

Case Histories – Innovative Roadway Landslide Repair Technologies



August 1, 2012

Colby Barrett

Nate Beard

Technology Overview



KOMATSU

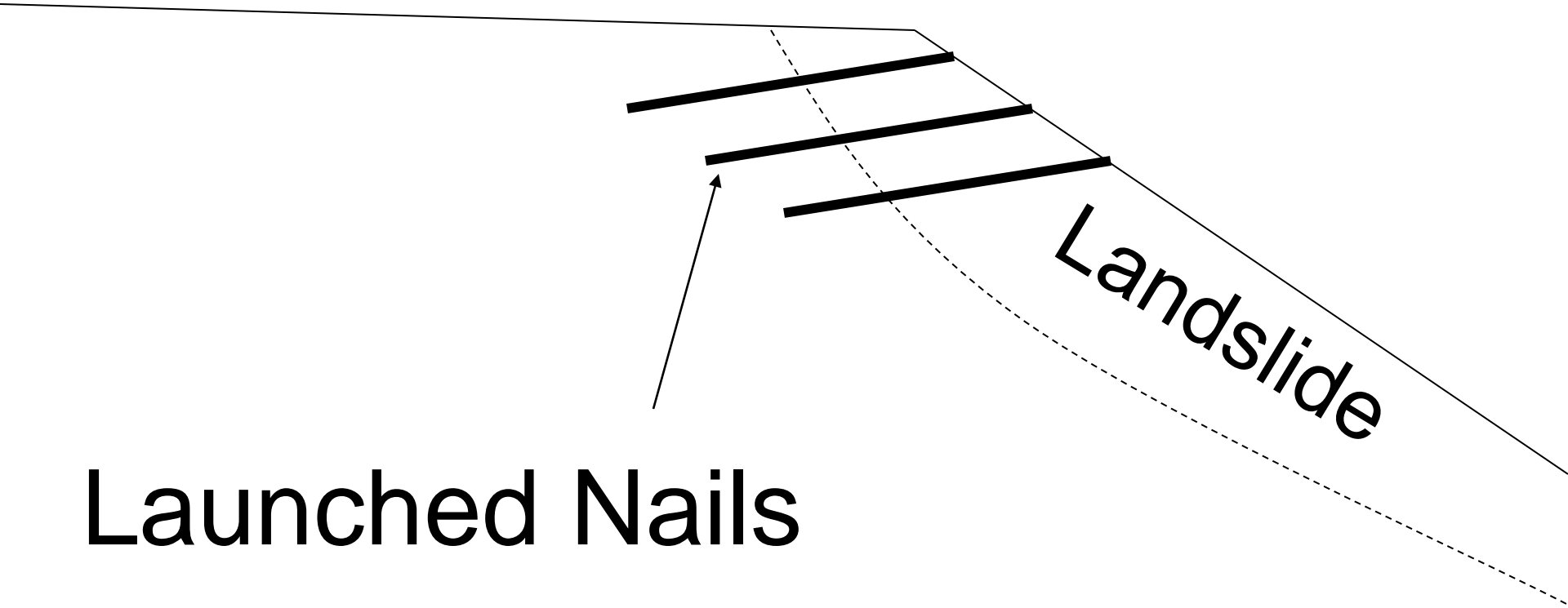
PC150LC

Soil Nail Launcher, Inc.



GalvaDized™ Launched Nails
Before Installation





Launched Nails

Landslide











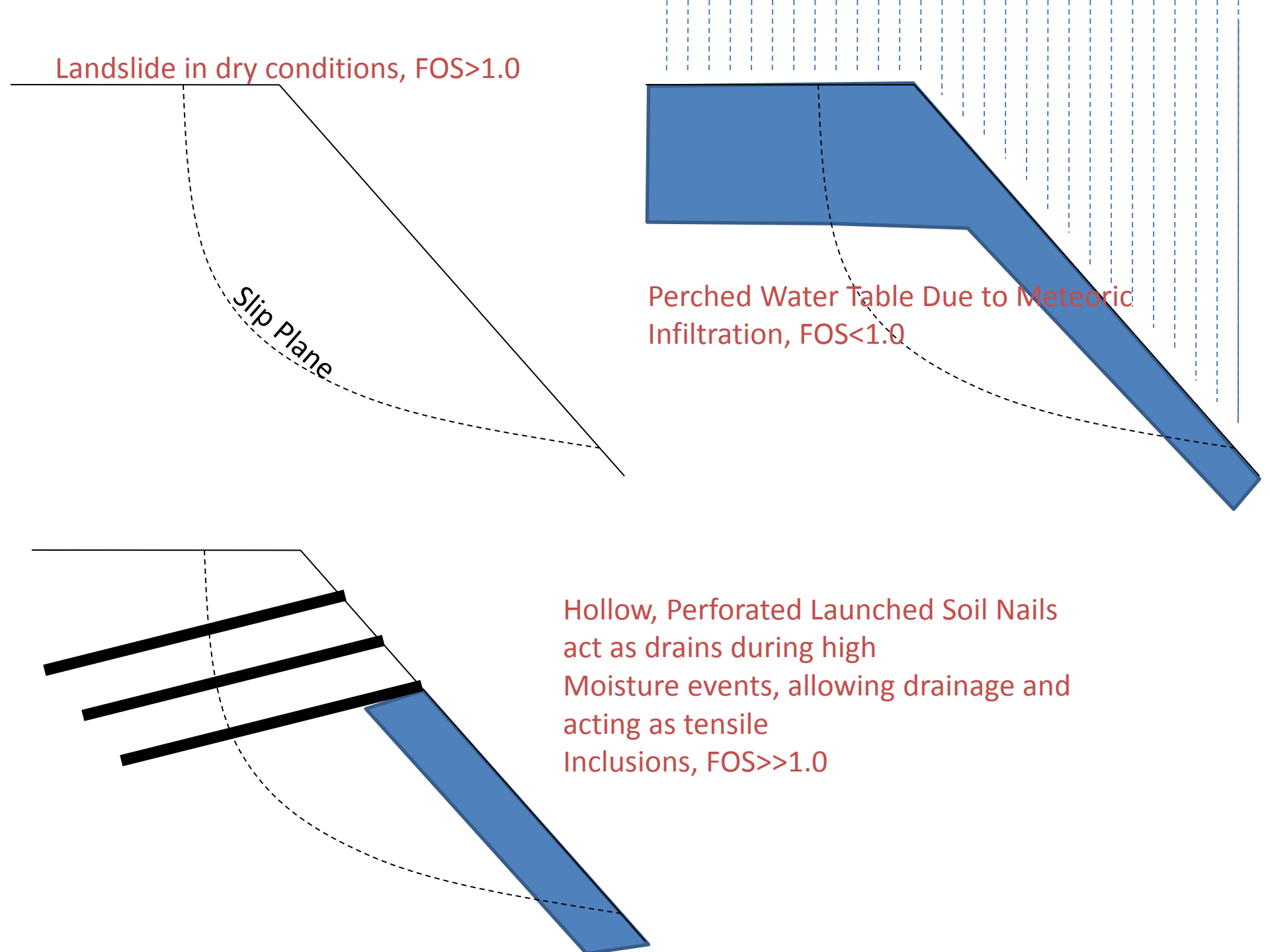


Landslide in dry conditions, $FOS > 1.0$

Slip Plane

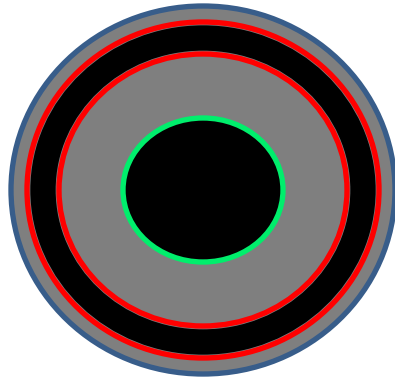
Perched Water Table Due to Meteoric Infiltration, $FOS < 1.0$

Hollow, Perforated Launched Soil Nails act as drains during high Moisture events, allowing drainage and acting as tensile Inclusions, $FOS \gg 1.0$

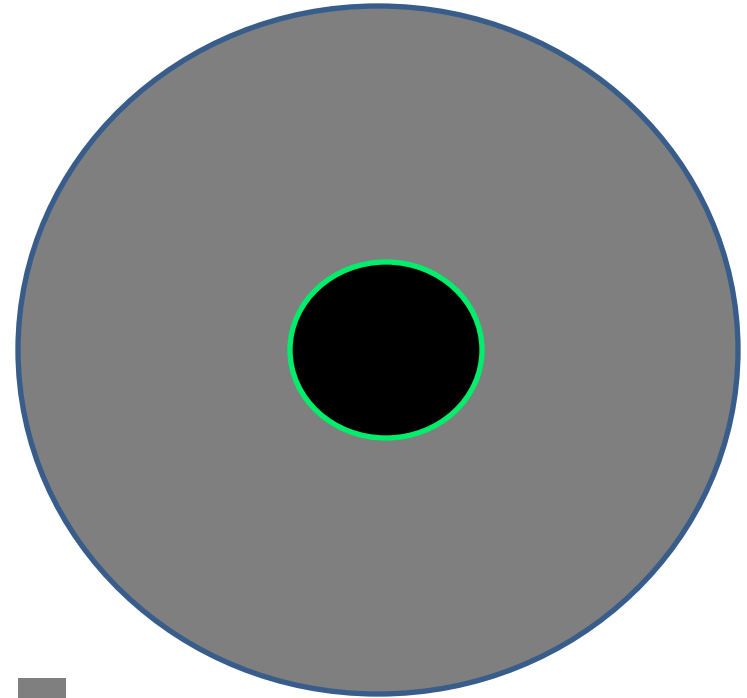




SuperNail®



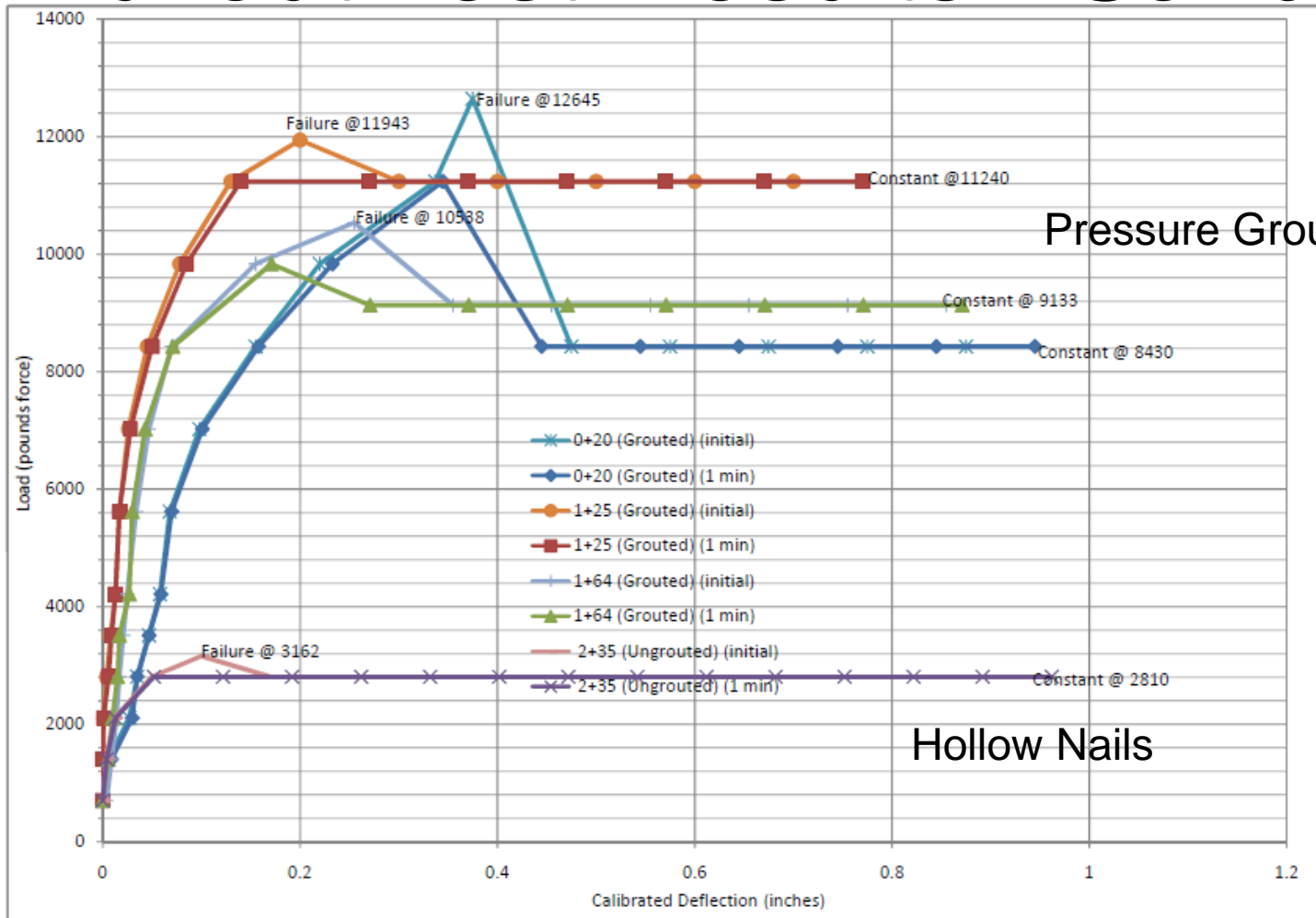
Traditional Soil Nail



Grout
Galvanization
Steel
Epoxy



Pullout Test Results - Sand



1. Average bond = 3.1 psi (ungrouted); 11.5 psi (grouted)



United States
Department of
Agriculture

Forest Service

Engineering Staff

EM 7170-12B



United States
Department of
Transportation

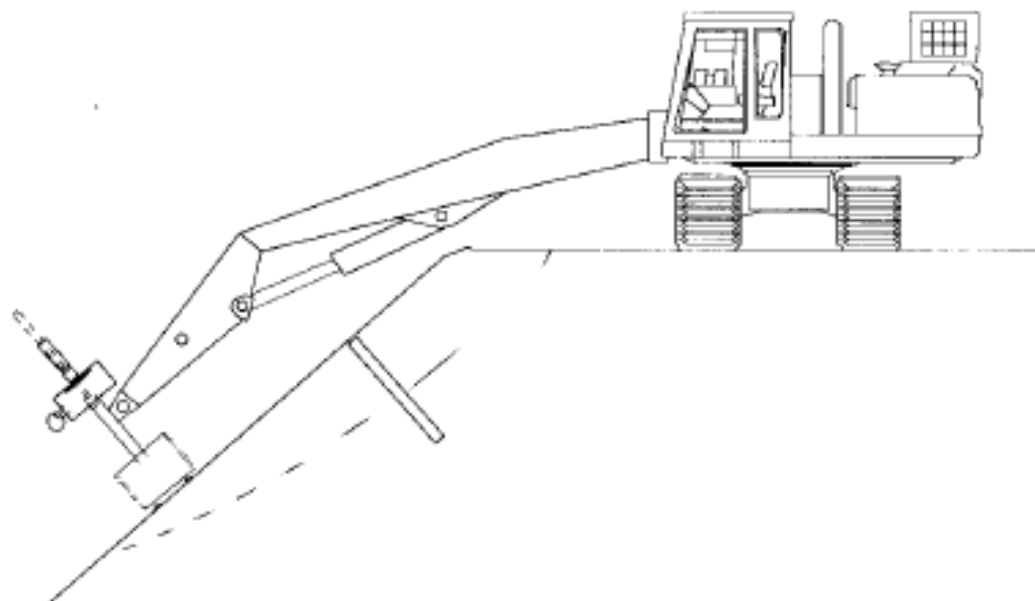
**Federal Highway
Administration**

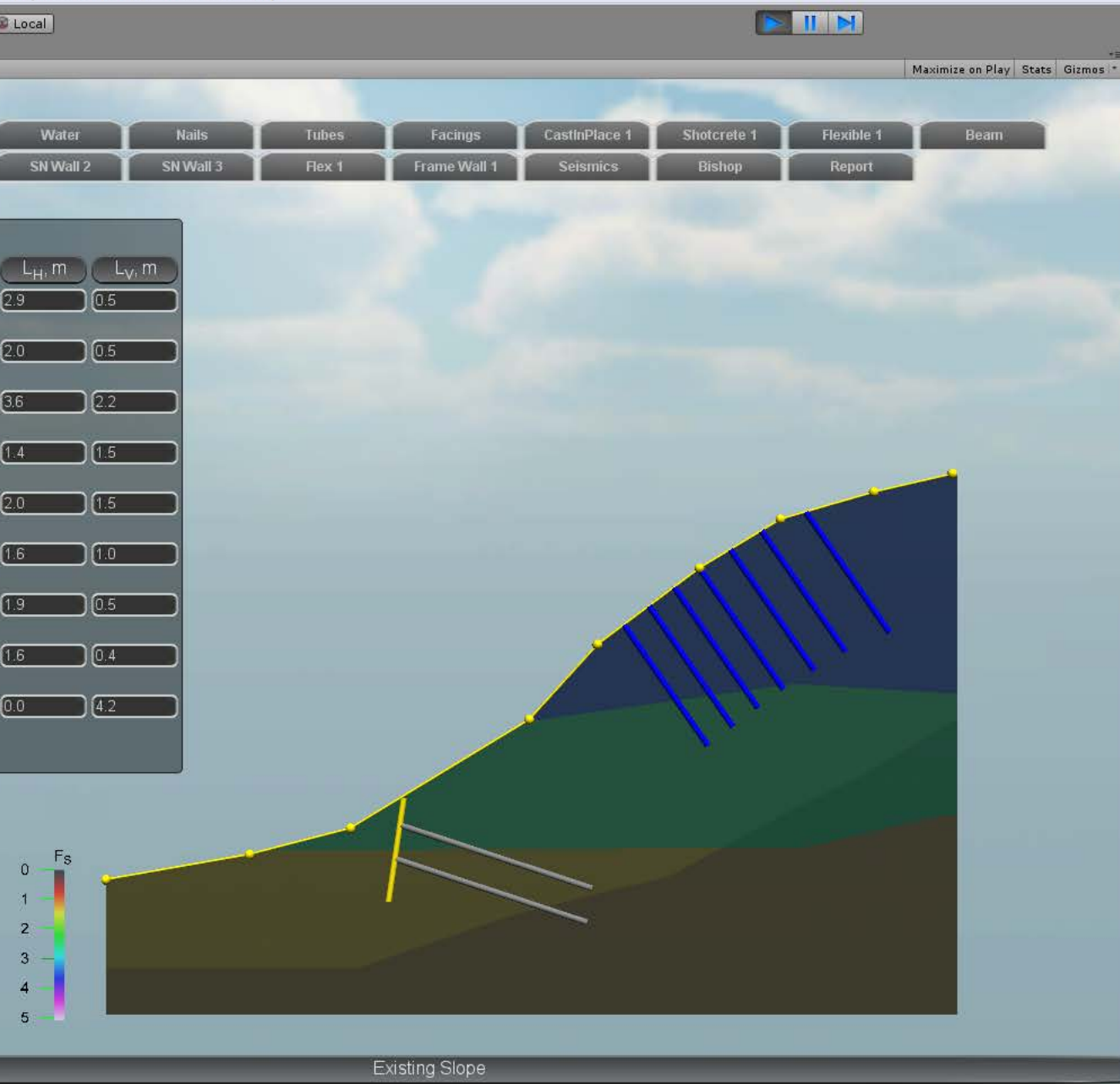
FHWA-FPL-93-004

July 1994

Project Report for Launched Soil Nails— 1992 Demonstration Project

Volume 2





- Water
- Nails
- Tubes
- Facings
- CastInPlace 1
- Shotcrete 1
- Flexible 1
- Beam
- SN Wall 2
- SN Wall 3
- Flex 1
- Frame Wall 1
- Seismics
- Bishop
- Report

Hierarchy

- Create
- Q+ All
- Blob Light Projector
- Enums
- LSnap
- Module_BookReader
- Module_Chat
- Module_DEM
- Module_LSnap
 - Bishop
 - Data
 - Facing
 - Facing CastInPlace
 - Facing Coefficients
 - Facing Flexible
 - Facing Nail Coefficients
 - Facing Shotcrete
 - Facings
 - Flex
 - Nails
 - Plane
 - Plane Base
 - Plot
 - Report
 - Rockery
 - Seismics
 - Slope
 - SnWall
 - Soils
 - Surcharge
 - Tubes
 - Walls
 - Water
- Module_Materials
- Module_Project
- Module_Rockery
 - Bishop
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 - Report
- Module_Server
- Module_SlopeSection

Project

- Create
- Q+ All
- Module_LSnap
- Module_LSnap
- Module_LSnap_Data
- Module_LSnap_Data_Bars
- Module_LSnap_Data_Coefficient
- Module_LSnap_Data_Coefficient
- Module_LSnap_Data_NailGeometric
- Module_LSnap_Data_Safety
- Module_LSnap_Data_Seismicity
- Module_LSnap_Data_SlopeGeometric
- Module_LSnap_Data_Soil

Inspector

Package_Base

Tag Untagged

Transform

Position

X 0 Y 0

Rotation

X 0 Y 0

Scale

X 1 Y 1

Package_Base (S)

Script

Package

Info

Warning

Project

Terrain

Module Gui Skin

Console

Clear Collapse Clear on play Error pause

Hand, Move, Rotate, Scale, Pivot, Local

Play, Pause, Stop

Scene Game Free Aspect

Maximize on Play Stats Gizmos

Projects LSnap

Slope Soils Water Nails Tubes Facings CastInPlace 1 Shotcrete 1 Flexible 1 Beam
Walls SN Wall 1 SN Wall 2 SN Wall 3 Flex 1 Frame Wall 1 Seismics **Bishop** Report

Fail_{Min} 2.06 m

Seismic

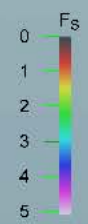
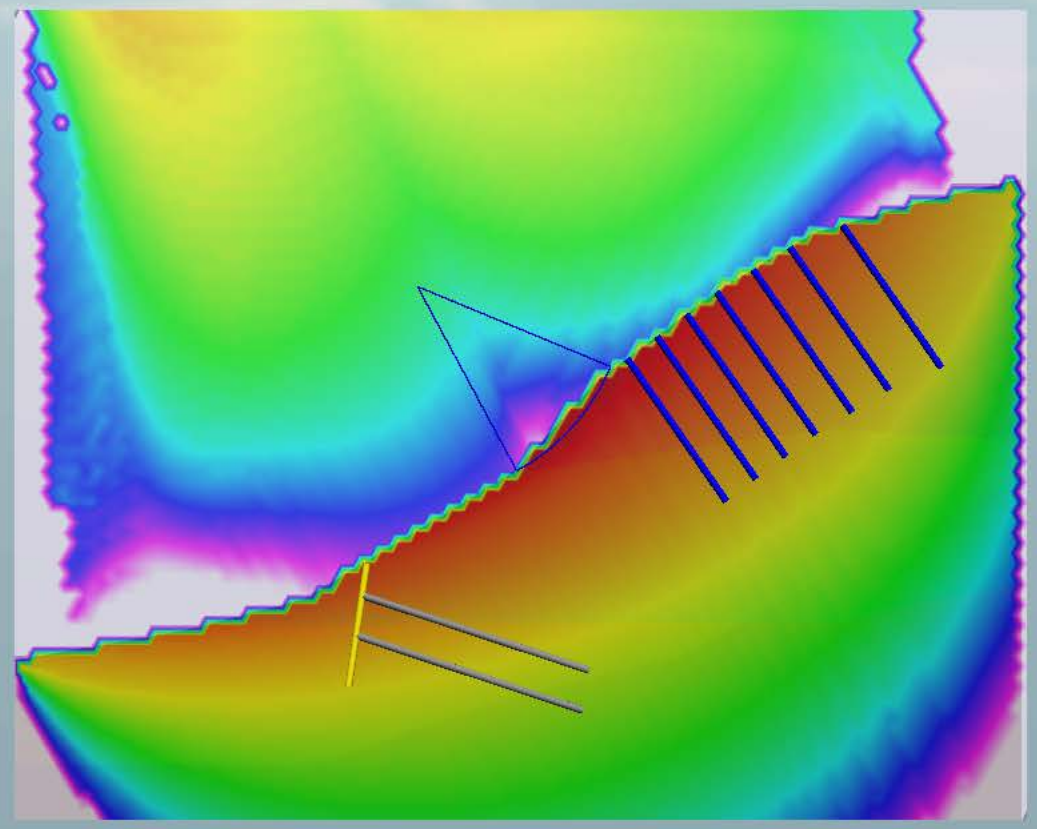
Scale 0.0.5.1

Center 1.0.6.1 m

Radius 3.5 m

FoS 0.64

Calc



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Blob Light Projector
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LSnap Wall Modified Bishop global stability -- (internal failures through rockery excluded)

Scene | Game | Free Aspect

Maximize on Play | Stats | Gizmos

Projects | LSnap

Fail_{Min} m

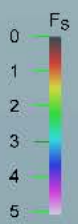
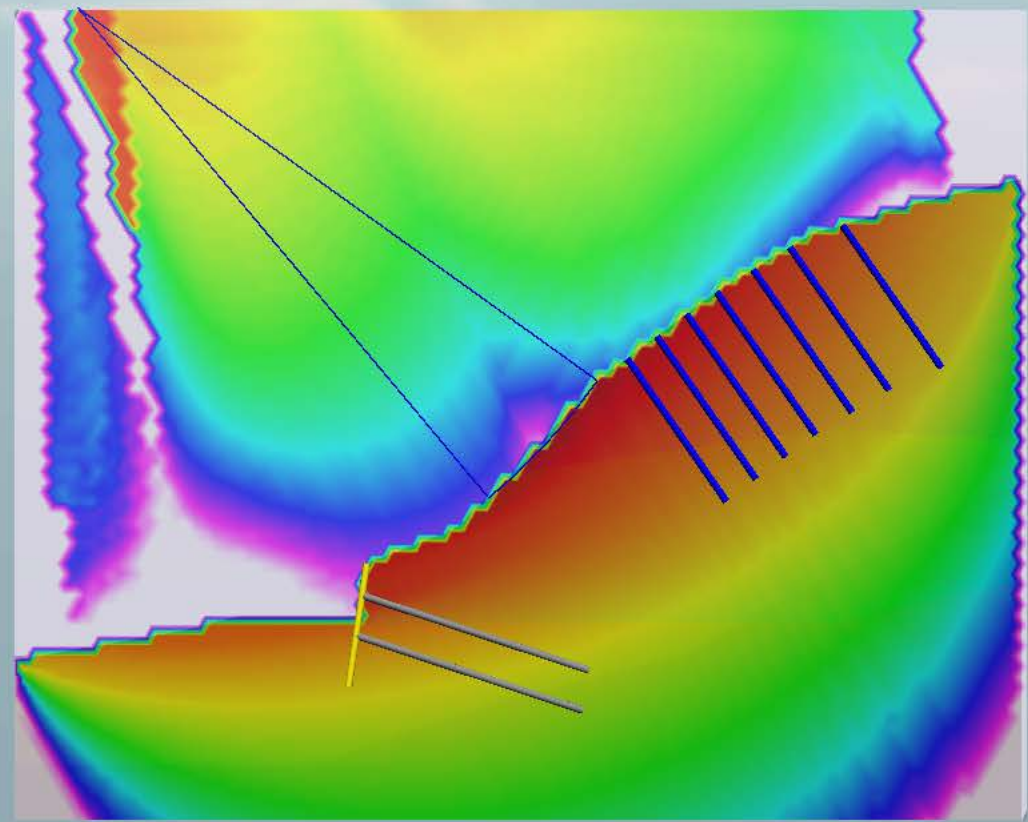
Seismic

Scale

Center m

Radius m

FoS



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Fail_{Min} m

Seismic

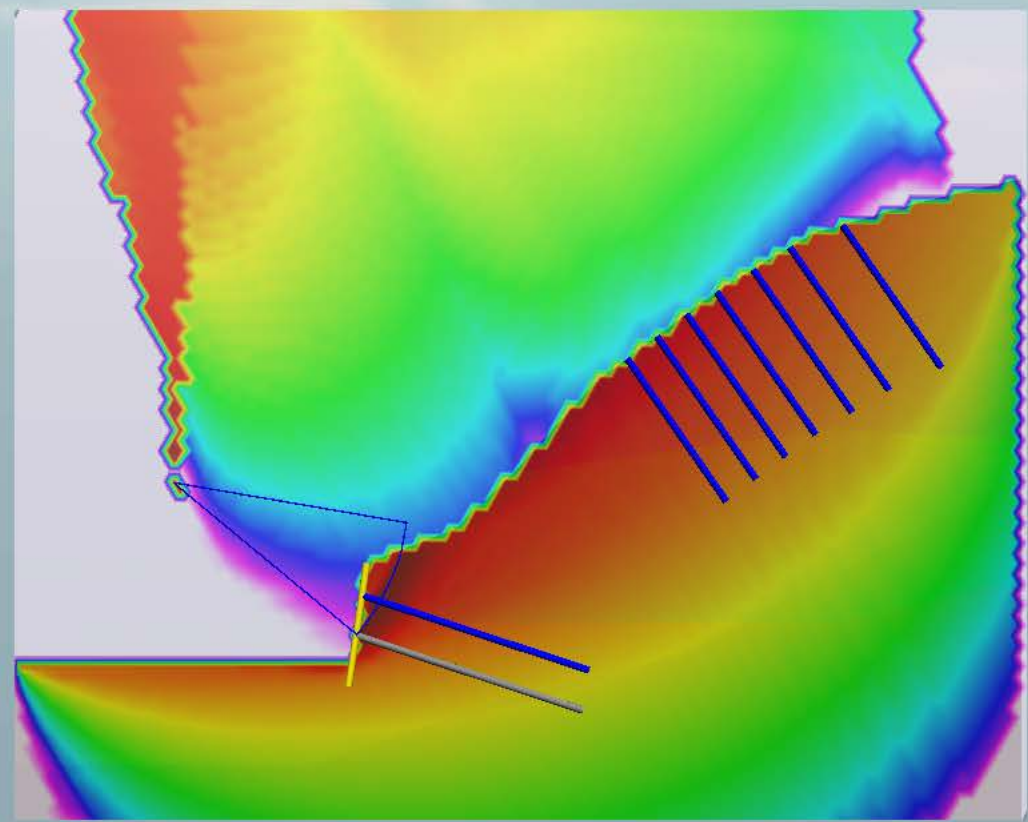
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Radius m

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Fail_{Min} m

Seismic

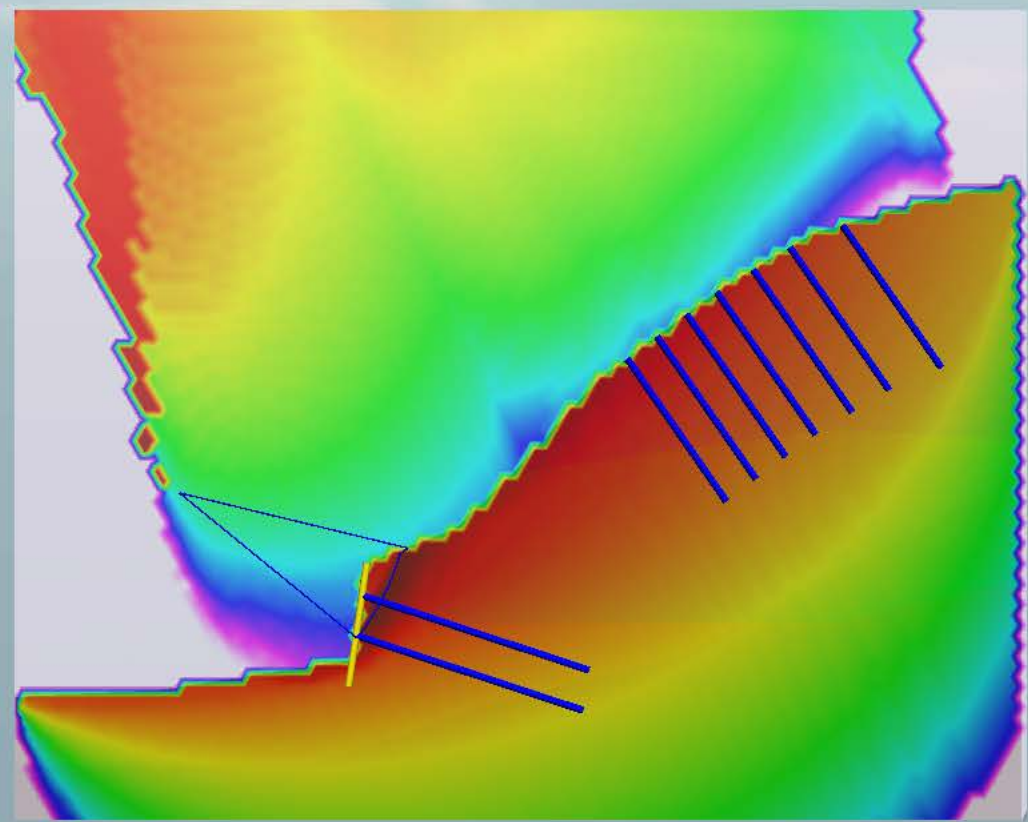
Scale

Center m

Radius m

FoS

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LSnap Wall Modified Bishop global stability -- (internal failures through rockery excluded)





KOMATSU

M011 2

PC150LC

Soil Nail Launcher, Inc.







11/06/2009











Case Study - Crescent City, CA



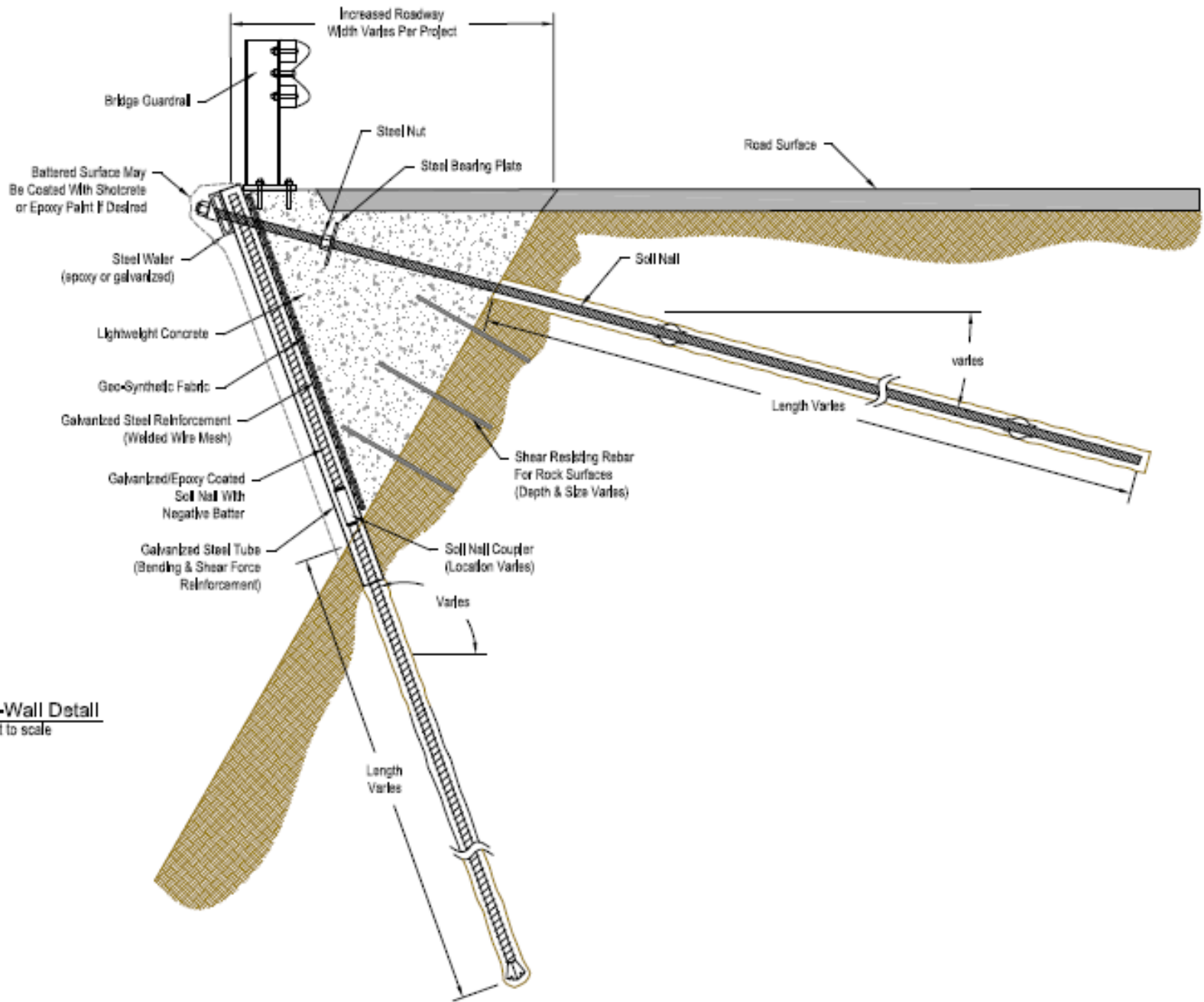






Case Study – Route 621, VA





A V-Wall Detail
 not to scale







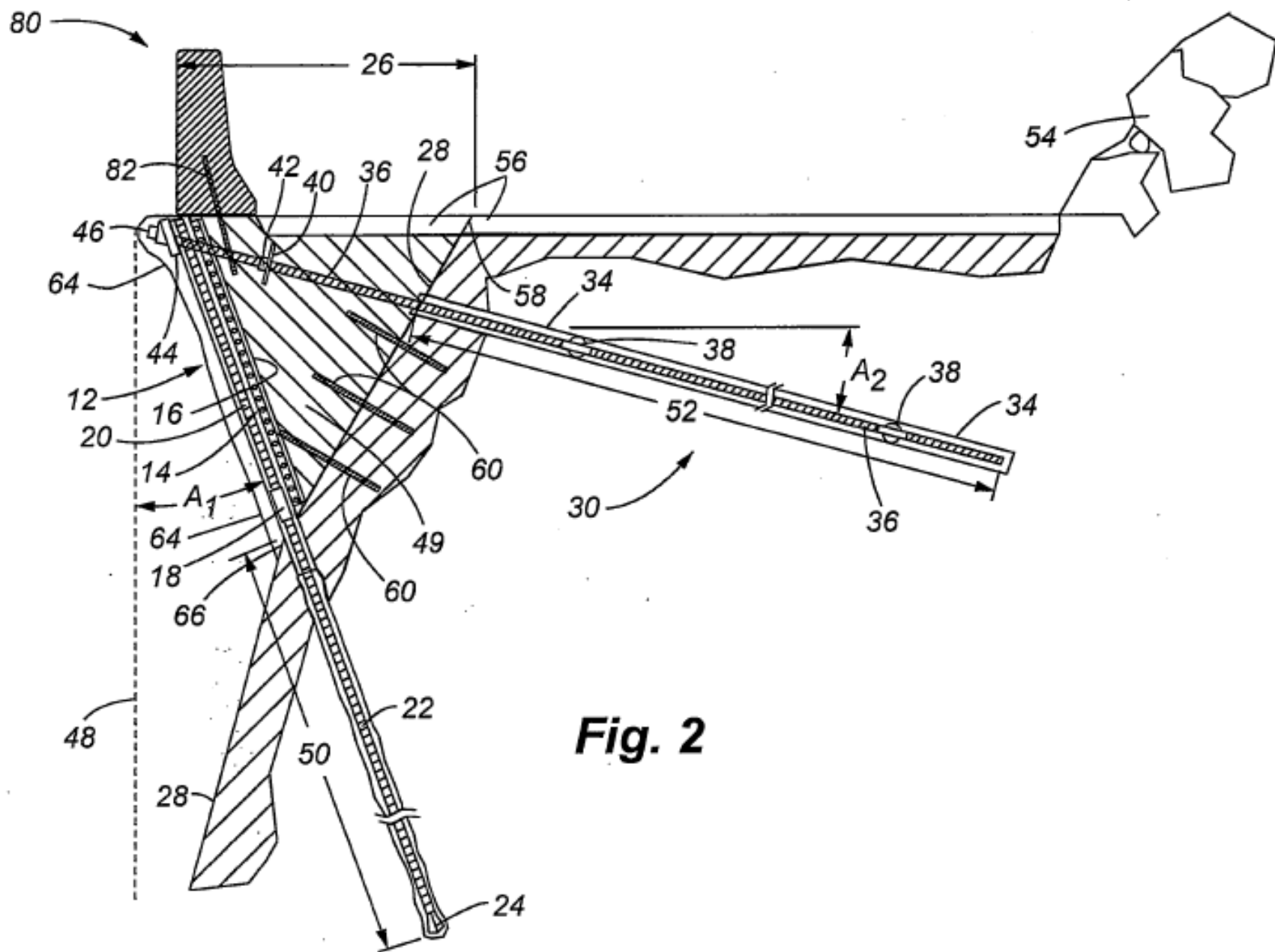








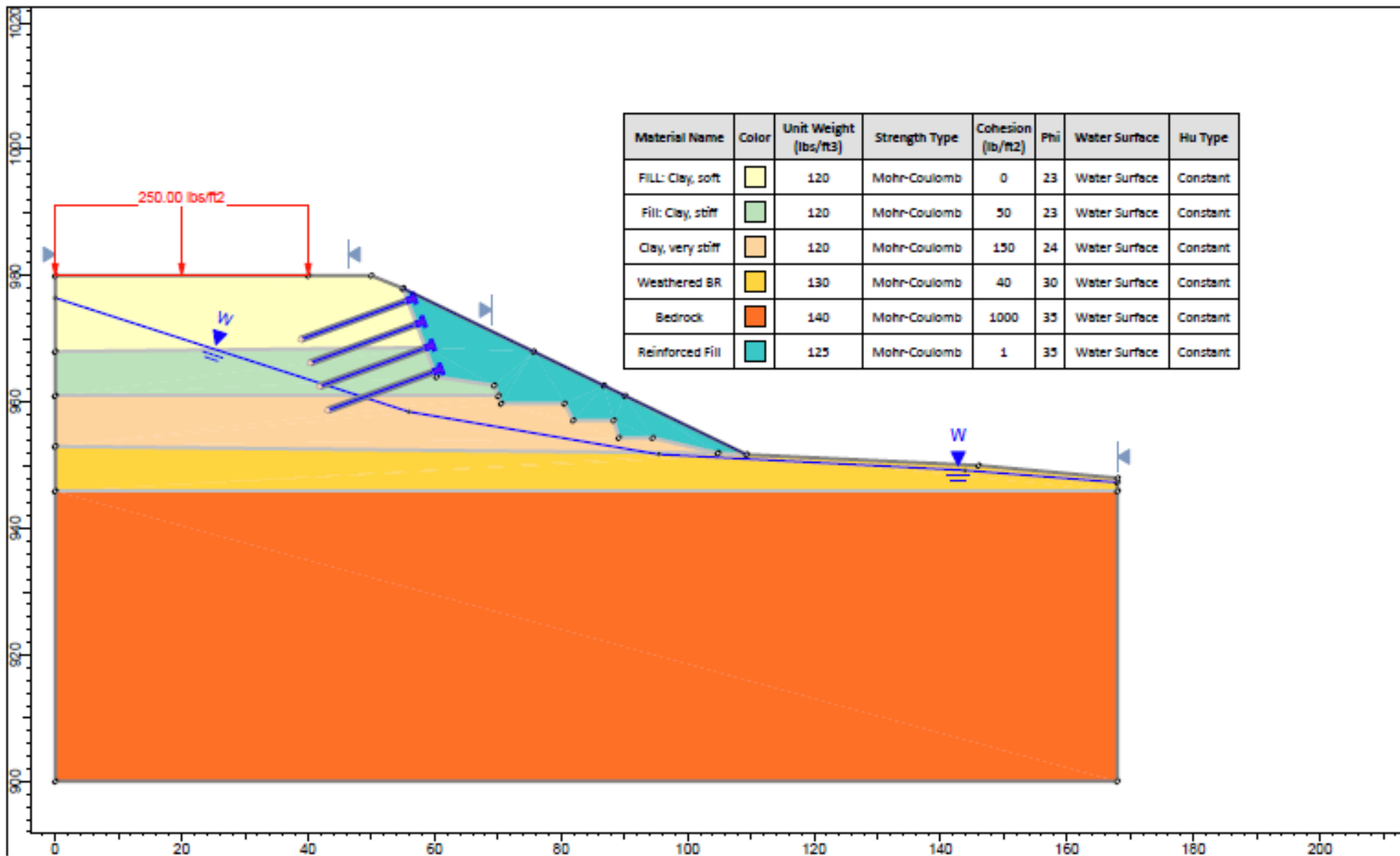













	Project			I90W MP 7.8		
	Analysis Description			Reinforced Fill w/ Launched Nails		
	Drawn By	MAB	Scale	1:252	Company	GeoStabilization
	Date	8/15/2011, 8:13:14 AM		File Name	Soil Nail Analysis RF.slim	



Montana Department of Transportation

**DESIGN-BUILD
REQUEST FOR PROPOSAL**

**D3-D4-D5 SOIL NAIL DESIGN BUILD PROJECT
Prairie, Glacier, Roosevelt, Judith Basin, Rosebud, and
Carbon Counties**



**Project Number: NH-STPP-IM STWD(107)
Control Number: 7756**

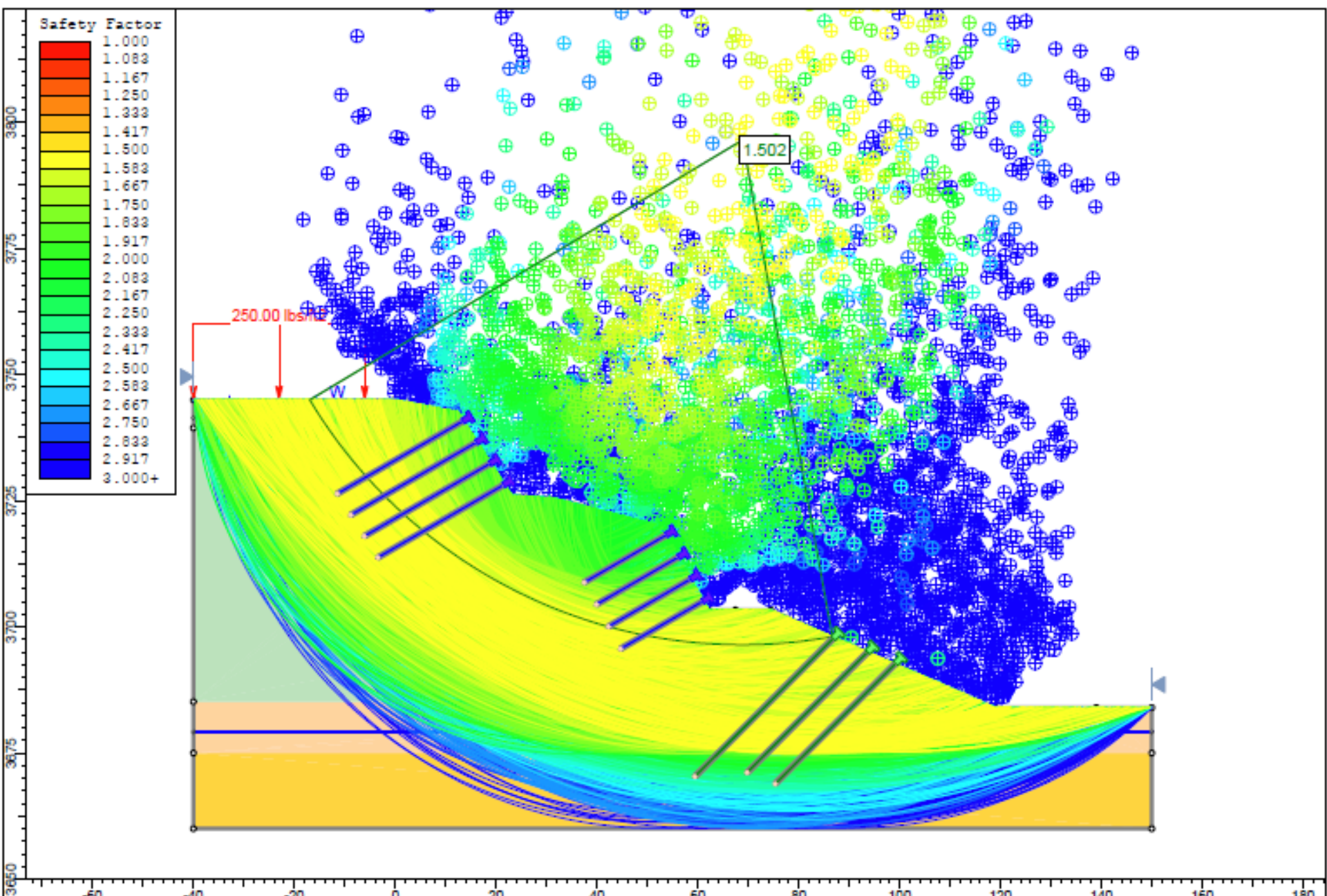
September 6, 2011



ROCKY MTN
CONCRETE
727-4155









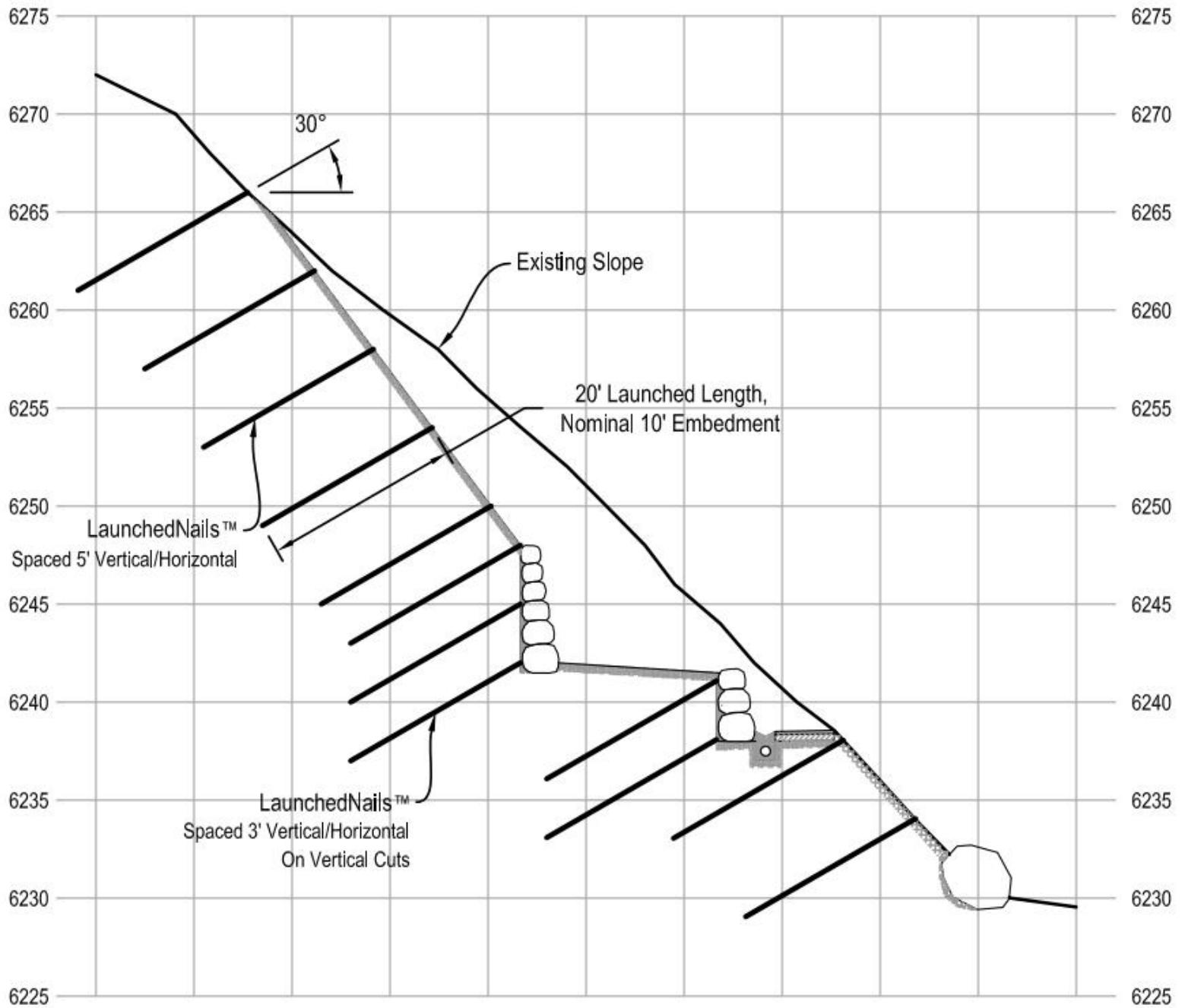


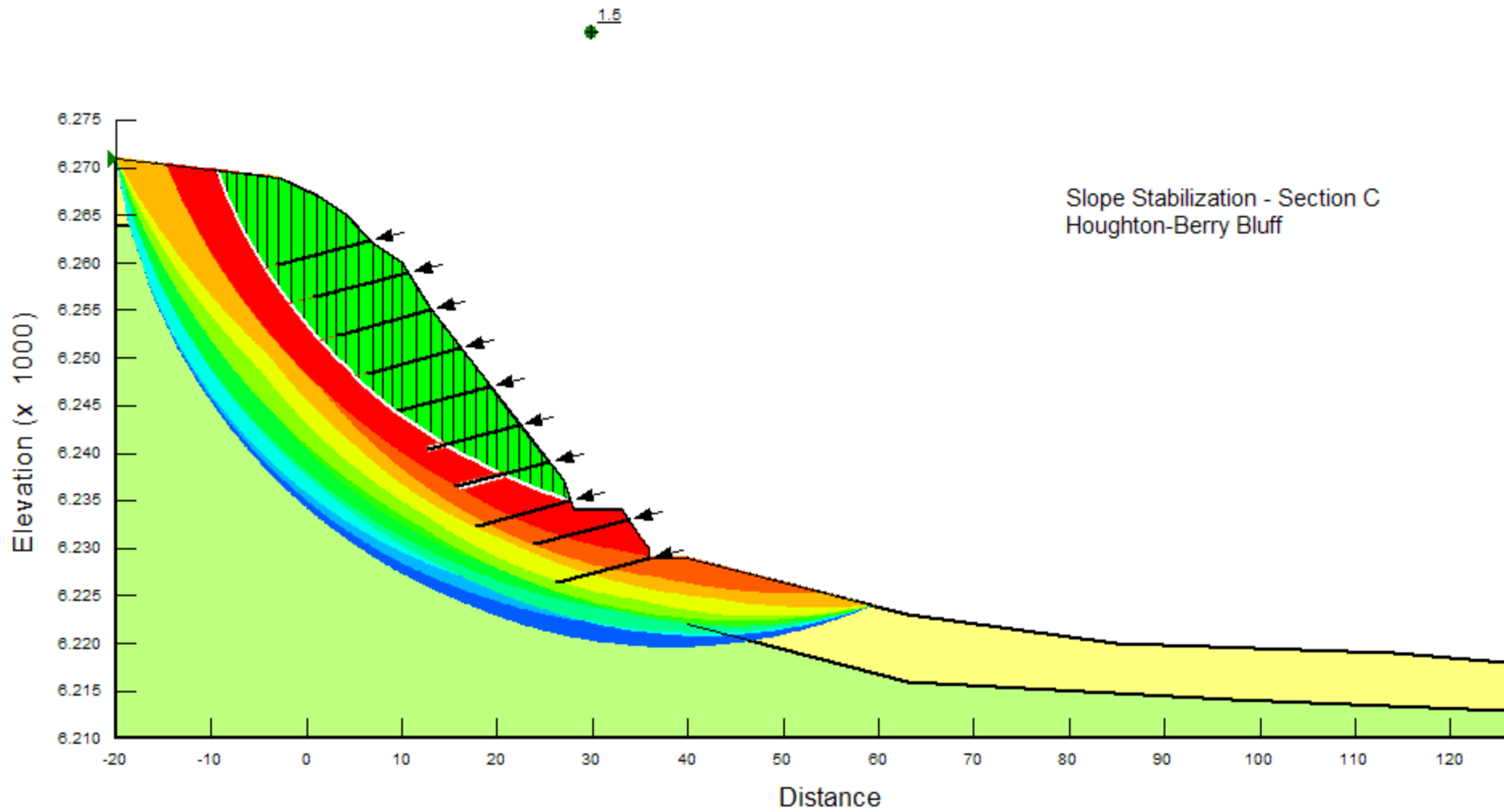
Case Study – Lake Tahoe, CA





























JUNE/JULY 2011
VOLUME 29 NUMBER 3

Geosynthetics

From eroded to elegant

**A Lake Tahoe
bluff restoration**

SUSTAINABILITY

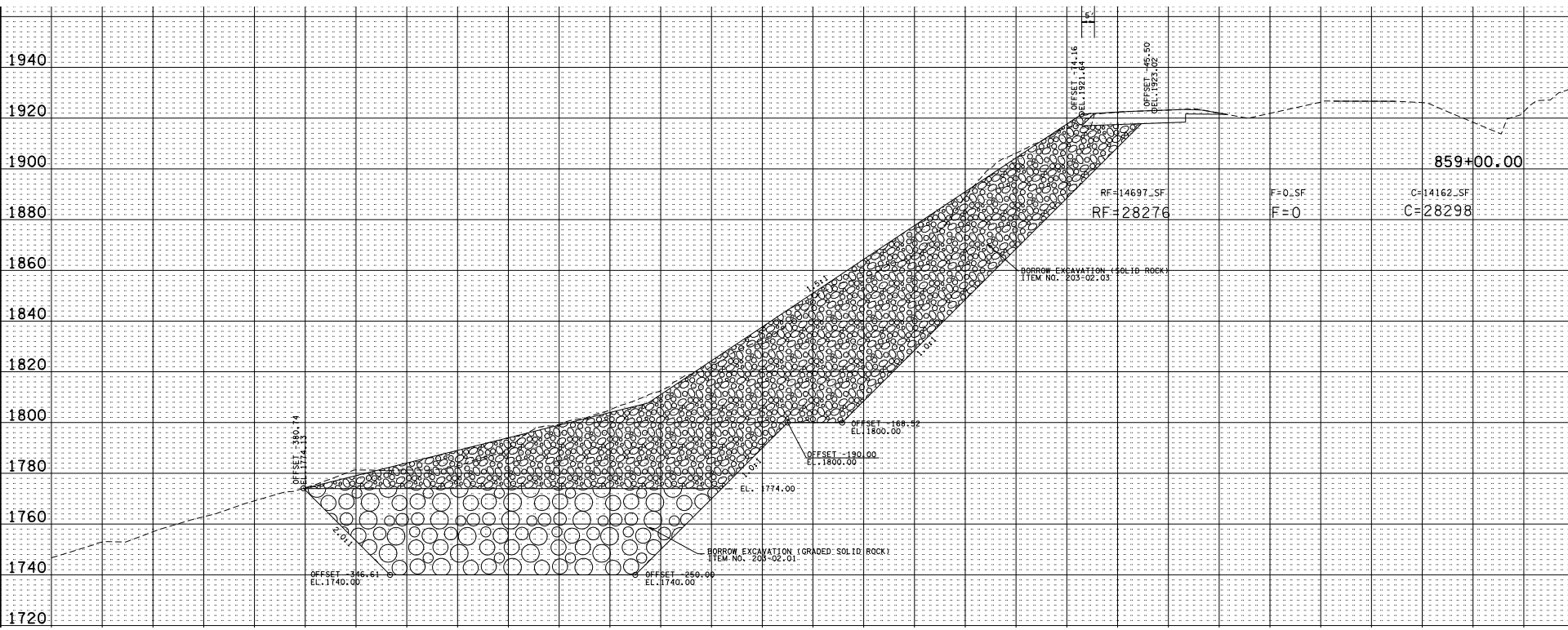
A European perspective

The return of "In the Lab"

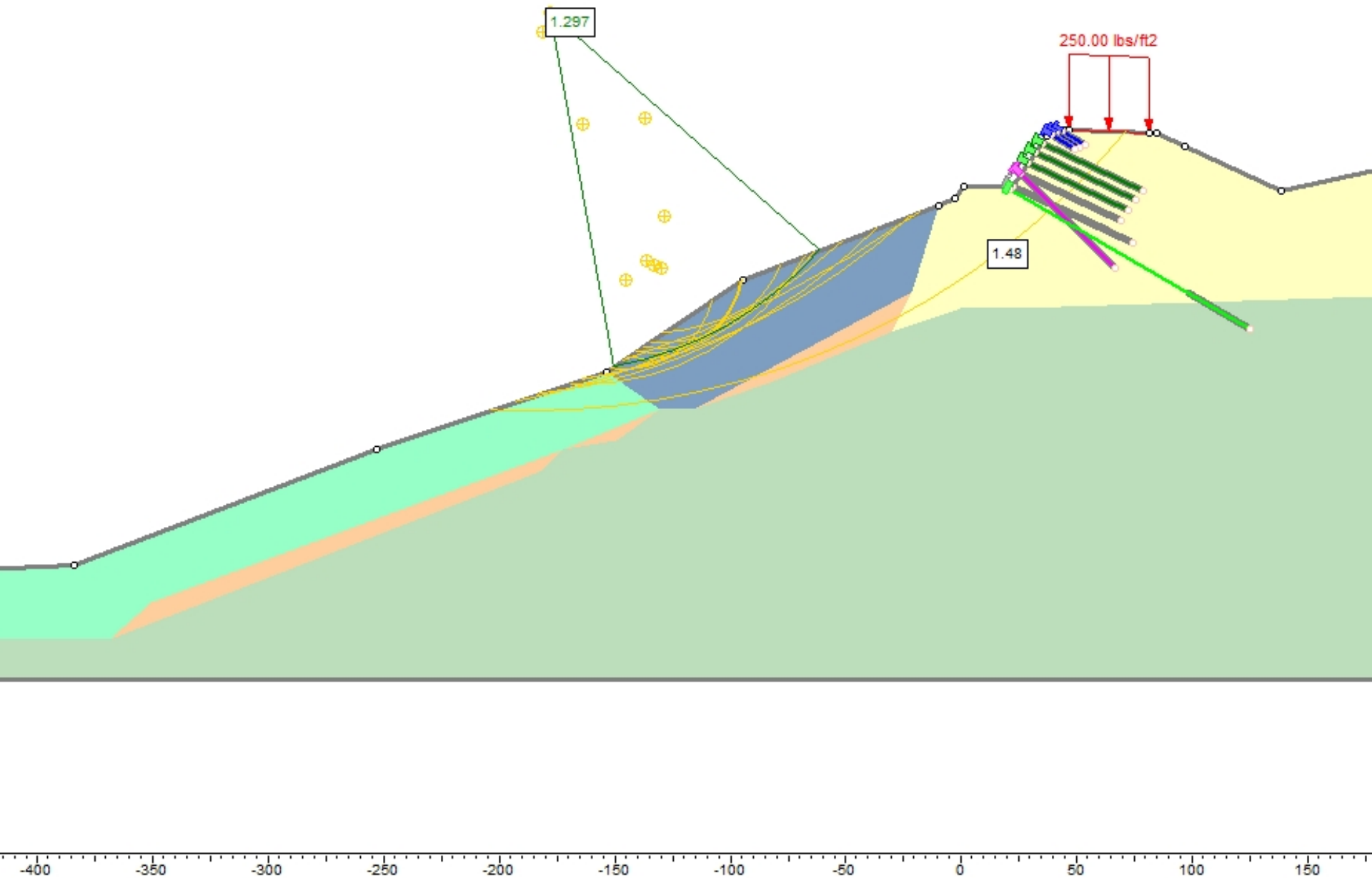
**Case histories examine
geomembrane performance**

Case Study – I-75, TN







































Questions?

www.soilnaillauncher.com