3904 Virginia Ave • Cincinnati, Ohio 45227 • Phone (513) 271-6000 • Fax (513) 271-4420

Multi-Layer Geogrids
Vs.
Single-Layer Geogrids

GREATER NUMBER OF TENSILE ELEMENTS PER UNIT AREA

This increased number of tensile elements allows for more effective interaction with the soil. The increased interaction with the soil greatly improves the pull out resistance of the geogrid in a wide range of soils – even clays. In fact, independent testing has shown that multi-layer geogrids consistently achieve superior pull out resistance in the widest range of soils. Just as is the case with concrete reinforcement, the use of a larger number of tensile elements frequently and evenly distributed throughout the soil as opposed to a fewer number of tensile elements will provide better optimization of reinforcement.

Multi-Layer Geogrids:	BaseGrid 22 = 192 tensile elements/sq. ft.
	BaseGrid 33 = 288 tensile elements/sq. ft.
	BaseGrid 50 = 432 tensile elements/sq. ft.
Single-Layer Geogrids:	= 111 tensile elements/sq.ft.

VARIABLE APERTURE SIZE

Multi-Layer Geogrids are comprised of multiple layers of high strength extruded, bi-oriented polypropylene grids. The multiple layers are welded and rolled together *without* superimposing the meshes creating a geogrid with variable sized apertures. The variable sized apertures greatly improve the geogrid's interlocking capacity with the soil. This is especially true when deploying the typical aggregate fill used for road construction that has particle size distribution of ¾" inch stone down to fines. The variable sized apertures are even more beneficial when the project calls for a fill material that is already on the project site with less than favorable soil characteristics. The different size of the openings allows for better filling of the void spaces in the cross section during placement of a soil with an extreme soil distribution curve, thus providing a better interlocking capacity.

SEPARATION

The multiple layers of a multi-layer geogrid provide an increased cross sectional thickness as compared to a single-layer geogrid. This increase in profile allows for increased separation between the subgrade soil and fill material. This separation effect is useful in preventing the intermittent migration of fill soil into the weak subgrade.

THERE ARE DESIGN EQUIVALENTS TO SINGLE-LAYER GEOGRIDS !

One of the most important characteristics of a geogrid is its ability to ensure a good interlocking of soil or aggregate fill material. The best way to determine that maximum interlocking of the soil or aggregate has taken place is by conducting a pullout test (results available upon request). Multi-layer geogrids have been independently tested to determine their corresponding pullout resistance. This independent testing supports the fact that multi-layer geogrids exhibit an excellent coefficient of interaction against pullout. The purpose of deploying a geogrid is to prevent rutting of the reinforced area. Tenax has performed full scale in-ground tests for geosynthetic-reinforced flexible paved roads that include both multilayer and single-layer geogrids. ***This testing indicated multi-layer geogrids provide equal if not superior structural contribution when compared to a single-layer geogrid***.

Additional tests available include : Full-Scale In-Ground Test on Geosynthetics in Reinforced Paved Roads, Construction Damage Tests, Independent Pullout Tests, among others.