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THE INTERNATIONAL DEEP FOUNDATIONS
AND MARINE CONSTRUCTION MAGAZINE

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FINANCING SURVIVAL GUIDE

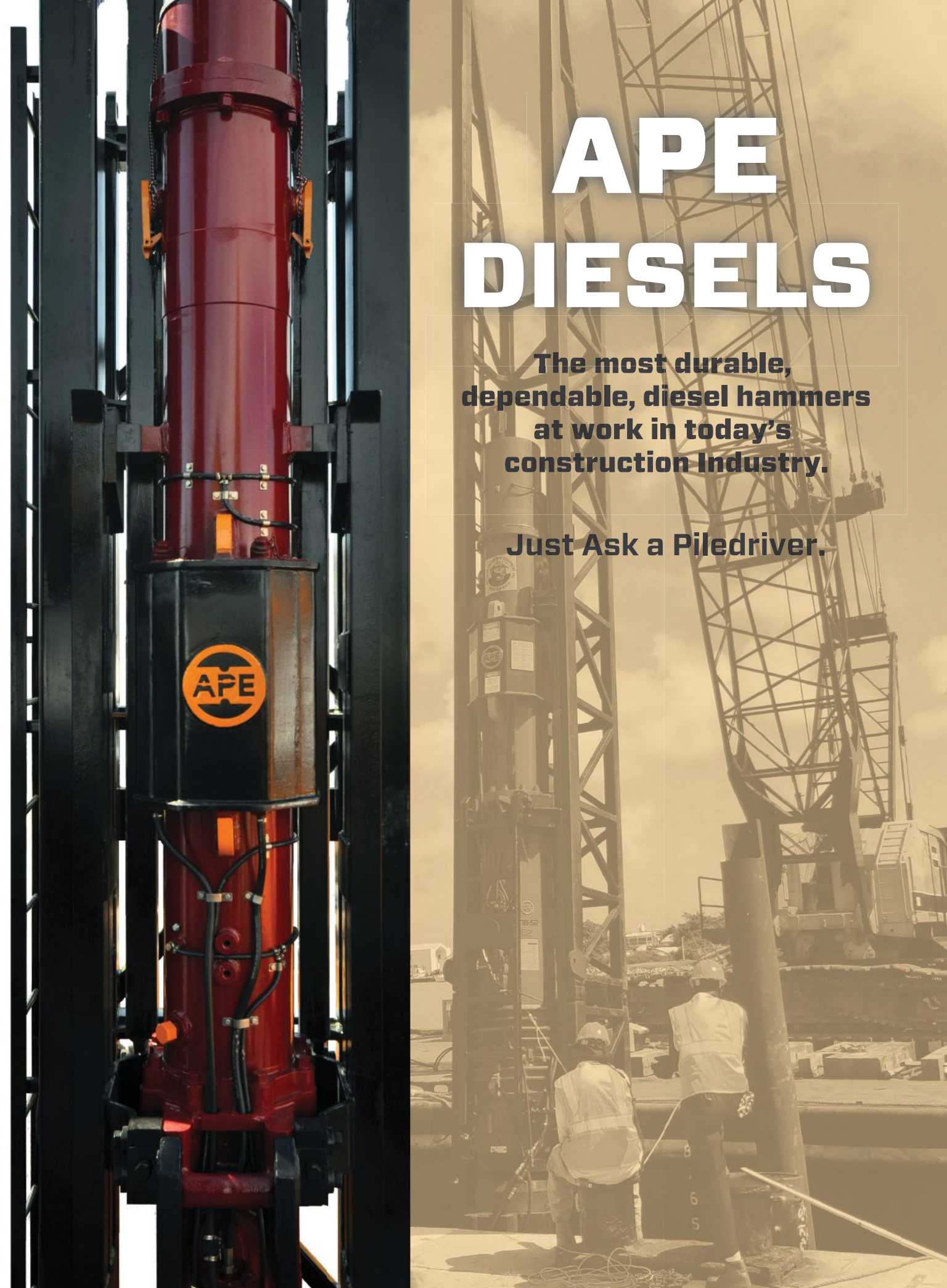
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A photograph of two construction workers in safety gear (hard hats and high-visibility vests) working on a large steel pier foundation. One worker is holding a measuring tape against the pier, while the other is using a spray can to mark the surface. In the background, there is a yellow excavator, a white pickup truck, and a multi-story building. The scene is outdoors on a construction site.

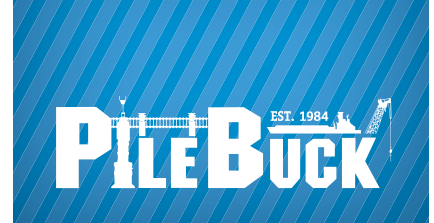
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- There are leasing options available that benefit seasonal businesses. These benefits may include a lower monthly payment during the “off season” while projects are not active and revenue is low.
- Some heavy lenders have close relationships with equipment distributors and manufacturers — and are even equipment experts themselves. This is a great opportunity to get a second opinion before you pull the trigger on a pricey rig.

Want to learn more? Check out this issue's cover story! ■

A handwritten signature in black ink that reads "A. Smoot".

Alex Smoot, Editor
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FEATURED PHOTO

The Boston Fire Department Marine unit is at Burroughs Wharf located in Boston's famed North End along Boston Harbor. Initially constructed in the late 1980s, the dock replacement project was the first upgrade. The docks replaced are located in tight quarters between the city piers. Coastal Marine Construction accomplished the installation of the Type 1200 concrete floating docks designed to withstand the vessel loads and wave action of the exposed Boston harbor location. Manufactured by SF Marina System USA (SF USA), the dock was designed in three sections with post tensioning system utilized to form a single, solid ramp landing area and finger for the fire department vessels. Gated pile guides allow the whole system to be removed providing access to the fixed pier. Photo credit: SF Marina Systems. Send us your photo for consideration in a future Pile Buck issue.





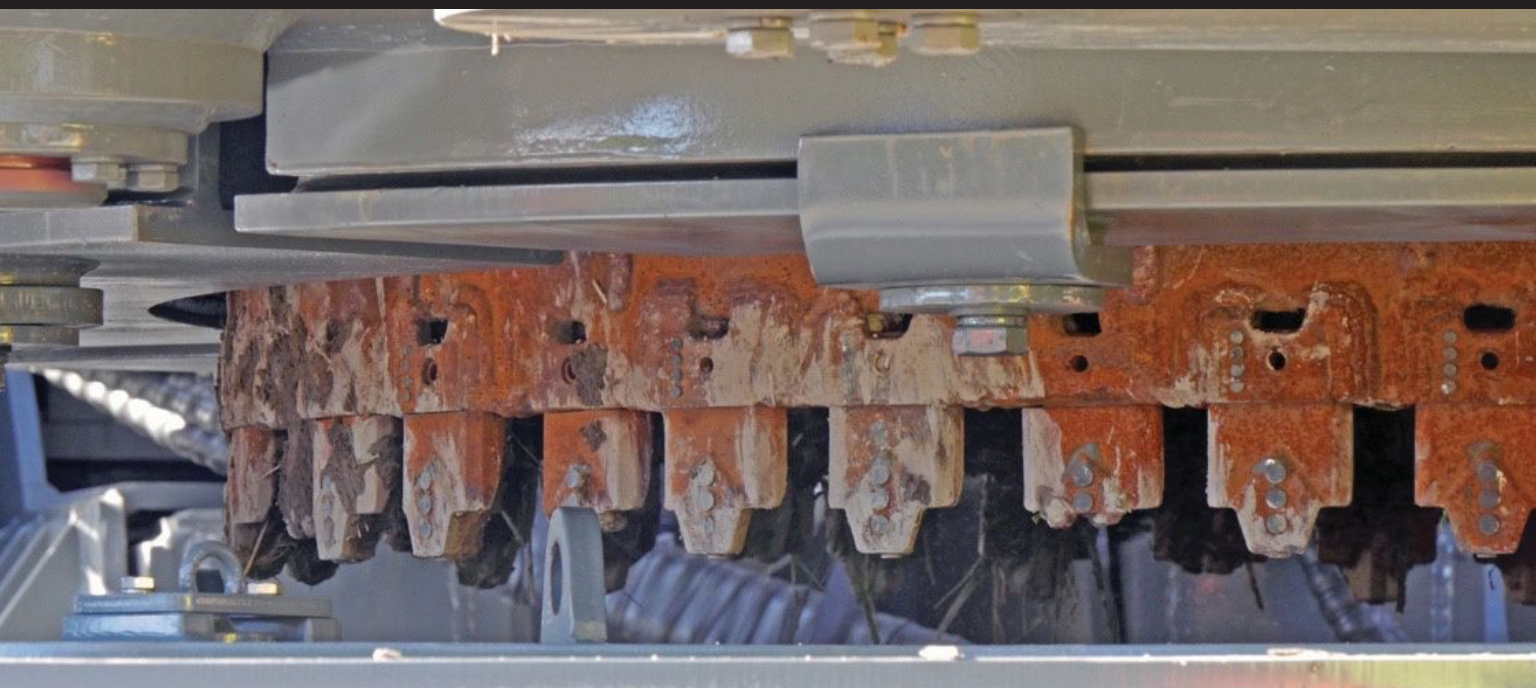
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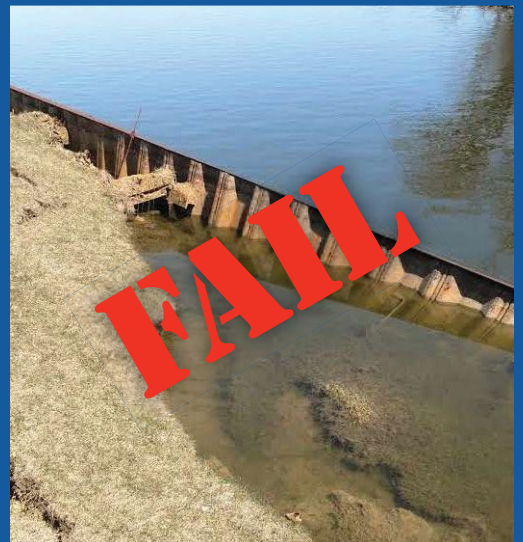
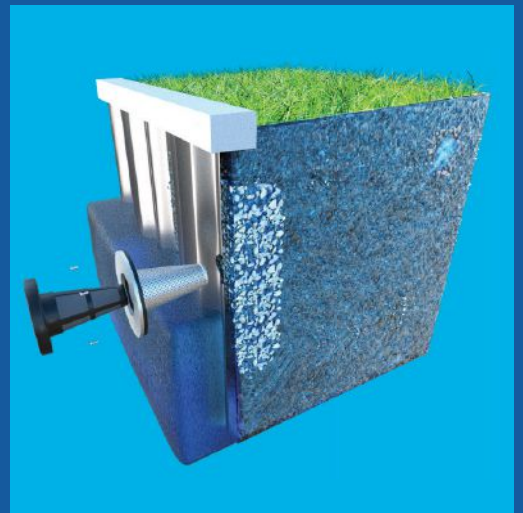
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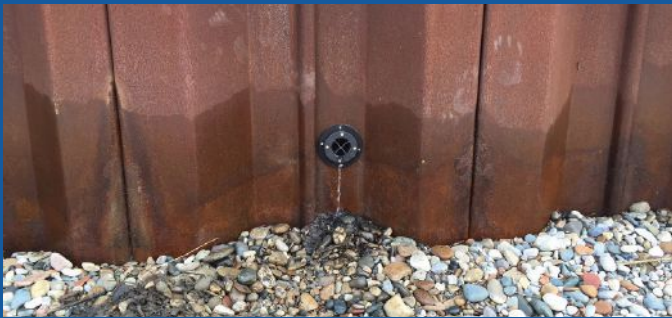
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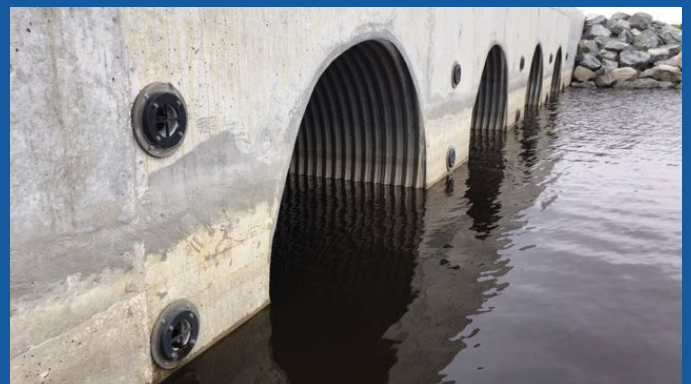
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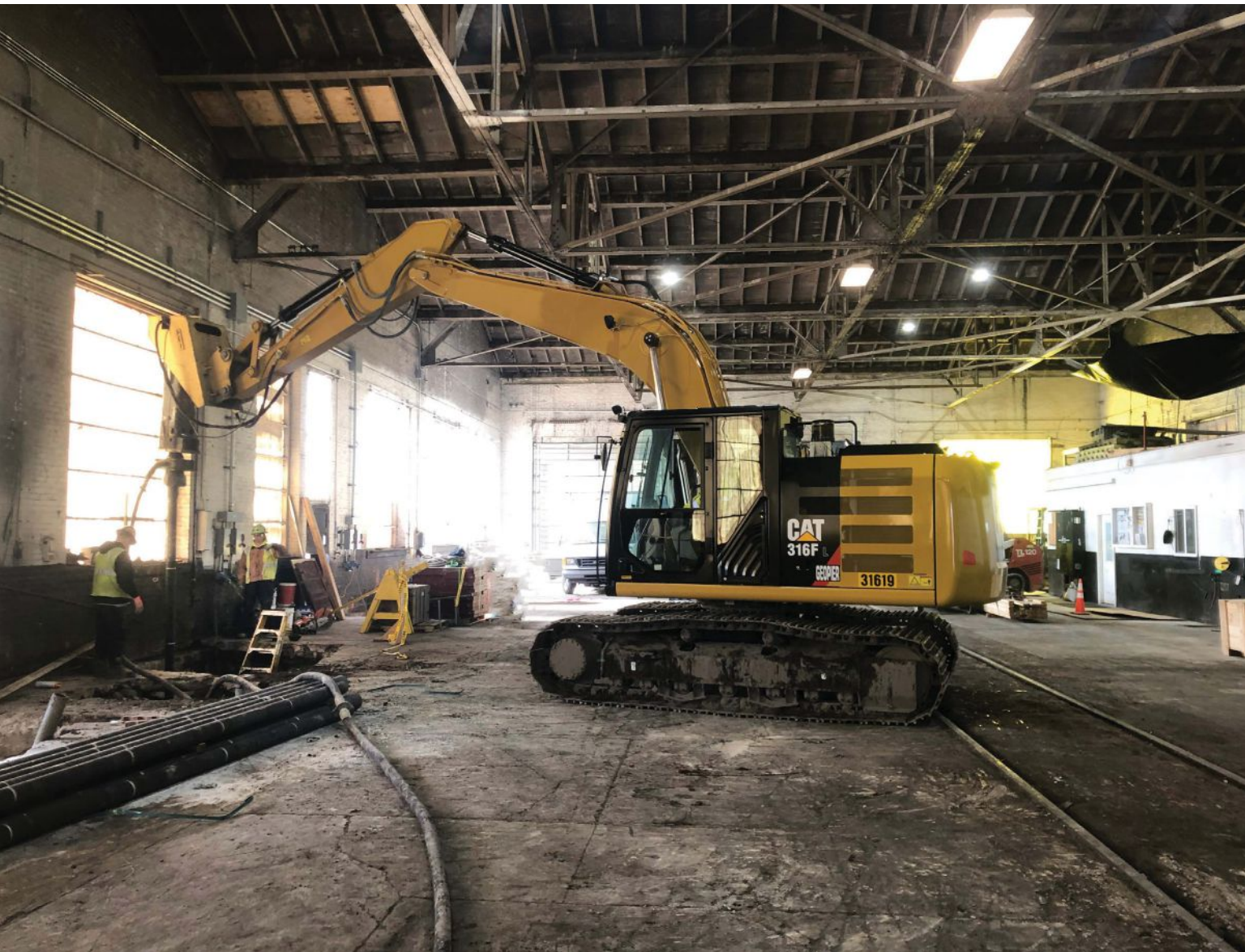
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JOB STORY



Expansions for manufacturing, warehousing and distribution facilities were on the rise even before the Pandemic. The tremendous surge in demand continues to drive the need for renovation and expansion projects. Unfortunately, deep foundation options in

the geotechnical toolbox for these types of projects are often limited. Piling solutions including helical piles and micropiles are typically recommended for support of new foundations and slabs. Yet project teams are often on the look out for alternative solutions to achieve higher capacity (and fewer) helical piles or a faster and

less costly foundation system than drilled micropiles.

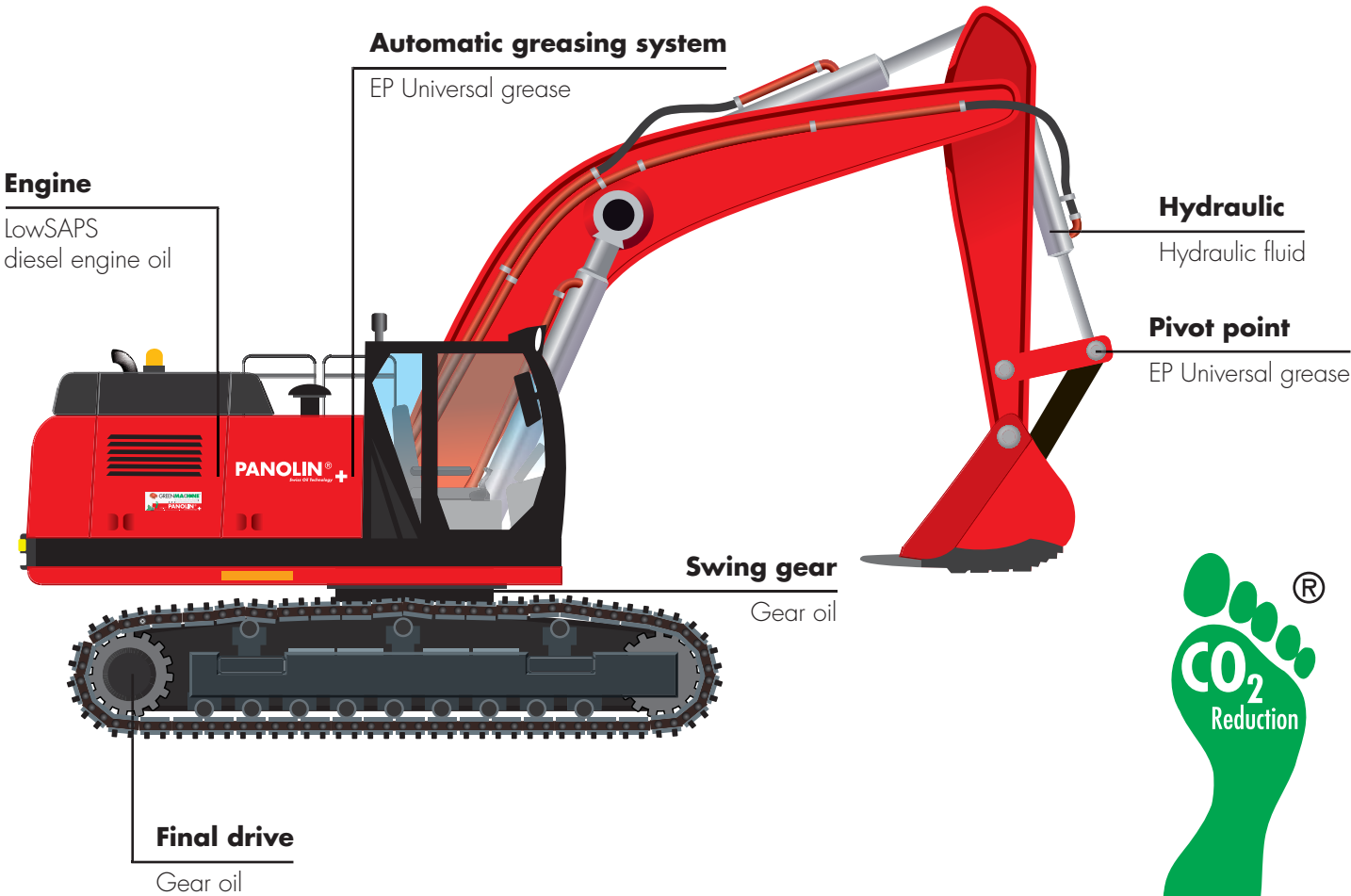
One such project involved the construction of a new crane system at the Norfolk Southern Mill Shop in Portsmouth, Ohio. The new 20-ton crane rail system was 48-ft wide and designed to run 180 feet through the shop interior. The new crane was planned within an area of the

existing facility with only 20 feet of overhead clearance.

Plans required a total of 16 new foundations to support the crane structure.

Initial recommendations for foundation support provided by Urban Engineers, the geotechnical engineer, included micropiles and augercast piles with compression capacities of 25 tons.

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JOB STORY

The project team, investigating additional cost-effective piling options, approached DuroTerra about a Ductile Iron Pile solution. Ductile Iron Piles have been used in Europe for four decades to provide an alternative to traditional foundations and are fast becoming a desired solution for foundation support in overhead restricted areas and many other challenging sites across the U.S.

Ground conditions consisted of 7 feet of sand fill underlain by soft to stiff silt and clay to a depth of about 40 feet followed by medium dense to very dense sand. Groundwater was encountered near 40 feet at the top of the sand. DuroTerra developed a friction pile solution consisting of exterior grouted Ductile Iron Piles installed through the upper silt and clay to terminate in the sand to develop working

capacities of up to 25 tons (compression), 5 kips (tension) and 2 kips (lateral).

The foundation plan developed by project structural engineer, L.A. Gates Company, included isolated foundations requiring a group of three piles to maintain rotational stability. A Series 118/9.0 Ductile Iron Pile section (118 mm outer diameter with 9 mm wall thickness) was designed with a 220 mm oversized grout shoe to produce an 8-inch diameter grouted displacement pile to provide a cost-effective alternative to the micropile and augercast options. A 10-ft long, #6 Grade 75 threadbar was inserted into the pile to resist the minor tension loads and to hold the bearing and tension plates.

Peterson Contractors, Inc. performed the Ductile Iron Pile installations at the site using a mobile CAT 316

excavator with a CAT H120 hydraulic hammer. The 5-meter (16.4 ft) pile sections were cut in half to work within the limited overhead condition. During the test pile installation, driving resistance (rate of advancement) substantially increased below depths of 35 feet. The test pile achieved “set” of less than 1 inch of movement in 50 seconds at a depth of 47 feet indicating a competent bearing condition on the very dense sand. Results of the full-scale load test showed 0.16 inches of deflection at 47 kips (100%) and 0.51 inches at (200%) to verify the performance of the alternative approach.

Production piles proceeded during the interim between test pile installation and full-scale load testing to help accelerate the pile scope

of work. Only 2 of the 3 piles were installed at each location initially to reduce the risk of pile cap geometry changes if the test results were unanticipated. Once the successful test was performed, the remainder of the piles in each group were installed. All piles were installed in similar fashion as the load test and achieved dense driving and set in the dense sand. A total of 48 piles were installed to depths of about 45 feet in 3 working days.

The use of low vibration, driven Ductile Iron Piles provided substantial reduction in time for the piling scope of work compared with the more traditional piling systems and reduced the overall foundation costs while still delivering a pile that met the design requirements. ■

DUCTILE IRON PILES HAVE BEEN USED IN EUROPE FOR FOUR DECADES TO PROVIDE AN ALTERNATIVE TO TRADITIONAL FOUNDATIONS AND ARE FAST BECOMING A DESIRED SOLUTION FOR FOUNDATION SUPPORT IN OVERHEAD RESTRICTED AREAS AND MANY OTHER CHALLENGING SITES ACROSS THE U.S.



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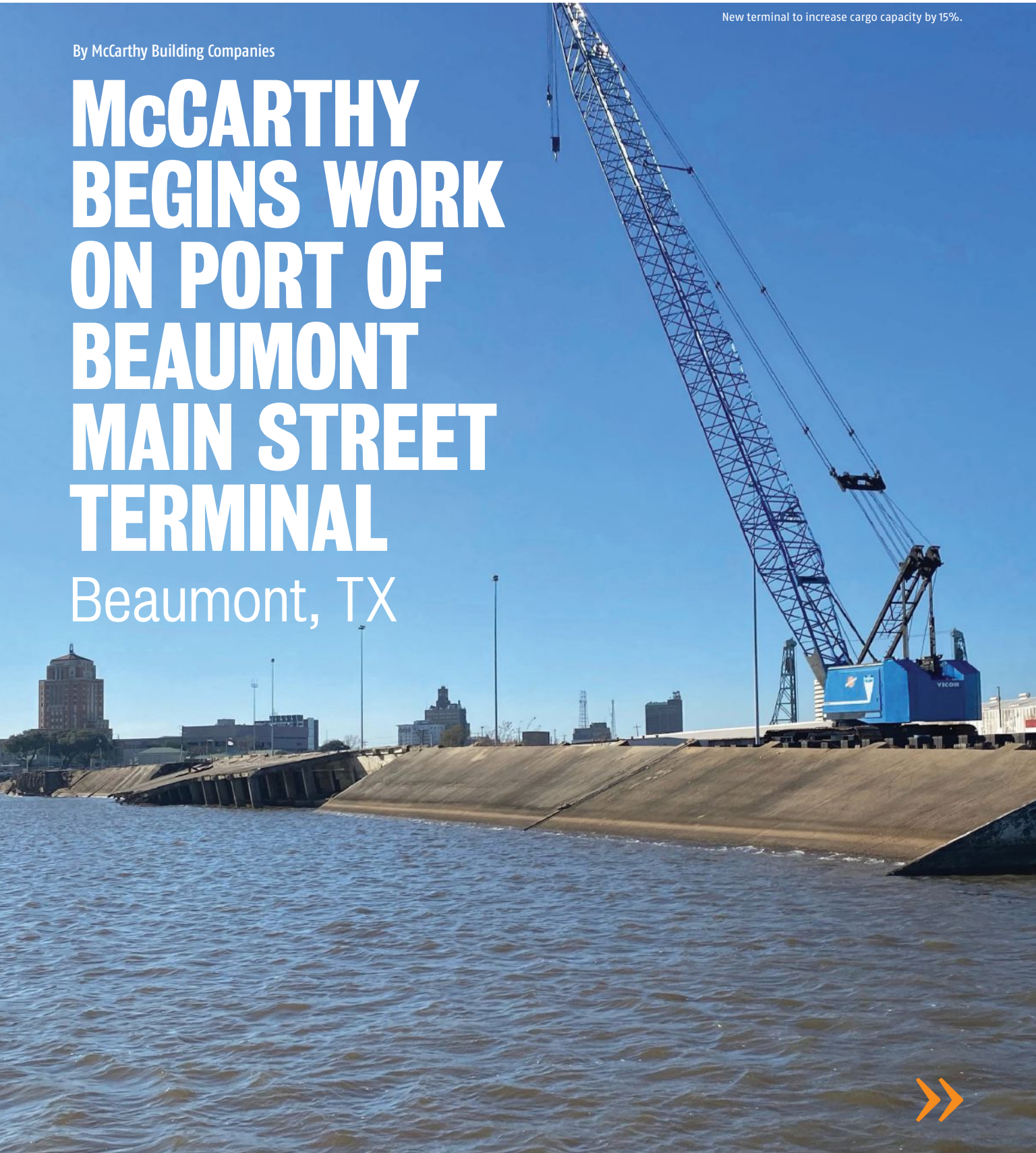


New terminal to increase cargo capacity by 15%.

By McCarthy Building Companies

McCARTHY BEGINS WORK ON PORT OF BEAUMONT MAIN STREET TERMINAL

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McCarthy Building Companies has started construction on Port of Beaumont's Main Street Terminal 1. Aimed at increasing the port's general cargo handling capacity by more than 15%, the project includes demolition of a failed dock structure and construction of a new state-of-the-art general cargo dock.

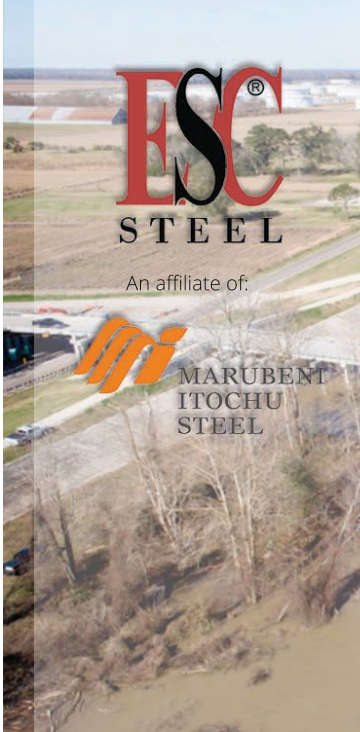
The Main Street Terminal is the main dock for the Port of Beaumont, and its central location makes it the number one strategic military port in the country. The original dock collapsed in 2012, thus McCarthy must first safely demolish the entire dock in water that has zero visibility. With portions of the dock still standing, it is critical to remove everything off the

floor before installing the new dock in the old dock's footprint, as any underwater obstructions could hinder pile driving installation.

The new dock will be 1,200 feet long and 130 feet wide, with a larger section in the middle measuring 152 feet wide. Its construction will consist of concrete piles, cast-in-place concrete caps and beams, pre-cast concrete deck panels, and a concrete topping slab. McCarthy

is self-performing all concrete and pile installation, as well as utility installation including water, and sewer.

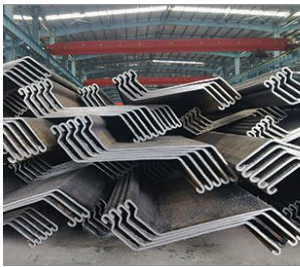
"We are pleased to work alongside the Port of Beaumont to build an important piece of infrastructure that will have positive economic and community impacts," said Robert Wood, project manager for McCarthy. "Our lengthy history of working with ports, along with our ability to self-perform work,



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JOB STORY

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With an opportunity for a complete redesign of the terminal, sustainability and resiliency were top of mind for the Port of Beaumont. Key building elements include use of concrete piles that provide a corrosion-resistant foundation for extended resiliency, and a final concrete topping slab that will be constructed using synthetic concrete reinforcing fibers, as opposed to traditional welded steel wire mesh. This reinforcing material will provide a corrosion proof surface which will slow deterioration. The new fender system includes an energy-absorbing component to reduce loads on the dock, which will extend the useful life of the dock.

“This project represents an evolution in marine construction, as evidenced throughout the Port’s various wharves,” said Director of Engineering Brandon Bergeron. “Since the Port is over 100

years old, we have docks constructed of timber, steel, and concrete, and this project represents the most up-to-date, state-of-the-art advancements in marine engineering design and construction techniques. The Main Street Terminal I project is ushering the port into a new era of development.”

The Main Street Terminal 1 project is the largest of the 20 projects on the Port of Beaumont’s 2022 Capital Improvement Program which includes three new docks and a new rail interchange track. McCarthy began work on the

Main Street Terminal Phase II in February of 2022, with completion scheduled for mid-2024.

McCarthy has worked at various ports along the Gulf Coast for approximately 30 years and is the nation’s fifth-largest port and marine builder ranked by *Engineering News Record*. McCarthy’s experience in marine construction spans a diverse array of project types including petrochemical liquid terminal facilities, bulk cargo handling terminals, and deep-water container terminal ship docks. ■

THE MAIN STREET TERMINAL 1 PROJECT IS THE LARGEST OF THE 20 PROJECTS ON THE PORT OF BEAUMONT’S 2022 CAPITAL IMPROVEMENT PROGRAM WHICH INCLUDES THREE NEW DOCKS AND A NEW RAIL INTERCHANGE TRACK.

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Missouri



PROJECT PARTNERS

Owner: MoDOT – Jefferson City, MO
General Contractor: KCI Construction – St. Louis, MO
Drilling Contractor: Case Foundation Company – Roselle, IL

PRODUCTS

Pipe Piles: 66" OD x .500", various lengths

PROJECT TIME FRAME

July 2018 through 2021



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HISTORY

The Meramec River is one of the longest free-flowing waterways in the state of Missouri, covering about 218 miles from the Meramec Spring near Salem to where it empties into the Mississippi River near St. Louis. The river is used commercially by tour boats and sand and gravel mining barges, as well as canoe outfitters and ferry boat excursions. The Meramec Spring, where the river begins, was declared a National Natural Landmark in October 1971, and the ruins of a historic iron works, which took advantage of the available hydropower, still sit at the spring.

PROBLEM

As a free-flowing river with no flood control dams, the Meramec River is often subject to flooding. Major floods in both December 2015 and May 2017 caused damage and shut down

roadways. In addition, Karst conditions can be found throughout the region, causing sinkholes and caves under the river.

The I-44/I-270 interchanges along the Meramec River in Missouri were built in a time when traffic volumes and automobile speeds were significantly less than they are today. Many of the bridges along the I-44 corridor were built more than 50 years ago and are in need of rehabilitation or rebuilding.

SOLUTION

The project to replace both the eastbound and westbound I-44 Meramec River Bridge will be broken into several phases, with Phase I currently in progress. Phase I, which began in July 2018, consists of a new westbound bridge built between the existing east and west bridges that are now in use.

The bridges and parts of I-44 will be raised to lift the interstate further out

of the floodplain. The project will also include a shared use path over the river for bicycles and pedestrians.

Case Foundation of Roselle, IL, a deep foundations specialist, was hired as the drilling contractor for this project and reached out to Nucor Skyline, as their steel foundation supplier. Because of some difficult loose sand and gravel conditions on top of the bedrock, Skyline manufactured the rolled and welded pipe piles to 66" OD x .500" in various lengths in order to minimize shaft cave in and stabilize the overburden of the soil conditions.

One of the pipe pile shafts had to be drilled deeper into the bedrock to create a seal when Karst conditions, underground drainage system that can include sinkholes and caves, were found at the site. Another condition at the site was high water on the Meramec River due to local storms. The project is expected to take three years to complete. ■



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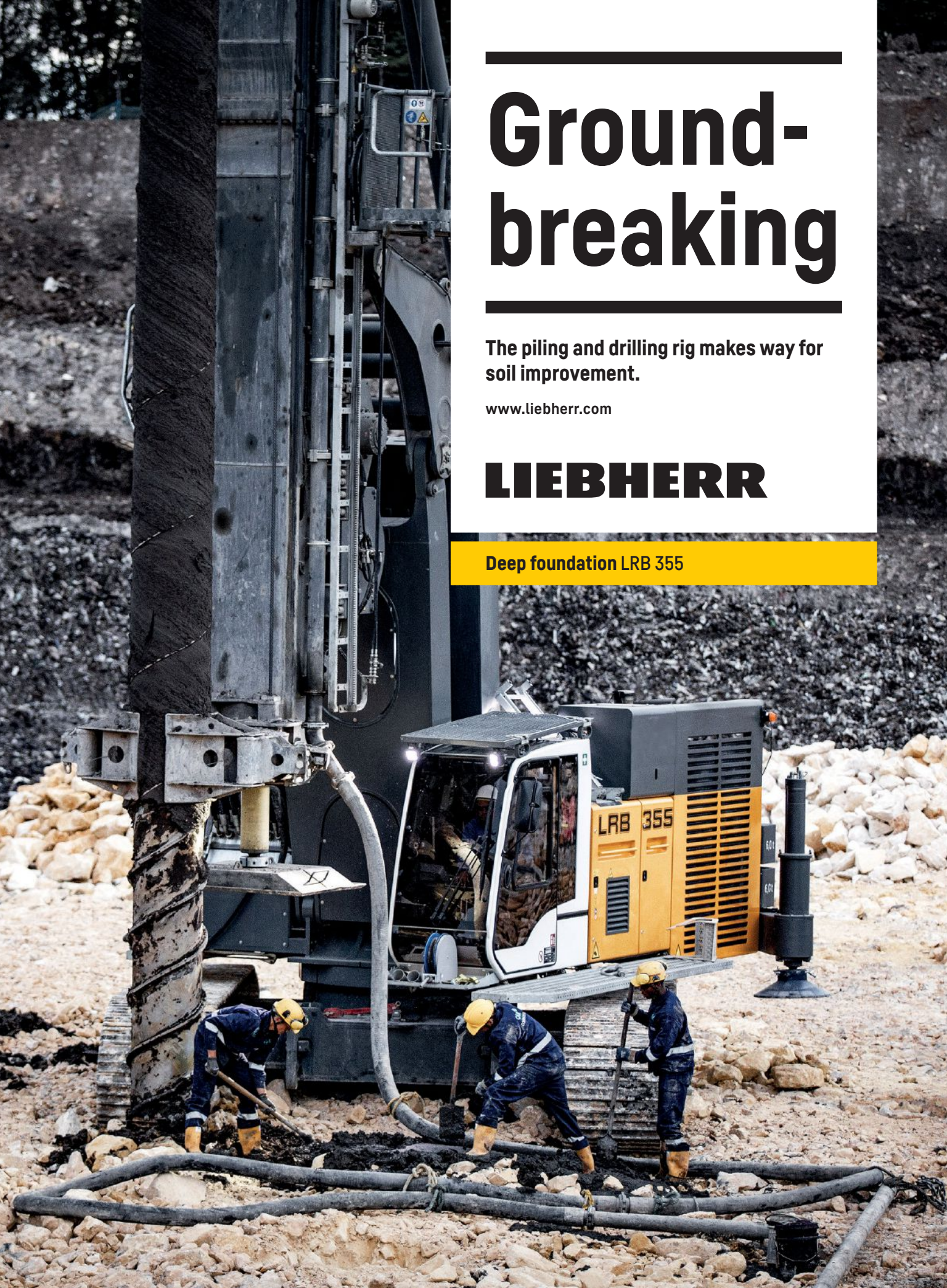
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BAUER CONSTRUCTS PILES FOR THE FURTHER EXPANSION OF THE B15

Rosenheim, Germany



A BAUER BG 39 and a BG 46 are in operation. © BAUER Group



JOB STORY

The aim of expanding B15 federal highway is to relieve the city of Rosenheim from truck traffic. In the course of this extension of the B15 with the Rosenheim west bypass, a new railway overpass is being constructed at Wernhardsberg over the Munich-Rosenheim railway line.

The joint venture Spezialtiefbau BW 8.2 Rosenheim, comprising BAUER Spezialtiefbau GmbH (technical management) and Menard GmbH (commercial management), was tasked with the required specialist foundation engineering works. For the bridge foundation, 74 fully cased large-diameter bored piles are being

constructed with a diameter of 1,200 mm up to a depth of 40 m. Due to the unfavorable soil conditions, the load of the structure will be transferred into the subsoil with the help of a mixed foundation consisting of piles, vertical drains and displacement columns.

Not only is all work being carried out during ongoing railway operation, but the construction soil also poses a particular challenge: It

consists of Rosenheim marine clay, a fine-grained, soft, water-logged soil with low load-bearing capacity. "This difficult and sensitive soil places very high demands on the pile installation as well as the accompanying documentation," explains Project Manager Klaus Stauber.

"This is because Rosenheim marine clay is highly unstable due to its properties."

The marine clay was created approximately 10,000

years ago, after the last Ice Age. When the Inn glacier melted, a lake was formed, generating these fine-grained deposits. The vertical drains and displacement columns provide an additional improvement of the marine clay's load-bearing capacity.

The work is being carried out with a BAUER BG 46 and a BG 39. The project commenced in summer 2021 and is expected to continue until summer 2022. ■

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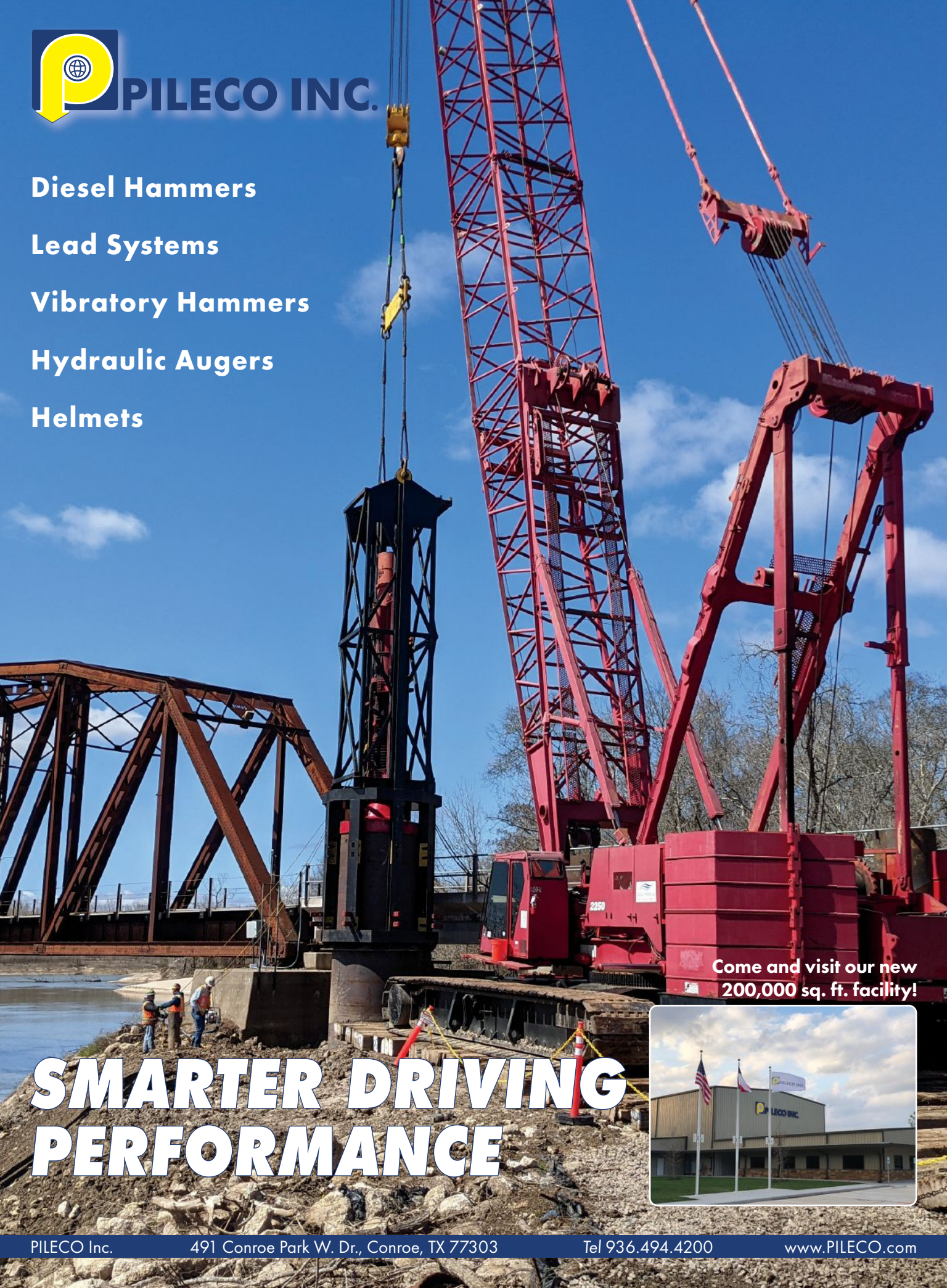
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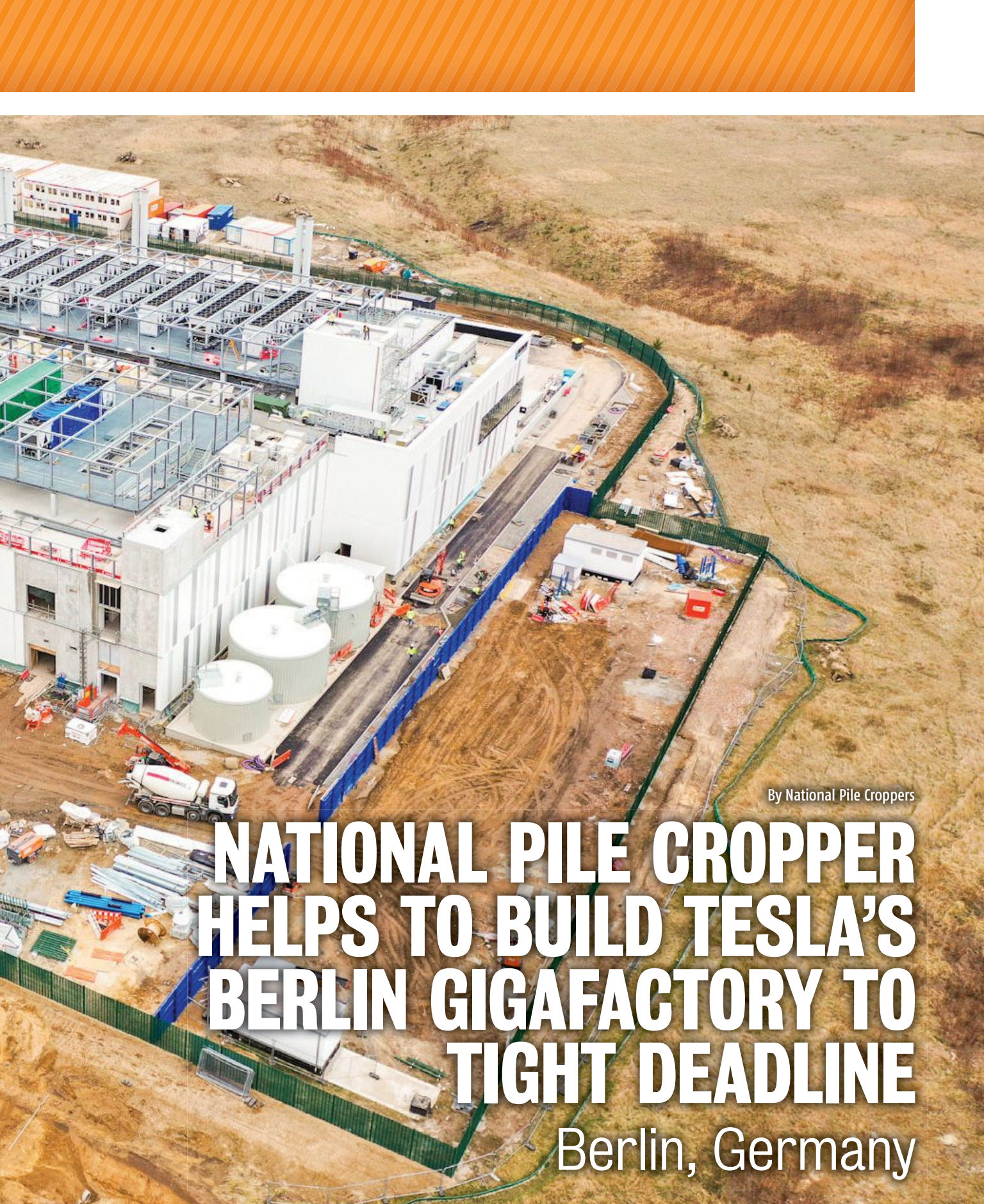
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JOB STORY





By National Pile Croppers

NATIONAL PILE CROPPER HELPS TO BUILD TESLA'S BERLIN GIGAFACTORY TO TIGHT DEADLINE

Berlin, Germany

JOB STORY

One of the major announcements in 2019 was that electric car pioneer Tesla was to build its next Gigafactory in Berlin, Germany. Playing an unheralded, yet vital part in the productive, efficient, and safe construction of the factory was an array of National Pile Cropper's solutions.

The Tesla Gigafactory Berlin-Brandenburg (also known as Gigafactory Berlin, Gigafactory 4 or Gigafactory Europe) is a state of the art European manufacturing plant for Tesla, Inc. which has been constructed in Grünheide, Germany. The campus is located some 35 kilometres south east of central Berlin on the Berlin–Wrocław railway, which forms the north border of the site between Erkner station and Fangschleuse railway station and the A10 autobahn, which forms the west border.

The facility and its Berlin location were announced by Tesla CEO Elon Musk in November 2019 at the Das Goldene Lenkrad award show. The factory is planned to produce batteries, battery packs and powertrains for use in Tesla vehicles and also assemble the Tesla Model Y. Construction began early in 2020, with site preparation and foundation work immediately

commencing including the essential foundation and site clearing work. The initial work saw the placing of the first four construction cranes and the arrival of trainloads of building materials including pillars, beams and literally thousands of concrete piles of all shapes and sizes. Tesla was keen that the work would be undertaken quickly, efficiently and environmentally friendly as equipment and systems would allow.

PREFABRICATED CONCRETE CONSTRUCTION

Prefabricated construction was used to produce concrete walls, beams and piles, being chosen as an efficient method for building structures. Large portions of the Gigafactory structure were assembled at a manufacturing site and then transported to the construction job site and installed where required. Reinforced concrete beams and walls that became

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JOB STORY

a part of some of the main structures of the facility were installed into the ground.

In order to crop the thousands of concrete piles as efficiently, productively and safely as possible, and with Tesla's avowed aim to have the factory completed as soon as possible, the main contractor, Arikon, turned to midlands based UK manufacturer and supplier of state of the art pile cropping solutions, National Pile Cropper. Its pile cropping solutions are mounted on a 360° excavator via quick release fittings, which when lowered onto the pile or beams, the hydraulic system operates the jaw(s) which allows the pile cropper to cut a de-bonded pile and cause the concrete to break away leaving a horizontal finish as a result. In doing this, the chisels penetrate in a precise direction up to the rebar to make the fracture. On bonded piles, the chisels will penetrate further, and due to the shape of the chisels and the reaction forces of the rebar, the concrete will break in pieces and can easily be lifted off the pile enabling recycling of the cut away concrete.

DIFFERENT TYPES AND SIZES

The piles that required cropping in Berlin came in a variety of sizes, diameters and construction techniques, all designed and developed to have the factory completed and functional as quickly as possible. The all-encompassing National Pile

Cropper range aided the construction, proving to be invaluable on the Tesla development and many other projects. Amongst the solutions provided included National Pile Croppers largest Quad cropper, 'Quadzilla'. This beast of a machine can handle the largest of piles and beams, delivering high rates of productivity and efficiency — just as Tesla required.

The current Quad range (including 'Quadzilla') is not the end of the NPC's investment in pile cropping solutions however. "Although our range covers virtually all applications and requirements, we continuously invest in R&D to develop and refine our solutions," explains company director Paul Emberton. "We work with our customers to find out what they want and how we can help make them more productive and profitable. To this end, this year will see the launch of new solutions that are currently undergoing field testing and refinement."

The National Pile Croppers that worked on the Tesla Gigafactory in Berlin proved their worth and have contributed to the efficiency of the project. "We are proud to work with a company of Arikon's standing on behalf of global trendsetter Tesla, to help them with this strategically vital project. The pile croppers we have supplied have helped ensure that the cropping part of the project was done to deadline, as efficiently, safely and productively as possible. We look forward to working with Arikon again on other projects as the need arises," concludes National Pile Cropper's Paul Emberton. ■

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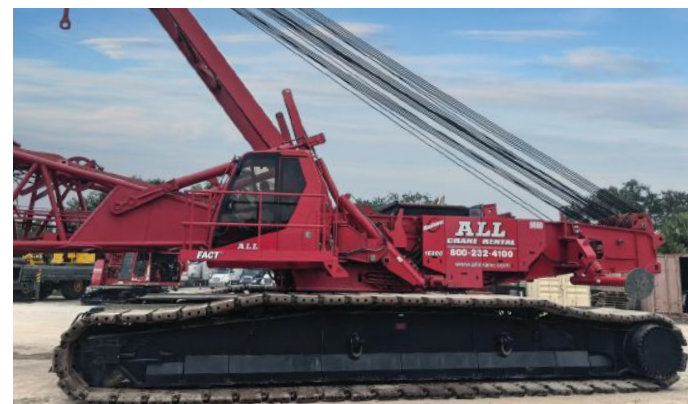
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By Chintan J. Patel

MICROPILE FOUNDATIONS FOR TRANSMISSION LINE STRUCTURES



Micropile with steel cap and tubular steel pole in mountain region. Photo credit: Crux Subsurface, LLC.

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Micropile installation

INTRODUCTION

At present, the Power and Energy sectors are set to be one of the largest contributions to North America's economic growth. From 2021 to 2028, the Powerline transmission market is projected to grow at a 4.0% rate and set to exceed 40 billion dollars market value during that span. With the growing electricity demand, rising power load demand, retrofitting of existing infrastructure, efficient grid of electricity lines, mixed-use of micro-grid and renewable energy, the powerline transmission sector requires standard construction practices, strong structures, and robust foundation systems to resist larger loads and stand for its design lifespan.

With an aging infrastructure of transmission lines and the development of high-power voltage lines, foundation systems of overhead structures need to be efficient, resilient, and economical. These days, Energy companies are bidding for modern foundation systems

that can be beneficial to their infrastructures and able to transfer large loads from overhead structures. Foundations of transmission line structures should be sufficient to overcome challenges faced due to high terrain conditions, environmentally sensitive areas, compact foot area for construction, difficulties for material transportation, uncertain geological conditions.

Micropiles are becoming groundbreaking solutions for transmission line structures due to their advantages over the past two decades. This innovative and compact foundation system gives more instrumenting benefits for major transmission line structures.

This article discusses the overview of micropile systems, their benefits for transmission line structures, and project photos by Utility companies.

MICROPILE OVERVIEW

Micropiles are slender, high capacity drilled, smaller diameter (less than

12 in) pile systems. Micropile consists of an upper-cased section to resist lateral load followed by uncased grouting bonded section to competent bearing strata and central reinforcing bar to the entire length of the pile. Micropile is constructed through drilling borehole into geological strata to competent bearing layer, lowering reinforced steel bar and grouting at the end.

Micropile upper cased section develops friction to surrounding soil to resist the lateral loads. High strength threaded bar interacts to combined loading in compression and tension from overhead structures. Micropile is connected with a steel pile cap or concrete cap on top with a high-strength coupler and washer and they can also develop high uplift and axial capacity bonded into rock layer.

Accurate determination of lengths can be recorded from the first installation of micropile to site and cased lengths and bond lengths can be adjusted based on accurate characterization. Pile load tests like a proof test, an



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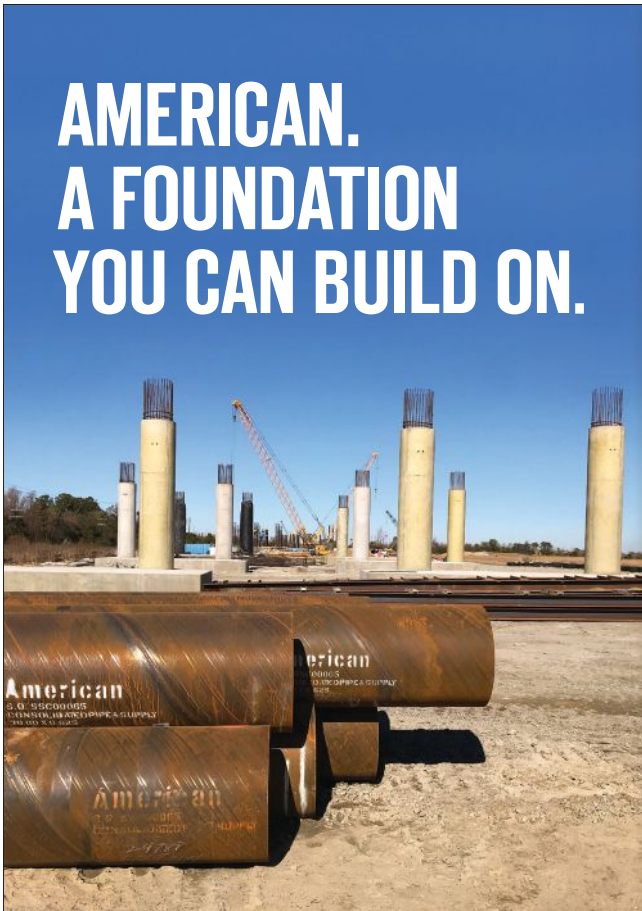
Micropile with steel cap installed. Photo credit: EBS Geo-Structural.

ultimate/a verification test are used per FHWA recommendations to validate the ultimate capacity of bond area and deflection against test load.

FHWA SA-97-070 and FHWA-NHI-05-039 design standards are the most current publications available for the design of micropiles. AASHTO and

IBC have recently published research case studies on micropiles. Deep Foundation Institute (DFI) is developing comprehensive design guidelines of foundations for transmission line structures and also focusing on micropile practices for it. For transmission line structures, a group of micropile systems

is constructed for foundation layouts battered away from the center of the foundation to derive capacity from surrounding native soil. Overall stiffness and group combined interactions of micropile systems develop composite resistance against higher combined loads from overhead structures.



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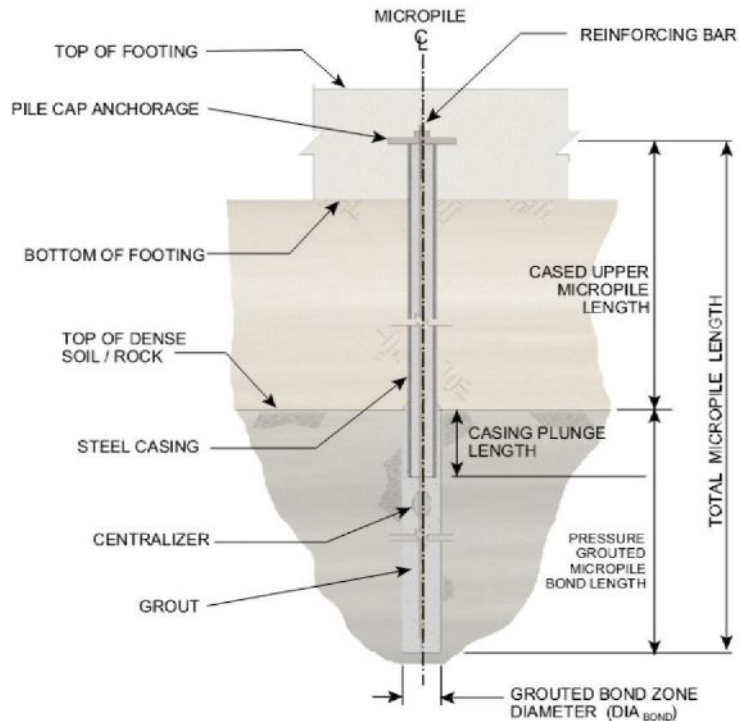
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Micropiles are advantageous in below favorable options to construct for transmission line structures:

1. Significant geological strata challenges
2. Transportation, overhead clearance, and access restrictions to a project site
3. Environmental sensitive area
4. Noise and disturbance limitation
5. Relatively uncertain conditions for construction and value engineering indeed
6. Hard rock, high groundwater, and special Geotech conditions
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Micropiles in transmission line structures are an efficient solution delivered in past for these types of challenging conditions. ■



Detail of composite micropile section (FHWA-NHI-05-039).

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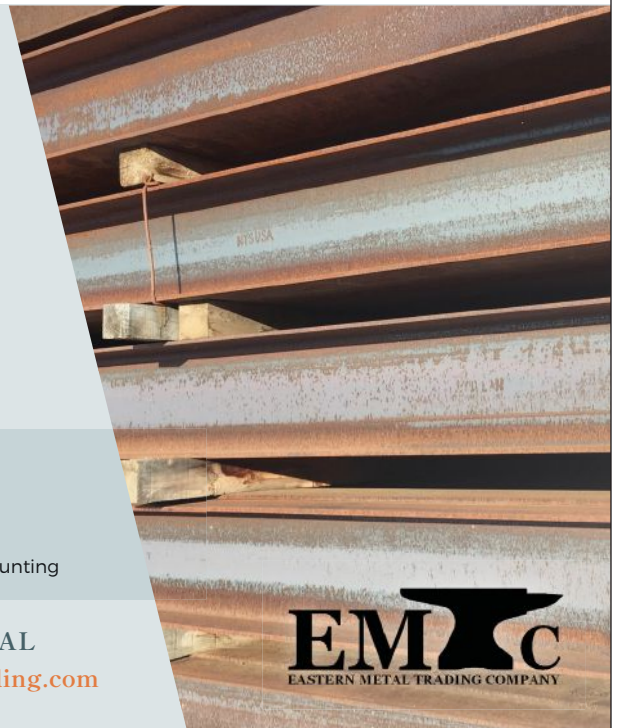
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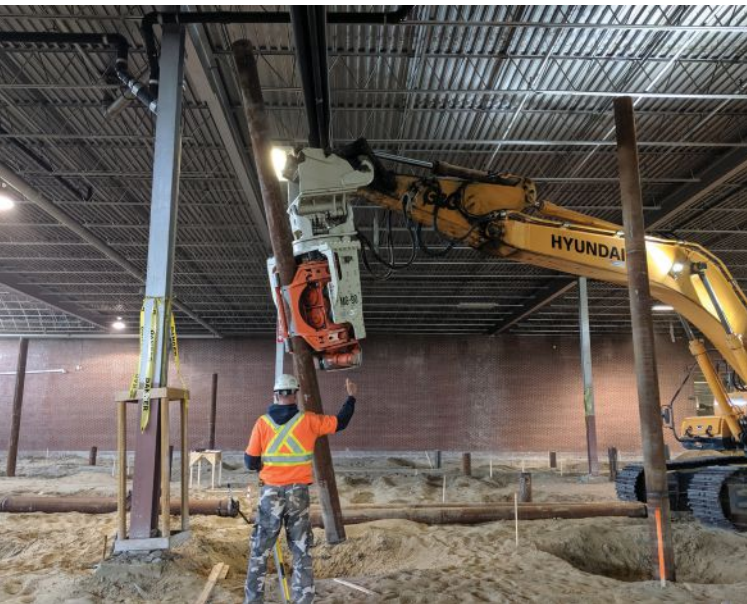
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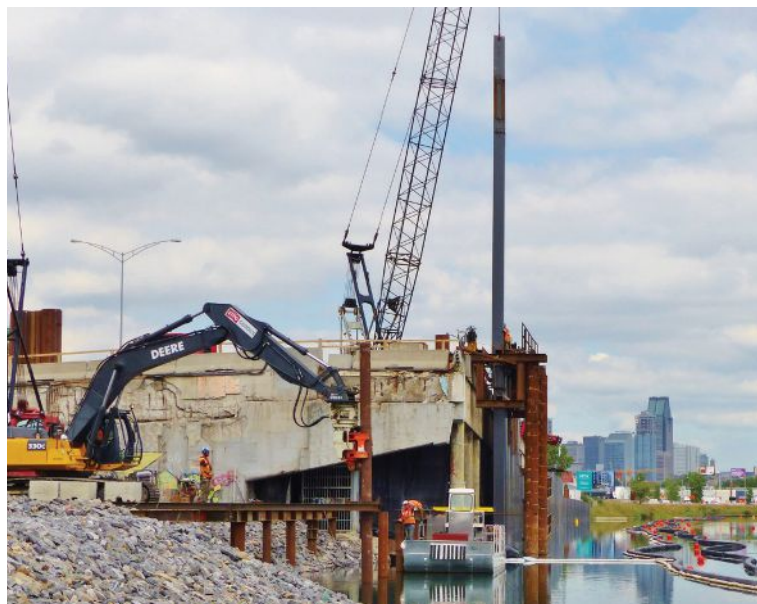


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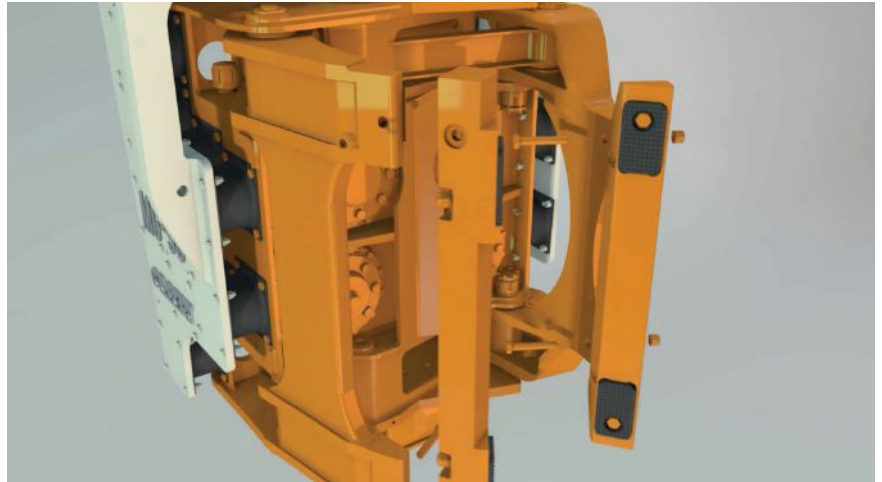
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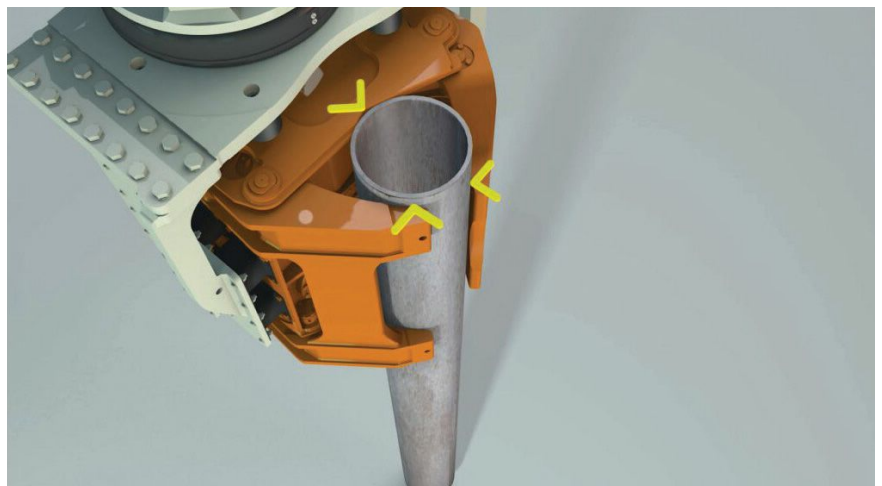
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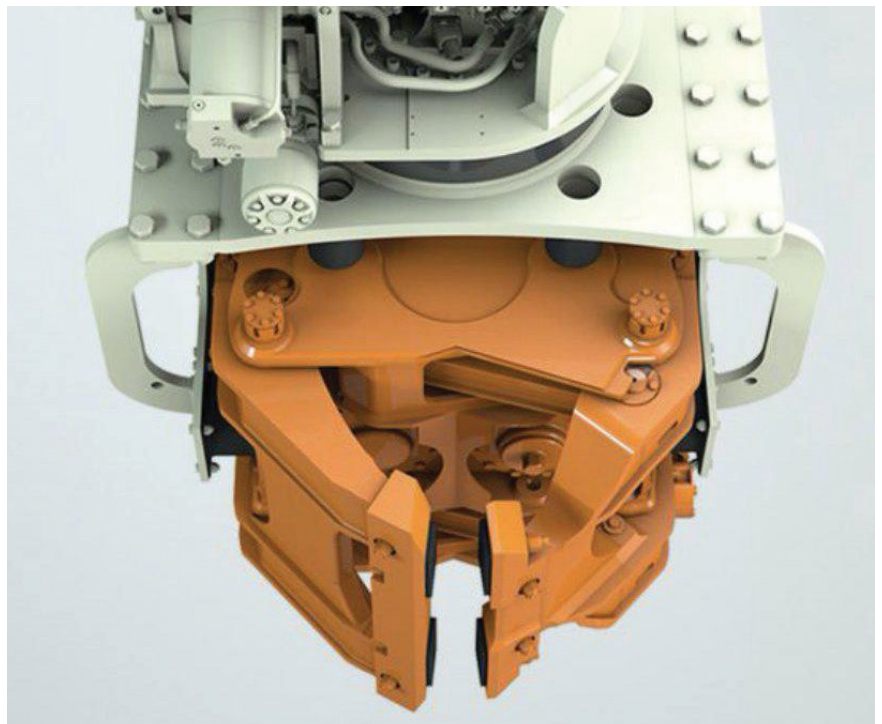
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INTERVIEW: IDEAL FOUNDATION SYSTEMS

Pile Buck's interview with Ben Stroyer at IDEAL Foundation Systems, a leader in the high-capacity helical pile and micropile industries.





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PB: How did IDEAL get its start?

BGS: My grandfather and his two sons started C.S. Stroyer & Sons in 1956, so we've been around construction all our lives. Through building custom homes and additions, we were taught the importance of high-quality craftsmanship and attention to detail from an early age. It didn't matter how much money we were making (or not making), getting the job done right was never optional.

During our interactions with homeowners in our area, we recognized a demand for basement waterproofing.

So, in the early '90s, Art and I started a waterproofing business. That evolved into residential foundation repair. With our time spent in the trenches underpinning homes with helical piles, it became very clear that the industry needed to see some change. So, in 2003, we began fabricating our own piles. Along the way, we have found so many great opportunities to grow and shape the high-capacity helical pile and micropile industries. We were actually the first US company to mass-produce high-capacity helical piles.

PB: It looks like IDEAL has a lot of patents.

BGS: We do. In the last five years, we have logged several International patents and patents pending, improved many parts of the helical pile, developed and patented the STELCOR® Drilled-In Displacement Micropile as well as Greenwalk, our modular boardwalk system. The reason for patenting is to, first and foremost, protect our customers, but its also important to protect the reputation of our technology and products within the industry. Of course, we aim to be

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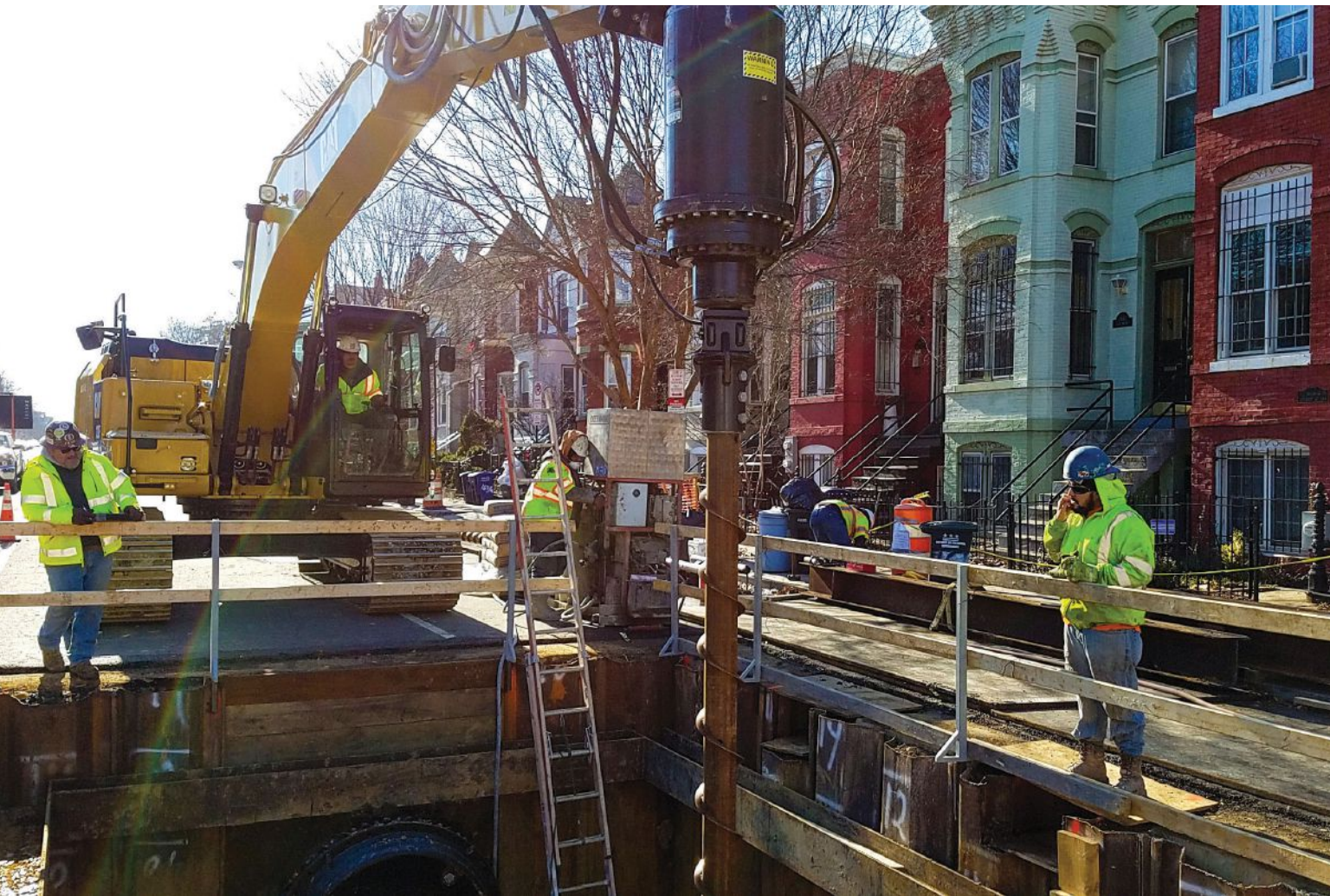


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successful and gain market share, but America is a great country that's more than full of opportunity for all of us to get a piece of the pie. We're not afraid of competition. In fact, we encourage it. It keeps us all on our A game. That's the reason we got into this industry in the first place. With helicals, we saw opportunities to improve something that was already good, but needed to be better.

PB: We've seen a lot about STELCOR in the past several

years. What sets the STELCOR® Drilled-In Displacement Micropile (DDM), as you call it, apart from a more traditional micropile?

BGS: The STELCOR® DDM is embedded into the improved soil with a unique corrugated weave of grout which greatly enhances the soil bond and load transfer capacity. For one, it uses relatively small installation equipment, most of which is already on every site already. Instead of a cumbersome rig, you're using an excavator, so tight access, especially

overhead, is of no concern. The mob/demob of equipment used for other pile types can be cost-prohibitive depending on the project location. Mess is another factor. If you've ever been on a site where a traditional micropile is being installed, you've seen how bad it can get. With STELCOR, there is no mud, no mess, no water — just some minimal grout here and there. The result is greater loads at lesser depths that consistently produces better results than were projected in the design.

WITH STELCOR, THERE IS NO MUD, NO MESS, NO WATER – JUST SOME MINIMAL GROUT HERE AND THERE. THE RESULT IS GREATER LOADS AT LESSER DEPTHS THAT CONSISTENTLY PRODUCES BETTER RESULTS THAN WERE PROJECTED IN THE DESIGN.



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PB: How about some of the other STELCOR-type piles come into the market in the last couple of years. Is there anything that makes STELCOR different?

BGS: Simply put, if the pile is not a STELCOR pile, don't expect it to perform the same way. I don't say this to infer that other pile types are inherently bad, that's certainly not the case. Every product has its own unique advantages. However, we take umbrage when other piles are referred to as "like STELCOR" when they lack each of the elements that make this pile type unique. As you can imagine, this is something we're very passionate about. We've had many situations where other pile types have been referred to as being "like STELCOR," specified for a project, and then failed in a situation where, based on our empirical data, STELCOR would have excelled. As a company who has put so much thought, research, design, and passion, into the technology, this can be

rather irritating. The one upside is that in many situations where this type of thing has occurred, we've been able to prove its (STELCOR) success after the fact, which is fantastic. The answer to this question really has a few important parts. Should I dive further into this, or do we move on?

PB: I'm always interested to learn and I'm sure our readers are as well.

BGS: I promise to keep this factual, and I'll try to make it brief. So, first, STELCOR has a unique and patented displacement head that allows it to advance easily into any soil type with a specified design for that soil type. This displacement head moves the soil outward creating a quantifiable annulus around the pile shaft. Second, there's a deformation structure which creates a secondary groove or secondary deformation in the annulus created by the lateral displacement plate. This screw like

profile is filled with grout and provides a higher friction coefficient in its contact with the displaced soil in comparison with a smooth grout column. This is also covered by international patents. Third, and again, internationally patented, we have the reverse-auger. The reverse-auger is a structural element which extends the full length of the pile and ensures that the grout is filling the annulus, as well as the secondary deformation grooves, on the entire length of the pile. The reverse-auger also transfers the load through the grout from the ground into the steel core and ensures there will be no shear between the grout and the smooth pile shaft. It is puzzling to me why other grouted piles, which all have a smooth shaft, are given consideration for the shear strength when any delamination of the grout from the smooth shaft renders it useless to the pile capacity. This is not the case with STELCOR as the grout is always captive between the reverse auger flightings.



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All these features are exclusive to the STELCOR pile and are patented. Does that cover it?

PB: Have you had some resistance to the STELCOR® pile?

BGS: I'm not sure I would call it resistance. It's not surprising that when there's an advancement in the industry, people have questions about it — and engineers are no exception. They have an obligation to have 100% confidence in something they're specifying. So, from that point you could say there has been resistance or hesitation. I think its more about educating the engineering community — which we've put a lot of effort into and its certainly paid off. That was then — this is now. STELCOR has been embraced by the engineering community and it's become a useful tool in their toolbox.

PB: Have you experienced any unexpected successes with STELCOR?

BGS: Actually, no. But there is a reason for this. We have an excellent design team and they review all of the project information before presenting STELCOR as a viable option. We don't pursue a project if the data tells us its not a good fit. The Clean Rivers project in DC is a good example. A helical pull-down pile was specified but engineers believed that it would have failed in torsion at less than 20,000 ft lbf. With time restraints, limited access, and other factors, we knew STELCOR was going to be a perfect fit. A pile was tested and exceeded the requirements. STELCOR had a resistance of 30,000 to 40,000 ft lbf in the top 10 feet, and a torque capacity of over 50,000 ft lbf. The loads were 102 Kips compression and 114 Kips Tension.

PB: Bet they were impressed by those results.

BGS: I do think they were quite impressed.

PB: Can you give our readers a brief lesson in helical piles?

BGS: Ok I'll try to keep this simple. A helical pile is a deep foundation. Its purpose is to transfer a structural load

to deeper, stronger, and less compressible materials bypassing any weaker and more compressible materials that would be unsuitable for the support of conventional shallow foundations. As a deep foundation, a helical pier should be considered for most applications that would call for a driven pile, drilled pier, or mini pile. With our large diameter helicals, we like to refer to them as torqued in pipe piles. Think of them sort of like an end bearing pipe pile but installed by torque and with an end bearing plate much larger than the pile shaft.

PB: What's the difference between a helical pier and a helical anchor?

BGS: The unit is called a helical pier if it resists compressive loads, which are usually downward. It is called a helical anchor if it resists tensile loads, which are usually upward or inclined. Many helical units function as both piers and anchors. A helical unit is installed by simply screwing it into the ground.

PB: Can you describe a typical helical unit?

BGS: A typical helical unit consists of a central steel shaft, to which can be attached one or more steel helices. The central shaft can be lengthened by adding extension pieces as necessary. The final component to the helical unit is the Load Transfer Device (LTD).

PB: What does the LTD do?

BGS: The LTD (load transfer device) is used to transfer the tension or compression load from the structure to the helical unit. The helical unit transfers tension or compression load to competent soil strata below incompetent soils. Wherever tension loads are present, the LTD is bolted to the helical unit.

PB: Helical piles literally came to the rescue at the beginning of the COVID-19 pandemic.

BGS: They did. In early 2020, when New York's COVID cases were surging, the Army Corp of Engineers built temporary field hospitals for non-COVID and lower-risk patients on Long Island. Helical piles were the perfect solution because they can be installed quickly



— and be easily removed when the hospitals are no longer needed. Which thank goodness they aren't now.

PB: Tell us about your installation equipment packages.

BGS: Having years of installation experience, we know firsthand what its like to lose time and money on a project due to a single missing component which results in delays. So, we've gone to great lengths to ensure an installer has everything they need for their projects to run



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smoothly. I could tell you all kinds of horror stories where everything seems just fine and you're on site and realize some essential component is missing and hours or days of install time are lost. We know that time is money, and we want to help people save it.

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something better out there now, they got the idea from us. the drive motor, linkage, mount bracket, ryno hitch, hose kit, differential pressure kit, and drive adapter. Everything you need to hit the ground running.

PB: You have a custom solution for tight spaces, yes?

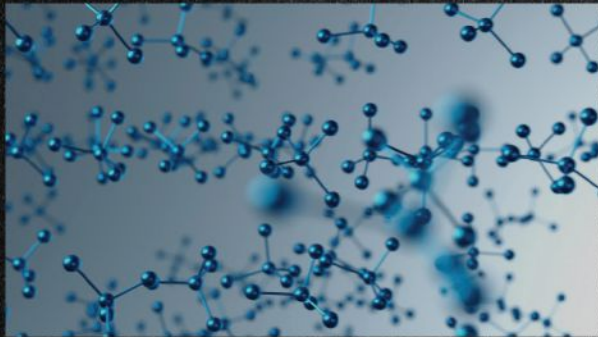
BGS: We do. Our team came up with a game-changing solution for tight access

installations. It includes a BROKK machine and a proprietary drive head setup using a Digga drive head. The remote-controlled BROKK excavator is a machine that was not yet being used in the helical pile industry. The maneuverability of the BROKK combined with the ultra-compact drive head has made it possible to perform installations on sites where it would have been extremely difficult, if not impossible. This

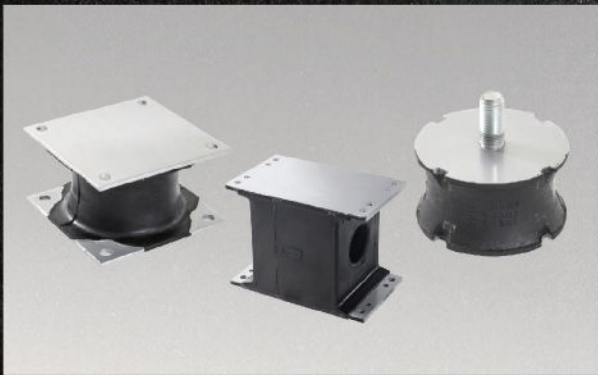
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is the IDEAL solution if you're installing in tight access environments and even more beneficial if there are high torque requirements. We are always looking for ways to make our client's jobs easier and this has been used with great success in limited-access applications.

PB: Can you tell me more about IDEAL "breaking out the Brokk" in a subway station?

BGS: That was a cool project. I'm glad you mention it. Skanska AB (a global construction company headquartered in Sweden) had a project in a New Jersey subway station and they had to get installation equipment and materials down through the escalator openings. They could get everything down below, but once down there, limited overhead access was still an issue. Have you ever tried getting an excavator down several flights of stairs and into a subway station? That was a rhetorical question. If you ever do, call us first!

PB: This is where IDEAL "broke out the Brokk."

BGS: That's right. Our design team worked with different manufacturers to provide proprietary install equipment that could handle the unique requirements of this subway project. I'm proud of our team and their ability to come up with new approaches and methods to address significant installation challenges. This project was a perfect example of that.

PB: We hear you're looking for good people – and are willing to poach?

BGS: That was our marketing team saying we're expanding our team and using humor to draw attention. We have never actually had to engage in any poaching. We've found that by being true to our values as a team and remaining genuine, persons with a shared mindset tend to seek us out. We've had many great new members join our team this year but we're always growing so there's always

room for more. You just need to be honest, hardworking, passionate, forward-thinking, and a team player. That's not so much to ask for what we offer in return. Contact IDEAL.

PB: What else do you want our readers to know about IDEAL?

BGS: Outside of our stock items, we routinely fabricate custom deep foundation solutions, including the associated brackets and load transfer devices. So, if you're having trouble finding what you need, just give us a call. We will design the perfect bracket for your unique project requirements. What else.. We manufacture in the USA. We're kind, honest, and happy people who love what we do. If you haven't worked with the IDEAL team yet, give us a try. We won't disappoint. ■

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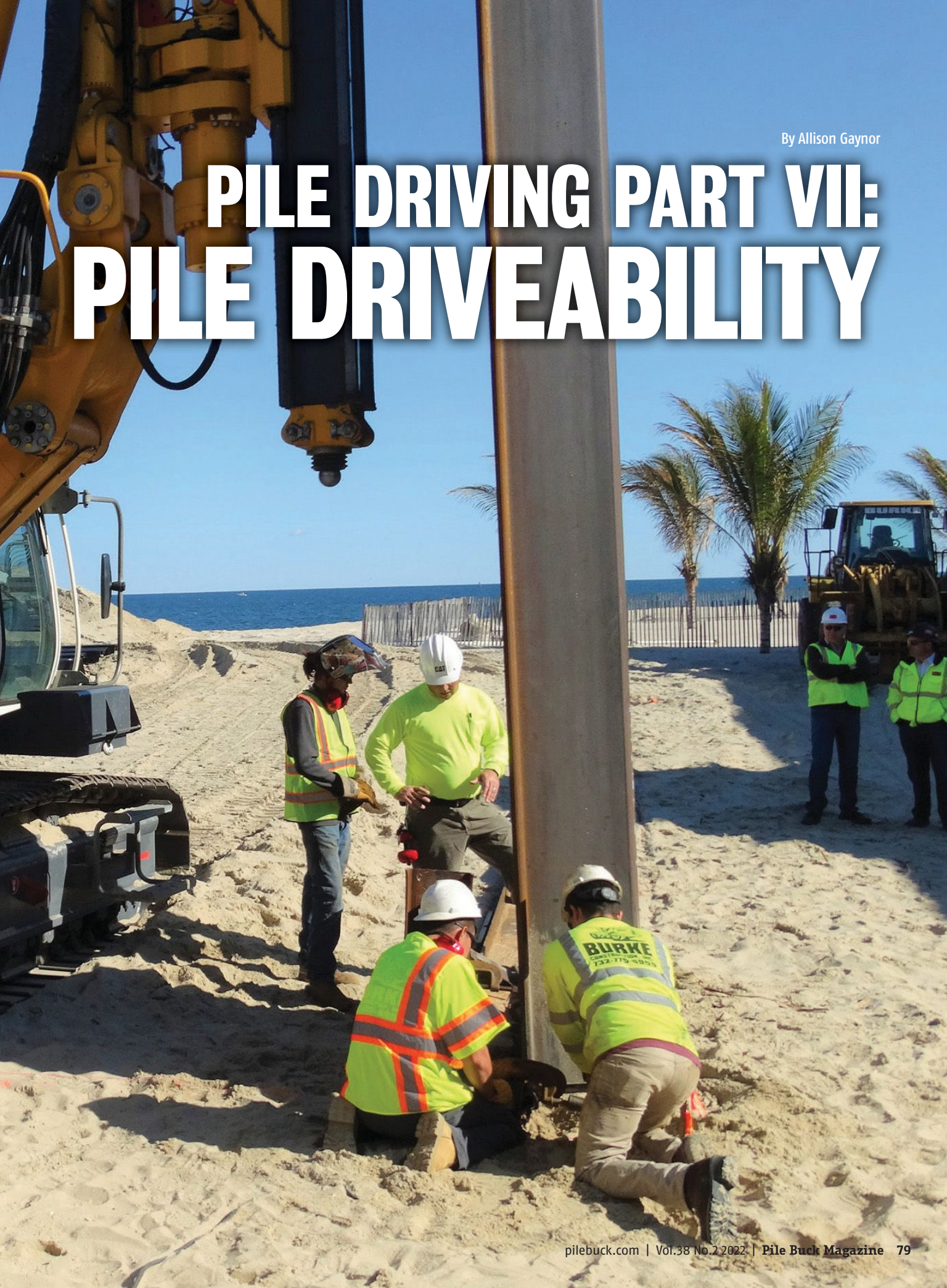


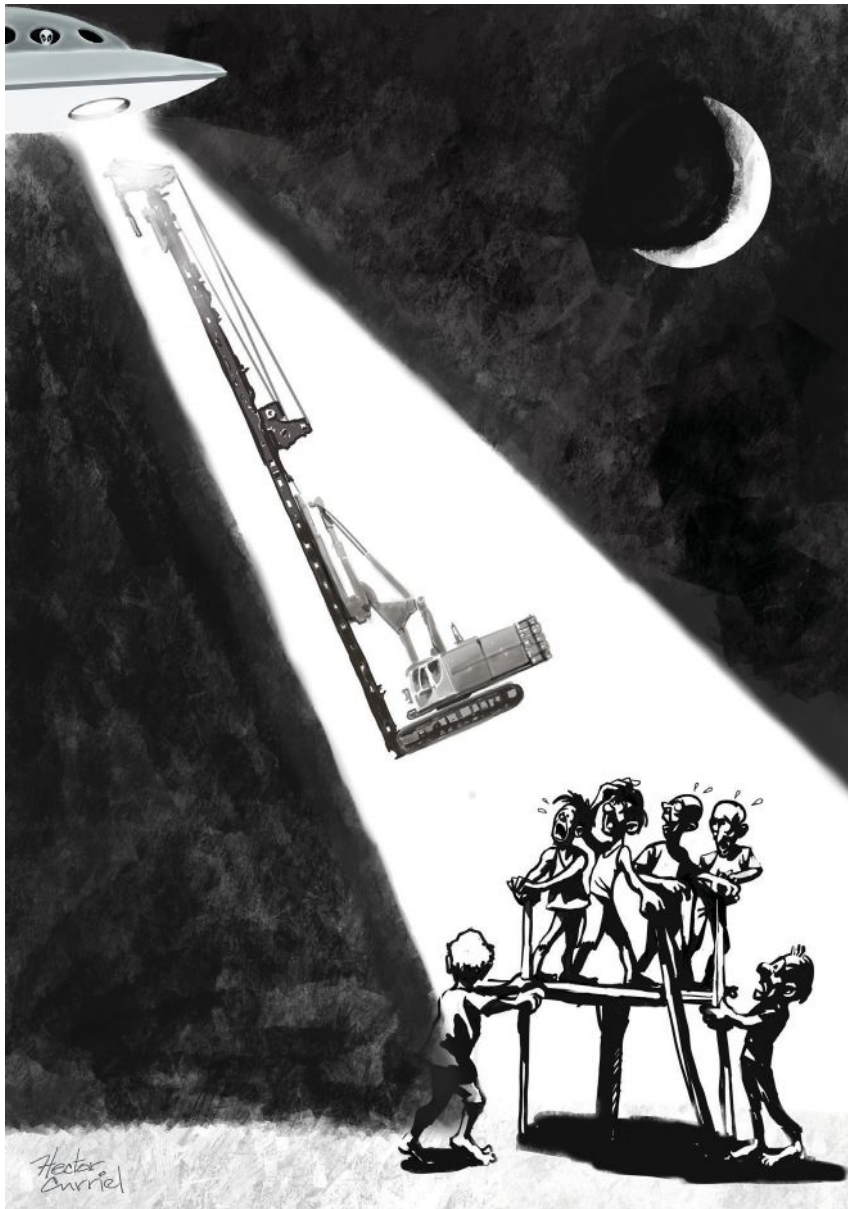


Burke Construction rented an RTG RG 19 T Pile Driver equipped with an MRV 150 AVM Silent Vibro from Equipment Corporation of America (ECA) in September 2019 to install a seawall in Point Pleasant Beach, N.J. Photo credit: Brian M. Fraley, Fraley Construction Marketing.

By Allison Gaynor

PILE DRIVING PART VII: PILE DRIVEABILITY





DYNAMIC ANALYSIS

Piles penetrate the ground by dynamic means such as impact or vibration. Obtaining a successful pile foundation, which meets the design objectives, depends largely on relating the static analysis results presented on the plans to the dynamic methods of field installation. Dynamic analysis can provide answers to the following site-specific questions:

1. Can a given pile be driven to the estimated depth and capacity with a specific hammer?

2. If so, what will be the set (deflection) in the final blows and what will be the maximum stress experienced by the pile?

If driving cannot be accomplished as specified in (1), what hammer characteristics are needed to successfully complete the project with the pre-selected pile? Alternatively, what other pile of the same length can, perhaps, be driven with the hammer first considered?

To answer these and other questions that may appear in connection with a particular piling project, rational

analysis based on the hammer-cushion-pile-soil system (dynamic analysis) is useful. Dynamic analysis should be performed during both the design and construction stages of a project.

PILE DRIVEABILITY

The limiting pile drivability for a specific pile-soil situation is the maximum soil resistance to which a pile can be driven without damage. The soil resistance developed is a function of the pile dimensions and the subsurface profile. An exception to this maximum is a pile penetrating very soft soil to bear



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FACTORS AFFECTING DRIVEABILITY

To perform successfully, a pile must satisfy two aspects of drivability: (1) the pile must have sufficient stiffness to transmit driving forces large enough to overcome soil resistance, and (2) the pile must have sufficient strength to withstand the driving forces without damage. For a given soil condition and pile length, the strength and stiffness of a pile determine its drivability.

It is important to recognize that even if the static structural and static soil capacities allow an increase in pile stresses, it may not be possible to develop the increased pile loads because the resulting driving stresses would exceed allowable pile driving stress limits.

The limitations on maximum allowable static design stresses in pile materials by various codes generally represent the static stress levels (static load capacity), which can be consistently developed with common driving equipment and methods.

METHODS FOR DETERMINING DRIVEABILITY

There are three available methods for evaluating drivability:

STATIC LOAD TESTS

Static Load tests are useful for checking drivability prior to production pile driving. Test piles are normally driven to pre-determined lengths and load tested. Load tests can be performed during design and/or construction stages.

WAVE EQUATION ANALYSIS

This method accounts for pile stiffness and predicts driving stresses as well as the relationship of hammer blow count versus ultimate pile capacity. It can be used to check drivability in advance of driving, to design the most economical pile wall thickness or pile section, and to select driving equipment.

Keller North America used an RTG RG 19 T Piling Rig to install 40-foot sheet piles for SOE in Somerville, Mass. Photo credit: Equipment Corporation of America (ECA).





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Concrete pile installation for the 148,000 sf St. Pete Pier, which was supported on more than 400 concrete piles. Photo credit: i+iconUSA.



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DYNAMIC MEASUREMENTS

These measurements and their analysis can be used to measure the driving stresses and static bearing capacity of piles during driving. It can also provide static soil resistance distribution and damping parameters for a wave equation analysis. Hammer and driving systems performance can also be evaluated from the measurements.

DRIVEABILITY AND PILE TYPE

Drivability should be a consideration in the design of all driven piles. It is particularly critical in the case of cast-in-place concrete filled pipe piles, wherein only the stiffness of the steel casing is available at the time of driving.

Single-material solid-section piles such as steel H, precast concrete, and timber are subject to drivability limitations, particularly as allowable design stresses increase. In the case of long prestressed concrete piles, drivability is

normally limited by the pile's compressive strength, but tensile strength will be critical in the early driving condition where large hammer energies may be imbalanced to the small soil resistance.

MECHANICAL EFFICIENCY

Mechanical losses are inevitable in any type of machinery. In pile driving equipment, they can be due to frictional losses between the moving (ram) and stationary (frame) parts, losses due to back-pressure in the valving of air/steam and hydraulic hammers or the exhaust ports of diesel hammers, and other sources. These are a function of both the design of the equipment and the way in which it is maintained.

NET STRIKING ENERGIES

A recommended way to evaluate hammers based on their impact energies is to compare their net striking energies rather

than their efficiency. Of course there are other factors to consider, such as the relationship of the (effective) stroke to the ram weight, type and size of cushion material and the effects of the necessary compression in diesel hammers. Wave equation analyses are usually based on rated striking energy times an efficiency, which yields a net striking energy.

BATTER PILES

Another factor in the reduction of output energy occurs when driving batter piles. This is generally considered an "efficiency" factor but strictly speaking is not. It comes from the geometry of the hammer relative to the gravity field and is most pronounced with single-acting hammers.

HAMMER SIZE SELECTION

It is important that the contractor and the engineer choose the proper hammer



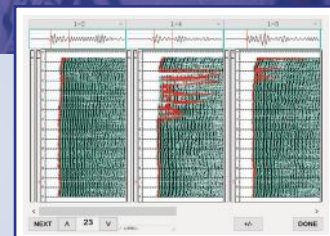
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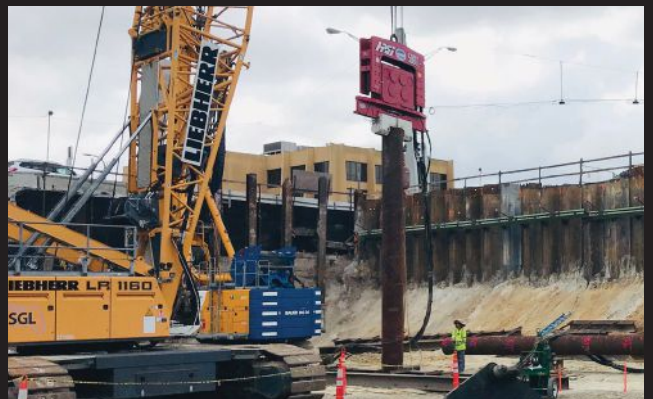
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for efficient use on a given project. A hammer that is too small may not be able to drive the pile to the required capacity or may require an excessive number of blows. On the other hand, a hammer that is too large may damage the pile. A wave equation analysis, which considers the hammer cushion-pile-soil system, is the recommended method to determine the optimum hammer size.

DYNAMIC ANALYSIS BY THE WAVE EQUATION

The wave equation analysis is now the standard method of predicting drivability in anticipation of pile driving. It is used to obtain the following information for a single blow of the hammer:

- To predict the driving stresses induced in the pile.
- To determine the resulting motion of the pile during the impact.
- To determine the resistance to penetration afforded by the soil at the time of driving.
- To estimate the transferred energy delivered to the pile top.

This information then enables the engineer to answer such questions as:

- Can a given hammer drive the pile to the required depth?
- What rate of penetration will the hammer provide, i.e., how long will it take to install the pile?
- To what maximum penetration can the pile be driven?
- What is the maximum soil resistance to penetration that the hammer can overcome?
- Will excessive stresses be generated in the pile or hammer during driving?

WAVE EQUATION AND DESIGN

The wave equation is also often used as an aid in design. For example, it is commonly used:

- To indicate the blow count required for penetration of the pile afforded by an estimated soil resistance at the time of driving.
- To optimize the cushion, i.e., to determine which cushion will effectively limit the driving stresses induced in the hammer and pile, and yet will

Extreme Marine Construction drove wooden piles with an excavator-mounted Pile Master air hammer. Photo credit: Equipment Corporation of America (ECA).



still produce the maximum possible permanent pile set per blow of the hammer.

- To determine the correct size of the driving hammer. This reduces the chance of selecting a very large and expensive hammer whose capacity is not needed and whose use would cause pile damage. The more unfortunate situation is selecting a small hammer whose driving capacity is found to be inadequate to drive the pile to the required resistance or depth.
- To determine the influence of the driving accessories. It has been

shown that in many cases the driving accessories absorb a major portion of the total energy output of the hammer. In some cases, these accessories account for a 50% reduction in the energy output of the hammer. The use of the wave equation enables the selection of optimum driving accessories required to minimize these losses.

The wave equation is also a powerful engineering aid for the foundation designer since numerous alternative designs can be quickly studied at very little expense. Such a study greatly increases



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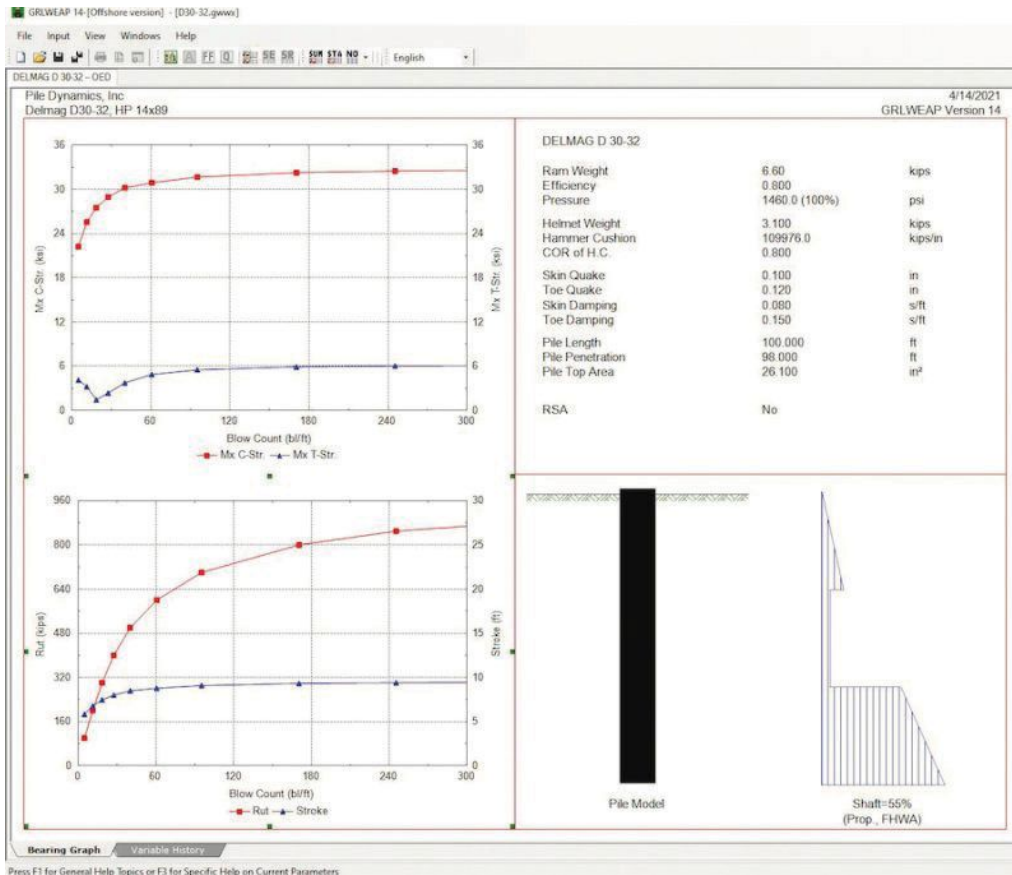
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GRLWEAP14 Wave Equation Analysis is a one-dimensional software program which models the pile driving process, simulating the motions and forces in a pile's foundation while installation with an impact or vibratory hammer. Following entry of a soil strength with depth profile, a drivability analysis calculates capacity, blow counts and driving stresses with depth, allowing recommendations on cushion stiffness, hammer stroke and other driving system parameters that optimize blow counts and pile stresses during pile driving.

the probability that the final design will be economical and that installation problems will be minimized.

HAMMER SELECTION: VIBRATORY HAMMERS

High installation rates can be achieved with vibratory hammers under certain conditions. This makes them attractive for installing piles. Toe resistance of the pile is a major consideration in the selection of the vibratory hammer. Using a vibratory hammer is particularly successful with piles that have small toe areas, such as sheet and H-piles. However, soil type should also be a key consideration, as follows:

- **Loose, wet, granular soils (including gravels):** Vibratory hammers are extremely effective in this type of soil.
- **Soft and low plasticity clays:** Vibratory hammers generally work well.

- **High plasticity clays, hardpan, and decomposed rock:** Vibratory hammers perform poorly in these types of soil because of their limited “chopping” effect (as compared to an impact hammer). If use of a vibratory hammer is desired in such soils, a heavier model with a large amplitude of oscillation should be specified.

VIBRATORY HAMMER SIZE

Soil conditions have a greater effect on the size requirement for the vibratory hammer than pile length. Examine the boring logs — if the material is loose or medium coarse sand with some moisture, driving should be easy, and a smaller vibratory hammer is required. On the other hand, if the material is very stiff or hard clay, driving will usually be difficult. Clay doesn't necessarily mean that a vibratory hammer will

be effective. Where there is sufficient moisture content, plasticity is low, and the vibratory hammer is large enough. Here amplitude is important; a very satisfactory result can be achieved with a vibratory driver.

CONCLUSION

Many successful pile contractors use the wave equation analysis to check and improve upon an engineer's pile design, for preparing bids, to avoid construction problems and to select the most appropriate pile hammer for the given project conditions. To achieve economical pile design, the engineer must match soil resistance, pile stiffness, pile strength and driving equipment. Failure to correctly understand the important physical concepts often results in project delays, claims, and additional costs. ■

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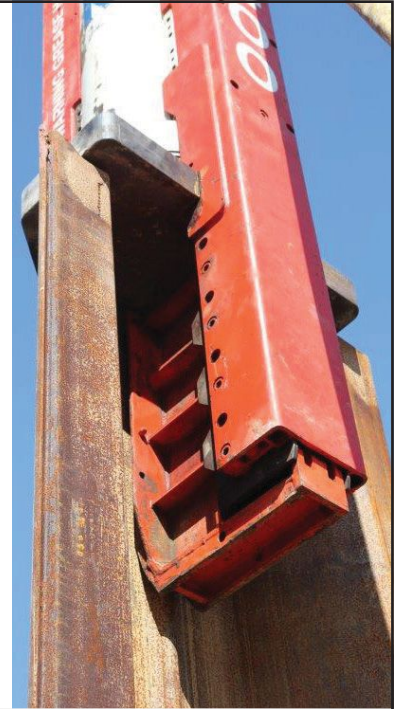
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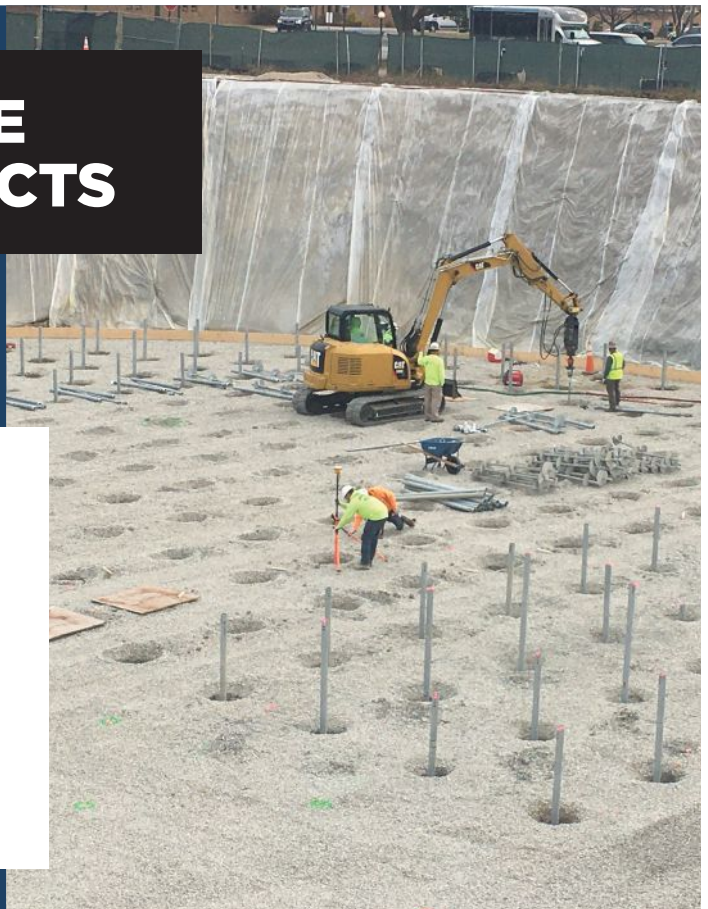
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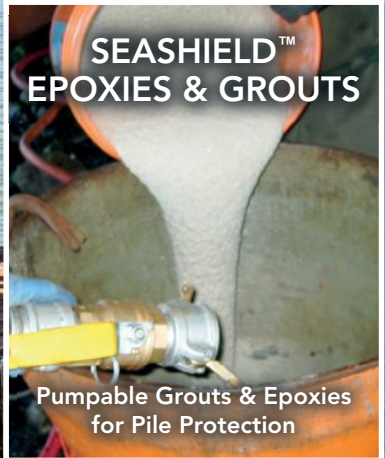
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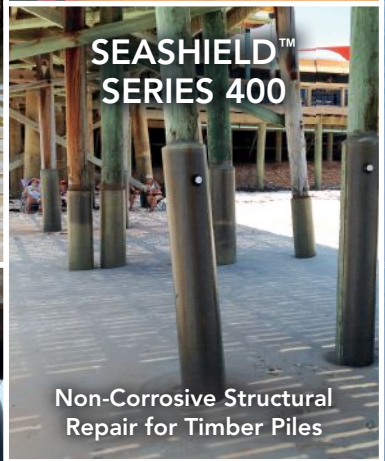
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Venice, Italy – A maintenance barge carrying a supply of wooden pilings moves along a canal in central Venice.

When it comes to marine construction applications, barges and floating equipment are used on a regular basis. This floating equipment may include heavy equipment like cranes and pile driving rigs, as well as materials such as steel and timber.

And when it comes to the United States Coast Guard (USCG), waterborne vessels and their “floating equipment inspection and certification,” is quite specific. The following is a collection of some of their most crucial guidelines.





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USCG GUIDELINES FOR FLOATING EQUIPMENT

All floating equipment regulated by the USCG should have required USCG documentation that is current before being placed in service. A copy of the report should be posted in a public area on board the vessel. A copy of any USCG Form issued to the vessel in the preceding year should also be kept on board the vessel.

All barges, quarter boats and/or workboats or skiffs not

subject to USCG inspection and certification or not having a current ABS classification should be inspected in the working mode annually by a marine surveyor accredited by the National Association of Marine Surveyors (NAMS) or the Society of Accredited Marine Surveyors (SAMS). These surveyors should have at least 5 years' experience in commercial marine plant and equipment inspection.

All other floating equipment should be inspected before being placed in use and at least annually by a qualified person.

ALL FLOATING EQUIPMENT REGULATED BY THE USCG SHOULD HAVE REQUIRED USCG DOCUMENTATION THAT IS CURRENT BEFORE BEING PLACED IN SERVICE. A COPY OF THE REPORT SHOULD BE POSTED IN A PUBLIC AREA ON BOARD THE VESSEL.

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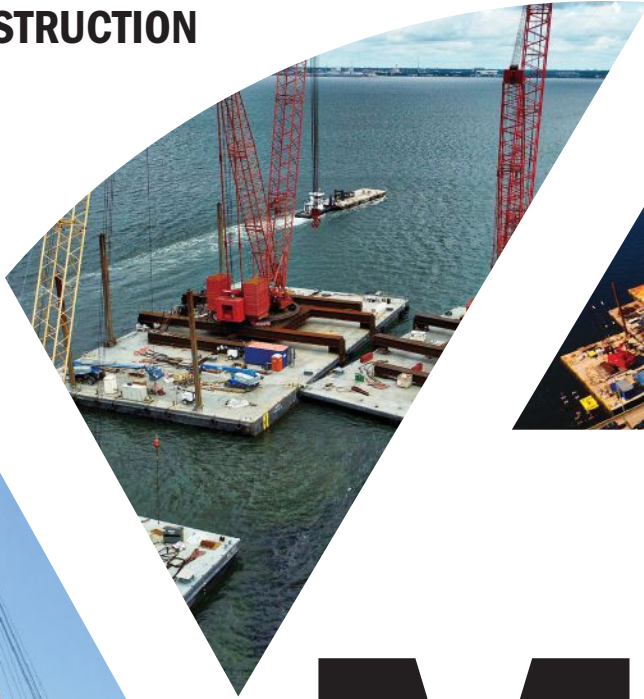


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Vancouver, Canada – A barge is beached after a storm from the previous evening. Photo credit: Tomas Frank.



Any inspection should be documented, a copy of the most recent inspection report should be posted in a public area on board the vessel, and a copy should be available in the event an on board inspection is made.

Any inspection should be appropriate for the intended use of the equipment being inspected, as a minimum, evaluate structural condition.

Records of inspections should be maintained at the site and be available to any on board inspection or inspector.

Any floating equipment or vessels found in an unsafe

condition should be taken out of service and its use prohibited until unsafe conditions have been corrected.

Any captain should be in possession of a current, valid USCG license, which shall be posted in a public area on board the vessel, or correctly endorsed document as required by the USCG.

SEVERE WEATHER PRECAUTIONS

When barges or floating equipment may be endangered by severe weather (including sudden and locally severe weather,

ANY FLOATING EQUIPMENT OR VESSELS FOUND IN AN UNSAFE CONDITION SHOULD BE TAKEN OUT OF SERVICE AND ITS USE PROHIBITED UNTIL UNSAFE CONDITIONS HAVE BEEN CORRECTED.



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WHEN BARGES OR FLOATING EQUIPMENT MAY BE ENDANGERED BY SEVERE WEATHER (INCLUDING SUDDEN AND LOCALLY SEVERE WEATHER, STORMS, HIGH WINDS, HURRICANES, AND FLOODS) PLANS SHOULD BE MADE FOR REMOVING OR SECURING ALL VESSELS AND THE EVACUATION OF PERSONNEL IN EMERGENCIES.

storms, high winds, hurricanes, and floods) plans should be made for removing or securing all vessels and the evacuation of personnel in emergencies.

Any in place “plan” should include:

- A description of the types of severe weather hazards any vessel or equipment may potentially be exposed to and the steps that will be taken to guard against the hazards;
- The time frame for implementing the plan (using as a reference the number of hours remaining for the storm to reach the work site if it continues at the predicted speed and direction), including the estimated time to move the barge/vessel to safe harbor after movement is started;
- The name and location of the safe location(s);
- The name of the vessel(s), type, capacity, speed, and availability that will be used to move any non-self-propelled equipment;

- River/tide gage readings at which floating equipment must be moved away from bridge piling, fender systems, dams, river structures, to safe areas. ■

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COVER STORY

By Pile Buck & NEXUS Commercial Finance

FINANCING SURVIVAL GUIDE FOR HEAVY CIVIL AND MARINE CONTRACTORS



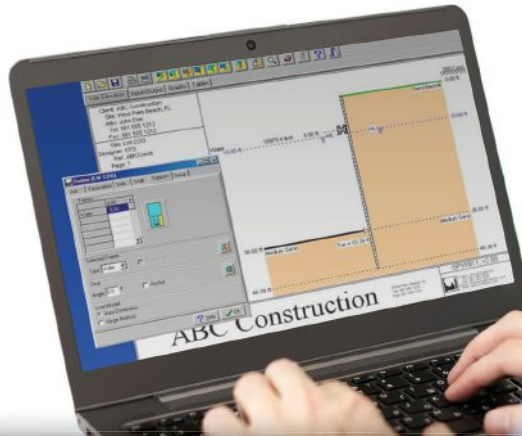


Whether you're pile driving, drilling, dredging — or whatever service you offer — it's going to cost you time, manpower, equipment, and materials. As most of you already know, none of these come cheap, especially these days with material and labor shortages, as well as a likely recession on the horizon.

What can you do about it?

The good news is that there are many options available for financing that equipment you need for the job. In this article, we're going to break down exactly what these options are and how they can benefit you. >>

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RECESSION CONCERNS

It's clear that a recession is likely to happen in the near future, and some may argue that the wheels are already in motion — that we're already in the early stages of one.

What is a recession?

According to Forbes, "a recession is a significant decline in economic activity that lasts for months or even years. Experts declare a recession when a nation's economy experiences negative gross domestic product (GDP), rising levels of unemployment, falling retail sales, and contracting measures of income and manufacturing for an

extended period of time. Recessions are considered an unavoidable part of the business cycle — or the regular cadence of expansion and contraction that occurs in a nation's economy."

In other words, people lose work, businesses make fewer sales, and the economy struggles.

What triggers a recession? Recessions are typically caused by excessive debt and/or too much inflation.

How long does a recession last? According to the National Bureau of Economic Research, from 1945 to 2009, the average recession lasted 11 months.

Although it's almost impossible to predict a recession or economic

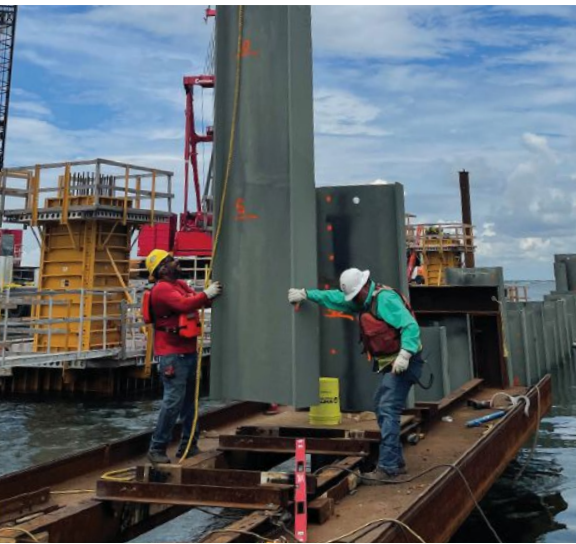
downturn of any kind, understanding the financing options available is crucial for success as a contractor.

REASONS TO FINANCE

Whether our country is officially in a recession or not, having capital — and even "cold hard cash" — available is one of the simplest and most effective ways to protect you and your construction business. For that reason, financing equipment is an excellent way to keep funds handy for rainy days or even just the basic operating and overhead costs.

Other reasons to finance your construction equipment includes:

ALTHOUGH IT'S ALMOST IMPOSSIBLE TO PREDICT A RECESSION OR ECONOMIC DOWNTURN OF ANY KIND, UNDERSTANDING THE FINANCING OPTIONS AVAILABLE IS CRUCIAL FOR SUCCESS AS A CONTRACTOR.



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- **Capital conservation:** When capital is preserved by financing or leasing equipment, it can be used for other necessities like payroll and materials.
- **Flexibility:** Unlike other types of financing in other industries, heavy equipment financing tends to be flexible and can be customized for specific business needs.
- **No need for additional collateral:** Most term loans require you to provide collateral that you already own, such as a vehicle. However, this typically isn't the case with an equipment loan. Generally, heavy equipment lenders are satisfied with using the equipment being purchased as collateral.
- **Business cycle consideration:** There are leasing options available that benefit seasonal businesses. These benefits may include a lower monthly payment during the "off season" while projects are not active and revenue is low.

- **Equipment expertise:** Some heavy lenders have close relationships with equipment distributors and manufacturers — and are even equipment experts themselves. This is a great opportunity to get a second opinion before you pull the trigger on a pricey rig.


FINANCING FAQs

Is this your first time acquiring financing for heavy equipment? Even if you've done it before, we would recommend considering these questions before you take action:

- **Can I get a heavy equipment loan with poor credit?** Yes. Many lenders do not require excellent credit if you can provide proof of solid revenue.
- **Can I obtain heavy equipment financing from a bank?** Yes. Even some of the smaller banks offer loans for heavy equipment. However, most banks are pretty strict when it comes to credit scores and proof of revenue.

- **What exactly do I need to qualify?** As mentioned before, qualifying for a heavy equipment loan is generally easier compared to other business loans, because the equipment being purchased is used as collateral.
- **What is considered a "good" credit score?** Generally scores ranging from 580-669 are considered "fair" — 670-739 are considered "good" — 740-799 are considered "very good" — and 800+ are considered "excellent."
- **What are the typical interest rates for a heavy equipment loan?** Interest rates are generally based on your credit score and business revenue, as well as the type of equipment and its condition. Depending on the lender, the average rate ranges between 7.5%-28%.
- **How long does it take to get a heavy equipment loan?** While banks tend to take weeks — even months — most financing companies usually provide the money within weeks — and even days — in some cases.



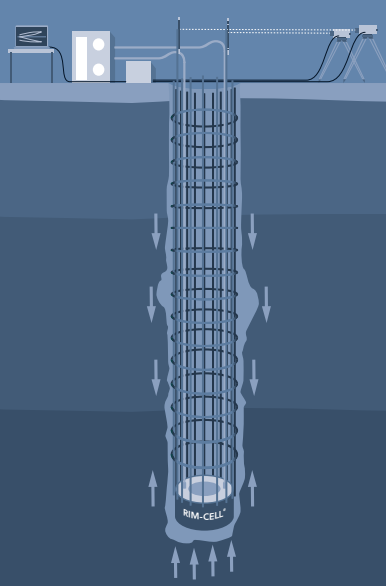


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Offering support and tips to heavy civil and marine contractors, Pile Buck's private Facebook group is comprised of experts from various fields including deep foundations, marine construction, pile driving, foundation drilling, and more.

The mission of this group is to provide an authentic, exclusive environment for contractors to support each other and exchange valuable information — without the inconvenience of misinformation and advertisements.

Click here to join.

(Join now and receive a free directory listing in The Buck annual publication.)

FAQs:

Why is there a cost?

The one-time charge of \$97 is necessary for the following reasons:

- 1) to discourage illegitimate "contractors" from joining and tarnishing the quality of discussion
- 2) to pay marketing costs to promote and grow the group

What are the rules?

This group is for educational purposes only. However, you may suggest a product or service if it is necessary to assist another member. Anyone who SPAMS a product or service will be removed from the group.

How do I access the group?

Once you purchase a membership at the Pile Buck store, we will email you more information.



ALTERNATIVE FINANCE COMPANIES

Looking for alternatives to large lenders and banks? We don't blame you. Although there are some advantages to using banks, alternative finance companies are becoming more-and-more popular for reasons including more attention and personalized relationships, as well as greater leniency with credit scores and business revenue.

One of these alternative finance companies is NEXUS Commercial Finance. Lenders like NEXUS get creative and want to help the smaller and mid-sized

contractors, which is why we sat down with them to help explain all of the options available to contractors right now.

LEASING EQUIPMENT

Leasing a pile hammer or excavator may make sense for deep foundations and marine contractors who are feeling unsure of the market — or future contracts. In some cases, there are tax advantages to leasing over buying. We recommend talking it over with your accountant.

Leasing a piece of equipment means renting it over an extended period of time. (Unlike renting equipment for a

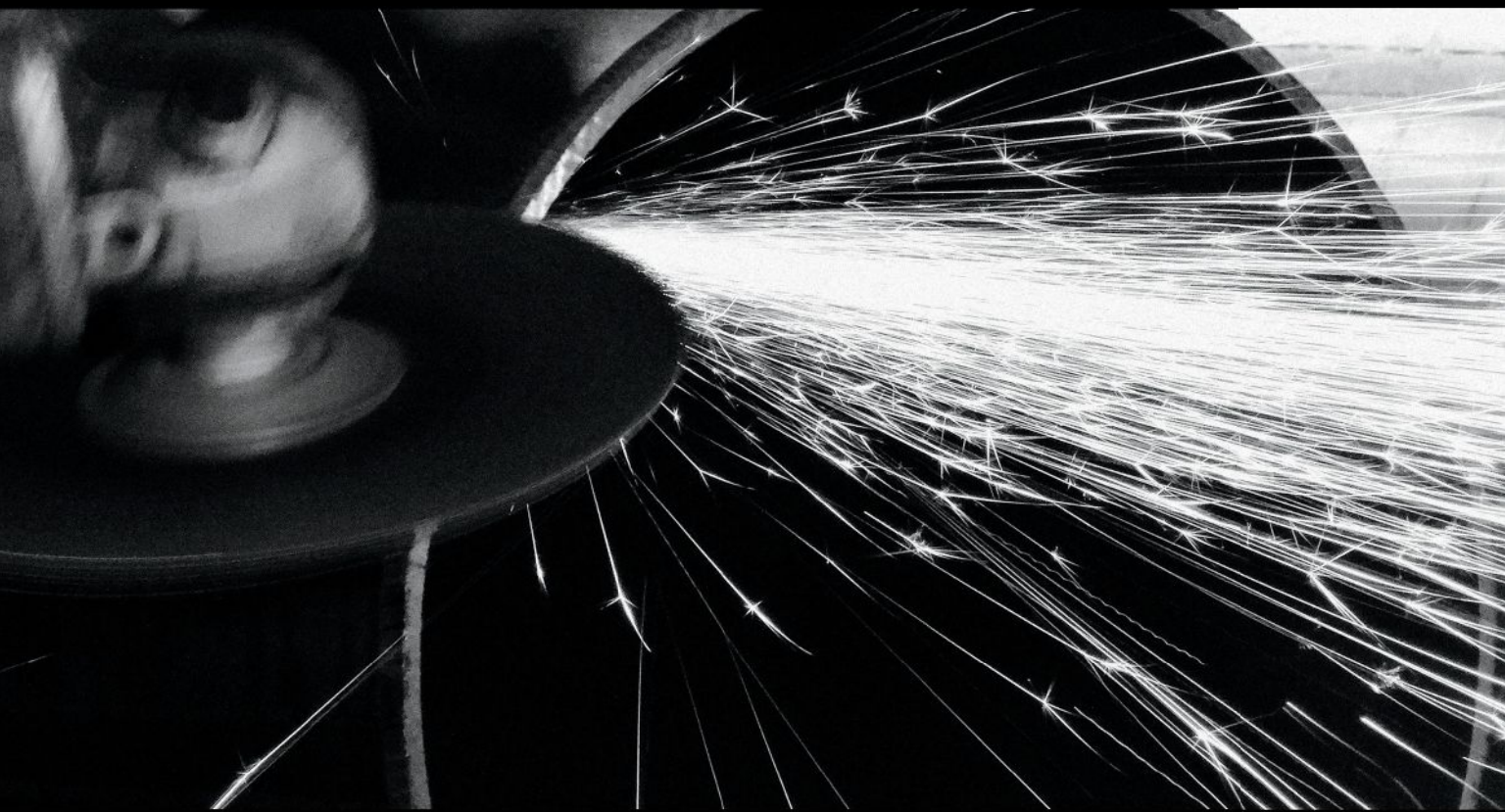
day from your local home improvement store.) At the end of the lease period, you either return the equipment or renew the lease contract. You may also have the option to buy the equipment, known as "lease-to-own." Lease-to-own gives contractors the opportunity to use the equipment before they commit to buying it.

SALES-LEASEBACK

For contractors who are equipment rich and cash poor, sales leaseback may be the answer to your capital needs prayers. Alternative financing

ALTHOUGH THERE ARE SOME ADVANTAGES TO USING BANKS, ALTERNATIVE FINANCE COMPANIES ARE BECOMING MORE-AND-MORE POPULAR FOR REASONS INCLUDING MORE ATTENTION AND PERSONALIZED RELATIONSHIPS, AS WELL AS GREATER LENIENCY WITH CREDIT SCORES AND BUSINESS REVENUE.

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COVER STORY

companies like NEXUS will buy equipment you own outright then lease it back to you. Some construction companies use this type of financing to raise money during a recession when credit is particularly tight.

Let's say you have a spud barge with a current market value of \$500,000. You would sell it to a financing company for a lump sum of cash. They would lease it back to you for some period of time. Now you are in an equipment lease. The only difference is that you were the one who owned the equipment to start with. At the end of the lease you can just return

the equipment or renew the lease. If you've set the contract up as a lease-to-own, you will own the spud barge again at the end of the lease term.

CUSTOM SALES-LEASEBACK CONTRACT

There are several variables to consider in a leaseback contract — there isn't a "standard" contract in most situations. The lump sum you receive for the equipment is typically 50-100% of its current market value. The length of the contract, lease-to-own terms, and type of lease (operating or capital) are all negotiable. A capital lease shows up as

a loan on your books; an operating lease does not. You may structure a capital lease so that you own the equipment again after the lease term. As you can see, the different options can get complex. You do want to have your lawyer review the contract before you sign.

USED EQUIPMENT FINANCING

Buying used equipment can lower costs and allow a contractor to submit more competitive bids. NEXUS advises that they will consider financing used equipment. Each scenario is different — obviously it depends on the type, age, and condition of the equipment.

FOR CONTRACTORS WHO ARE EQUIPMENT RICH AND CASH POOR, SALES LEASEBACK MAY BE THE ANSWER TO YOUR CAPITAL NEEDS PRAYERS. ALTERNATIVE FINANCING COMPANIES LIKE NEXUS WILL BUY EQUIPMENT YOU OWN OUTRIGHT THEN LEASE IT BACK TO YOU.

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PL5-12-210-1	4,500 lb
PL5-12-210-2	4,500 lb
PL8-3-30-1	7,000 lb
M8-3-30-1	8,500 lb
H8-3-30-1	8,500 lb
M8-3-30-2	8,500 lb
H12-3-97-1	12,121 lb
H12-3-97-5	12,121 lb
H12-3-97-7	12,121 lb

Part Description	Base Line Pull
M12-3-97-1	12,121 lb
M12-3-97-7	12,121 lb
H18-3-101-1	18,000 lb
M18-3-101-1	18,000 lb
PL1-12-227-1	1,102 lb
H30-3-207-2	25,000 lb
H30-6-207-2	25,000 lb
M25-3-86-1	25,000 lb
M25-3-86-2	25,000 lb
M25-3-86-3	25,000 lb

Part Description	Base Line Pull
H50-3-207-2	39,610 lb
H50-6-207-2	39,610 lb
M50-3-86-2	39,610 lb
H50-3-86-13	50,000 lb
H50-6-86-13	50,000 lb
H75-7-191-5	85,000 lb
H75-7-191-6	75,000 lb
H75-10-191-6	75,000 lb
H75-10-191-5	85,000 lb

* Plus various Lantec models 540, 542, and 750.
* Spec info subject to change

PULL MASTERTM
Call for current inventory

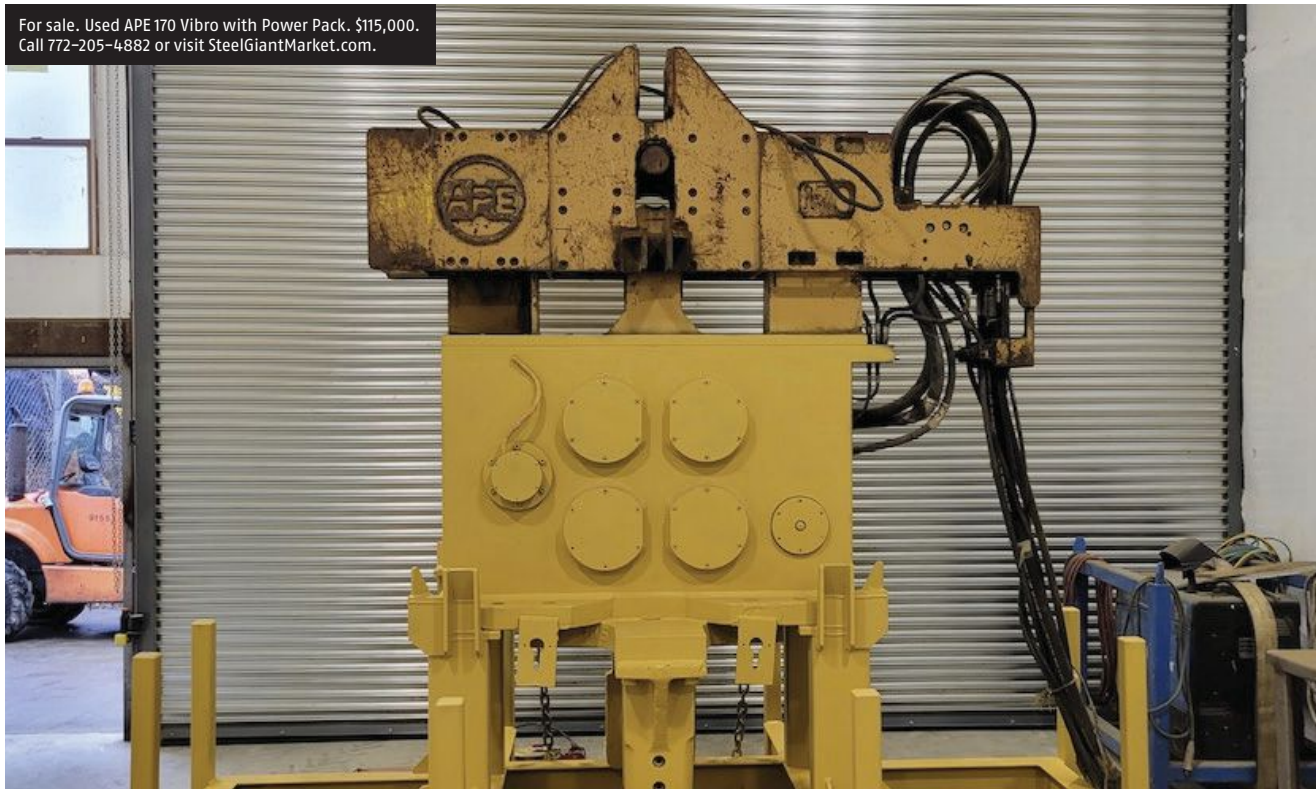
Model: H30-6-207-2
Line Pull: 25,000 lb
Line Speed:
Forward: 140 fpm
Reverse: 651 fpm



Model: H50-6-207-2
Line Pull: 39,610 lb
Line Speed:
Forward: 88 fpm
Reverse: 411 fpm



For sale. Used APE 170 Vibro with Power Pack. \$115,000. Call 772-205-4882 or visit SteelGiantMarket.com.



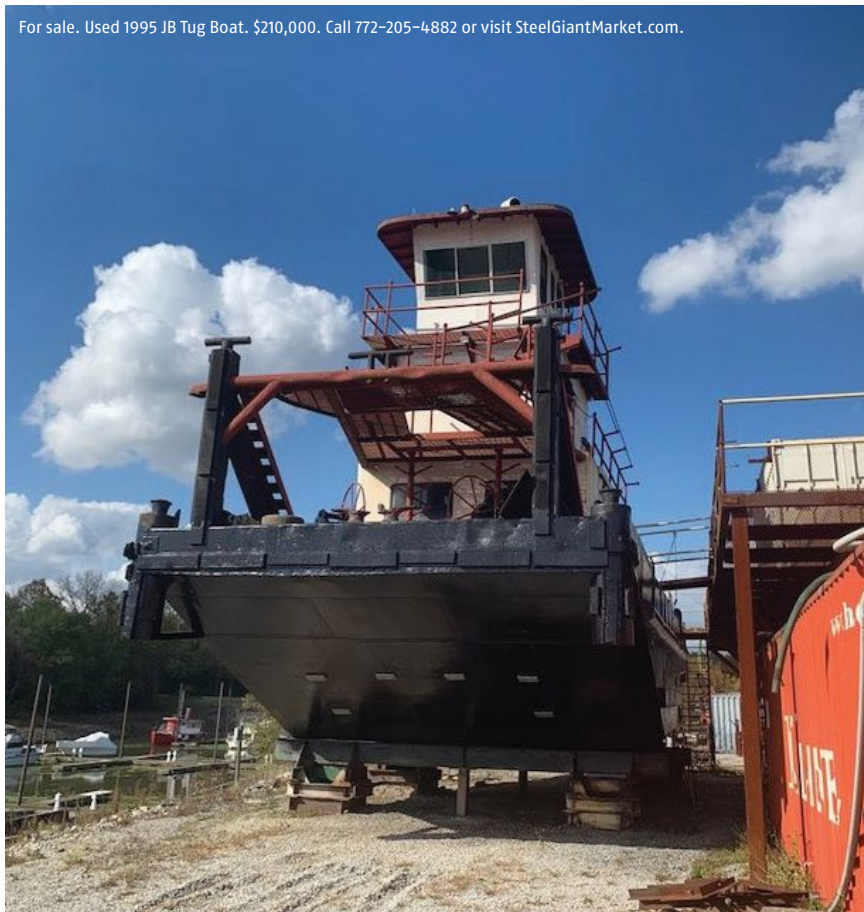
Once you identify the used equipment you want to buy, provide the information to the lender for review. It is typically easier to finance equipment that is under 10 years old. You may also be able to finance a group of construction equipment. The criteria that impacts the interest rate for a used equipment loan include your personal credit and the age / condition of the equipment. How long you have been in business and annual revenue are also considered.

ACCOUNTS RECEIVABLE FINANCING

NEXUS will allow you to borrow against your accounts receivable. Typically, you can borrow at least 80% of the value of your outstanding invoices. In this type of financing, the lender is more interested in your customers. How likely are they to pay? How long will it take for them to pay? Again, it's an assessment of risk — and the interest rate will reflect that.

You must submit your construction company's outstanding invoices and other requested documents to the lender. Based on factors such as

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the type of industry in which you do business and the credit-worthiness of your customers, the lender gives you a percentage of the value of your accounts receivable in a lump sum. For example, if you have \$100K in invoices, they may lend you \$80K — or 80%. The lender charges you a fee, typically weekly, until your customer pays the invoice directly to them. The remaining 20%, or \$20K, of invoices will be paid to you, less the lender's fees.

BLANKET EQUIPMENT LOAN

A blanket equipment loan is a way to consolidate loans for equipment that qualifies for re-finance. This typically helps contractors lower their monthly payments. For example, you may have

purchased a new crane, then a used barge, and then a new pile driving rig. You financed each one and are making three separate payments each month. You can consolidate the three loans under one blanket equipment loan.

A lender will review all or some of your outstanding equipment loans and allow you to borrow enough money to pay them off. You will need to show that you have been paying those loans consistently and on time. Note that the lender will pay off the outstanding loans. You now have one loan. It only makes sense if the new loan substantially lowers your monthly payment. The lender may do this by offering a lower interest rate and / or a longer loan term.

PRE-APPROVALS

NEXUS advises that small contractors can apply for pre-approval as a way to determine costs before (or during) the bidding process. Of course, you want pre-approval to make sure you can obtain financing should you win the bid.

INTEREST RATES

Don't assume that alternative financing companies like NEXUS will always charge higher interest rates. It's true that rates will be higher in some of the more creative financing scenarios. Higher risk — higher rates. But not always. It is worth talking to an alternative lender — even if you can qualify for a traditional loan.

NEXUS ADVISES THAT SMALL CONTRACTORS CAN APPLY FOR PRE-APPROVAL AS A WAY TO DETERMINE COSTS BEFORE (OR DURING) THE BIDDING PROCESS.



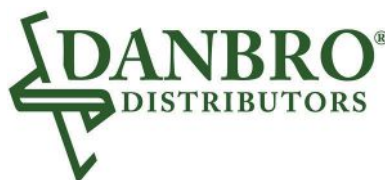
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COVER STORY

NEXUS advises that although clients often turn to them after they've been denied a traditional loan, they may be able to offer low-risk borrowers similar rates to banks. It's always good business to consider all of your financing options.

FINANCING GROWTH

NEXUS tells us that alternative financing is becoming popular for those construction companies who are growing quickly. Newer companies (less than 3 years old) that have very high growth will typically have cash flow issues because they are hiring new employees, expanding their offices, and taking on

more projects. They often have immediate capital needs that traditional lenders can't (or won't) provide.

WORKING CAPITAL

NEXUS and other alternative financing companies can offer customized financing for working capital. You'll need to hire employees, cover overhead expenses, etc. as you're building your construction company. In some cases, having cash available allows you to advance payment to a vendor for a substantial discount. Borrowing money for cash discounts makes sense only when the savings are substantial enough to exceed the borrowing costs.

START-UP FINANCING

Getting financing for a marine or deep foundations construction startup company is challenging. For some, if Aunt Minnie doesn't agree to cough up some cash, their entrepreneurial dreams are dashed. Alternative financing companies like NEXUS will consider funding your startup. You still need a solid business plan. Yes, rates will definitely be higher for a startup. But you'll be free from Aunt Minnie's unwanted business advice.

Have any additional questions? Give NEXUS a call at 408-451-3993. ■

NEXUS AND OTHER ALTERNATIVE FINANCING COMPANIES CAN OFFER CUSTOMIZED FINANCING FOR WORKING CAPITAL. YOU'LL NEED TO HIRE EMPLOYEES, COVER OVERHEAD EXPENSES, ETC. AS YOU'RE BUILDING YOUR CONSTRUCTION COMPANY.



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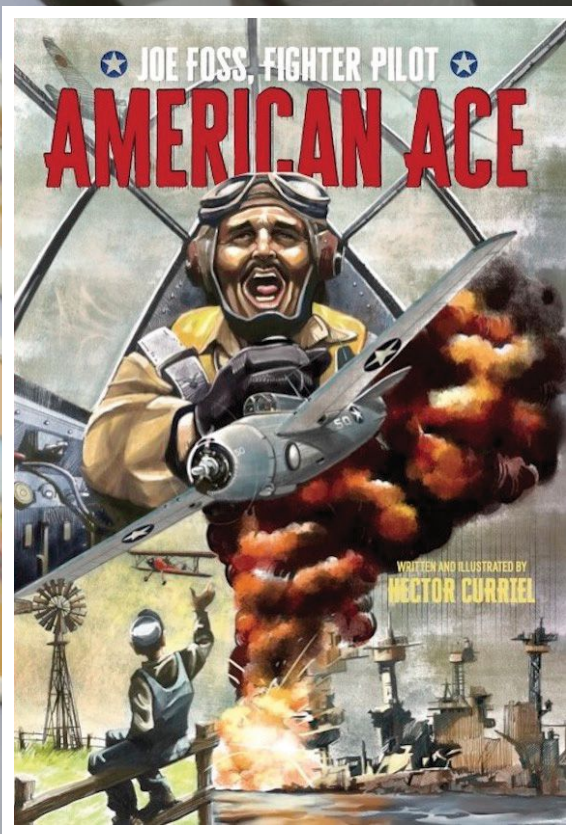
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INDUSTRY NEWS





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Hector Curriel's
AMERICAN ACE –
Joe Foss, Fighter Pilot.
Available April 19, 2022.

SYNOPSIS

In the darkest moments of history is when heroes become known. In 1942 during World War 2, in the Pacific zone, the United States faced one of the most frightening battles against the Japanese Empire for the control of the strategic island of Guadalcanal.

In May 1942, the Japanese started constructing an airfield that would permit its Air Force to pursue its advance in controlling the South Pacific. In that scenario, there was a South Dakota combat pilot, Joe Foss, who stood out as a leader of young pilots who were called "The Cactus Circus." Their mission was to repeal the Japanese's attack from air, sea, and land. With his leadership, the United States was able to control the airfield.

By the end of his service in Guadalcanal, Joe Foss had shot down 26 Japanese planes and obtained the highest record in history for US aviation. He was decorated with a Medal of Honor by President Roosevelt for his bravery and patriotism. After the war, he became the youngest governor of South Dakota. Later as the first football commissioner of the AFL, he helped negotiate what would become the Super Bowl.

But what made it possible for a man like Joe Foss who was born in rural South Dakota and grew up in the middle of the Great Depression to become one of the most extraordinary combat pilots in the US history?

Discover the events that led to his incredible feats and read about the facts of Joe's life in my book. It will captivate you from the beginning to the end! ■

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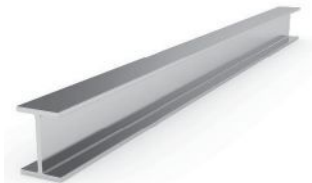
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