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Michigan CEW 2026
MIRAFI® H_2Ri

The Road to 100-Year Pavement Foundations

3 February 2026
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eader in Environmental Infrastructure Solutions

Wor

My email…

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Our roads…
Where are we today?

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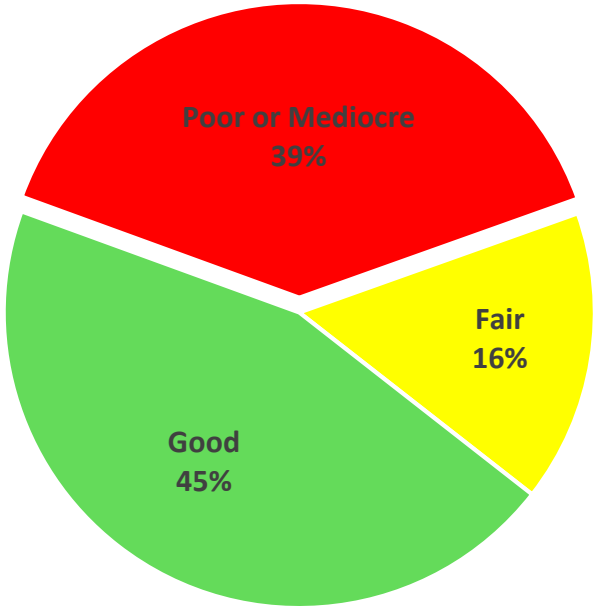
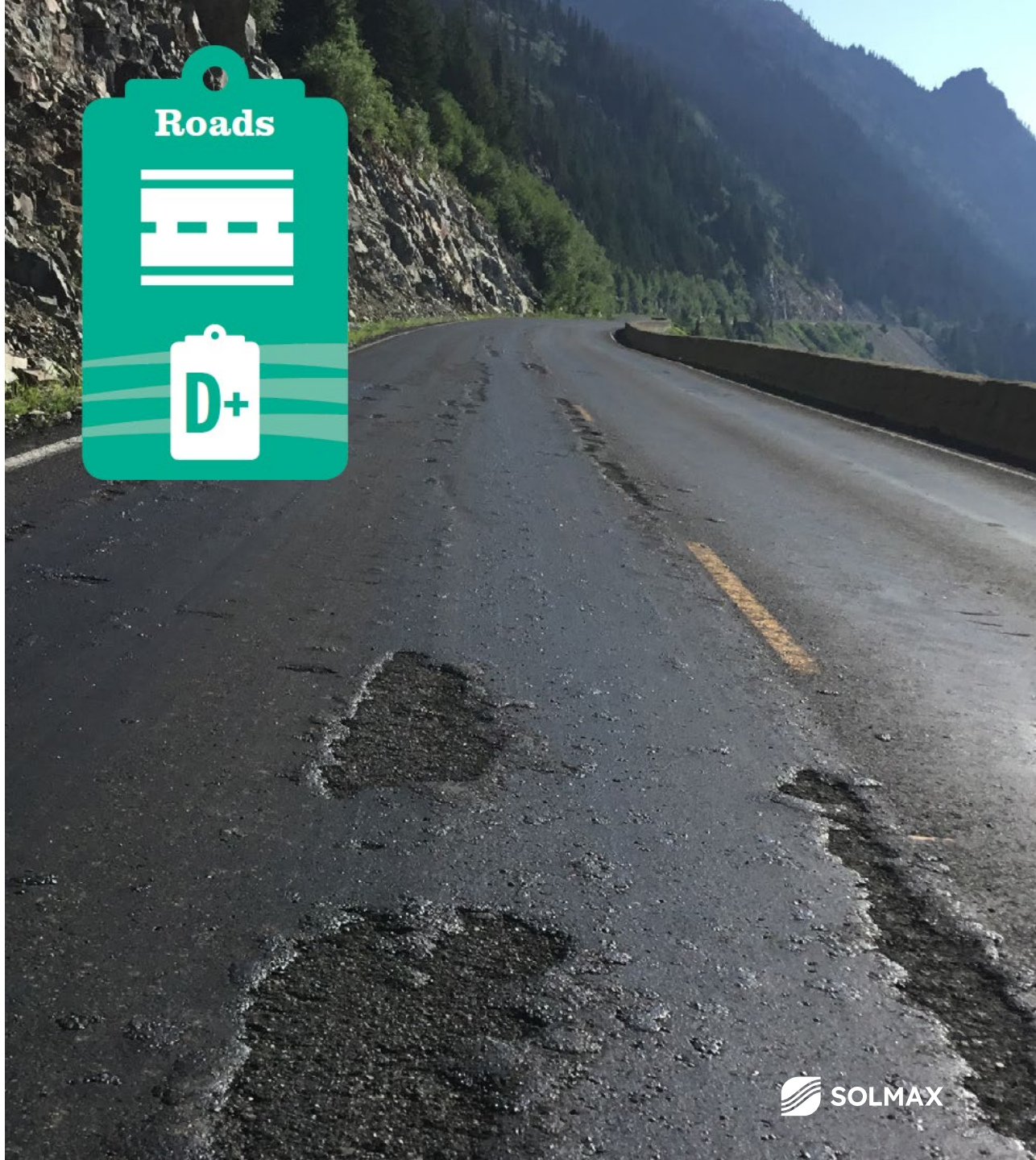
2025

ASCE Report Card on Roads

- > **4.1 million miles** of public roadways in US
- Pavement failure: **traffic, moisture and climate**





2025

ASCE Report Card on Roads

- **~122,040 miles** of public roadways in **Michigan**
- Pavement failure: **traffic, moisture and climate**

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The Road to 100-Year Pavement Foundations

MIRAFI H_2Ri

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Geosynthetics…

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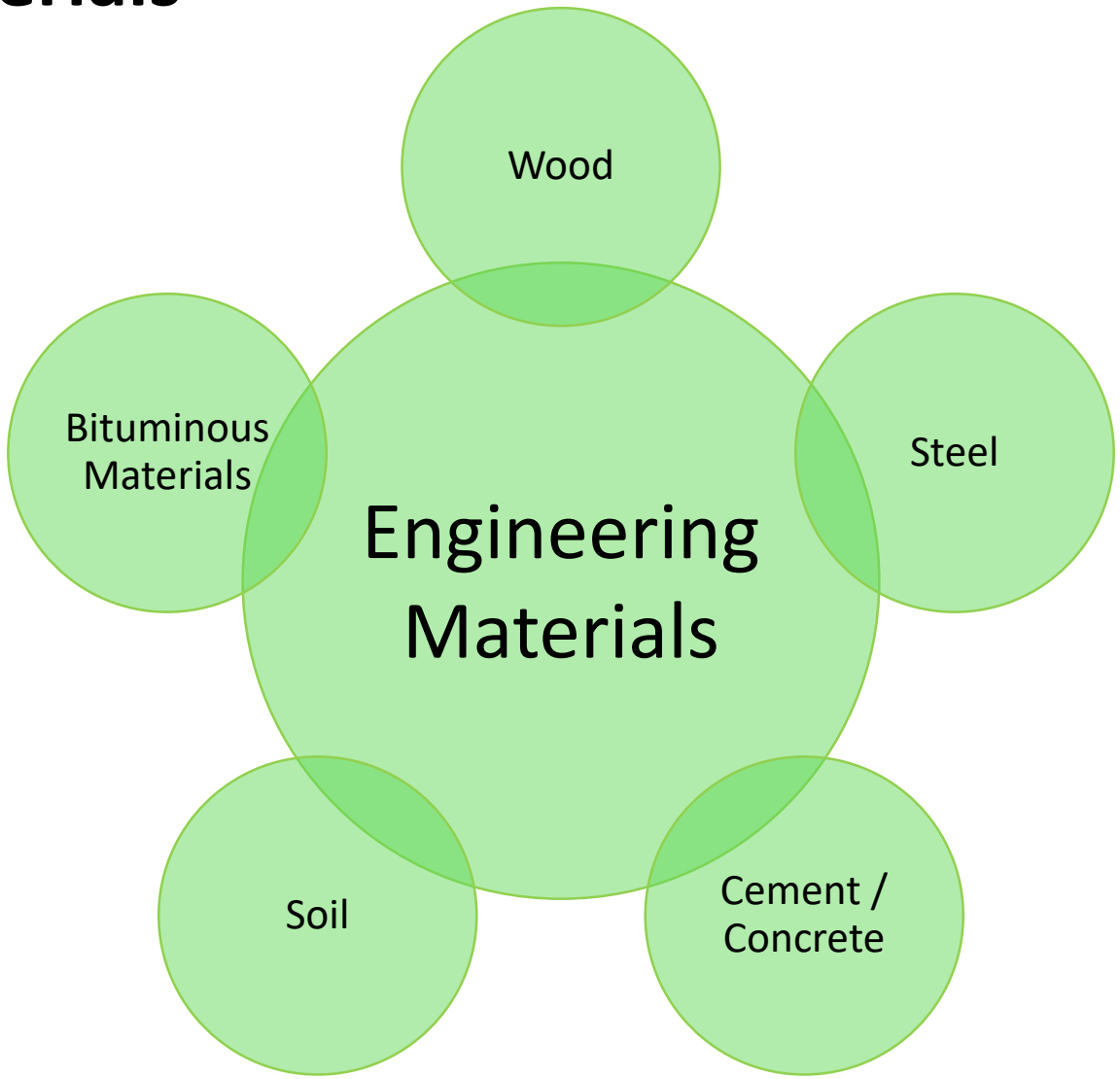
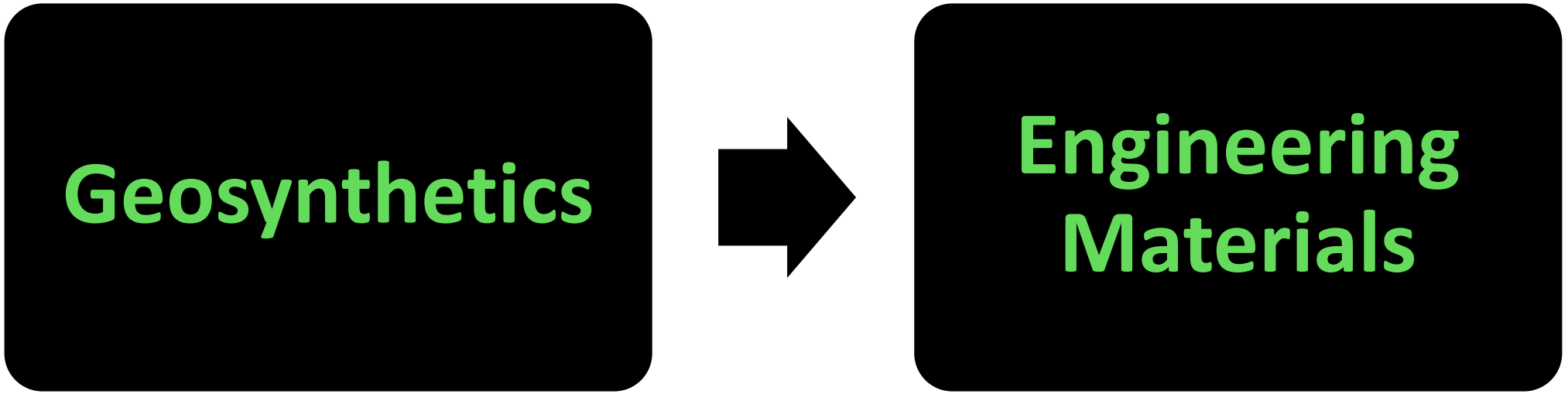
Engineering Materials

Engineering Materials

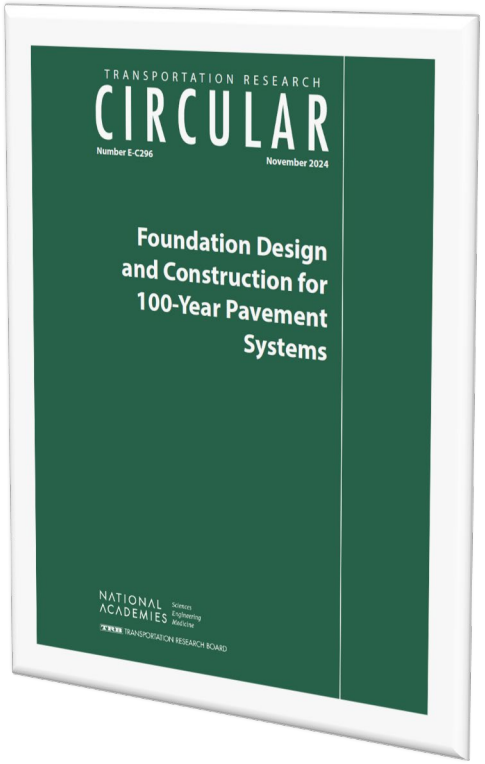


Engineering Materials

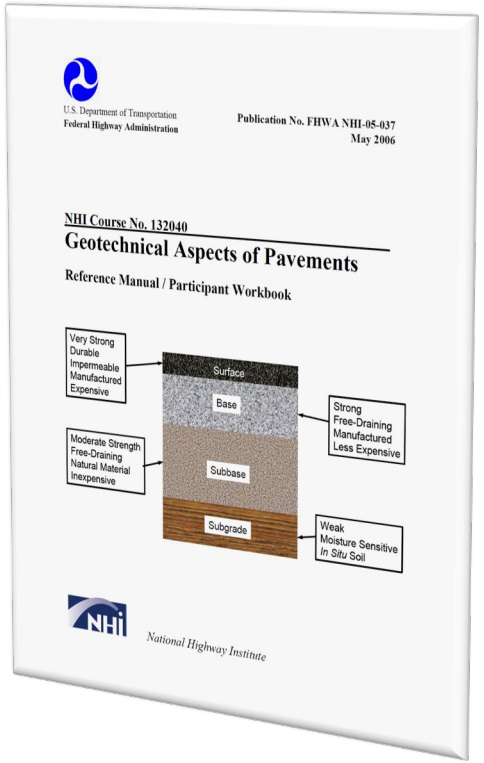


Let’s focus on three documents

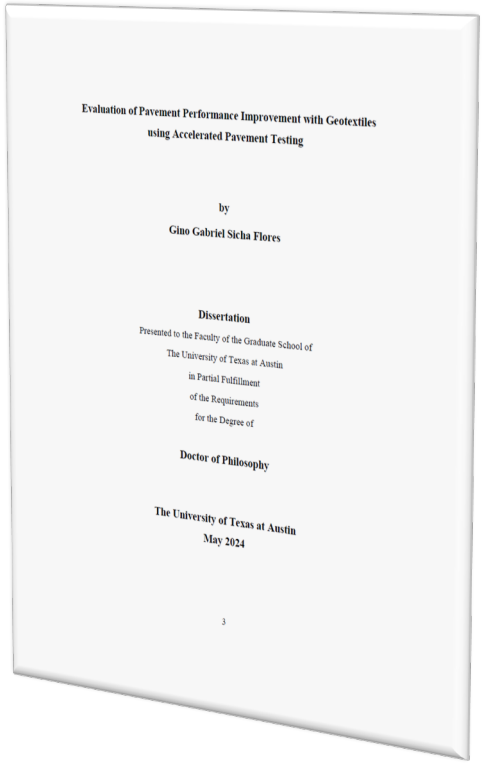
Transportation Research Board Circular



FHWA: Geotechnical Aspects of Pavements



University of Texas @ Austin: Accelerated Pavement Testing



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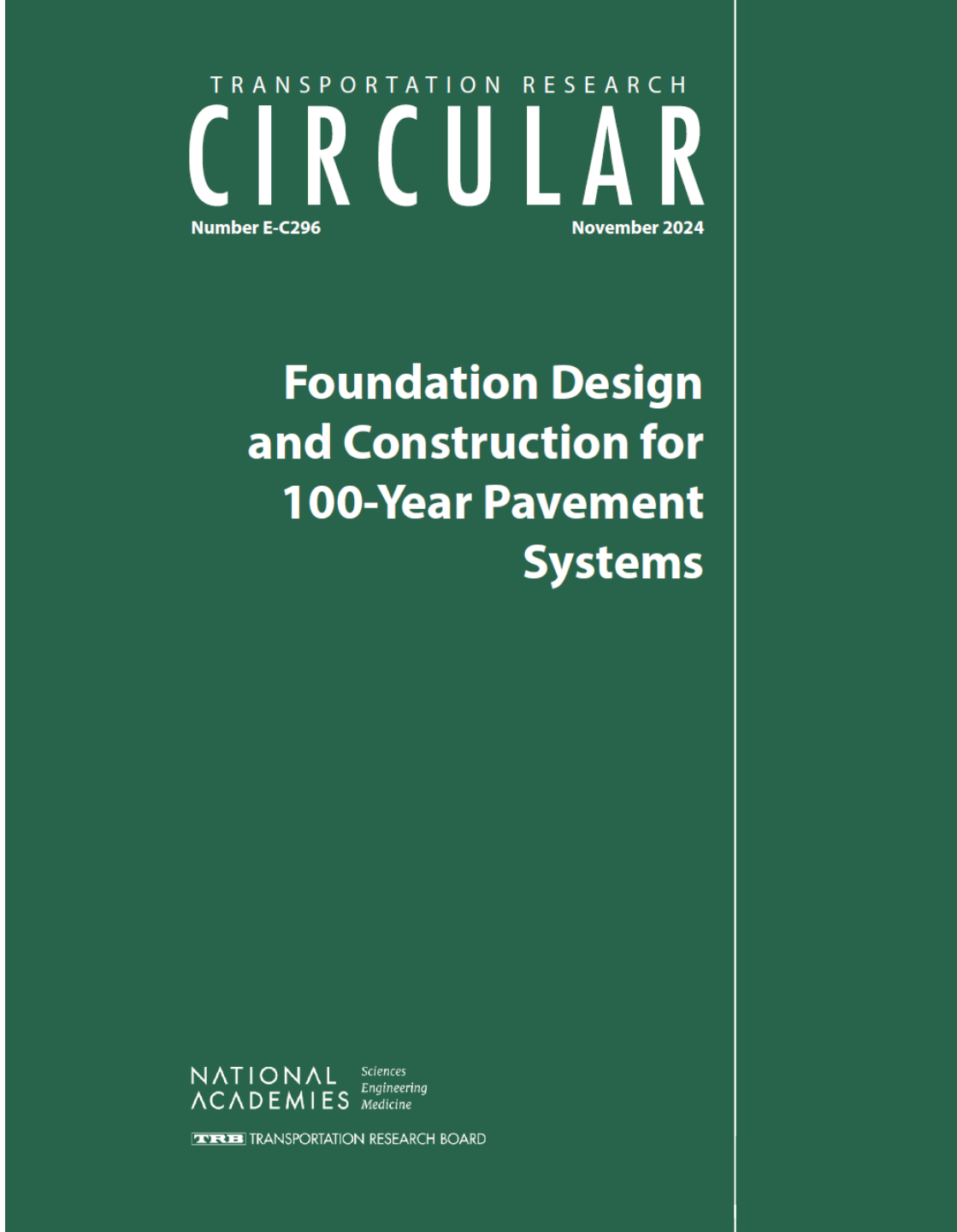
Circular E-C296 – November 2024

Transportation Research Board

- Workshops conducted in 2023, 2024 & 2025
- 68 page circular published (2023/24)



TRB Circular E-C296 – November 2024

Key recommendations to attain a 100-year pavement foundation

- Evaluate projects for **increased sustainability and resiliency**… to achieve long-term performance.
- “Quantify the benefits and costs of geomaterial stabilization materials, such as **geosynthetics**”
- “**Deploy geosynthetics** and other stabilizing materials **to provide sustainable and effective solutions** for long-term durability, adequate support, and pavement foundation uniformity”
- “Pavement foundation design using durable and resilient geomaterials including **improved control of moisture variation** to increase the long-term performance”
- “Quantify the benefits and costs of constructing and maintaining durable foundations with **effective drainage** during the expected long-term performance period of the pavement foundation asset”

TRB

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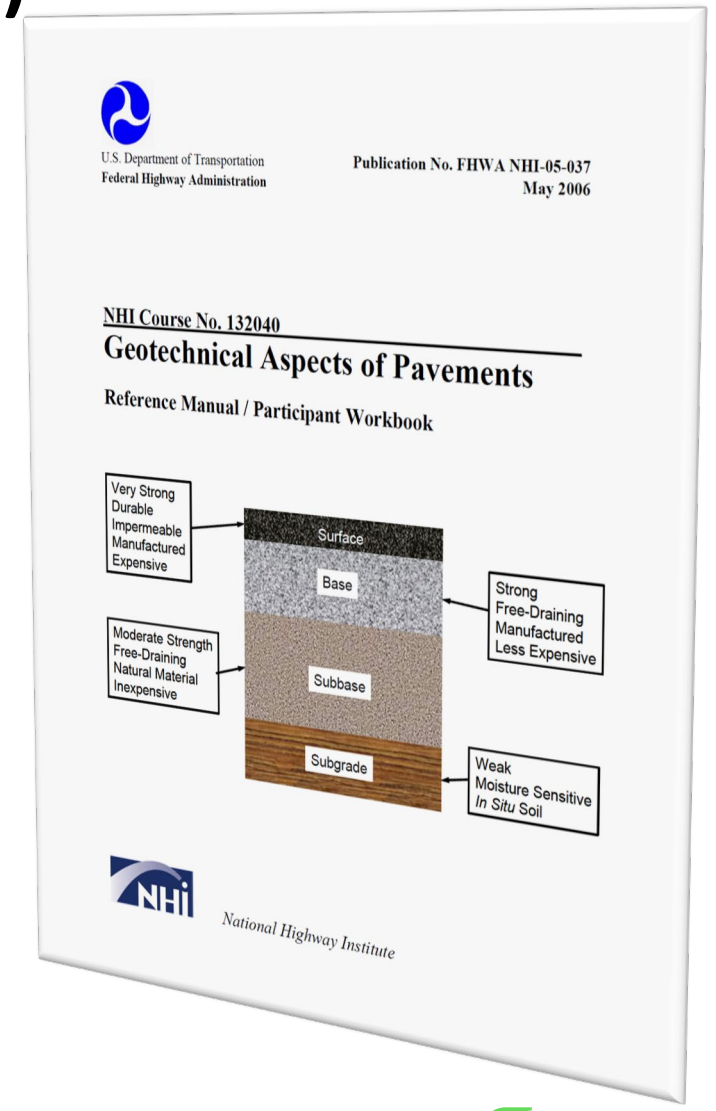
FHWA – Report No. NHI-05-037 (Course No. 132040)

Geotechnical Aspects of Pavements (May 2006)

"Pavement failures may occur due to the ***intrusion of subgrade soils*** *into the granular base…* ***excessive loads****… surface fatigue… excessive settlement, volume change, freezing and thawing of the subgrade…* ***inadequate drainage of water*** *from the base and subgrade"*



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These issues are costly

- Motorists pay **> $725 every year** in additional vehicle operating costs
- Potholes cost US motorists **> $26 billion every year**
- **$684 billion funding gap** to 2035
- **Average annual investment of $151.1 billion** needed annually until 2038
- Pavement rehabilitation costs **20-30% higher** in expansive soils, **10%-20% higher** in frost susceptible soils

FHWA – NHI-05-037

Geotechnical influences on major distresses in flexible pavements

	Fatigue Cracking	Rutting	Corrugation	Bumps	Depressions	Potholes	Roughness
Contamination	✓	✓			✓		✓
Insufficient Base Stiffness/Strength	✓	✓	✓		✓		✓
Insufficient Subgrade Stiffness/Strength	✓	✓					✓
Moisture/Drainage Problems	✓	✓			✓	✓	✓
Freeze/Thaw	✓	✓	✓	✓	✓	✓	✓
Swelling				✓			✓

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FHWA – NHI-05-037

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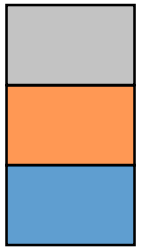
Swelling				✓			✓



Separation

Reinforcement

Moisture management

Road to 100-year pavement foundation

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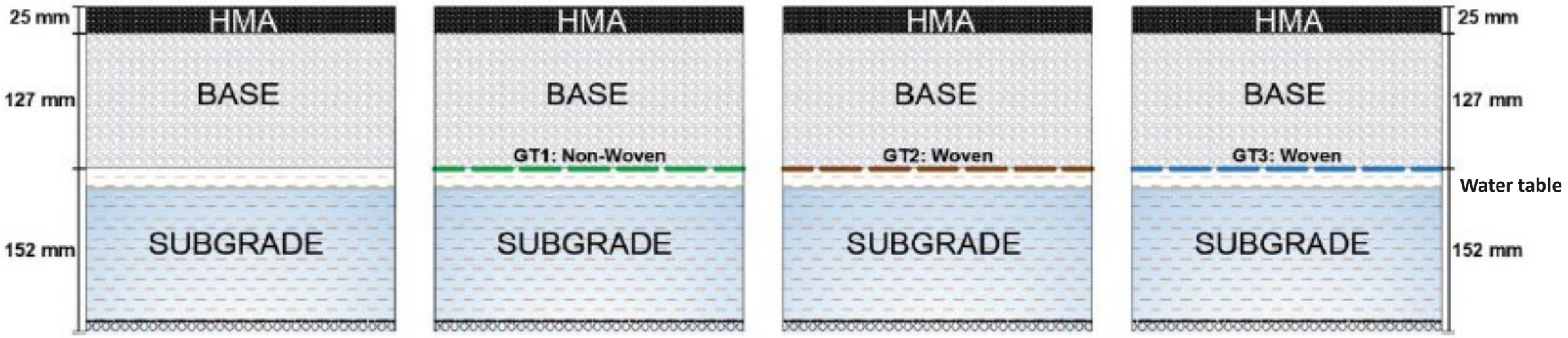
University of Texas at Austin

Evaluation of Pavement Performance Improvement with Geotextiles Using Accelerated Pavement Testing



Control Section	Section with separation geotextile	Section with separation + reinforcement geotextile	Section with separation + reinforcement + moisture management geotextile

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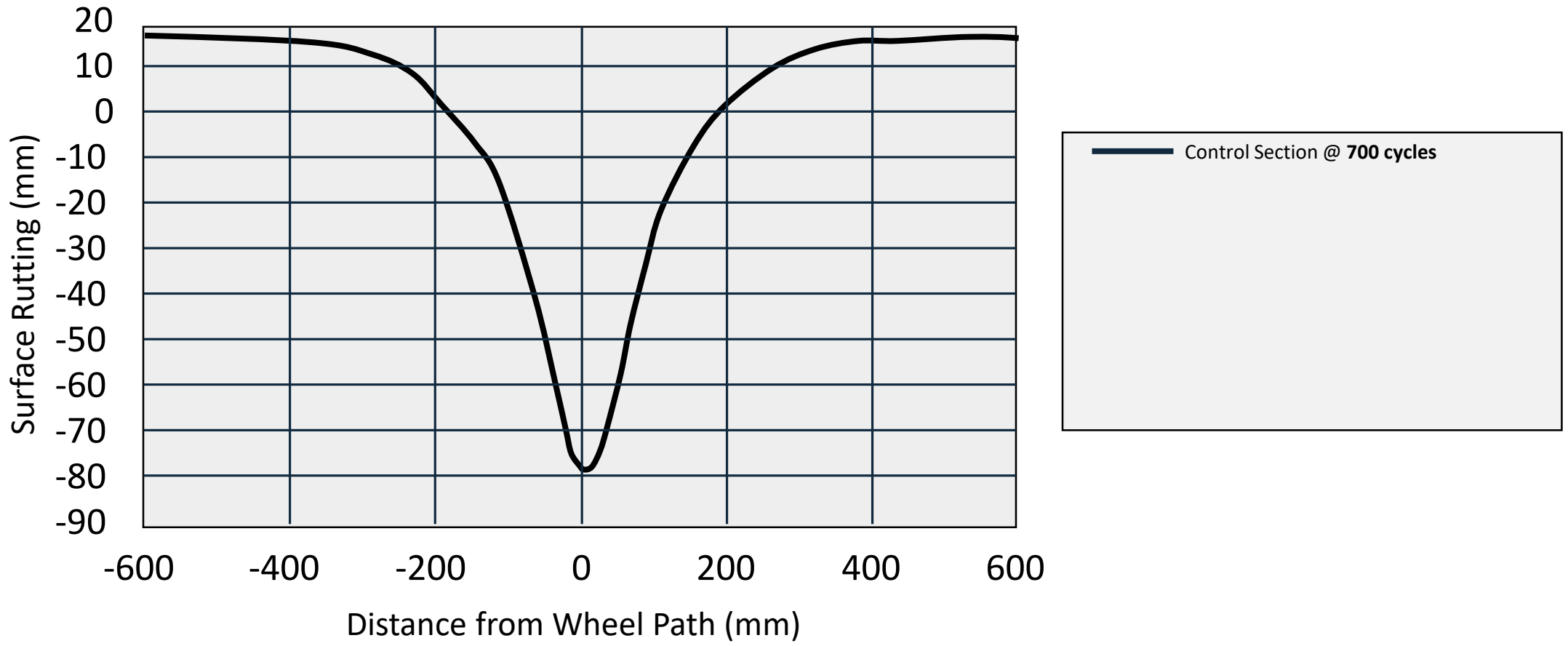
Pavement rutting profiles at different loading cycles

University of Texas at Austin – Accelerated pavement testing



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FHWA – NHI-05-037

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Freeze/Thaw	✓	✓	✓	✓	✓	✓	✓
Swelling				✓			✓

Separation

Reinforcement

Moisture management

Status Quo

Road to 100-year pavement foundation

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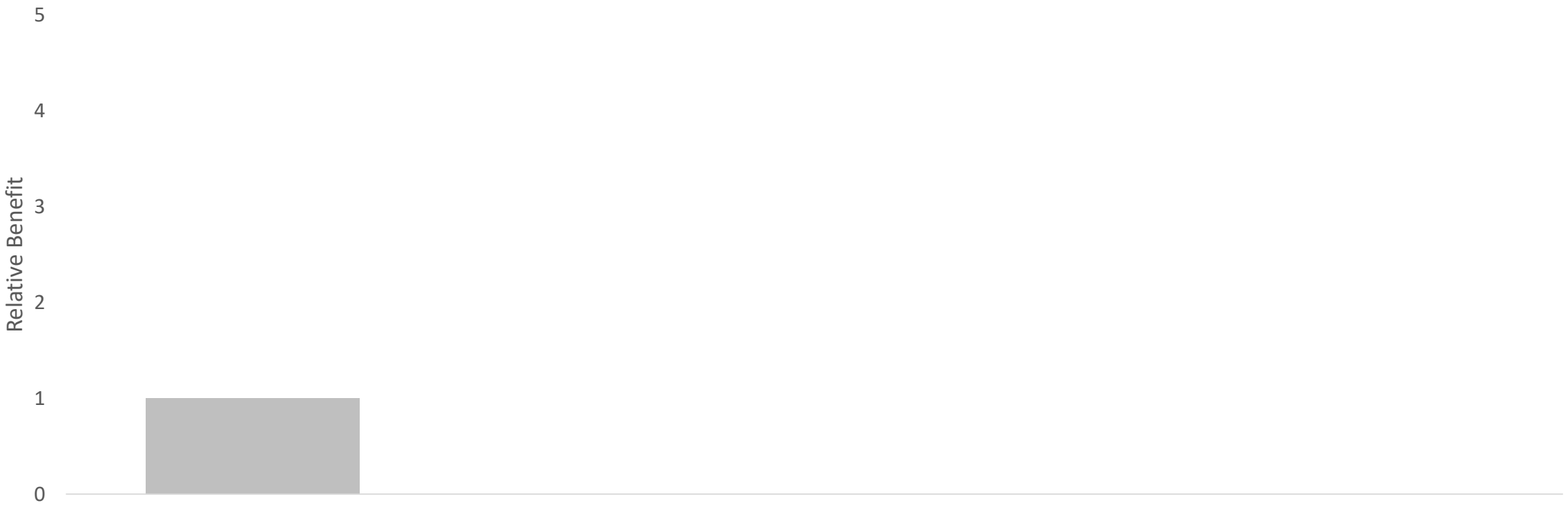
University of Texas at Austin

Compounding function benefit to roadways



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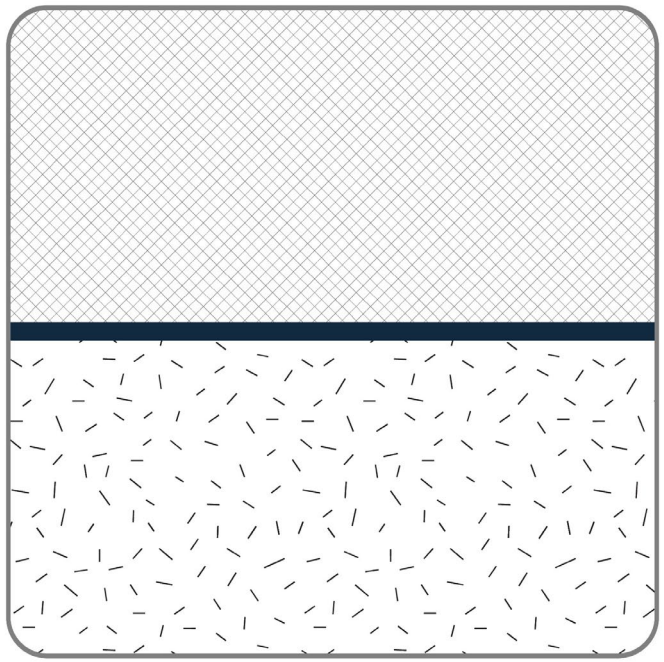

SEPARATION

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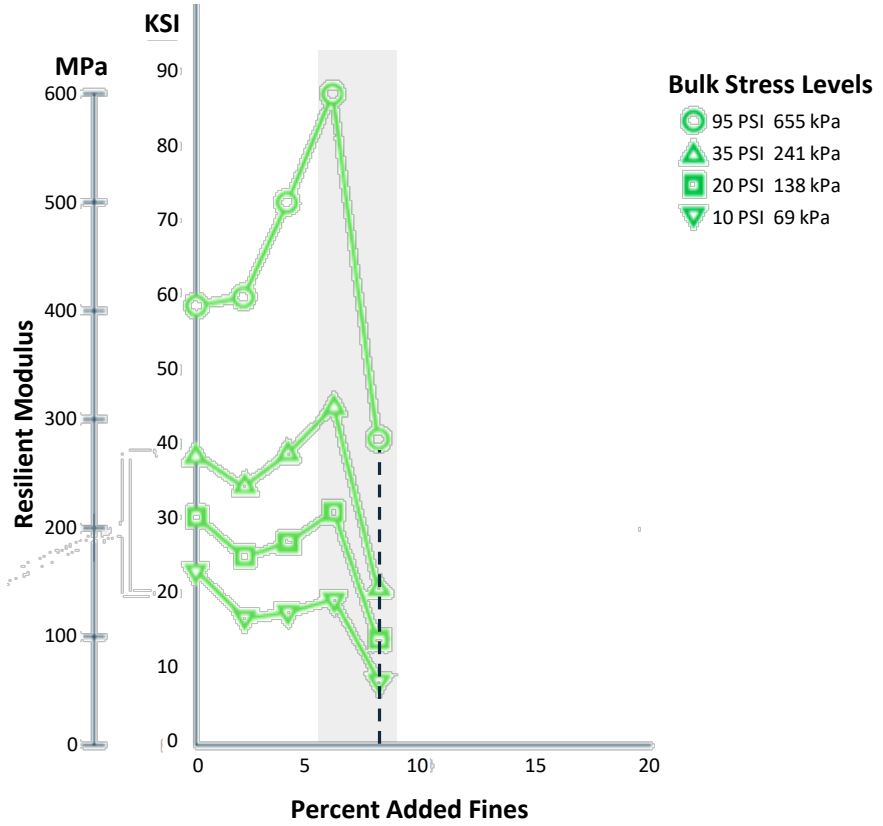
The importance of separation in roadways

Gravel road without separation geotextile



Less than 10% fines contamination of the unbound aggregate base can **lower its effective strength by as much as 50%**

-Jorenby & Hicks (1986)-

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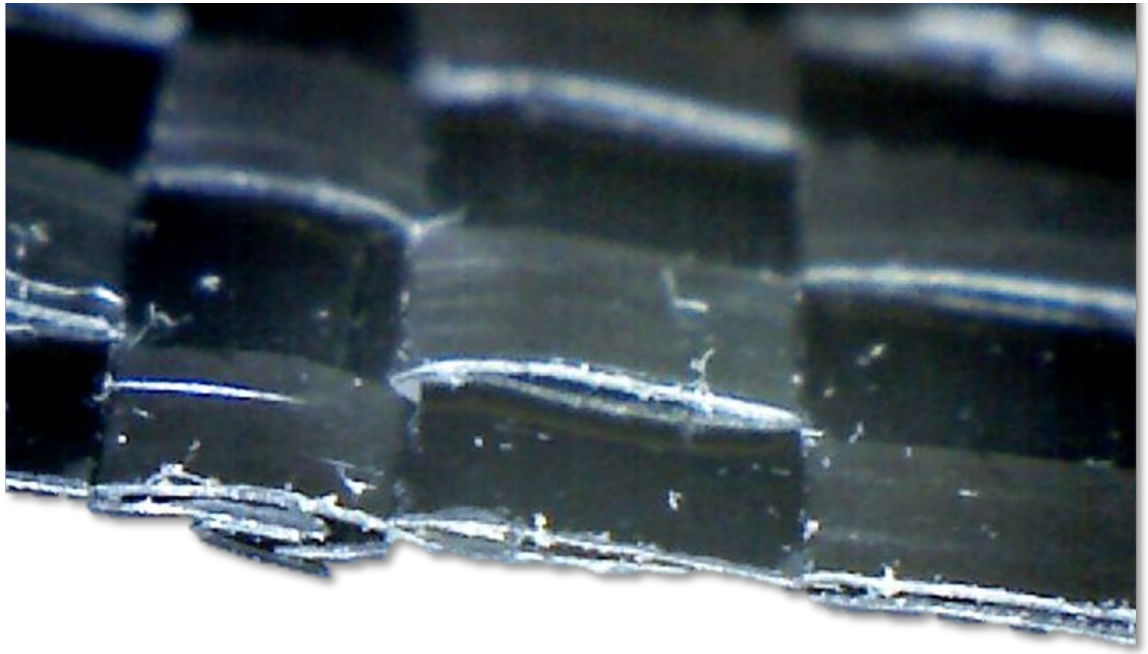
Not all separation geotextiles are created the same

Nonwoven geotextile



Slit tape geotextile

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Slit tapes have poor water flow characteristics

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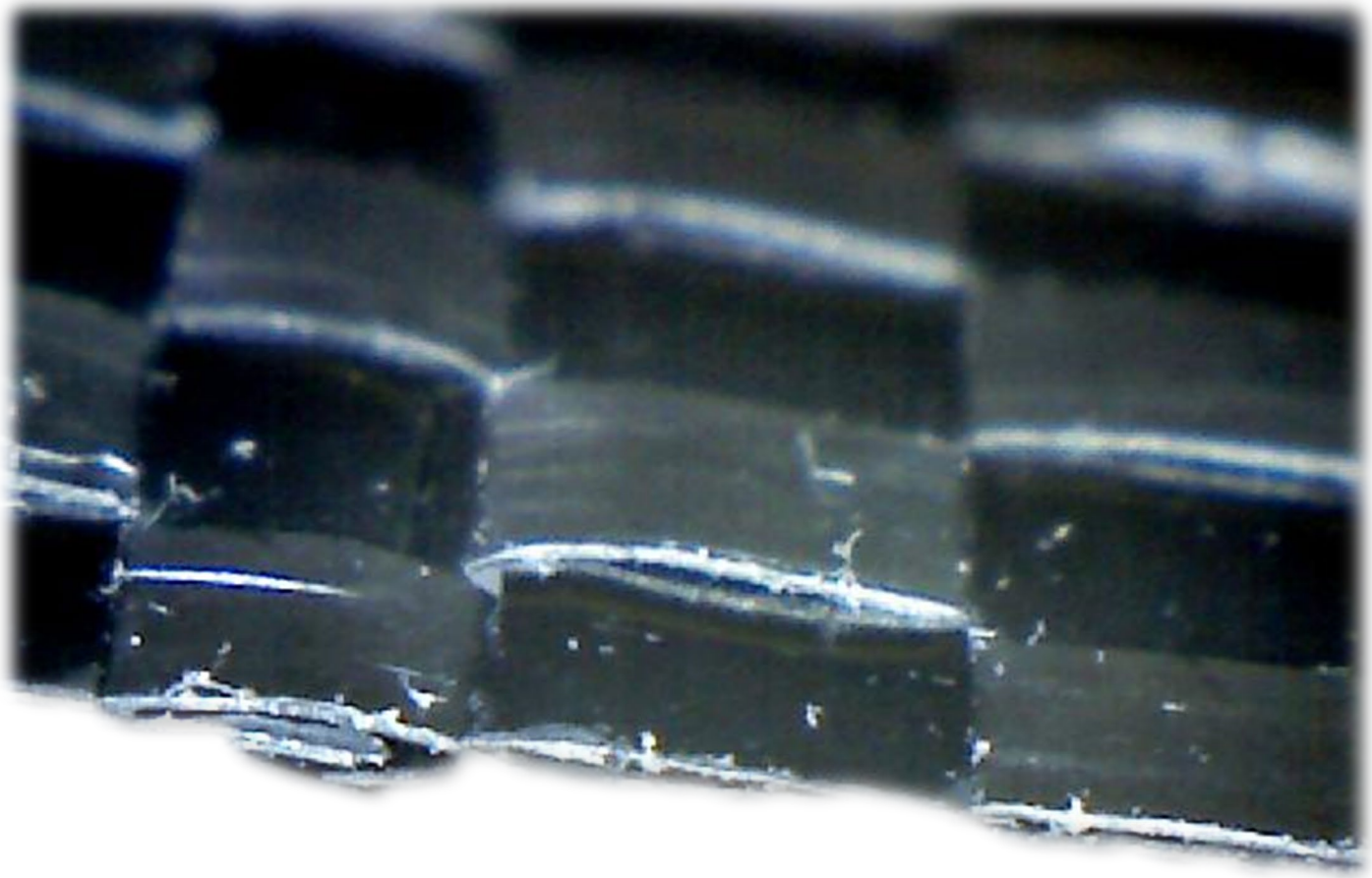
MDOT Geotextile Specification

MDOT Section 910
Table 910-1
Woven Geotextile Separator
and
Stabilization Geotextile



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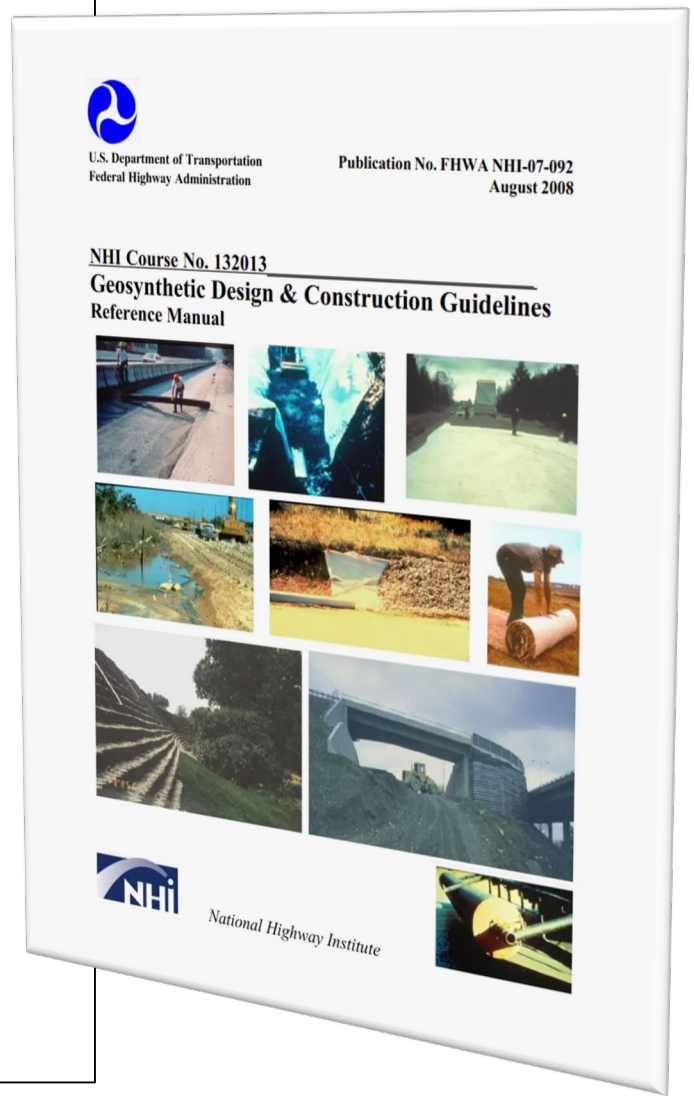
FHWA – NHI 132013

Geosynthetic Design & Construction Guidelines (2008)

Table 5-3
Geotextile Property Requirements[1,2,3] for Stabilization Applications (CBR < 3)
(after AASHTO, 2006)

Property	ASTM Test Method	Units	Requirement	
SURVIVABILITY			Geotextile Class 1[4]	
			Elongation < 50%[5]	Elongation > 50%[5]
Grab Strength	D 4632	lb (N)	315 (1400)	200 (900)
Sewn Seam Strength[6]	D 4632	lb (N)	270 (1200)	180 (810)
Tear Strength	D 4533	lb (N)	110 (500)	80 (350)
Puncture Strength	D 6241	lb (N)	620 (2750)	433 (1925)
Ultraviolet Stability (Retained Strength)	D 4355	%	50% after 500 hours of exposure	
DRAINAGE AND FILTRATION[7]				
Apparent Opening Size	D 4751	mm	0.43 for < 50% passing No. 200 (0.075 mm) sieve < 0.3 for > 50% passing No. 200 (0.075 mm) sieve	
Permittivity	D 4491	sec^{-1}	0.5 for < 15% passing No. 200 (0.075 mm) sieve 0.2 for 15 to 50%passing No. 200 (0.075 mm) sieve 0.1 for > 50% passing No.200 (0.075 mm) sieve	

NOTES:
1. Acceptance of geotextile material shall be based on ASTM D 4759.
2. Acceptance shall be based upon testing of either conformance samples obtained using Procedure A of ASTM D 4354, or based on manufacturer's certifications and testing of quality assurance samples obtained using Procedure B of ASTM D 4354.
3. Minimum; use value in weaker principal direction. All numerical values represent minimum average roll value (*i.e.*, test results from any sampled roll in a lot shall meet or exceed the minimum values in the table). Lot samples according to ASTM D 4354.
4. Default geotextile selection. The engineer may specify a Class 2 geotextile (see Appendix D) for moderate survivability conditions, see Table 5-2.
5. As measured in accordance with ASTM D 4632.
6. When seams are required. Values apply to both field and manufactured seams.
7. The geotextile permeability should be greater than the soil permeability.
8. Due to filtration and drainage requirements, woven slit film geotextiles should not be allowed.



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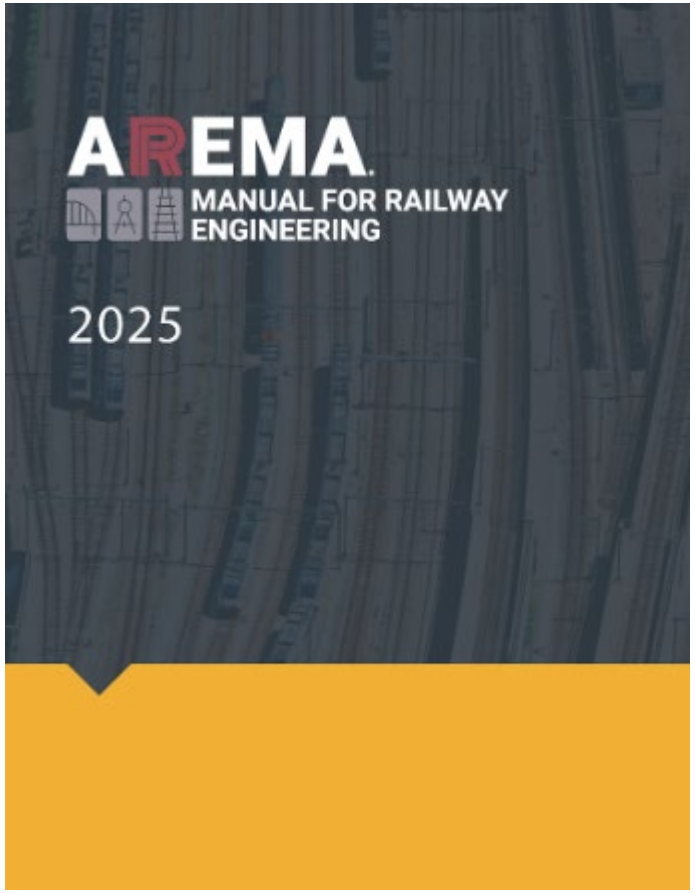
AREMA Manual for Railway Engineering 2025



Volume 1 – Track

- Chapter 1 – Roadway & Ballast
  - Part 10 - Geosynthetics

Does not allow slit film geotextiles!

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20 State DOTs…and counting

US State DOTs that DOT ALLOW Slit Tape Geotextiles

- Alabama
- Alaska
- Arizona
- California
- Florida
- Georgia
- Indiana
- Iowa
- Kansas
- Kentucky
- Louisiana
- Mississippi
- Missouri
- Nevada
- Oklahoma
- Pennsylvania
- Texas
- Vermont
- Wisconsin
- Wyoming

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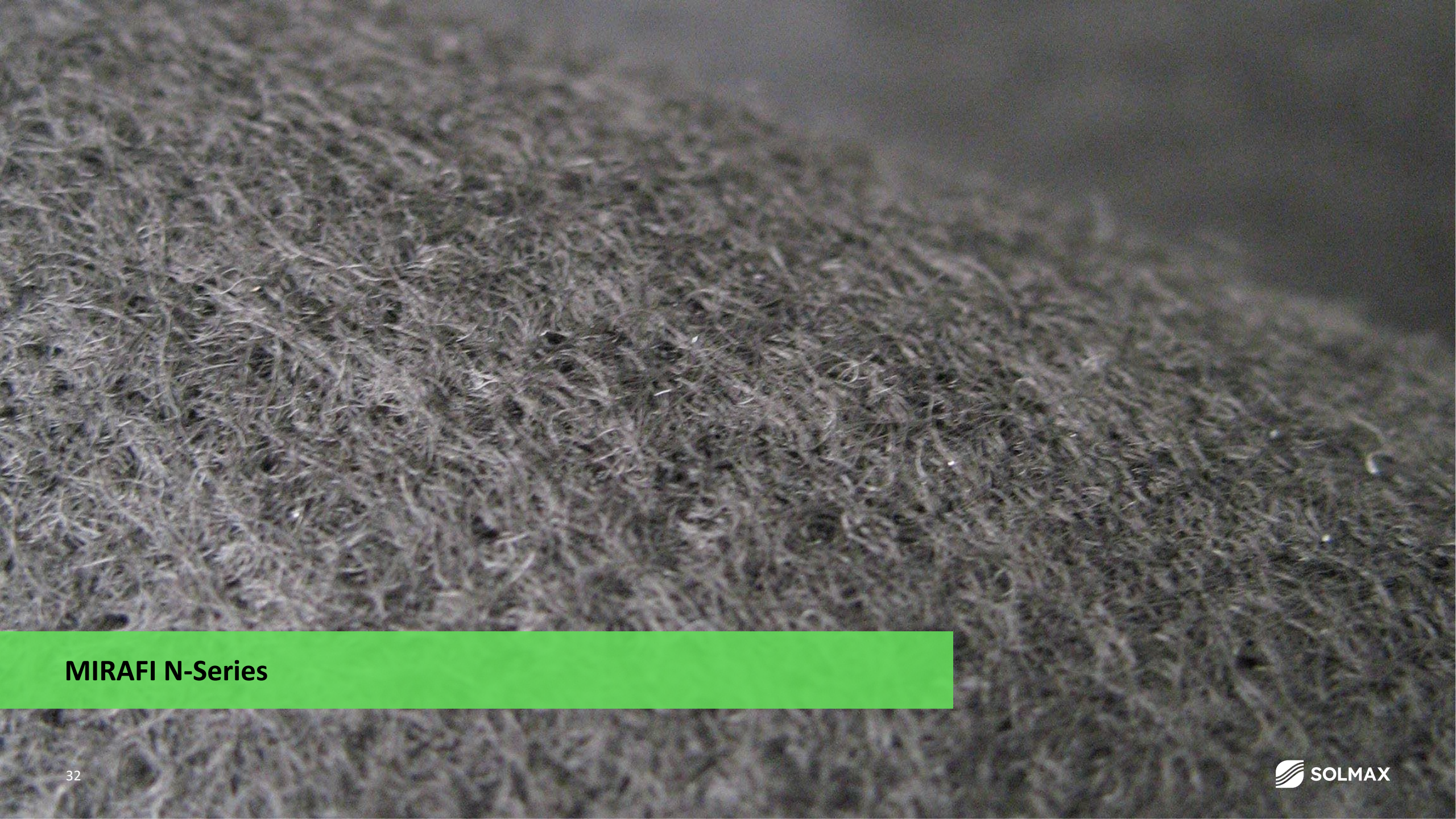

MIRAFI N-Series

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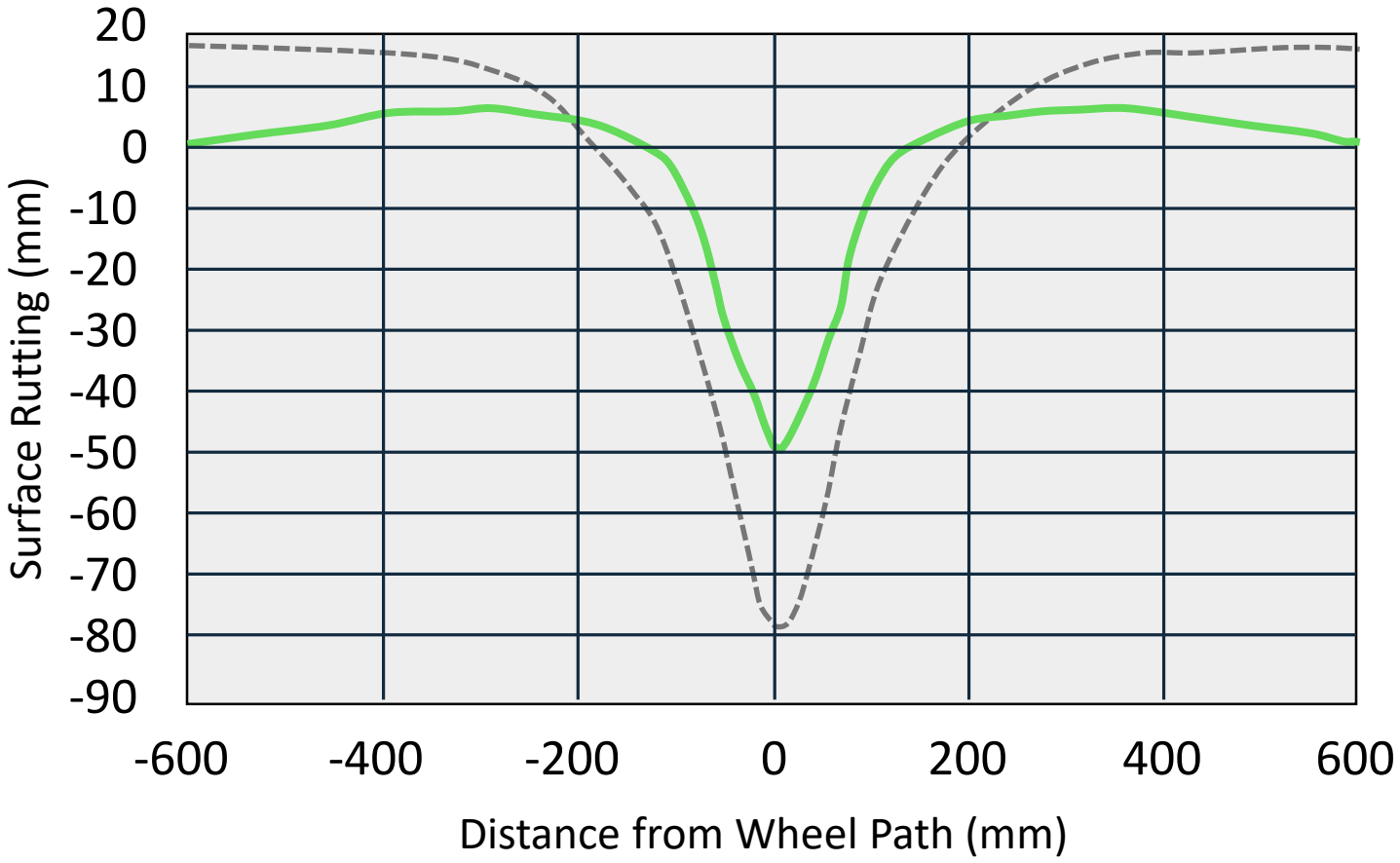
Pavement rutting profiles at different loading cycles

University of Texas at Austin – Accelerated pavement testing



Control Section @ **700 cycles**

Separation @ **1185 cycles**

35% less rutting
70% more axle passes

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University of Texas at Austin

Compounding function benefit to roadways

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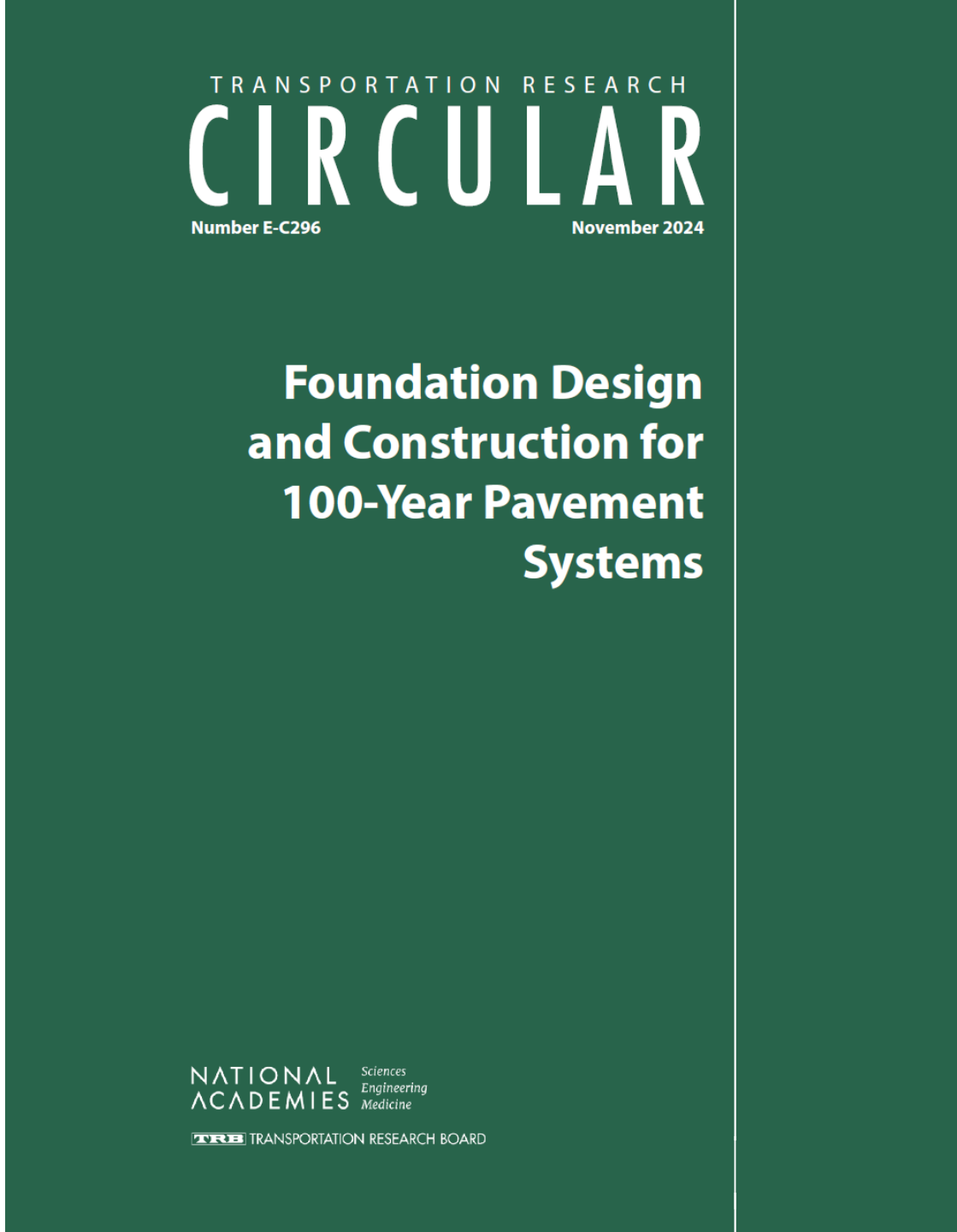
Circular E-C296 – November 2024

Transportation Research Board

- ***Separation*** mentioned 7 times



FHWA – NHI-05-037

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Insufficient Base Stiffness/Strength	✓	✓	✓		✓		✓
Insufficient Subgrade Stiffness/Strength	✓	✓					✓
Moisture/Drainage Problems	✓	✓			✓	✓	✓
Freeze/Thaw	✓	✓	✓	✓	✓	✓	✓
Swelling				✓			✓

Separation

Reinforcement

Moisture management

Status Quo Separation

Road to 100-year pavement foundation

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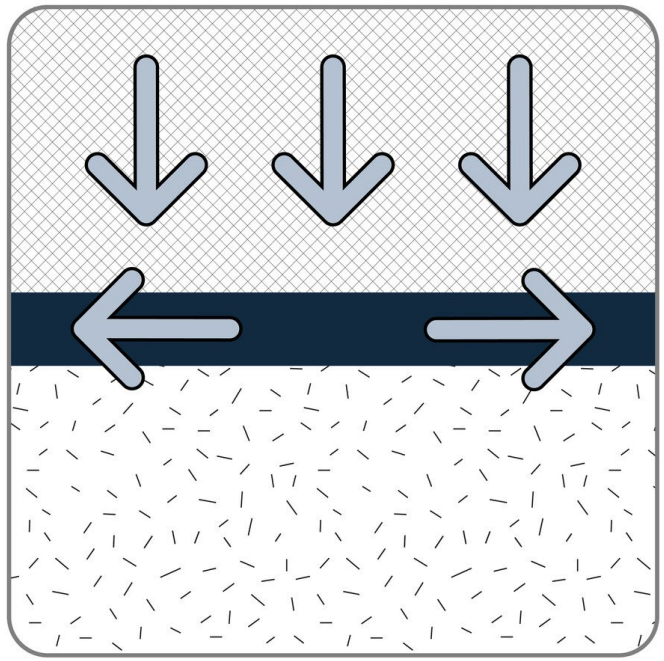

REINFORCEMENT

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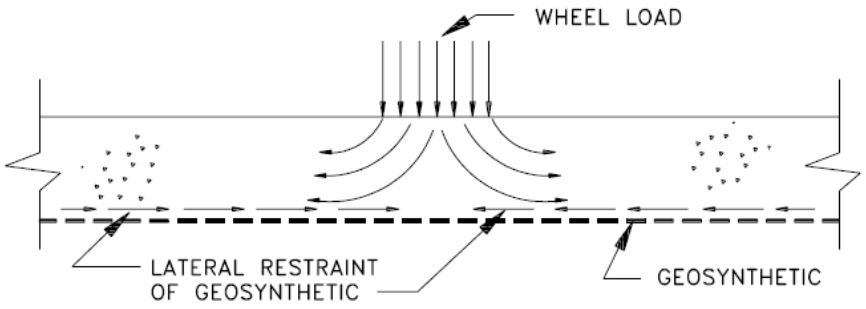
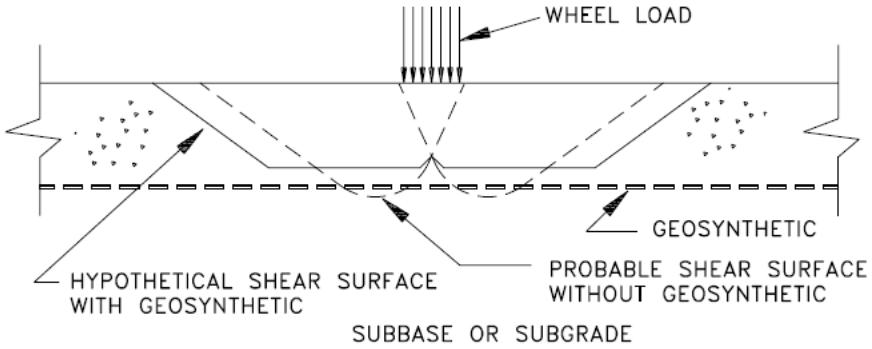
Reinforcement mechanisms for 100-year pavement foundation



Lateral restraint
(Confinement)



Increased bearing capacity
(Tensile modulus)

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Why is reinforcement necessary in civil structures?

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MIRAFI RS*i*-Series

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What is the MIRAFI RS*i*-Series?

High modulus woven geotextile

Higher water flow

Better separation & confinement

MIRAFI RS580i was best performing geosynthetic in the "Montana State Report"

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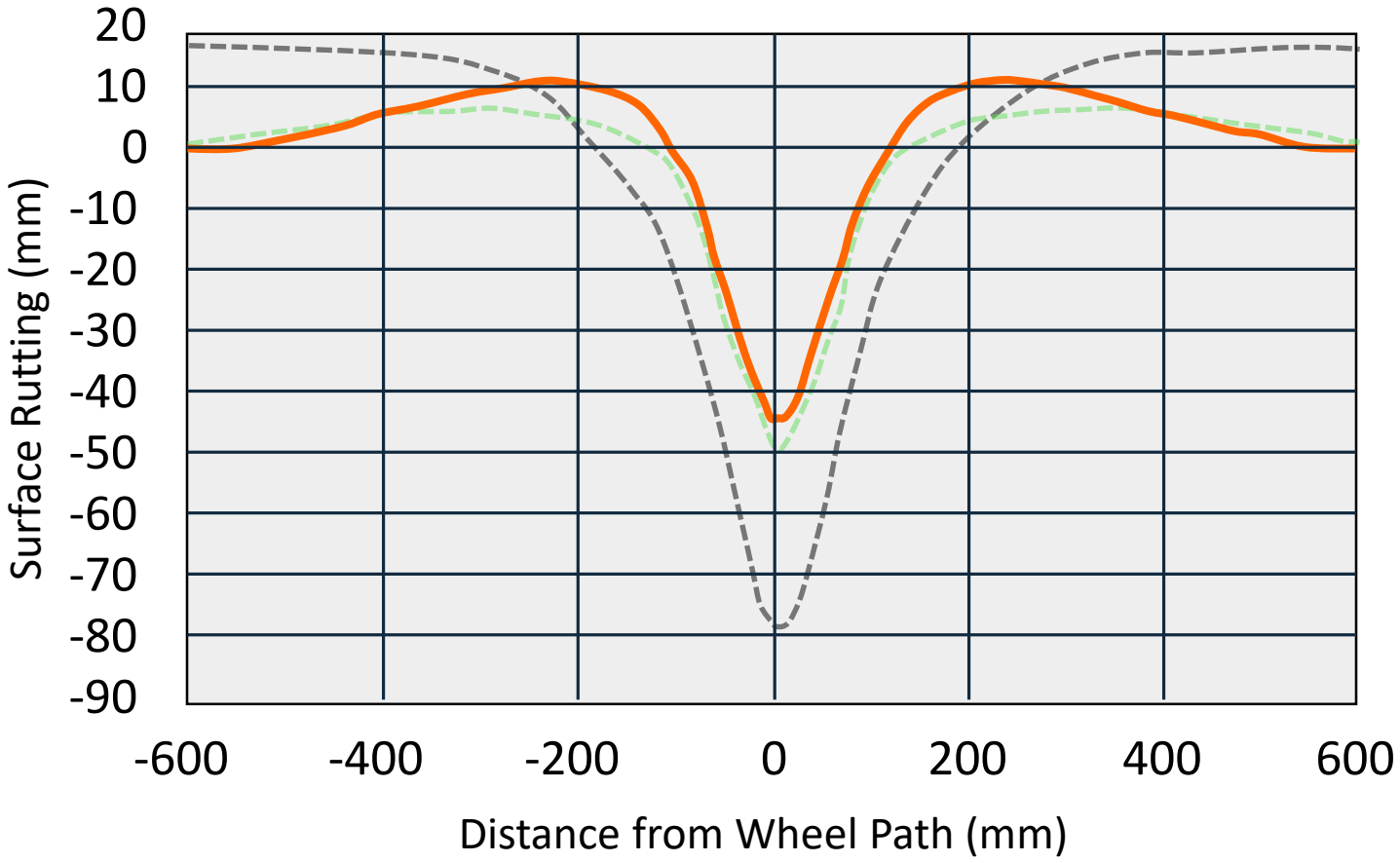
Pavement rutting profiles at different loading cycles

University of Texas at Austin – Accelerated pavement testing



Control Section @ **700 cycles**

Separation @ **1185 cycles**

Separation + reinforcement @ **6400 cycles**

45% less rutting
814% more axle passes

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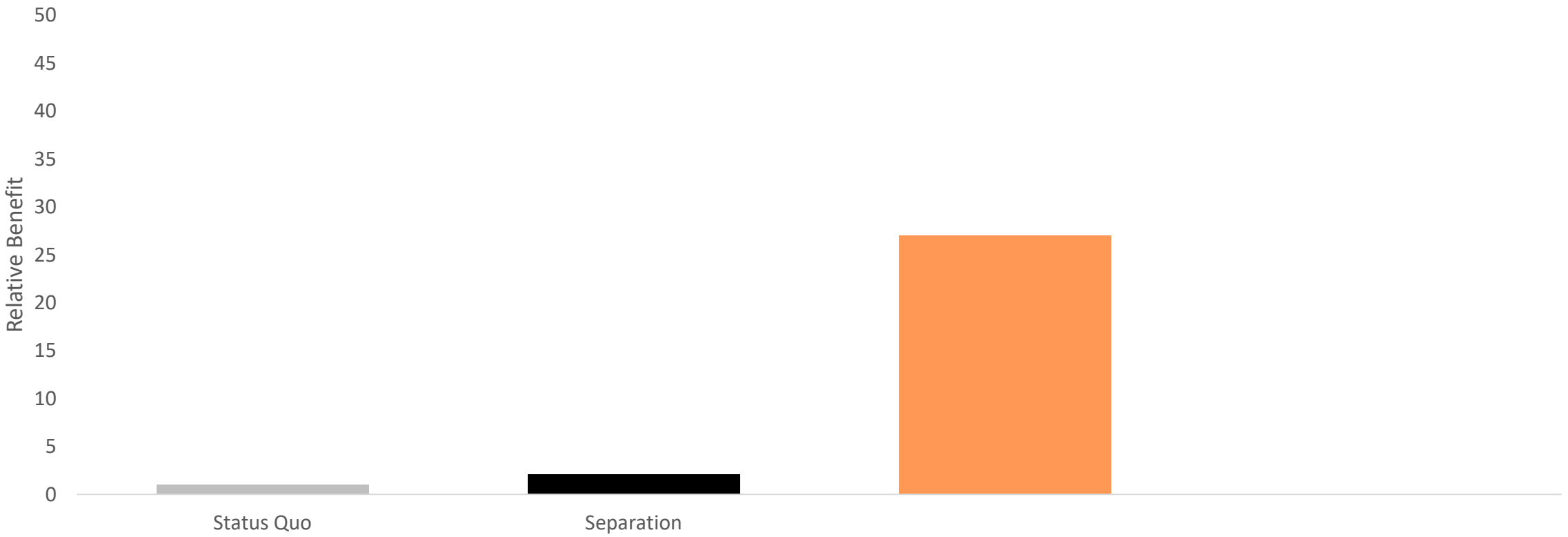
University of Texas at Austin

Compounding function benefit to roadways



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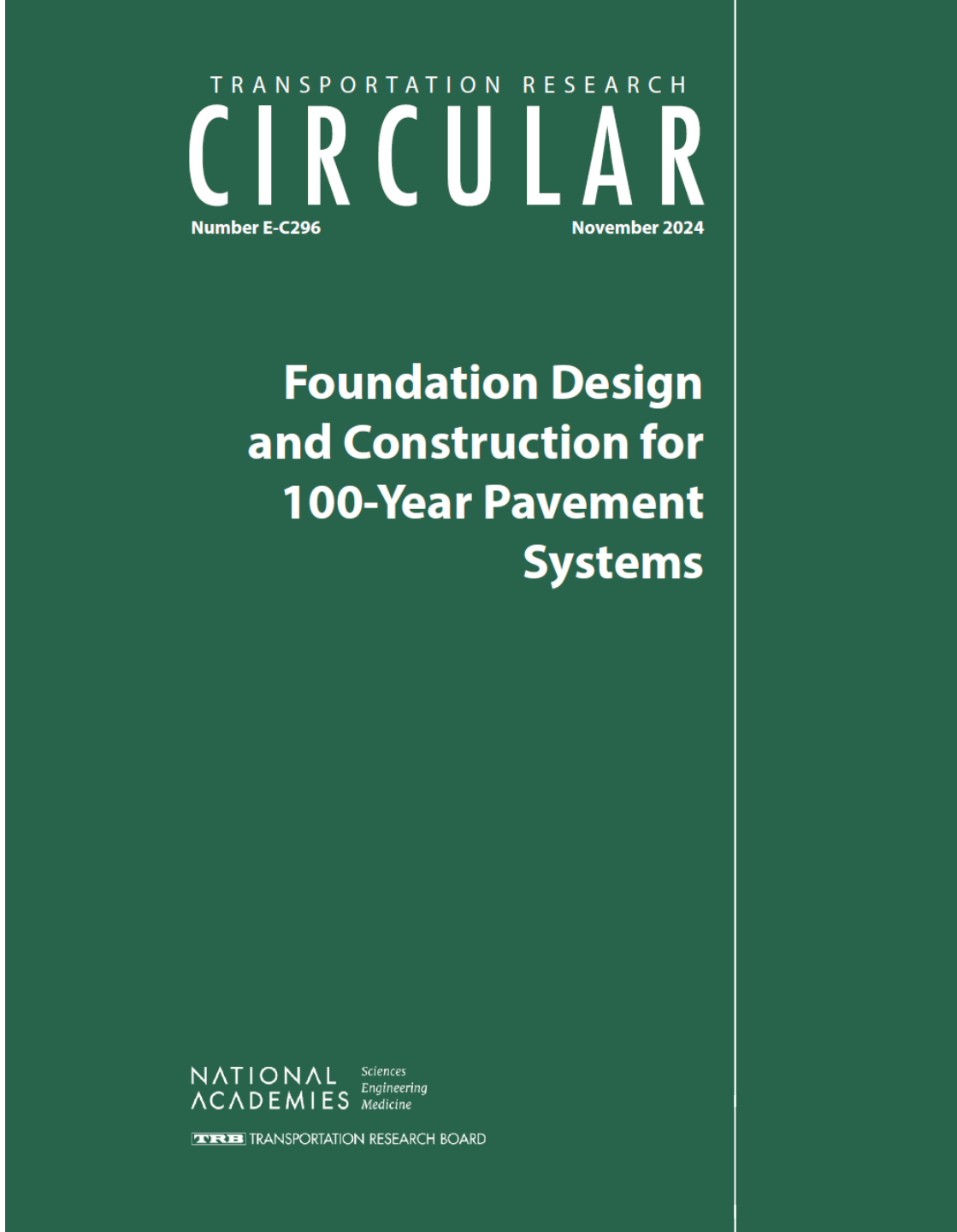
Transportation Research Board

- ***Separation*** mentioned 7 times
- ***Reinforcement*** mentioned 8 times



FHWA – NHI-05-037

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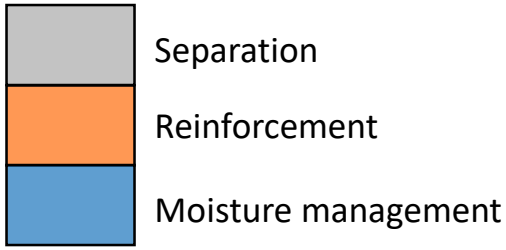
Freeze/Thaw	✓	✓	✓	✓	✓	✓	✓
Swelling				✓			✓



Status Quo | Separation | Separation + Reinforcement

Road to 100-year pavement foundation

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FHWA – NHI-05-037

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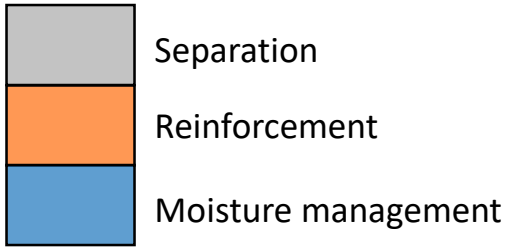
Freeze/Thaw	✓	✓	✓	✓	✓	✓	✓
Swelling				✓			✓



Status Quo | Separation | Separation + Reinforcement

Road to 100-year pavement foundation

SOLMAX

FHWA – NHI-05-037

Geotechnical influences on major distresses in flexible pavements

	Fatigue Cracking	Rutting	Corrugation	Bumps	Depressions	Potholes	Roughness
Contamination	✓	✓			✓		✓
Insufficient Base Stiffness/Strength	✓	✓	✓		✓		✓
Insufficient Subgrade Stiffness/Strength	✓	✓					✓
Moisture/Drainage Problems	✓	✓			✓	✓	✓
Freeze/Thaw	✓	✓	✓	✓	✓	✓	✓
Swelling				✓			✓

Separation

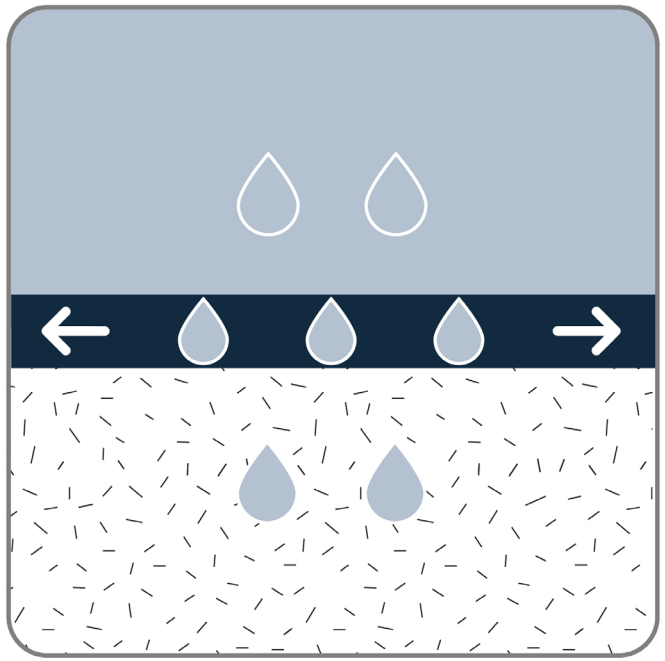
Reinforcement

Moisture management

Status Quo Separation Separation + Reinforcement

Road to 100-year pavement foundation

SOLMAX



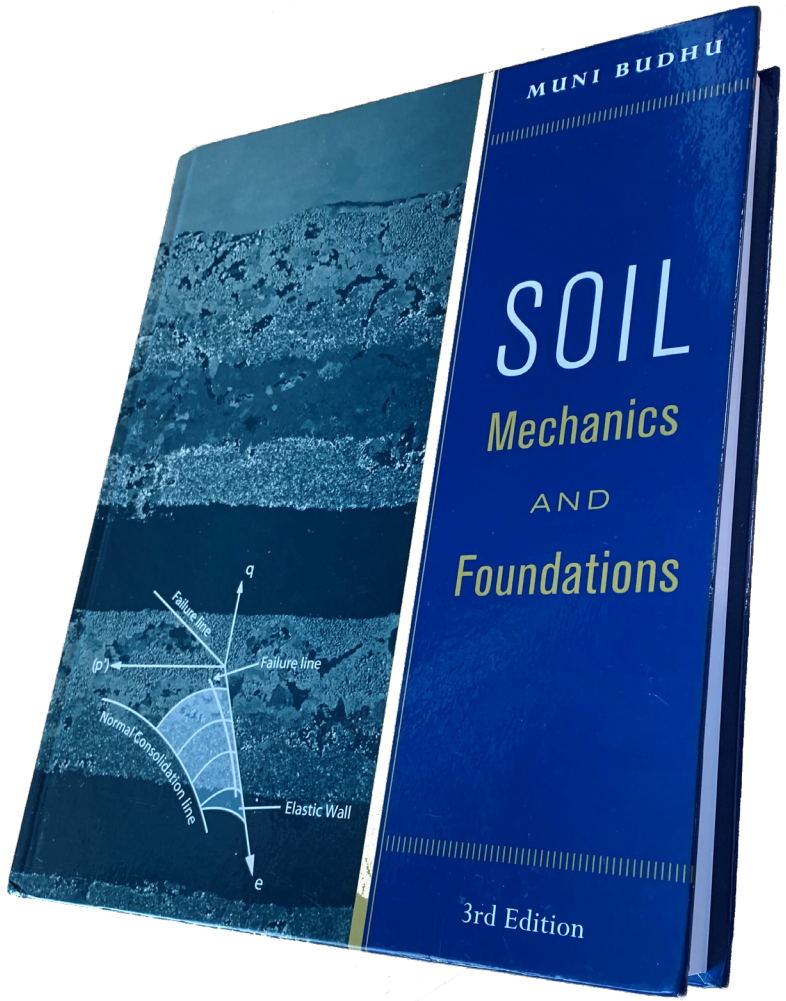
MOISTURE MANAGEMENT

SOLMAX

According to Budhu (2008)

Moisture in the subgrade

The undrained shear strength of fine-grained soils can increase about 20% for 1% reduction in the moisture content



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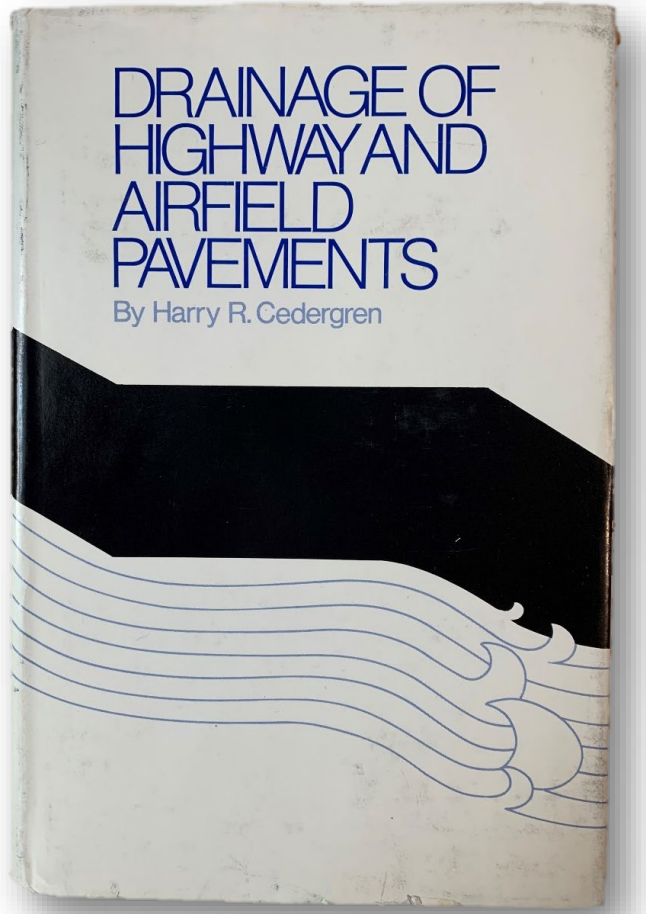
Cedergren (1987)

Drainage of Highway and Airfield Pavements

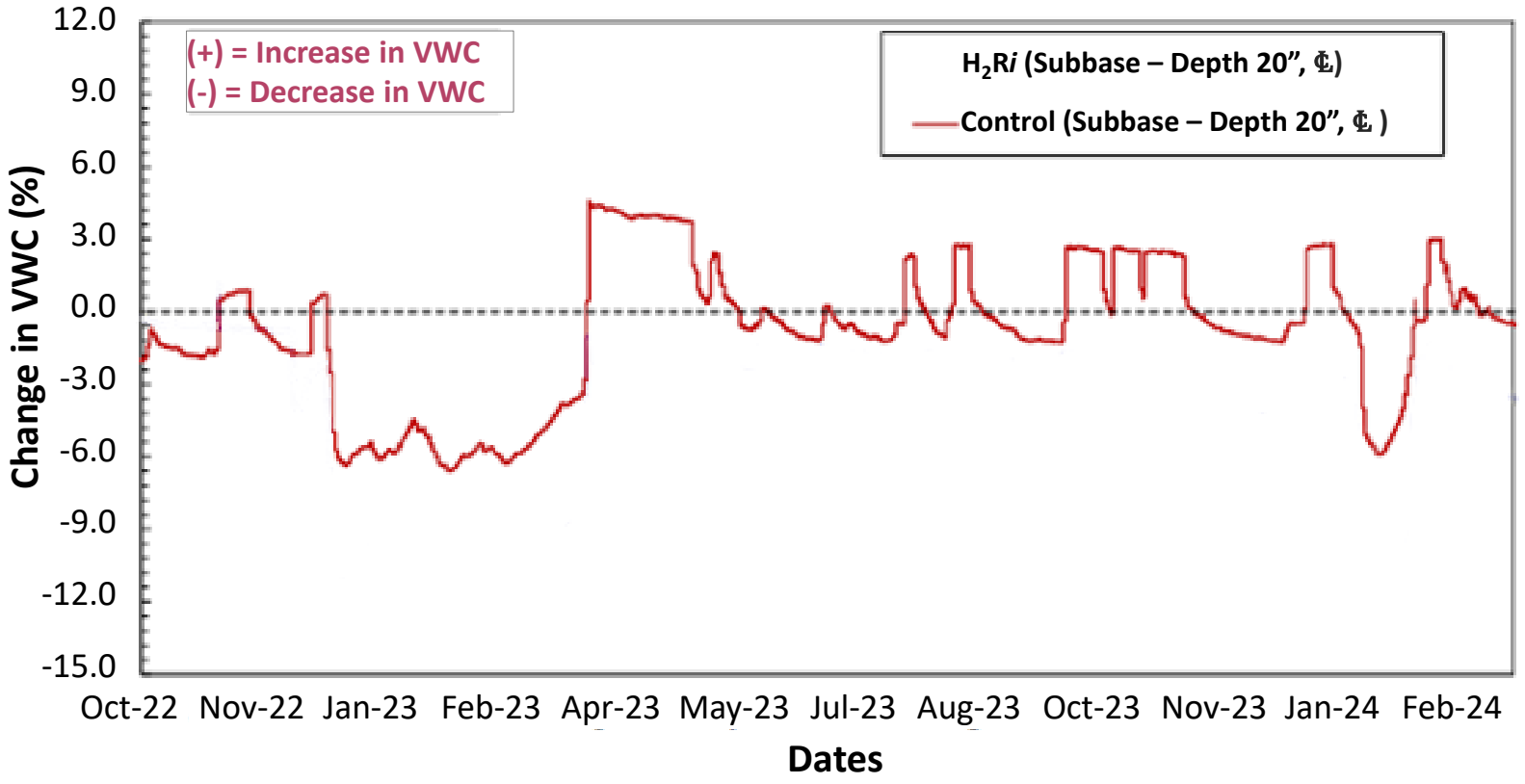
*"…pavement service life could be **reduced by half** if the pavement approaches **saturation just 10% of the time**."*



SOLMAX

MnROAD – Michigan State – Texas A&M

Volumetric water content comparison in the subbase



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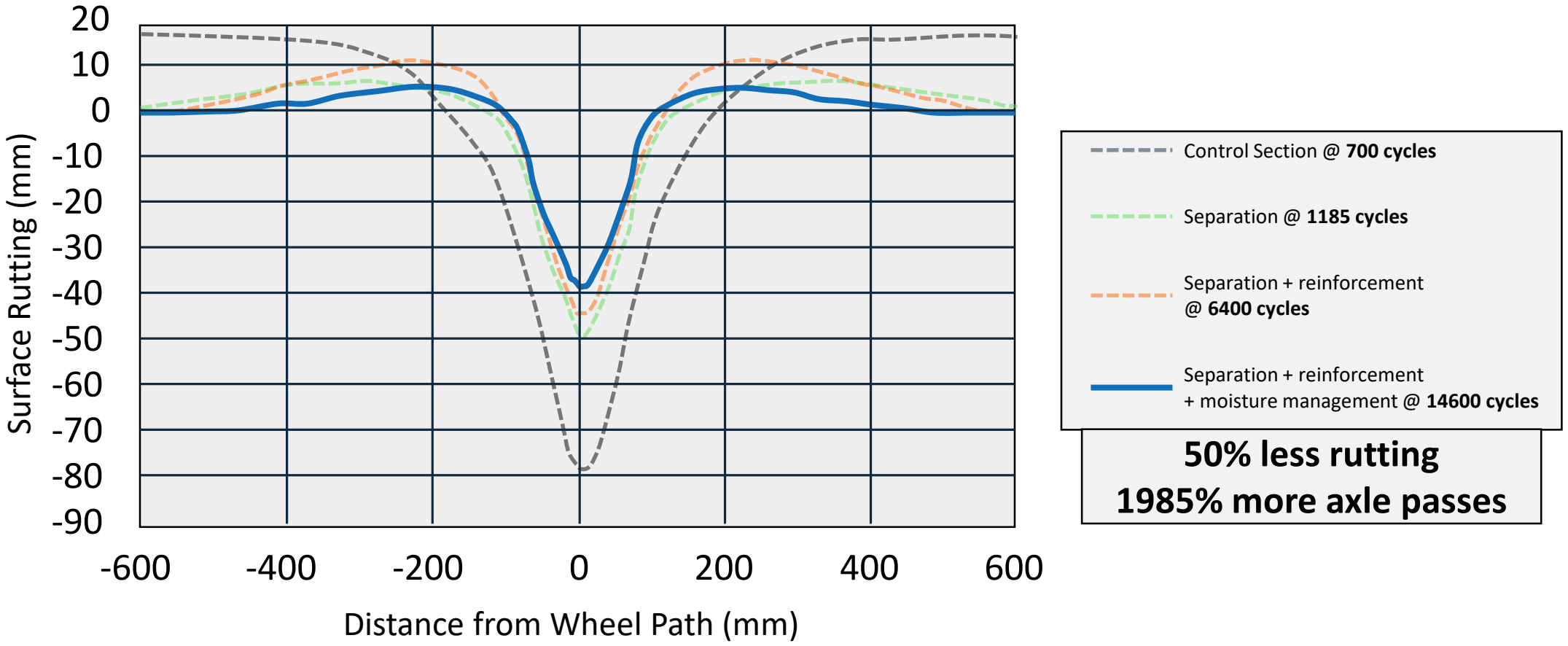
MIRAFI H_2Ri

SOLMAX

Pavement rutting profiles at different loading cycles

University of Texas at Austin – Accelerated pavement testing



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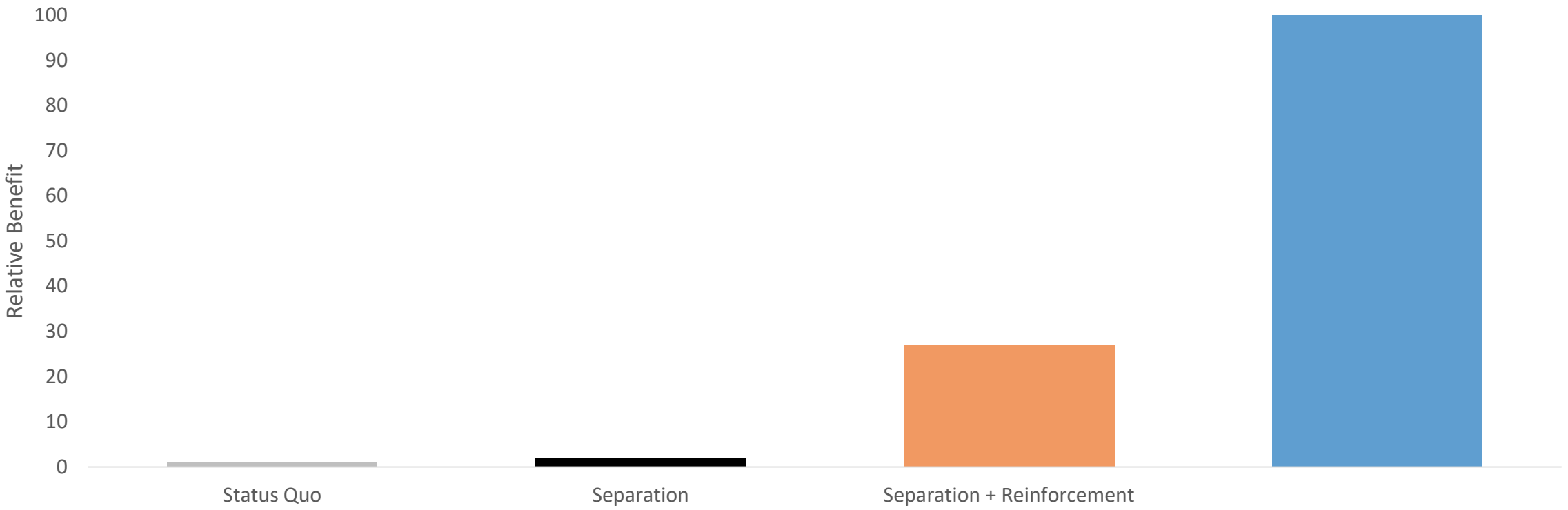
University of Texas at Austin

Compounding function benefit to roadways



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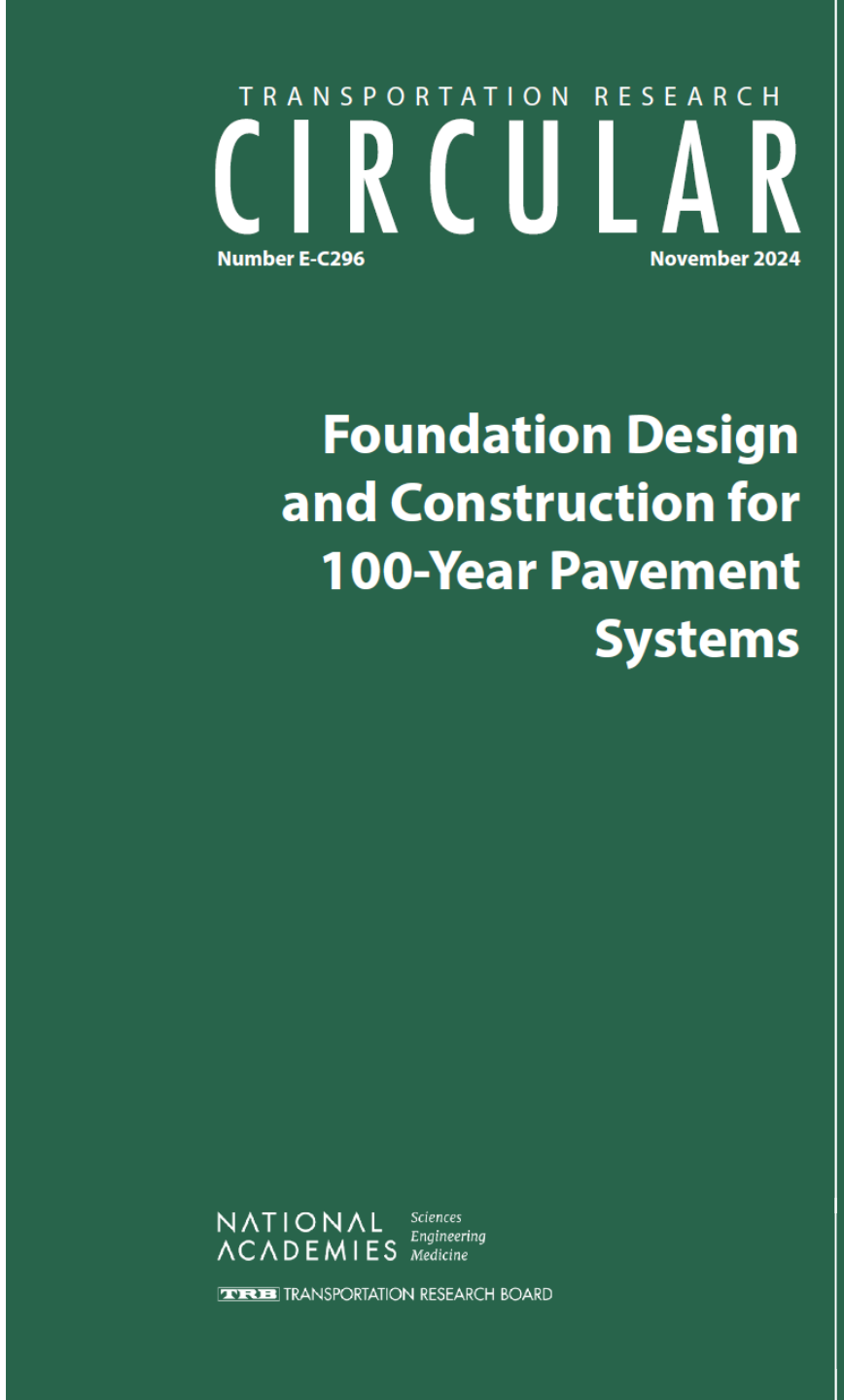
Transportation Research Board

- ***Separation*** mentioned 7 times
- ***Reinforcement*** mentioned 8 times
- ***Moisture/water/drainage*** mentioned **243 times**



FHWA – NHI-05-037

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Freeze/Thaw	✓	✓	✓	✓	✓	✓	✓
Swelling				✓			✓

Separation

Reinforcement

Moisture management

Status Quo | Separation | Separation + Reinforcement | Separation + Reinforcement + Moisture Management

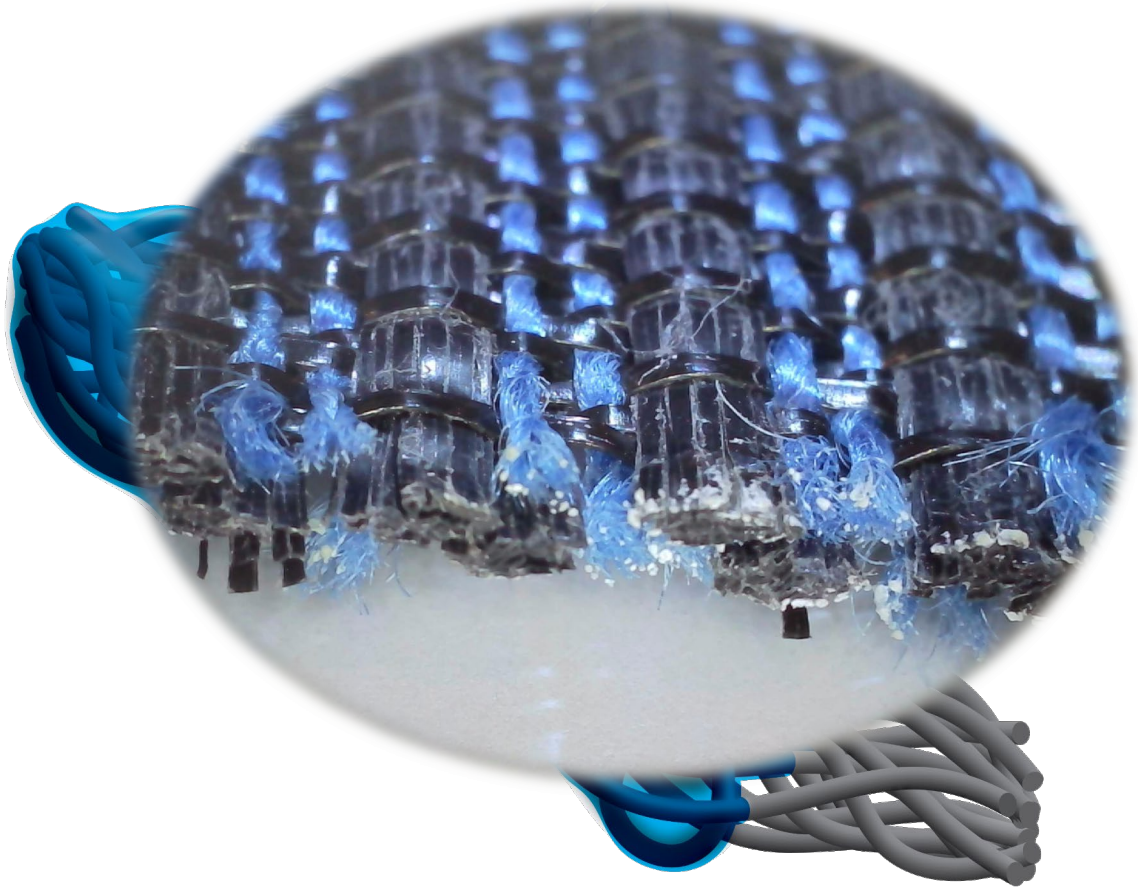
Road to 100-year pavement foundation

SOLMAX

The 100-year foundation solution: MIRAFI H_2R*i*

A pathway for moisture – Wicking filaments

- Two components
  - Black **high-modulus** reinforcement yarns
  - Blue engineered **moisture management** yarns: ~10 million filaments in every 15’ x 300’ roll
- Each filament is the size of a human hair



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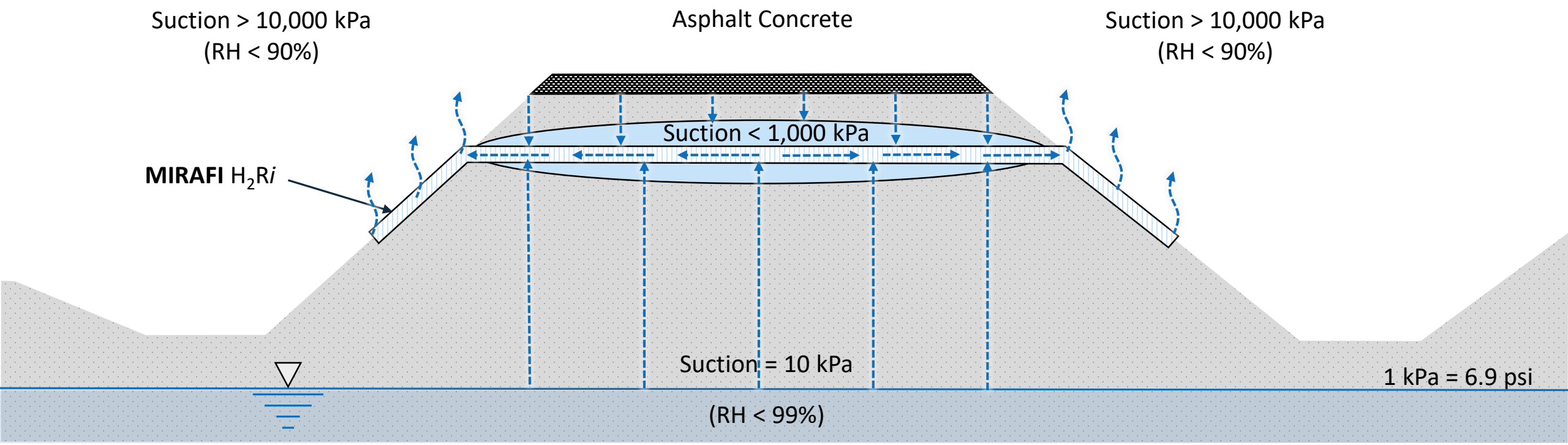
How is moisture drawn out?



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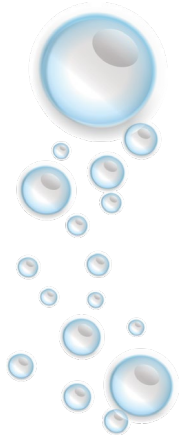
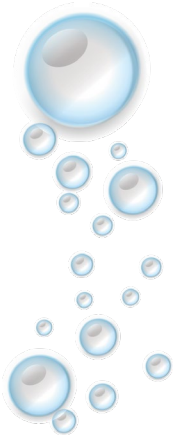
MIRAFI H_2Ri provides *Active Moisture Management*



Continuous process of controlling and removing moisture
from soil and aggregate materials
to ensure the stability and longevity of civil structures



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Three key aspects of MIRAFI H_2Ri

Unsaturated Conditions

It can remove water in saturated & unsaturated conditions

Influence

It has a zone of hydraulic influence within base course & subgrade

Gradient

It can overcome a negative gradient

Three key aspects of MIRAFI H_2Ri

Unsaturated Conditions

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It can overcome a negative gradient

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Three key aspects of MIRAFI H_2Ri

Unsaturated Conditions

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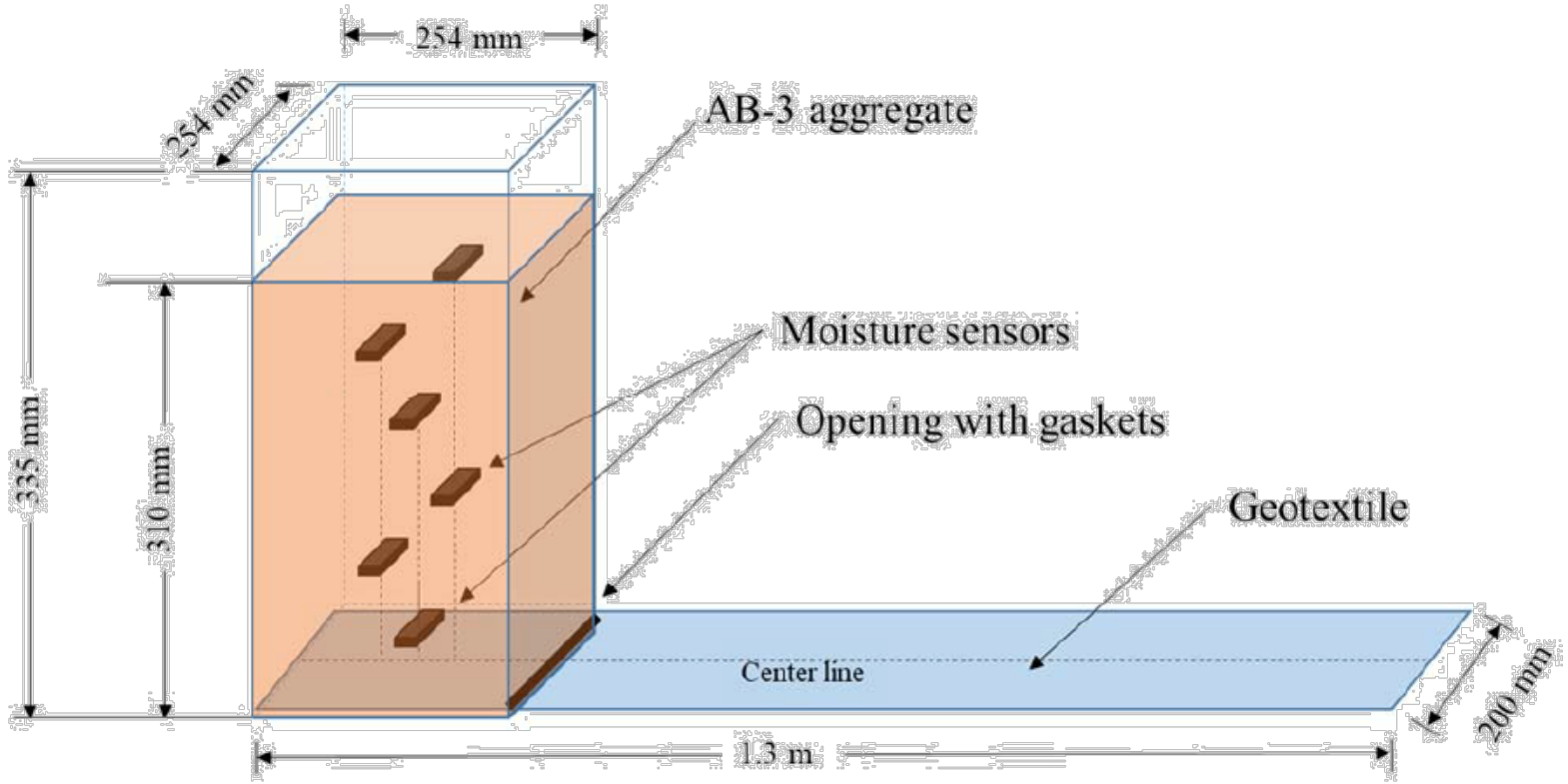
University of Kansas & Missouri University of Science & Technology

Evaluation and Design of Wicking Geotextile for Pavement Applications



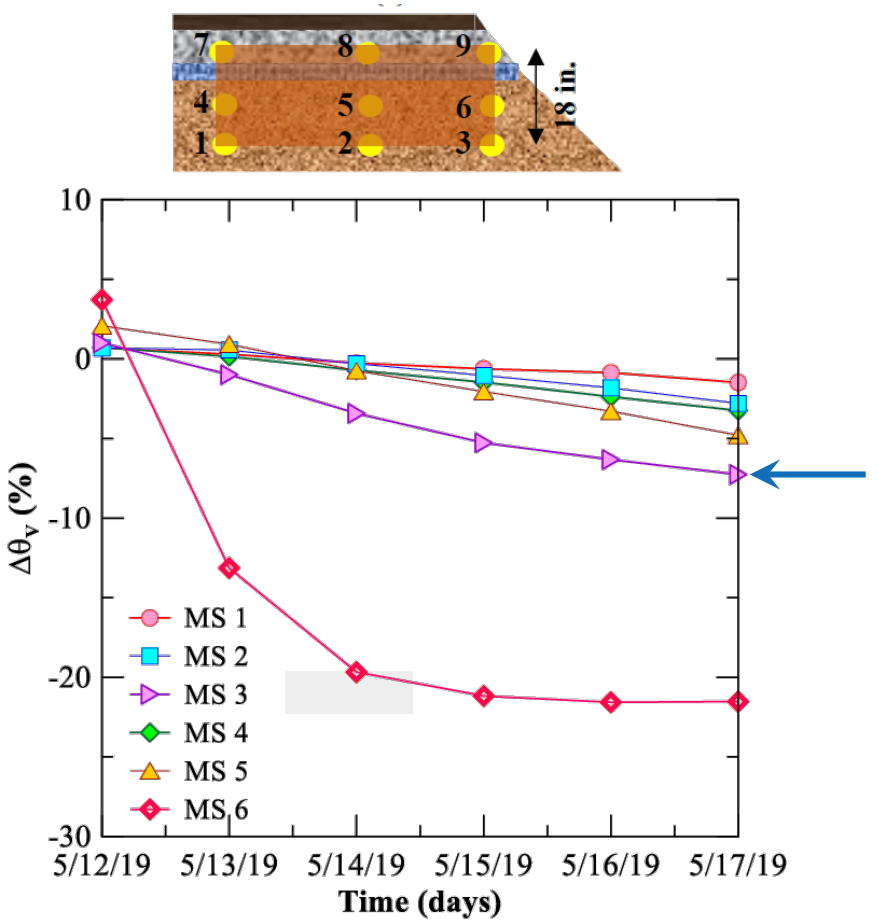
Zone of influence in base course up to 10”

SOLMAX

Depth of Influence of a Wicking Geotextile Below the Flexible Pavement Constructed Over Expansive Subgrade

- Percentage reduction in θ_v at different depths
- **Remember: CH soil**
- MS 3 located 12” below **MIRAFI** H_2Ri

Zone of influence in CH subgrade up to 12”



SOLMAX

Three key aspects of MIRAFI H_2Ri

Unsaturated Conditions

It can remove water in saturated & unsaturated conditions

Influence

It has a zone of hydraulic influence within base course & subgrade

Gradient

It can overcome a negative gradient

SOLMAX

We've added some wicking yarns to MIRAFI RS380*i* & RS580*i*

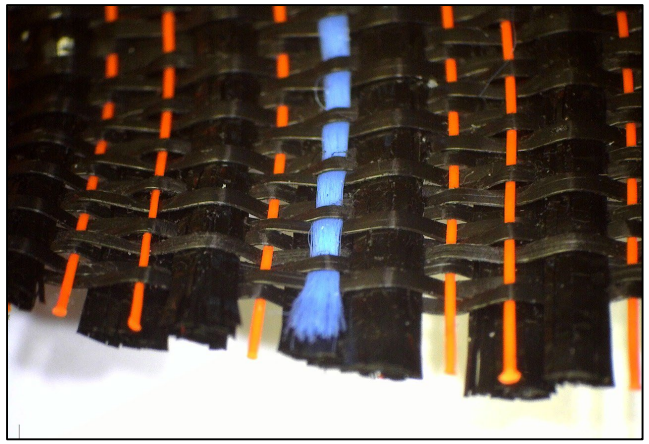
*Managing moisture is **ALWAYS** a good idea*

Same mechanical reinforcement

*1/10th the wicking of **MIRAFI** H_2Ri*

*Provides **Passive Moisture Management***

MIRAFI H_2Ri – Side View



MIRAFI RS580*i* – Side View

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Moisture Management: *Active vs Passive*

ACTIVE

(MIRAFI H_2R*i*)

Continuous process of controlling and removing moisture

from soil and aggregate materials

to ensure the stability and longevity of civil structures

PASSIVE

(MIRAFI RS380*i* & RS580*i*)

Process of balancing moisture *in soil*

and aggregate materials to ensure uniformity

and enhance the durability and functionality of infrastructure

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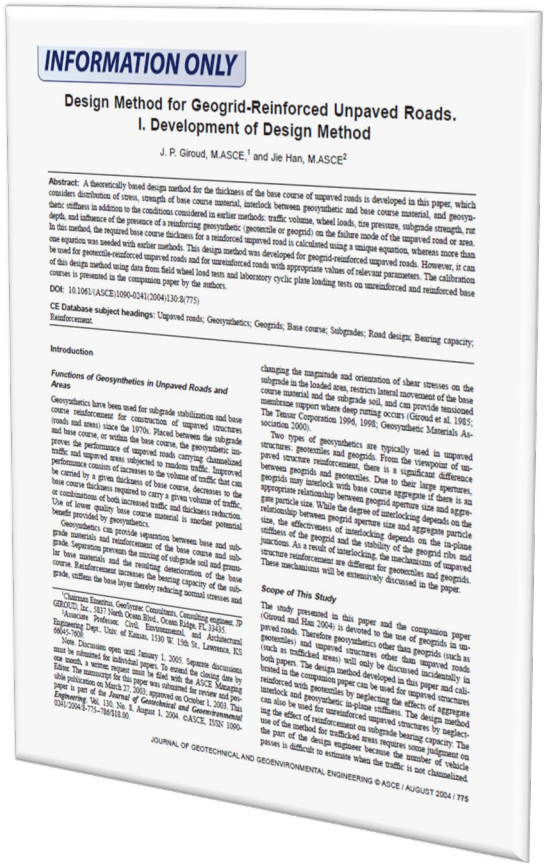
Current roadway design methodologies using geosynthetics



INFORMATION ONLY

Design Method for Geogrid-Reinforced Unpaved Roads. I. Development of Design Method

J. P. Giroud, M.ASCE,[1] and Jie Han, M.ASCE[2]

Abstract: A theoretically based design method for the thickness of the base course of unpaved roads is developed in this paper, which considers distribution of stress, strength of base course material, interlock between geosynthetic and base course material, and geosynthetic stiffness in addition to the conditions considered in earlier methods: traffic volume, wheel loads, tire pressure, subgrade strength, rut depth, and influence of the presence of a reinforcing geosynthetic (geotextile or geogrid) on the failure mode of the unpaved road or area. In this method, the required base course thickness for a reinforced unpaved road is calculated using a unique equation, whereas more than one equation was needed with earlier methods. This design method was developed for geogrid-reinforced unpaved roads. However, it can be used for geotextile-reinforced unpaved roads and for unreinforced roads with appropriate values of relevant parameters. The calibration of this design method using data from field wheel load tests and laboratory cyclic plate loading tests on unreinforced and reinforced base courses is presented in the companion paper by the authors.

DOI: 10.1061/(ASCE)1090-0241(2004)130:8(775)

CE Database subject headings: Unpaved roads; Geosynthetics; Geogrids; Base course; Subgrades; Road design; Bearing capacity; Reinforcement.

Introduction

Functions of Geosynthetics in Unpaved Roads and Areas

Geosynthetics have been used for subgrade stabilization and base course reinforcement for construction of unpaved structures (roads and areas) since the 1970s. Placed between the subgrade and base course, or within the base course, the geosynthetic improves the performance of unpaved roads carrying channelized traffic and unpaved areas subjected to random traffic. Improved performance consists of increases in the volume of traffic that can be carried by a given thickness of base course, decreases in the base course thickness required to carry a given volume of traffic, or combinations of both increased traffic and thickness reduction. Use of lower quality base course material is another potential benefit provided by geosynthetics.

Geosynthetics can provide separation between base and subgrade materials and reinforcement of the base course and subgrade. Separation prevents the mixing of subgrade soil and granular base materials and the resulting deterioration of the base course. Reinforcement increases the bearing capacity of the subgrade, stiffens the base layer thereby reducing normal stresses and changing the magnitude and orientation of shear stresses on the subgrade in the loaded area, restricts lateral movement of the base course material and the subgrade soil, and can provide tensioned membrane support where deep rutting occurs (Giroud et al. 1985; The Tensar Corporation 1996, 1998; Geosynthetic Materials Association 2000).

Two types of geosynthetics are typically used in unpaved structures: geotextiles and geogrids. From the viewpoint of unpaved structures reinforcement, there is a significant difference between geogrids and geotextiles. Due to their large apertures, geogrids may interlock with base course aggregate if there is an appropriate relationship between geogrid aperture size and aggregate particle size. While the degree of interlocking depends on the relationship between geogrid aperture size and aggregate particle size, the effectiveness of interlocking depends on the in-plane stiffness of the geogrid and the stability of the geogrid ribs and junctions. As a result of interlocking, the mechanisms of unpaved structure reinforcement are different for geotextiles and geogrids. These mechanisms will be extensively discussed in the paper.

Scope of This Study

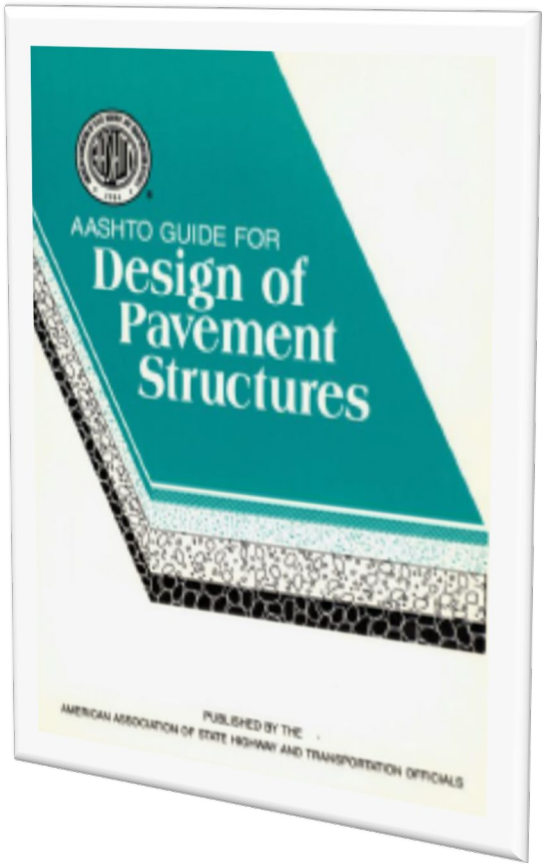
The study presented in this paper and the companion paper (Giroud and Han 2004) is devoted to the use of geogrids in unpaved roads. Therefore geosynthetics other than geogrids (such as geotextiles) and unpaved structures other than unpaved roads (such as trafficked areas) will only be discussed incidentally in both papers. The design method developed in this paper and calibrated in the companion paper can be used for unpaved structures reinforced with geotextiles by neglecting the effects of aggregate interlock and geosynthetic in-plane stiffness. The design method can also be used for unreinforced unpaved structures by neglecting the effect of reinforcement on subgrade bearing capacity. The use of the method for trafficked areas requires some judgment on the part of the design engineer because the number of vehicle passes is difficult to estimate when the traffic is not channelized.

[1]Chairman Emeritus, GeoSyntec Consultants, Consulting engineer, JP GIROUD, Inc., 5817 North Ocean Blvd., Ocean Ridge, FL 33435.
[2]Associate Professor, Civil, Environmental, and Architectural Engineering Dept., Univ. of Kansas, 1530 W. 15th St., Lawrence, KS 66045-7609.

Note. Discussion open until January 1, 2005. Separate discussions must be submitted for individual papers. To extend the closing date by one month, a written request must be filed with the ASCE Managing Editor. The manuscript for this paper was submitted for review and possible publication on March 27, 2003; approved on October 1, 2003. This paper is part of the *Journal of Geotechnical and Geoenvironmental Engineering*, Vol. 130, No. 8, August 1, 2004. ©ASCE, ISSN 1090-0241/2004/8-775–788/$18.00.

Giroud-Han (2004)

www.InfraSolve.com



AASHTO ‘93

SOLMAX

MIRAFI RS*i*-Series and H_2R*i* are tested and calibrated to these design methodologies

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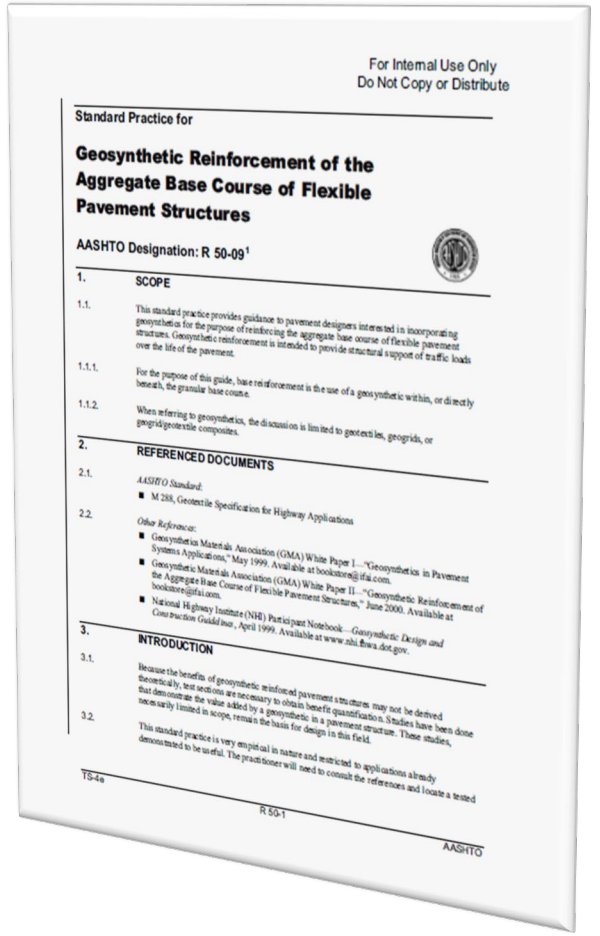
AASHTO R50-09

Geosynthetic Reinforcement of the Aggregate Base Course of Flexible Pavement Structures

- Provides guidance to designers
- Benefits cannot be obtained theoretically
- Relevant test sections are required
- Geosynthetic specific



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Standard Practice for

Geosynthetic Reinforcement of the Aggregate Base Course of Flexible Pavement Structures

AASHTO Designation: R 50-09[1]

1. SCOPE

1.1. This standard practice provides guidance to pavement designers interested in incorporating geosynthetics for the purpose of reinforcing the aggregate base course of flexible pavement structures. Geosynthetic reinforcement is intended to provide structural support of traffic loads over the life of the pavement.

1.1.1. For the purpose of this guide, base reinforcement is the use of a geosynthetic within, or directly beneath, the granular base course.

1.1.2. When referring to geosynthetics, the discussion is limited to geotextiles, geogrids, or geogrid/geotextile composites.

2. REFERENCED DOCUMENTS

2.1. *AASHTO Standard:*
- M 288, Geotextile Specification for Highway Applications

2.2. *Other References:*
- Geosynthetics Materials Association (GMA) White Paper I—"Geosynthetics in Pavement Systems Applications," May 1999. Available at bookstore@ifai.com.
- Geosynthetic Materials Association (GMA) White Paper II—"Geosynthetic Reinforcement of the Aggregate Base Course of Flexible Pavement Structures," June 2000. Available at bookstore@ifai.com.
- National Highway Institute (NHI) Participant Notebook—*Geosynthetic Design and Construction Guidelines*, April 1999. Available at www.nhi.fhwa.dot.gov.

3. INTRODUCTION

3.1. Because the benefits of geosynthetic reinforced pavement structures may not be derived theoretically, test sections are necessary to obtain benefit quantification. Studies have been done that demonstrate the value added by a geosynthetic in a pavement structure. These studies, necessarily limited in scope, remain the basis for design in this field.

3.2. This standard practice is very empirical in nature and restricted to applications already demonstrated to be useful. The practitioner will need to consult the references and locate a tested

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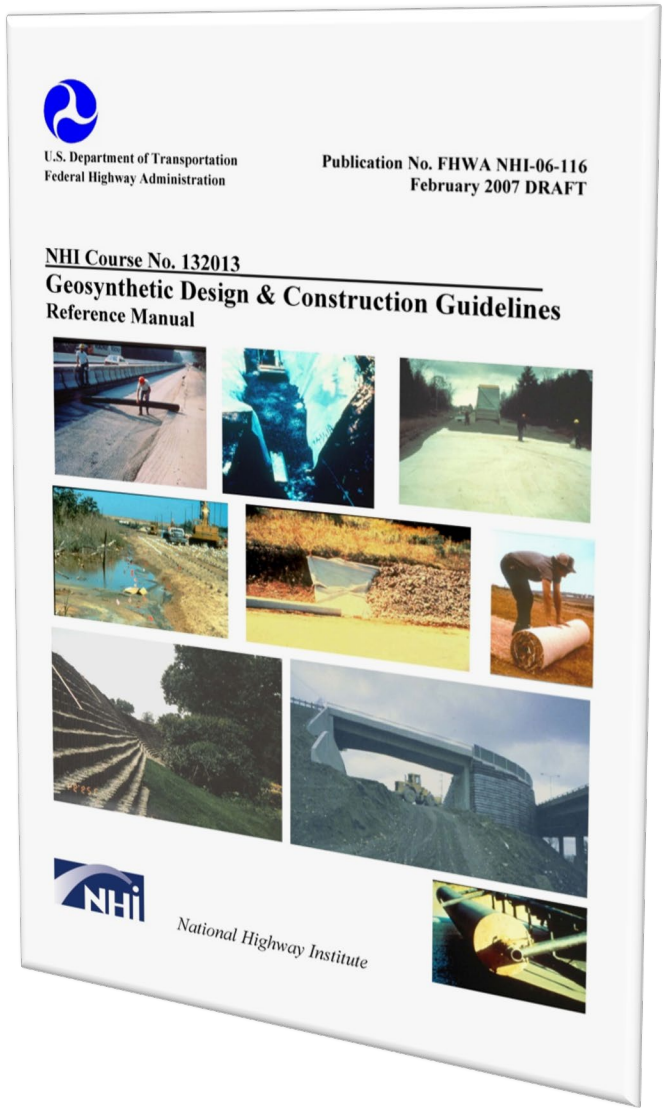
FHWA NHI-07-092

Geosynthetic Design & Construction Guidelines



"To assess and characterize the appropriate TBR or BCR values, the user is advised to refer to **product-specific studies and test sections that demonstrate the value added by the geosynthetic reinforcement** in pavement structures"

TBR = Traffic Benefit Ratio
BCR = Base Course Reduction

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Value-Added Examples

SOLMAX

Vol. 35, No. 3 – Winter 2023/2024

The Bridge

A quarterly newsletter from Michigan's Local Technical Assistance Program

The Alaska Department of Transportation successfully installed a wicking fabric in the Beaver Slide pavement to help drain the embankment, thus reducing hazardous rutting and maintenance needs on the road segment.

Beaver Slide:
How Geotextiles Made One Road Safer

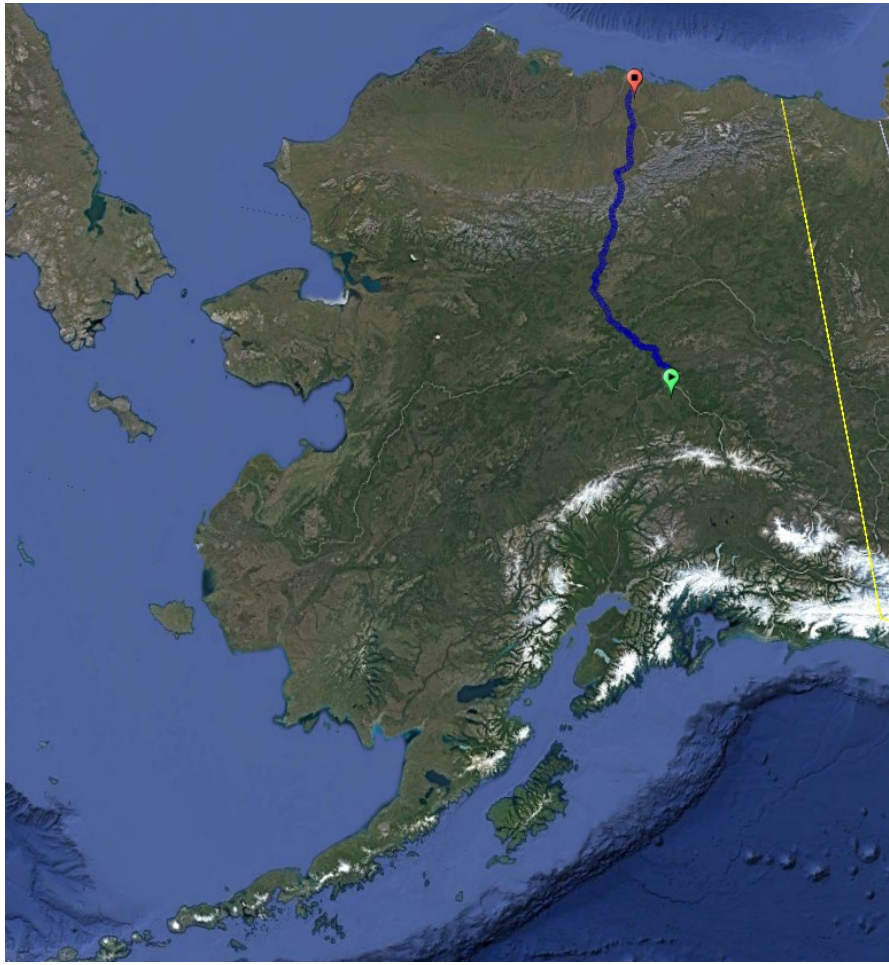
Allison Szlachta, Technical Writing Intern
Center for Technology & Training

SOLMAX

Photo: Courtesy of Solmax

Dalton Highway, AK

- Beaver Slide in 2010
- >160,000 yd^2 installed in 2012
- Dalton Hwy MP 97 – 209 in 2013
- AK DOT&PF issued their final report in December 2016



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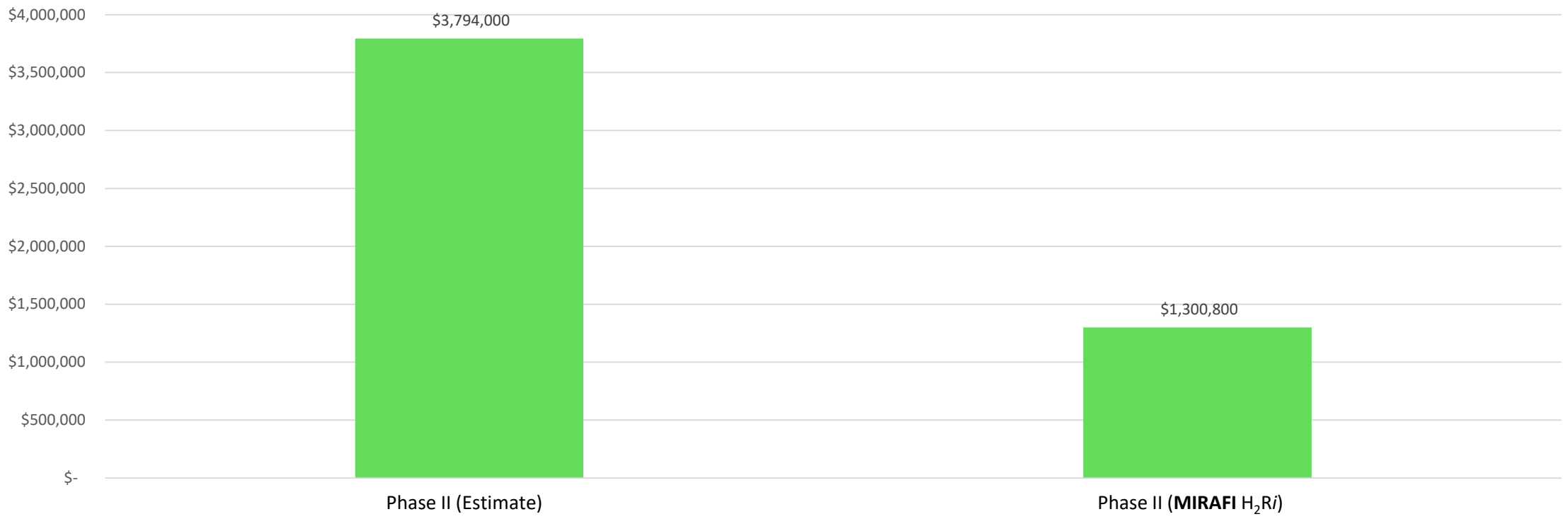
Dalton Highway without **MIRAFI** H_2Ri, June 2013

Dalton Highway with **MIRAFI** H_2Ri, June 2013

Dalton highway MP197-209 rehabilitation project



Total savings was $2.5 million in construction costs alone

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Port Project in North America

MIRAFI H_2Ri – Value Engineering Example

Port Improvements Project

- 72-acre Container Yard (~ 350,000 yd^2)
- Reconfigure layout to add capacity
- Tear out and replace pavement and rail (in 4 phases over 3 years)
- High water table, concern with water intruding into new pavement system
  - Herringbone drainage system beneath the pavement system

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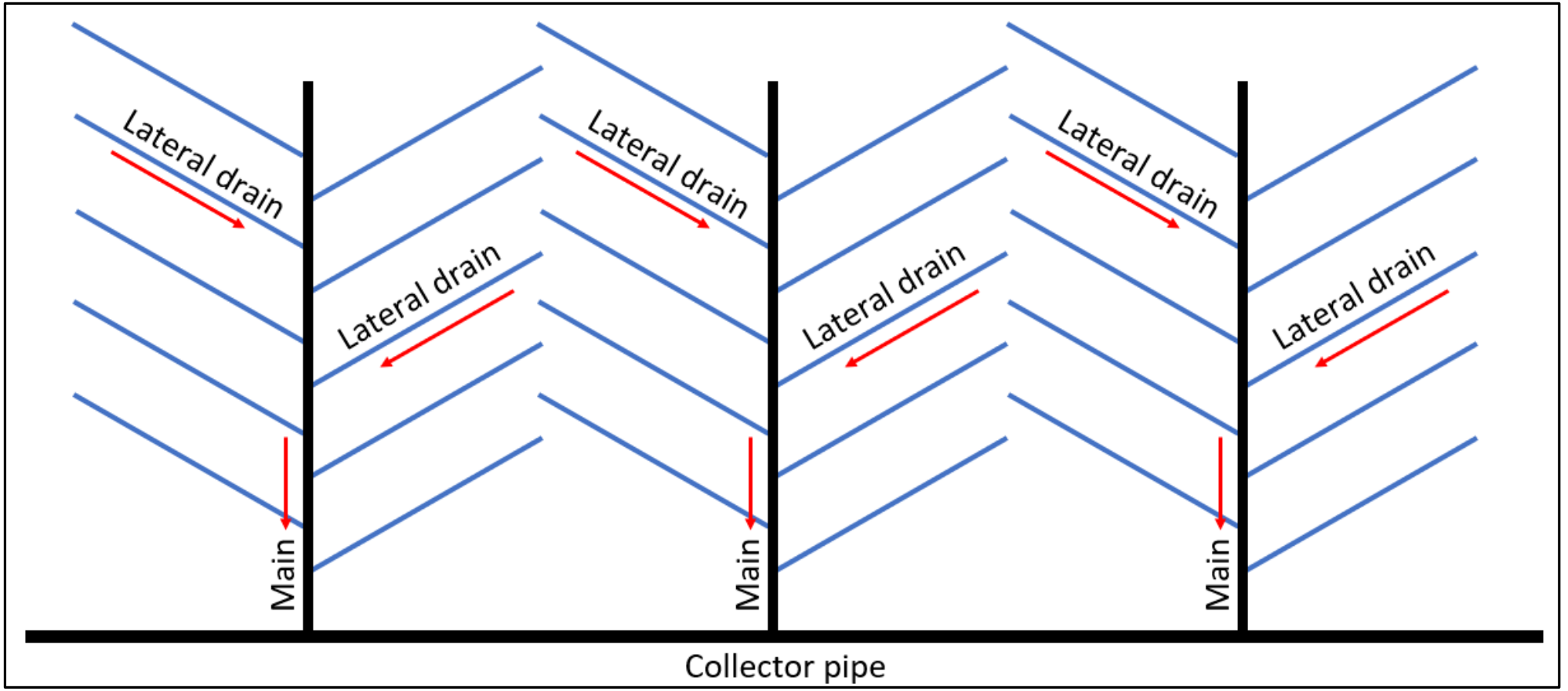
Port Project in North America

MIRAFI H_2Ri – Value Engineering Example

Typical Herringbone Drain Layout – Plan View



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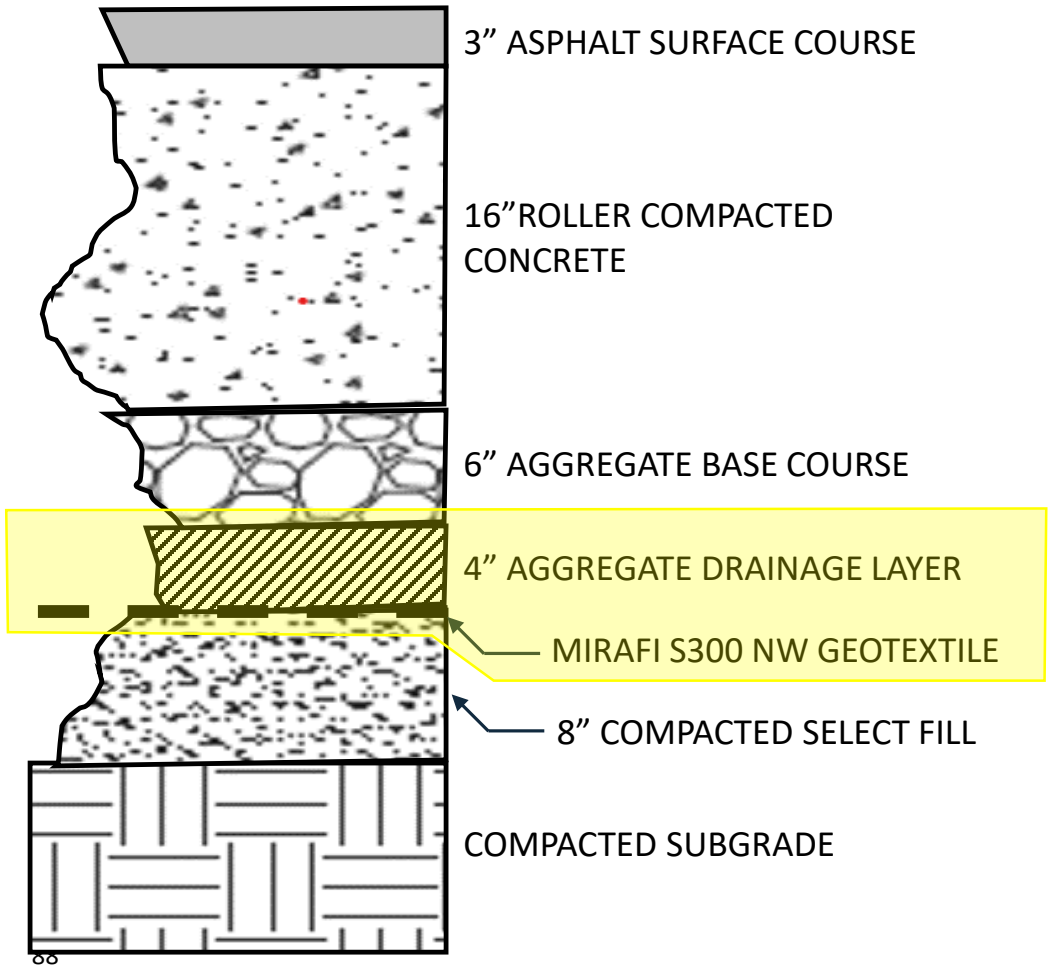
Port Project in North America

MIRAFI H_2Ri – Value Engineering Example

Design Section



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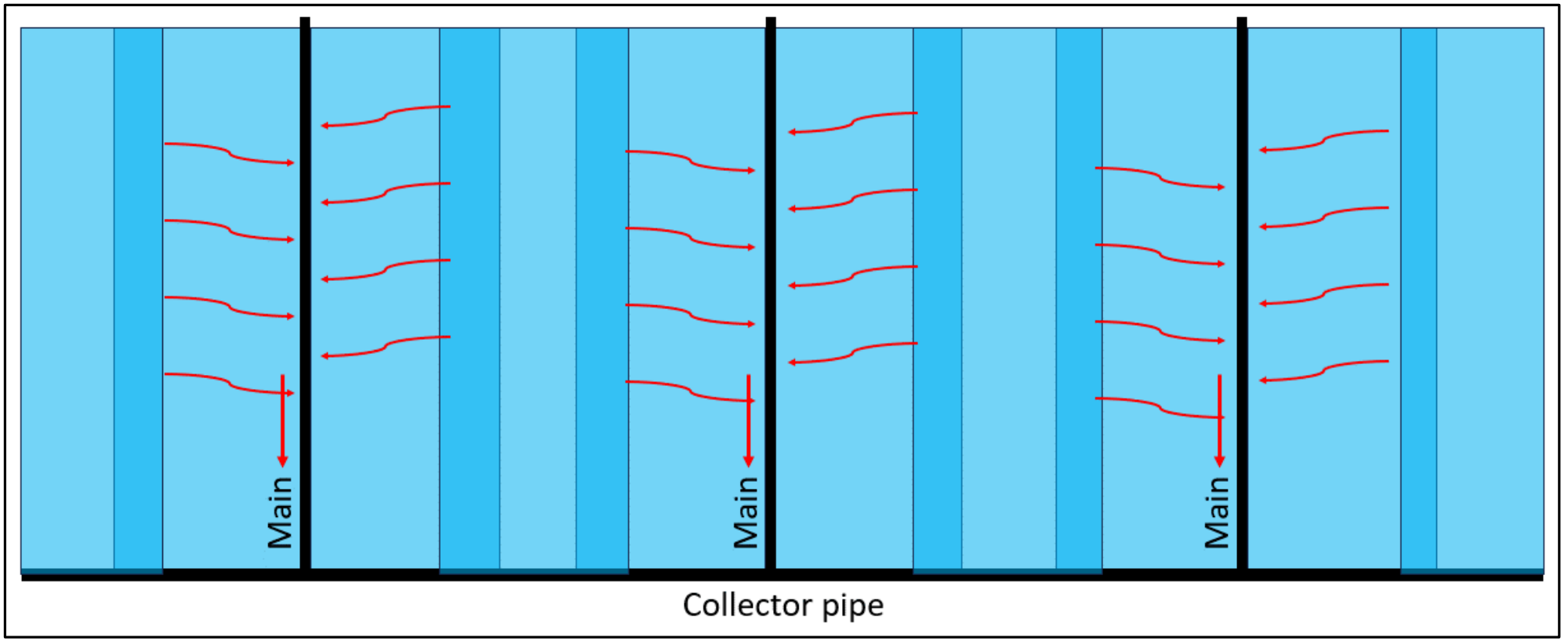
Port Project in North America

MIRAFI H_2Ri – Value Engineering Example

MIRAFI H_2Ri Layout – Plan View



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Port Project in North America

MIRAFI H_2Ri – Value Engineering Example

Port Improvements Project – Benefits of the **MIRAFI** H_2Ri Option

- Eliminated the 4-inch aggregate drainage layer
  - 77,364 tons aggregate
  - 3,095 truckloads of aggregate (25 tons per truck)
- Non-performed the nonwoven geotextile separation fabric
- Eliminated the lateral drains of the herringbone system
  - Trench excavation, aggregate and pipe

Port Project in North America

MIRAFI H_2Ri – Value Engineering Example

Benefits of the **MIRAFI H_2Ri** Option…

- Less Cost
- Reduced Carbon Footprint
- Faster Construction
- More Sustainable Solution
- Less Natural Resources
- Increased Safety

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Madison Ave SE & Fulton St. Reconstruction (2015)

CSO 21 & CSO 22 Projects
Grand Rapids, MI

THE PROBLEM

- Fluctuating ground water causing water issues with pavement and adjacent buildings.

THE SOLUTION

- **Engineered** Reinforcement & Moisture Management Geotextile, **MIRAFI** H_2Ri

BENEFITS

- **Reduced** pavement cross section while maintaining desired structural performance (SN = 4.24)
- Provides continuous active moisture management system beneath pavement section.
- Provides **more resilient infrastructure**

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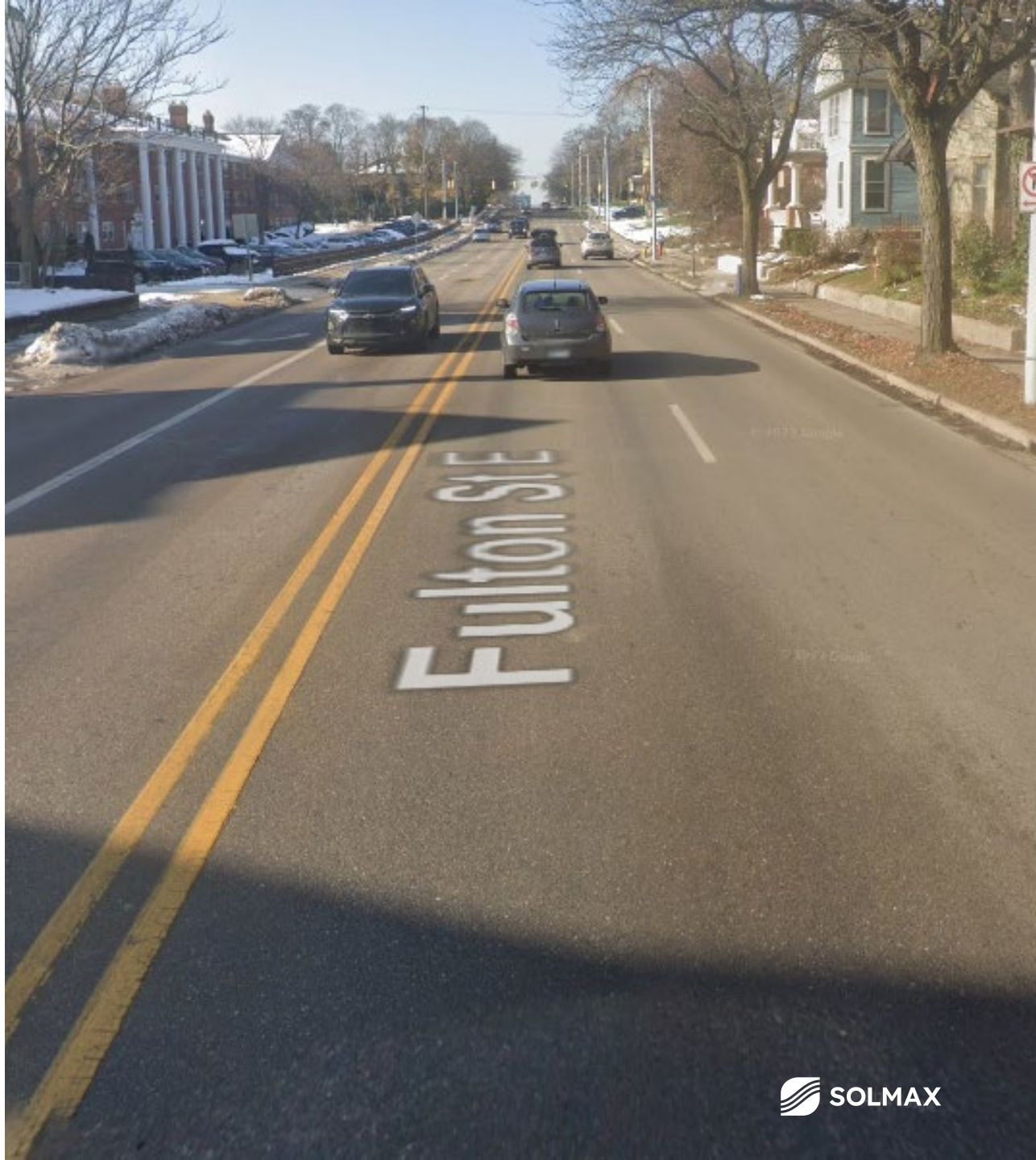

LRE Asphalt Parking Lot (2023)

LRE Engineers & Surveyors Walker, MI

THE PROBLEM

- Changes in subgrade moisture led to increased settlement, heaving, cracking and deterioration of the asphalt parking lot.

THE SOLUTION

- **Engineered** Reinforcement & Active Moisture Management Geotextile, **MIRAFI** H_2Ri was used in the reconstructed pavement section.

BENEFITS

- **Reinforced** aggregate base course of the flexible pavement section to extend service life.
- **Active Moisture Management** technology to continuously remove excess water and minimize impact of moisture on the pavement system.
- Provides **more resilient infrastructure**

LRE A

LRE

100th Street SE – Reconstruction (August 2022)

Kent County Road Commission
Kent County, MI

THE PROBLEM

- Excess water in subgrade.
- Perpetual freeze-thaw issues.

THE SOLUTION

- **Engineered** Reinforcement & Active Moisture Management Geotextile was used in the reconstructed pavement section.

BENEFITS

- **Reinforced** aggregate base course of the flexible pavement section to extend service life.
- **Active Moisture Management** technology to continuously remove excess water and minimize impact of moisture on the pavement system.
- Provides **more resilient infrastructure**

100th Stree

Kent C

Key takeaways

- ASCE Report Card on roads: **D+**
- TRB & FHWA agree on issues
  - Intrusion of fines
  - Excessive loads
  - Moisture
- **MIRAFI** H_2R*i* addresses these issues
- Real-world applications
- Cost savings
- **InfraSol*ve*** design tool

Infrastructure is built to last.
Your designs should be, too.

Reach out today, and let’s start building smarter, stronger, and more resilient roads.

SOLMAX

“Nothing changes if nothing changes.”

- Said someone

SOLMAX

Thank you

Questions?

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