

Project Info



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CC8™ Bulk Rolls



1500m²



Transverse layers



Dunrobin Castle, Golspie,
Scotland



QTS Group Ltd



CC8™ used to line a
crest drainage channel
to prevent earthwork
failure within the slope



Completed channel lining installation in Sutherland

In January 2019, Concrete Canvas® (CC) GCCM* was specified by Network Rail to line a crest drainage channel near historic Dunrobin Castle in Sutherland, in the Highland area of Scotland.

The aim of the project was to reline a 500 linear metre open drainage channel to prevent erosion and reduce cutting saturation, which could potentially cause land slippage. The works were carried out by QTS, who have extensive experience installing CC for Network Rail.

If the channel had remained unlined, it would have meant periodic and costly de-vegetation of the channel in order to prevent blockages and subsequent overspill and slope saturation. CC was specified due to its ease and speed of install, as well as providing a long-term solution due to the BBA's certification of CC for erosion control and weed suppression applications with a life expectancy in excess of 120 years under normal UK weather conditions.

Prior to installation, 12 bulk rolls of 8mm thick CC (CC8™) were delivered to the project site and the channel excavated and compacted to profile using an excavator and V bucket. The material was unrolled into the channel transversely and cut to specific profile length. CC8™ layers were overlapped by 100mm in the direction of water flow and were then screwed together at 200mm intervals using 30mm stainless screws.

*Geosynthetic Cementitious Composite Mat





Dunrobin Castle station



Excavation of the channel profile



CC laid transversely across the channel



CC terminated into anchor trenches



Anchor trenches backfilled prior to erosion mat installation



Steep CC-lined channel section



Completed CC lined channel

CC8™ was extended 300mm up the side slopes before being anchored into the slopes by a minimum of 200mm and fixed to the substrate with 250mm ground pegs. A permeable turf reinforcement mat was then installed from the crest of the side slopes and terminated 100mm below the CC material. This allowed surface runoff from the adjacent saturated field to migrate into the CC lined channel and reduce cutting saturation.

Following each day's work, the CC was hydrated using a 1000L bowser and hose with a diffused spray nozzle from the adjacent field. The material cannot be overhydrated and has a working time of 1-2 hours after hydration which meant it could still be installed in the rain without any programme disruption. The ability to deploy the material from the adjacent field also meant there was no need for costly line possession, allowing for installation without any disruption to rail services.

In total, 1,500m² of CC8™ were installed by a team of four in inclement weather conditions within a period of 3 weeks. The ease and speed of installation resulted in significantly reduced time on site and a reduction in the overall project costs. The CC material will also prevent cutting saturation, which could otherwise have potentially caused rotational earthwork failure within the slope and subsequent line closures in future. Due to these factors, the contractor and client deemed the installation a success and the material will continue to be specified for similar applications in the region.

"QTS have successfully carried out numerous Concrete Canvas installations over the last eight years and we have found it extremely user friendly and easily adaptable to any site conditions."

Mel Kay
Operations Manager, QTS