

MULTI-LAYER GEOGRID FOR REINFORCING A PARKING LOT PAVEMENT BASE

PROJECT NAME	Pennsylvania Employee Credit Union
LOCATION	Harrisburg, Pennsylvania
PRODUCTS	Multi-layer Geogrid MS330
APPLICATION	Base Reinforcement
ENGINEER	Gannett Fleming, Inc.



Multi-layer geogrids also have ‘more 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. MS330 geogrid has 288 tensile elements/sq. ft. compared to 111 tensile elements/sq. ft. for a conventional Single- Layer Geogrid.

Multi-layer geogrids also have a ‘variable aperture size’. Multi-Layer Geogrids are comprised of multiple layers of high strength extruded, bioriented polypropylene grids. The multiple layers are rolled and stitched 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.

Problem

An employee parking lot, measuring approximately 100,000 square feet (9,290 square meters), is associated with the premises of the Pennsylvania Employees Credit Union (PESCU) located in Harrisburg, Pennsylvania. This facility and the parking lot were constructed in 1987. Subsequently a large number of depressions (of various sizes) were observed in the bituminous concrete pavement pertaining to the parking lot.

In 1996, investigations attributed the depressions to the miscellaneous, uncontrolled fill materials immediately underlying the pavement. It was recommended that the bituminous concrete pavement be reconstructed upon a base reinforced with layers of geogrids. The purpose of the geogrid was to bridge potential voids, minimize differential settlements, and enhance the bearing capacity of the foundation system. Three layers of geogrids were incorporated to reinforce the pavement foundation for a relatively large parking lot.

