

Portland Cement Concrete Overlays

Problem: Improper Overlay Alternative Selection and Poor Construction Increases the Life Cycle Cost and Decreases Pavement Performance

Portland Cement Concrete (PCC) overlays are not routinely being considered when selecting an overlay rehabilitation strategy. This may result in choosing a pavement rehabilitation alternative that does not address the existing traffic and pavement condition and results in poor performing pavement. Poor performance increases traffic congestion, compromises public safety, and raises maintenance costs due to frequent repairs. Each year, transportation agencies spend more than \$20 billion to improve the Nation's pavements. Many State highway Agencies choose an overlay rehabilitation alternative based on past experience and initial cost, without considering PCC overlay alternatives available and possible future cost savings.

Solution: State of Technology on Portland Cement Concrete Overlays

PCC Overlays are increasingly being used as a rehabilitation technique for both existing PCC and hot mix asphalt pavements. The use of PCC overlays offers a potential for extending service life, increased structural capacity, reduced maintenance requirement, and lower life-cycle cost when compared with other overlay alternatives. PCC overlays have been used to rehabilitate existing pavements for several decades. However, in the last decade, there has been an increase on the use of PCC overlays spurred by improvements in PCC paving technology. For example, innovations such as the use of zero-clearance pavers, fast track paving concepts, and high-early strength PCC mixtures have greatly increased the ability of PCC overlays to serve as a viable rehabilitation alternative that can meet almost any paving demand.

The FHWA in cooperation with the American Concrete Institute (ACI) has developed a synthesis report, entitled *PCC Overlays State of the Technology Synthesis Report*. This material presents the latest information on design, construction, and performance of PCC overlays. It

describes design and construction techniques for the four types of PCC overlays that are commonly used in highway pavement applications: bonded, unbonded, conventional whiteopping, and ultra-thin white topping. Information is also provided on the selection of PCC overlays as possible rehabilitation alternative for existing pavements. A one-day workshop and technical briefs are now available based upon the synthesis report.

Deployment Process:

The FHWA completed a contract that developed training material, report, and briefing documents. The contract included one pilot workshop, and four workshops for State Highway Agencies. With the contract now satisfactorily completed, ACI is taking over coordination of future workshop sessions nationwide. The PCC overlay workshop involves a one-day instruction with detail information on recommended applications, critical design elements, current overlay design methodologies, recommended construction practices, alternative selection, and performance highlights for each one of the four types of overlay described. Participants of the workshop receive one copy of the report and participant's handouts with printed slides. The workshop also includes two hands-on practice exercises that complement the learning process.

The FHWA offices can request the workshop by contacting the Resource Center or the Office of Pavement Technology. State highway agencies, local governments, industry and private organizations can request the workshop from ACI.

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