BARGES
THE DIFFERENT TYPES AND FUNCTIONS

PLUS

SOILMEC SF-55
The Next Generation CFA Rig

PILE DRIVING
An Introduction to History and Techniques

PILE LOAD TEST PROGRAM
Substantial Cost Saving for Bridge Project
SUPERIOR MIDWEST ENERGY TERMINAL GETS SUPERIOR PILE REMEDIATION

Duluth-Superior Harbor, MN

View of terminal where 240 steel piles were prepared with FX-70® pile protection system.

PROJECT INFORMATION

Category: Bridge and Marine
Project Owner: Midwest Energy Resource Company
FRP Installer: Nordic Underwater Services
Application: Repair and protection of corroded H-shaped steel infrastructure piles in the harbor
Simpson Strong-Tie Products: FX-70® structural pile repair and protection system
The Superior Midwest Energy Terminal (SMET) of Duluth-Superior Harbor was commissioned in 1976 to help accommodate the low-sulfur western coal needs of the DTE Electric power plants around the Great Lakes. The terminal is owned and operated by the Midwest Energy Resource Company (MERC) and includes a wharf structure elevated on steel H-shaped piles.

**THE CHALLENGE: FIND A STRENGTHENING SYSTEM THAT WOULD PROTECT PILES AGAINST CORROSION AND ICE FLOES**

In 1998, it was noticed that microorganisms were accelerating the corrosion of infrastructure piles in the harbor. From 2004–2006, AMI Consulting Engineers and MERC identified the need to repair and protect numerous seriously corroded H piles on the SMET pier. A major challenge of the project was providing a corrosion protection system that would hold up to the extreme winter environment and the impact of ice pushed by ships into the pilings.

**THE SOLUTION: FX-70® PILE REPAIR AND PROTECTION SYSTEM WITH FIBERGLASS JACKETS AND PUMPABLE EPOXY GROUT**

On the advice of AMI, dive inspections were conducted to ascertain the location and extent of the corrosion damage. AMI tested many different pile repair products over a period of five
13’ H-pile jackets installed.
years. The contractor, Nordic Underwater Services, along with AMI, determined that an FRP jacket product similar to the Simpson Strong-Tie FX-70® pile repair and protection system would be the most cost-effective solution for repair and long-lasting protection of the piles. It was also agreed that the epoxy grout should be pumped into the jacket rather than poured, to minimize the formation of air pockets in the material.

THE RESULTS: PIER FULLY OPERATIONAL AND PROTECTED FROM THE ELEMENTS BEFORE WINTER ARRIVED

The total repair took approximately 5½ months to complete. The key to the timely execution was excellent communication throughout every stage of the project from pre-construction and manufacture through mobilization and installation. Simpson Strong-Tie RPS specialists and RPS logistics coordination teams, along with their manufacturing and product management in West Chicago, worked closely with the contractor to ensure a seamless process and successful project installation. Before the cold winter weather could intrude, the pier was fully operational and protected from the corrosive elements of the harbor.
Don’t replace. Repair in place.

With 40+ years of proven performance, our FX-70® Structural Repair and Protection System repairs concrete, steel and wood piles in service without dewatering while protecting against further deterioration. From custom-manufactured fiberglass jackets to underwater epoxies and cementitious grouts, we have cost-effective, practical, long-term solutions for your repair projects.

Since 1956, Simpson Strong-Tie has brought innovative solutions to customers’ construction challenges. To learn more about our products that repair, protect and strengthen, visit go.strongtie.com/rps or call us at (800) 999-5099.

Watch How to Install FX-70® Jackets in Water at strongtie.com/videolibrary and subscribe to our YouTube Channel at youtube.com/strongtie.