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12. Performing Organization Name and Address NDDOT M+R <input checked="" type="checkbox"/> North Dakota DOT NDDOT OTHER* <input checked="" 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 Fargo			
15. Abstract <u>Purpose and Need</u> The NDDOT desires to evaluate methods to permanently repair separated and misaligned pipe to avoid the expense of replacement. Repair methods should return the pipe to its intended design function and allow the pipe to remain in place for the manufacturers suggested service life. <u>Objective</u> NDDOT Materials and Research personnel will work with District and pipe industry representatives to select and design potential solutions to the problem. Several products and repair methods will be used and evaluated. The project will be used to evaluate different materials and techniques, and develop cost comparisons for the repair methods. <u>Scope</u> The evaluation will be conducted on two sections of 88 inch span arch pipe on Interstate 29 north bound near reference point 75, north of Fargo, ND. The pipe joints have various different problems due to deterioration which are described in the construction report. Three different contractors will perform different pipe repair methods. These methods are documented by Materials and Research. Three contractors performed the pipe repairs; Cretex Inc, Subsurface Inc., and QuakeWrap Inc. The project started October 28, 2009 and was completed in approximately 20 days. The total cost of the pipe repairs was \$112,430 plus prime contractor markup of \$3,722.90 for a total of \$116,152.90. <u>Summary</u> The repairs required for this project were; rehabilitating misaligned or damaged joints, sealing open joints, and filling voids behind the pipe. Repairs were completed using 'permanent' techniques with the knowledge that the pipes would be replaced in an upcoming roadway rehabilitation project. The purpose of the project was to evaluate permanent pipe repair techniques. The planned future replacement offered the opportunity to evaluate the effectiveness of those repairs, particularly the use of expanding foam to fill voids behind the pipe and under the roadway. An evaluation of the repair performance was conducted during the 2011 replacement of the pipes. Some deterioration of joint sealing material was noted; but in general, joints remained sealed and internal repairs were performing as expected. The effectiveness of the expanding foam to fill voids showed mixed results; possibly due to unknown size and location of the voids.			
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