



## PROJECT PROFILE

## Maritime Academy



**CHALLENGE:** Welding underwater, gaps in sheet piling

**SOLUTION:** Underwater welders, shims were required

**OWNER:** Maritime Academy

**CONTRACT AMOUNT:** 458,700

**DESIGN ENGINEER:** JJR

**ENGINEER CONTACT:** 608-327-9952

**LOCATION:** Maritime Academy

**DATE STARTED:** Spring 2018

**DATE COMPLETED:** 7-17-18

**SELF-PERFORMED:** 90%

**PARTNERS:** Great Lakes Diving

## BY THE NUMBERS

Divers: 5

60' H-Piles: 8

Grading: 7,392 feet

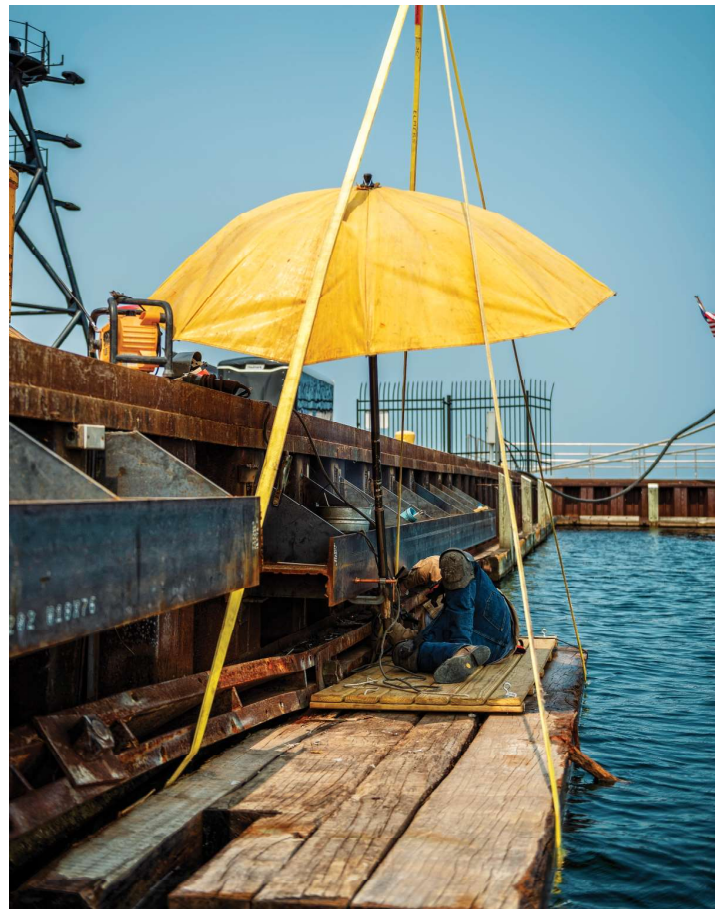
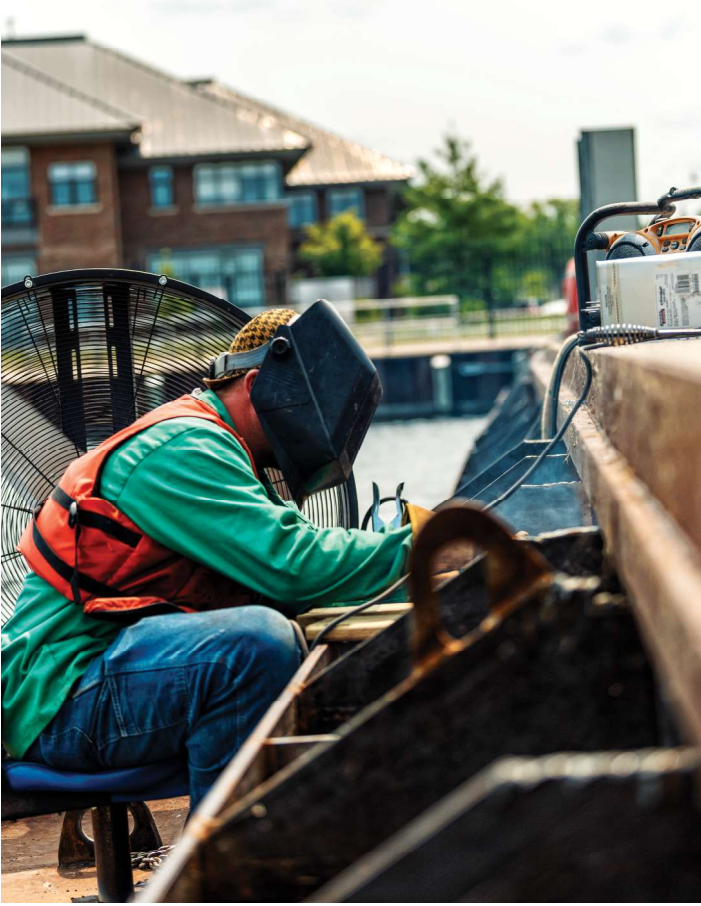
Mooring Bollards: 2

W-beams with welded stiffeners: 10

**Let's Dive** right in. That was the case for Team Elmer's when they were accepted as the contractor for the Maritime Academy Project that required underwater work.

The Maritime Academy is located on the shore of West Grand Traverse Bay, near the mouth of the Boardman River. The project involved construction of new mooring bollards on the existing dock. The existing dock was constructed of steel sheet piling, infilled with granular sand. The issue with the existing dock was that the ship, T/S State of

Michigan was bouncing around from the waves while it was docked. The T/S State of Michigan is federally owned and NMC pays to operate the ship. SmithGroupJJR determined the loading and location of the borings for the project. Two Mooring bollards were required for the project to help stabilize boat movement during wave action. Selecting the right kind of bollard was based upon site factors including weather, vessel size, and water depth. Each bollard weighed 60 ton. There was a 60 foot long H-pile for each bollard and the concrete caps were four inches thick. Installation of new bumpers was required



for the project to keep the ship from rocking around when the waves come in. The wind blows from the north of the harbor. When there are strong winds, they gather a lot of wave energy. The pre-existing bumpers were unable to capture the energy in a 2016 storm causing the bumpers to collapse. The new bumpers installed are four feet in diameter and ten feet long, much larger, and sustainable than the last. Bumper supports were also welded to the existing sheet pile wall. The project also required relocation of a fence at the federal harbor where the ship is berthed.

The biggest challenge that Team Elmer's faced on the project, was the gaps in the sheet piling. There was extended welding work requiring the welders to fill in the gaps with shims. There were five divers on the project in total and two were welders. The divers were time constrained due to the maximum amount of time they were allowed to be underwater.

With diligent effort and careful planning, the new mooring bollards were safely and successfully installed.