



A GEOTECH CASE STUDY

When A Railway Calls for Reinforcement – Geotech Answers the Call

Geotech Services uses compaction grouting to help stabilize ground in Norfolk Southern rail yard in Bellevue, Ohio

Norfolk Southern Corporation is one of the nation's premier transportation companies. Norfolk Southern Railway operates approximately 20,000 route miles and over 36,000 track miles in 22 states and the District of Columbia. They own or lease over 4,000 locomotives and 87,000+ freight cars, serving every major container port in the eastern United States, and are a major transporter of coal and industrial products throughout the US.

Norfolk Southern operates a 'hump yard' in Bellevue, Ohio and their growing rail shipment business has prompted a need to significantly increase the capacity of this facility. (Note: Hump yards use gravity to help sort rail cars. Trains from a common origin are broken down and sorted into new trains for common destinations. The cars to be sorted are pushed only forward, up an incline. As cars reach the summit, they are uncoupled and switches are aligned to route the car into the proper track siding as it rolls down the other side.)

The Bellevue hump yard was originally built in the mid-70s and the need to expand their capacity has been a growing one. This project doubles the yard in size and is the single largest construction project that Norfolk Southern is completing in the U.S. at this time; a sign of their commitment to the automatic rail system of the future.

One key challenge to this expansion has been the ground the yard was built upon.

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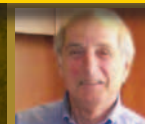
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INDUSTRY



WELCOME

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In the years since the construction of the first half of the “hump yard”, the yard operators experienced a number of ‘problem’ areas where the siding tracks developed ‘pumping’ subgrade under the track beds. These were caused by random pockets of fine grain soils (the ground beneath some of the Bellevue track beds) are second cousins to quicksand. Over time, cyclic loading and unloading (as rail car wheels move across the pockets) causing internal pore water pressure to increase with the weight and passage of the cars creating a ‘water-bed’ condition. Tracks moved and interfered with the car movement. Therefore, as part of this expansion of the yard, the designers included a prophylactic step of increasing strength and density beneath the surface to stabilize the ground. The remedy is compaction grouting of the portion of the site expected to experience the most traffic.



Geotech Services was called in by E.S. Wagner of Toledo (the general contractor on the job) to do the compaction grouting beneath the new sidings prior to the track bed and rail installation to help stabilization. The goal was to get ahead of the new construction and to densify a wide area to strengthen the random seams of the site as a precautionary measure to avoid the development of unstable pockets experienced in the past.

Geotech drilled down to the rock with casings and extracted the casings slowly while pumping Portland cement-based grout into the holes in a pattern of 5 foot on center. Geotech drilled down between 10 to 30 feet at each injection point to pump the grout throughout the site. The lateral pressure created by the compaction grouting reduced the potential of loosening up from cyclical loading of the passing railcar wheels.

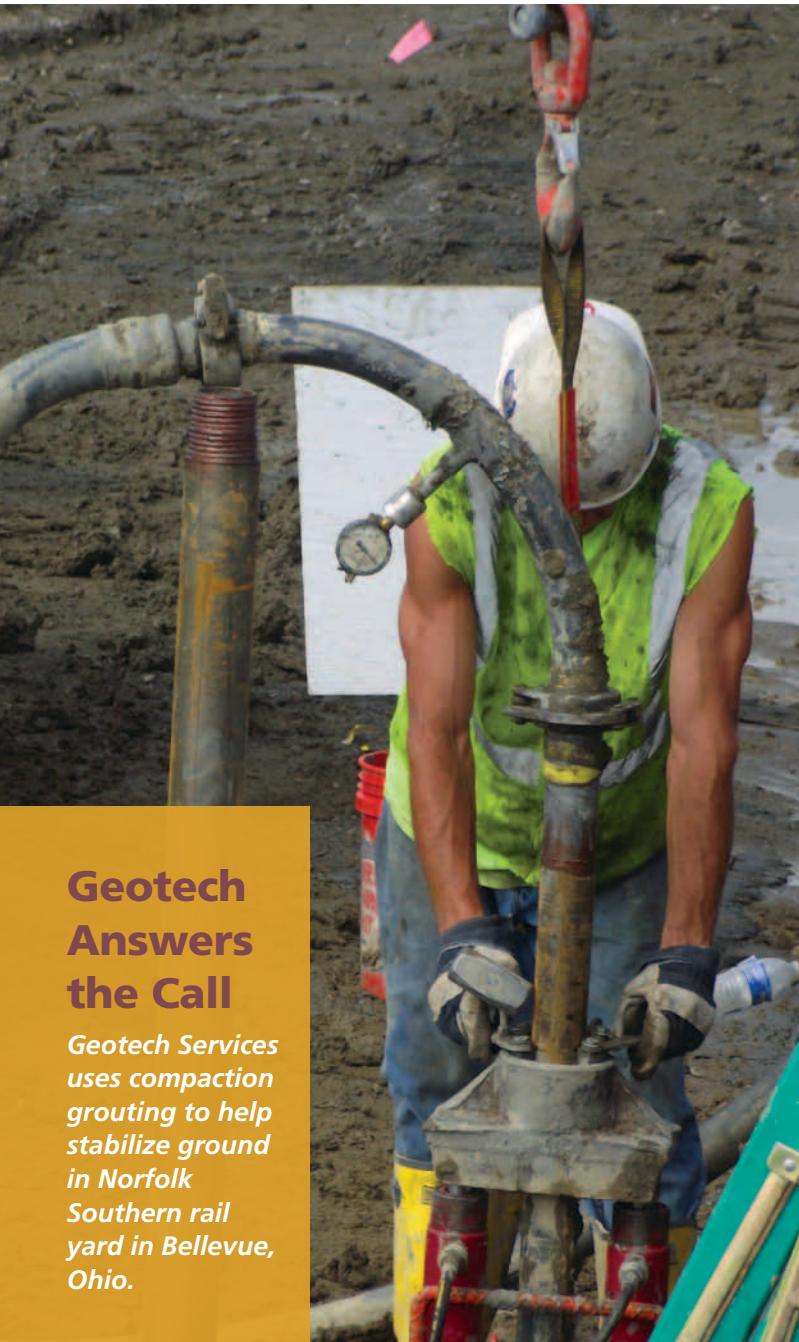
“We knew that performance and close coordination were critical on this project,” said Ted Webster, Geotech Services’ Senior Engineer. “We even provided an on-site concrete compression test machine to measure the compression strength of the grout at 24 hours after placement and we’re proud to say that all of our grout passed the tests.”

The project started more than a year ago (July 2012) and continued for two months. Grouting resumed for two more weeks in June of 2013, meeting the critical windows in the project schedule. Geotech installed approximately 12,000 lineal feet of casing and pumped more than 29,000 cubic feet of grout via 631 injection locations.

Geotech Services also installed deep (90-120 ft.) rock tieback anchors for a bridge in the rail yard where tracks pass over/under each other. “Norfolk Southern and E.S. Wagner both have high standards and we’re proud to say that we definitely measured up,” said Webster.

“Norfolk Southern also puts strong emphasis on safety, greater than on many construction sites. They had stringent requirements for safe work practices and required everyone working on site to be trained on railroad safety practices in addition to typical construction site safety practices. They insist that everyone in the yard knows how to act safely around railroad tracks and equipment,” added Webster.

In all, this was a project that fit Geotech Services’ reputation for unique solutions to challenging assignments. “It was a great test that we passed with positive results and feedback,” said Webster.



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IN THE TRENCHES

Pat Lenczewski, Chief Mechanic

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Fellow employees joke that if Paul Stubbs (Operations Manager) can dream it – Pat Lenczewski can build it. Geotech Services' Chief Mechanic is definitely the 'go to' guy when it comes to customizing equipment for a specific job or unique application. He's had a fair amount of practice at it, too. Lenczewski has been with the company for over 18 years.

Lenczewski has seen quite a bit of growth and tremendous change in the industry as well as in the company during his tenure with Geotech. One thing that has remained consistent, however, is the company's willingness to try what others might not be willing to attempt. "From the day Ray (Tartabini) hired me, I realized that this company will take on challenging projects that other companies shy away from and then utilize our creativity," he said.

"If we can build something that will make it easier on the guys or more efficient for the company, I'm all for it. That's my job," says Lenczewski.

When asked if there was a specific project that his fabrication handiwork played a key role in, Lenczewski said, "We customized a drill mast on a project for ODOT in Napoleon, Ohio to enable us to drill 30 feet with no steel changes. It was incredible!"

When he's not customizing rigs, Pat keeps the rest of the equipment and vehicles in top working order. "I'm really comfortable wrenching on things. I'm definitely not afraid to tear something apart and put it back together – or

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just tune up our equipment and keep the boys working," he said.

That's not to say that Lenczewski is stuck in the shop, though. Vice President Steve Tartabini quickly points out that Pat is "our utility player". His years of experience with the company and his familiarity with the work have made him a very valuable asset. "When I'm needed, I can jump into almost any project and help the team get it done," Pat said. "I really like the opportunity to get into the field whenever necessary."

Off the job, Pat enjoys escaping to a cottage in Fremont, Ohio with his wife, Andrea for fishing and boating. And, like many who ply their mechanic skills on the job, Lenczewski has his 'projects' at home, too. He's a muscle car guy who has 1964 and 1969 Pontiac GTOs and a 1972 Olds Cutlass that he is rebuilding. "The '69 is a major project. It hasn't seen the street since the 80s. But the '64 and '72 are my weekend hobbies."

Pat and Andrea live in Twinsburg, Ohio and are the parents of four children, Kristine (24), Patrick Jr. (21), Timothy (19) and Loren (17).

Industry UPDATE

Geotech Services is supportive of industry associations that provide their members with information and education that enables them to conduct business effectively. Each issue of Foundations features an article or description from/of one of the leading organizations supporting our industry. We're proud to present the following report from the American Concrete Institute.



Founded in 1904 and headquartered in Farmington Hills, Michigan, the American Concrete Institute is advancing concrete knowledge by conducting seminars, managing various certification programs, publishing technical documents, and offering scholarships to students in the field. With 99 chapters, 65 student chapters, and nearly 20,000 members spanning over 120 countries, the American Concrete Institute has always retained the same basic mission — provide knowledge and information for the best use of concrete.

The American Concrete Institute's 318, "Building Code Requirements for Structural Concrete" covers the materials, design and detailing of structural concrete. The reorganiza-

tion of this Code in 2014 will benefit the entire design and construction community by making the code more intuitive and easier to use, thus providing increased confidence that a design satisfies all code requirements.

In the 318-14 building code, each building member (beams, columns, slabs, diaphragms, etc.) will have its own chapter containing complete design and detailing rules, and all Code requirements related to construction will be in a single chapter. The reorganized ACI 318-14 will improve language and style consistency in phrases, tables, equations, lists, notation and figures. Planned for launch in Late 2014, visit www.concrete.org/ACI318 for details.



DIGGING DEEP

PRESIDENT'S MESSAGE



I grew up in an era that embraced and rewarded a strong work ethic. You were expected to give an honest day's work for your wages and we were proud to have our jobs and pleased that we could provide for our families.

Some might say that times have changed. But, I'd like to take a moment to talk about the team here at Geotech. We're very fortunate to have a solid workforce with a

pervasive, positive attitude. Everyone works hard and, to a person, I'm proud to say that they are constantly looking for creative solutions to every day's work assignments. Elsewhere in this issue of Foundations, you'll read about Pat Lenczewski, one of our employees. He's a great guy and we appreciate what he does for us. And the fact is, his creativity and work ethic is a reflection of the entire group.

So, as we head into the last quarter of the year, I can honestly say I'm thankful for having such a solid team here – and appreciate the confidence our customers place in us.

Sincerely,

Ray Tartabini

Ray Tartabini, President
GEOTECH SERVICES, INC.

