Condition Assessment of Corroded Prestressed Concrete Bridge Girders

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Abstract:

As of 2019, more than 42% of the 617,000 bridges in the US have reached the end of their intended life cycle (50 years), and 7.5% of all bridges are in "poor" condition, according to the American Society of Civil Engineers. Additionally, according to the Association for Materials Protection and Performance (AMPP), resolving durability concerns directly costs around $13.6 billion a year. Even though extensive research has been done to create concrete that is incredibly resistant, no defined standard testing procedure has yet made it clear how to characterize the degree of corrosion and the resulting structural damage. In addition to helping bridges last longer, the development of durable cementitious materials is essential for creating a methodical framework that can accurately assess the structural performance that has not yet been compromised by corrosion. This study focuses on identifying the level of corrosion and investigating how corrosion affects the bond strength of concrete.

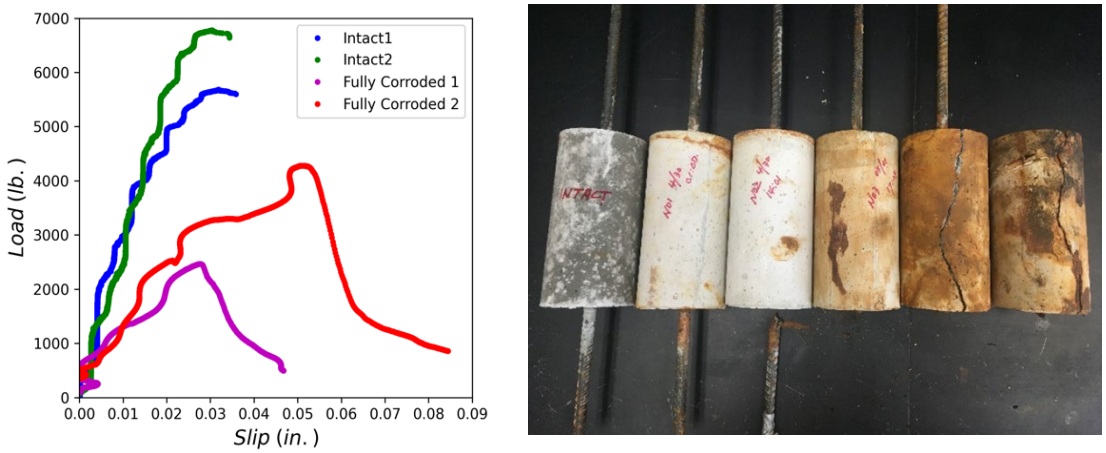

Figure 1: Comparison of Bond-Slip response of corroded and intact specimens (Left) and variations of corrosion degree produced by the accelerated corrosion test (Right).

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References:

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[2] "Highways and Bridges," the Association for Materials Protection and Performance (AMPP), https://www.ampp.org/resources/what-is-corrosion/corrosion-reference-library/highways-bridges (Assessed November 3, 2022)