IP-GROUP

# CONCEPT MANUAL
# ROADGRID & SOILSTABILIZATION

## THE MULTIPURPOSE ROAD STABILIZATION CONCEPT

# SOIL **STABILIZATION**

**Problem:** Poor load-bearing soils pose a significant problem for transportation and construction needs. Soil stabilization for unpaved areas, such as access roads, maintenance roads, parking lots, subgrade improvement, etc can be highly vulnerable to near-surface shear failure and rutting, especially in moist conditions or areas with higher expected loads. For road base stabilization typically, engineers bridge over weak soils with rigid structures such as thick, reinforced concrete for roads and highways. However, such techniques are prohibitively expensive and inordinately difficult to install. The poorer the quality of the sub-base and the heavier the expected loads, the greater the amount and better the quality of support required. From an environmental viewpoint, hard-pavement, as an impervious surface, is far more harmful for the environment than a porous surface. If the environment is a primary concern for the construction application, then a pervious solution should be considered.

# ROAD **GRID**

**Solution:** Road Grid & Soil Stabilizations provides a direct, cost-effective solution. The high-strength cell walls maintain the shape and integrity of the structure, allowing for heavy equivalent axle loads without fear of lateral movement of the fill material. The cellular design of Road Grid & Soil Stabilizations also distributes the loads to an extended area, thus reducing the stress to the grid itself as well as to the sub-grade below. The thickness of the overall framework and sub-base can be decreased with equivalent or greater structural integrity. In most cases the Road Grid & Soil Stabilizations solution can reduce a typical cross section to 1/3 or the original design. This can also create pavement reduction due to the higher base structural value.

## COST EFFECTIVE SOLUTION

Using Road Grid & Soil Stabilizations for road base reinforcement also allows for lower quality aggregates found locally, eliminating the need to import better or more material. Compact sections of Road Grid & Soil Stabilizations filled with sandy soil can thus replace truckloads of crushed stone or other granular fill or even asphalt or concrete.

## POOR SUB-BASE

The poorer the quality of the sub-base and the heavier the expected loads, the greater the amount and better the quality of support required

## RGST 20

RGST 20 stabdard section are manufactured from 58 strips of HDPE, resulting in a section length of 29 cells and 10 cells wide. Each strip is the appropriate with and 3,6 m in length. Cell density is 35 cells per meter  squared

## RGST 30

RGST 30 stabdard section are manufactured from 58 strips of HDPE, resulting in a section length of 29 cells and 8 cells wide. Each strip is the appropriate with and 3,6 m in length. Cell density is 22 cells per meter  squared

## RGST 40

RGST 40 stabdard section are manufactured from 58 strips of HDPE, resulting in a section length of 29 cells and 5 cells wide. Each strip is the appropriate with and 3,6 m in length. Cell density is 9 cells per meter  squared

# GUIDLINE SOIL **ROADGRID**

When traffic loads are applied to a soil subgrade, the soil will not deform or rut if the shear strength of the soil exceeds the applied loads. The strength of the soil is a function of such characteristics as its angle of internal friction, its cohesion, and its degree of compaction.

Most road and parking systems consists of one or more layers of good quality fill materials placed and compacted on soil subgrades. The fill materials allow the system to support traffic loads that the soil, by itself, would not be able to withstand. The function of the layer(s) of base material is to distribute the imposed loads over a large area, thereby reducing the pressure (load divided by area), which is transferred to the subgrade

# GUIDLINE SOIL **ROADGRID**

The base material is able to distribute the loads because the individual aggregate particles lock together. Applied loads are transmitted through the base material both as vertical and horizontal forces.

If the horizontal (lateral) forces push the base material sideways, rutting develops, resulting in a thinner layer less able to resist additional load applications which leads to failure. Even a good quality base material, with the proper internal strength and interlocking of individual particles, can be forced to move laterally. The poor quality subgrade in contact with the base material does not provide the required friction at the interface to restrain the movement.

# SOLUTION **CONCEPT**

In order to prevent lateral movement at the bottom or within the base layer, high modulus (low elongation) geotextiles or geogrids have been used for many years. Because of their strength, resistance to elongation, and structure, fabrics and grids are more capable of restraining the lateral movement of the base materials with which they come in contact. Although they are very useful in many stabilization applications, fabrics and grids can only have an effect at the boundary where they contact the base material/soil. Prevention of lateral movement of the base materials above and below this boundary still depends totally upon the quality of the base material
itself. Road Grid takes the concept of confinement from two dimensions (length and width) and expands it to a third dimension (depth). This vertical and horizontal confinement of the entire depth of the base layer represents a quantum leap in stabilization technology, and has major implications upon cost effectiveness and the project's long-term performance.

# SOLUTION **CONCEPT**

Because the cell walls resist lateral movement, a lower quality, lower cost, base material can be used. Additionally, the base material can be more open graded which will dramatically improve drainage of the system, resulting in a longer expected life for the road/parking lot. If a parking lot is not paved, storm water would be allowed to seep into the subgrade, possibly eliminating the need for a detention pond. Another major benefit of stabilizing soils with Road Grid is the effectiveness of a geocell to distribute applied loads over a large area. Since each cell within a section is connected to adjoining cells, each section of Road Grid acts as a large mat or pad. The Concept significantly reduces the pressure applied to the subgrade by a load exerted on the top surface of the Road Grid. The benefit is that stabilization can be achieved with a minimum amount of base material used in conjunction with Road Grid & Soil Stabilizations.

# ACCESSORIES **ROADGRID**

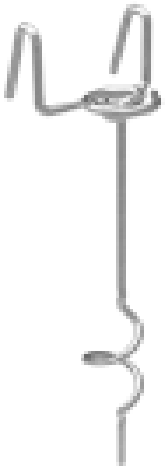
## GRID LOCK

The Grid Lock is a one piece mechanical tool that securely fastens adjacent Road Grid & Soil Stabilizations panels. The Grid Lock can join up to the full depth of the cell. Once locked in place they cannot move or become dislodged.
The Grid Lock can be used on all applications and are quick and easy to install. They are UV stabilized and made out of high strength nylon. Assembled without use of tools

## TENDONS

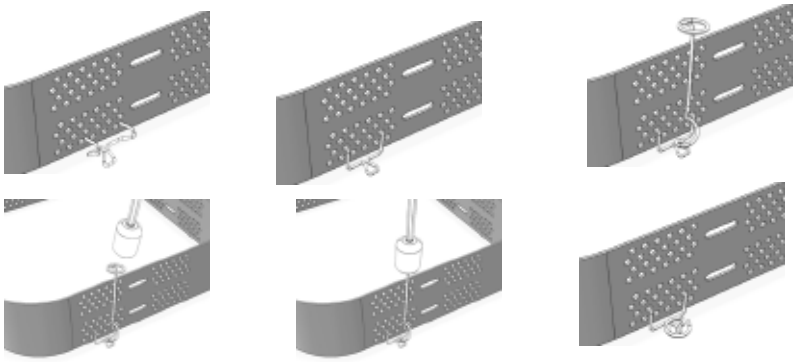
Tendons are used to anchor the Road Grid & Soil Stabilizations panels on steep slope applications. A veneer stabilization calculation will determine if there is a positive net sliding force of the system. The number and break strength of the tendons will be designed to surpass the sliding force and secure the panel in place. Based on your project requirements the tendons come in 6 different break strengths.

# ACCESSORIES **ROADGRID**



## CLIP TWIST ANCHOR

The Clip Twist Anchor secures and enhances the performance of our Road Grid & Soil Stabilizations. Quick and easy to install with an electric drill and custom chuck - 5 times faster installation process compared to standard stakes



## FEATURES/BENEFITS

- Eliminates time, labor, and safety concerns from carrying and hammering heavy rebar on steepened slopes
- Anchors flush to the ground eliminating tripping or tire puncture hazards that rebar systems create
- Superior performance when compared to traditional rebar J-hooks, up to 9 times the pull out force of J-hooks

# ROADGRID & SOILSTABILIZATION

# THE **DIRECT** COST-EFFECTIVE **SOLUTION**



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