

State of Wisconsin/Department of Transportation
RESEARCH PROGRESS REPORT FOR THE QUARTER ENDING: June 30, 2005

Program: SPR-0010(36) FFY99

Part: II Research and Development

Project Title: Portland Cement Concrete Pavement Over Rubblized PCC

Project ID: 0092-00-11

Administrative Contact: Nina McLawhorn

Sponsor: WHRP

WisDOT Technical Contact: James Parry

Approved Starting Date: Mar 28, 2000

Approved by COR/Steering Committee:

Approved Ending Date: Nov 28, 2005

Project Investigator (agency & contact): Marquette University, James A. Crovetti

Percent Complete: 85%

Project Description:

This project is investigating the feasibility of placing PCC pavements over rubblized PCC pavements with or without interlayers. Finite element analyses of PCC pavement systems were conducted to investigate the contributions of rubblized PCC base layers of variable stiffness to stress reductions in the PCC surface layer under loadings. Field investigations of constructed test sections will also be included to document performance results and to validate the results of computer modeling.

Progress This Quarter:

(Includes project committee mtgs, work plan status, contract status, significant progress, etc.)

A performance review was conducted on the constructed PCC over rubblized PCC test sections. The initial project, constructed as a bus pad near the intersection of Wisconsin Avenue and 87th Street in Milwaukee was completed in early September, 2003. Based on the most recent performance review after 21 months of service, the corner break and mid-panel transverse crack which exist in the same outer corner slab remain at low severity ratings.

The second project was constructed along a 9-mile portion of the southbound lanes of I-39 in Portage/Marathon Counties, between CTH X and STH 34, WisDOT Project ID 1160-00-73. Primary pavement details include an 11 inch PCC slab placed over a 3 inch CABC interlayer placed over a 9 inch rubblized PCC layer. The pavements are performing well with limited distress after approximately 12 months of service. Observed distress includes limited low severity joint spalling and isolated low severity slab cracking and patching. One location of slab cracking includes a diagonal crack running across both traffic lanes, at a point approximately 1.1 miles south of the northern project limit. The second location of cracking includes a mid-panel transverse crack across the outer traffic lane just north of the southern project limit. Three full-width patches are also present, most likely the result of corrective actions due to mid-panel transverse cracking occurring during construction. At one patch location, approximately 3 miles south of the northern project limit, large areas of corrective surface grinding are also present. Deflection testing was intended but due to a hydraulic line failure on the Marquette 2m-FWD testing had to be delayed..

Work Next Quarter:

A field survey, including more detailed distress measurements and deflection testing will be conducted using either the Marquette University KUAB 2m-FWD (if repairs are complete) or the WisDOT KUAB 2m-FWD. This testing will be used to characterize the PCC over rubblized PCC pavement structure and to provide comparative measures to control sections constructed over CABC without rubblized PCC. Testing will be completed during periods of cooler temperatures (<70F) to avoid joint lock-up and to limit temperature curling.

Circumstances affecting progress/budget:

At the project inception it was proposed that PCC over rubblized PCC test sections would be constructed during the year 2000 construction season. Initially targeted construction projects were altered by WisDOT, removing the PCC surfacing and replacing it with HMA. Various attempts were made to incorporate PCC over rubblized PCC test sections on planned projects during subsequent years but no projects were constructed. The first successful modification was made to the 87th St construction project, completed by Milwaukee County DPW in August 2003, and included the construction of a single bus pad. The performance of this project has been monitored since construction, to date representing 21 months of service. A second construction project was completed in 2004 along I-39, representing the first significant PCC over rubblized PCC highway section. Performance monitoring has begun on this section but data collection will only extend to 15 months of service.