StrataWeb®
Engineered slope protection solution
StrataWeb® geocells are light weight, but strong three-dimensional, honeycomb-like cellular confinement systems. They can be used as foundation reinforcement mats for improvement of load-bearing capacities of weak soils, and as an erosion control barrier for slope surfaces.

**StrataWeb® slope protection system**
StrataWeb® geocell slope protection system is a low-cost, high-performance solution that addresses slope erosion challenges while providing several facing options, such as, vegetation for aesthetic cover, concrete for permanent cover etc., thereby enabling a sustainable footprint.

**Sectors and applications**
StrataWeb® slope protection systems have the following applications, though not limited to:
- Highway embankments
- Reservoir lining and ash pond lining
- Railway embankments
- Landfill slope lining (municipal solid wastes/ hazardous waste/ mine tailing)
- Mine overburden dumps
- Slope protection for earthen dykes
- Canal lining
**Why is StrataWeb® better than stone pitching**

### Technical aspect

<table>
<thead>
<tr>
<th>StrataWeb®</th>
<th>Stone Pitching</th>
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<tbody>
<tr>
<td>• Due to its three-dimensional cellular structure, StrataWeb® helps in reducing erosion of soil along the slope surface.</td>
<td>• Stones may have a tendency to slide away or settle down due to their self-weight and infiltration of pore water. Leading to crack generation and propagation either during or post construction.</td>
</tr>
<tr>
<td>• Cellular confinement by StrataWeb® geocells can prevent erosion along steep slope with gradient as high as 1V:0.5H.</td>
<td>• For erosion protection, it is applicable only for gentle slopes having gradient 1V:2H.</td>
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### Aesthetics

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<td>• The green, finished surface gives a pleasing aesthetic look.</td>
<td>• For a good aesthetic look, stones have to be laid with smooth surface finished face (Incurs extra cost for the smooth surface finish).</td>
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<tr>
<td>• Does not require any mortar.</td>
<td>• Requires mortar for bonding of stones/ concrete tiles.</td>
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<tr>
<td>• The textured surface with perforations on the cell wall enables ease of movement for growth of roots. Expediting the growth of greenery. Environment friendly solution.</td>
<td>• Requires more consumption of conventional resources. Not an environment friendly solution.</td>
</tr>
<tr>
<td>• StrataWeb® geocells are aesthetically pleasing to the eye due to green surface finish.</td>
<td>Stone pitching comparatively looks dull due to the color of the stones.</td>
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### Installation Aspect

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<td>• Installation can be done in most weather conditions.</td>
<td>• Installation process is difficult in the monsoon season.</td>
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<tr>
<td>• It is easy to install in difficult terrains.</td>
<td>• Carrying heavy stones/ boulders to remote sites is a challenging task. Hence, difficult to work in such areas.</td>
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<tr>
<td>• Execution is possible with minimal labour (semi-skilled/ unskilled)</td>
<td>• Since work has to be done in stages, it’s a time-consuming process, requiring more skilled labour. Comparatively, a very slow process.</td>
</tr>
<tr>
<td>• StrataWeb® can be laid up to 500m²/day with a team of 15 labour workers.</td>
<td>• Stone pitching can be laid up to 100-200m²/day with a team of 15 labour workers.</td>
</tr>
<tr>
<td>• Locally available, vegetative soil may be utilized as an infill material for StrataWeb®.</td>
<td>• Stones/ boulders may need to be transported from quarry (process is done either by blasting or extraction by grinding and cutting, producing stone dust).</td>
</tr>
<tr>
<td>• Once the vegetation grows, least maintenance required in the future.</td>
<td>• It requires periodical monitoring and maintenance as some stones/ boulders may get displaced or damaged due to weathering, extreme temperatures and water.</td>
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### Commercial Aspect

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<td>• Economical, where stones are difficult to procure.</td>
<td>• Expensive compared to StrataWeb® geocells in areas where stone/boulder availability is meager.</td>
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</table>

### Environmental Aspect

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<td>• Minimal consumption of diesel/ petrol during hauling of material.</td>
<td>• Additional cost for consumption of diesel/ petrol due to repeated hauling of graded material.</td>
</tr>
<tr>
<td>• Lower carbon footprint.</td>
<td>• Considerable carbon footprint.</td>
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</tbody>
</table>
Installation methodology

01 Site preparation
Stone, debris, rank material, dead wood etc., should be removed from the site. In order to remove undulation and ensure proper placement of StrataWeb®, the slope should be dressed and compacted properly.

02 Crest anchorage
The anchor trench should be excavated as per the size and shape required. A minimum distance of 500mm should be provided between trench and slope edge; ensuring that the anchor trench does not fail in shear or the anchor mound material does not erode over the crest. There should be no flow of water which usually results in erosion of anchorage.

03 Connections and placement
The J hook (plain, mild steel rods) has to be installed with 50mm protruding above the ground. The anchorage should be done as per the detailed drawing submitted. The adjoining panels of StrataWeb® should be connected by Strata connectors as per the drawing in length and width. StrataCord should be passed through the perforation/slot prior to expansion of the StrataWeb® panels. The panel should be connected face-to-face or flap-to-flap.

04 StrataWeb® placement
The sections of StrataWeb® should be expanded in designed position. After laying StrataWeb® in the anchor trench, the trench is infilled with specified material. The StrataWeb® panels are then expanded in length down the slope in the prescribed manner. Care should be taken that the expanded area conforms to the specifications.

05 Infill
Infilling should commence from top and gradually progress towards the bottom in order to avoid stressing the system. To prevent possible damage to the system, the height of infill drop should be limited to 0.5m. The StrataWeb® panels should be overfilled by 25mm to 50mm with sand, granular or top-soil fills, and should also allow for settling and compacting of the material.

Soil fills should be lightly hand-tamped with a mechanical tamper. In case of concrete (grade shall be as specified on the drawing), the infill should overtop StrataWeb® just adequate to trowel smooth without the rim of StrataWeb® being visible.

06 Finished Slope
Please note that the information above is given as a guide only. All sizes and weights are nominal figures and may vary to what is published. Strata Geosystems (India) Pvt. Ltd. will not be liable for damage caused by incorrect installation of this product. Final determination of the suitability of any information or material for the use contemplated and the manner of its use is the sole responsibility of the user, and the user must assume all risk and responsibility in connection therewith. This field guide is provided as an aid to assessing the mechanical stabilization requirements in commonly encountered site conditions.
Benefits

- It spreads imposed loads and enhances load carrying capacities of weak subgrades
- The cellular profile confines the infill and prevents spreading of the material and erosion
- It can be rapidly installed as compared to conventional solutions
- Collapses into a flat pile of straps which is easily and economically transported
- Once placed, the system requires marginal maintenance, if any over long time intervals; this reduces life cycle costs
- Using locally available infill material for an engineered solution with StrataWeb® can bring down the overall solution cost
- StrataWeb® helps fostering green solutions for slopes and reduces carbon footprint by minimizing logistics

Highlights:

1. Design life - Over 25 years
2. Cellular profile confines infill and prevents spreading of material and erosion

Technical details

The stability of geocell mattress on slopes is evaluated using a static sliding block analysis. Along any slope surface, the normal and shear forces shall be in equilibrium for effective surface erosion control of the soil mass. Using geocell reinforcement, tensile forces of the tendon and the confinement effect within geocell pocket (acting as an interceptor barrier / check dams) contribute in restraining / resisting the soil mass from sliding.

Indicative reference projects

- Slope erosion protection for embankment on NH-15, Amritsar - Pathankot
- Slope protection for abutment of minor bridge at NH-91
- Slope protection for partial flyover on bridge NH-202
- Slope protection for highway embankment in Haryana
- Slope protection for highway embankment on NH-50, Khed - Sinnar
- Slope and liner protection for raw water reservoir for captive thermal power plant in Chennai
- Slope erosion protection for a golf course
- Erosion protection of slopes at hydrocarbon plant
- Erosion protection for landfill encasement slope
- Slope erosion protection for embankment on NH-59, Gujarat - MP border
Strata India offers a comprehensive range of high-quality geosynthetic and geotechnical solutions to India’s civil engineering and construction industry.

Strata India provides turnkey solutions for various applications like reinforced soil structures, slope protection and stabilization, erosion control, precast arch bridges, foundation improvement for structures and embankments, steep slope embankments, strengthening of paved/unpaved roads, storage/container yards etc.

About us

Established
2004

Joint Venture
Strata Systems Inc. USA
(Division of Glen Raven Group)

Global Presence
USA, Brazil & Ireland

Manufacturing Facility
StrataGrid™ geogrid, StrataWeb®
geocells at Daman, India.

Project Track Record
Timely & infallible installation

Certification

Strata India offers a comprehensive range of high-quality geosynthetic and geotechnical solutions to India’s civil engineering and construction industry.

Strata India provides turnkey solutions for various applications like reinforced soil structures, slope protection and stabilization, erosion control, precast arch bridges, foundation improvement for structures and embankments, steep slope embankments, strengthening of paved/unpaved roads, storage/container yards etc.