

## FEATURED PROJECT

# Composite Tank Repair

## CARBON FIBER REINFORCEMENT OF A RAW SEAWATER TANK

### CUSTOMER

Rutgers Marine Research Group

### APPLICATION TEAM

CTI

### SYSTEM

FRP 110 HT Tack/FRP 210 HT/CF-500 BD/HP-300 Epoxy

### LOCATION

Cape May, NJ

### DATE OF APPLICATION

Feb. 2021

### SUBSTRATE

Carbon Steel

### PROBLEM

Upon inspecting a 23 ft. diameter, riveted steel tank containing raw seawater, numerous failures of the existing internal coating were found, allowing widespread corrosion of the substrate to occur. The internal corrosion was severe enough to cause multiple through-wall failures creating external corrosion under the existing insulation of the tank. As an alternative to a costly tank replacement due to the severe corrosion, the facility looked to Advanced FRP for a reliable, cost-effective composite solution. The composite could not contain any solvents or other small molecules that could leach into the seawater and affect marine life at the facility.

### SOLUTION

After assessing the condition of the tank and determining that the majority of the tank had less than 50% wall loss, a solution was designed that would enhance the strength of the existing tank while repairing the existing through-wall failures and eliminating the areas of internal corrosion on the substrate.

#### INSTALLATION STEPS:

1. The tank was cleaned, and then grit blasted to an SSPC SP-10 Near-White metal finish.
2. HP 300 Epoxy was applied via brush/roller at 15 - 20 mils DFT to the entire tank. FRP Repair Putty was then used to fill in any deep pitting and to cover internal rivets.
3. FRP 110 HT Tack was applied as a tack coat over the bottom tier of the tank before two layers of a high-strength, bi-directional carbon fiber composite (CF-500 BD saturated with FRP 210 HT Saturant) were applied.
4. A final coat of HP-300 Epoxy was applied via brush/roller at 15 - 20 mils.

Application of the system was performed in winter so the tank had to be heated to 70°F during the application and for 72 hours after to facilitate a full cure.

### BENEFITS

- An easy-to-install internal carbon fiber system allows for two layers to be installed per shift.
- A custom solution was provided to help make the repair more economical, taking into account the differential loading of each tank tier.
- Zero-VOC, non-flammable, non-leaching saturating resin and coating system ensures worker safety during and after the repair.

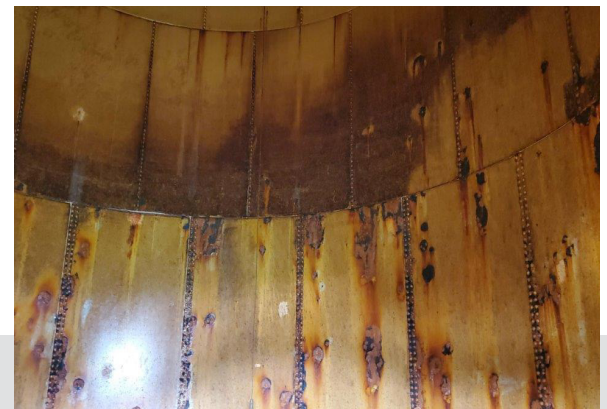


Figure 1 Extensive Internal Corrosion of the Tank was Documented After Clean-up



Figure 2 HP-300 Epoxy was installed at 15 - 20 mils and FRP Repair Putty covers the Rivets

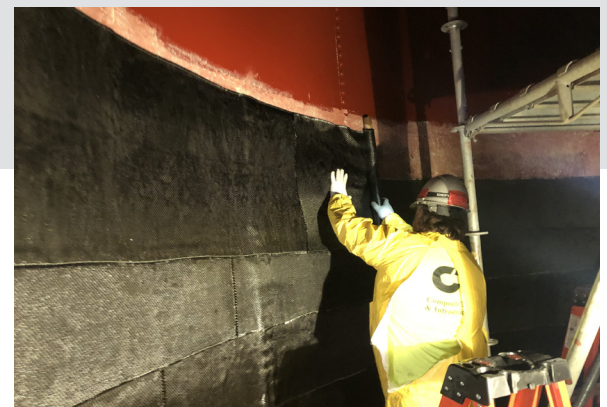


Figure 3 Installation of the High Strength Carbon Fiber on the Lower Tier