

I-5 North Coast Corridor (NCC) (Contract No. 11-2T2184)

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2. PROJECT CHALLENGES
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 - IMPROVED CONSTRUCTABILITY AND SUSTAINABILITY
4. FINAL TYPICAL SECTIONS ON THE PLANS
5. PERFORMANCE VERIFYING DESIGN CHANGE

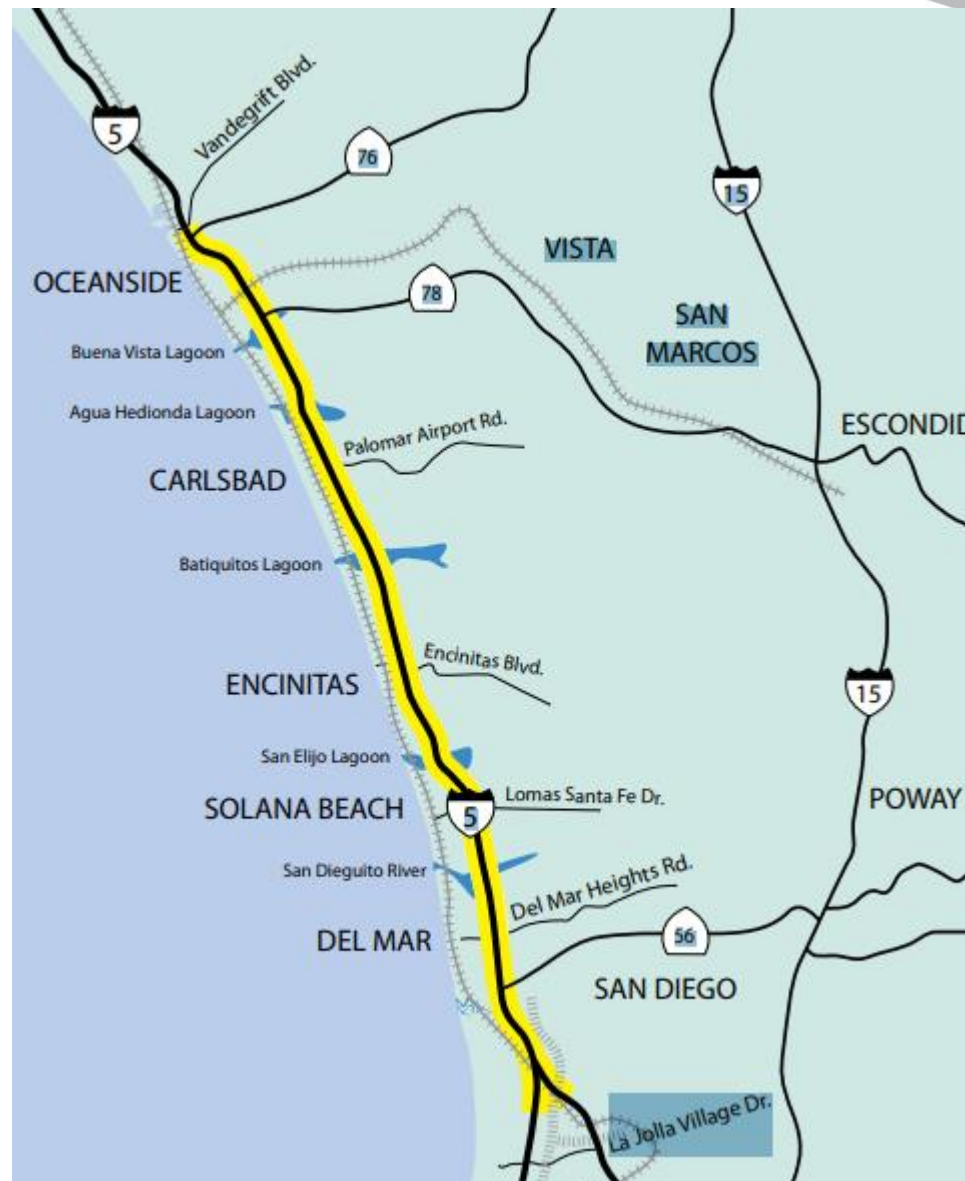
1. Project Overview

The Project

This 27-mile project will add highway lanes and operational improvements to provide mobility choices for motorists on Interstate 5 (I-5) in the northern San Diego region.

The project extends along I-5 from La Jolla Village Drive in San Diego to Vandegrift Boulevard in Oceanside. The corridor is critical both for commuters and goods movement.

- » Two Express Lanes in each direction will be added from La Jolla Village Drive to Vandegrift Boulevard. The Express Lanes will be free for carpools, vanpools and buses and available to single-occupant vehicles for a fee.

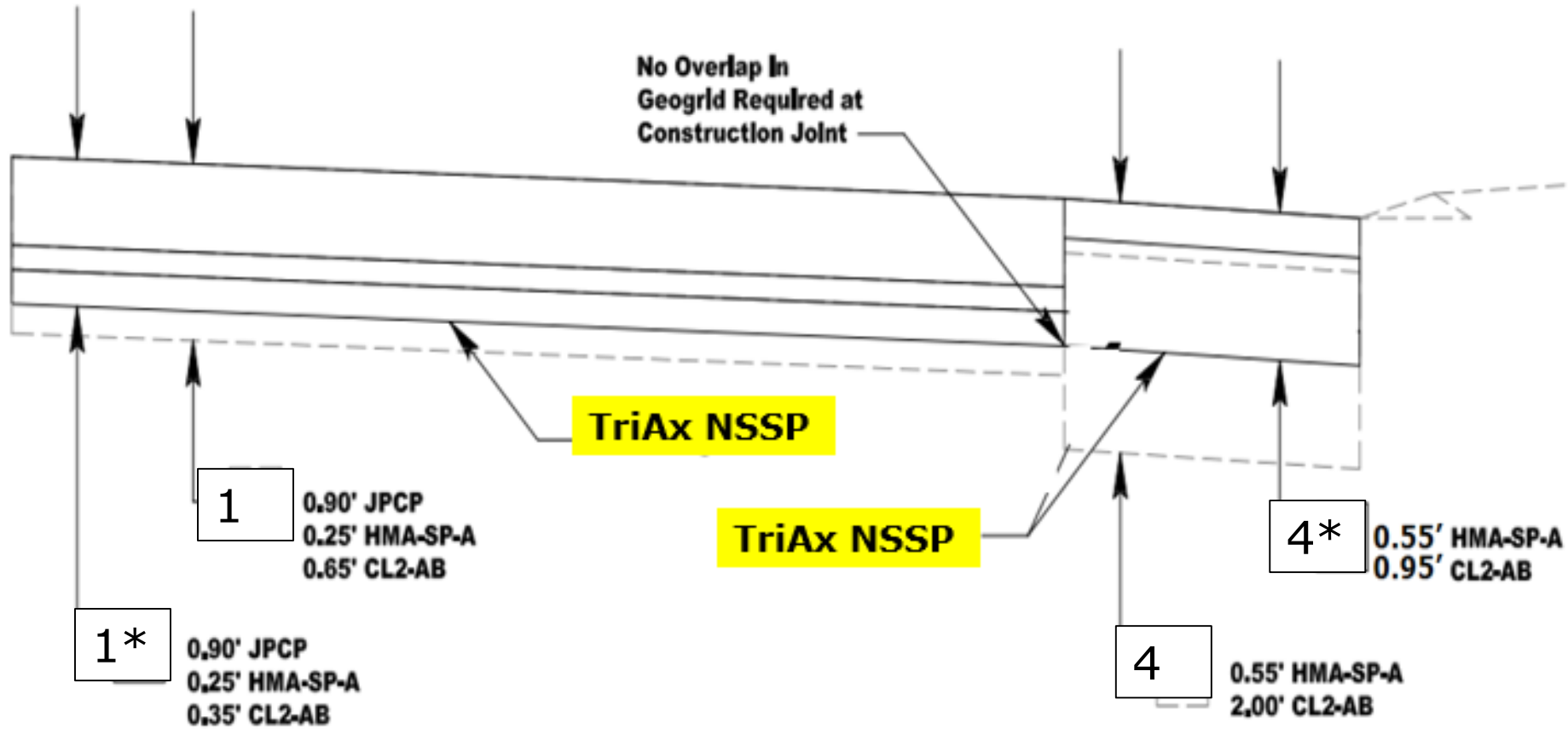


2. Project Challenges

- CMGC Project Value Engineering/Sustainability Requirements
- Overall an aggressive schedule
- Short working windows for lane closures
- Constrained Footprint/ Lack of staging areas. Therefore, the ability to store roadway ex/ aggregate base is limited.
- Being an export project that will require the export of on-site material that will contribute to traffic congestion and increased risk for project delays
- Environmental issues being close to the ocean and lagoons

3. BENEFITS OF VALUE ENGINEERING DESIGN CHANGE

TriAx Value: Uniform Subgrade, Cost Reduction, Time Reduction

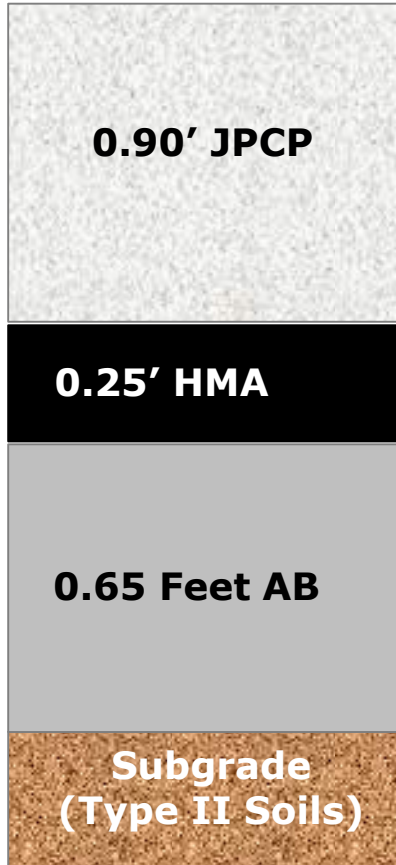


3. BENEFITS OF VALUE ENGINEERING DESIGN CHANGE

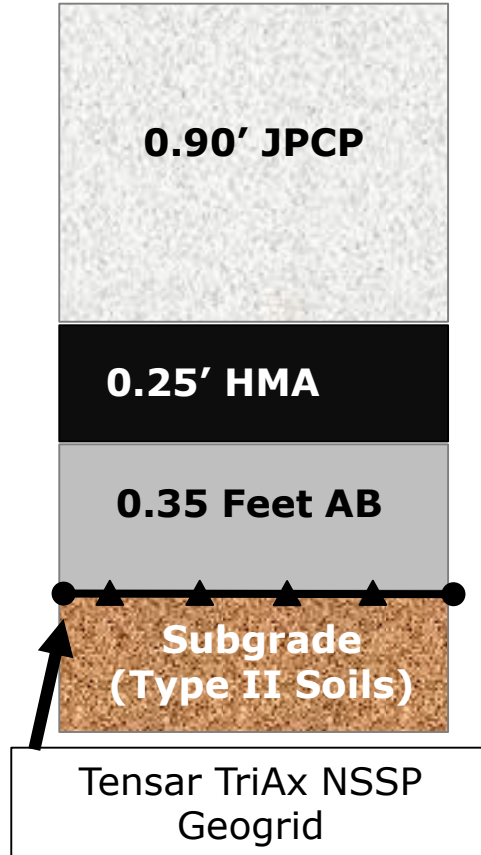
Outside Travel Way

HOV Lane

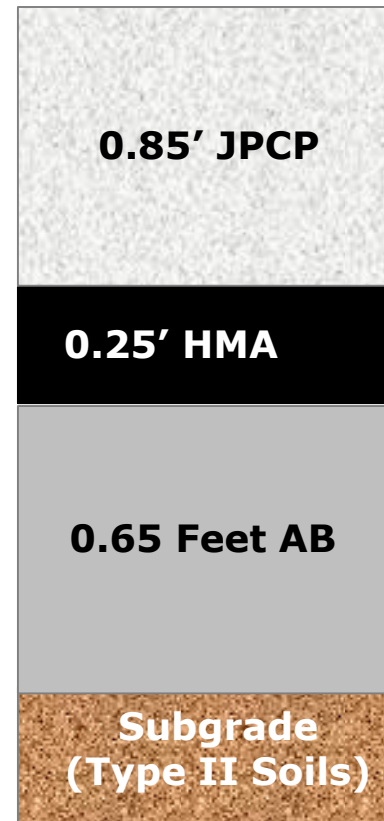
Alternate Non-Stabilized Section



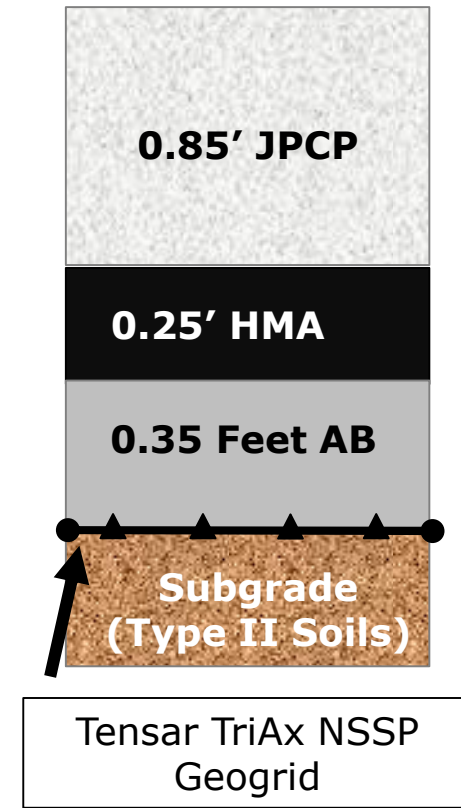
TriAx Geogrid NSSP Enhanced Section



Alternate Non-Stabilized Section



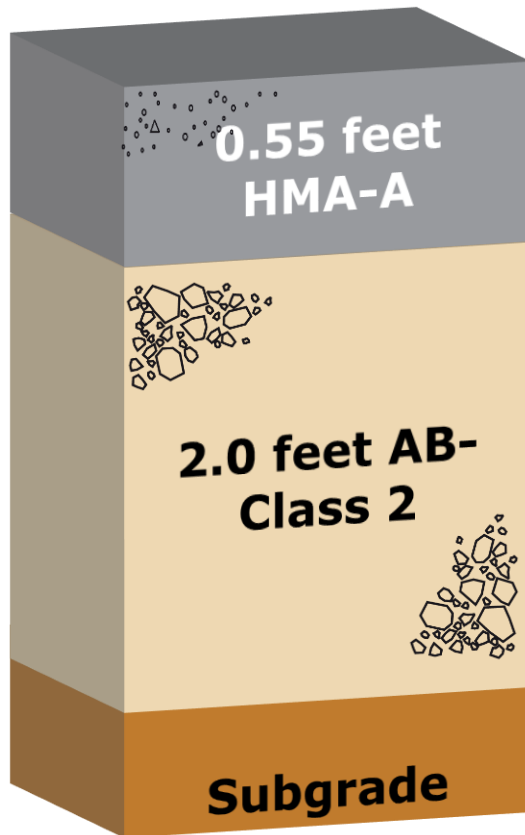
TriAx Geogrid NSSP Enhanced Section



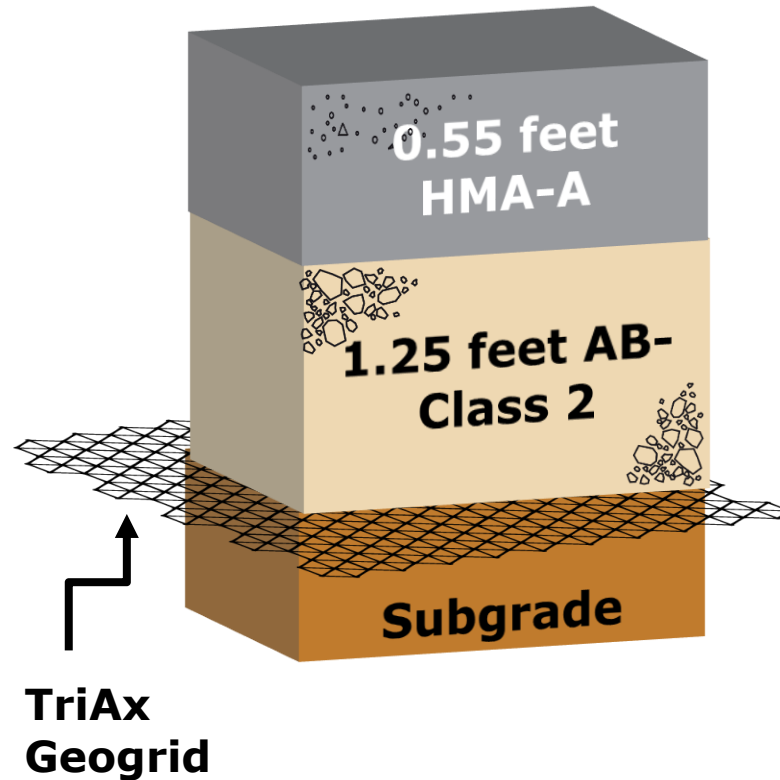
3. BENEFITS OF VALUE ENGINEERING DESIGN CHANGE

RAMPS: TI = 11.0, Subgrade R-value=10

Non-Stabilized Section



TriAx Enhanced Section



Construction, Operation, and Maintenance Summary

Meeting Caltrans Sustainability Goals

Description	Units	Sustainability Enhancement
Aggregate Base Import	Cubic Yards	-60,000
Excavation Export	Cubic Yards	-60,000
Truck Loads	Number	-10,000
Water	Gallons	-1,500,000
Fuel	Gallons	-35,000
Carbon Output Emissions	Tonnes of CO ₂	-2,500
Cost Savings	\$	\$3,000,000

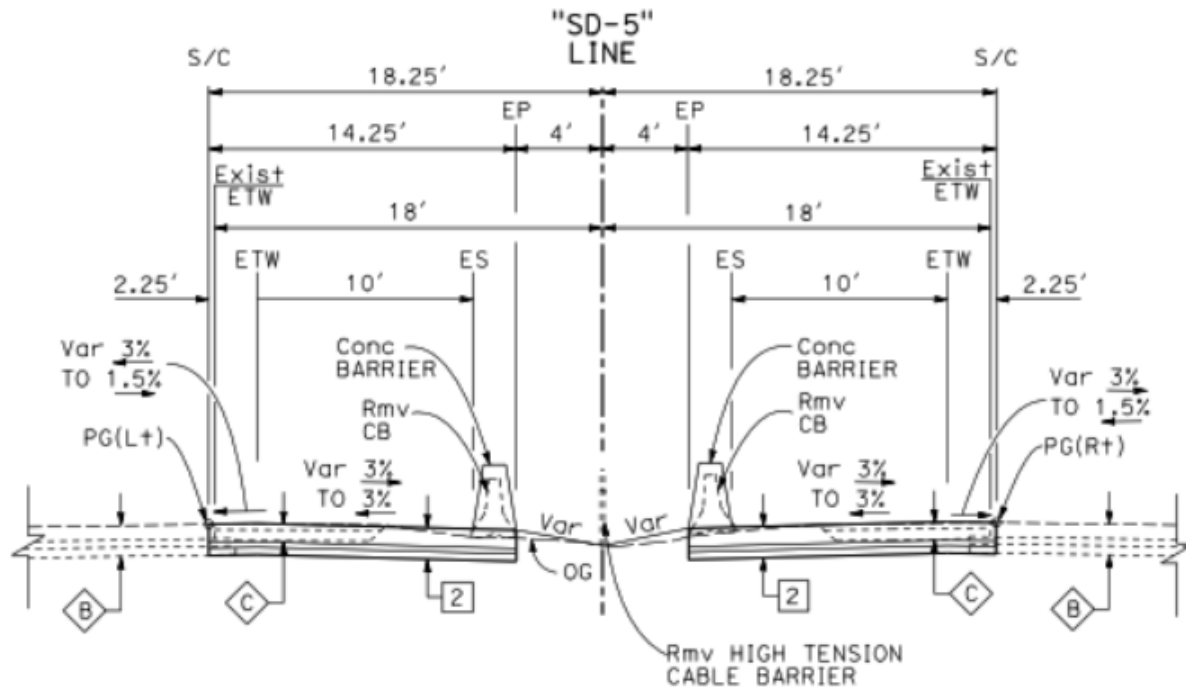
‡ Safety: Less trucks entering and exiting construction site, reducing time spent during temporary closures, decrease the number of pavement work zones.

‡ Construction: 50% less AB Installation and significant reduction in export, allowing for an increase in the speed of construction

‡ Maintenance : Uniformity of the foundation below the pavement maximizes investment to keep it in a state of good repair, perpetual pavement

‡ Environment: Fewer trucks reduces carbon emission, less impact to communities, minimizes dust control and tracking of soil on dedicated haul routes.

4. TYPICAL SECTIONS ON PLANS



- 1 0.90' JPCP
0.25' HMA (TYPE A)
0.35' CLASS 2 AB
TRIAx GEOGRID

- 2 0.85' JPCP
0.25' HMA (TYPE A)
0.35' CLASS 2 AB
TRIAx GEOGRID

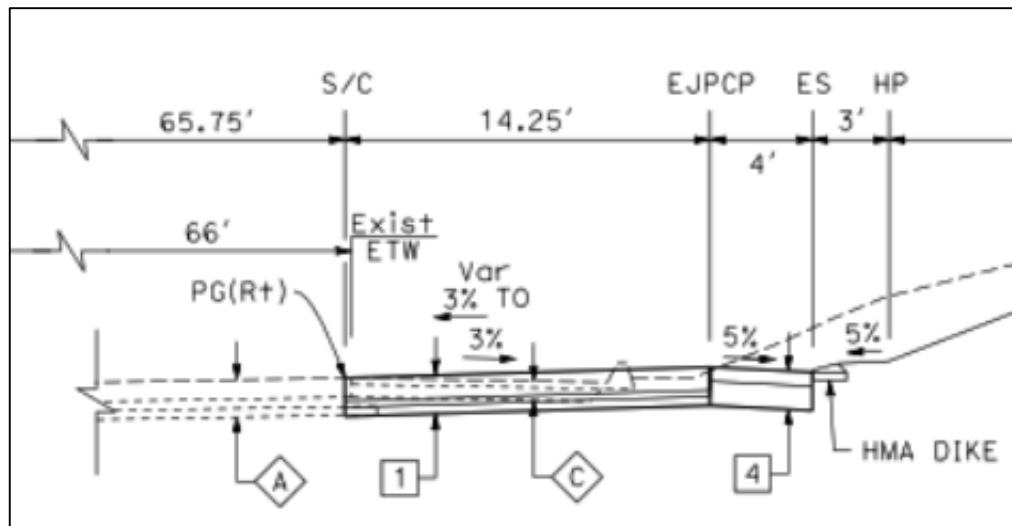
- 3 0.90' JPCP (RSC)
0.75' LCBRS

- 4 0.15' RHMA (TYPE G)
0.40' HMA (TYPE A)
0.95' CLASS 2 AB
TRIAx GEOGRID

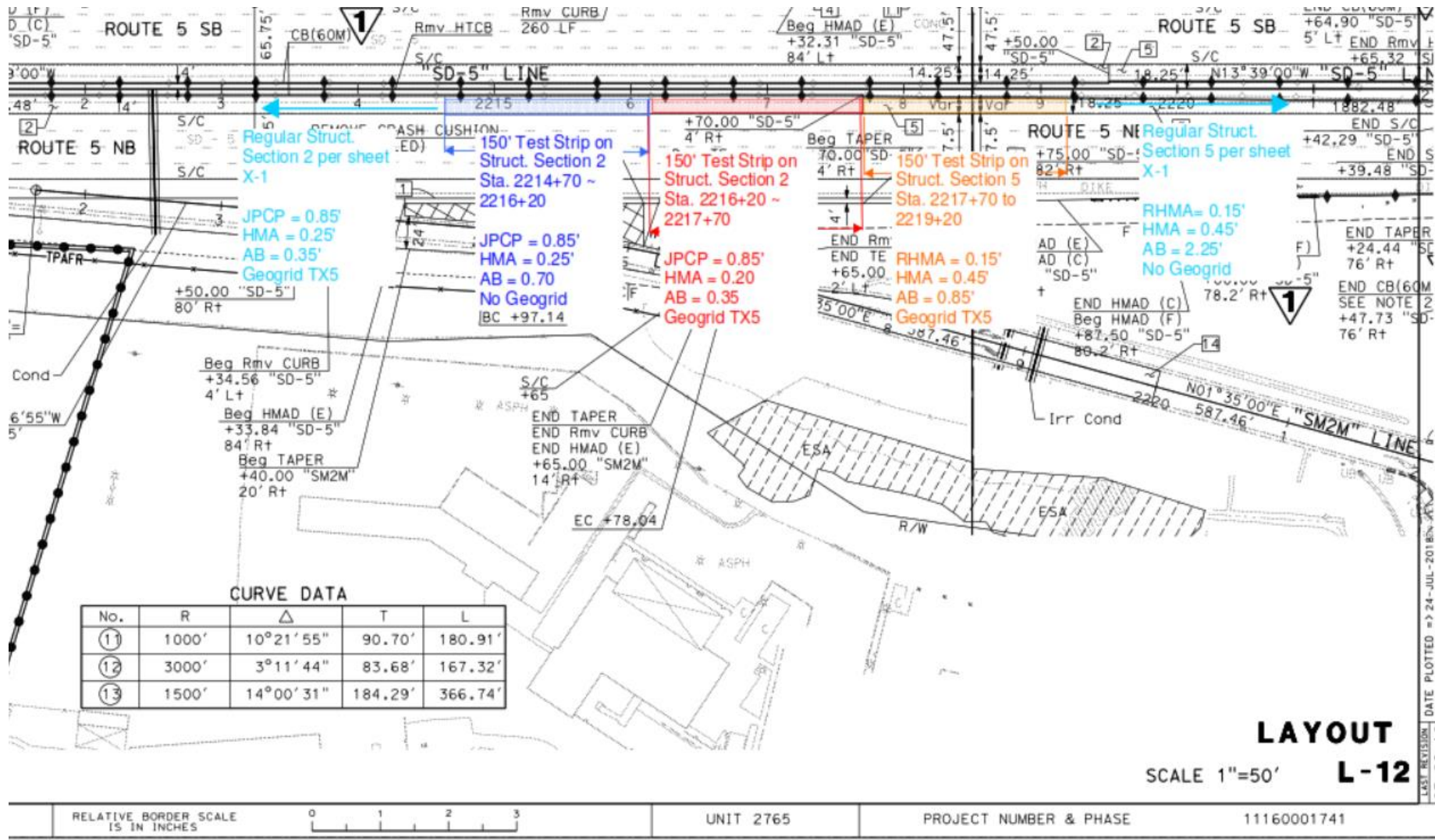
- 5 0.15' RHMA (TYPE G)
0.45' HMA (TYPE A)
2.25' CLASS 2 AB

- 6 0.15' RHMA (TYPE G)
0.60' HMA (TYPE A)
2.65' CLASS 2 AB

- 7 0.15' RHMA (TYPE G)
0.40' HMA (TYPE A)
1.25' CLASS 2 AB
TRIAx GEOGRID



5. PERFORMANCE TESTING LOCATIONS ON PLANS



Site Conditions and Pictures



5. PERFORMANCE TESTING RESULTS

Because the 0.35 feet AB on TriAx section increased the AB resilient modulus by 15% and reduced AB surface deformation by 40% compared to the 0.70 feet AB section, the 0.35 feet on TriAx layer creates a more uniform layer for the overlying wearing surfaces consisting of asphalt concrete or Portland cement concrete. Research paper is available.

