AGGREGATE BASE REINFORCEMENT SYSTEM
What is an AllianceGeo BX Geogrid?

AllianceGeo BX geogrids are plastic, grid-like products delivered to a job site in roll form. Manufactured using polypropylene, these products feature high stiffness at low strain and excellent resistance to installation damage and environmental effects (UV, chemical, biological attack, etc.). BX geogrids have been used successfully in roadway applications for more than 30 years.

How do AllianceGeo BX Geogrids work?

AllianceGeo BX geogrids are manufactured such that their ribs and apertures form an integral structure. This facilitates “mechanical interlock” as larger aggregate particles partially penetrate through the geogrid’s apertures. Once the overlying aggregate is compacted, the effect is to provide an efficient means by which to transfer dynamic loads to the geogrid and thereby form a composite material with increased stiffness and better performance when trafficked.
**BX Geogrid Applications and Benefits**

**UNPAVED ROADS AND TEMPORARY WORKING SURFACES**

The required thickness of an unpaved road or working surface is principally a function of the traffic intensity it experiences (magnitude of axle load, number of vehicle passes) and the shear strength of the underlying subgrade — more intense traffic and weaker subgrades result in a requirement for thicker aggregate layers.

For a given set of design conditions BX Geogrids can be used to reduce the required aggregate thickness by up to 60%. This results in:

- Initial cost savings typically in the range of 40-50%
- Faster construction
- More environmentally friendly or ‘greener’ construction methods – 20 to 40% reduction in the carbon emissions associated with the road construction

**CONVENTIONAL AND HEAVY-DUTY PAVEMENTS**

The same principles apply in both flexible and rigid pavements that incorporate a granular layer within the main pavement structure. BX geogrids are typically used to provide one of the following benefits:

- Optimize the pavement section to provide maximum initial cost savings – typically 10-20%
- Maintain an existing pavement design but “beef it up” with a geogrid to extend its design life – typically 2- to 6-fold.
- Develop a cost-neutral solution i.e. provide some design life extension whilst ensuring there is no additional cost resulting from the use of the geogrid.

**RAIL STRUCTURES**

BX Geogrids are approved for use by the American Railroad Engineering and Maintenance-of-Way Association (AREMA). They can be used to:

- Reinforce the ballast layer extending the period between re-surfacing events by 3 to 5 times
- Reinforce the sub-ballast layer in order to reduce the required roadbed thickness and provide maximum initial cost savings – typically $30-50,000/linear mile of track

### Allowable Traffic

<table>
<thead>
<tr>
<th>ESAL’s</th>
<th>3” Asphalt Concrete</th>
<th>3” Asphalt Concrete</th>
<th>3” Asphalt Concrete</th>
<th>3” Asphalt Concrete</th>
</tr>
</thead>
<tbody>
<tr>
<td>89,000</td>
<td>12” Aggregate Base</td>
<td>12” Aggregate Base</td>
<td>7.5” Aggregate Base</td>
<td>10” Aggregate Base</td>
</tr>
</tbody>
</table>

**Alternative pavement solutions using BX Geogrids**
Case Studies

LAYDOWN YARD, PORT OF NANAIMO, BC
OWNER: Nanaimo Port Authority
CONTRACTOR: Hazelwood Construction
PRODUCTS: AllianceGeo BX2020
» DETAILS
It was necessary to construct a laydown area within the port facility. Two layers of biaxial geogrid were placed within a 14 inch thick aggregate layer. Incorporating a geogrid solution resulted in a 50% reduction in the required thickness thus saving 8,000 tons of aggregate and 5 days of construction time.

INTERMODAL FACILITY, CHARLOTTE, NC
OWNER: Norfolk Southern Corp.
ENGINEER: Patrick Engineering
CONTRACTOR: Milord Company
PRODUCTS: AllianceGeo BX Type 2
» DETAILS
The heavy-duty pavements constructed adjacent to the rail tracks in this facilitate are required to carry extremely high wheel loads. A layer of geogrid placed at the bottom of the aggregate layer helped reduce the required thickness of the overlying roller-compacted concrete.

US25 – LEXINGTON TO GEORGETOWN ROAD, KY
OWNER: The Kentucky Transportation Cabinet (KYTC)
CONTRACTOR: ATS Construction, Lexington, KY
PRODUCTS: AllianceGeo BX Type 1
» DETAILS
This project involved the widening of an existing highway. The target grade for the new section of road was achieved by placing and compacting local embankment fill. A geogrid was then placed directly on top to provide additional stability to the overlying 12 inch thick unbound aggregate layer. Asphalt binder and an asphalt surface course made up the rest of the pavement structure. The presence of the geogrid increases the life of the pavement significantly. Although originally designed using a proprietary triaxial geogrid, the client agreed a switch to a more conventional biaxial geogrid which provided additional material cost savings with no loss of performance.