

Geosynthetics Testing at NAPTF

Construction Cycle 9

Presented to: REDAC

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Date: September 8, 2021



Federal Aviation
Administration



Geosynthetics Initiation

H.R.4 of the 115th Congress – FAA Reauthorization Act of 2018

Received May 8, 2018

Signed October 5, 2018

540 pages

AN ACT: To reauthorize programs of the Federal Aviation Administration, and for other purposes.
Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled

Title V - Miscellaneous

SEC. 558. GEOSYNTHETIC MATERIALS.

The Administrator of the Federal Aviation Administration, to the extent practicable, shall encourage the use of durable, resilient, and sustainable materials and practices, including the use of **geosynthetic materials** and other innovative technologies, in carrying out the activities of the Federal Aviation Administration.



Program Overview

- ✓ Literature Review
- ✓ Establish Draft Specification for Use of Geosynthetics
- ✓ Incorporate into AC 150/5370-10H Update
 - Obtain/Analyze Data through Full-Scale Testing
 - Modify Specifications based on Full-Scale Testing
 - Include Geosynthetics into FAARFIELD



Definition

- **Geosynthetics**

- Synthetic polymeric materials that are specifically manufactured to be used in geotechnical and geoenvironmental applications

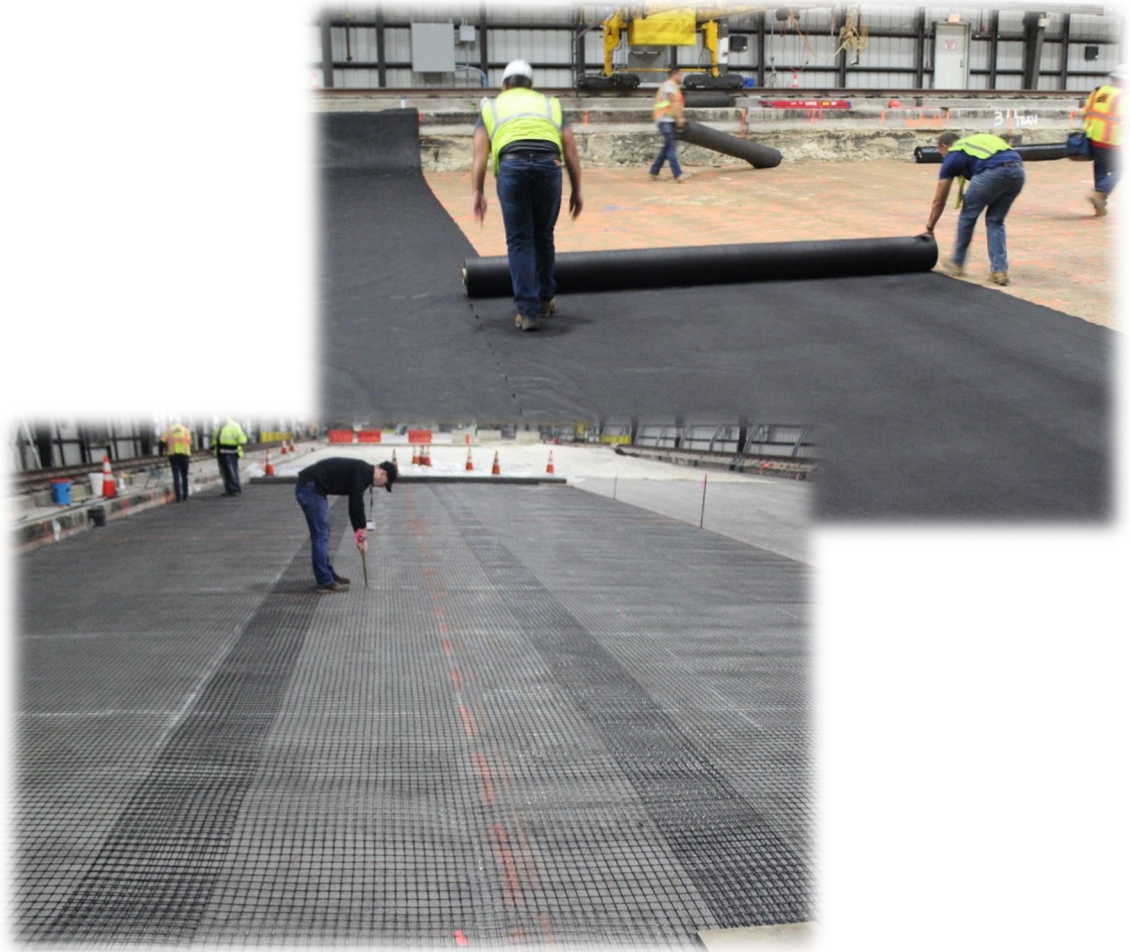
- **Types**

- **Geotextiles, Geogrids**, Geomembranes, Geonets, Geocomposites, Geocells, Geosynthetic clay liners, Erosion control products, Many others (Geofibers, Geofoam, Geopipes, Paving interlayers)

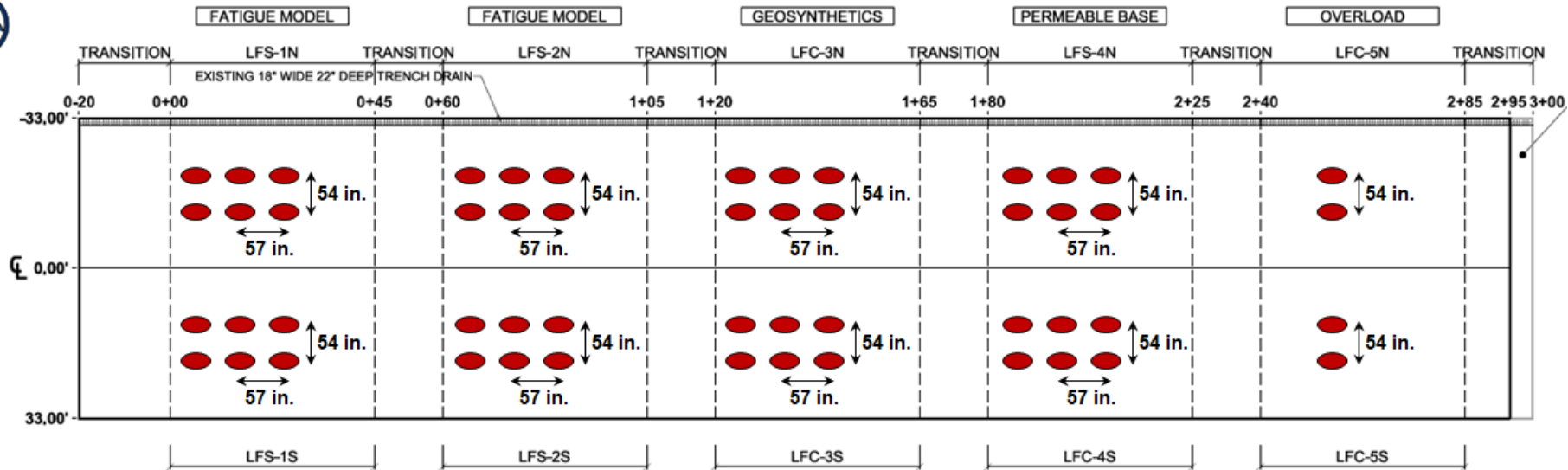


Geosynthetic Functions

- Separation
- Reinforcement
- Stiffening
- Filtration
- Barrier
- Drainage
- Protection



NAPTF Construction Cycle 9 (CC9)



Pavement Structures

LFC-3N [**Geogrid & Fabric**]

St. 1+20 – 1+65 North

5.1 inch P-401

7.7 inch P-209

Geogrid, Class B

29.1 inch P-154

Separator Fabric, Class 2

Clay Subgrade (CBR=5)

LFC-3S [**Fabric Only**]

St. 1+20 – 1+65 South

5.2 inch P-401

7.7 inch P-209

29.1 inch P-154

Separator Fabric, Class 2

Clay Subgrade (CBR=5)

LFC-4S [**Control**]

St. 1+80 – 2+25 South

5.2 inch P-401

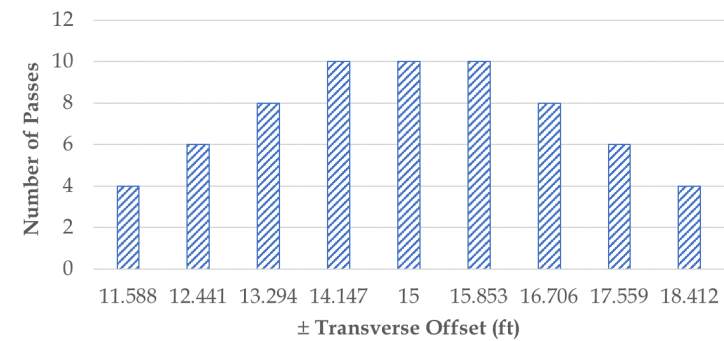
7.8 inch P-209

29.1 inch P-154

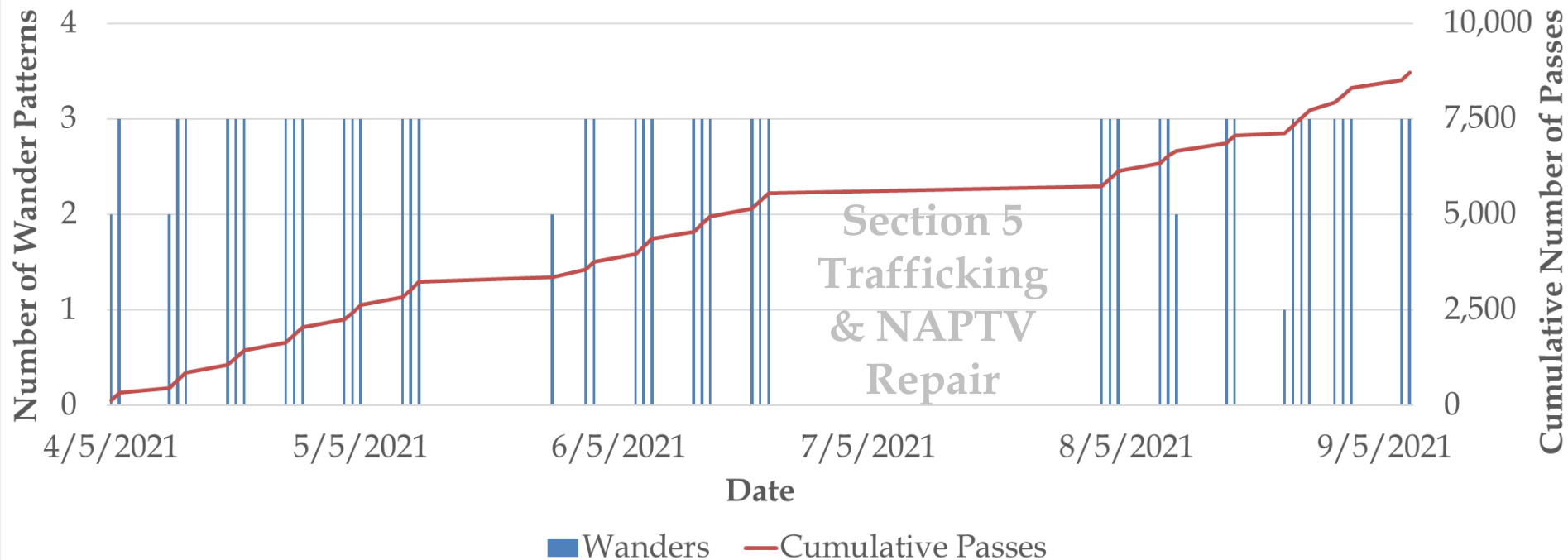
Clay Subgrade (CBR=5)



Trafficking

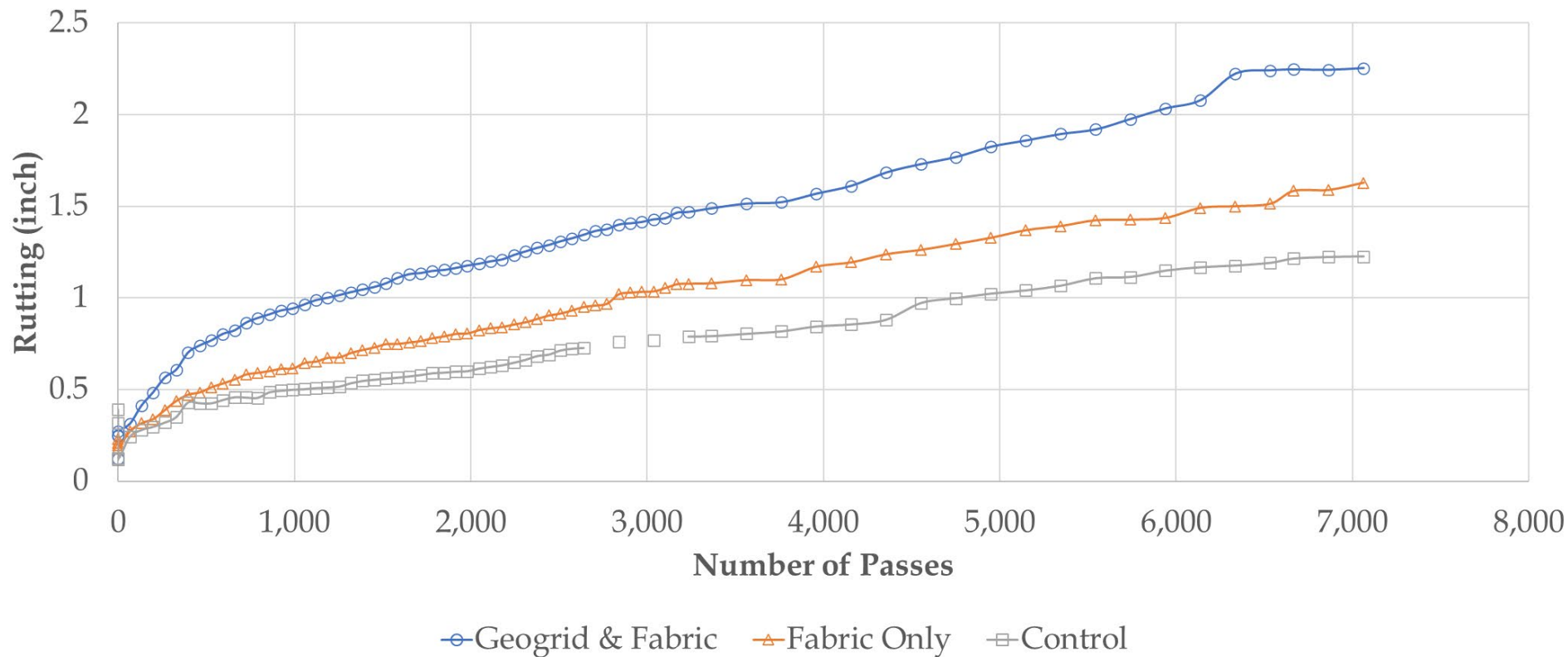
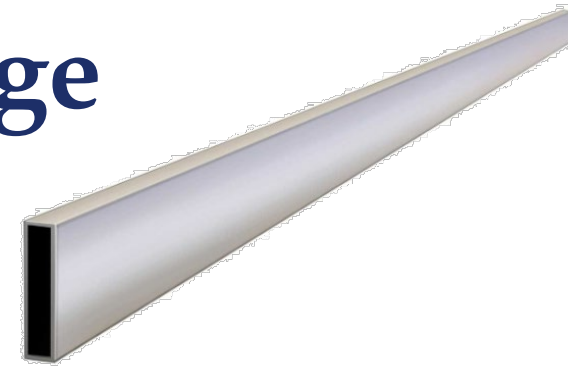


- Started on April 5, 2021
- 129 wanders applied (8,514 passes) as of Sept. 7



Rutting using Straightedge

- No cracking
- Only rutting

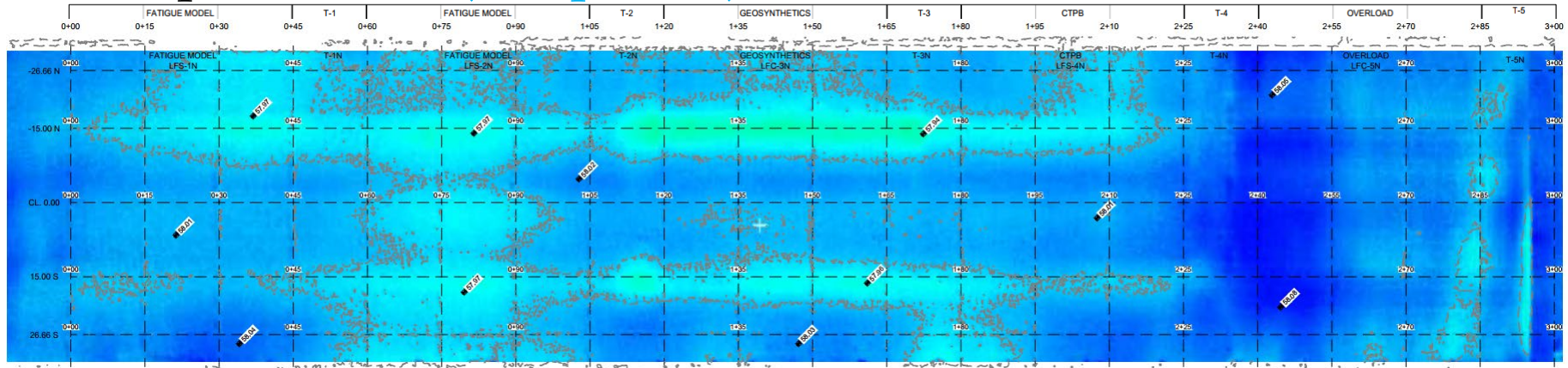


Leica 3D Scanner

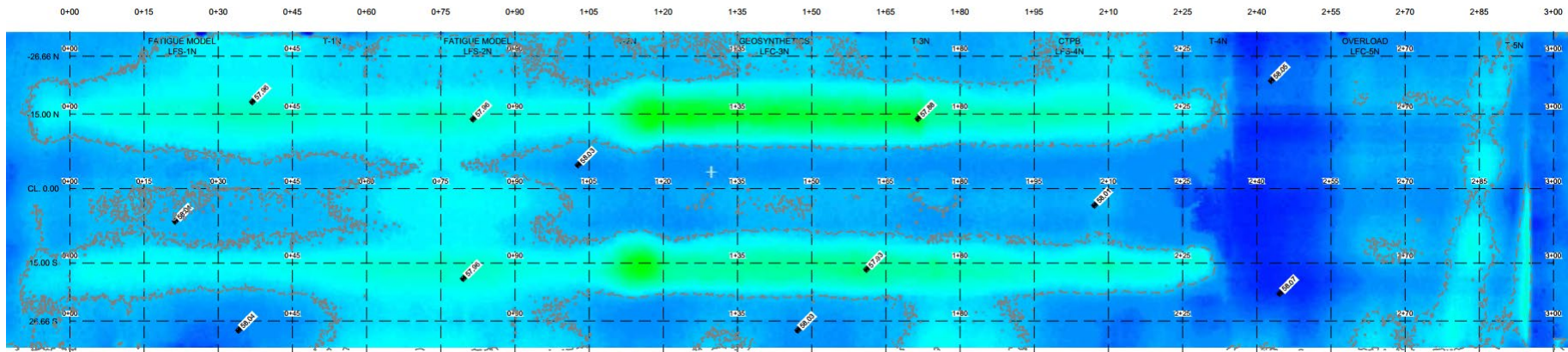
Trafficking Start:
April 5



- April 9, 2021 (330 passes)



- May 14, 2021 (3,234 passes)



Color Range= 100 colors

Color Increment= .05'

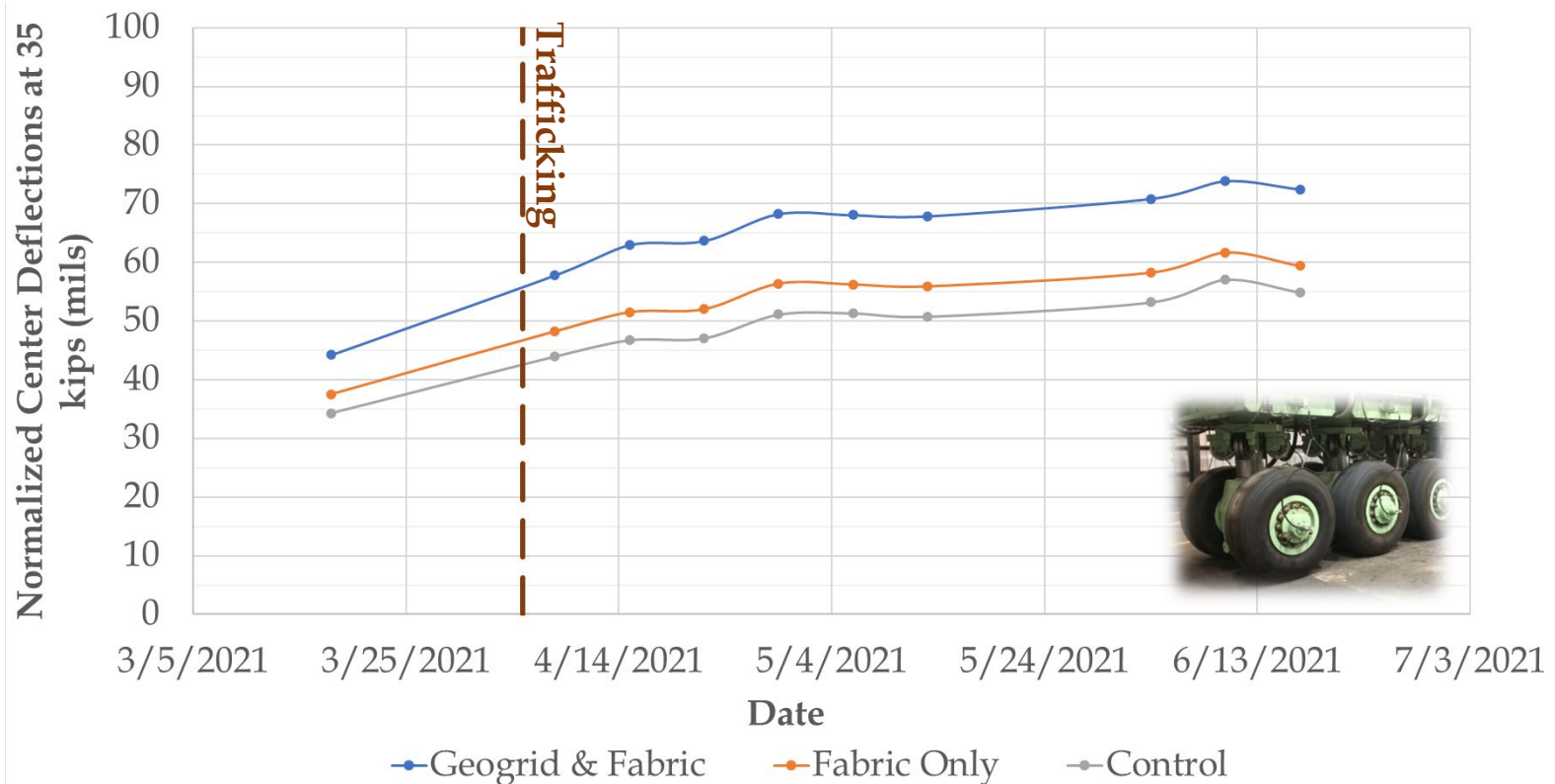


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Heavy Weight Deflectometer



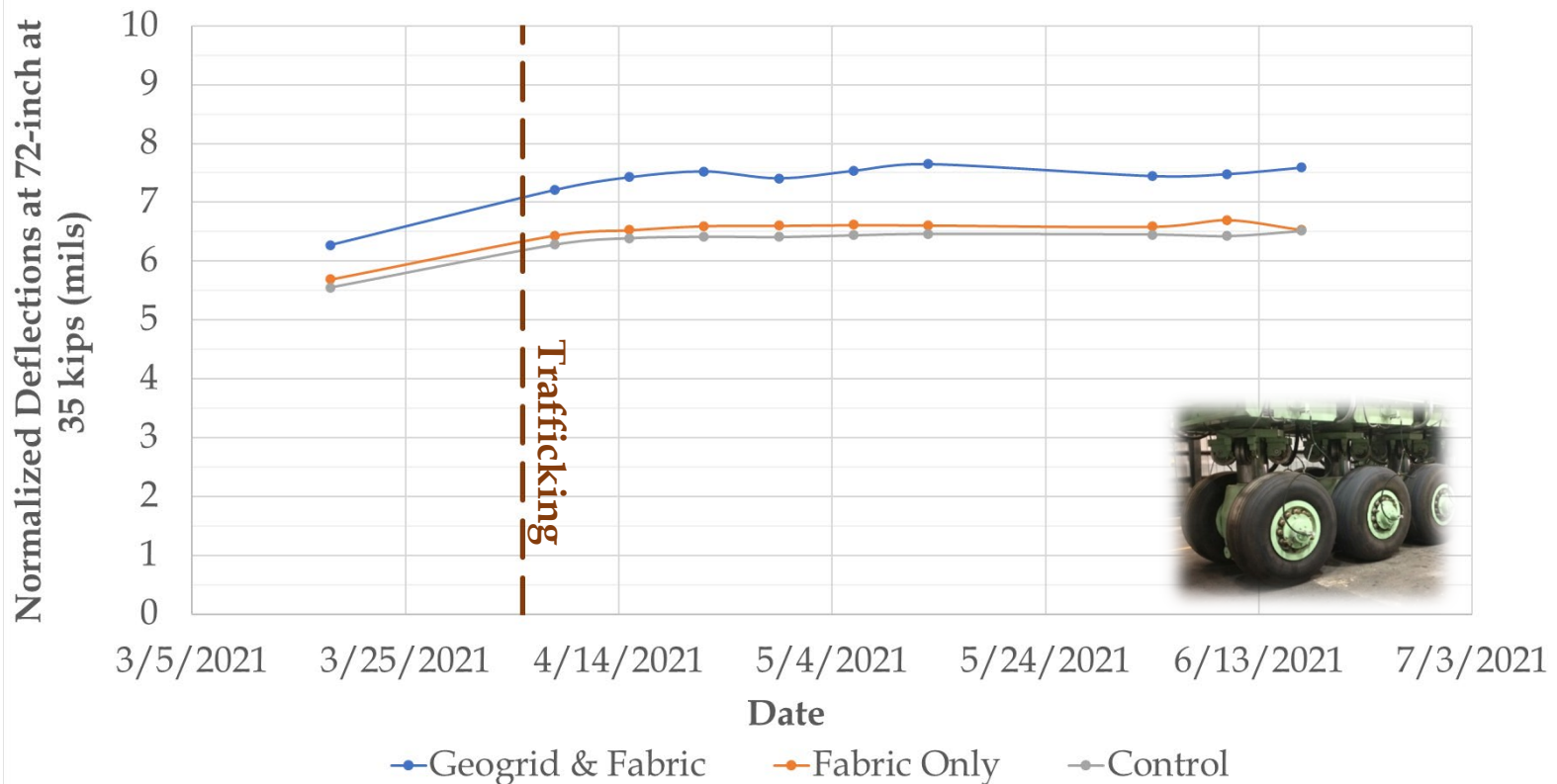
- Normalized Deflections at 0-inch Offset



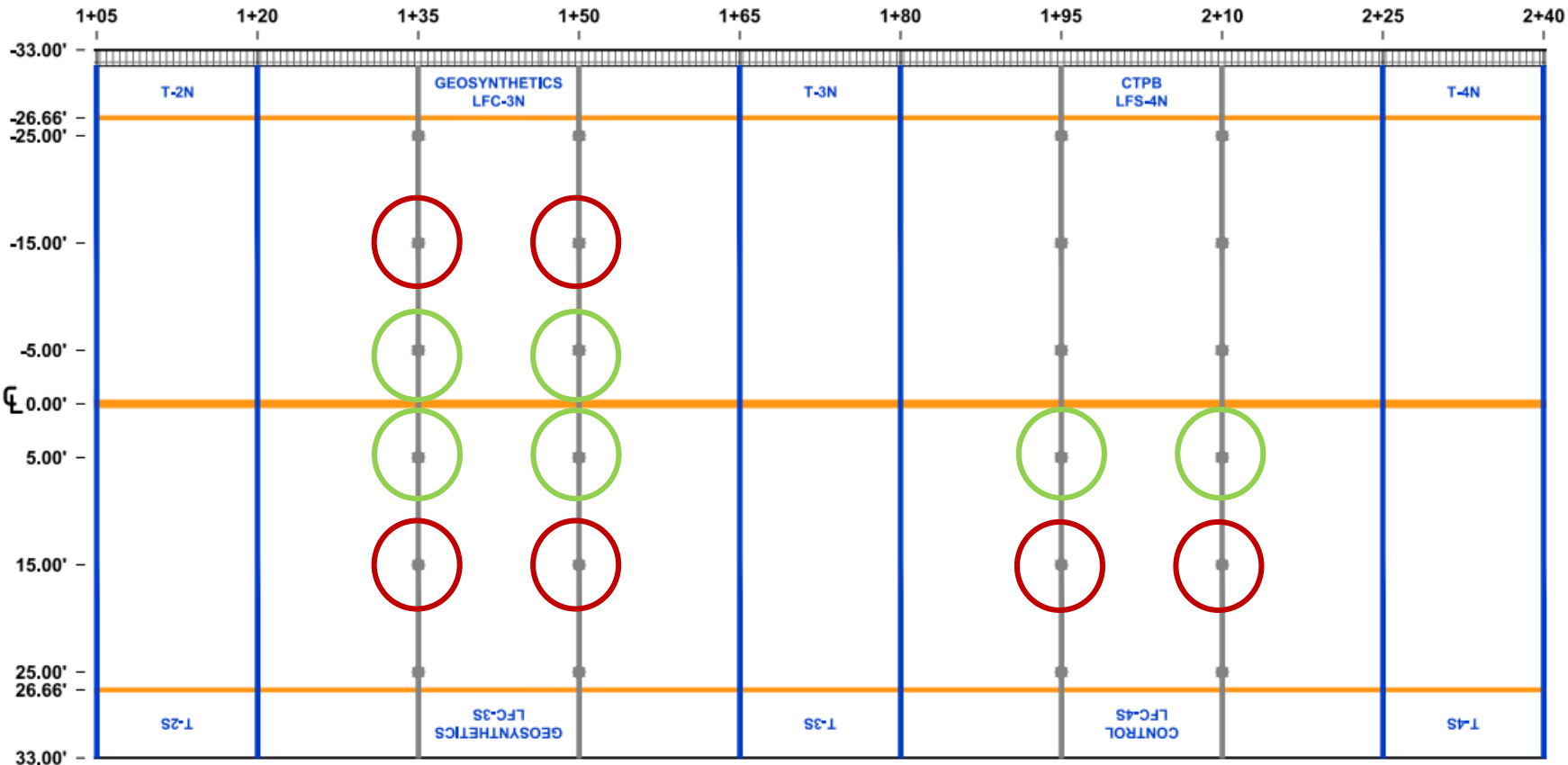
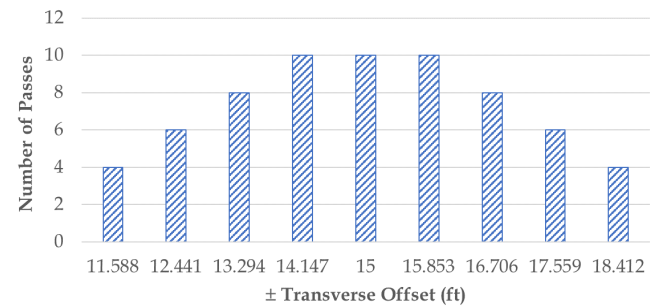
Heavy Weight Deflectometer



- Normalized Deflections at 72-inch Offset



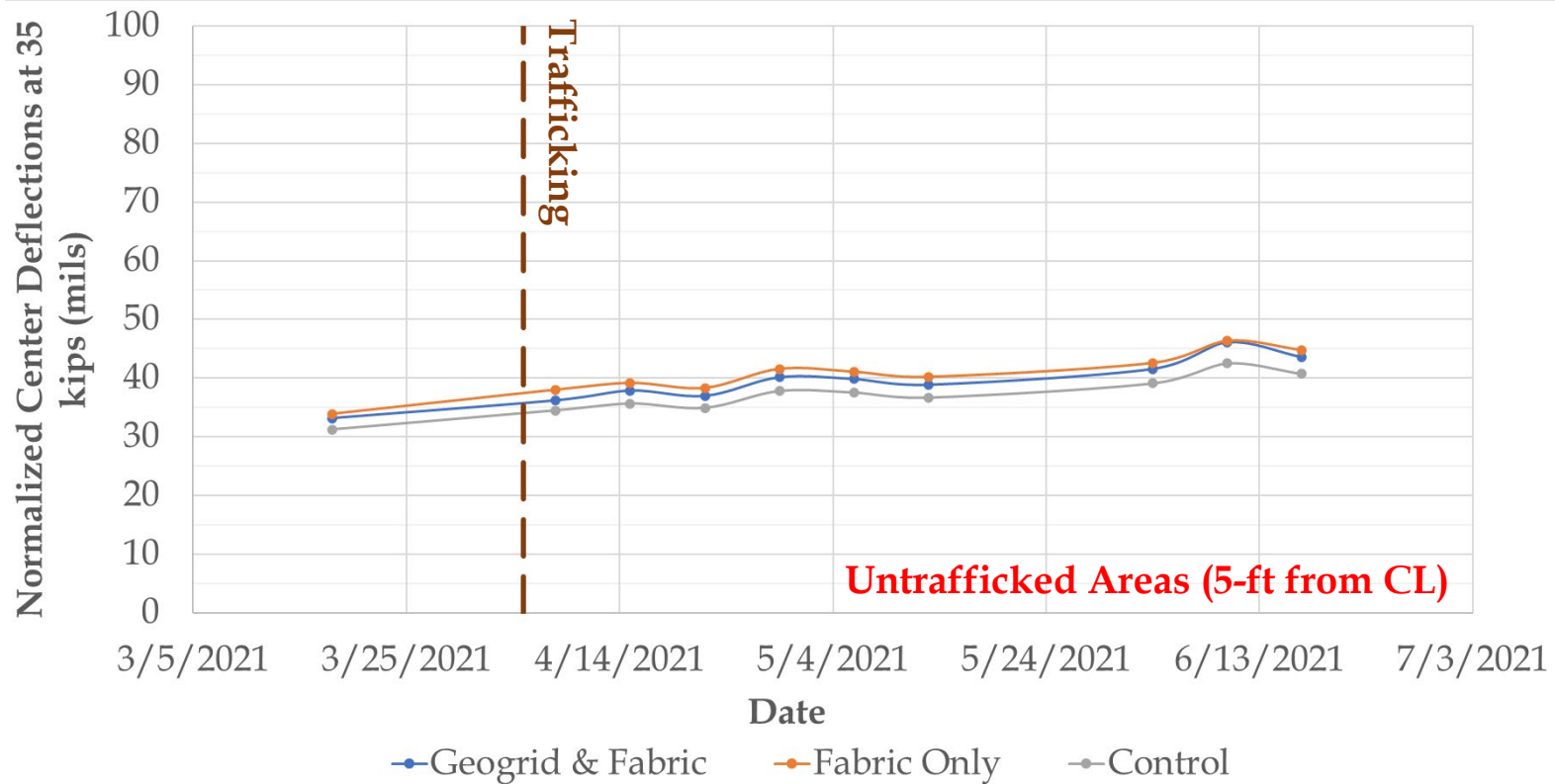
Trafficking & HWD Testing



Heavy Weight Deflectometer



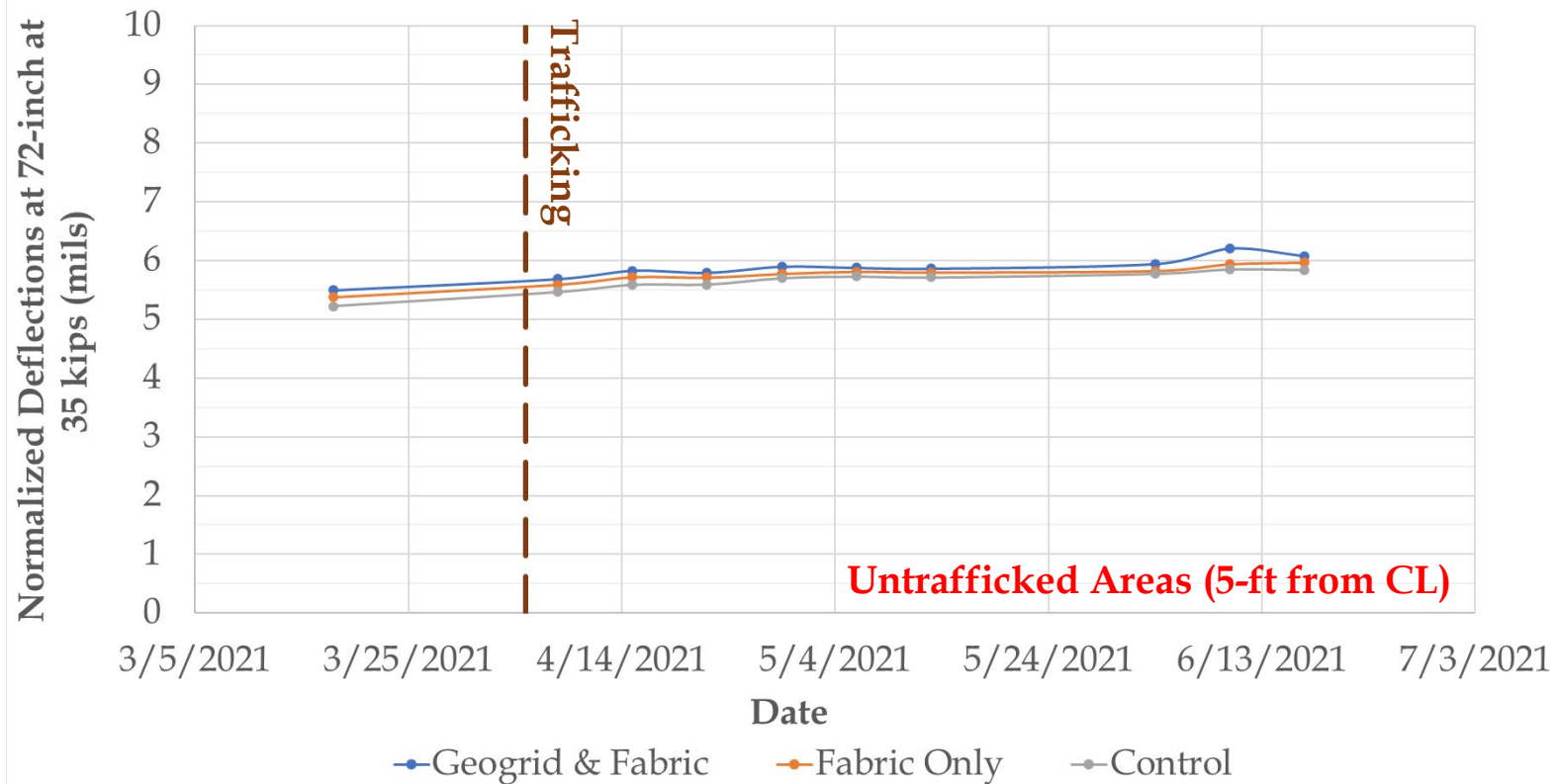
- Normalized Deflections at 0-inch Offset



Heavy Weight Deflectometer



- Normalized Deflections at 72-inch Offset



Summary

- **Initial trafficking shows higher rutting for test items with geosynthetics**
 - Trafficking is still at early stages
 - Conclusions can't be drawn from initial results
- **Variation in rutting performance could be due to slight variations in subgrade**
- **Trafficking can be repeated in untrafficked areas (5-ft from CL), where deflections are similar**



Thank you

