

CASE HISTORY

North-South Roadway Bridge Deck



PROBLEM

New construction application: Post tensioned cables were shipped from the mainland with no corrosion protection and inserted into steel ducts in the girders of the bridge. Because they were to sit for a period of time before grouting, corrosion of strands was a concern. MCI®-309 was fogged into the ducts to provide temporary corrosion protection to the cables.

Due to the corrosive nature of the environment, MCI®-2005 NS was also added to the ready mix concrete placed for the new bridge deck, to extend the life expectancy of the structure. MCI® Mini Grenades were used in hand lay-up and mortars to exposed tie in reinforcing steel specifically at junction points in areas where direct pour of ready mix concrete was not feasible.

APPLICATION

Temporary Protection of Post Tensioned Cables: MCI®-309 powder was fogged into girders at a rate of 0.5 ounces/cubic foot (500g/m³) after placement of the post tensioned cables. Dosing was done by using a low pressure air flow of 35 psi to fog the powder from one end of the girder to the other.

A hose attached to the air compressor was inserted a short distance into the girder duct and rags or absorbent pads were used to seal the opening of the duct around this hose to prevent MCI®-309 powder from blowing back out of the hole. Inspection at the opposite end of the girder was done to ensure that once the powder reached the end, air flow was stopped and only little material was lost out of the opposing side.

Long Term Protection of the Bridge Deck: MCI®-2005 NS was added to the ready mix concrete at the batch plant with the mixing water at a rate of 1.5 pt/yd³ (1 l/m³). MCI®-2005 NS does not change the setting time of the concrete or adversely affect any other properties of the mix. Unlike the calcium nitrite based corrosion inhibitor used on previous projects, MCI®-2005 NS did not increase shrinkage cracking of the deck.

CONCLUSION

Cortec® MCI®-309, MCI®-2005 NS, and MCI® Mini Grenades were able to provide temporary and long term protection to the North South Roadway Bridge. These products are environmentally friendly and easy to use.

DATE

August 2008

DISTRIBUTOR

Bonded Materials

SPECIFYING ENGINEER

KSF Inc.

READY MIX SUPPLIER

Island Ready Mix

CUSTOMER/OWNER

Hawaii DOT

CONTRACTOR

Kiewit Pacific

LOCATION

Oahu, Hawaii

East & Westbound H2 Roadway

PRODUCTS

MCI®-309

MCI®-2005 NS

MCI® Mini Grenades®

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Why MCI® Chosen?

MCI®-309 can provide up to 24 months of temporary protection to the un-grouted cables when properly applied. Most importantly, MCI®-309 did not need to be removed from the ducts prior to tensioning/grouting. MCI®-309 was compatible with the grout, meaning it did not affect its setting time or other mechanical properties, nor did it affect bond strength.

MCI®-2005 NS and MCI® Mini Grenades were able to provide long term corrosion protection to the concrete deck without any adverse effects of the mix design.

All of the MCI® products were easy to apply and environmentally friendly. Hawaii DOT has since implemented the use of MCI® products on other projects statewide.

