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*Making Conservation a California Way of Life.*

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Subject: Tensar TriAx Geogrid Non-Standard Special Provision (NSSP)

To Whom It May Concern,

District 11 has extensive experience with the Tensar TriAx Geogrid. To date, our district has recommended and installed over 8.5+ million square feet (130+ lane miles). The TriAx geogrid was installed without difficulty and is performing well. Some of the larger projects are listed below:

- Caltrans Contract No. 11-091824 Hwy 905 (La Media Undercrossing, FROM Otay Mesa Rd. to Airway Rd.)
- Caltrans Contract No. 11-413604, Interstate 8 in Imperial County near El Centro From 0.6 Mile West of Anderholt Road Overcrossing To 0.5 Mile East of East Highline Canal Bridge. Implemented by Caltrans as a cost savings measure.
- Caltrans Contract No. 11-2T1804, Hwy 805 South
- Caltrans Contract No. 11-2T0814, I15 Managed Lanes Project
- Caltrans Contract No. 11-091834, HWY 905 in San Diego from 1.2km east of Route 905/805 separation to 0.3 km west of the United States – Mexico border
- Caltrans Contract No. 11-080234, State Route 98
- Approved for use on upcoming Caltrans Contractor Numbers: 11-2T21714, 11-2T2114, 11-2T2124 Interstate 5 North Coast Corridor Project, which will be an additional 50 lane miles.

In the above projects, our recommendations for using TriAx Geogrid include the following:

- Mainline Rigid pavement:
    - TriAx geogrid has been recommended to reduce the thickness of the aggregate base layer, placing a minimum 0.35' aggregate base on top of the TriAx geogrid, when

Type 2 Subgrades (firm) are encountered. When Type 3 subgrades (pumping) are encountered on contract No.11-413604, District 11 has used TriAx geogrid with a minimum of 0.50' aggregate base to provide a firm construction platform for the paving machines.

- Flexible pavement shoulders/ramps/Port of Entry (POE)/ State Highways: TriAx geogrid has been used on various projects to reduce the thickness of the Hot Mix Asphalt and Aggregate Base layers.

Caltrans District 11 uses the non-standard special provision (NSSP) for the TriAx geogrid on the above projects. In part 2 of the TriAx Geogrid non-standard special provision (NSSP), the performance requirements were established using the CAL/APT Program validation process. The enhanced pavement sections with TriAx geogrid NSSP have been compared to traditional control sections (no geogrid) to quantify the benefit of the geogrid. The TriAx NSSP has been tested on three separate phases of Accelerated Pavement Testing (APT) in accordance with National Cooperative Highway Research Program (NCHRP) standards.

District 11 has participated in the TriAx NSSP published research study (GeoCongress 2012) on Caltrans project 11-091834, at the location of the City of San Diego La Media Undercrossing on the 905, installed seven years ago. The TriAx geogrid pavement sections are performing well. Additional research was conducted on TriAx NSSP on Caltrans Project 11-413604, underneath the mainline rigid pavements of Interstate 8.

The main reasons District 11 uses TriAx geogrid NSSP to enhance the pavement sections are as follows:

- Cost Benefits: Thinner hot mix asphalt and aggregate base sections are constructed on TriAx NSSP with equal or better performance compared to thicker hot mix asphalt and aggregate base sections without geogrid. TriAx NSSP enhanced pavement sections have saved the District millions of dollars, thousands of trucks, and increased the speed of construction, which is important to the tax payers.
- Performance, Operation and Maintenance Benefits: The TriAx geogrid NSSP interlocks and stiffens the aggregate base making it more uniform during construction and retains the stiffness during the life of the pavement.

  - This improves the pavement wearing surface. Risk is reduced by minimizing the potential for pavement stress over non-uniform subgrades and base materials.
  - Due to short working windows for the ramps (10 to 30 days) and aggressive schedules, the TriAx NSSP Geogrid enhanced pavement sections improve construction efficiencies by allowing our District to stay on or ahead of our construction schedule, opening roads sooner to the public
- Environmental Benefits: The enhanced TriAx NSSP pavement section designs allow our team to create a sustainable project meeting several of the goals in the Caltrans Sustainability Policy DP-33, such as Planet, Prosperity, and Innovation.
  - Truck reduction
  - Less impact on surrounding streets.
  - Water reduction
  - Carbon emission reduction
  - Improved safety

Sincerely,

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