

**Technical Report Documentation Page**

<b>1. Report No.</b> FHWA DTFH61-01-X-00042 (Project 6) IHRB Project TR-511		<b>2. Government Accession No.</b>		<b>3. Recipient's Catalog No.</b>	
<b>4. Title and Subtitle</b> Design and Construction Procedures for Concrete Overlay and Widening of Existing Pavements				<b>5. Report Date</b> September 2005	
				<b>6. Performing Organization Code</b>	
<b>7. Author(s)</b> James K. Cable, Fouad S. Fanous, Halil Ceylan, Douglas Wood, Daniel Frentress, Toni Tabbert, Sun-Yoong Oh, Kasthurirangan Gopalakrishnan				<b>8. Performing Organization Report No.</b> CTRE Project 04-169	
<b>9. Performing Organization Name and Address</b> Center for Portland Cement Concrete Pavement Technology Iowa State University 2901 South Loop Drive, Suite 3100 Ames, IA 50010-8634				<b>10. Work Unit No. (TRAIS)</b>	
				<b>11. Contract or Grant No.</b>	
<b>12. Sponsoring Organization Name and Address</b> Federal Highway Administration                      Iowa Highway Research Board U.S. Department of Transportation                      Iowa Department of Transportation 400 7th Street SW, HIPT-20                                      800 Lincoln Way Washington, DC 20590    Ames, IA 50010				<b>13. Type of Report and Period Covered</b> Final report	
				<b>14. Sponsoring Agency Code</b>	
<b>15. Supplementary Notes</b> Visit <a href="http://www.ctre.iastate.edu">www.ctre.iastate.edu</a> for color PDF files of this and other research reports.					
<b>16. Abstract</b>  State Highway Departments and local street and road agencies are currently faced with aging highway systems and a need to extend the life of some of the pavements. The agency engineer should have the opportunity to explore the use of multiple surface types in the selection of a preferred rehabilitation strategy. This study was designed to look at the portland cement concrete overlay alternative and especially the design of overlays for existing composite (portland cement and asphaltic cement concrete) pavements.  Existing design procedures for portland cement concrete overlays deal primarily with an existing asphaltic concrete pavement with an underlying granular base or stabilized base. This study reviewed those design methods and moved to the development of a design for overlays of composite pavements. It deals directly with existing portland cement concrete pavements that have been overlaid with successive asphaltic concrete overlays and are in need of another overlay due to poor performance of the existing surface.  The results of this study provide the engineer with a way to use existing deflection technology coupled with materials testing and a combination of existing overlay design methods to determine the design thickness of the portland cement concrete overlay. The design methodology provides guidance for the engineer, from the evaluation of the existing pavement condition through the construction of the overlay. It also provides a structural analysis of various joint and widening patterns on the performance of such designs. This work provides the engineer with a portland cement concrete overlay solution to composite pavements or conventional asphaltic concrete pavements that are in need of surface rehabilitation.					
<b>17. Key Words</b> asphaltic concrete overlays—pavement performance—portland cement concrete overlays—rehabilitation				<b>18. Distribution Statement</b> No restrictions.	
<b>19. Security Classification (of this report)</b> Unclassified.		<b>20. Security Classification (of this page)</b> Unclassified.		<b>21. No. of Pages</b> 150	<b>22. Price</b> NA