TriDurLE

National Center for Transportation
Infrastructure Durability & Life-Extension

Title: Corrosion propagation monitoring using galvanostatic pulse on reinforced concrete legacy samples

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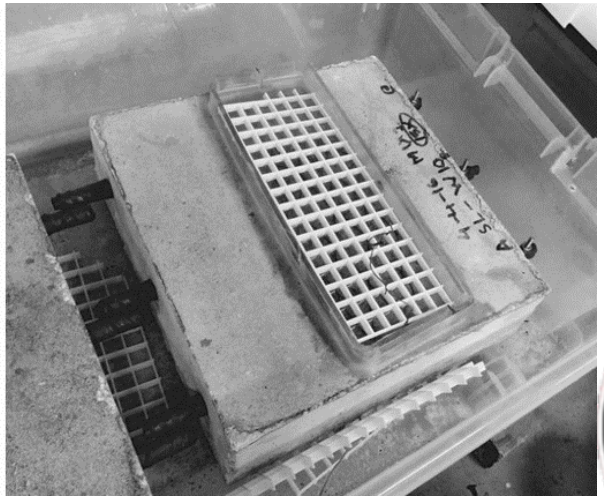
The corrosion propagation stage of carbon steel rebar in high performance concrete might last longer than the typically five years usually attributed for carbon steel rebar in concrete with type I/II Portland cement as the only cementitious material. Monitoring the corrosion rate for a longer period within the propagation stage is relevant. Legacy samples are available at FAU in which corrosion propagation will be monitored using galvanostatic pulse, on samples exposed outdoors and indoors

Samples prepared with 20% fly ash, 50% slag, 20% fly ash and 50% slag will be monitored. On the right single and three rebar specimens are shown.



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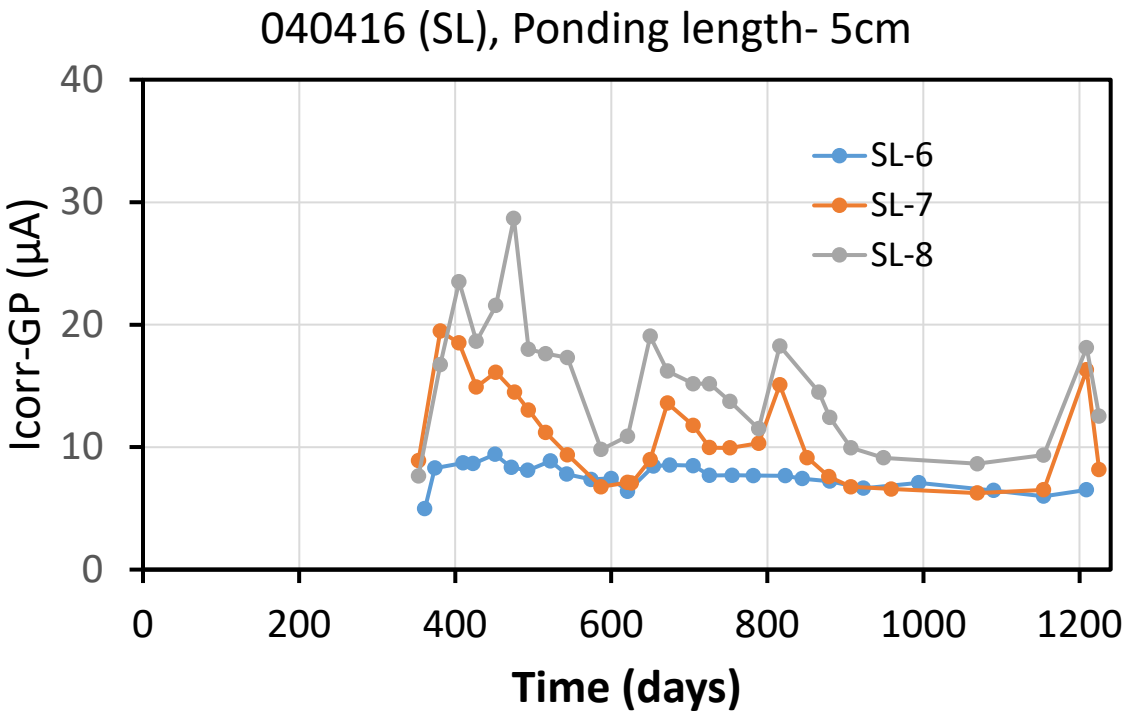
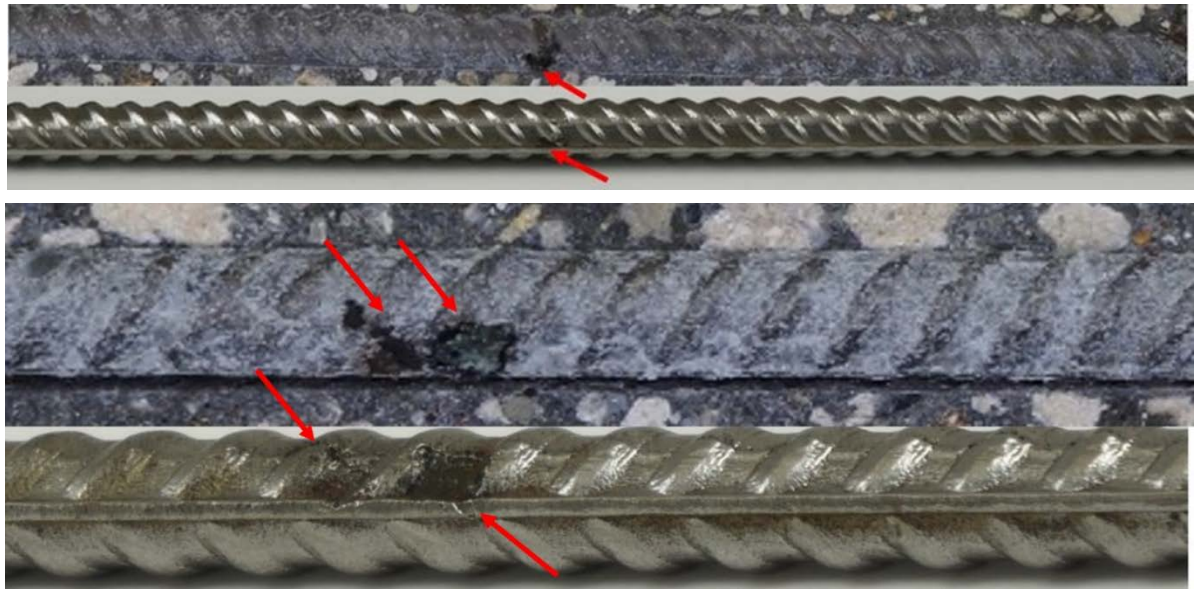
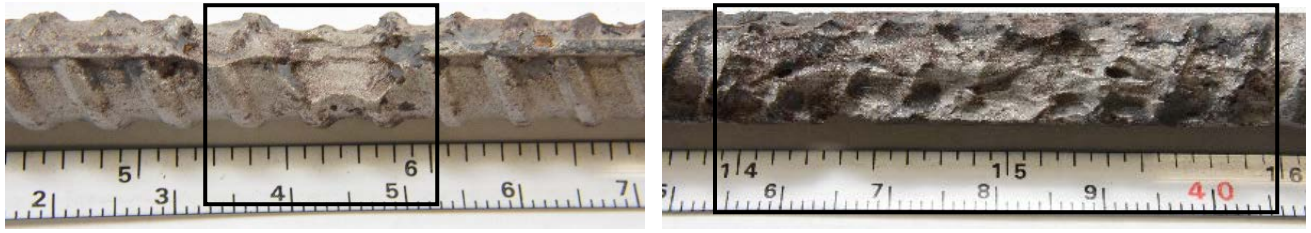


Typical evolution of the corrosion current obtained from Galvanostatic pulse measurements



Forensic examination before and after cleaning rebar in specimens FA8 (top) and FA9 (bottom) (Presuel, 2018). Terminated at 600 days of age

Galvanostatic pulse measurements are planned every other month. The test typically applies 10 microamperes and monitors the rebar potential over 120 to 200 seconds. From these measurements both corrosion current and solution resistance are obtained.



Forensic examination of rebars obtained from samples exposed outdoors to seawater. Terminated after 23 years of exposure