

**DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA**

INTERDEPARTMENT CORRESPONDENCE

FILE: EDS-545(40), BRN-014-1(73) & (74) McDuffie **OFFICE:** Engineering Services
P. I. Nos.: 222250, 227815, & 227816
U.S. 78/S.R. 17/S.R. 10 Widening and Reconstruction

DATE: September 11, 2007

FROM:  Brian Summers, P.E., Project Review Engineer

TO: Babs Abubakari, P.E. State Consultant Design and Program Delivery Engineer

SUBJECT: IMPLEMENTATION OF VALUE ENGINEERING STUDY ALTERNATIVES

Recommendations for implementation of Value Engineering Study Alternatives are indicated in the table below. Incorporate alternatives recommended for implementation to the extent reasonable in the design of the project.

ALT No.	Description	Savings PW & LCC	Implement	Comments
ROADWAY (R)				
R-1	Reevaluate the existing pavement analysis from Sta. 0+00 to Sta. 186+83; and if possible, utilize the existing pavement and profile "as is"; upgrade existing pavement to meet structural or surfacing requirements.	\$2,351,141	No	Based on recommendations approved by the Pavement Design Committee, full depth pavement should be used.
R-7	Retain Existing CR 6/Smith Mill Road existing alignment.	\$63,328	Yes	This should be done.
R-11	Retain Existing CR 301/Ridge Road/CR 5/Russell's Landing Road	\$656,559	Yes	This will be done. Subsequent evaluations determined that the existing intersection provides the minimum Intersection Sight Distance; however, a Design Exception/Variance will be required.

ALT No.	Description	Savings PW & LCC	Implement	Comments
ROADWAY (R) - continued				
R-14	Delete Type 7 Curb and Gutter at intersections	Design Suggestion	Yes	This should be done.
R-15	Increase Shoulder Paving to full depth and add "V" Gutter in lieu of Asphalt Curb	Design Suggestion	Yes	This should be done.
R-16	Review cost estimate for bridge removal cost (appears very low), and the quantity of Rip Rap being called for (appears high)	Design Suggestion	Yes	This should be done.
BIG CREEK BRIDGE (BCB)				
BCB-3	Construct one new total width bridge in lieu of two new bridges	\$535,942	No	Not consistent with the typical section for bridges on a GRIP corridor.
BCB-4	Use Steel "H" Piles in lieu of Drilled Caissons	\$307,596	No	Bridge Office recommends Drilled Caissons due to the existing Geotechnical conditions and increased span lengths; layout is being revised, so spans will be longer and loads will be increased for each bent.
BCB-5	Use a 32' bridge width design (gutter to gutter)	\$416,609	No	Based on the Design Year traffic (13,800) and 17% trucks, the State Bridge Design Engineer recommends retaining the 38' gutter to gutter width at this location. This bridge is 320' long.
HART CREEK BRIDGE (HCB)				
HCB-1	Construct one new total width bridge in lieu of two new bridges	\$311,598	No	Not consistent with the typical section for bridges on a GRIP corridor.

ALT No.	Description	Savings PW & LCC	Implement	Comments
HART CREEK BRIDGE (HCB) - continued				
HCB-2	Use Steel "H" Piles in lieu of Drilled Caissons	\$307,596	No	Bridge Office recommends Drilled Caissons due to the existing Geotechnical conditions.
HCB-3	Use a 32' bridge width design (gutter to gutter)	\$125,741	No	Based on the Design Year traffic (13,800) and 17% trucks, the State Bridge Design Engineer recommends retaining the 38' gutter to gutter width at this location. This bridge is 180' long.
DRAINAGE (D)				
D-1	Consider Jack and Bore in lieu of "open cut" for Stage I Construction	Design Suggestion	No	The Staging will be revised to better accommodate drainage for Stage I.
D-3	Consider using pipes in lieu of box culverts to save open cut	Design Suggestion	Yes	Pipes will be considered in lieu of box culverts, where appropriate.
D-4	Review and modify the construction documents and/or staging plan as needed to transport stormwater runoff from new southbound lanes to an outfall on east side of northbound lanes. May need to consider routing runoff north or south in median to be able to cross northbound lanes.	Design Suggestion	Yes	This should be done.

A meeting was held on August 29, 2007 to discuss the above recommendations. Mitchell Greenway with Stantec, Tom Cox with Consultant Design, and Brian Summers, Ron Wishon and Lisa Myers with Engineering Services were in attendance. Additional information was provided on September 7, 2007 and a follow up meeting was held on October 1, 2007 with Mike Haithcock, Tom Cox, Paul Liles, Bill Duvall, Brian Summers, Ron Wishon and Lisa Myers in attendance.

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VE Study Implementation
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Approved:  Date: 10/10/07
Gerald M. Ross, P. E., Chief Engineer

BKS/REW

Attachments

c: Gus Shanine
Todd Long
Rusty Merritt
Lynn Bean
Richard Marshall
Tom Cox
Joe King
Ken Werho
Nabil Raad
Lisa Myers

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

INTERDEPARTMENT CORRESPONDENCE

FILE EDS-545(40) McDuffie County **OFFICE** Atlanta
PI No. 222250
US 78 / SR 17 / SR 10 Widening **DATE** August 16, 2007



FROM Mohammed (Babs) Abubakari, P.E.
State Consultant Design & Program Delivery Engineer

TO Brian Summers, P.E. Project Review Engineer
Attention: Lisa Myers

SUBJECT VALUE ENGINEERING STUDY – FINAL REPORT RESPONSE

Below are the responses to the Value Engineering Study conducted on April 16-19, 2007 for the above referenced project. Each comment was studied and addressed by both the Department's Project Manager and the Consultant's Project Manager:

**The Widening and Reconstruction of US 78 / SR 17 / SR 10
From SR 43 to CR 6/Smith Mill Road**

ROADWAY (R):

Value Engineering Alternative No. R-1: Re-evaluate existing pavement analysis from Sta. 0+00 to Sta. 186+83; and if possible, utilize the existing pavement and profile as is; upgrade existing for "structure" and or "surface course" as needed.

COMMENTS: This recommendation has been reviewed and considered. A.J. Jubran, State Pavement Engineer, reviewed the original full depth reconstruction recommendation and commented as follows:

The pavement recommendation was based on: 1) core conditions of the existing pavement show bottom up cracking (cracked full depth), and 2) approximately 29% of the existing pavement was originally intended to be retained. The existing pavement is approximately seven (7) inches in depth over a sand clay base. The recommended full depth pavement structure is 11.5 inches of asphaltic concrete (AC) over 12 inches of graded aggregate base. The VE Study recommends overlaying the existing pavement that is proposed to be retained with 3.5 inches of AC.

As a rule of thumb, bottom up cracks re-appear at the rate of one year per inch of overlay thickness. If this alternative is adopted, the existing pavement will have to be resurfaced in approximately 3.5 years, and every 1.5 years thereafter.

(We do not recommend the implementation of this design suggestion).

Value Engineering Alternative No. R-7: Retain Existing CR 6/Smith Mill Rd. existing alignment.

COMMENTS: This recommendation will be carried forth. The plans will be revised to retain the existing CR 6/Smith Mill Rd. alignment and extend tie-in only as necessary.

Value Engineering Alternative No. R-11: Retain Existing CR 301 (Ridge Road)/CR 5 (Russell's Landing Road)alignment.

COMMENTS: This recommendation has been reviewed and considered. The existing alignment of CR 301 ties to SR 17 at a 58-degree angle. The existing alignment of CR 5 ties to SR 17 at a 68-degree angle. Both angles are less than the 70-degree minimum set forth in GDOT's Design Policy Manual. Maintaining the existing tie-ins with the proposed divided highway will result in increased exposure time for crossing movements, sharper turning angles, and increased driver discomfort.

Smaller curves to tie in with SR 17 would result in an offset intersection. While the AASHTO *Green Book* acknowledges that this is an acceptable realignment, it would require vehicles from one of the intersecting roads to perform u-turn movements at a median crossover upstream from the desired travel direction. This would require increased exposure time for those vehicles and is not recommended.

(We do not recommend the implementation of this design suggestion.)

Value Engineering Alternative No. R-14: Delete type 7 curb and gutter at intersections.

COMMENTS: This recommendation will be carried forth. The plans will be revised accordingly.

Value Engineering Alternative No. R-15: Increase shoulder paving to full depth and add "V" gutter in lieu of asphalt curb.

COMMENTS: This recommendation will be carried forth. The plans will be revised accordingly.

Value Engineering Alternative No. R-16: Review cost estimate for bridge removal cost (appears very low), and the quantity of rip rap being called for – appear high.

COMMENTS: This recommendation will be carried forth. The detailed estimate and opinion of probable costs will be reviewed and revised as necessary.

BIG CREEK BRIDGE (BCB)

Value Engineering Alternative No. BCB-3: Construct one new total width bridge in lieu of two new bridge.

COMMENTS: This recommendation has been reviewed and considered. This alternative is not consistent with the shoulder widths as per discussion with the Office of Bridge Design on GRIP Corridor projects with a 65-mph design speed. The VE study recommended 2' inside shoulder widths and 6' outside shoulder widths. The inside shoulders widths need to be at 4' and the outside shoulder width needs to be 10'.

(We do not recommend the implementation of this design suggestion.)

Value Engineering Alternative No. BCB-4: Use "H" piles in lieu of drilled caissons.

COMMENTS: This recommendation has been reviewed and considered. This alternative will be implemented if structurally feasible. There is concern over the unbraced length of the piles, and whether the required piles will be economically feasible. Stantec will evaluate this and discuss the most economical and structurally sound method with GDOT's geotechnical and bridge personnel and the project geotechnical engineer.

Value Engineering Alternative No. BCB-5: Use a 32' bridge width design (gutter to gutter).

COMMENTS: This recommendation has been reviewed and considered. This alternative will not be consistent with the shoulder widths as per discussion with the Office of Bridge Design on GRIP Corridor projects with a 65-mph design speed. The VE study recommended 2' inside shoulder widths and 6' outside shoulder widths. The inside shoulders widths need to be at 4' and the outside shoulder width needs to be 10'.

(We do not recommend the implementation of this design suggestion.)

HART CREEK BRIDGE (HCB)

Value Engineering Alternative No. HCB-1: Construct one new total width bridge in lieu of two new bridge.

COMMENTS: This recommendation has been reviewed and considered. This alternative will not be consistent with GDOT Policy for shoulder widths on GRIP Corridor projects with a 65-mph design speed. The VE study recommended 2' inside shoulder widths and 6' outside shoulder widths. The inside shoulders widths need to be at 4' and the outside shoulder width needs to be 10'.

(We do not recommend the implementation of this design suggestion.)

Value Engineering Alternative No. HCB-2: Use "H" piles in lieu of drilled caissons.

COMMENTS: This recommendation has been reviewed and considered. This alternative will be implemented if structurally feasible. There is concern over the unbraced length of the piles, and whether the required piles will be economically feasible. Stantec will evaluate this and discuss the most economical and structurally sound method with GDOT's geotechnical and bridge personnel and the project geotechnical engineer.

Value Engineering Alternative No. HCB-3: Use a 32' bridge width design (gutter to gutter).

COMMENTS: This recommendation has been reviewed and considered. This alternative will not be consistent with GDOT Policy for shoulder widths on GRIP Corridor projects with a 65-mph design speed.

(We do not recommend the implementation of this design suggestion.)

DRAINAGE (D)

Value Engineering Alternative No. D-1: Consider jack and bore in lieu of "open cut" for Stage 1 construction.

COMMENTS: This recommendation has been reviewed and considered. Staging plans will be revised to accommodate drainage during construction. Jack-and-bore should not be necessary.

(We do not recommend the implementation of this design suggestion.)

Value Engineering Alternative No. D-3: Consider using pipes in lieu of box culverts to save open cut.

COMMENTS: This recommendation should be carried forth, but not from a standpoint of jack-and-bore. Pipes will be used instead of box culverts at appropriate locations.

Value Engineering Alternative No. D-4: Review and modify the construction documents and or staging plan as need be, to transport stormwater runoff from new southbound lanes to an outfall on east side of northbound lanes. May need to consider routing runoff north or south in median to be able to cross northbound lanes.

COMMENTS: This recommendation should be carried forth. Drainage will be designed to accommodate drainage during staging. Longitudinal pipe systems will be considered in the medians where necessary.

Cox, Tom

From: Greenway, Mitchell [mitchell.greenway@stantec.com]
Sent: Tuesday, September 25, 2007 3:06 PM
To: Cox, Tom
Cc: Gillis, Bret
Subject: RE:
Attachments: SIGHT DISTANCE PLANS.pdf; SIGHT DISTANCE PROFILES.pdf

Tom,

I sketched lines-of-sight on the profile and plans for existing and proposed (as currently designed) conditions. Results are tabulated below.

	<u>Sight Distance (approximate)</u>		<u>Stopping Sight Distance</u>	
	<u>Looking South</u>	<u>Looking North</u>	<u>Flat Grades</u>	<u>3% Upgrades</u>
Existing (55 mph)	2080'	620'	495'	469'
Proposed (65 mph)	2080'	735'	645'	612'

The intersection is at the top of a crest vertical curve with proposed grades of +2.37% and -4.89%. The sight distances, determined from Microstation design files, exceed the minimum stopping sight distance. Of course, the existing stopping sight distance should be confirmed in the field. To date, this has not been verified. Sight distance is controlled by the vertical elements. Horizontal sight distance far exceeds the vertical sight distance. I show this in the attached pdf files. The profiles drawing shows the calculated sight distance. The plans drawing shows a horizontal check of this sight distance. (The drawings should print on 24x36 at 100 scale)

Again, the decision to proceed with the conceptual layout was based primarily on the minimum intersection angle limitations defined in the GDOT Design Policy Manual. It should be noted that traffic on CR 5 is mainly recreational vehicles (RVs, trucks pulling campers, trucks pulling boats, etc.).

Mitchell

From: Cox, Tom [mailto:Thomas.Cox@dot.state.ga.us]
Sent: Tuesday, September 25, 2007 12:00 PM
To: Gillis, Bret; Greenway, Mitchell
Subject: RE:

Bret,

You or Mitch won't need to come to this meeting. The Chief Engineer is looking at our VE recommendations and has questions. The "new" mindset is to have **all of the justification in complete detail in writing & it includes calculations , etc.** for valid reasons for not using or using VE study recommendations.

They are also considering other options just as putting a median opening and keeping the existing side road alignments as is. They wanted the existing sight distances so they can look at this further. If you can give me the required sight distances using the existing side roads if available.

Also based on a to risk analysis being performed now we may end up using a 32' bridge width for Big Creek & Hart Creek.

Thanks,

Tom

From: Gillis, Bret [mailto:bret.gillis@stantec.com]
Sent: Tuesday, September 25, 2007 11:30 AM
To: Greenway, Mitchell; Cox, Tom
Subject: RE:

Tom - Please see additional comment below in red. Thanks. Bottom line is that this is not a really sight distance issue, but rather one of driver comfort and GDOT policy. The wide proposed right-of-way and roadway widening would likely ensure adequate clearing for sight distances anyway. The decision for realignment was based on standard GDOT policy. These alignment were in the concept prepared by GDOT, and we have maintained these alignments throughout the project design.

We have already had a VE implementation meeting for this project. Does the mean there will be another meeting on October 1st that we should attend?

From: Greenway, Mitchell
Sent: Tuesday, September 25, 2007 11:13 AM
To: Cox, Tom
Cc: Gillis, Bret
Subject:

Mitch/Bret,

Tom,

What sight distance calcs are you referring to? The reason this alternative was not selected is because the intersection angles were 58 degrees and 68 degrees. Both are less than the 70-degree minimum in GDOT's Design Policy Manual. The profile through that intersection meets speed design of 65 mph, so vertical sight distance is not an issue. From my understanding, the 70-degree minimum is to improve a perception issue for drivers at intersections of sharp angles. If we put in small curves so cars are 90-degrees at the intersection (to make the intersections at 90 degrees but at the existing locations), we end up with an offset intersection on a divided highway. This means cars will have to cross traffic on one side and u-turn to cross traffic on the other side. According to AASHTO Green Book, this increases exposure time for those vehicles and is not ideal.

Mitchell

This has become a high priority issue.

I need the intersection sight distance requirement information/calculations for the intersection of the mainline & its existing side roads of CR 301 & CR 5 as soon as possible this morning. We need proof on why we can't use the existing side road alignments based on the sight distances.

I am meeting w/ Babs to discuss this issue after lunch today.

Thanks,

Tom

-----Original Appointment-----

From: Wishon, Ron

Sent: Tuesday, September 25, 2007 10:08 AM

To: Wishon, Ron; Cox, Tom; Summers, Brian; Myers, Lisa; Abubakari, Babs; Liles, Paul; Haithcock, Michael; DuVall, Bill

Cc: 'Gillis, Bret'

Subject: VE Implementation Meeting --- EDS-545(40) & BRN-014-1(73) & (74) McDuffie {P.I. Nos. 222250, 227815, & 227816}

When: Monday, October 01, 2007 1:30 PM-2:30 PM (GMT-05:00) Eastern Time (US & Canada).

Where: Room 266 - G.O.

A meeting was held with Gerald Ross on 9/25/07 concerning the above noted projects. There are two issues that still need to be resolved from the VE Study on these projects. One is the intersection sight distance requirements at the Existing CR 301/Ridge Road/CR 5/Russell's Landing Road intersection. The VE Team recommended retaining the existing intersection alignment. The other is the bridge width at the Big Creek and Hart Creek sites. The VE Team recommended a 32 feet width. From the meeting this morning, Gerald wanted a "Risk Analysis" done on the bridge width in order to use the 38 feet gutter to gutter width stated in TOPPS 4265-10. The VE Implementation Decision on "R-11", "BCB-5", and "HCB-3" from a previous meeting was "No". The final disposition for these items will be resolved at this meeting.

Mitchell Greenway, PE

Project Manager

Stantec

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