

# SPECIAL EXPERIMENTAL PROJECT (SEP-14)

## Alternative Pavement Bidding

Michigan Department of Transportation I-69 Design Build Finance Project Final Report Control  
Section 77024 Job Number 74766A

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## **Introduction**

The Michigan Department of Transportation (MDOT) submitted a final SEP-14 report for the use of alternative pavement bidding on M-6 in August, 2001. The SEP-14 work plan was developed in September of 2000 to allow both the concrete and asphalt paving industries to compete for the paving work on M-6, a new limited access freeway near Grand Rapids, MI.

MDOT's typical process selects one pavement option early in the design based on the results of a life cycle cost analysis. The SEP-14 work plan permits MDOT to develop structurally equivalent concrete and hot mix asphalt (HMA) pavement cross sections for a project. HMA and concrete paving contractors are then allowed the opportunity to competitively bid on the project. This process is intended to increase competition which may result in more favorable bids for MDOT.

In 2008, MDOT requested to pilot an alternate pavement bidding program based on the original SEP-14 work plan developed for M-6. The pilot program allows a limited number of highway projects to proceed with an alternate pavement bidding component. In 2008 and 2009, the FHWA approved adding projects to the SEP-14 work plan developed for M-6. Several of these projects have since been removed as alternate pavement bidding candidate projects, and a list of all projects and their current status is provided in Exhibit 6.

This report provides detailed information on the alternate pavement bidding project along I-69 in St. Clair County. Additional reports will be provided as additional alternate pavement projects are completed.

### **I-69 Design Build Finance Project Background (MDOT Control Section 77024, Job No. 74766A)**

MDOT selected a section of I-69 in St. Clair County to pilot a Design-Build-Finance (DBF) project that contained an alternate pavement bidding component. I-69 is the first project awarded since M-6 that contained an alternative pavement component. The I-69 DBF project reconstructed a six mile section of rural divided freeway, including the reconstruction of one interchange, pavement rehabilitation of an existing rest area, and rehabilitation of five structures.

The I-69 DBF project was awarded on September 2, 2008, and construction was completed in the fall of 2009. Concrete cross-overs were constructed in 2008, and the majority of the work was completed in 2009. The I-69 DBF project required the contractor to provide the financing of the project during construction. MDOT made a small initial payment to the contractor when the project was substantially completed. MDOT will continue to make small incremental payments every 3 months until November, 2011 (fiscal year 2012) when the balance of the contract will be paid.

## **I-69 DBF Project Procedures**

Life Cycle Cost Analysis MDOT developed the concrete and hot mix asphalt (HMA) pavement designs through the departments standard procedures, which utilize the 1993 AASHTO Guide for Design of Pavement Structures. During the advertisement of this DBF project, contractors were not permitted to propose changes to the design of the pavement structure. In order to account for the varying life cycle costs by each pavement structure, MDOT developed equations that would consider the initial construction costs, future maintenance costs, and user delay costs for each pavement alternative. The equations convert a contractors bid to an Equivalent Uniform Annual Cost (EUAC) for each pavement type. The contractor whose bid equated to the lowest EUAC would be selected for the project. The initial construction costs and the user delay costs were to be provided by the contractor in their bid; and MDOT estimated the future maintenance costs based on historical data. The contractor's bid was then entered into the equation associated with the specified pavement type. The contractor's bid included all work to construct the project including the pavement, earthwork signing, restoration, etc. Exhibit 5 contains the pay items used on this project.

To account for delays to the traveling public, MDOT incorporated lane rental costs into the project. Contractors were required to include a lump sum dollar amount in their bid that would reflect the cost of the delays to the public. MDOT provided the hourly rates contractors would be charged for each hour they had lane restrictions on I-69. Exhibit 3 contains the final lane rental special provision used on this project.

The I-69 project incorporated MDOT's frequently used special provisions for concrete and HMA paving, and for the material and workmanship warranty requirements (Exhibits 4 and 5).

Contracting Industry Involvement Through this project MDOT has reinforced the concept that early coordination with industry is critical when venturing into new methods of contract procurement. There were several industry meetings regarding the DBF concept, as well as the alternate pavement bidding component, prior to advertising the project.

A letter (See Exhibit 1) was provided to the Michigan Concrete Paving Association (MCPA), the Asphalt Paving Association of Michigan (APAM) and the Michigan Infrastructure and Transportation Associates (MITA) that detailed the development of the EUAC. This letter gave Michigan's contracting association's detailed information on how the EUAC equation was developed, and how it would be utilized in the I-69 DBF project. It also explained that user delay costs were determined by a lane rental pay item.

MDOT held a meeting with MCPA, APAM, and MITA to seek concurrence on the proposed alternate paving methodology. MCPA, APAM, and MITA had no objections to MDOT's proposed methods on the I-69 DBF project. The APAM stated that they believe the 26 year evaluation period currently used in MDOT's LCCA process should be a longer duration in order to adequately assess the actual maintenance costs on a pavement. However, APAM agreed this project should proceed per the current LCCA process. Exhibit 2 contains the minutes from this meeting.

I-69 Bid Evaluation The I-69 DBF project did not receive any bids from HMA contractors. MDOT speculates that an HMA pavement structure was cost prohibitive due to the additional earthwork required to construct the project with an HMA pavement.

The final bids received were under the engineer's estimate. The low bid was \$38,325,355. It is difficult to evaluate the effect of the alternate pavement component since only one paving industry submitted bids on the project, and the financing component of the project may have impacted the number of potential bidders.

MDOT does not believe the alternate pavement bidding component of the project added any significant cost to the development of the I-69 DBF contract. Additional internal costs to develop the alternate pavement bidding component were minimal because the project utilized design-build procurement. The procedures used on I-69 to determine the pavement sections are also performed on all MDOT trunkline reconstruction projects with pavement costs over \$1,000,000. Therefore, the costs to develop the alternate pavement component would be similar to the costs needed to determine the final pavement on traditional project.

#### **Final Evaluation of the I-69 Alternative Pavement Project**

The I-69 project was constructed entirely with concrete pavement. The design build contractor has proposed several changes on the project related to the paving to accomplish this. The original contract specified temporary HMA cross-overs and an HMA overlay at the rest area. The contractor proposed to use temporary concrete crossovers, and to whitetop the rest area. MDOT accepted both of these proposed changes. The contractor also proposed to change the transverse dowel bar spacing on the project. MDOT accepted this change and the project received a financial credit from the contractor for this work.

On February 9, 2009, MDOT held a post-award meeting with Michigan's contracting industries to discuss the I-69 DBF project, including the alternate pavement component. Contractors indicated that the method used to evaluate the concrete and HMA paving alternatives were clear. Industry did not offer any explanation or insight as to why only concrete paving contractors bid on the project.

To date, the MCPA has not voiced concerns with MDOT's alternate pavement bidding process, and supports the current process on future alternate pavement bid pilot projects. The APAM, at various meetings with MDOT, has reiterated their belief that the 26 year evaluation period currently used in MDOT's LCCA process should be a longer duration in order to adequately assess the actual maintenance costs on a pavement. MDOT has formed a technical committee to evaluate if changes are needed in the LCCA process, and is reviewing APAM's concern.

MDOT will continue to meet with industry on future alternative pavement projects.

**Update on Other Alternate Pavement Bidding Projects**

MDOT let an alternate pavement bid project on US-31 in Berrien County that was awarded on April 28, 2009. The contractor will use HMA for the pavement.

MDOT let a design-build alternate pavement bid project on I-475 in Genesee County that was awarded on December 16, 2009. The contractor will use concrete for the pavement.

MDOT let an alternate pavement bid project on I-94 in St Clair County that was awarded on December 16, 2009. The contractor will use concrete for the pavement.

A project on I-96 in Ingham County was originally selected to be an alternate pavement pilot project. This project was removed from consideration when the engineers estimate showed a cost difference of approximately \$12 million between the two pavement alternatives. MDOT contacted MITA, APAM, and MCPA with this finding, and the project will be designed and let with only the concrete pavement option designed per MDOT's typical pavement selection procedures.

MDOT will provide addition reports on each alternative pavement project once additional projects are completed, or as requested by the FHWA. MDOT expects to gather a better understanding of the effects of the alternate pavement component as more projects are placed under contract. These findings will be detailed in future reports.