

# KEY NOTE



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SITE CIVIL IMPROVEMENT ↔ EROSION CONTROL ↔ SURFACE WATER QUALITY

Geopro® Learning Tool

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## Geosynthetic Synergy

When used together, geotextiles and geogrids perform synergistically – significantly lengthening a roadway’s useful life [lowering its life-cycle cost], minimizing pavement structure materials [lowering its as-built cost] or some balance in-between.

### Geotextile Contributions

Whether constructed over competent or poor subgrades, geotextiles provide at least filtration and separation functions. A geotextile prevents upward movement of subgrade soil particles into an aggregate even though subgrade water moves rapidly through the geotextile – hence, filtration is achieved. Similarly, base and subbase aggregate particles cannot migrate through a geotextile – separation of differing soil materials is thereby achieved.



National Gypsum - Alpena, MI 2001  
Propex 4553 Geotextile beneath Tensar BX1100 Geogrid

Net Effect – Using a geotextile preserves design aggregate thickness and gradation - which affects performance properties such as permeability and shear strength - remain constant throughout the roadway’s life. Without a geotextile providing filtration and

separation functions, many Michigan roadways should be expected to prematurely degrade or fail.

### Geogrid Contribution

Geogrids prevent aggregate translation and rotation stemming from traffic-induced dynamic loads. By confining aggregates, geogrids improve shear strength and load distribution qualities of the aggregates. Both benefits result regardless of subgrade strength, although they are more pronounced for softer subgrades.

Net Effect – A geogrid improves the performance of a chosen aggregate, resulting in a) The development of a significantly longer roadway life-expectancy, b) The ability to use a thinner aggregate layer to achieve comparable performance or C) Some combination of the two.



National Gypsum - Alpena, MI 2001  
Propex 4553 Geotextile beneath Tensar BX1100 Geogrid

### The Synergy

When properly utilized within a designed roadway, appropriately selected *Skaps* geotextiles and *Tensar® BX Geogrids* work synergistically, i.e., the roadway will



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perform far better than would be possible without their combined use.

**Net Effect For Structures Designed To Maximize Longevity** – Roadways will withstand several times the number of axle load repetitions, compared to identical roadways built without the geosynthetic combination, prior to developing a failure criterion characteristic, e.g., a one-inch rut depth.

**Net Effect For Structures Designed To Minimize Construction Costs** – Roadways incorporating *Skaps* geotextiles with *Tensar* geogrids will support equal axle load repetitions to those roads designed with up to 50% more aggregate.



Stonegate Development - Brighton, MI 2001  
Tensar BX1100 over Comtrac 200 geotextile

**Net Effect For Most Roads** – Designed roadways usually balance as-built costs with improved performance longevity and the associated maintenance cost reductions. When properly used, geosynthetic synergy enables significantly improves road performance with nominal initial investment.

## **Achieving Geosynthetic Synergy**

Geosynthetic synergy and its benefits does not ‘just happen’. This synergy results from using *appropriate* geosynthetics within a *designed* road structure.

**SpectraPave2™**, a software program available at no charge from *Tensar Earth Technologies, Inc.*, utilizes AASHTO 93 design protocols to rapidly estimate roadway life expectancy in terms of axle load repetitions. In addition, the program quantifies what benefits **BX** geogrids offer to such structures, in terms of either increased axle repetitions or lowered pavement material requirements. Using **SpectraPave2** results in time-efficient designs and significantly increased road benefit/cost ratios.

Contact your *Price and Company, Inc. Regional Representative* to learn more about this user-friendly design tool and the application technologies associated with geotextile and geogrid use.

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