PRESS-IN PILING PROJECT ACHIEVEMENTS

in North America

- Drainage Channels
- Seawalls
- Roads, Railroads, and Bridges
- Private Sector
- Emergencies

GIKEN Construction Solutions Company

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PRESS-IN PILING PROJECT ACHIEVEMENTS in North America

Drainage Channels

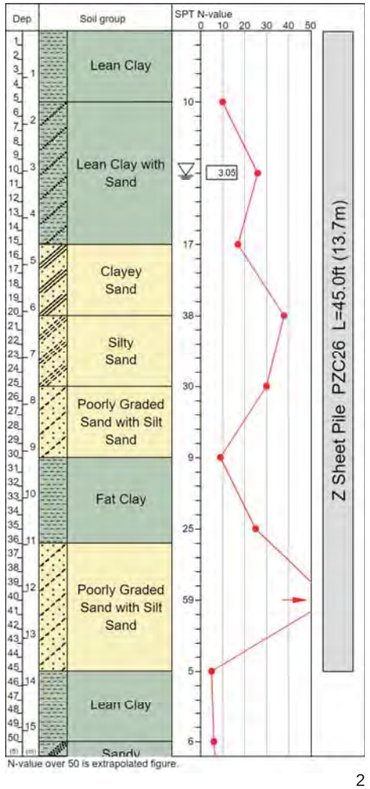
Wintersburg Channel Improvements Phase 2

Under Construction

Before Construction

After Completion

Project Name	East Garden Grove-Wintersburg Channel Improvement Project
Purpose of Project	Flood Protection
Location	Huntington Beach, CA, U.S.A
Employer	County of Orange Public Works Flood Division
Duration	March 2013 to September 2013
Press-in Machinery	SCZ-675WMG & ECO1400S
Pile Section & Length	Z Sheet Pile PZC26, L=45.0 ft (13.7m)
Features & Remarks	The Press-in Method was specified by the Orange County Public Works Flood Division in California to install a double sheet pile floodwall to minimize environmental impacts to the surrounding residential areas. 2-3 Silent Pilers were utilized simultaneously to reduce the duration & operating costs of the project.



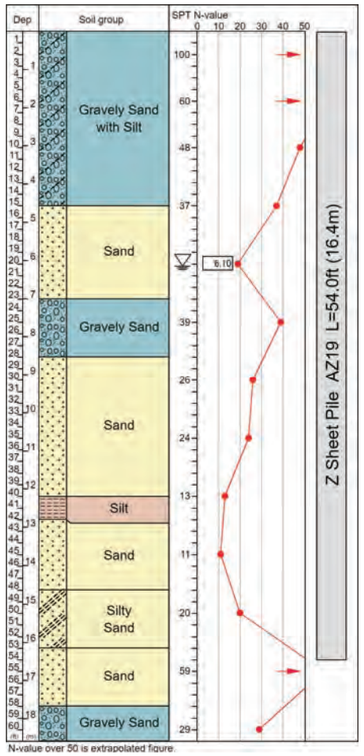
N-value over 50 is extrapolated figure.

Trabuco Creek Levee Protection

Under Construction

Under Construction

After Completion



N-value over 50 is extrapolated figure.

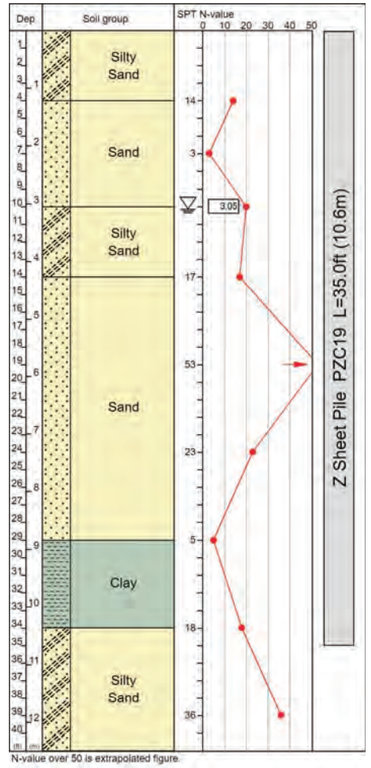
Project Name	Trabuco Creek Channel Levee Protection Phase 7
Purpose of Project	Levee Protection
Location	San Juan Capistrano, CA, U.S.A.
Employer	County of Orange Public Works Department
Duration	September 2013 to October 2014
Press-in Machinery	Silent Piler GV-ECO1400S
Pile Section & Length	Z Sheet Pile AZ25 & AZ19, L=35.0 ft (10.6 m) & 54.0 ft (16.4 m)
Features & Remarks	The Press-in Method was specified by the Orange County Public Works Department in California to install a sheet pile wall in order to effectively minimize the chance of levee breaches due to flooding and erosion. Due to the hard ground conditions along the channel, the Crush Auger System was required to install the sheets within limited space.

J Street Drain Improvement Phase 1

Sheet Pile Installation

Before Construction

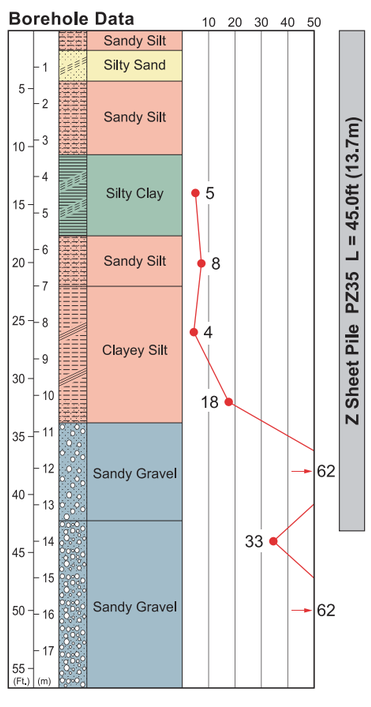
After Completion



N-value over 50 is extrapolated figure.

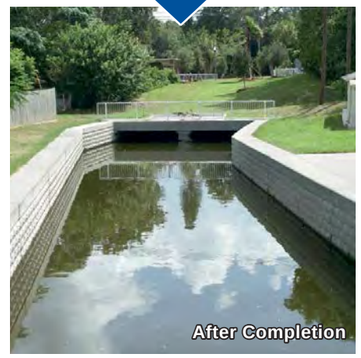
Project Name	J Street Drain Improvement Phase 1
Purpose of Project	Drain Improvement
Location	Oxnard, CA, U.S.A.
Employer	County of Ventura Watershed Protection District Zone 2
Duration	December 2013 to November 2014
Press-in Machinery	Silent Piler GV-ECO1400S
Pile Section & Length	Z Sheet Pile PZC19, L=35.0 ft (10.6 m)
Features & Remarks	The Press-in Method was specified by the City of Ventura Watershed Protection District in California to minimize noise & vibration impacts to adjacent apartments & homes while installing a retaining wall system. An existing sewer line located just 12 inches away from the sheet pile line was another reason for the specification of the Press-in Method.

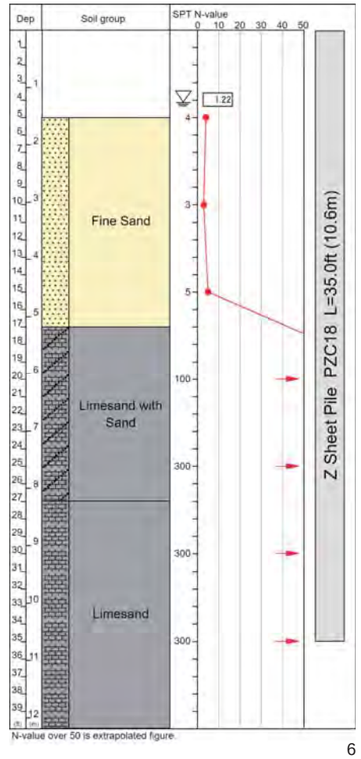
Wintersburg Channel C05 Improvement



Project Name	Wintersburg Channel C05 Improvement
Purpose of Project	Channel Improvements
Location	Huntington Beach, CA, U.S.A.
Employer	County of Orange Public Works Flood Division
Duration	January to February 2008
Press-in Machinery	Super Crush Z Piler SCZ-675WM, 10-ton Clamp Crane, Unit Runner, Pile Runner
Pile Section & Length	Z Sheet Pile PZ35, L=45.0 ft (13.7 m)
Features & Remarks	The GRB system was specified by the owner to install an emergency flood control wall to minimize environmental impact and install the wall as quickly as possible working 24 hours each day.

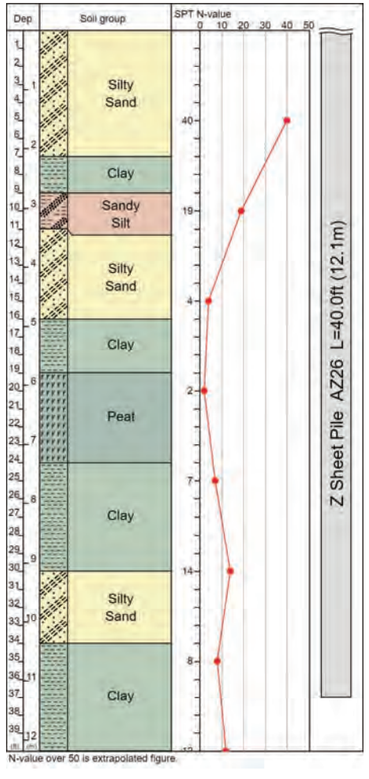
Booker Creek Storm Drainage Improvements





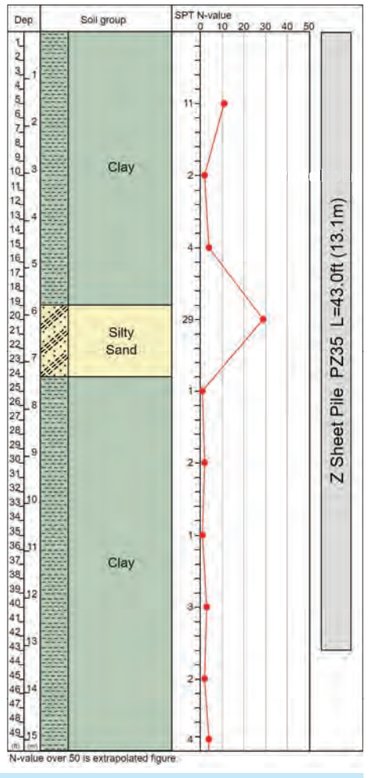
Project Name	Booker Creek Storm Drainage Improvements
Purpose of Project	Road Retaining Wall Improvement
Location	St. Petersburg, Florida, U.S.A.
Employer	City of St Petersburg
Duration	January to February 2007
Press-in Machinery	Super Crush Z Piler SCZ-675WM
Pile Section & Length	Z Sheet Pile PZ35 & PZC18, L=25.0 ft (7.6 m) & 35.0 ft (10.7 m)
Features & Remarks	The owner specified the Super Crush system for this project due to very difficult soil conditions and the close proximity to existing homes. Conventional pile driving equipment could not penetrate into the hard soils.

Secondary Activated Sludge Facility 2 at Plant No.1



Project Name	Secondary Activated Sludge Facility 2 at Plant No.1
Purpose of Project	New Sludge Plant Construction
Location	Fountain Valley, CA, U.S.A.
Employer	County of Orange Public Works Flood Division
Duration	August 2007
Press-in Machinery	Super Crush Z Piler SCZ-675WM
Pile Section & Length	Z Sheet Pile AZ26 L=40.0 ft (12.1m)
Features & Remarks	The Press-in Method was specified by the owner to install a temporary sheet pile shoring system within 12in of an existing 96in force main without any settlement. Previous attempts using conventional shoring systems caused settlement of the force main resulting in costly repairs.

Gardere Canal Improvements

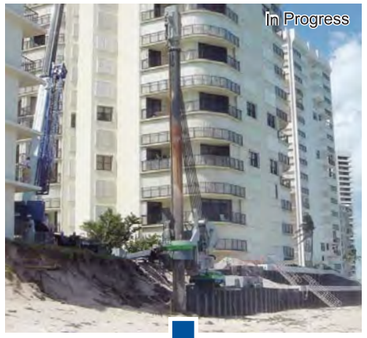


Project Name	Gardere Canal Improvements
Purpose of Project	Canal Improvements
Location	New Orleans, LA, U.S.A.
Employer	US Army Corps of Engineers
Duration	March 2007
Press-in Machinery	Super Crush Z Piler SCZ-675WM (2 Units)
Pile Section & Length	Z Sheet Pile PZ35, L=38.0 ft (11.6 m) & 43.0 ft (13.1 m)
Features & Remarks	The Press-in Method was specified by the US Army Corps of Engineers to minimize disruption to nearby homes and businesses in the community. In addition, the utilization of two Super Crush Z Piler SCZ-675WM Silent Pilers significantly reduced the duration of the pile driving activities that ultimately helped reduce the project duration.

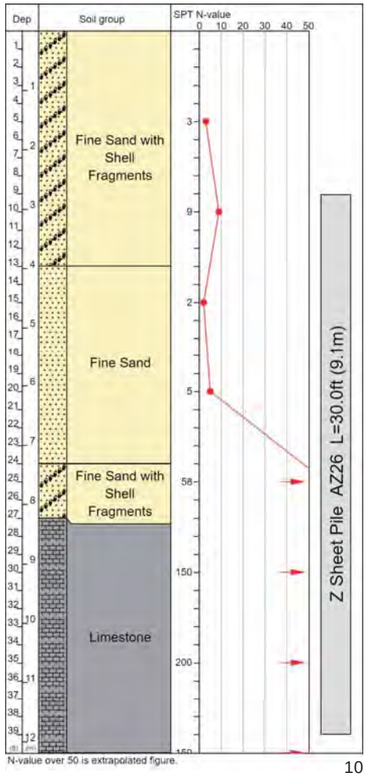
PRESS-IN PILING PROJECT ACHIEVEMENTS in North America

Seawalls

Connemara / Sea Dunes Seawall



Project Name	Connemara / Sea Dunes Seawall
Purpose of Project	Seawall Expansion
Location	Singer Island, FL, U.S.A.
Employer	Sea Dunes Condominium
Duration	September to October 2006
Press-in Machinery	Super Crush Z Piler SCZ-675WM
Pile Section & Length	Z Sheet Pile AZ26, L= 25.0 ft (7.6 m) & 30.0 ft (9.1 m)
Features & Remarks	The Super Crush system was used to install 100% of the design length of sheet pile into dense coquina to create a benched retaining wall system to protect a 15-story condominium from eminent failure due to erosion.



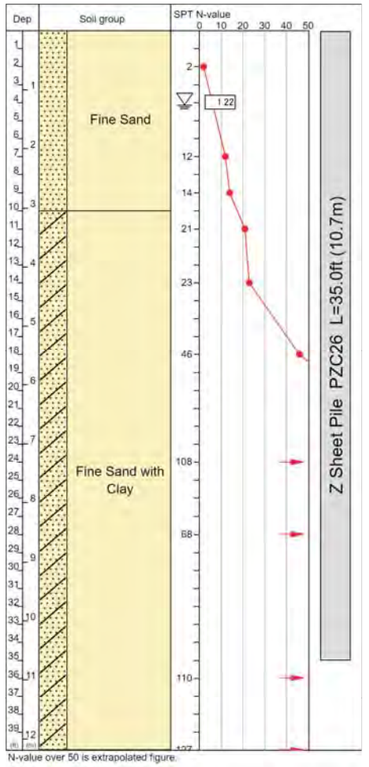
N-value over 50 is extrapolated figure.

Lantana Emergency Seawall

Under Construction

Erosion Damage (Before Construction)

New Seawall (After Completion)



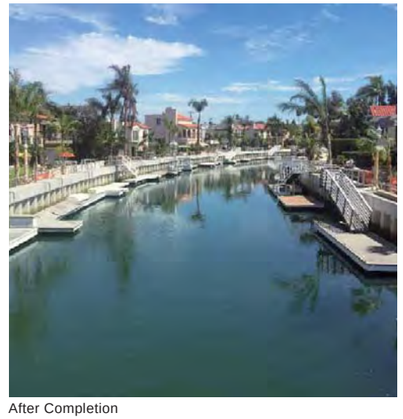
N-value over 50 is extrapolated figure.

Project Name	Lantana Emergency Seawall
Purpose of Project	Erosion Control
Location	Lantana, FL, U.S.A.
Employer	Town of Lantana
Duration	January to February 2009
Press-in Machinery	Silent Piler GV-ECO1400S
Pile Section & Length	Z Sheet Pile PZC26, L=35.0 ft (10.7 m)
Features & Remarks	The Town of Lantana specified the Press-in Method with the Crush Auger System to penetrate into very difficult soil conditions, minimize the risk of settlement of nearby existing structures, and reduce noise & vibration impacts to keep from disturbing restaurant patrons & park visitors.

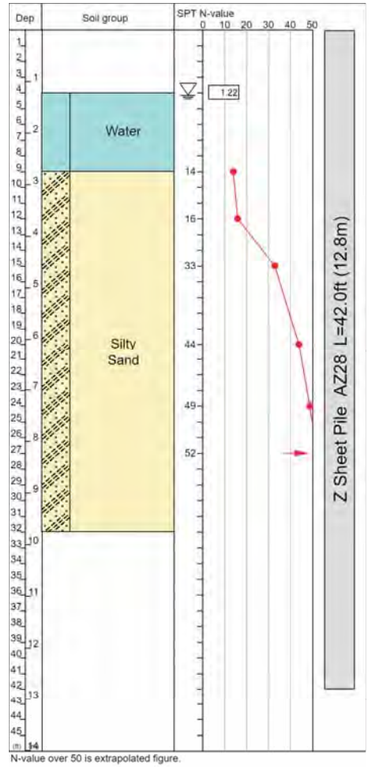
Naples Island Seawall Repair Phase 1

Under Construction

Before Construction



After Completion



N-value over 50 is extrapolated figure.

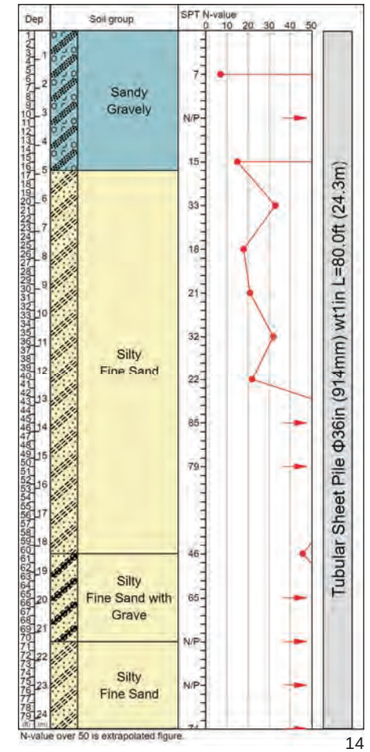
Project Name	Naples Island Permanent Seawall Repair - Phase 1
Purpose of Project	Seawall Repair
Location	Long Beach, CA, U.S.A.
Employer	City of Long Beach Department of Public Works
Duration	January to March 2015
Press-in Machinery	Silent Piler GV-ECO1400S
Pile Section & Length	Z Sheet Pile AZ28, L=42.0 ft (12.8 m)
Features & Remarks	The Press-in Method was specified by the City of Long Beach, CA to minimize noise & vibration impacts to adjacent homes and sensitive existing structures while installing new steel sheet pile flood walls in front of the existing failing walls with the Giken Silent Piler. Concrete capping was applied to the finished sheet pile walls afterwards.

PRESS-IN PILING PROJECT ACHIEVEMENTS in North America

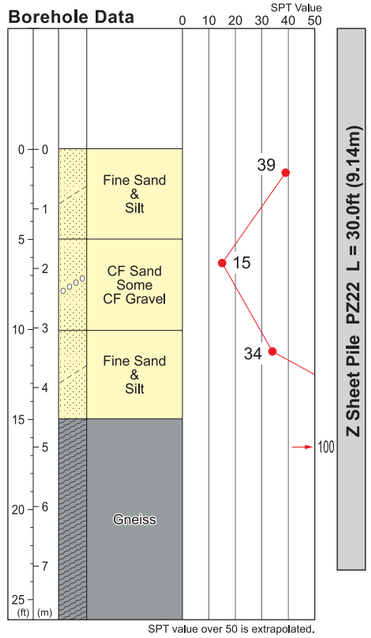
Roads, Railroads, and Bridges

Long Island Expressway Road Retaining Wall

Project Name	Long Island Expressway Road Retaining Wall
Purpose of Project	Road Widening and Bridge Replacement
Location	Queens, NY, U.S.A.
Employer	New York State Department of Transportation
Duration	February to August 2001, January to May 2002
Press-in Machinery	Super Crush Tubular Piler SCP260
Pile Section & Length	Tubular Sheet Pile Φ36 in (914 mm), wt=1 in, L=80.0 ft (24.3 m)
Features & Remarks	Fully cantilevered 35ft wall constructed on steep slope with difficult soil conditions. Compact and mobile machines were required for limited access adjacent to active traffic. Lane closures, temporary staging, and earthwork were not required for piling activities with the Giken system.



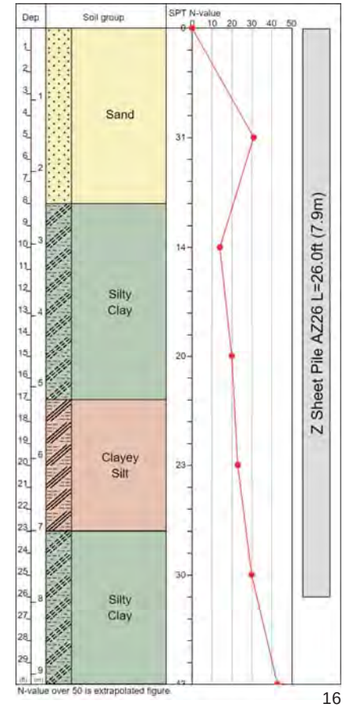
I-495 Washington Capital Beltway



SPT value over 50 is extrapolated.

Project Name	I-495 Washington Capital Beltway
Purpose of Project	Erosion Control
Location	Bethesda, MD, U.S.A.
Employer	State of Maryland Department of Transportation
Duration	December 2004 to May 2005
Press-in Machinery	Super Crush Z Piler SCZ-675SM, 10-ton Clamp Crane
Pile Section & Length	Z Sheet Pile PZ22, L=26.0 ft (7.9 m) & 30.0 ft (9.1 m)
Features & Remarks	Installation of piles adjacent to Beltway without disrupting traffic. Use of the GRB system to penetrate rocky soil in a confined space between the Beltway and a river without damaging existing structures.

CSX and MD450

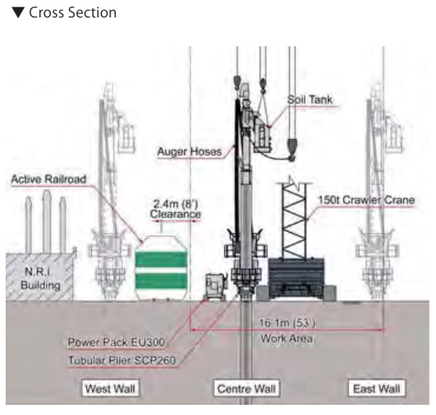


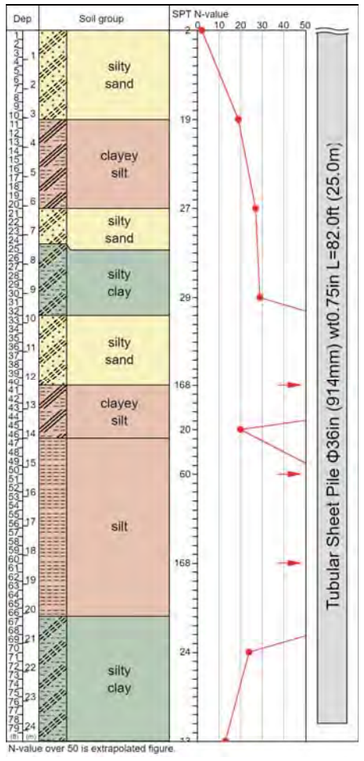
N-value over 50 is extrapolated figure.

Project Name	CSX and MD450
Purpose of Project	Railroad Grade Separation
Location	Bladensburg, MD, U.S.A.
Employer	Balfour Beatty, CSX, State of Maryland Department of Transportation
Duration	June to August 2005
Press-in Machinery	Super Crush Z Piler SCZ-675SM
Pile Section & Length	Z Sheet Pile AZ26 & CZ19, L=26.0 ft (7.9 m)
Features & Remarks	Silent and non-vibratory operation adjacent to historical buildings. Safe and secure operation while maintaining regular rail services.

West Toronto Diamond Grade Separation

▼ Cross Section

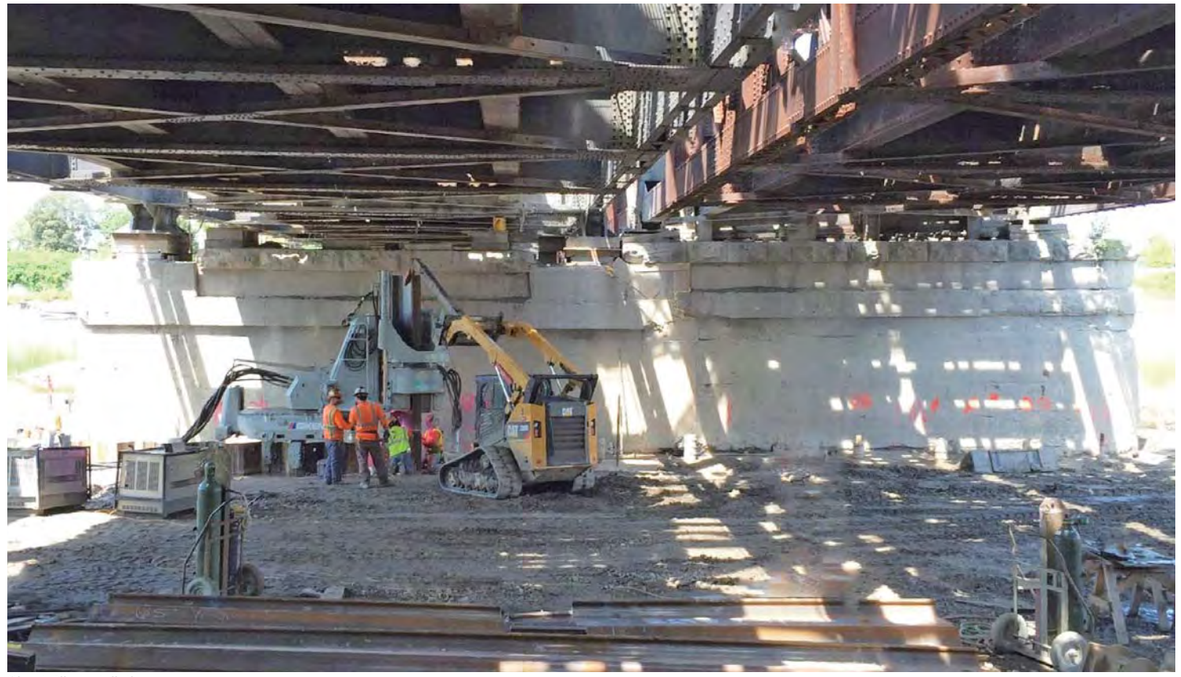




N-value over 50 is extrapolated figure.

Project Name	West Toronto Diamond Grade Separation
Purpose of Project	Construction of Semi-subterranean Subway Rail
Location	Toronto, ON, CANADA
Employer	Go Transit
Duration	September 2009 to September 2010
Press-in Machinery	Tubular Piler SCP260
Pile Section & Length	Tubular Sheet Pile Φ36 in (914 mm), PT Interlock, wt=0.75 in, L=82.0 ft (25.0 m)
Features & Remarks	No negative impact to neighbors and nearby commercial facility. Sheet piling work at the silt layer with gravel with SPT N-value over 160. Safety piling work without disturbing active railway service. Press-in piling carried out 6.5 ft from an existing building.

CSX Bridge Concrete Pier Repair

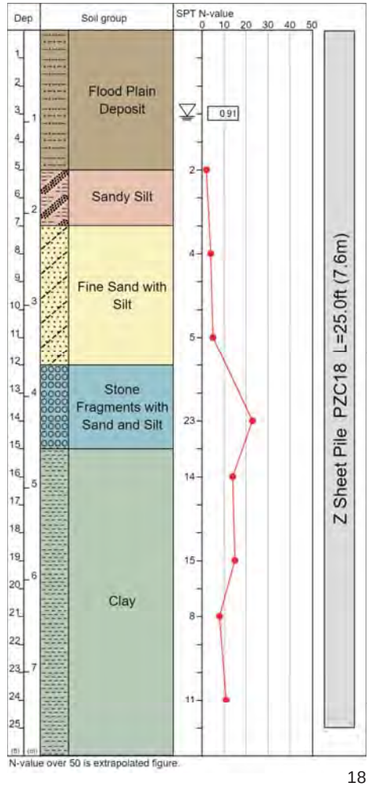


Sheet Pile Installation

Spliced Pile Welding

After Excavation

Project Name	CSX Bridge Concrete Pier Repair
Purpose of Project	Concrete Pier Repair
Location	Columbus, OH, U.S.A.
Employer	CSX
Duration	April to August 2015
Press-in Machinery	SCZ675SMG, UP150
Pile Section & Length	Z Sheet Pile PZ18 & U Sheet Pile SX27, L=25.0 ft (7.6 m)
Features & Remarks	The Press-in Pile Driving Method was utilized for this emergency bridge pier repair on the Scioto River in Columbus, OH since conventional pile driving equipment may have caused more damage to the actively sinking bridge pier. In addition, the smallest Giken Silent Piler in the U.S. was used for this project due to the project's limited vertical clearance. Piling work proceeded on a 24-hour basis due to the Silent Piler's non-vibratory and minimal noise characteristics. The Silent Piler's power pack was able to elude the river's increasing and decreasing water levels during its 24-hour operation since the power pack is remote-controlled and equipped with a crawler.



N-value over 50 is extrapolated figure.

PRESS-IN PILING PROJECT ACHIEVEMENTS in North America

Private Sector

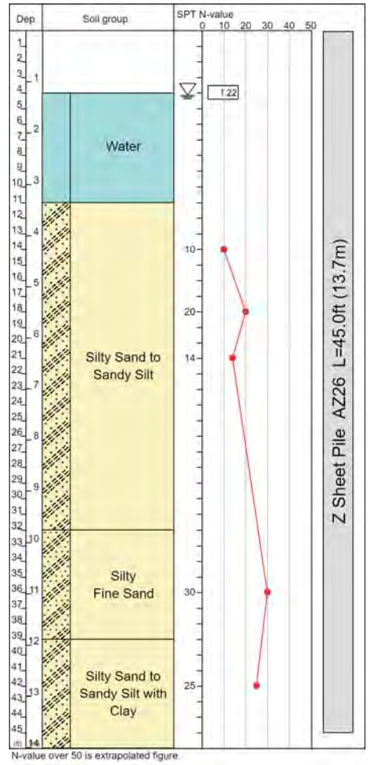
Theme Park Causeway in Orlando

Sheet Pile Installation

Sheet Pile Installation

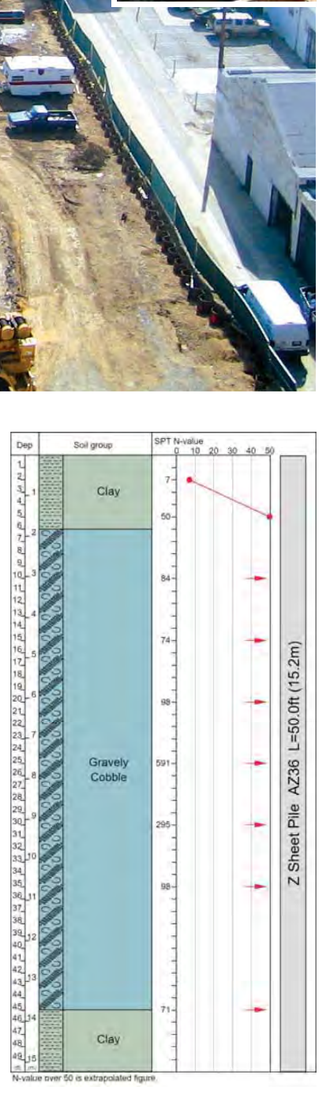
Completion

Project Name	Theme Park Causeway
Purpose of Project	Stormwater Retention
Location	Orlando, FL, U.S.A.
Employer	Theme Park in Orlando, FL
Duration	February to April 2014
Press-in Machinery	Silent Piler GV-ECO1400S
Pile Section & Length	Z Sheet Pile AZ26, L=45.0 ft (13.7 m)
Features & Remarks	The Press-in Method was utilized to install a steel sheet pile cofferdam in Orlando, FL with a Giken Silent Piler press-in pile driver in order to minimize noise & vibration impacts for the theme park visitors. Due to its accurate functions, the Silent Piler was also used to overcome very tight pile line tolerances on the project site since pre-cast concrete panels were to be installed after sheet pile installation was complete. The entire length of this causeway was designed based on a predetermined radius. The pressed-in sheet piles were designed to carry the entire bridge load.



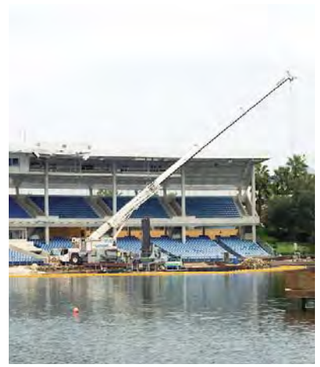
N-value over 50 is extrapolated figure.

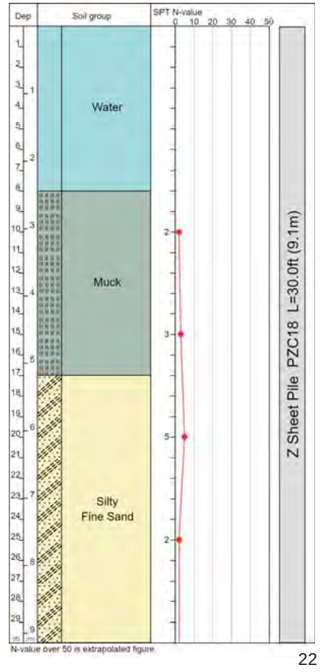
Evo Condominiums Lot 114



Project Name	Evo Condominiums Lot 114
Purpose of Project	Underground Car Parking Structure
Location	Los Angeles, CA, U.S.A.
Employer	Howards Wright Construction Co
Duration	February to April 2006
Press-in Machinery	Super Crush Z Piler SCZ-675SM x 2 units
Pile Section & Length	Z Sheet Pile AZ36, L=50.0 ft (15.2 m)
Features & Remarks	Installation into very dense coarse sand with gravel and cobbles. (Max. SPT value was more than 500)

SeaWorld Bayside Stadium Stage Expansion



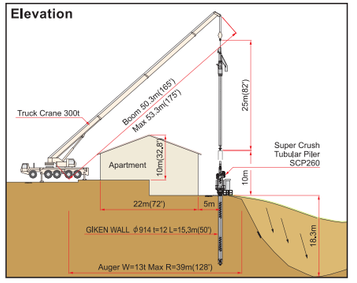


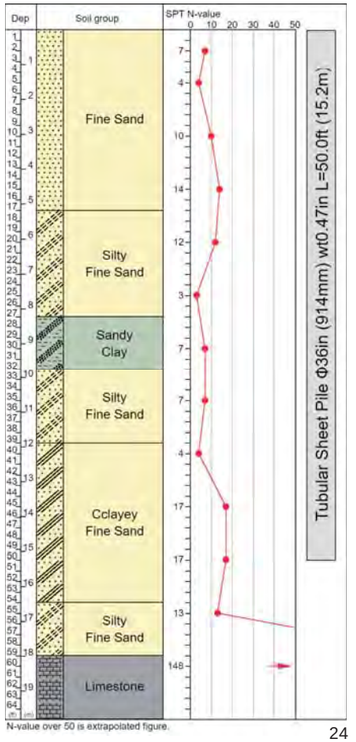
Project Name	SeaWorld Bayside Stadium Stage Expansion
Purpose of Project	Stage Expansion (Seawall)
Location	Orlando, FL, U.S.A.
Employer	SeaWorld Orlando
Duration	August 2008
Press-in Machinery	Super Crush Z Piler SCZ-675SM
Pile Section & Length	Z Sheet Pile PZC18, L=15.0 ft (4.5 m) & 30.0 ft (9.1 m)
Features & Remarks	The owner and general contractor selected the Press-in system to install the steel sheet pile bulkhead wall for their stadium expansion. The Press-in system was selected to minimize temporary falsework as well as minimize the environmental impact to the operations of the animal theme park.

PRESS-IN PILING PROJECT ACHIEVEMENTS in North America

Emergencies

Woodhill Sinkhole





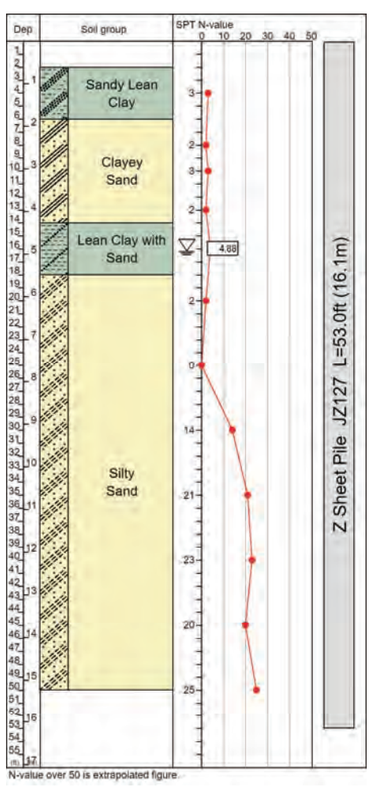
Project Name	Woodhill Sinkhole
Purpose of Project	Rescue Method (protecting structures from sinkhole)
Location	Orlando, FL, U.S.A.
Employer	The Willson Company
Duration	June to July 2002
Press-in Machinery	Super Crush Tubular Piler SCP260
Pile Section & Length	Tubular Sheet Pile Φ36 in (914 mm), PT Interlock, wt=0.47 in, L=50.0 ft (15.2 m)
Features & Remarks	Narrow and laterally limited working area. Piling close to the existing structures. Risk of damage to buildings significantly reduced while piling. Safety consideration to the building foundations and the unstable ground itself.

Massive Drainage Collapse

Sheet Piling

Completion of Sheet Piling

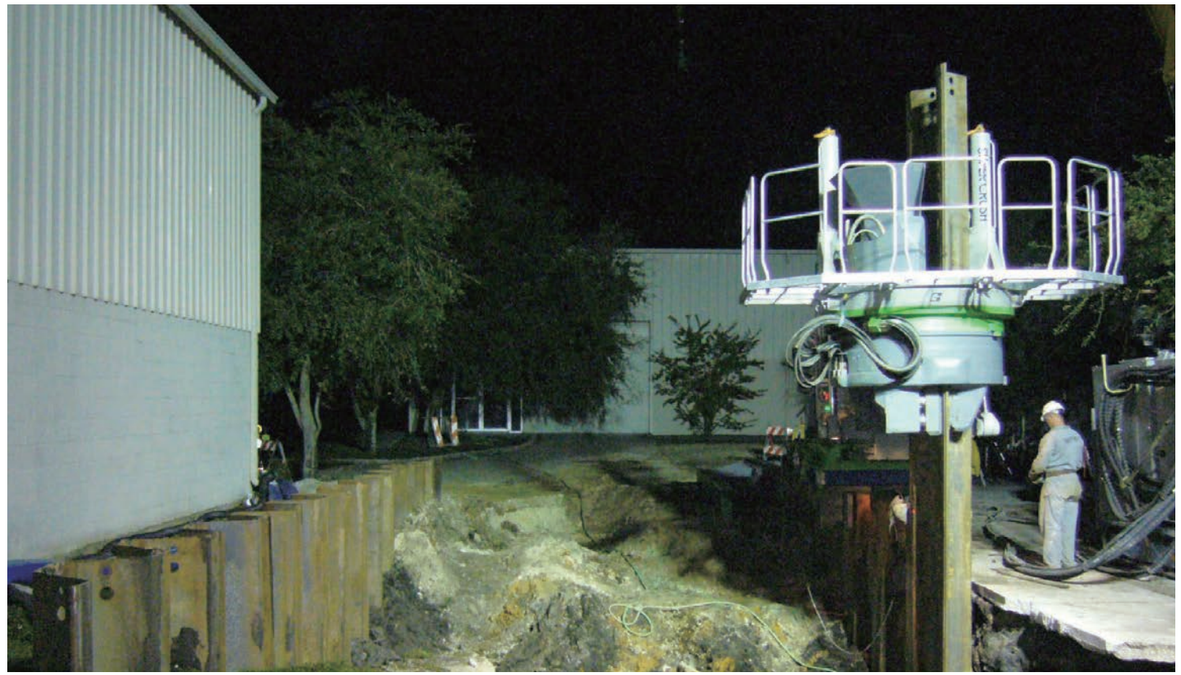
Top: After Parking Lot Collapse
Bottom: Sheet Piling



N-value over 50 is extrapolated figure.

Project Name	Massive Drainage Collapse
Purpose of Project	Drainage Work
Location	Meridian, MS, U.S.A.
Employer	City of Meridian
Duration	November 2015
Press-in Machinery	Silent Piler GV-ECO1400S
Pile Section & Length	Z Sheet Pile JZ112, 120, & 127; L=53.0 ft (16.1 m)
Features & Remarks	Emergency repair work was performed at a ditch collapse incident that happened on November 7, 2015 in Meridian, MS. Sheet pile driving was necessary for the emergency project. However, due to the risk of a secondary disaster occurring at an adjacent building by using a vibratory hammer, the Silent Piler was chosen to press in the sheet piles.

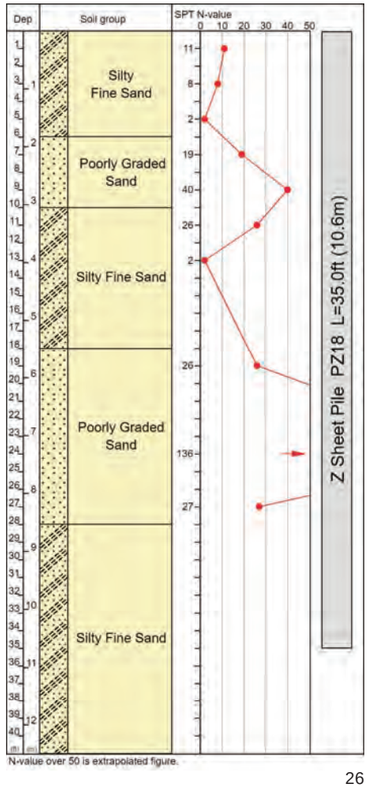
Carpet N' Drapes Culvert Rehabilitation



Sheet Pile Installation

Before Construction

Completion of Sheet Piling



N-value over 50 is extrapolated figure.

Project Name	Carpet N' Drapes Culvert Rehabilitation
Purpose of Project	Culvert Rehabilitation
Location	Jacksonville, FL, U.S.A.
Employer	Clay County
Duration	October 2007
Press-in Machinery	Super Crush SCZ-675WM
Pile Section & Length	Z Sheet Pile PZC18, L=35.0 ft (10.6 m)
Features & Remarks	Due to heavy rain, a storm drain culvert collapsed, resulting in the above ground to collapse as well. In consideration of the risk of a secondary disaster occurring at an adjacent building by using a vibratory hammer, the Silent Piler was chosen to press in the sheet piles.