TrackTex™ Anti-Pumping Geocomposite Excels in Multi-Year Test

Mud Spot Remediation on Trackbed Performance Test

Christianburg, VA

In September 2014 TrackTex Anti-Pumping Geocomposite was supplied to Norfolk Southern for installation on the Whitethorne District of Virginia. The aim was to determine how effectively TrackTex protected the ballast from mud pumping on known trouble spots.

PROJECT BACKGROUND

TrackTex was installed at three locations on the Christiansburg subdivision between Narrows, WV and Roanoke, VA. The locations were chosen as all three had known mud pumping problems. Two sections were straight, one including an at-grade crossing, and the third on a 2˚ curve.

All three sections of track had been undercut and renewed with clean ballast within the previous two years, but track settlement problems were already recurring with mud visible at the surface.

At each location the track was undercut to a depth of approximately 12” to 14”. The track was lifted and the TrackTex geocomposite simply slid under the track, meaning minimal time added to the overall renewal operation. The new ballast was placed and tamped to a shallow depth to avoid damage to the TrackTex, and the associated drainage ditches were cleaned and reprofiled. Following this renewal, a detailed monitoring period ran for two and a half years. During this time there was approximately 60MGT of traffic with a timetable speed of 40 mph.

TESTING RESULTS

In March 2016 the 18 month inspection of the test sections reported in all locations the track surface and ballast condition was excellent, with no signs of degradation. It was observed that mud had appeared at one of the locations in the low-side shoulder of the track, but this was below the TrackTex installation depth and the analysis was that the TrackTex was preventing the mud pumping into the ballast section, which remained clean and structurally sound.

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PROJECT DETAILS

Product
TrackTex Anti-Pumping Geocomposite

Owner
Norfolk Southern

Engineer
Norfolk Southern

Testing Date
September 2014 - April 2017

Just two years after the track renewal (before TrackTex installation) the ballast was severely fouled to a 14 in. depth due to mud pumping from poor subgrade.

The track was lifed and TrackTex was simply slid into position with no requirement for special equipment.

TESTING RESULTS CONTINUED

In September 2016, two years after installation, it was reported that the areas treated with TrackTex remained in excellent condition. An untreated section 25 feet west of one test area had deteriorated with visible mud at the surface and track geometry changes, confirming that the substructure problems were still present.

In April 2017 the shoulder boils were removed for detailed investigation. Excavations by hand found mud had penetrated the shoulder leaving the ballast there impacted by firm clay. However the ballast under the ties and in the crib was wet but free of fine grained material. When the TrackTex was exposed it was observed that water was running continuously from beneath the TrackTex.

Mud boils were visible in the shoulder 2 years after TrackTex installatoin. They formed below the level of the TrackTex since it keeps mud from the ballast.

FINAL REPORT

The final Engineer report concluded that TrackTex performed very effectively, completely covering very weak substructure including a low spot and saturated subgrade. The ballast on top of the TrackTex was wet but clean,howing it had stopped upward movement of fines thus preventing the subgrade from fouling the ballast section.

In one area it was noted that even though the track profile had dropped, the track and subgrade were both solid, and there was no track movement evident under traffic.

TrackTex exposed, ballast above is wet and free from fines, but the shoulder outside the TrackTex has been recontaminated with mud from the weak subgrade.

CONCLUSION FROM THE ENGINEER REPORT:

"By preventing the subgrade from fouling the ballast section, and by more effectively distributing the vertical loads to that subgrade, the TrackTex has greatly extended surfacing cycles and the life of the ballast.

The fact that the track needs only occasional shoulder cleaning and surfacing, despite resting on such a weak subgrade, is remarkable."n this project. To date we are happy with the way things went."

- RESEARCH AND TESTS ENGINEER
MAY 2017

Even where track was observed to have dropped there was no movement evident under traffic.

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