In the lobby of DuroTerra's corporate office with Rima Veitas, Brendan Fitzpatrick and Chad Graybill. Missing is Christian Littlefield.

DuroTerra

Offering simple driven pile alternatives with ductile iron piles

By Lisa Kopochinski

In 2014, DuroTerra leaders took on a wonderful opportunity when they launched their company while working with Austria-based Tiroler Rohre, GmbH (TRM), a manufacturer of ductile iron piles. These piles have been used in Europe for more than three decades and in the United States for more than 10 years.

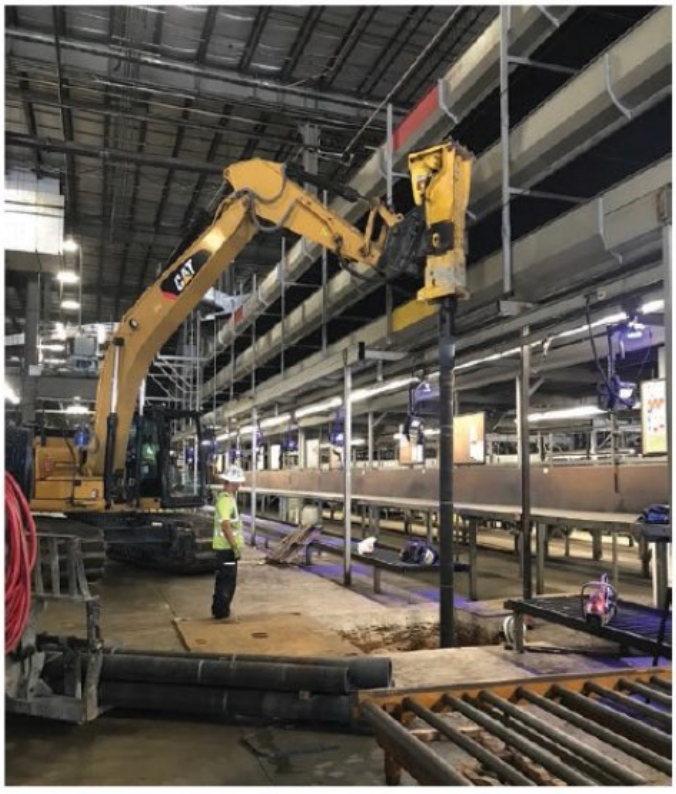
"The sister company of DuroTerra, LLC, is a specialty geotechnical contractor in the Northeast U.S. and has installed more than 50 successful ductile iron pile projects," said Rimas Veitas, P.E., who along with partners Chad Graybill and Christian Littlefield (owners of Helical Drilling and who have more than 80 years of combined experience in the specialty contracting and engineering industry) comprise the DuroTerra's corporate team.

Brendan Fitzpatrick, P.E., a prior vice president at Geopier Foundation Company, joined the team in 2014 as director of engineering/marketing and manages operations of the company.

With its corporate office and distribution yard located in the Greater Boston, Mass. area, DuroTerra is a distribution company specializing in ductile iron piles, which it distributes through a client base across U.S. and Canada along with select locations throughout Latin America.

"In addition to material supply, DuroTerra also provides its customers with project feasibility assessments and preliminary design evaluations based on geotechnical site conditions and foundation plans to help evaluate the construction and technical suitability of the system," said Veitas.

Photos courtesy of DuroTerra



A project in Philadelphia required foundation support for a mezzanine expansion within the existing shipping facility with low overhead clearance. Ductile iron piles provided a low vibration pile solution to reach bearing layers at depths of 70 to 100 feet with overhead clearances of only 20 to 30 feet.

"We also provide equipment and construction support to assist installers in getting adequately set up for a ductile iron pile job and following construction guidelines to aid in the installer's construction success."

Benefits of ductile iron piles

Ductile iron piles are a modular, low-vibration driven pile system. The system utilizes a medium-sized excavator and percussion (demolition-type) hammer to install the piles, making it well suited for constrained urban sites or interior renovation work where overhead clearances are 18 feet or higher.

"The equipment needed is simple and makes installation simple," said Graybill. "While the system has been used cost-effectively on wide-open sites, the vast majority of our customer's projects include building additions, interior retrofit work or tight, urban development sites. The system is versatile and can be installed to develop capacities ranging from 25 to more than 100 tons in either end-bearing on a competent bearing layer (i.e., rock or very dense ground) or by using an oversized pile shoe and continuously pumping grout during driving to create an efficient grout-to-ground bond zone for frictional capacity."

Littlefield added, "Projects primarily include industrial and manufacturing additions and improvements, warehouse retrofits, commercial and residential buildings and additions and the occasional bridge support and municipal application. When a project uses ductile iron piles, the pile can go 150 feet without mobilizing a large crane. All that is needed is an excavator."

When asked how contractors can find out whether ductile iron piles would be the right choice for their project, Littlefield

Ductile iron piles were installed in downtown Boston near Fenway Park. Fifty-ton ductile iron piles replaced H-piles on the urban site for support of a new five-story apartment. With loads approaching 600 kips, deep foundation support was required at the fill/soft soil site.

said that besides meeting directly with project teams and participating in industry events, "Our team works with geotechnical contractors, engineers and owners to evaluate applicability of ductile iron piles for their projects. Involvement and feasibility assessment occur at all stages – from early design phases prior to the selection of foundation systems through bidding (including value engineering opportunities) and even into construction when specified solutions are encountering issues and teams are looking for alternatives."

Littlefield says the system is more cost-effective compared to micropiles, which can help a contractor secure the job.

Fitzpatrick, who has more than 20 years of design/build geotechnical construction experience, concurs.

"I encourage all of our existing and future customers to provide us with project information (structural foundation plans, geotechnical reports, boring logs, etc.) to evaluate and discuss whether the system is well-suited for their project. While it'd be great for all projects to make sense for ductile iron piles, we recognize that there are many different foundation solutions available to project stakeholders. We want to make sure that our solutions are providing value against other options."

As for a project that stands out, DuroTerra was recently brought in as an alternative to a micropile system on an active project where a new interior mezzanine level was being constructed for an international shipping company. The project had overhead clearance restrictions of generally about 30 feet, but as low as 24 feet in some locations.

"After encountering conditions that required the specified micropiles to go deeper than planned, the project team was

"When a project uses ductile iron piles, the pile can go 150 feet without mobilizing a large crane. All that is needed is an excavator."

– Christian Littlefield

looking for alternatives to avoid costly foundation overruns," said Fitzpatrick.

"The ductile iron pile system was selected on a 1:1 replacement of the 50-ton micropiles and construction immediately proceeded to keep the project schedule on track. A total of 116 piles were installed in only six days, while working around existing distribution facility operations."

He adds that the success of the ductile iron pile system for this project has led to ductile iron pile solutions on three other similar projects for the same international shipping company.

"The most notable was a large interior project installed by PDCA member GeoStructures, Inc. near the Philadelphia International Airport. The project involved another mezzanine expansion and required more than 330 piles installed to depths ranging from 70 to over 100 feet to develop capacities of 45 to 75 tons. Overhead clearances were limited to around 35 feet in many locations, but did drop to 25 feet in limited locations. The pile installations were completed in four weeks while working around active facility operations."

[Editor's note: GeoStructures, Inc. received a PDCA Project of the Year Award for the above-mentioned project; read the full story on page 75 of this edition of PileDriver.*]*

These projects, Fitzpatrick says, along with a number of other similar jobs, illustrate some of the advantages of the system when working on projects with tight access, overhead clearance restrictions and vibration-sensitive conditions.

PDCA membership and the future

A relatively new member of PDCA, DuroTerra recently joined the association at the suggestion of Larry Moore, P.E., past president of PDCA and COO of GeoStructures, Inc.

"We joined as a way to become more connected with the pile driving community," said Veitas. "We are looking forward to being better connected with contractors in the driven piling industry."

As for the company's plans, Veitas says that like most companies, DuroTerra is focused on growth.

"From a start-up company five years ago – to having successful projects with customers in about half of the U.S. and Canada – we see growth opportunities both geographically as we develop a greater customer base in the U.S. and abroad, and also by raising awareness of the DuroTerra™ brand and the benefits offered by the ductile iron pile system. Despite its long-term use in Europe and availability in the U.S., many contractors and engineers are not yet familiar with the system and the substantial benefits it provides – in the right application." ▼

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- Constrained work sites
- Low vibration requirements
- Variable ground conditions

BENEFITS:

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- Typical cost savings of 20-40%
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- Addresses variable bearing depths and reduces waste with Plug & Drive connection
- Proven experience for over 30 years

Project Type: An International Shipping Facility
Project Needs: Cost effective deep foundation
Challenges:
- Overhead height restrictions
- Low vibration requirement
- Tight site access

ution: End-Bearing Ductile Iron Piles

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FOR MORE INFORMATION OR PROJECT FEASIBILITY EVALUATIONS

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