year design life & 75-year warrantee, natural flood-management properties & habitat/biodiversity preservation. The Flex MSE® system can be vegetated in a variety of ways including hydroseeding, live-staking or brush-layering, either blending in with the natural environment or creating a living, breathing green space in urban environments.



Flex MSE® is unique in so much as that the system can incorporate the use of geogrids and other such reinforcement products, including earth/rock anchors.



The main USPs of Flex MSE® Vegetated Wall Systems include:

- 120-year design life with a 75-year warrantee
- Installed in less than 2/3 of the time compared to traditional systems
- Costs up to 60% compared to traditional systems
- Can be filled with site-won materials
- Can be vegetated with native plant species
- Is currently the only man-made product to be approved for use on SSSIs by the Environment Agency
- BREEAM compatible
- BBA Certification Stage 3 Reached
- Can be installed from horizontal (living roofs) to near-vertical (retaining walls & slopes)

Flex MSE® Applications & Uses Include:

- Retaining walls
- Riverbank/coastline erosion repairs
- Free-standing flood-walls
- Landscaping features
- Ditch lining & slope cladding
- Culvert headwall repairs