



MIGRATORY CORROSION INHIBITOR (MCI®) PRODUCTS FOR CONCRETE

CASE HISTORY

Extending Seawall Service Life for Future Generations



DATE

November 2017

CUSTOMER

Private Property Owner

READY MIX SUPPLIER

Cemex

CONTRACTOR

Duncan Seawall

LOCATION

Longboat Key, FL

PRODUCTS

MCI®-2005

PROBLEM

A private property owner building a new residence on Longboat Key wanted to preserve his property for future generations. This included building a seawall to protect the shoreline from erosion. The owner wanted the reinforced concrete seawall to have a service life of at least 100 years before it would need repairs. While achieving this extended design life in normal circumstances is challenging, it is especially so in the corrosive subtropical marine spray environment of the seawall construction site. When the standard concrete mix design for seawalls was entered into LIFE-365 service life prediction modeling, the seawall was expected to have only 15.2 years before the first repair would be needed. This projected design life fell far short of the property owner's wishes.

APPLICATION

By adding MCI®-2005 into the mix design, Cortec® was able to significantly increase the predicted time to repair to 46.9 years, three times the predicted service life of the original mix. However, because of the customer's high expectations for a 100 year design life, the ready mix supplier proposed an alternative concrete mix used with the Florida DOT. The new mix decreased the water/cement ratio and added pozzolans to make the concrete denser and longer-lasting. This alone brought the service life prediction up to more than 100 years. However, after adding MCI®-2005 into the LIFE-365 model, the service life prediction increased to more than 150 years, well beyond the customer's expectations.



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MIGRATING CORROSION INHIBITORS
FROM GREY TO GREEN

CONCLUSION

Specifying a high-density concrete mix containing MCI®-2005 admixture met and exceeded the requirements of the property owner, extending the predicted service life of his seawall much longer than initially hoped. In addition, MCI®-2005 was a safer, more sustainable choice than traditional calcium nitrite admixtures because it contains 67% USDA Certified Biobased Content and is UL certified to meet ANSI/NSF Standard 61 for use in structures containing potable water. MCI®-2005 is much less water-soluble than calcium nitrite and will not harm the marine environment even if it does leach into the surrounding water. Because the MCI®-2005 was manufactured in nearby Sarasota, within a 500 mile (805 km) radius of the residence, the admixture will also help the structure qualify for LEED certifications if desired. The use of MCI®-2005 with the chosen concrete mix design will therefore leave behind a safer, more sustainable structure for many generations to come.



