GEOSYNTHETICS FOR RAILWAY ENGINEERING

BENEFITS OF USING GEOSYNTHETICS IN RAILWAY LINES
CULVERT FOUNDATIONS – GEOWEB OPTION

The Presto GEOWEB® load support system is a highly effective, economical solution to problems that result from subgrade material failure or surface or base material instability. Under concentrated or distributed loads, the 3D cellular structure confines infill material and controls shearing, lateral and vertical movement of the infill material. As a base stabilization system, the GEOWEB® material significantly improves performance and when confined, base material requirements can be reduced by 50% or more by substantially reducing the loading on sub-surface soils. As a result, reduced excavation and granular infill needs reduce overall installation cost.

GEOWEB® System Benefits:

» Produces a stiff base with high flexural strength.

» Acts like a semi-rigid slab by distributing loads laterally.

» Minimizes impact of differential and overall settlement.

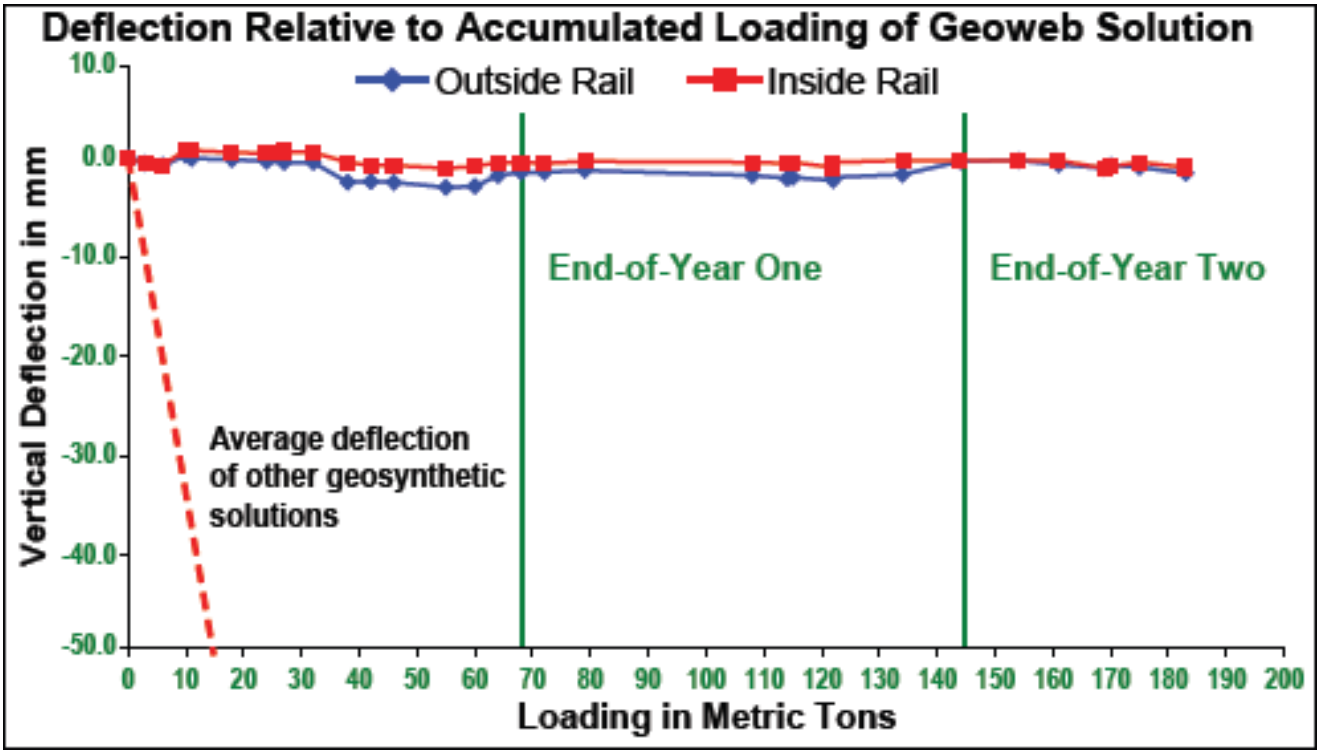
» Reduces fill depth requirement by 50%.

» May allow use of poor-quality granular fills, e.g. Fouled Ballast, in place of more costly imported materials.

» Allows subgrade materials to withstand more than 10 times the number of cyclic-load applications before accumulating the same amount of permanent deflection.

» Provides over 30% stress reduction when supporting aggregate under pavement.

The GEOWEB® system is selected based on 30 years of rail industry use and independent testing conducted in 1998 at AAR FAST High Tonnage Loop in Pueblo, CO. The testing examined soft sub grade solutions for tracks subjected to heavy loads and determined that the GEOWEB® load support system significantly improves load distribution, therefore reducing the vertical stresses reaching the sub grade. The system's three-dimensional structure performs like a semi-rigid slab.



GEOWEB® Integral Components:

GEOWEB® is a Complete Solution which includes proper components which have a critical role in contributing to the overall design strength of the engineered solution. Presto's GEOWEB® accessories provide higher design strength than alternative methods. They are also designed to save contractors time and money during installation and minimize the potential for incorrect installations.

For over thirty years, GEOWEB® material has been manufactured from only the highest quality blend of High Density Polyethylene (HDPE) and it is recognized in the geosynthetics industry as the original high quality, high-performance geocell.

Figure 1 GEOWEB® Connection Device.

ATRA® keys, made from weather-resistant polyethylene, are 3 times stronger and 3 times faster than stapling. Easy installation: ATRA® keys are inserted through adjoining GEOWEB® cell walls, turned and locked for the most secure connection.

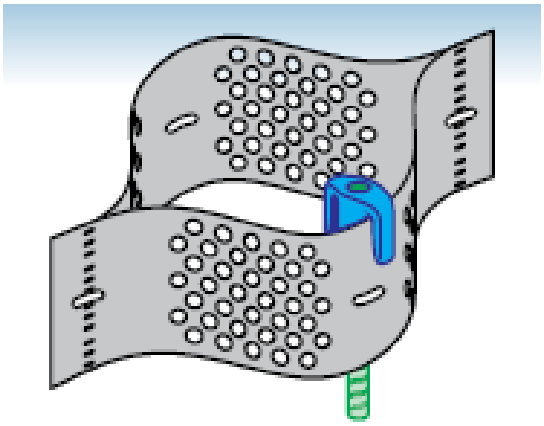
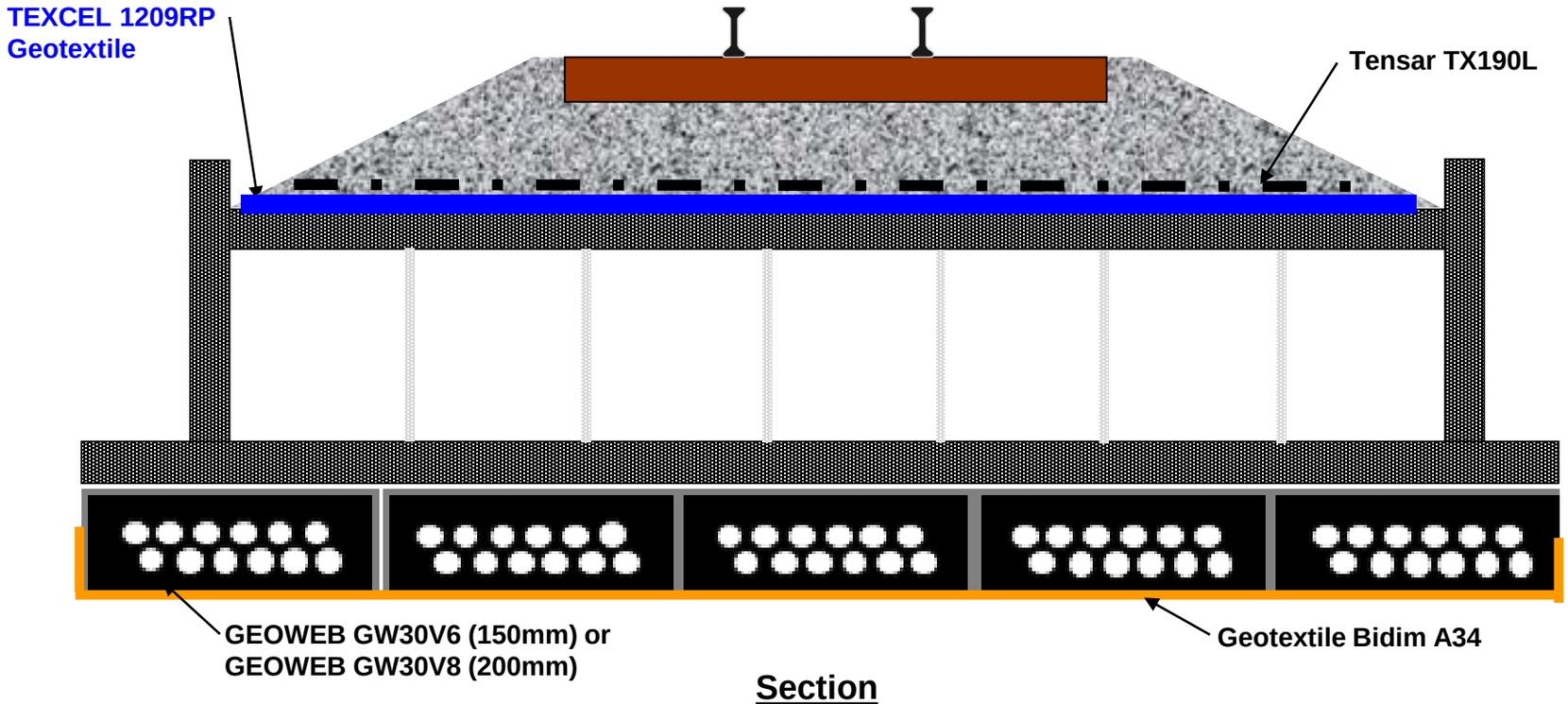


Figure 2 GEOWEB® ATRA® Anchors

Presto's ATRA® anchors make a secure connection with the GEOWEB® cell wall and are faster and easier to drive than J-hooks.

Application Suggestion
Culvert Foundation Stabilisation
Geoweb Option



Section

Construction Procedure:

1. Excavate for culvert base to required depth.
2. Install Geotextile **Bidim A34** directly on excavated surface.
3. Lay **Geoweb** (Depth as per design) directly over **Bidim A34**
4. Infill the **Geoweb** with:
   a) Imported granular material or
   b) An infill of the contaminated excavated ballast and formation could be considered in lieu of imported granular material. A well graded mixture of fines and old ballast is required.
5. Overfill **Geoweb** and compact to max. 50mm.
6. Construct culvert on compacted base.

Advantages:

1. Save 50% or more in excavation.
2. Save 50% or more in imported granular material.
3. If option b) is adopted
   i. There is no requirement for disposal of excavated fouled ballast and formation.
   ii. No testing of excavated material to prove safe to dispose outside of rail corridor (if required).
   iii. No requirement to import new granular material.
   iv. **Geoweb** will provide a stiff platform by confining the infill material and allow the culvert base to be constructed. Refer test data AAR FAST High Tonnage Loop (TTCI) in Pueblo, Colorado

DESCRIPTION:

All dimension in mm

This drawing is a suggestion only. The suggestion needs to be approved by a certified professional engineer with appropriate site specific knowledge prior to implementation. Geofabrics Australasia P/L takes no responsibility for the inappropriate use of this design suggestion.

CLIENT:

GEOWEB®
bidim®

GEOFABRICS®
Smarter Infrastructure

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