

**DEPARTMENT OF TRANSPORTATION  
STATE OF GEORGIA**

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**INTERDEPARTMENT CORRESPONDENCE**

**FILE:** EDS-441(49), (48), (46), & (41) Clinch/Atkinson **OFFICE:** Engineering Services  
P. I. No.: 422410, 422400, 422390, & 422380  
U.S. 441 from Fargo to Pearson

**DATE:** August 9, 2004

**FROM:** David Mulling, Project Review Engineer *DEM*

**TO:** Brent Story, State Consultant Design 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.

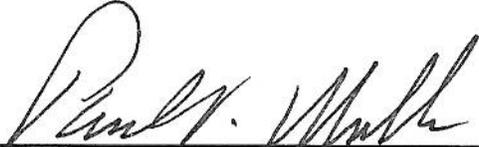
ALT No.	Description	Savings PW & LCC	Implement	Comments
<b>STRUCTURAL/BRIDGES (SB)</b>				
1.0	Reduce left Sweet Gum Bridge by one span (41)	\$91,000	No	Decreases the area of opening by 1/3, violates Bridge Office's 10 foot "setback" requirement, and would increase backwater.
2.0	Reduce right Hog Creek Bridge by one span and align bent on widened portion (41)	\$182,000	No	Decreases the area of opening by 1/3, violates Bridge Office's 10 foot "setback" requirement, and would increase backwater.
3.0	Reduce both left and right Jones Creek Bridges by one span (48)	\$185,000	No	Would result in an increase in backwater of over 1 foot.
4.0	Reduce both left and right Camp Branch Bridges by two spans (48)	\$370,000	No	Would result in an increase in backwater of over 1 foot.
5.0	Reduce both left and right Tatum Creek bridges by five spans (48)	\$930,000	No	Would result in an increase in backwater of over 1 foot.

ALT No.	Description	Savings PW & LCC	Implement	Comments
6.0	Install pre-cast bottomless arches (i.e. Conspan units) in lieu of pile bent constructed bridges	Design Suggestion	No	Could cost considerably more money depending on the type of foundation that would be required for the Conspan units.
8.0	Shorten Southbound deceleration lane over Hog Creek Bridge (48)	\$420,000	No	Results in a sub-standard decel lane length.
<b>Note: 8.0 is mutually exclusive and can not be accepted with 1.0 though 6.0</b>				
<b>ROADWAY/PROFILE (RW)</b>				
1.0*	Revise typical roadway section to a rural roadway section with a 20' raised median	\$1,005,000	No	Not consistent with GRIP Guidelines dated 1/7/03.
1.1	Reduce median width from 44' to 32' for the entire length of the projects	\$1,215,000	No	A 32' width has been used at locations where wetland impacts dictated.
2.0	Leave existing road with crown in lieu of leveling as proposed	\$2,300,000	No	Bases on further pavement evaluation by OMR, the existing pavement will now have to be replaced.
3.0	Do not rework/elevate existing road as appropriate	Design Suggestion	Yes	This has been done. The cross sections for (46) have been corrected.
4.0	Reduce width of outside paved shoulder from 6'-6" to 2'-0" and reduce from full depth to 5.5" Asphaltic Concrete	\$8,700,000	No	Not consistent with GRIP Guidelines dated 1/7/03. and would not accommodate bicycles and Rumble Strips.
5.0	Reduce total shoulder width from 10 feet to 8 feet	\$1,075,000	No	Not consistent with GRIP Guidelines dated 1/7/03. This is not equal or better than what was proposed.
7.0*	Re-evaluate the need to widen road based on projected future traffic volumes	±\$151 million	No	Does not satisfy the Need and Purpose of GRIP projects.
9.0*	Construct 44' wide crowned median to improve drainage	\$1,075,000	No	Not consistent with GRIP Guidelines dated 1/7/03.

ALT No.	Description	Savings PW & LCC	Implement	Comments
10.0	Develop separate profile grade lines for Northbound and Southbound lanes	\$2,200,000	No	No longer applies since the existing pavement will have to be replaced.
11.0	Allow Soil Cement Stabilized Base as an alternate to the Graded Aggregate Base Course	Design Suggestion	Yes	This will be done.
12.0	Install a Type "A" Median Opening in lieu of the Type "B" Median Opening	\$2,465,000	No	Not consistent with current guidelines dated 10/16/02.
13.0	Standardize the cost estimate format and unit costs	Design Suggestion	Yes	This will be done.
* Note: RW-1.0, RW-7.0, & RW-9.0 are mutually exclusive. All other VE Alternates can be added and accepted.				

A meeting was held on August 6, 2004 to discuss the above recommendations. Kimberly Nesbit of Consultant Design, Scott Gero of Earth Tech, and Ron Wishon of the Office of Engineering Services were in attendance.

The above reflects the consensus of those in attendance and those that provided comments.

Approved:   
 Paul V. Mullins, P. E., Chief Engineer

Date: 8/16/04

DTM/REW

Attachments

c: Gus Shanine, FHWA  
 Lindsey Gardner, U.S. Cost, Inc.  
 John McWhorter and Steve Linley, JB Trimble  
 Larry Cook, HNTB  
 Scott Gero and Ken McDuff, Earth Tech  
 Rick Knoedler, URS  
 Ian Macrae, KCA  
 General Files

James Magnus  
 Nabil Raad  
 Chauncey Elston  
 Joe Cowan  
 Tim Warren  
 Keith Carver  
 Lisa Myers  
 Kimberly Nesbitt

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**FILE** EDS-441(49), (48), (46) & (41) **OFFICE** Consultant Design  
P.I. 422410, 422400, 422390 & 422380  
US 441 from Fargo to Pearson

**FROM** Brent Story, P.E., State Consultant Design Engineer <sup>BAS</sup> **DATE** February 27, 2004

**TO** David Mulling, P.E., State Design Review Engineer  
Attention: Lisa Myers

**SUBJECT** **VALUE ENGINEERING STUDY-FINAL REPORT  
RESPONCE**

Below are the responses to the Value Engineering Study conducted on January 27-29, 2004 for the above mentioned projects. Each comment was study and addressed by both the Department's Project Manager and the Consultant's Project Manager or Lead Design Engineer:

**STRUCTURAL BRIDGES:**

**SB-1.0: Sweetgum Bridge (41) – Reduce left bridge by one span.**

This would decrease the existing area of opening by 1/3 and create an increase in the upstream elevations (backwater) as well as an increase in velocities. The removal of this span would also violate the 10 ft setback requirement from the endroll toe to the channel bank.

**SB-2.0: Hog Creek Bridge (41) – Reduce right bridge by one span and construct as a single bridge.**

Due to the downstream meander of Hog Creek, these design elements are required to provide the required 10 ft setback distance from the end roll toe to the channel bank.

**SB-3.0: Jones Creek Bridge (48) – Reduce both left and right bridges by one span.**

These bridges were sized to meet GDOT's backwater criteria of 1.0 ft for the 100 year storm. The proposed backwater for the 100 year storm is 0.99 ft. The recommended span removal would violate this requirement. These bridges have been approved as designed by the GDOT Bridge Office.

**SB-4.0: Camp Branch Bridge (48) - Reduce both left and right bridges by two spans.**

These bridges were sized to meet GDOT's backwater criteria of 1.0 ft for the 100 year storm. The proposed backwater for the 100 year storm is 0.99 ft. The recommended span removal would violate this requirement. These bridges have been approved as designed by the GDOT Bridge Office.

**SB-5.0: Tatum Creek Bridge (48) - Reduce both left and right bridges by five spans.**

These bridges were sized to meet GDOT's backwater criteria of 1.0 ft for the 100 year storm. The proposed backwater for the 100 year storm is 0.97 ft. The recommended span removal would violate this requirement. These bridges have been approved as designed by the GDOT Bridge Office.

**SB-6.0: 8 Different Sites – Install precast bottomless arches (ie. CONSPAN units) vs. Pile Bent Bridges.**

The recommendation specifically targets bridges of 80' to 120' in length. The Sweetgum Bay and Hog Creek bridge sites are in this length range. However, since the existing bridges are to be retained and widened, using an alternate structure type as a parallel structure is not recommended. A structure of the same length consisting of Conspan units would reduce the existing area of opening and create an increase in the upstream water surface elevations (backwater).

The Conspan units would likely require deep (pile) foundations given the soil type; and a recent project in the general area required this. Also, channel relocation may be required to use these sections at these sites.

Generally, RCDG (T-beam) pile bent bridges are very economic structures for this area of the state. According to Bridgetek, a pile foundation can be more than twice the cost of the Conspan unit itself. This is based on another project in Clinch County on Tatum Creek. The Conspan units were \$64,105 for this project with the foundation (piles) increasing the cost to over \$150,000 (Letting Nov 21, 2003 #21 – EDS-84(20) 01 Clinch County, SR 38/US 84).

**SB-8.0: Hog Creek Bridge (41) – Shorten southbound deceleration lane to avoid constructing a wider bridge over Hog Creek.**

Shortening the southbound deceleration lane would not allow adequate distance for drivers to reduce their speed before making a proper turning movement. It would also increase the number of rear end collisions and road run offs.

**ROADWAY:**

**RW-1.0: Revise typical roadway section to a rural roadway section with a 20' raised median.**

This would not be consistent with GDOT's desired typical section for GRIP Corridors. In addition, this would require the reduction of speed to 45 mph. This would not be a reasonable speed limit for these long sections of rural roadway. GDOT Design Guidance dated January 7, 2003 specifies 44-foot depressed median for GRIP.

corridors. Lower speed design would be required. Speed is currently 55 mph in the rural section, and is proposed to be 65mph. Raised median in SE sections would be difficult to drain because of flat grades. A 44-foot median with a type B crossover provides better sight distance and reduces interlocking left-turns, and provides for easier U-turns.

**RW-1.1: Reduce median width from 44' to 32' for the entire project.**

US 441 is a GRIP corridor and the 44' median has been set as standard statewide for future development and economic growth.

**RW-2.0: Leave existing road with crown in lieu of leveling as proposed.**

This would not be consistent with GDOT policy for GRIP Corridors. Early project coordination determined there was a desire to crown proposed roads and correct leveling.

**RW-3.0: Do not rework (elevate) existing except as necessary.**

Our intention is to do a crown removal and minimum overlay of existing with a separate smooth profile applied to the new roadway. The exception to this minimum overlay would be in areas having a history of flooding, in which case the existing would be raised to an elevation to prevent flooding of the roadway. The existing side of the road was elevated in areas in order to meet hydraulic clearances. This was coordinated in association with J.B. Trimble and their hydraulic models. Target elevations along the profile were met. Witnesses having knowledge of areas that have a history of roadway water overtopping also justify the raising of the profile in critical areas. Pavement failure and maintenance of the existing roadway also reinforced raising the profile.

**RW-4.0: Reduce width of outside paved shoulder from 6'-6" to 2' and reduce full depth to 5.5" of asphaltic concrete.**

This would not be consistent with GDOT's desired typical section for use on GRIP Corridors. With a smaller paved shoulder there is a greater chance of a vehicle drifting off of the pavement and not having additional paved surface to recover and return to the road. GDOT Design Guidance dated January 7, 2003 says "The 6.5-foot shoulder will be the one shoulder consistently used on multi-lane widening and/or reconstruction projects with rural shoulders." A 2 ft shoulder does not provide enough width for rumble strips. The outside paved shoulder is per GA Detail S-8. The 6.6' width provides enough width to incorporate future bicycle accommodation. The 6-6" shoulder width has also been the policy of Traffic Operations. Districts do not like to reduce the paving depths on the shoulder due to history of pavement failure and the need to.

**RW-5.0: Reduce total shoulder width from 10 ft to 8 ft.**

Reducing the shoulder width from 10 ft. to 8 ft. would not allow vehicles the additional surface they may need to gain control and return back onto the paved surface.

**RW-7.0: Re-evaluate the need to widen road based on projected traffic volumes. –**

Traffic volumes were not a factor in widening this roadway. US 441 is a GRIP project which primary purpose is to cause economic development. Fargo is a tourist destination

with its new state parks. In addition, one of the entrances to the Okefenokee Swamp, another tourist destination, SR 177, is located at the southern project limit.

**RW-9.0: Construct 44' crowned median to improve drainage.**

A 44 ft. crowned median may cause excess water to follow across the road surface which may increase hydroplaning and debris in the road. It may also increase the number of vehicles improperly traveling across the median.

**RW-10.0: Develop separate profile grade lines for both northbound and southbound lanes.**

Our intention is to do a crown removal and minimum overlay of existing with a separate smooth profile applied to the new roadway. The exception to this minimum overlay would be in areas having a history of flooding, in which case the existing would be raised to an elevation to prevent flooding of the roadway. The existing side of the road was elevated in areas in order to meet hydraulic clearances. This was coordinated in association with J.B. Trimble and their hydraulic models. Target elevations along the profile were met. Witnesses having knowledge of areas that have a history of roadway water overtopping also justify the raising of the profile in critical areas. Pavement failure and maintenance of the existing roadway also reinforced raising the profile.

**RW-11.0: Allow Soil Cement Stabilized Base as an alternate to the graded aggregate base courses in the pavement structure**

The Soil Survey Summary we received February 17, 2004 lists soil cement as an acceptable base material. Once the paving designs have been done and sent to the GDOT Paving Design Committee, the Committee decides what base alternates to include in the project.

**RW-12.0: Install Type "A" median openings in lieu of Type "B" median openings.**

The Department guideline which was affective January 7, 2004 is to use Type B medians. Type B medians cause left turn traffic movements to face one another which reduces left turn interlocking and increases sight distance. It also allows for extra road surface which may be used for u-turn movements.

**RW-13.0: Standardize cost estimate format & unit costs.**

The cost estimates will be standardized using GDOT's estimating software and data for the final cost estimates. Costs prepared for this VE Study was produced prior to GDOT's standardizing the cost estimating process.

If you have any questions or concerns, please contact Kimberly Nesbitt at (404) 565-5404.

BAS:KN:yr

cc: Joe Cowen-District 4 Construction  
Gus Shanine-FHWA  
James Magnus-Construction  
Tim Warren-District 4 Construction  
Keith Carver- District 4 Construction  
Nabil Raad-Traffic Safety and Design  
Chauncey Elston-OEL  
Scott Gero-EarthTech