



GEOCELLS for Erosion Control of Slopes

Cellular Confinement System

A geocell is a three-dimensional Cellular Confinement System created by the interaction of soil, cell walls and geometry. The expandable cellular structure confines and reinforces a variety of fill materials, helping to reduce lateral movement, improve load distribution and resist the downward migration of material caused by hydraulic flow.

GA Geocells are manufactured from HDPE and are suitable for use in slope protection, erosion control, ground stabilisation and load support applications. The perforated and textured cell walls help improve interaction between the geocell and the infill material, while allowing movement of water and air through the structure.

Erosion Control

Geocells offer erosion protection for steep slopes, riverbanks, ditches, spillways and other exposed areas. Varying levels of protection can be achieved by selecting different infill materials to suit the exposure, drainage and durability requirements of the site.

Where geocells are used to create vegetative cover, the ground conditions should be checked to ensure that roots from seeded topsoil or small shrubs are able to grow into the underlying soil.



Granular material can be used where a non-vegetative cover is required. Concrete or grout can also be used as an infill to provide a hard, durable barrier where severe erosion protection is needed.

Depending on the site conditions, availability of suitable quality material and whether the ground allows roots to penetrate into the underlying soil, alternatives such as riprap, turf reinforcement mats, shotcrete or concrete mats may also need to be considered by the designer.

Geocell Facts

- Geocells vary in height from 75 to 200 mm.
- Panels are supplied flat for efficient transport, handling and storage.
- Geocell walls are usually made from textured HDPE to increase frictional resistance and reduce soil displacement.
- Geocell walls are usually perforated to allow drainage and movement of air and water from one cell to another.
- Geocells are commonly used on slopes with an incline of up to 45 degrees (1:1), subject to engineering assessment.
- On steep slopes, geocells may require additional support during filling to prevent the walls collapsing.
- To reduce labour during filling and compaction, suitable equipment such as an excavator, conveyor or crane-mounted skip can be used.



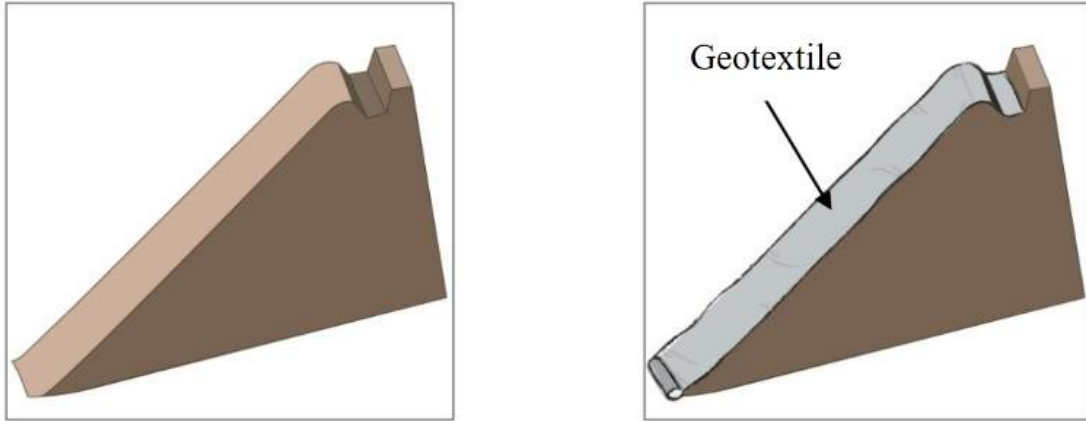
Current Geocell Product Range

Product	Cell Depth	Seam Peeling Strength	Expanded Cell Size (W x L)	Expanded Panel Size (W x L)	Expanded Panel Area
INFRACELL75-445	75 mm	1065 N	320 x 287 mm	2.56 x 8.35 m	21.40 m ² ±10%
INFRACELL100-445	100 mm	1420 N	320 x 287 mm	2.56 x 8.35 m	21.40 m ² ±10%
INFRACELL150-445	150 mm	2130 N	320 x 287 mm	2.56 x 8.35 m	21.40 m ² ±10%
INFRACELL200-445	200 mm	2840 N	320 x 287 mm	2.56 x 8.35 m	21.40 m ² ±10%

Base Preparation

In most cases, the performance of a Cellular Confinement System depends on the condition and preparation of the subsoil. The potential for slope face movement is increased on steep, freshly graded or disturbed slopes, especially where there is inadequate slope face compaction or saturated ground conditions.

Soil movement can be influenced by a number of parameters, including the angle of the batter, soil structure, slope length, drainage conditions and erodibility. The subsoil should be free from buried services, existing vegetation should be removed, and the slope should be shaped and compacted to achieve a generally even gradient.



Typical slope preparation and geotextile placement

Where required by the project design, anchor trenches may be installed at the crest and toe of the slope. If a separation or filtration geotextile is required for a non-vegetated slope, the geotextile should be rolled down the slope and secured before the geocell panels are installed.

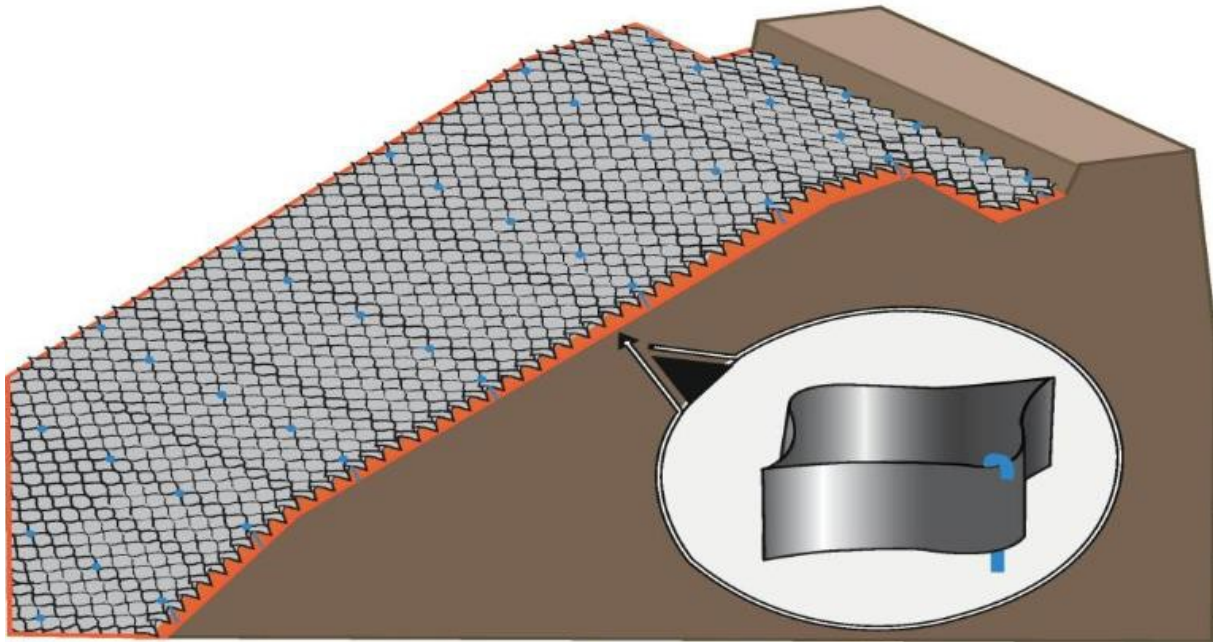
Adjacent geotextile rolls should be overlapped in accordance with the project specification or engineer's requirements. Temporary pins, sandbags or similar restraints may be used to hold the geotextile in place until the geocell layer is installed and the anchor trenches are backfilled.

Installation of Geocell Panels

Panels are supplied flat, making them easier to transport, handle and install. During installation, the geocell panels are expanded on site, joined as required and positioned over the prepared surface along the slope direction or application area.

Depending on the slope and soil conditions, geocells may be secured using suitable anchors, pins, tendons, clips, anchor trenches or other approved fixing methods. The final anchoring method and spacing should be determined by the project engineer based on slope gradient, subgrade condition, cell depth, infill type and loading requirements.

Anchoring and Panel Placement



Indicative geocell panel placement on a slope

Geocell panels should be expanded so the cells are fully open but not overstressed. Temporary pins, anchors or partial filling may be used to hold the panels in an open position during placement. Adjacent panels should be correctly aligned and connected so that the outer cells sit evenly with the neighbouring panel.

For slope applications, the upper edge of the geocell layer may be secured at the crest of the slope using an anchor trench or other approved anchoring method. The lower edge may also require restraint depending on the slope geometry and infill material. Site-specific anchoring details should be confirmed by the project engineer before installation.

Infill

Once the geocell panels have been expanded and anchored in place, they are filled with materials selected to suit the project requirements. The infill should be placed carefully into the expanded cells to avoid displacement or damage to the cell walls.

- Seeded topsoil and sand may be used to establish vegetative cover.
- Granular material, aggregate or recycled concrete may be used for non-vegetative slope protection.
- Concrete or grout may be used where a hard, durable surface is required for severe erosion conditions.
- Asphalt or unbound gravel may also be applied as surface layers where suitable for the project design.

Placement should generally proceed from the crest of the slope toward the toe, with care taken to avoid localised overloading. Filling geocells on steep slopes may require additional labour or temporary support to keep the walls open during placement.

Infill Placement and Material Handling

The infill material should be selected to suit the required erosion control, load support or stabilisation function. Free-flowing granular material should be placed evenly into the expanded cells and compacted to the required project finish level. Suitable material handling equipment such as a backhoe, front-end loader, conveyor or crane-mounted skip may be used. Drop height should be kept low to avoid damage or displacement of the cell walls.



Common Technical Properties

Property	Test Method	Unit	Value
Material	-	-	HDPE
Density	ASTM D1505	g/cm ³	0.940
Carbon Black	ASTM D1603	%	1.5
Weld Spacing	-	mm	445 (±0.5%)
Sheet Thickness - Smooth	ASTM D5199	mm	1.1 or 1.2
Sheet Thickness - Textured	ASTM D5199	mm	1.5

Application Guidance

Cell Depth	Typical Application
75 mm	Pedestrian paths, landscaping and light-duty surface stabilisation.
100 mm	Driveways, domestic traffic and light access applications.
150 mm	Car parks, access roads, slope protection and light commercial traffic.
200 mm	Heavy access, construction traffic, embankments and higher-load applications.

This guide is indicative only. Final product selection, slope gradient, anchoring method, geotextile requirement and infill specification should be confirmed by a suitably qualified engineer based on site conditions and project requirements.

Notes: Section size can be customised upon request. Dimensions listed are theoretical and may vary in actual use. Additional datasheets with specific project information can be provided upon request.