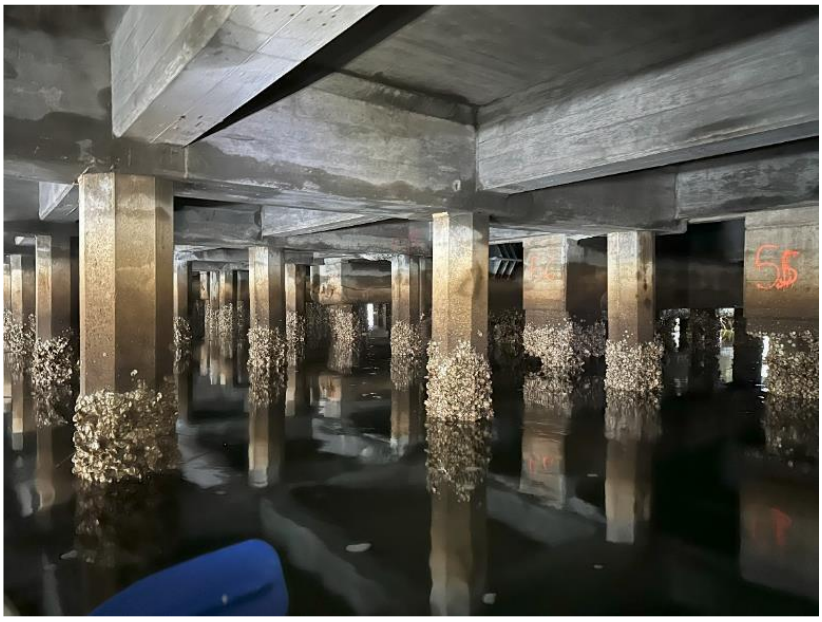
TC WHARF
NORTH CHARLESTON, SOUTH CAROLINA, U.S.A

SERVICES
Non-Destructive Corrosion Testing
Laboratory Testing
Service Life Modeling

KEY PERSONNEL
Mark Dixon, Project Manager
Kyle Stanish, President/Managing Principal

REFERENCE
David Melnyczuk
Moffatt & Nichol
301 Main Street Suite 800
Baton Rouge, LA 70801

dmelnyczuk@moffattnichol.com



Tourney Consulting Group (TCG) was contracted through Moffatt & Nichol to complete a durability assessment of the existing TC Wharf concrete above the Cooper River water level located at the Joint Base Charleston in South Carolina. The durability assessment included both field and laboratory investigations of the original wharf concrete constructed in 1941 and the structure additions in 1955, 1963, and 2001. The objective was to determine the level of corrosion and estimate the remaining service life of the reinforced concrete deck, pile caps, and piles.

The field assessment included detailed visual observations, concrete sounding for delaminations, and non-destructive half-cell potential testing for corrosion. Rebar was located using ground penetrating radar and locations were mapped for both steel and concrete samples to be extracted.

Laboratory testing of the extracted steel rebar included a detailed visual assessment and corrosion rating. The steel was chemically cleaned using ASTM G1 method C3.5, and weight measurements were recorded for the structural team to use in their assessment. Concrete cores were tested for chloride and carbonation from the surface to below the depth of rebar.

The remaining service life of the concrete was evaluated for chloride-induced reinforcement corrosion. Where chloride concentrations at the level of the steel were currently below the corrosion threshold level, computer modeling was used to model chloride ingress further out in time and predict the time to corrosion initiation. For locations that have already initiated corrosion, an additional analysis was done to calculate the corrosion rate.