CONCRETE CANVAS®

CHANNEL LINING

Project Info

- 03 / 02 / 10
- CC8™ Bulk Rolls
- 240m²
- Longitudinal layers
- Church Village Bypass, South Wales, UK
- Costain
- CC8™ used to line a drainage channel at the crest of a slope adjacent to a newly constructed bypass.

CONFORMS TO: ASTM D8364-STANDARD SPECIFICATION FOR GCCMS

Aged Images of completed channel in Church Village

In February 2010, Concrete Canvas® GCCM* (CC) was used to line a drainage channel in Church Village, South Wales. The slope was situated along the crest of a slope, and adjacent to a main road. In the previous year, Costain were appointed as the main contractor for the £90m Church Village Bypass scheme.

The scheme involved the construction and introduction of two road bridges, four roundabouts, three community footbridges, two cattle grids and one subway, along with the installation of holding ponds and an extensive surface drainage network. The contractor aimed to use alternative materials, such as recycled aggregates, to minimise the impact on the local ecology and environment. Following approval from the Environment Agency, the Costain specified the CC GCCM for use within the drainage network.

GCCMs are flexible, concrete filled geotextiles that harden on hydration to form a thin, durable and waterproof concrete layer. The use of GCCMs to provide durable surface erosion control solutions has increased globally in recent years, meaning the need to standardise the classification and define the intended uses has never been more vital. Users can now protect themselves by specifying GCCMs that conform to the only international specification standard for GCCMs, by using ASTM D8364 'Standard Specification for GCCM materials'. ASTM D8364 is an essential tool for all GCCM users, making specifying the right product easier for the designer whilst ensuring they meet minimum performance requirements, helping to prevent project failures. Concrete Canvas® GCCM (CC) is the original GCCM and the first product to declare conformance to ASTM D8364.

*Geosynthetic Cementitious Composite Mat

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CHANNEL LINING

Site prior to works - channel is at close proximity to a main road

Deploying CC

Cutting CC to required length using hand tools

CC was laid in three longitudinal sections

CC edges were captured in anchor trenches following installation

Anchor trenches were backfilled to prevent ingress

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Termination of channel into stream

Completed installation

Install was re-visited in winter to find out how well the material was performing in cold, frosty conditions

CC8™ is a Type II GCCM as defined in ASTM D8364, it is suitable for use on soil subgrades and was chosen for this project to suit the abrasion, wear and loading requirements. CC8™ is also BBA certified with durability in excess of 120 years when used in erosion control applications.

The original channel was graded and vegetation removed prior to installation. The Bulk Rolls were then delivered to site and lifted on a spreader beam using plant equipment before being unrolled and laid within the channel. The was installed in a 3 layer longitudinal layup, with the first length of material laid along the channels invert and fixed to the substrate using ground pegs. The 2 remaining layers were then laid either side of the first length, overlapping this first layer by 100mm. The overlaps were then jointed using screws at approximately 200mm intervals, however the overlaps were not sealed in order to allow for natural weep paths. The edges of these layers were then fixed to the substrate within anchor trenches on each shoulder of the channel, which were later backfilled following hydration. A total of 240m^2 of CC8™ was installed in the installation.

"The Church Village Bypass scheme presented our team with a unique challenge. The location and nature of the works required the sensitive use of appropriate construction materials in order to minimise the impact on the local environment. Concrete Canvas provided a means of rapidly installating a low carbon concrete ditch whilst maintaining the natural aesthetic of the overall scheme."

Daniel Powrie CEng MICE,
Project Manager,
Costain Group

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9 YEARS AFTER INSTALLATION

Despite significant weed and vegetation growth around the channel, the CC is performing as expected and providing weed suppression within the channel itself

Downstream view of the channel

Algae and moss growth established on the fibrous top surface of the CC material

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12 YEARS AFTER INSTALLATION

CC is still performing as expected 12 years after installation

Downstream view of the channel

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