

Introduction

GCL is a geosynthetic clay liner produced by sandwiching a layer of bentonite, a clay mineral which expands when wet between two or more layers of geotextiles.

Bentonite absorbs water from the surrounding soil, its expansion is impeded by layer pressure from the geotextile membranes creating an impermeable lining material able to be used as a containment barrier. GCL replaces the need to use all traditional mineral sealants, it offers better sealing performance and is more cost-effective and eco-friendlier.

Preparing the subgrade surface

The subgrade surface to receive the GCL must be free of sharp objects, organic matter and other detritus larger than 50mm dia. The subgrade should be compacted at least 90% of its maximum dry density. While compacting with a smooth-wheeled or rubber-tired roller, to provide a clean, dry and smooth surface prior to deployment of the GCL.

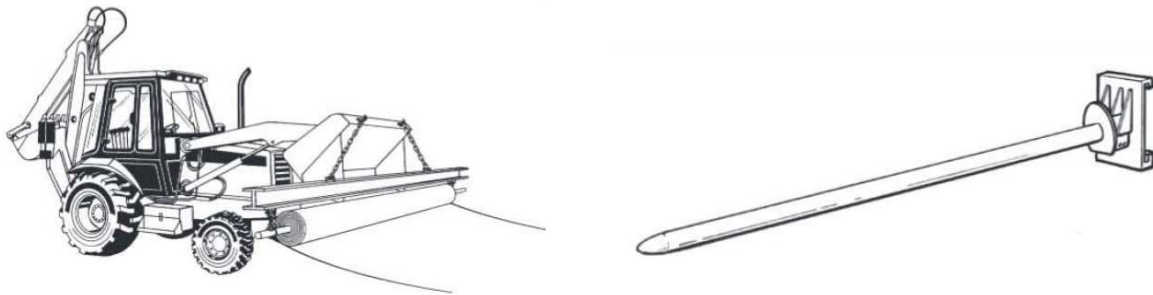
Delivery and storage

GCL is supplied in rolls with a width of 5m and a length of 40m. The average roll diameter is 60- 70cm, and the weight is approximately 1000kg. GCL is wound on solid plastic cores with an inner diameter of 10 cm. Every roll is packed in a plastic sleeve UV resistant. All rolls are marked with a label containing the dimensions, lot, and roll number.

Each roll is equipped into a set of two lifting belts. It is recommended while unloading from the truck to put a steel pipe inside to prevent the bending of the roll. While storing GCL, do not place the rolls directly on the ground but allow for pallets or bracing beams (wood) or similar constructions underneath the rolls. Rolls should not be stacked more than 5 rolls high. GCL should not be directly exposed to the elements during storage. Cover all rolls with a plastic sheet or a tarpaulin. Do not remove the plastic sleeves prior to installation.

GCL handling

Appropriate lifting equipment should be employed for handling the rolls of GCL for and during installation into the working area. It is recommended the use of spreader bars or pole cores are used during installation.



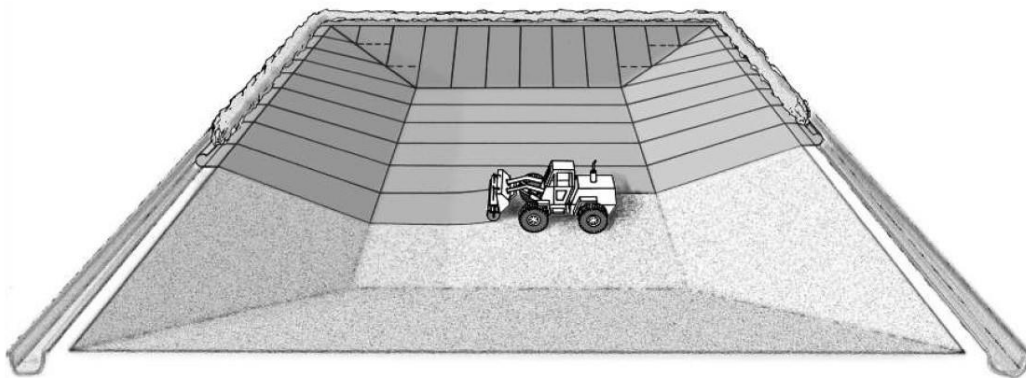
Jointing and sealing

Each roll of GCL has a printed overlap line to assist with installation, and the edges of the rolls are enhanced with additional bentonite such that rolls can be installed quickly and easily without the need for lots of accessory bentonite.

Rolls of GCL should be overlapped by a minimum of 300mm, with longitudinal edges formed in the direction of the slope (where sloped construction is relevant).

A 25kg bag of bentonite powder for every 3 rolls of GCL is also supplied. The bag is meant for application in the cross-seam overlapping areas (roll ends). Where additional bentonite is applied, the dry application should be $>0.4\text{kg/linear metre}$ of overlap. Alternatively, a bentonite paste can be formed from 1 part bentonite to 4-6 parts water. The paste is then applied over a minimum 200mm area, ensuring a 300mm overlap is maintained.

Rolls of GCL should be installed such that the amount of overlapping and roll cutting is minimised. Typical GCL deployment is indicated below. We are able to offer advice on panel layout drawings if required.

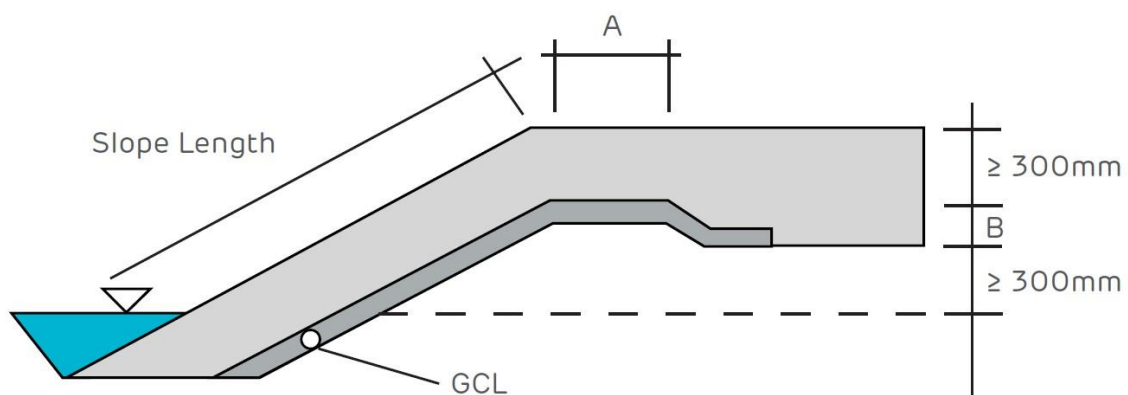


Cover soil layer

Installed rolls of GCL should be covered with a minimum thickness of 300mm in well-graded soils (in the absence of a geomembrane layer above). The cover soil grading should be uniform where possible, and free from sharp objects, and detritus material that may damage the GCL.

Anchor trench detailing

Guidance for typical anchor detailing is provided below.

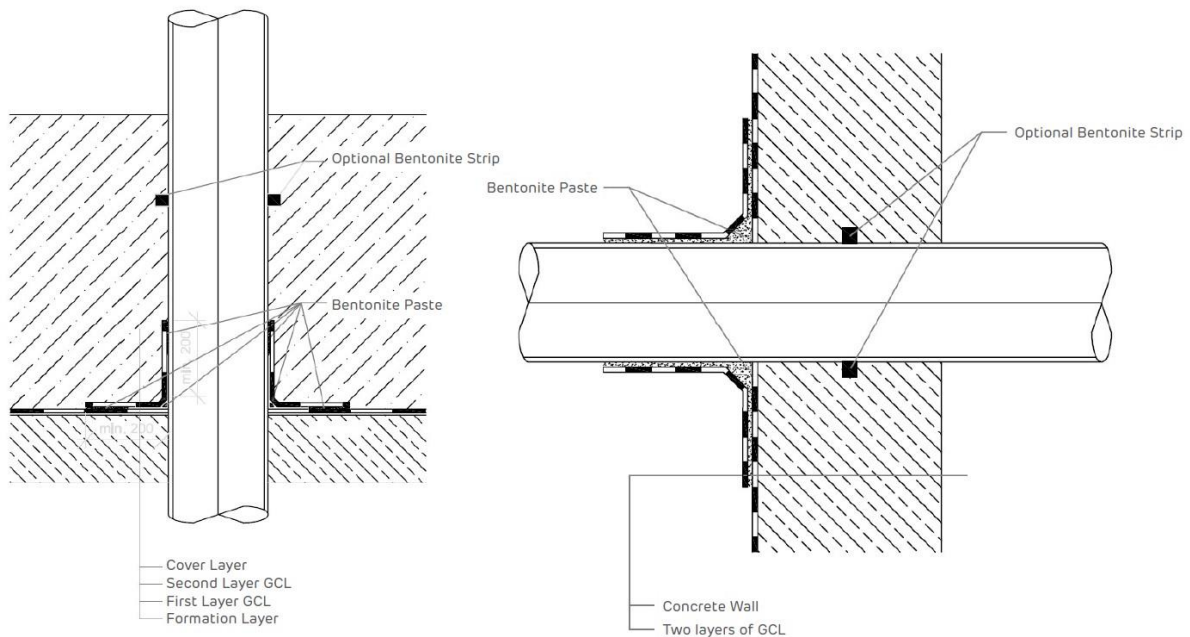


< 10	≥ 500	≥ 500
10-40	≥ 800	≥ 600
< 40	≥ 1000	≥ 800

Service penetrations

Sealing around pipework or penetrations should be completed with a 'boot' of GCL wrapped around the penetration, overlapping by a minimum of 200mm vertically and horizontally,

with an additional layer of accessory bentonite paste applied between the two layers. Examples are indicated below.



Detailing around headwalls

The precise nature of the headwall and the configuration should be determined at the design stage, but the GCL can either be laid below/behind the headwall structure pre-placement, or jointed up to and sealed to the structure following post-placement.

Repairing damage

Areas of GCL which are damaged during installation should be patched using a section of matching GCL, ensuring a 300mm overlap in all directions of the damaged area. Accessory bentonite should be used to seal the patched area.