

Title : Research Summary Documenting TriAx Geogrid performance

Number	Study	Type	Objectives	Results
1	Accelerated loading on 2 Full-Scale pavements with HMA placed on aggregate base and geogrid stabilized aggregate base(Phase 1)	Accelerated pavement tests with HVS, Analyses	Primary Objective: develop data to quantitatively verify existing Caltrans design methodologies for flexible pavements with TriAx Geogrid. Other objective is to quantify the gravel factor to the composite AB and TriAx layer	Gravel factors greater than 2.2 for aggregated base sections were realized for the aggregate base. This validates HMA and AB reduction for TriAx enhanced pavement sections. Comparison of the measured results between the control and TriAx sections demonstrate the validity of the design method and use of a 2.2 gravel factor for TriAx/AB composite systems.
2	Accelerated loading on 3 Full-Scale pavements with HMA placed on aggregate base and geogrid stabilized aggregate base(Phases 2 & 3)	Accelerated pavement tests with HVS, Analyses	Primary Objective: develop data to quantitatively verify existing Caltrans design methodologies for flexible pavements with TriAx Geogrid. Other objective is to quantify the gravel factor to the composite AB and TriAx layer	Gravel factors greater than 2.2 for aggregated base sections were realized for the aggregate base. This validates HMA and AB reduction for TriAx enhanced pavement sections. Comparison of the measured results between the control and TriAx sections demonstrate the validity of the design method and use of a 2.2 gravel factor for TriAx/AB composite systems.
3	Highway 905 and La Media	Field Test and Long Term Performance Testing	To Validate the field performance during construction as well as provide a long term performance evaluation.	The TriAx geogrid section demonstrated gravel factors greater than 2.2, with less deformation than the control section. Results show that the Flexible Pavement Section underlain by TriAx geogrid is performing as well or better than the control section after 10 years of service
4	Carroll Canyon Road	Field Test and Long Term Performance Testing	To Validate the field performance during construction as well as provide a long term performance evaluation.	The TriAx geogrid section demonstrated an improved gravel factor and less surface deformation than the control section. Results show that the Flexible Pavement Section underlain by TriAx geogrid is performing as well or better than the control section after 10+ years of service.
5	I-5 North Coast Corridor Flexible Sections	Automated Plate Load Testing	To validate field performance of the 0.85 feet AB/TriAx compared to control section of 2.25 feet of AB.	The 0.85 Feet of AB/TriAx had similar composite resilient moduli values with less permanent deformation compared to control section of 2.25 Feet AB. This demonstrates the validity of the design method and use of a 2.2 gravel factor for TriAx/AB composite systems.
6	Navajo 20, US Highway 89T, Page Arizona	Longterm performance testing	Demonstrate the longterm performance of TriAx enhanced pavements with IRI data.	Results show that the 4 inches of Asphalt Concrete underlain by 4 inches of TriAx geogrid is performing well after 6 years of service
7	Structural Condition Assessment of Reinforced Base Course Pavement, USCOE ERDC/CRREL and NHDOT.	FWD and short term performance testing	Evaluate the benefits of geogrid in flexible pavement sections for base course reduction	The US Army Corps of Engineers Cold Regions Research and Engineering Laboratory (CRREL) teamed with the New Hampshire DOT(NHDOT)to perform a structural condition assessment of three distinct pavement sections. The report, released in November 2015, presents the results of a 4-year study focused on a 2-mile section of Pickering road in Rochester, New Hampshire. Seasonal structural assessment consisted of falling weight deflectometer (FWD)testing on all pavement sections. Based on the seasonal back-calculated moduli for 2014 and 2015 values the TriAx stabilized pavement section provided higher moduli than the other sections.
8	Caltrans Contract No. 11-413604, Interstate 8 near El Centro	Automated Plate Load Testing	To validate the improved support characteristics with TriAx on soft Type 3 subgrade soils	Surface of 0.5 feet of AS placed on TriAx was firm and unyielding for HMA Placement. An average composite Mr of 16,533(R-Value > 50) was achieved.
9	Applied Research Associates(ARA) SpectraPave Review	Independent Review of Tensar Design Methods	Third Party Review of Tensar's Design methods validating compliance with AASHTO R-50	Tensar's Design Methods and Calculations are compatible and consistent with AASHTO R50 09.
10	ShacTec Review of Tensar Research Specific to Caltrans Design Methodology	Independent Review of Tensar Design Methods	Validate Tensar California Gravel Equivalent design methods using TriAx geogrids as well as benefits	Tensar's Design Methods and Calculations are compatible and consistent with Caltrans Design Methods and provide financial and environmental benefits

Caltrans/Accelerated Pavement Testing Protocol

