I-64 Pavement Rehabilitation

Carter County, KY.
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VALUE ENGINEERING STUDY

FINAL REPORT

May 19, 2005

EXECUTIVE SUMMARY

A value engineering study of the Interstate 64 pavement rehabilitation project located in Carter County Kentucky has been completed. The topics were the amount of level and wedging set up on the job and the rock cuts. Those in attendance were the following:

Scott Tingle – Central Office, Highway Design
Evan Wisniewski – FHWA
Darrin Eldridge – District 9, Design
David Ritchie – District 9, Design
Dan Hite – Central Office, Pavement Design
Michael Blevins – Division of Materials, Geotechnical Branch
Siamak Shafaghi – Central Office, Highway Design
Charles Briggs – Central Office, Maintenance
Katrina Bradley – Chief District Engineer, District 9
Robert Martin, Central Office, Highway Design
Robert Semones, Central Office, Highway Design

The value engineering team focused on two major cost items concerning the project. One major cost item is the level and wedging setup for the project and the other major item is the stability of the existing cut slopes.

ALTERNATES OF LEVEL AND WEDGING

Three different alternates of level and wedging for the job were investigated. All alternates attempt to correct the shoulder slope, upgrade the mainline cross slope and include a thickness of overlay.

Alternate Number 1

Alternate Number 1 (See enclosed illustration) consists of upgrading the shoulder from an existing 8 percent slope to a more desirable 4 percent slope. This method consists of constructing a wedge beginning at the edge of the outside driving lane and constructing a wedge of pavement over the 10 foot shoulder. This method for the shoulder is used in conjunction with the mainline cross slope correction. The existing cross slope is 3/16” per foot while the recommended cross slope is ¼” per foot. Quantities and costs for alternate number 1 was compared using a ½” overlay and a 1” overlay.

Quantities of pavement for ½" overlay

Shoulder – 21,335 tons
Mainline cross slope correction – 5,343 tons
½" overlay – 7,124 tons

Total for alternate number 1 – 33,820 TONS (1/2" OVERLAY)

Total for alternate number 1 - (1" OVERLAY) – 40,945 TONS (conservative)

Cost for alternate number 1 using a ½" overlay is estimated to be $1, 050,484.00

Cost for alternate number 1 using a 1" overlay is estimated to be $1,271,794.00

Alternate Number 2A

Alternate Number 2A (See enclosed illustration) consists of milling the mainline 1" in depth beginning at the centerline of the driving lanes over to the shoulder and basically construct the shoulder wedge as mentioned in Alternate Number 1.

Quantities for milling – 20,348 tons
Level and wedging – 12,468 tons

Cost for Alternate Number 2 - $894,325.00

Alternate Number 2B

Alternate Number 2B (See enclosed illustration) consists of milling the mainline beginning at the crown and extend the milling to the shoulder. The shoulder would be constructed basically the same method mentioned above.

Quantities for milling – 5,500 tons
Level and wedging – 17,455 tons

Cost for Alternate Number 2 - $795,993.00

It must be noted that the above figures are in addition to a requested final overlay of 4.5 inches of pavement for the project. The current cost estimate shows 55,000 tons of level and wedging while alternate number 1 shows a very conservative figure of 40,945 tons. It was discussed in the meeting that 10,000 additional tons of level and wedging would be needed for problem areas along the pavement to repair swales, and areas of the shoulder once the cut slopes are corrected.

Since the project team has experienced this type of problem in the past, it is the consensus of the project team to accept the current bid of 55,000 tons of level

and wedging for the project. This would minimize any change orders pertaining to additional level and wedging in the future.

CUT SLOPE CORRECTIONS

The cut sections within the project limits are comprised mainly of shales and sandstone. The sandstone layer varies in elevation along the cuts. If benching was used, the shale layer below the sandstone would weather and ultimately undermine the layer of sandstone above it. Once the shale layer weathers below the sandstone, the sandstone tends to become unstable and fail in large boulders. This would be very costly in the future since it would be a constant maintenance problem.

The Geotechnical Branch has recommended constructing the cut slopes on a 1:1/2: 1 configuration. This would leave the face of the slope uniform, thus minimizing the failure of the shale layer resulting in less maintenance problems. (See geotechnical report enclosed).

It is recommended by the project team to accept the proposed addition of the cut slopes stability recommendations with the pavement rehabilitation of this project. The cut slopes along with the pavement rehabilitation can be performed with one job. This will eliminate the need to perform work on the cut slopes in the future.

Enclosed is a copy of the geotechnical report and calculations verifying the level and wedging.

If there are nay questions or comments regarding this study, please feel free to contact Robert Semones at 502-564-3280.