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FIBERS STRENGTHEN MILL AND FILL OUTSIDE KENNEDY SPACE CENTER

BY SANDY LENDER

V.A. Paving produced a FC12.5 mix with PG76-22 at 335 degrees F about 12 miles from the job site. The company uses a 300 TPH Dillman unified counterflow drum with three 250-ton silos. *Photo courtesy V.A. Paving.*

The 50th Anniversary of Apollo 11's historic mission to the moon brought extra excitement to the Kennedy Space Center (KSC) this summer. As luck would have it, maintenance work on the roads belonging to NASA fixed up avenues to the visitor's center prior to celebrations and paved the way for a fancy entrance, thanks to asphalt, V.A. Paving Inc. of Cocoa, Florida, and some innovative demo with fiber reinforcement. Take a look.

Kennedy Parkway (SR3) was due for repairs in June 2019, according to Eugene Hajdaj, the construction manager at KSC. Al Mallard, a vice president at V.A. Paving, explained how the company got to perform those repairs.

"We had a project at NASA with Silver Mountain, a North Wind Company, to repair roads in various locations," Mallard shared. "The project consisted of milling and paving 2 inches on Kennedy Parkway (SR3). We were about to start our second phase of work, which was to pave about two and a half miles northbound lane on SR3 from NASA property line to 5th Street, when Brevard County Road and Bridge contacted me about them using fiber reinforced asphalt on their future projects. We had several meetings on fiber reinforced asphalt and Brevard County had a residential street they were going to try some fiber reinforced asphalt ton, but they asked me if V.A. Paving could use the second fiber company for a test strip on one of our current projects. That's when we asked NASA if we could do a one-mile test strip in one lane using fiber and the adjacent lane without fiber so that it can be monitored for years to come. We sent a deviation waiver to NASA for approval, which con-

The V.A. Paving crew placed 2 inches of mix over an NTQS1 trackless tack, using a Cat A1000F paver fed by a Roadtec Shuttle Buggy. Their tonnage for the first day was 1,291 tons—800 tons with fiber and 491 without. *Photo courtesy Forta Corp.*

sulted with Jones Edmunds Engineering, and it was approved by Jesse Salazar and NASA Design Manager Christine Hartett to proceed with test and follow-up with test results."

Scott Nazar, the engineering services manager for Forta Corp., Grove City, Pennsylvania, shared how the demonstration project began from their end. He stated there was a lot of interest in fiber reinforced asphalt at the American Public Works Association (APWA) conference held in Daytona, Florida, April 15-18, 2019.

"Molly Anderson, technical engineer, and Roger Linde, sales representative, were working the FORTA-FI booth and spoke with some of the folks from Brevard County who were interested in the benefits they could get with fiber-modified asphalt."

With encouragement from Anderson, Linde set up a meeting with Brevard County during which Nazar presented "The Benefits of Using Fiber Reinforced Asphalt" for the Brevard County engineers. "The meeting and presentation seemed to go very well," Nazar said. "This project [on Kennedy Parkway] was a demonstration for the county as well as NASA. Brevard County is considering doing a couple projects with fiber hopefully this year."

The timing was fortuitous. Not only did Brevard County get to see FORTA-FI in action on a real-world project, the road to the visitor's center at KSC got a facelift prior to summer celebrations. "The road was in bad shape," Hajdaj said, but it wasn't being milled and overlaid specifically to prepare for the Apollo 11 celebrations. Hajdaj said it was up next on the construction facility's schedule. He also said it was ideal for the side-by-side comparison Forta and V.A. Paving proposed.

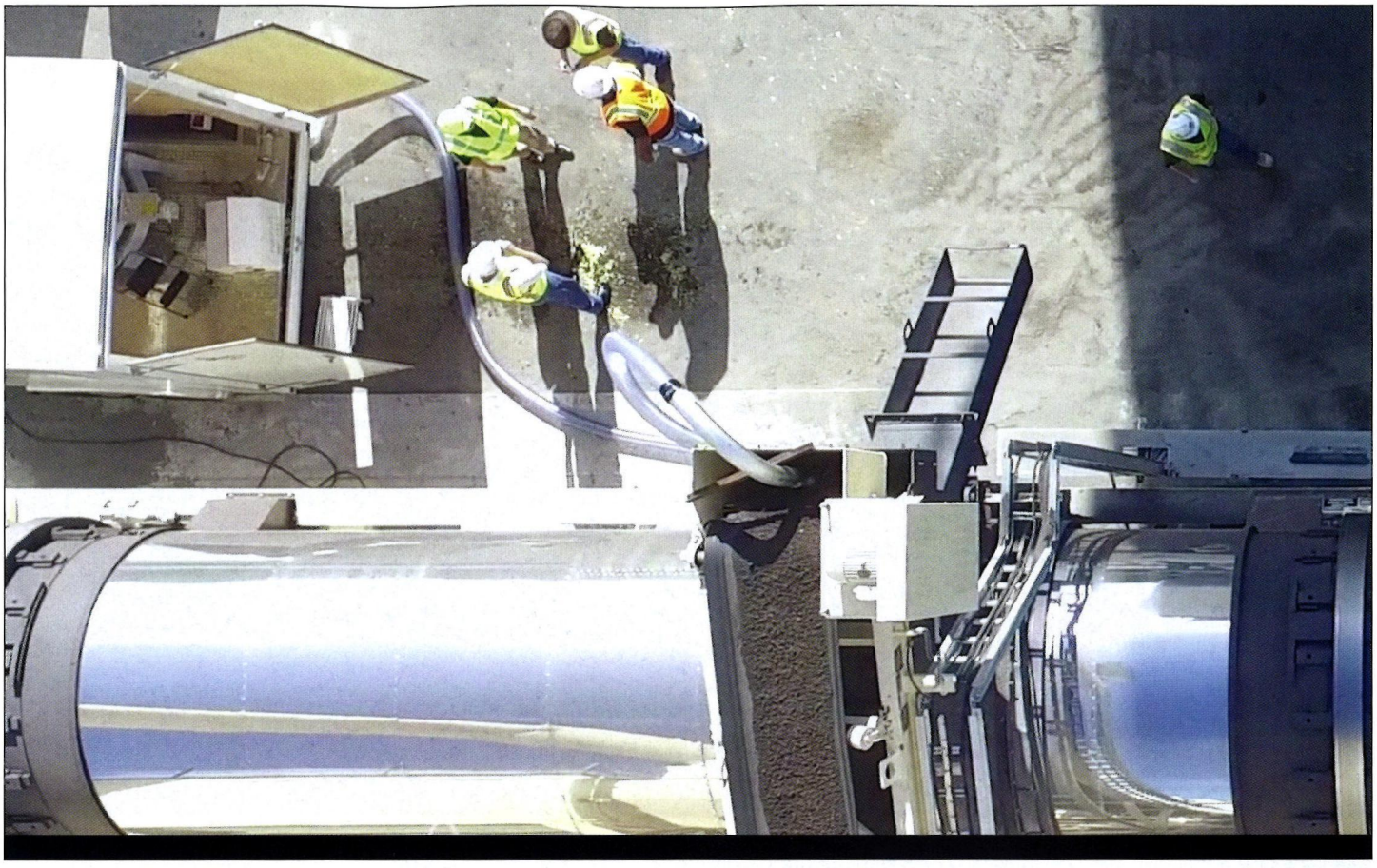
"Forta was the company we used for the test strip," Mallard said. "We contacted Brevard County, NASA, Cape Canaveral Air Force, and FDOT to come and see the fiber being injected into the asphalt and go to the job site to see it being placed. Everyone was impressed by the application to mix and how it laid on the roadway. There was no impact to equipment or testing. All of our density passed and other lab test passed."

To accomplish fiber injection, V.A. Paving worked hand in hand with Forta team members.

Nazar explained how Forta's director of operations jumped in to help. "Chris Lovett and Bill Surrena, also in operations, flew down to Florida and picked up the Voyager fiber feeder at our office in Sarasota. They hooked up the feeder to the plant in less than an hour without interfering with the plant operation."

V.A. Paving uses a 300 TPH Dillman unified counterflow drum with three 250-ton silos. The plant manager, Denny Sheppard, has been with the company for 28 years and the assistant plant manager and operator, Jeremy Black, has been with the company for 17 years. They didn't report any worries, according to Mallard. "The Forta Voyager hose fed into the RAP inlet chute; they told us that was the best way," Mallard shared. "The Forta Voyager had a wireless controller from the fiber feeding bin to our control room, which let our operator control production speed to fiber machine. We run the plant at 200 tons per hour and the fiber machine run the same at one pound of fiber per one ton of mix. We did not see any change in our asphalt production. No change in temperature, no damage to equipment, no clogging. Just add to existing mix and run."

Nazar explained: "The Voyager comes with a remote-control box that sits in the plant operations room. The plant operator can start/stop and adjust the feed rate to match the production rate of the asphalt plant at the touch of a button.



"The Voyager is on load cells and accurately meters the fibers based on loss in weight," he continued. "The technology is a trade secret, but it involves a special rake and minimal moving parts. The fiber blend itself plays an even bigger part in preventing bridging and clogging. The feed rate in real-time is measuring the amount of fiber that's blown into the drum plant via the RAP collar. At the end of the day, you can print off the feed rates and the total production for the day."

To place the fiber-enhanced mix, it was business as usual. The paving superintendent for the job was Josh Moores, who has been with V.A. Paving for 17 years. After MILL-IT Corp used two Roadtec cold planers to mill the existing roadway, the V.A. Paving crew placed 2 inches of mix over an NTQS1 trackless tack, using a Cat A1000F paver fed by a Roadtec Shuttle Buggy.

"For this project, longitudinal fatigue cracking was the issue to resolve," Nazar shared. "FORTA-FI has shown to reduce fatigue cracking by up to 95 percent in both laboratory testing and side-by-side field evaluations. So the goal was to reduce cracking and extend the life of the overlay by three to five years."

Mallard provided the specs for the project, stating that the mix was FC12.5 with PG76-22. They produced it at 335 degrees F about 12 miles from the job site. Their tonnage for the first day was 1,291 tons—800 tons with fiber and 491 without.

"The material had no issues," Mallard shared. "The only way you could tell it had fiber was when you shoveled it or raked it; then you could see the fibers hanging onto the blade. Place and rolling was no issue; it did not affect the material."

They achieved compaction with two Cat 534W rollers, a Bomag traffic roller and a Cat CW34 pneumatic roller.

The Voyager is located on load cells within a portable trailer. The feed rate in real-time is measuring the amount of fiber that's blown into the drum plant via the RAP collar. *Photos courtesy Forta Corp.*

"We are delighted that V.A. Paving offered us this opportunity to experiment. We cannot wait to start measuring the difference in performance and the long term change to life cycle costs," Hajdaj said.

Nazar spoke kindly of the project: "V.A. Paving is really open to innovation and new technology; they embraced the fiber reinforcement concept and wanted to bring that to NASA, who, like them, are also innovative."

"Special thanks to Brevard County John Denninghoff, Susan Jackson, Bruce Black and Daniel Blackburn," Mallard said. "They are the reason this all came together. And thanks goes to NASA for letting us use their project for a test site. I believe this product does make roads stronger; it has thousands of fibers holding all the asphalt particles together." P