VE 199910

Commonwealth of Kentucky
Transportation Cabinet
Frankfort, Kentucky 40622

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Secretary of Transportation

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Deputy Secretary

MEMORANDUM

TO: Value Engineering Decision Makers
and Other Interested Parties

FROM: Robert Semones, P.E. RTS
Value Engineering Coordinator

DATE: August 18, 1999

SUBJECT: Perry County
KY 15 Reconstruction from North KY 550 to KY 28
FD04 097 0015 013-017 048 D
FD52 097 0015 015-021 052 D; OOONH 00151 023
Item No. 10-269.00 & 10-269.01
Value Engineering Study

The value engineering study for this project has been completed. Seven value opportunities for the project were presented.. The value opportunities offer $14,200,818.00 in savings. Comments on the Value Engineering study were received from the Division of Design- Location Section, Division of Bridges and GRW Engineers, Inc.

Value Opportunity No. 1 involves the removal of the existing structure carrying KY 15 traffic across the Kentucky River Coal Co. Railroad and First Creek and replacing it with a new structure carrying northbound and southbound traffic.

The value engineering team proposed using the existing structure for southbound KY 15 traffic.

Comments: The existing bridge would not have the required superelevation rate for the proposed roadway design. Widening the existing piers would reduce the horizontal clearance to the railroad tracks, which is currently, less than desirable. Widening on the inside of the existing KY 15 horizontal curve (superelevated) would reduce the vertical clearance for the railroad, which is already at a minimum. Due to these issues, this value opportunity is not accepted for implementation.

Value Opportunity No. 2 deals with the modification of the template under the Daniel Boone Parkway and ramps. The proposed typical section for KY 15 under the Daniel Boone Parkway consists of a Standard Barrier Median (Type 2) and standard curb and gutter.

The value engineering team recommended removal of all curb and gutter. The value engineering team felt like this would eliminate the snow removal problems associated with the raised curbs and medians and eliminate future maintenance costs associated with these items.

Comments: The project team felt curb and gutter would be necessary to channelize the traffic associated with this busy signalized interchange. There is also concern that traffic problems would develop because of the vehicles not adhering to pavement markings. Due to these concerns, this value opportunity will not be recommended for implementation.

Value Opportunity No. 3 involves the median width. The proposed median width is 14 feet.

The value engineering team proposes the use of a 12-foot median width. The value engineering team felt that the 12-foot median width would provide an adequate width for left turn storage and would also provide an adequate acceptable lateral separation between the opposing traffic lanes. The value engineering recommendation would reduce the amount of cut in some areas thus reducing construction costs.

Comments: The 14 foot median width was proposed due to the large amount of coal truck traffic in the area. The wider median provides an improved maneuvering mechanism for the large trucks. The heavy traffic along with the amount of trucks in this area warrants justification that this recommendation not be considered for implementation.

Value Opportunity No. 4 deals with the project limits. The "As Proposed" northern limit for this KY 15 project is Sta. 6+176.540. The southern limit for the adjoining project has already been moved to the south to approximate Station 4+900. This means that another consultant is already designing the last 1,800 meters of this project.

The value engineering team suggests this project end at Station 4+336.991, which is a T.S. point on the alignment. This would shorten this project by 1,839.5 meters. The cost of this 1,839.5 meter section should not be included in this project since it has already been included in the WMB project to the north. The 1,839.5 meter reduction of this project would result in an estimated construction cost savings (for this project) of $2,106,080. In addition to the construction cost that should not be included in this project, there is also an estimated right of way cost reduction of $2,605,700 for a total of $4,711,780.00 in proposed savings.

Comments: The project team has been discussing the realignment at KY 28 and will make appropriate adjustments in the project limits as necessary. Much of the decision will depend on the staging of the construction segments.

The value engineering section will continue to track this value opportunity.

Value Opportunity No. 5 involves the frontage road near the KY 267 interchange. The "As Proposed" consists of using the existing roadway of KY 15 as a frontage road to provide access to abutting businesses with two connections (approx. Sta. 13+230 & Sta. 13+660) to connect the proposed frontage road to relocated KY 15. In addition, a residential drive near the northerly end of the frontage road is also proposed to be connected to relocated KY 15 (approximate Sta. 13+765). A new connection to KY 267 on the west side of KY 15 is proposed to intersect at approximately Sta. 13+000. Because of the terrain, the proposed grade for KY 15

is 6.5% in this general area. The proposed KY 267 connection is to be located near the bottom of this steep grade.

The value engineering team concluded that it would be advantages to extend the frontage road to the new construction of KY 267.

Comments: The project design team feels this recommendation moves the KY 267 North intersection to a more desirable location. An issue considered in designing the frontage road was the truck traffic frequently accessing the businesses adjacent to the proposed frontage road. Semi-trailers often stop traffic on KY 15 to back into these businesses. With the frontage road as proposed for the preferred alternate, there would be adequate room for trucks to access the businesses as well as enter and exit KY 15 without turning around. The VE proposal would require all large trucks to turn around before re-entering KY 15. Another possibility is to keep Approach Road "A" (south frontage road approach) and extend the frontage road to KY 267. This would still eliminate the KY 267 intersection close to the bridge and allow better access to the businesses. These considerations may be outweighed by improved safety associated with the VE recommendation. It is important to note that this recommendation will add costs to the project. The projected additional cost for this recommendation is $500,000.00

It is recommended that this value opportunity be considered for further study.

Value Opportunity No. 6 deals with an alignment revision. The "As Proposed" alignment leaves the existing KY 15 at approximately Sta. 0+900 and goes cross country with a tangent section through a high hill for some 800 plus meters and ties back in with the old KY 15 alignment at approximate Sta. 2+200. This alignment keeps the new facility completely away from the water park commercial area while providing access to it. This alignment requires a very large amount of excavation due to the cut section through the hill. It should be noted that this alignment completely displaces the small cemetery left of Sta. 1+830. There are approximately 40 graves in the cemetery.

The value engineering team identified the alignment from Sta. 0+900 to Sta. 2+200 as a potential area for an alignment relocation to reduce the excavation. This proposed shift is approximately halfway between the existing KY 15 and the "As Proposed " alignment. The Value Engineering recommended alignment comes down the hillside and more closely follows the contour lines. This alternate keeps the new facility away from the waterpark commercial area but greatly reduces the amount of excavation required. The cemetery left of Sta. 1+830 is not disturbed with the Value Engineering Alternate (See report for illustration).

The estimated possible savings with the Value Engineering Alternative are $7,072,160. These savings are a result of the large decrease in roadway excavation (2,073,169 cu. m VS 674,737 cu. m) by shifting the alignment to avoid a cut having a maximum depth of approximately 77 meters as compared to 35 meters in the Value Engineering Alternative.

This alternative needs to be considered for further implementation.

Value Opportunity No. 7 deals with reducing the shoulder width from 3.6 meters fully paved to 3.0 meters fully paved.

Comments – The design team feels that a 3.6 meters fully paved shoulder would be beneficial in this case. This recommendation should not be implemented.

The maximum possible savings from the implemented recommendations are approximately **$11,283,940.00**

We would like to thank those who participated or assisted in making this a successful value engineering study. Please contact this office if you have any comments.

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