



INDIANA DEPARTMENT OF TRANSPORTATION

Driving Indiana's Economic Growth

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November 2, 2009

TO: Mr. Robert F. Tally
Division Administrator
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THRU: Mr. Dave H. Andrews *DXA*
Manager, Office of Pavement Engineering

FROM: Mr. Pankaj G. Patel *PGP*
Pavement Research Engineer

SUBJECT: Work Plan for Special Experimental Project No. 14 (SEP-14)
For Alternate Bids on Pavement Type

Attached is a work plan for an Experimental Project which will use alternate bids to determine the pavement type on ten (10) projects.

It should be noted that these projects have been designed based on Mechanistic Empirical Pavement Design Guide (MEPDG) for both HMA and PCCP pavement types. The pavement design will be in accordance with Chapter 52 of the Indiana Design Manual (IDM). FHWA real cost software will be used to perform Life Cycle Cost Analysis (LCCA). One set of plans will be developed for each project. The project will be bid with both HMA and PCCP in an alternate pay items options along with all other pay items of the contract. These pay items options of HMA and PCCP will compare to each other using a present worth cost. The selected projects are on the National Highway System except one which is on interstate.

If additional information is required, please contact this office.

PGP
Cc: Thomas Duncan,

Encl,

Indiana Department of Transportation

WORK PLAN for Special Experimental Project, SEP-14 With Alternate Bids on Pavement Type

PURPOSE

The Indiana Department of Transportation (INDOT) has scheduled ten (10) Federal-aid projects that will incorporate a choice of alternate pavement type designs, Hot Mix Asphalt (HMA) pavement or Portland Cement Concrete Pavement (PCCP). INDOT has developed an innovative procedure for the implementation of alternate pavement bidding for these projects and are processing it as an experimental feature in the use of alternate bids to determine the pavement type on the project. INDOT has actively involved the Asphalt Pavement Association of Indiana (APAI), the Indiana Chapter of the American Concrete Pavement Association (ACPA) and a representative contingent of contractors that are members of these associations in the development of this procedure. These industry representatives generally approve of utilizing this experimental process to determine if there is merit in it as a sound procedure to promote competition and provide economic benefits to the tax payers and stakeholders.

SCOPE

INDOT has selected the ten (10) projects for utilizing alternate bids to determine the pavement type. Out of these ten projects five (5) of them are on US 31 Kokomo By-Pass, one (1) on SR 25 Hoosier Heartland, one (1) each on Proposed Interstate 69 and Interstate 469, one (1) on PR 641 Terra Haute By-Pass, and one (1) on US 24 Fort to Port. All projects are on new alignment except I-469 and involve constructing new pavement. The Descriptions of the projects are as follow:

Description of Projects						
Route	Des. No.	Contract No.	Location	County	Letting Date	Length
US 31	0800268	R-30108	0.5 mi S of SR 26 to 0.5 mi N of SR 26	Howard	1/13/2010	1.0 mile
US 31	0600339	R-30108	0.5 mi N of SR 26 to 1.5 mi S of SR 22/US 35	Howard	1/13/2010	1.25 miles
PR 69	0800284	R-30983	0.03 mi N of SR 68 to 1.54 mi N of SR 68	Gibson	2/10/2010	1.5 miles
SR 25	9802920	R-30840	I-65 to 0.1 mi E of CR 750 E (Seg. 1, Ph-A)	Tippecanoe	4/14/2010	4.5 miles
US 31	0800234	R-30889	0.5 mi S to 0.5 mi N of SR 22/US 35	Howard	7/7/2010	1.0 mile
US 35	9706380	R-30889	Goyer Rd to CR 300 E	Howard	7/7/2010	1.95 miles
US 24	0300291	R-30162	0.5 mi E of I-469 to 0.5 mi E of Ryan/Bruick Rd Phase-1	Allen	8/4/2010	2.5 miles
US 31	0600340	R-30107	CR 550 N to 0.5 mi S of SR 26	Howard/ Tipton	7/20/2011	2.5 miles
PR 641	0200305	R-30091	1600 ft N of SR 46/Riley Rd to I-70 (Ph-IVA)	Vigo	4/11/2012	1.0 mile
I-469	0400603	R-30314	0.7 mi W of SR 1 to 0.5 mi E of US 27	Allen	10/7/2011	6.55 miles

INDOT will submit all documentation required for a complete evaluation under SEP14. The schedule of the projects bid letting varies.

The INDOT Alternate Pavement Bidding procedure is a non-traditional construction contracting technique which deviates from the competitive bidding provisions in 23 USC 112. INDOT expects to evaluate this procedure by measuring three (3) benefits from the process:

1. Attract more bidders and competition.
2. Obtaining true cost savings over similar conventional bid projects.
3. Provide a more competitive market, i.e. lower bid costs on paving items using this procedure versus the standard procedure where the pavement type is pre-determined.

SCHEDULE

The contract will be advertised approximately four weeks prior to the letting date of a respective project. The target for award date will be one week after the letting date. The date for work to proceed will be approximately two weeks after the award date. The target for completion of construction for each project will be determined at a later time closer to the letting date.

MEASURES

The project will be evaluated to determine if the low bid alternate was the same alternate determined to be most economical by INDOT's standard Pavement Type Selection (PTS) process. INDOT will also evaluate the process for its success in attracting more bidders than under the conventional bidding method.

INDOT will compare each bid to the appropriate estimated alternate design, and review all bids to determine whether there were irregularities associated with this bidding process. There will be no adjustments made to the method of payment for either asphalt or concrete. Concrete pavements are paid by the square yard with cores taken to determine the thickness. Asphalt pavements are paid by the ton and the contractor is required to place the material at the proper rate to achieve the specified thickness, density, air voids, and VMA.

The successful low bid will be evaluated to determine if alternate bidding provides true cost savings to the State. The bids received will be evaluated to determine if alternate bidding is providing a more competitive market, such that lower bid costs on all items are being received than on like projects on which the pavement type was specified. The evaluation will also include the industry's comments on the alternate bidding process.

PROPOSED BIDDING PROCEDURE

- 1) INDOT uses Mechanistic Empirical Pavement Design Guide (MEPDG) software to design HMA and PCCP pavements.
- 2) One set of plans will be developed for each project with both HMA and PCCP typical section. The project will be bid with both HMA and PCCP in an alternate pay items options. The separate pay items options for the HMA and PCCP alternates will include all pay items for the contract.

- 3) INDOT will use FHWA real cost software to perform Life Cycle Cost Analysis (LCCA) on the pavement designs for both HMA pavement and PCCP.
- 4) Both HMA pavement and PCCP will be analyzed for a 50 year service life. The strategy for LCCA is as follows:

HMA Pavement:

- a) 20 Year Design
- b) Joint Seal at year 3, 6, 9, 12, 15, & 18
- c) At year 20 Functional Overlay and cost of items as follow:
 - 1) 1" mill on Travel Lanes and Inside and Outside shoulder
 - 2) Overlay on Travel lanes and inside shoulder (same pay items) with 1.5" Surface on 2.5" Intermediate.
 - 3) Overlay on Outside shoulder with 1.5" Surface on 2.5" Intermediate.
 - 4) Traffic Maintenance (5%).
- d) Joint Seal at year 23, 26, 29, & 32
- e) At year 35 mill and resurface and cost of items as follow:
 - 1) 1" mill on Travel Lanes and Inside and Outside shoulder.
 - 2) Overlay on Travel lanes and inside shoulder (same pay items) with 1.5" Surface.
 - 3) Overlay on Outside shoulder with 1.5" Surface.
 - 4) Traffic Maintenance (5%).
- f) Joint Seal at year 38, 41, 44, & 47
- g) At year 50 salvage value \$0.00.

PCCP:

- a) 30 year Design
- b) Joint Seal at year 8, 16, and 24
- c) At year 30 Functional Overlay and cost of items as follow:
 - 1) Profile Scarify mill PCCP on Travel Lanes.
 - 2) Profile Scarify mill on Inside and Outside HMA shoulder.
 - 3) Full depth PCCP patch on Travel Lanes about 1.5% of the area.
 - 4) Overlay on Travel lanes and inside shoulder (same pay items) with 1.5" Surface on 2.5" Intermediate.
 - 5) Overlay on Outside shoulder with 1.5" Surface on 2.5" Intermediate.
 - 6) Traffic Maintenance (5%).
- d) Joint Seal at year 33, 36, & 39
- e) At year 42 mill and resurface and cost of item as follow:
 - 1) 1" mill on Travel Lanes and Inside and Outside shoulder.
 - 2) Full depth patch on Travel Lanes about 0.75% of the area.
 - 3) Overlay on Travel lanes and inside shoulder (same pay items) with 1.5" Surface.
 - 4) Overlay on Outside shoulder with 1.5" Surface.
 - 5) Traffic Maintenance (5%).
- f) Joint Seal at year 45 & 48
- g) At year 50 salvage value \$0.00.

INDOT uses a 4.0% Discount Rate, No user cost, and No future miscellaneous cost associated with rehabilitation of pavement contracts such as sign, guardrail, etc. Both the Asphalt and Concrete Pavement industries participated in the development of the 50 year service life pavement strategies that INDOT uses; however, both believe that treatment life and year of application need to continue to be monitored

- 5) Cost of the items for both HMA pavement and PCCP will come from the data base maintained by the Office of Pavement Engineering as unit price averages.
- 6) Pavement design and LCCA will yield two Present Worth (PW) Costs, one for HMA pavement and one for PCCP.
- 7) Both pay item options will be compared to each other with pay item option amount plus present worth cost as follows:

$$\text{HMA Pay Item Option} = \text{HMA Pavement pay item option Amount} + \text{PW of Future HMA Rehabilitation}$$

$$\text{PCCP Pay Item Option} = \text{PCCP pay item option Amount} + \text{PW of Future PCCP Rehabilitation}$$

Winner Bid = Lower of HMA Pay Item Option versus Lower of PCCP Pay Item Option

The winner Bid with lower pay item option will be executed for that type pavement. This procedure will be published when the solicitation for bids is advertised. The PW of Future HMA Rehab and PW of Future PCCP Rehab will not be published until the bid is opened.

REPORTING

INDOT will prepare and submit to FHWA an initial and final report on the project. The initial report will include the paving industries' reaction to the alternate bid for pavement type selection process. It will also contain the letting procedures, individual pavement pay items, quantities, and cost for the work as well as the life cycle cost procedures and estimated costs. The initial report will be issued within six (6) month of the individual project letting.

INDOT will prepare and submit to FHWA a final report at the completion of the individual project construction and when the contract is finalized. The final report will contain an overall evaluation of the process along with any suggestions and recommendations for improving the process. Additional information will be obtained and included in the final report in regard to the feasibility of this type of procedure being utilized on future projects. The advantages and disadvantages of this type of bidding process from both the INDOT's and Industries' points of view will be evaluated further.