CASE STUDY

Rivenhall Integrated Waste Management Facility

Slope Drainage – GPT Drainage Geocomposite

Artists impression of the final scheme

Project Information	
Location	Braintree, Essex
Owner	Indaver UK
Engineer	Doran Consulting
Contractor	PJ Hegarty
Products	GPT5 Drainage Geocomposite

The original design required a 300 to 500mm granular starter layer in a number of areas where embankments were to be constructed using site won class 2 material. The design identified that a thick stone layer would be required to provide sufficient drainage capacity. GEOfabrics were approached and following an initial assessment proposed using a geocomposite to meet the drainage requirements and allow reduction of or removal the need for imported stone.

Scheme Overview

This Energy from Waste facility is located in a former quarry. Major engineering works were required to reduce the visual impact, meaning this largely below ground facility was designed with granular starter layers to facilitate construction over made ground. GEOfabrics were asked to propose a value enginnered solution to reduce the amount of imported material required.

Indaver UK are developing Rivenhall Integrated Waste Management Facility near Braintree , Essex to process up to 853,000 tonnes per annum of municipal solid waste, commercial and industrial waste, all diverted from landfill. When finished the scheme will include a materials recovery facility, anaerobic digestion plant, mechanical biological treatment plant as well as a Energy from Waste plant with power generation capacity of 49.9MW

The scheme is designed to be largely hidden from view which meant excavation to 15m below ground level. PJ Hegarty & Sons were awarded the civils works package, which included 2.5m toned of excavation, soil nailing and construction of embankments to provide access routes, carparks and other infrastructure for the building and operational phases.

GPT5 installed on natural ground ready for fill placement

The GPT5 drainage geocomposite could be placed between the engineered fill and natural ground to provide drainage and separation in a single layer just a few millimeters thick. Reducing the volume of imported stone provided a number of benefits, including faster construction, reduced vehicle movements to and from site as well as within the working areas, and lower material cost. Geosynthetics solutions have also been shown to reliably reduce carbon emissions by more than 50% compared to traditional methods.

Geofabrics Limited, Skelton Grange Road, Stourton, Leeds LS10 1RZ, United Kingdom

0113 202 5678 info@geofabrics.com www.geofabrics.com

GPT5 installed with a top of slope anchor trench, ready for fill to be placed.

The **key benefits** of using Geofabrics GPT5:

Wide width for fast installation – 5.90m wide rolls

Manufactured for hydraulic performance – Band drains placed at intervals across the roll width to remove water from the structure

Isotropic properties – strength in all directions

High tensile elongation – sufficient stretch during cover soil placement

Puncture resistance – manufactured to CBR value taking into account soil weight, drop height and factor of safety

UV Stabilised – active carbon black

100% virgin polymer Fibres – 100 years durability in accordance with independently verified ISO test standards

Sustainability—using GPT5 in place of drainage stone reduces material volume and associated vehicle movements to and from site

Doran Consulting ran their analysis using GPT5 in place of the stone, and concluded that the material provided equivalent drainage performance and so was a suitable alternative to the specified stone. GPT5 was approved to completely replace the stone layer on the sloped areas and to be used in conjunction with a thinner stone compaction layer of 150mm on shallower slopes.

GPT5 drainage geocomposite comprises longitudinal band drains incorporated within a needle punched geotextile to provide cost effective drainage and separation. Rolls are supplied 5.9m wide for rapid installation, with band drains at 1m centres as standard. This can be reduced to 0.5m centres where increased hydraulic capacity is required.

Designed to effectively and efficiently disperse water, in this case GPT5 was used to remove a potential slip circle between the engineered fill and natural soils. It can also be used in horizontal applications, for example beneath a structure/stockpile where separation, filtration and drainage performance can all be beneficial.

The geotextile used in the manufacture of GPT5 is highly permeable to water, which means whether the water is falling onto the surface or moving up through sub-grade it can enter the drainage paths and escape.

GEOfabrics manufacture from virgin polymer for assured durability and compliance with EA and other guidance and regulatory requirements. Our in-house UKAS testing facility ensures consistent quality across all of our product ranges.

Manufactured with band drains at 1m or 0.5m centres incorporated within a needle punched geotextile

GEOfabrics offer in person and online technical learning sessions for all of our materials.

Please contact us for more information

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