

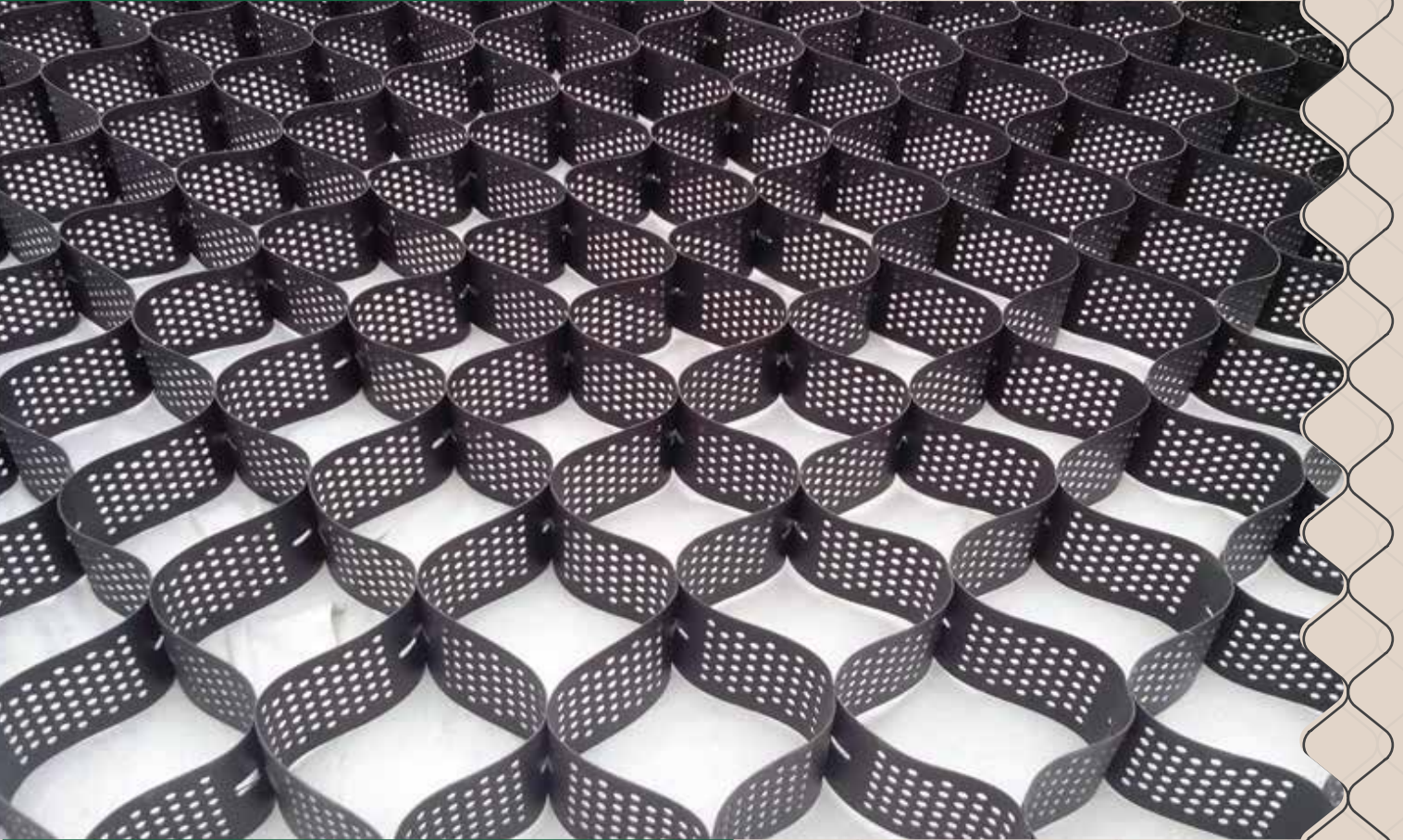


Decoland Geocell

Erosion Control System



What is Geocell ?



Cellular Confinement System

G E O C E L L

Geocell (Cellular Confinement System) is a high quality erosion control and soil stabilization material with a three-dimensional honeycomb structure. The system provides fast, economical and long lasting solutions for soil stabilization applications and hydraulic structures, while preventing earth loss due to water and wind in general purpose sloping surfaces.

Geocell, produced by first quality polymer strips with special additives with innovative ultrasonic welding technology, provides excellent protection and reinforcement on the applied surface.

While the perforated structure of the material allows fast drainage of water, the textured surface of the cells allow the filling material to be reliably held even at high slopes, cells can be filled with different materials (sand, gravel, soil, concrete) according to the purpose of use.

Cell heights vary between 50-300 mm depending on project requirements.

Geocell Applications

EROSION CONTROL

- » Shoreline revetments
- » Landscape applications
- » Landfill linings and covers
- » Cut or fill embankment slopes
- » Containment dikes and levees
- » Dams and spillways
- » Abutment protection
- » Vegetated channel structures
- » Highway and railway ride slopes

SOIL STABILIZATION

- » Roadway shoulders
- » Stabilized drainage layer
- » Permeable load-support
- » Stabilized base for asphalt pavements
- » Permanent and temporary access roads
- » Parking areas
- » Trails and walkways
- » Track ballast and subballast structures
- » Foundation mattresses and pipeline protection

RETAINING WALLS

- » Green MSE walls (Mechanically stabilized earth)
- » Culvert headwalls
- » Shoreline revetments
- » Steepened embankments
- » Sound barriers
- » Road widening
- » Dike and levee protection
- » Dams and flood defence bunds

HYDRAULIC STRUCTURES

- » Down chutes
- » Flow channels
- » Culvert outfalls
- » Shore protection
- » Dam faces and spillways
- » Storm water diversion or containment
- » Drop structures
- » Process water channels
- » Geomembrane protection
- » Swales and drainage ditches
- » Storm water/waste water lagoons

PERFORATED - TEXTURED GEOCELL WALL

A D V A N T A G E S

- ✔ Perforations facilitate parallel slope drainage of the infill cell. In saturated conditions, the removal of excess water increases infill friction, reducing down slope sliding forces, resulting in a more stable system.
- ✔ In vegetated systems, perforations allow roots to grow from cell-to-cell creating greater vegetative stability against short-term hydraulic events. Perforations also allow nutrients & micro-organisms to pass through neighbouring cells.
- ✔ Textured surfaced cells significantly increase the frictional resistance of the cell wall with the infill material. Frictional surface limits the movements and the loss of the infill materials due to freeze-thaw cycles, water and other eroding factors.

Why Geocell ?

High Quality Materials

Geocell is manufactured from the highest quality materials. Cells reinforced with specially added polymers serve safely even in the most difficult natural conditions.

Textured Cell Wall

The specially designed textured frictional surface prevents the loss of material in the cell by increasing the adhesion of the cell wall and the fill material.

Increased Strip Thickness

Geocell has superior strength against tensile loads with strip thickness of 1.20 millimetres and over.

Excellent Welding Strength

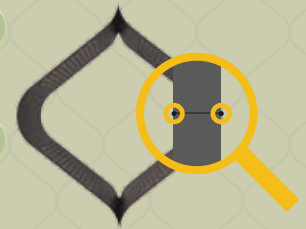
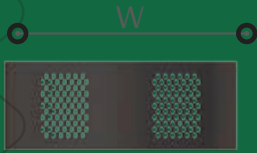
Geocell has a special ultrasonic welding system with superior strength that does not break even under extreme loads.

Perforated Cell Wall

The increased perforated structure permits rapid drainage of water between cells and propagation of the plant root system.



Technical Data



W WELDING DISTANCE

The distance between two welding points of the cell. The cell size increases as welding distance increases.

AxB CELL SIZE

(A) is the transverse and (B) is the longitudinal inner distances of the opened cell.

H CELL HEIGHT

It is determined by the height of the material to be filled into the cell according to the slope increases.

T STRIP THICKNESS

It is the strip thickness of the cell walls. Increasing the tensile strength with more strips thickness.

Welding Distance (W)	Cell Width (A)	Cell Length (B)	Cell Height (H)	Strip Thickness (t)
330 mm	210 mm	X 245 mm	50/75/100/150/200/300 mm	1,2 - 2,0 mm
400 mm	260 mm	X 290 mm	50/75/100/150/200/300 mm	1,2 - 2,0 mm
450 mm	280 mm	X 340 mm	50/75/100/150/200/300 mm	1,2 - 2,0 mm
500 mm	340 mm	X 365 mm	50/75/100/150/200/300 mm	1,2 - 2,0 mm
600 mm	390 mm	X 420 mm	50/75/100/150/200/300 mm	1,2 - 2,0 mm
660 mm	420 mm	X 490 mm	50/75/100/150/200/300 mm	1,2 - 2,0 mm
700 mm	448 mm	X 520 mm	50/75/100/150/200/300 mm	1,2 - 2,0 mm

Infill Materials

Erosion Control



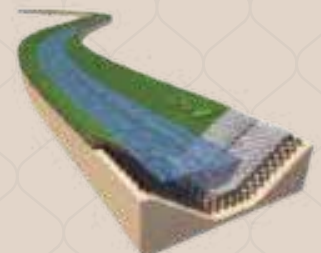
- » Vegetative Soil
- » Vegetative Soil & Crushed Stone
- » Crushed Stone

Soil Stabilization & Retaining Walls



- » Mechanical Fill
- » Crushed Stone

Hydraulic Structures



- » Vegetative Soil
- » Vegetative Soil & Crushed Stone
- » Crushed Stone
- » Concrete

Supplies

- Anchorage Bar
- Plastic Clips/Stapling
- Geotextile
- Tendon
- Geogrid

Hand Tools

- Hammer
- Driller
- Shovel
- Compactor



Concrete



Cellular confinement system protects a number of engineering structures, such as high containment dikes and levees, abutments against erosion and landslides. Way and railway side slopes, Even on extremely sloped surfaces, the system prevents the valuable material on the slope surface from being lost due to environmental factors (rain, water, wind etc.)

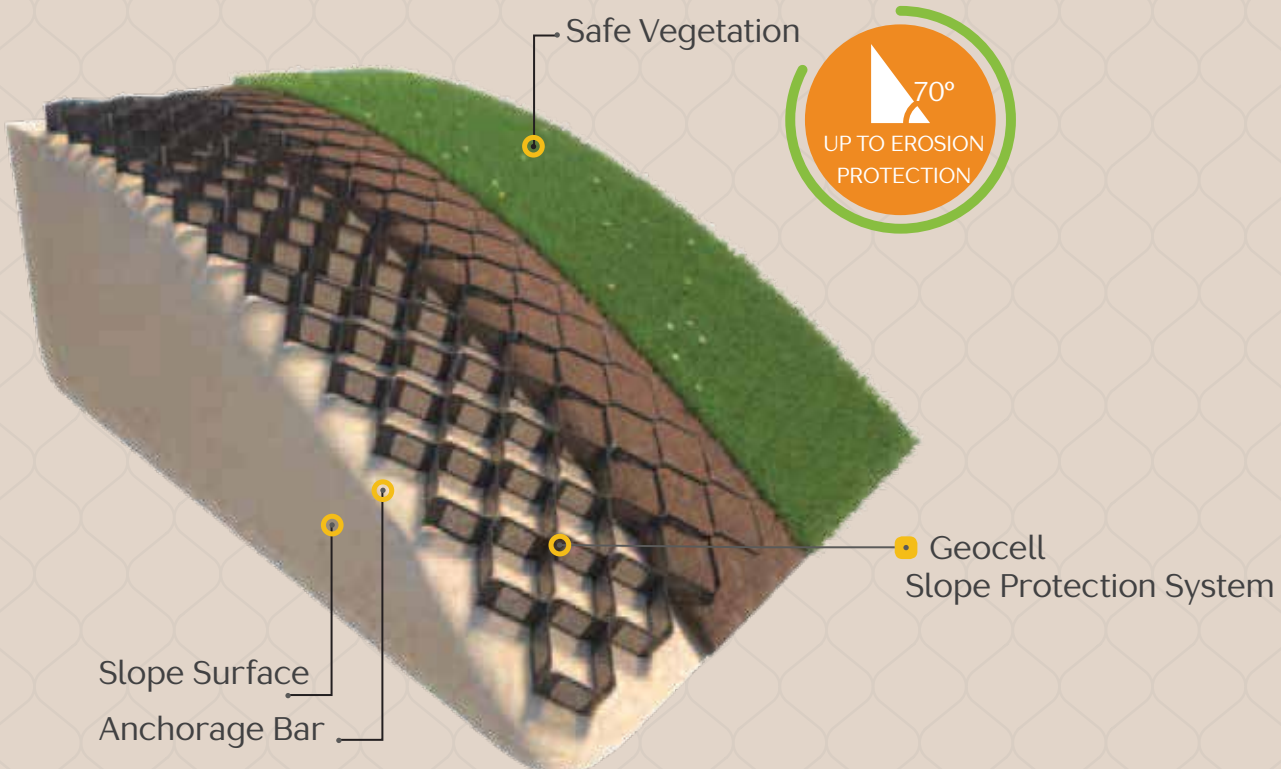
The cell size and cell height are determined according to the slope height and slope to be applied. The type of infill material to be used has also an important influence on cell size selection.

Weathering erosion is the removal of valuable vegetative soil by water and the transport of soil particles through small cracks. As abrasion and decomposition increase, or as the flow rate of water increases, the gutters deepen and expand.

Geocell significantly increase the performance of slopes against erosion by controlling the flow of water and the migration of fill material inside the cells.



- » Cut or fill embankment slopes,
- » Shoreline revetments,
- » Containment dikes and levees,
- » Landscape applications,
- » Landfill linings and covers,
- » Abutment protection,
- » Highway and railway side slopes,
- » Dams and spillways,
- » Vegetated channel structures.



WEATHERING EROSION



ROOT PROTECTION [VEGETATIVE SOIL]

Reinforces root systems and directs hydraulic flows over the top of cells, with the cells acting as a series of check dams.



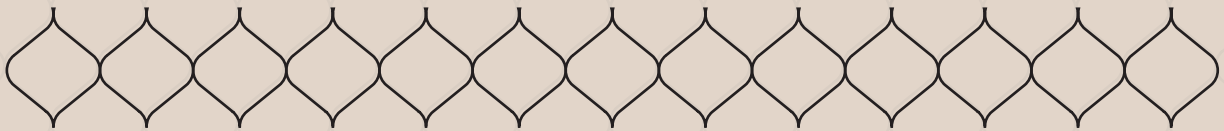
GRANULAR PROTECTION [CRUSHED STONE]

Improves the performance of granular filled slopes by controlling the migration of fills that would otherwise be initiated by hydraulic and gravitational forces.



Advantages

- ✔ Allows aesthetic landscape applications,
- ✔ Prevents the loss of material on the slope surface,
- ✔ Increases slope stability by regulating water intake from the surface,
- ✔ Protects the root system of plants and provides safe vegetation.



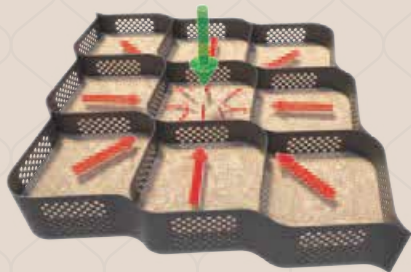
In slopes suitable for cultivation, the cells are filled with agricultural soil. Colorful plant seeds can be placed to provide an aesthetic, attractive appearance.



In slopes that are not suitable for planting, the cells are filled with colored stones to provide a permeable and aesthetic appearance.



C E L L U L A R C O N F I N E M E N T



Horizontal movements of the infill material are prevented by the confinement effect of the interconnected three-dimensional cells. The system works with a flexible base principle and spreads the loads that affect the system to a wider area.

Geocell forms a three dimensional load support system that significantly increases the load bearing capacity of the underlying subgrade soil.

Each cell confines the soil, preventing lateral spreading and increasing base stiffness. Both soil interaction with the cell walls and passive resistance developed between adjoining cells increases vertical shear resistance of the infill material. When filled with granular infill, Geocell can reduce base course thickness by as much as 50%.



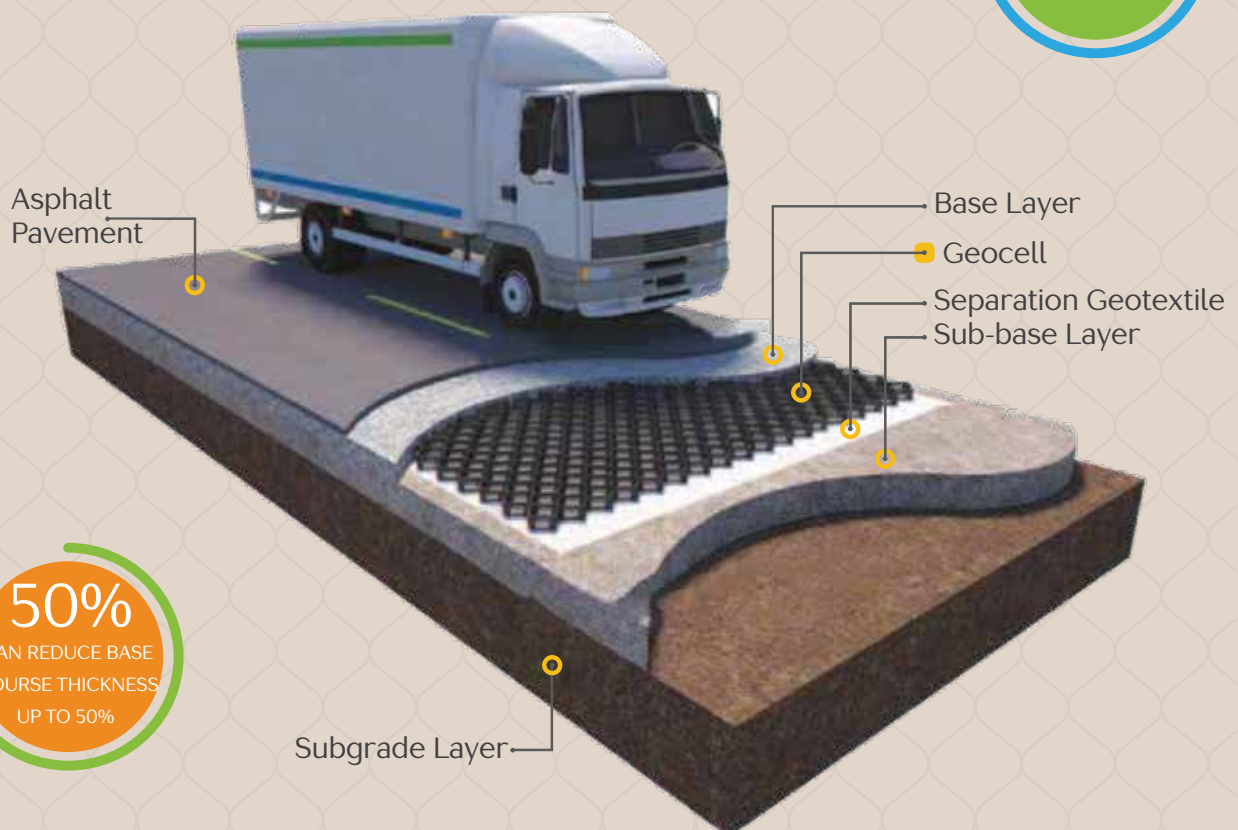
Advantages

- ◇ Significantly minimizes surface rutting,
- ◇ Increases load bearing capacity of the soil,
- ◇ Allows fast and controlled soil compaction,
- ◇ controls shearing and lateral movement of the coarse infill material,
- ◇ Distributes loads laterally and reduces vertical deflection.



- » Stabilized drainage layer,
- » Permanent and temporary access roads,
- » Permeable load-support,
- » Roadway shoulders,
- » Stabilized base for asphalt pavements,
- » Track ballast and subballast structures,
- » Trails and walkways,
- » Foundation mattresses and pipeline protection,
- » Sports fields and playgrounds
- » Parking areas.

x10

UP TO 10 TIMES LONG
LASTING STRUCTURES

BURIED STRUCTURES FOUNDATIONS



Geocell system performs well in protecting the underground utilities and buried pipelines. The geocell layer can reduce the spread and intensity of shear strain under the footing, tending to reduce both soil surface settlement and pipe deflection.



SOIL STABILIZATION

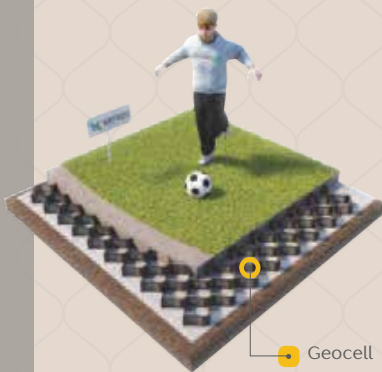
STABILIZED SUPPORT SYSTEM

With the use of Geocell, vehicle and pedestrian loads are distributed over a larger area instead of a direct contact point.

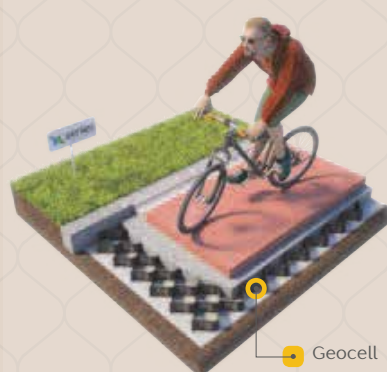


Stabilized 3D support system.

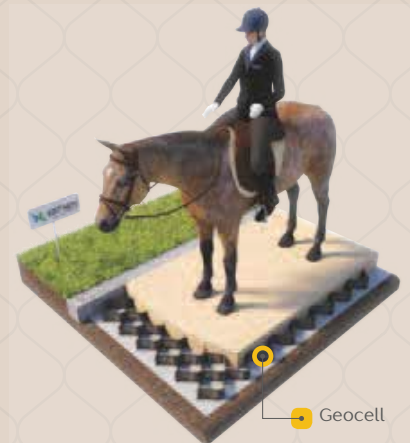
Thanks to the superior confinement effect of the system, the load concentration on the base decreases significantly. Due to the high drainage capacity of the material, settlements are reduced dramatically.



SPORTS FIELDS
PLAYGROUNDS



BICYCLE/MOTORCYCLE
TRAILS AND WALKWAYS



SAND STABILIZED
ACCESS ROADS

“

In areas with limited easements, Geocell retaining wall can be constructed by filling the cells with concrete or crushed stone.

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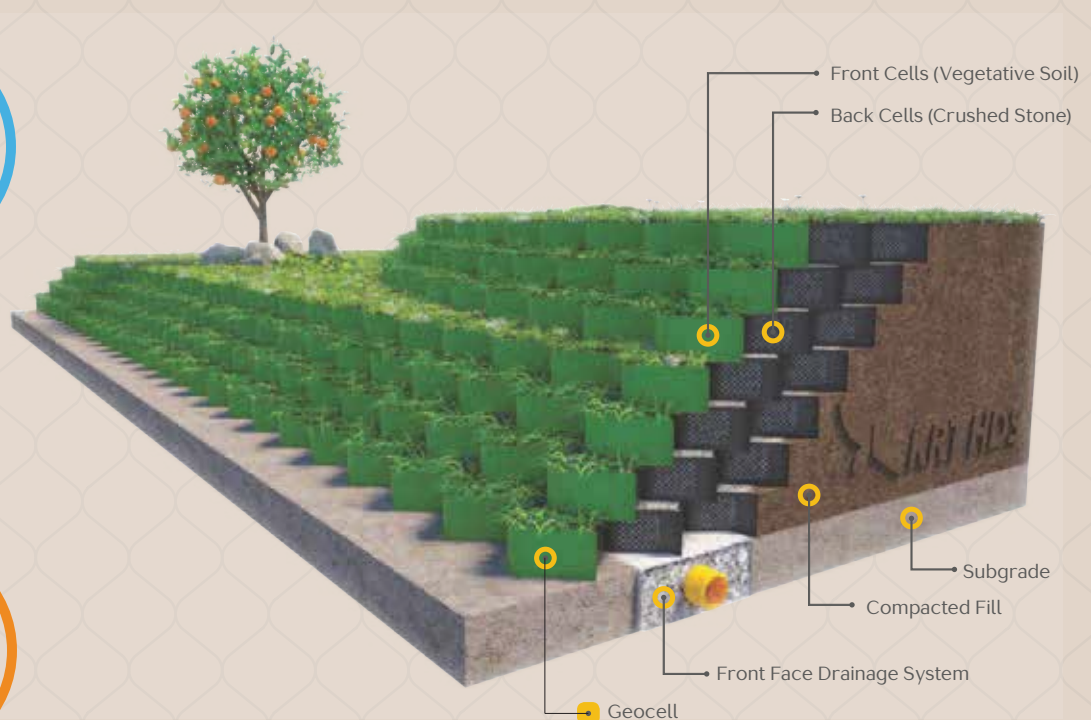
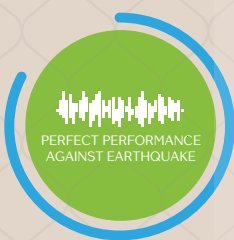
Geocell retaining walls manufactured using the cellular confinement system are green retaining structures that do not require concrete and mold, are perfectly compatible with nature and are extremely resistant to earthquake.

Geocell walls can easily reach the height that conventional retaining walls (stone, reinforced concrete) can not reach. The system allows for construction flexibility and provides aesthetics through a completely vegetated face.



- ❖ It has an aesthetic vegetated front face integrated with nature,
- ❖ Fits with horizontal and vertical geometry perfectly,
- ❖ Retaining walls with unlimited height can be manufactured,
- ❖ Its flexible structure provides excellent performance against earthquake,
- ❖ The system does not require concrete and mold.

- » Green MSE walls,
- » Steepened embankments,
- » Shoreline revetments,
- » Dike and levee protection,
- » Culvert headwalls,
- » Landscape development walls,
- » Vegetated channel structures,
- » Sound barriers
- » Dams and flood defense bunds,
- » Road widening.



RETAINING WALL FRONT FACE DRAINAGE SYSTEM



In Geocell retaining wall applications, the cells behind the cells filled with vegetable soil on the front of the wall are filled with a crushed stone so that the water can be transferred to the continuous drainage system at the base of the wall.

Geocell retaining walls constructed to ensure the stability of the steep slopes against the landslide can be manufactured with the method of laying geogrid reinforcements and compacting high quality filling material at every stage. Desired front face angle (α) of the wall can be achieved by setting offsets(s) at every stage with a prescribed distance. The main components of the wall system are Geocell wall element, high quality fill material and geogrid reinforcements.



Geocell Retaining Wall Cross Section Detail



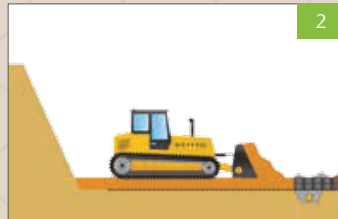
GEOGRID REINFORCEMENT APPLICATION



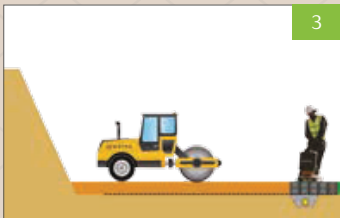
Geogrid reinforcements are used in Geocell retaining walls when the wall height is too high or there is a relatively high surcharge load on the wall. Geogrids are used in different lengths and types in each filling stage of the MSE wall to reinforce the compacted fill material with friction and interlocking mechanism.



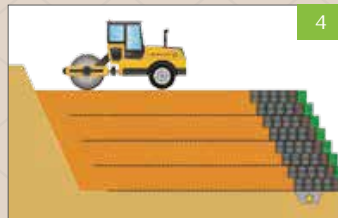
1
Levelling and drainage excavation are done according to the project. Geocell and other materials are installed.



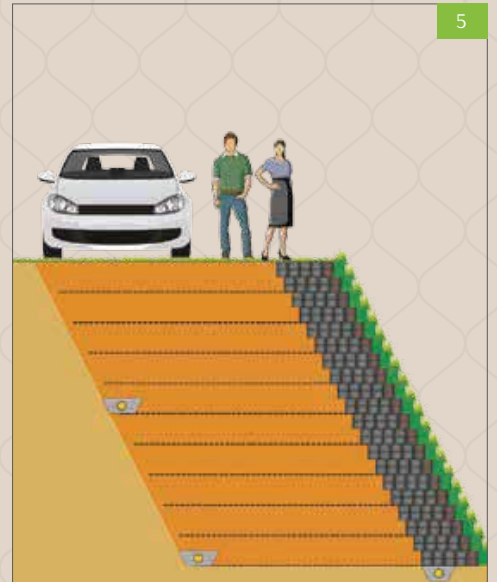
2
At each level of the compaction laying of geogrid and geocell is done With extensive care so that the geogrids are not damaged.



3
The front face cells are filled with crushed stone and vegetative soil in each step and compacted with vibrating plate compactor.



4
In order to achieve desired front face angle of the wall, ofsets are set with Geocell at each level of laying/compaction.

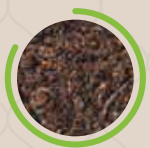


5
The application of the wall is completed when the laying and compacting process reaches the specified height Geocell front cells are planted to create aesthetic natural look.



- » Storm water diversion or containment,
- » Flow channels,
- » Shore protection,
- » Culvert outfalls,
- » Dam faces and spillways,
- » Down chutes,
- » Drop structures,
- » Swales and drainage ditches,
- » Process water channels,
- » Storm water/waste water lagoons,
- » Geomembrane protection.

INFILL MATERIALS



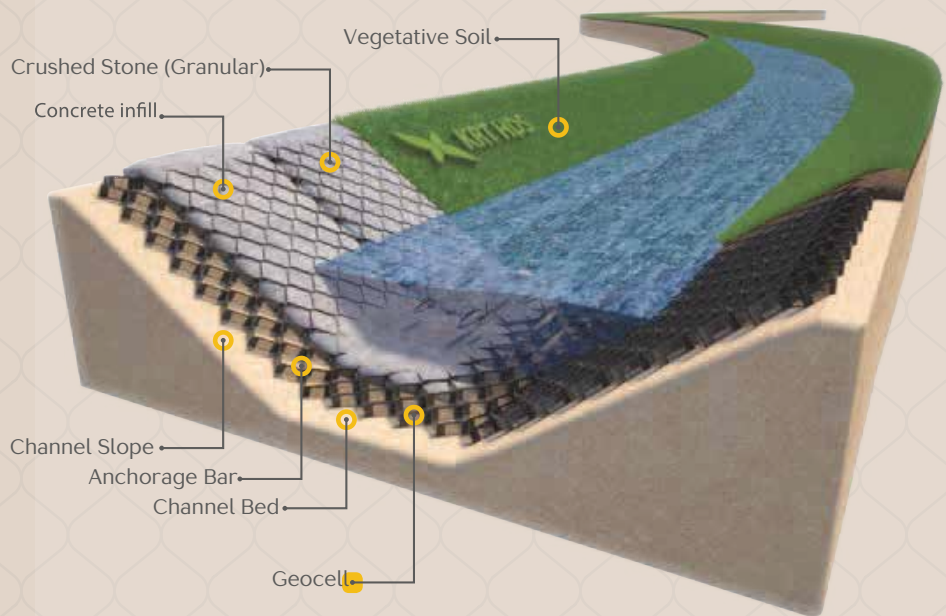
Vegetative Soil



Crushed Stone



Concrete





3D DIMENSIONAL CONFINEMENT



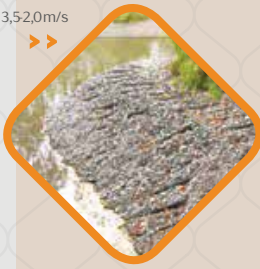
Geocell system greatly improves the hydraulic performance of conventional protection materials such as aggregate, rip-rap and vegetation by confining them within the three dimensional flexible cellular structure.



Geocell Geomembrane Protection Layer

Geocell offers a great protection system applications. Geocell filled with concrete creates a protective layer on the geomembrane against uplifting of water and erosion.

FLOW RATE: 3,52,0m/s



☉ CONTINUOUS FLOW
☾ INTERMITTENT FLOW

CRUSHED STONE INFILL PERMEABLE PROTECTION

Performs well, allowing the use of different sizes for variances in flow velocities encountered from site to site.

- ★ Allow to use smaller diameter, less costly aggregate by confining and improving the performance of infill material,
- ★ Cost effective alternative to large rip rap or hard armoring protection,
- ★ Directs flow over the top cells; there by increasing the shear resistance of the fill,
- ★ Limits the movement of the aggregates due to the eroding effect of flow.

FLOW RATE: 6,00,0m/s



☉ INTERMITTENT FLOW

VEGETATIVE SOIL PLANT ROOT PROTECTION

Provides an aesthetically pleasing look and performs exceptionally well in applications with low to moderate flows.

- ★ Reinforces root zones and directs flow over the top cells; there by increasing the shear resistance of the fill,
- ★ Confined vegetative soil performs well where the flow is intermittent,
- ★ Prevents formation of cracks,
- ★ Compared to conventional methods, it offers a more aesthetically superior solution.

FLOW RATE: 13,03,5m/s



☉ CONTINUOUS FLOW
☾ INTERMITTENT FLOW

CONCRETE INFILL RIGID PROTECTION

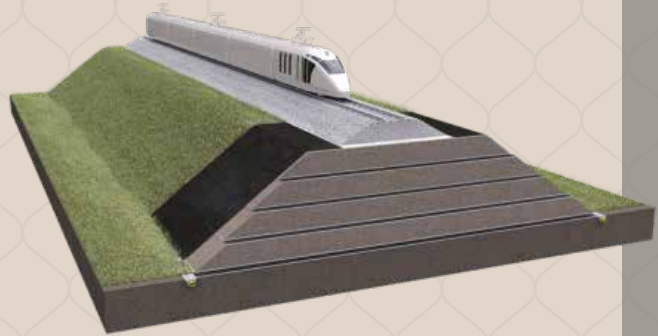
A cost effective alternative to traditional installed concrete lined channels.

- ★ Installation costs are dramatically reduced through elimination of costly forms and other construction techniques,
- ★ Increases the stability significantly in steep slopes where the flow rate is relatively high,
- ★ Can produce a flexible concrete slab for a low-friction, armored channel lining,
- ★ Permits conformance with subgrade movement without the potential cracking and undermining associated with poured-in-place concrete slabs.





Geocell reduce maintenance, and have been demonstrating the most significant cost saving in railways construction and maintenance, by eliminating the need for high quality construction materials, and while improving the structure for long-term applications. The growing infrastructure activities across the globe are giving the geocell market as these composites offer high quality and are cost-effective alternative in various applications.

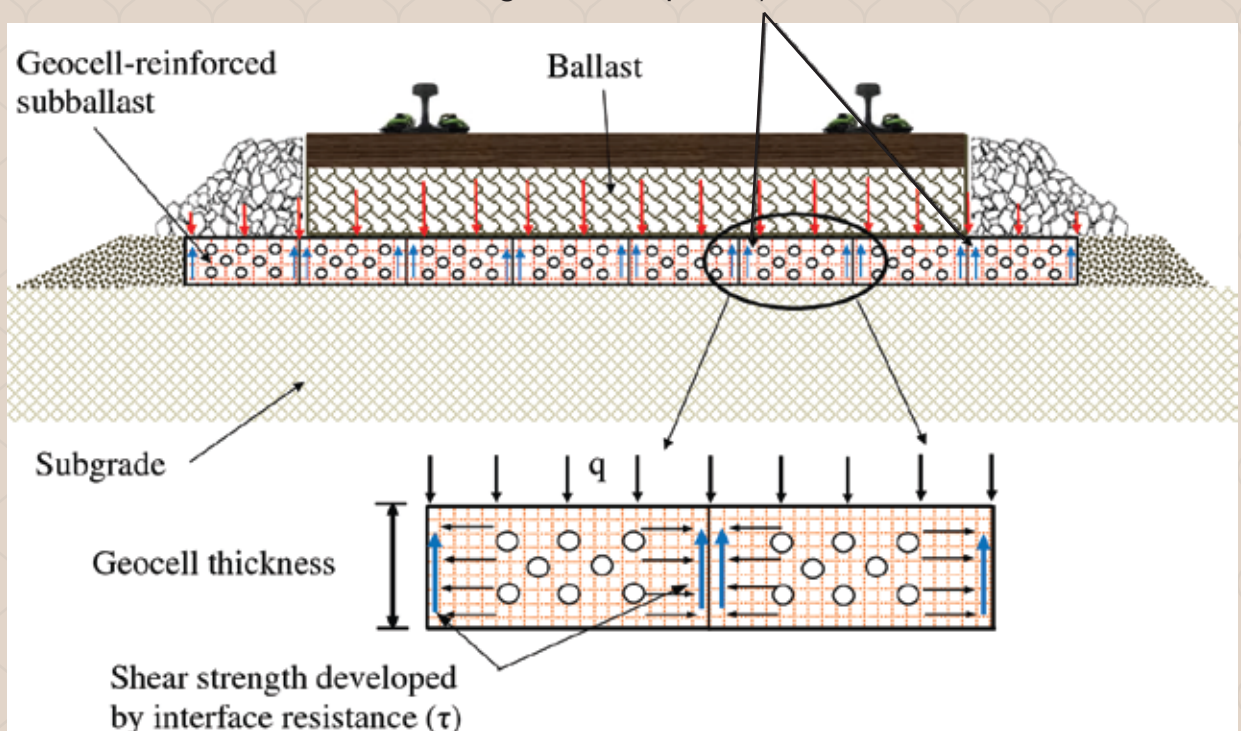




» Geocell technology is the best solution to increase saving cost efficiency in Railways Applications and maintenance contributes to the anticipated growth of this field.

» Geocell is used in all surfaces of the transportation industry including roadways, airport, rail roads & waterways.

Shear strength developed by interface resistance

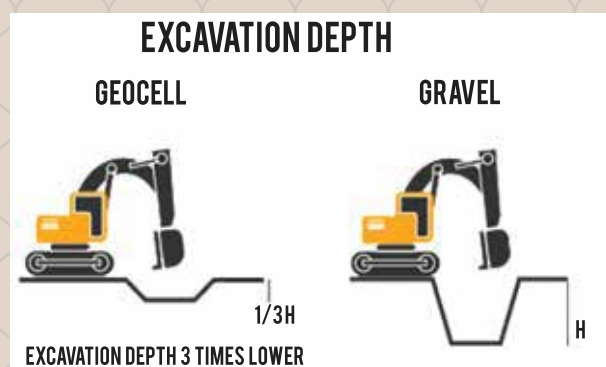




» Geocell is the best selection founded by authorities as they have been searching for innovative techniques special for airport road runways application, which offer a suitable reinforcement alternative to the conventional method, that improves the overall structural strength, reduce operational costs, minimizing maintenance requirements and uses on-site or recycled materials.



Geocell have the increasing demand in Airport applications is accounted for the emergence of this solution, mainly as it offers an alternative to costly granular materials and to distant quarries costly transport to the sites. Geocell soil stabilization improves the bearing capacity of soft soils. This increases the strength of shoulders to safely support even heavy aircraft loads if required in an emergency situation.



Road Construction



Strategic tank warehouse - Military Base

Retaining Wall



Imperial Collage School

Erosion Control



Jalala Heights



Fayed - Jalala Road



Almaza Bay



Decoland

Landscaping Innovative Sustainable Solutions

DECOLAND was founded in Egypt in 2012 as an Eco-friendly company to develop, manufacture, and distribute 'green' products and solutions for landscapes and urban spaces. We have built an edge in the market in which we provided ecological sustainable solutions with high technology, high quality and unique applications.

Based on long standing cooperation with BERA we have gained their trust and obtained an exclusive license to locally produce the Honeycomb® (Gravel Fix), the Aluminium separators and the HDPE Edges in Egypt.

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With the company's historical roots and wealth of know-how in landscaping and architectural fields, they create innovative and environmentally sustainable solutions, supplied throughout Europe, the Middle-East, Africa, Central America and S-E Asia regions.

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