

Technical Report Documentation Page

1. Report No. RC-1560	2. Government Accession No.	3. MDOT Project Manager Steven Kahl, P.E.	
4. Title and Subtitle Stainless and Stainless-Clad Reinforcement for Highway Bridge Use		5. Report Date December 2011	
		6. Performing Organization Code	
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9. Performing Organization Name and Address Michigan Department of Transportation Operations Field Services Division P.O. Box 30049 Lansing, Michigan 48909		10. Work Unit No. (TRAIS)	
		11. Contract No.	
		11(a). Authorization No.	
12. Sponsoring Agency Name and Address Michigan Department of Transportation Operation Field Services Division 425 West Ottawa Street Lansing Michigan 48933		13. Type of Report & Period Covered Final	
		14. Sponsoring Agency Code	
15. Supplementary Notes			
16. Abstract <p>Stainless steel as concrete reinforcement has been in use for several decades. Although highly resistant to corrosion, and able to provide greater than 100 years maintenance-free service life, the main drawback to widespread use has been the cost of the material. Stainless steel reinforcement has a higher price premium than epoxy coated reinforcement, but overall the cost accounts for less than ten percent of typical bridge rehabilitation projects. To help offset the price premium of solid stainless reinforcement, stainless-clad reinforcement (SCR) is available in selected reinforcement sizes, and provides the corrosion resistance of solid stainless steel at a lower cost.</p> <p>Considerations for use of stainless and stainless-clad reinforcement include locations where: future repair and maintenance would be very disruptive to traffic, requiring mitigation measures to minimize travel delay; over navigable waterways or protected wetlands sensitive to environmental impact from construction activity; the reinforcement concrete cover is less than three inches; and bridges located over high volume railway lines where access and right of way restrictions exist. Life cycle cost analysis (LCCA) should be used, including consideration of user delay costs, to provide the best choice for the traveling public.</p> <p>LCCA for selected structures demonstrated a lower present value cost for the stainless steel and SCR alternative, and a break-even point when the epoxy-coated reinforced bridge deck attains 83 years maintenance-free service life. Conversely, the break-even point for the stainless and SCR alternative is when the material costs exceed 24 percent of the construction cost. The cost savings are expected to further improve when reduced concrete cover and utilization of empirical bridge deck design are incorporated.</p> <p>Selective use of stainless and stainless-clad reinforcement, along with cost savings from reduced concrete cover and deck design with less reinforcement, will provide a reasonable balance between higher cost and maximizing service life. Use of stainless steel and stainless-clad steel for bridge deck construction ensures a long life with low maintenance costs, providing a more sustainable solution. The challenge remains, however, to overcome the barriers in funding the increased cost of these corrosion resistant materials.</p>			
17. Key Words Stainless steel, stainless-clad reinforcement, life cycle cost, corrosion, bridge deck, service life, sustainability		18. Distribution Statement No restrictions. This document is available to the public through the Michigan Department of Transportation.	
19. Security Classification - report Unclassified	20. Security Classification - page Unclassified	21. No. of Pages 26	22. Price