

## Project Info



01 / 07 / 2020



CC8™ Bulk Rolls



2,500m²



Transverse



Slochd, The Highlands,  
Scotland



QTS Group, Ltd on  
behalf of Network Rail  
Scotland



CC8™ used to line two  
crest drainage channels  
catching water and  
routing to a new cess  
drainage to manage the  
flow of water.



Completed installation

In July 2020, Concrete Canvas® GCCM\* (CC) was used to line two crest drainage channels catching water from the crest of the cutting and routing it to the new cess drainage to manage the flow of water.

The Highland Main Line drainage improvement project at Slochd began in September 2019 and was designed to help protect against landslips and target known areas of embankment with a history of instability, or prone to rock-fall or flooding. It represented an investment of £4.8 million by Network Rail to protect the infrastructure.

In just over a year, QTS Group Ltd completed drainage improvements along two kilometres of railway. Using over 13,000 tonnes of stone, more than 400 metres of railway embankment were regraded with certain sections over 14 metres in height.

In addition, due to the large catchment and significant flows of water, more than 840 metres of crest drainage channels were created on either side of the railway track and lined with Concrete Canvas CC8™ (a Type II GCCM to ASTM D8364) to manage the flow of water away from the railway and route it to the new cess drainage and natural water courses. The CC lined drainage channels are designed to prevent saturation of the slope which could cause landslips and localised flooding of the rail tracks.

\*Geosynthetic Cementitious Composite Mat





CC8™ (Type II GCCM) cut to length on site & laid transversely across channel



Water flow after installation



CC Interceptor channel



Completed CC Installation



Snow build up during the winter



View of the Highland Main Line at Slochd



*Completed channel lining works*

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 remote location, site conditions and inclement weather during the installation presented several challenges for the contractor. Due to heavy rainfall and soft ground conditions, crushed aggregate was placed in the channel and compacted to ensure a stable and uniform substrate. The Bulk Rolls were delivered to the remote site and deployed using a spreader beam mounted on tracked plant machinery from the adjacent field. The material was unrolled into the channel transversely and cut to specific profile length. The CC8™ layers were overlapped by 100mm in the direction of water flow and were then screwed together at 200mm intervals using 30mm stainless screws.

The material was terminated into 150mm anchor trenches on either side of the channel and fixed to the substrate using 250mm ground pegs prior to being backfilled with site won material. A permeable erosion control mat was then installed on the field side of the channel which will help keep sediment and topsoil from shifting until vegetation takes root. The contractor ensured that any CC8™ installed during the day was fully hydrated at the end of every shift.

In total over 2,500m<sup>2</sup> of Concrete Canvas® was installed at Slochd. As a result, the contracting team reduced the logistical footprint of the project and ensured that the surrounding drainage and embankments are future-proofed to protect the railway from the impact of increasingly unpredictable weather in the Scotland region.