

| | | | |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------|
| 1. Report No. MR 1996-01 | 2. Report Date June 2006 | 3. Contract No. N/A | 4. Project No. IM-1-094(017)156 |
| 5. Title and Subtitle Evaluation of Epoxy-Coated Reinforcing Steel | | 6. Report Type Click on link to open report Work Plan <input type="checkbox"/> Construction <input type="checkbox"/> Evaluation <input type="checkbox"/> Final <input checked="" type="checkbox"/> | 7. Project No. 8. Project No. 9. Project No. 10. Project No. |
| 11. Author(s)/Principle Investigator(s) Curt Dunn, Rhaub Walker, and Steven Henrichs | | 12. Performing Organization Name and Address NDDOT M+R <input checked="" type="checkbox"/> North Dakota DOT NDDOT OTHER* <input type="checkbox"/> Materials and Research Division NDSU <input type="checkbox"/> 300 Airport Road UND <input type="checkbox"/> Bismarck ND 58504-6005 UGPTI <input type="checkbox"/> OTHER* <input type="checkbox"/> *see supplementary notes | |
| 13. Sponsoring Agency Name and Address North Dakota DOT Materials and Research Division 300 Airport Road Bismarck ND 58504-6005 | | 14. Supplementary Notes | |
| 15. Abstract <u>Purpose and Need</u> Reinforced concrete structures can experience premature deterioration due to the effects of corrosion of the reinforcing steel. When the reinforcing steel is exposed to moisture and oxygen, corrosion is formed. The addition of salt related admixtures can accelerate the corrosion process. The NDDOT desires materials that will resist corrosion and lengthen the life of reinforced concrete. <u>Objective</u> The objective of this study is to determine if epoxy-coated reinforcing steel will serve as a corrosion-protection system for concrete structures and ultimately extend the service life of the structure. <u>Scope</u> The NDDOT has substituted epoxy-coated reinforcing steel for regular reinforcing steel in a portion of the continuous reinforced concrete pavement in project, IM-1-094(017)156 westbound. This portion of roadway served as a test section and was compared to a section of roadway containing regular reinforcing steel. The test and control sections will be visually evaluated annually for the number and size of cracks. <u>Summary</u> After approximately ten years of service, there appears to be little difference in performance between the control section and the test section. For both of the segments evaluated, the widths between the transverse cracks were typical for reinforced concrete. The number of transverse cracks is slightly higher in the control section than that of the test section. The crack widths are approximately the same in both segments. Cores taken in the control and experimental segments show that the regular reinforcing steel has evidence of rust and the epoxy coated reinforcing steel does not. <u>Recommendations</u> Epoxy coated reinforcing steel doesn't appear to negatively affect the performance of CRCP and cores show that the epoxy coated reinforcing steel resisted corrosion better than regular reinforcing steel. However, the distresses that CRCP, typically, exhibits are not related to corrosion of the reinforcing steel. It is likely, within the currently used 30 year design life, that using epoxy coated reinforcing steel would not significantly reduce the distresses of the CRCP. Due to the additional cost of using epoxy-coated reinforcing steel and its limited benefits; it is not recommended to use epoxy coated reinforcing steel on CRCP projects. | | | |
| 16. Key Words Concrete Pavement Continuous Reinforcement Epoxy-coated Reinforcing Steel | 17. Distribution Statement No restrictions. This document is available to the public from: North Dakota Department of Transportation Materials and Research Division: 300 Airport Road Bismarck ND 58504-6005 Office: (701) 328-6900 Fax: (701) 328-0310 | 18. No. of Pages 19 | 19. File type/Size PDF 1.3 MB |