

VALUE ENGINEERING WORKSHOP

ABERCORN STREET EXTENSION TO I-95 PROJECTS: NH-111-1(24) Chatham County, Georgia

PREPARED FOR:



**Georgia Department of Transportation
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Atlanta, Georgia 30334-1002**

PREPARED BY:

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VALUE ENGINEERING TEAM STUDY

TABLE OF CONTENTS

Executive Summary	
Project Description and Background	2
Key Information/Notes.....	4
Summary of Recommendations.....	9
Proposals	
Structural/Bridges (SB)	12
Roadway/Profile (RW).....	50
Appendix A	
Contact Directory	77
Cost Model	78
Function Analysis.....	79
Cost Driver Analysis.....	81
Brainstorming or Speculation Ideas	82
Appendix B	
Team Study Agenda.....	83
Cost Estimate Summary.....	86

VALUE ENGINEERING TEAM STUDY

PROJECT DESCRIPTION AND BACKGROUND

The NH-111-1(24) project is part of the improvement projects in Chatham County and the City of Savannah. It is also proposed to serve as part of the proposed economic development of Chatham County. The Abercorn Street Extension to I-95 - NH-111-1(24) is essential to the effort to reduce the travel demands on the existing corridors through Savannah and Chatham County.

The NH-111-1(24) project connects to Phase VI from Abercorn Street to Whitfield Avenue.

The typical road section for this project would be a rural arterial 6-lane divided highway with 12 foot lanes separated by a 2'-6" wide concrete median barrier. Ten foot (10) wide outside shoulders and ten foot (10) wide inside shoulders will be provided. Proposed right-of-way (ROW) would vary with intersections ROW being wider as necessary.

Major structures proposed:

- Widen bridge over CSX Railroad approximately 170 feet long
- Widen bridge over Forest River 854 feet long
- New bridge over King George Blvd. approximately 200 long

Signalized On-grade intersections are proposed at the following locations:

- Rio Road
- King George Boulevard

Wetlands sites that were identified along the proposed corridor will have no impact on the project.

The current design has the lowest Right of Way cost of three alternates studied.

The Design Cost Estimates for the project indicate the following:

Abercorn Street Extension to I-95 NH-111-1(24) with an ECC of \$22.2 Million, plus ROW cost of \$11.4 Million.

Concerns and Objectives:

This project is part of an overall scheme to widen and reconstruct Abercorn Street Extension to I-95 from Rio Road to CSX Railroad Bridge in Chatham County, Georgia. Over the past fifteen years, the phases of this system have been slowly coming together; spurred by the increased traffic that crosses through the general area from downtown Savannah, heading South on I-95. The Forest River and topographic terrain dictates local traffic patterns; wetland sites in the area; and residential growth. Development of commercial and industrial properties (King George Blvd.) makes the roadway development a complex and potentially costly project.

VALUE ENGINEERING TEAM STUDY

PROJECT DESCRIPTION AND BACKGROUND

The following are some of the highlighted concerns and objectives noted by the VE team for project:

Abercorn Street Extension to Interstate I-95:

Concerns/Observations	Problems/Objectives
On-grade intersections	High speed rural traffic (60 mph) and signal light at Rio Road and King George Blvd.
CSX Railroad Bridge requirements & unknown Flag Man Cost to contractor	Bridge clearance requirements need to be verified – may require jacking of the bridge.
Environmental Impact Statement	Was not available to the team to evaluate
Material haul distances	Cost and location of borrow material/site
Construction sequence/Constructibility	Coordination of this project & traffic control
Layout of intersections	Not ideal layout at King George Blvd. Expect delays and back-ups at Rio Rd. with 8 lanes feeding into 6 lanes
Cost Estimate Inadequate	Cost estimate needs to address budget for award in 2008 – project has inadequate inflation
Right-of-Way purchase	Delaying ROW purchase in a developing community may double the cost
Design for 60 mph ilo rural/urban 55 mph	Stop lights and accidents in congested areas
Traffic Congestion on King George Blvd during construction	Light sequencing and safety of commuters

Project Objectives:

- Complete the Abercorn Street Extension to I-95
- Reduce travel time & Benefit the local economy

The estimated combined construction cost (ECC) for the Widening and Reconstruction Project NH-111-1(24) is projected to be around \$22.2 Million, with a schedule advertising date of mid 2008.

VALUE ENGINEERING TEAM STUDY

KEY INFORMATION/NOTES

Introduction:

U.S. Cost Incorporated conducted the Value Engineering Team Study on Abercorn Street Extension to I-95 from Rio Road to CSX Railroad Bridge in Chatham County, Georgia. The V.E. study was conducted for three (3) days, 24-26 February 2004, at the Georgia Department of Transportation Conference Room #280 in Atlanta, GA. The study team was furnished with document for project NH-111-1(24) that consisted of a Concept Design submittal package. The following individuals were members of the V.E. team:

Name	Firm	Discipline
Lindsey Gardner, P.E., CVS	U.S. Cost, Inc.	VETL
Alex Stone, P.E.	MAAI	Roadway Design
Sam Deeb, P.E.	MAAI	Bridge Design
Laland Owens	MAAI	Construction
Lisa Myers	GDOT	Value Engineer
George Bradfield	GDOT	Cost Engineer
Darryl VanMeter, P.E.	GDOT	Project Liaison

Information Phase/Function Analysis:

The V.E. team was first briefed on the project design by GDOT representatives in an orientation meeting the morning of the first day of the V.E. Study. The briefing gave insight into the current design, and also into the aspects of the Abercorn Street Extension to I-95 urban plan, which impact the site. The briefing included a review of the design requirements and rationale for the location and arrangement of the major functional areas in addition to information on the replacement bridge structural systems. Discussions regarding project funding, required functions, and project criteria followed the design presentation.

As a basic part of the V.E. process, the team conducted a partial function analysis session on Abercorn Street Extension to I-95 to identify the needs and goals of the project and facilitate the creative idea session, by addressing functions as opposed to the specific design elements.

The Basic Function of the project is to *Enhance Economy*. A strong secondary function is to *Enhance Travel* by construction of the Abercorn Street Extension to I-95. A detailed project function analysis of the characteristics of the project and their relationships is presented in Appendix A.

VALUE ENGINEERING TEAM STUDY

KEY INFORMATION/NOTES

Risk Analysis:

The group identified the following project risk elements, which may impact the construction of Abercorn Street Extension to I-95. This exercise served as a catalyst for the Creative Phase of the study, when several ideas were suggested which would mitigate these project construction risks.

Risk Elements:

- Maintaining uninterrupted flow of traffic on existing roads during construction
- Present value with 2008 award and ROW purchase
- Delays and impact on the traveling/commuting public
- Contractor Phasing Coordination and traffic control
- Poor Progress/Quality By A Low Bid Construction Contractor
- Accidents at at-grade intersections King George Blvd. and Rio Road
- Limited bidders/tenders
- Wetland impact on widening road and bridge
- May have to jack RR bridge for adequate clearance
- Driver expectations
- Accidents and potential lawsuits during construction

Project Criteria:

During the meeting, project goals, criteria and sensitivities were also identified. The following prioritized listing identifies the key items of which the V.E. team should be aware. Criteria with a score of 5 or higher were considered of prime importance, and those criteria therefore must be considered in the review of any design alternative. The ranking below is the V.E. teams' impression of the sensitivity of the criteria from discussions held with Georgia DOT representatives.

VALUE ENGINEERING TEAM STUDY

KEY INFORMATION/NOTES

Project Criteria Analysis:

Life Safety	10
Operational Issues	10
No additional ROW purchases	10
Aesthetics and profile of Forest River Bridge	10
Compliance with approved EIS	10
Constructibility	8
GDOT Criteria Compliance	8
Functionality	8
Life Cycle Cost (Analysis)	8
AASHTO 2001 Compliance	7
Local Code Restrictions	7
Maintenance and Operations	6
Cost Savings Impact	2

Creative Phase:

The Creative Phase of the V.E. study was initiated the morning of the second day of the study. A total of twenty-one (21) creative ideas were generated for further investigation by the team. Many of the creative ideas focused on enhancements to the roadway safety, line of sight, excavation techniques, ramp storage, bridge construction techniques, utility locations, and drainage impact, plus various other design elements of the Project. Additional ideas were generated reflecting alternative materials based on an understanding of local construction products and materials and the relative costs of installing them.

A listing of all creative ideas on Abercorn Street Extension to I-95 is included in Appendix A.

Evaluation Phase:

The ideas generated during the Creative Phase were reviewed and evaluated by the VE team during a meeting held on the morning of the second study day. The intent of the meeting was to allow the V.E. team an opportunity to discuss and evaluate the ideas. A few of the V.E. ideas were dropped at that time as being conceptually unacceptable or in conflict with established Criteria, Right of Way (ROW) conflicts, previous agreements, or local construction methods. The ranking system consisted of VE team representatives assigning a designation to each idea. Those ideas, which the V.E. Team felt had the most promise, were given a designation of 1-5 on acceptability and 1-5 on cost impact, for a maximum rating of 10 points. This is a time management tool to identify those proposals that have the greatest potential. Approximately nineteen (19) out of the original twenty-one (21) creative ideas were deemed promising for further investigation and analysis by the V.E. team.

VALUE ENGINEERING TEAM STUDY

KEY INFORMATION/NOTES

The time management ranking system used by the VE team is as follows:

FEASIBILITY OF IDEA

- 5 points - Excellent Idea
- 4 points - Good Idea
- 3 points - Fair Idea
- 2 points – Marginal Idea
- 1 point - Poor Idea –do not develop

COST IMPACT

- 5 points - > \$ 500,000
- 4 points - \$400,000 to 499,999
- 3 points - \$300,000 to 399,999
- 2 points - \$200,000 to 299,999
- 1 point – zero to \$199,999
- DS – Design Suggestion – sometimes reflects an increase in cost

Development Phase:

The specific proposals found in the body of this report represent the positive results of Investigations by the V.E. team on the Abercorn Street Extension to I-95 Project NH-111-1(24). Each proposal represents a quality enhancing or cost saving alternative, which is documented by words, drawings and numbers. The proposal format presents the idea, describes the original design element proposed for change and the proposed change, lists the perceived advantages and disadvantages of the proposed change and supports the idea with a detailed cost estimate for the original and proposed design. Where necessary for clarity, the proposal also includes thumbnail design drawings and supporting engineering calculations.

Many of the V.E. proposals may require some level of redesign on specific portions of the project to implement the modification. Further, several of the V.E. ideas may involve modifications to the Criteria, or current goals, of Abercorn Street Extension to I-95 Rio Road to CSX Railroad Bridge. These ideas are presented to initiate additional discussion and investigation during the next phase of design.

Presentation Phase:

Due to time constraints, a final presentation was not performed.

VALUE ENGINEERING TEAM STUDY

KEY INFORMATION/NOTES

Resolution Phase:

Upon receipt of the Final Value Engineering Report, Abercorn Street Extension to I-95, Georgia DOT representatives are requested to prepare written comments on the acceptability of each of the V.E. proposals. Responses should include the rationale for accepting, rejecting, or modifying the V.E. proposal.

Basis of V.E. Cost Savings:

The cost information for proposals in this report are based on the cost data included in the concept & design submittal. Therefore, the savings presented in the proposals is a general order of magnitude (estimate of the potential savings) if the idea were to be accepted. These figures are solely intended to identify the most attractive design solution, and are not prepared to represent a net deduction to the overall project budget. The costs are in 2004 dollars (escalated for 2 years at 5% per year). All life cycle cost analyses are prepared utilizing Present Worth methodology, a 25-year economic period, a 4.0% net discount factor (inclusive of inflation), and 3% escalation in the cost of utilities. With a bid opening of 2008 it appears the estimated escalation cost (15%) is inadequate and needs to be re-evaluated.

Sustainable/Green Design Proposals:

Sustainable design incorporates energy conservation, increased use of renewable energy sources, the reduction or elimination of toxic and harmful substances in facilities, efficiency in resource and material utilization, recycling of building materials, the use of recycled material, the reduction of waste products during both the construction and operation of the facility, and facility maintenance practices that reduce or eliminate harmful effects on people and the natural environment. In keeping with the National Policy objective of building all new facilities with sustainable design features, the VE team proposed sustainable design elements and/or practices. There are no developed sustainable proposals in this report; however, the construction contractor should have the option to employ construction techniques and materials to shorten the bridge construction time from the current projected time, also the contractor can re-cycle demolished asphalt and concrete materials.

VALUE ENGINEERING TEAM STUDY

SUMMARY OF RECOMMENDATIONS

NUMBER	PROPOSAL DESCRIPTION	CAPITAL SAVINGS	OP. & MAINT. (PW)	TOTAL SAVINGS (LCC)	GDOT PM	A/E GDOT	LOCAL RECOM.	FINAL
	STRUCTURAL/BRIDGES (SB)							
1.0	Reduce median width on Forest River Bridge from 20'-0" to 10'-6"	251,000		251,000				
1.1	Replace Forest River Bridge with a spliced girder design for improved aesthetics	(1,600,000)		(1,600,000)				
1.2	Reduce shoulder width requirements and leave Forest River Bridge as-is and re-stripe existing bridge for three (3) lanes in both directions	6,900,000		6,900,000				
2.0	Specify and utilize 50 ksi high strength steel on RR bridge and reduce median width from 20'-0" to 10'-6"	292,000		292,000				
2.1	Reduce inside shoulders section on CSX RR bridge from 20'-0" to 10'-6' new section (4'-0" inside shoulders+2'-6" median barrier)							
3.0	Replace existing CSX RR bridge with 4'-0" inside shoulder and 10'-0" outside shoulder ilo widening and jacking	(393,000)		(393,000)				
6.0	Reduce median width on King George Bridge from 20'-0" to 10'-6" and utilize MSE walls	1,000,000		1,000,000				

VALUE ENGINEERING TEAM STUDY

SUMMARY OF RECOMMENDATIONS

NUMBER	PROPOSAL DESCRIPTION	CAPITAL SAVINGS	OP. & MAINT. (PW)	TOTAL SAVINGS (LCC)	GDOT PM	A/E GDOT	LOCAL RECOM.	FINAL
	ROADWAY/PROFILE (RW)							
2.0	Construct a Single-Point Urban interchange at King George Blvd./SR 204	2,200,000		2,200,000				
2.1	Replace diamond interchange with partial cloverleaf ramps at the NW and SE corners	Design Suggestion		DS				
2.2	Realign ramp "C" to avoid impacts to Waterford Plantation Apartments	540,000		540,000				
2.3	Replace diamond interchange with partial cloverleaf ramps at the NW corner	Design Suggestion		DS				
3.0	Do not construct MSE walls on the North side of Abercorn and shift traffic to one side	560,000		560,000				
3.1	Stage construct new bridge over King George one half at a time and direct traffic on complete section	Design Suggestion		DS				
6.0	Reduce the inside shoulder width from 10'-0" to 4'-0" for the entire length of the project (roads and bridges)	1,750,000		1,750,000				
7.0	Allow soil cement alternate in pavement design	Design Suggestion		DS				

VALUE ENGINEERING TEAM STUDY

SUMMARY OF RECOMMENDATIONS

NUMBER	PROPOSAL DESCRIPTION	CAPITAL SAVINGS	OP. & MAINT. (PW)	TOTAL SAVINGS (LCC)	GDOT PM	A/E GDOT	LOCAL RECOM.	FINAL
	ROADWAY/PROFILE (RW)							
8.0	Use PCC pavement on ramps instead of asphalt concrete	Design Suggestion		DS				
13.0	Move Mariners Way relocation onto Cove Court and extend South to Pine Grove Road	254,000		254,000				

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER:	SB-1.0
PAGE NUMBER:	1 of 7

PROJECT TITLE: ABERCORN STREET EXTENSION TO I-95

PROJECT LOCATION: GEORGIA DOT – Chatham County, Georgia

PROPOSAL DESCRIPTION: REDUCE MEDIAN WIDTH SECTION ON FOREST RIVER BRIDGE FROM 20'-0" TO 10'-6" NEW SECTION (4'-0" INSIDE SHOULDERS+2'-6" MEDIAN BARRIER).

ORIGINAL DESIGN: The original design contains a combination of short Type III span beams and steel girders with four 56'-0", five 60'-0" and a 330'-0" continuous steel girder span. The width of the bridge is 88'-0" gutter-to-gutter with a median barrier. The current bridge accommodates 2 lanes in both directions and 10'-0" shoulders. The bridge is to be widened to accommodate an additional lane in either direction thereby increasing the width to 56'-0" in either direction and the total width of gutter to gutter to 114'-6".

PROPOSED CHANGE: The proposed design recommends the reduction in shoulder widths to 4'-0" inside and 10'-0" outside shoulders thereby reducing the widening to a minimum and a total width of 51'-3" in either direction and a total width of gutter to gutter of 102'-0".

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:	\$ 6,921,906		\$ 6,921,906
PROPOSED CHANGE:	\$ 6,671,289		\$ 6,671,289
		SAVINGS:	\$ 250,617

ADVANTAGES/DISADVANTAGES/JUSTIFICATION

PROPOSAL NUMBER:	SB-1.0
PAGE NUMBER:	2 of 7

PROJECT TITLE: ABERCORN STREET EXTENSION TO I-95

PROJECT LOCATION: GEORGIA DOT - Chatham County, Georgia

ADVANTAGES:

- Total life cycle cost savings of \$250,617.
- Faster Construction time.
- Less materials.
- Less maintenance area.
- Less disruption time to traffic during construction.

DISADVANTAGES:

- Less inside shoulder.

JUSTIFICATION:

Drastic reduction in construction costs and construction time justify the need to reduce the inside shoulders.

COST ESTIMATING WORKSHEET

PROPOSAL NUMBER:	SB-1.0
PAGE NUMBER:	3 of 7

PROJECT TITLE: ABERCORN STREET EXTENSION TO I-95

PROJECT LOCATION: GEORGIA DOT - Chatham County, Georgia

ORIGINAL DESIGN

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Type III spans	7	LS	1	1,210,643	1,210,643
Steel Spans	7	LS	1	4,326,882	4,326,882
SUBTOTAL:					5,537,525
25 % MARK UP:					1,384,381
TOTAL:					6,921,906

PROPOSED CHANGE

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Type III spans	7	LS	1	1,142,011	1,142,011
Steel Spans	7	LS	1	4,195,020	4,195,020
SUBTOTAL:					5,337,031
25 % MARK UP:					1,334,258
TOTAL:					6,671,289

SOURCES

- | | |
|--|--|
| <ol style="list-style-type: none"> 1. Project Cost Estimate 2. CES Data Base 3. CACES Data Base 4. Means Estimating Manual | <ol style="list-style-type: none"> 5. Richardson's Estimating Manual 6. Vendor (Specify) 7. Other (GDOT Mean Summary) |
|--|--|

ORIGINAL DESIGN CALCULATIONS

PROPOSAL NUMBER:	SB-1.0
PAGE NUMBER:	4 of 7

PROJECT TITLE: ABERCORN STREET EXTENSION TO I-95

PROJECT LOCATION: GEORGIA DOT - Chatham County, Georgia

Cost Estimate
Original Forest River
Approaches

Project : SR 204/Abercorn, Chatham County
Project Number : M482
Made By : HSD Date : Feb 04
Checked By : Date :

Tag	Pay Item	Description	Quantity	Unit	Unit Cost	Cost
3	500-1006	SUPERSTR CONCRETE, CL AA, BR NO-	363.4	CY	\$619.38	\$225,081
4	500-3101	CLASS A CONCRETE	13.3	CY	\$467.06	\$6,193
9	500-0100	GROOVED CONCRETE	1503.3	SY	\$4.69	\$7,050
10	525-1000	COFFERDAM	1.00	EA	\$18,000.00	\$18,000
11	500-2100	CONCRETE BARRIER	1048.0	LF	\$35.63	\$37,340
12	511-3000	SUPERSTR REINF STEEL, BR NO-	72879.6	LB	\$0.56	\$40,701
13	511-1000	BAR REINF STEEL	1325.9	LB	\$0.52	\$689
15	507-9002	PSC BEAMS, AASHTO TYPE II, BR NO -	2096.0	LF	\$92.80	\$194,509
8	522-1000	SHORING	1.0	EA	\$45,000.00	\$45,000
25	520-2218	PILING, PSC, 18 IN SQ	2400.0	LF	\$41.49	\$99,576
43	603-2024	STN DUMPED RIP RAP, TP 1, 24 IN	8959	SY	\$40.66	\$364,257
44	603-7000	PLASTIC FILTER FABRIC	8959	SY	\$4.12	\$36,909
45	515-2020	ALUM HANDRAIL, STD 3626	2096.0	LF	\$22.07	\$46,259
29	520-5000	PILOT HOLES	0.0	LF	\$600.00	\$0

Bridge Sub Total = \$1,121,565

5% Mobilization	\$56,078
5% MOT	\$56,078
2% Contingency	\$22,431

Total Bridge Cost = \$1,256,152
per Bridge

Deck Area (sq ft) = BL (BW) = 14890
Unit Cost (\$ / sq ft) = \$84.36
per bridge

ORIGINAL DESIGN CALCULATIONS

PROPOSAL NUMBER:	SB-1.0
PAGE NUMBER:	5 of 7

PROJECT TITLE: ABERCORN STREET EXTENSION TO I-95

PROJECT LOCATION: GEORGIA DOT - Chatham County, Georgia

ORIGINAL
Cost Estimate
~~Proposed Forest River~~
 Main Steel girder Spans

Project : SR 204 Abercorn, Chatham County
Project Number : 0442
Made By : HSO **Date :** Feb-04
Checked By : **Date :**

Tag	Pay Item	Description	Quantity	Unit	Unit Cost	Cost
3	500-1006	SUPERSTR CONCRETE, CL AA, BR NO-	286.77	CY	\$619.38	\$177,621
4	500-3101	CLASS A CONCRETE	271.15	CY	\$467.06	\$126,642
9	500-0100	GROOVED CONCRETE	1,003.90	SY	\$4.69	\$4,708
10	525-1000	COFFERDAM	1.00	EA	\$18,000.00	\$18,000
11	500-2100	CONCRETE BARRIER	990.00	LF	\$35.63	\$35,274
12	511-3000	SUPERSTR REINF STEEL, BR NO-	76,281.23	LB	\$0.56	\$42,717
13	511-1000	BAR REINF STEEL	32,537.78	LB	\$0.52	\$16,920
22	501-3000	STR STEEL, BR NO -	1,611,610.00	LB	\$1.95	\$3,142,640
8	522-1000	SHORING	1.00	EA	\$45,000.00	\$45,000
25	520-2218	PILING, PSC, 18 IN SQ	2,880.00	LF	\$41.49	\$119,491
1	540-1102	REMOVAL OF EXISTING BR, STA NO -	1.00	LS	\$90,577.00	\$90,577
45	515-2020	ALUM HANDRAIL, STD 3626	1,980.00	LF	\$22.07	\$43,699
29	520-5000	PILOT HOLES	-	LF	\$600.00	\$0

Bridge Sub Total = \$3,863,288

5% Mobilization	\$193,164
5% MOT	\$193,164
2% Contingency	\$77,266

Total Bridge Cost = \$4,326,882

Deck Area (sq ft) = BL (BW) = 9378
 Unit Cost (\$ / sq ft) = \$461.41

PROPOSED CHANGE CALCULATIONS

PROPOSAL NUMBER:	SB-1.0
PAGE NUMBER:	6 of 7

PROJECT TITLE: ABERCORN STREET EXTENSION TO I-95

PROJECT LOCATION: GEORGIA DOT - Chatham County, Georgia

Cost Estimate

Proposed Forest River Main
Steel girder Spans

Project : SR 294 Abercorn, Chatham County
Project Number : 04422
Made By : JFD Date : Feb 04
Checked By : Date :

Tag	Pay Item	Description	Quantity	Unit	Unit Cost	Cost
3	500-1006	SUPERSTR CONCRETE, CL AA, BR NO-	203.93	CY	\$619.38	\$126,311
4	500-3101	CLASS A CONCRETE	210.70	CY	\$467.06	\$98,411
9	500-0100	GROOVED CONCRETE	541.67	SY	\$4.69	\$2,540
10	525-1000	COFFERDAM	1.00	EA	\$18,000.00	\$18,000
11	500-2100	CONCRETE BARRIER	990.00	LF	\$35.63	\$35,274
12	511-3000	SUPERSTR REINF STEEL, BR NO-	54,245.85	LB	\$0.56	\$30,378
13	511-1000	BAR REINF STEEL	25,284.44	LB	\$0.52	\$13,148
22	501-3000	STR STEEL, BR NO -	1,811,610.00	LB	\$1.95	\$3,142,640
8	522-1000	SHORING	1.00	EA	\$45,000.00	\$45,000
25	520-2218	PILING, PSC, 18 IN SQ	2,400.00	LF	\$41.49	\$99,576
1	540-1102	REMOVAL OF EXISTING BR, STA NO -	1.00	LS	\$90,577.00	\$90,577
45	515-2020	ALUM HANDRAIL, STD 3626	1,980.00	LF	\$22.07	\$43,699
29	520-5000	PILOT HOLES	-	LF	\$600.00	\$0

Bridge Sub Total = \$3,745,553

5% Mobilization	\$187,278
5% MOT	\$187,278
2% Contingency	\$74,911

Total Bridge Cost = \$4,195,020

Deck Area (sq ft) = BL (BW) = 5858
Unit Cost (\$ / sq ft) = \$716.18

PROPOSED CHANGE CALCULATIONS

PROPOSAL NUMBER:	SB-1.0
PAGE NUMBER:	7 of 7

PROJECT TITLE: ABERCORN STREET EXTENSION TO I-95

PROJECT LOCATION: GEORGIA DOT - Chatham County, Georgia

Cost Estimate

*Proposed Forest River
Approaches*

Project : SR 564/Abercorn, Chatham County
 Project Number : 64402
 Made By : HSD Date : Feb-04
 Checked By: Date :

Tag	Pay Item	Description	Quantity	Unit	Unit Cost	Cost
3	500-1006	SUPERSTR CONCRETE, CL AA, BR NO-	231.9	CY	\$619.38	\$143,608
4	500-3101	CLASS A CONCRETE	8.5	CY	\$467.06	\$3,979
9	500-0100	GROOVED CONCRETE	811.1	SY	\$4.69	\$3,804
10	525-1000	COFFERDAM	1.00	EA	\$18,000.00	\$18,000
11	500-2100	CONCRETE BARRIER	1048.0	LF	\$35.63	\$37,340
12	511-3000	SUPERSTR REINF STEEL, BR NO-	46371.7	LB	\$0.56	\$25,968
13	511-1000	BAR REINF STEEL	851.9	LB	\$0.52	\$443
15	507-9002	PSC BEAMS, AASHTO TYPE II, BR NO -	2096.0	LF	\$92.80	\$194,509
8	522-1000	SHORING	1.0	EA	\$45,000.00	\$45,000
25	520-2218	PILING, PSC, 18 IN SQ	2400.0	LF	\$41.49	\$99,576
43	603-2024	STN DUMPED RIP RAP, TP 1, 24 IN	8959	SY	\$40.66	\$364,257
44	603-7000	PLASTIC FILTER FABRIC	8958.6	SY	\$4.12	\$36,909
45	515-2020	ALUM HANDRAIL, STD 3626	2096.0	LF	\$22.07	\$46,259
29	520-5000	PILOT HOLES	0.0	LF	\$600.00	\$0

Bridge Sub Total = \$1,019,652

5% Mobilization	\$50,983
5% MOT	\$50,983
2% Contingency	\$20,393

**Total Bridge Cost = \$1,142,011
per Bridge**

Deck Area (sq ft) = BL (BW) = 9301
 Unit Cost (\$ / sq ft) = \$122.78
 per bridge

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER:	SB-1.1
PAGE NUMBER:	1 of 7

PROJECT TITLE: ABERCORN STREET EXTENSION TO I-95

PROJECT LOCATION: GEORGIA DOT – Chatham County, Georgia

PROPOSAL DESCRIPTION: REPLACE FOREST RIVER BRIDGE WITH A SPLICED GIRDER DESIGN TO INCREASE AESTHETICS.

ORIGINAL DESIGN: The original design contains a combination of short Type III span beams and steel girders with four 56'-0", five 60'-0" and a 330'-0" continuous steel girder span. The width of the bridge is 88'-0" gutter-to-gutter with a median barrier. The current bridge accommodates 2 lanes in both directions and 10'-0" shoulders. The bridge is to be widened to accommodate an additional lane in either direction thereby increasing the width to 56'-0" in either direction and the total width of gutter to gutter to 114'-6".

PROPOSED CHANGE: The proposed design recommends the full replacement of the bridge with a spliced girder design that incorporates the utilization of a 3 span bridge with dual hammerhead piers on the banks and the reduction in shoulder widths to 4'-0" inside and 10'-0" outside shoulders for a total width of gutter to gutter of 102'-0".

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:	\$ 6,921,906		\$ 6,921,906
PROPOSED CHANGE:	\$ 8,536,389		\$ 8,536,389
		SAVINGS:	\$ (1,557,471)

ADVANTAGES/DISADVANTAGES/JUSTIFICATION

PROPOSAL NUMBER:	SB-1.1
PAGE NUMBER:	2 of 7

PROJECT TITLE: ABERCORN STREET EXTENSION TO I-95
PROJECT LOCATION: GEORGIA DOT - Chatham County, Georgia

ADVANTAGES:

Less maintenance.

Build at Present value vs. future.

Aesthetically more pleasing.

Hydro facets enhanced with less piers.

DISADVANTAGES:

Total life cycle cost increase of \$1,557,471.

Less inside shoulder.

More disruption time to traffic during construction.

JUSTIFICATION:

The aesthetics, maintenance, and future construction replacement value would drive the need for such a replacement at the present time.

COST ESTIMATING WORKSHEET

PROPOSAL NUMBER:	SB-1.1
PAGE NUMBER:	3 of 7

PROJECT TITLE: ABERCORN STREET EXTENSION TO I-95 PROJECT LOCATION: GEORGIA DOT - Chatham County, Georgia

ORIGINAL DESIGN

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Type III spans	7	LS	1	1,256,252	1,256,252
Steel Spans	7	LS	1	4,326,882	4,326,882
SUBTOTAL:					5,583,134
25 % MARK UP:					1,395,784
TOTAL:					6,978,918

PROPOSED CHANGE

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
3 Span Spliced Girder Bridge	7	LS	1	6,829,111	6,829,111
SUBTOTAL:					6,829,111
25 % MARK UP:					1,707,278
TOTAL:					8,536,389

SOURCES

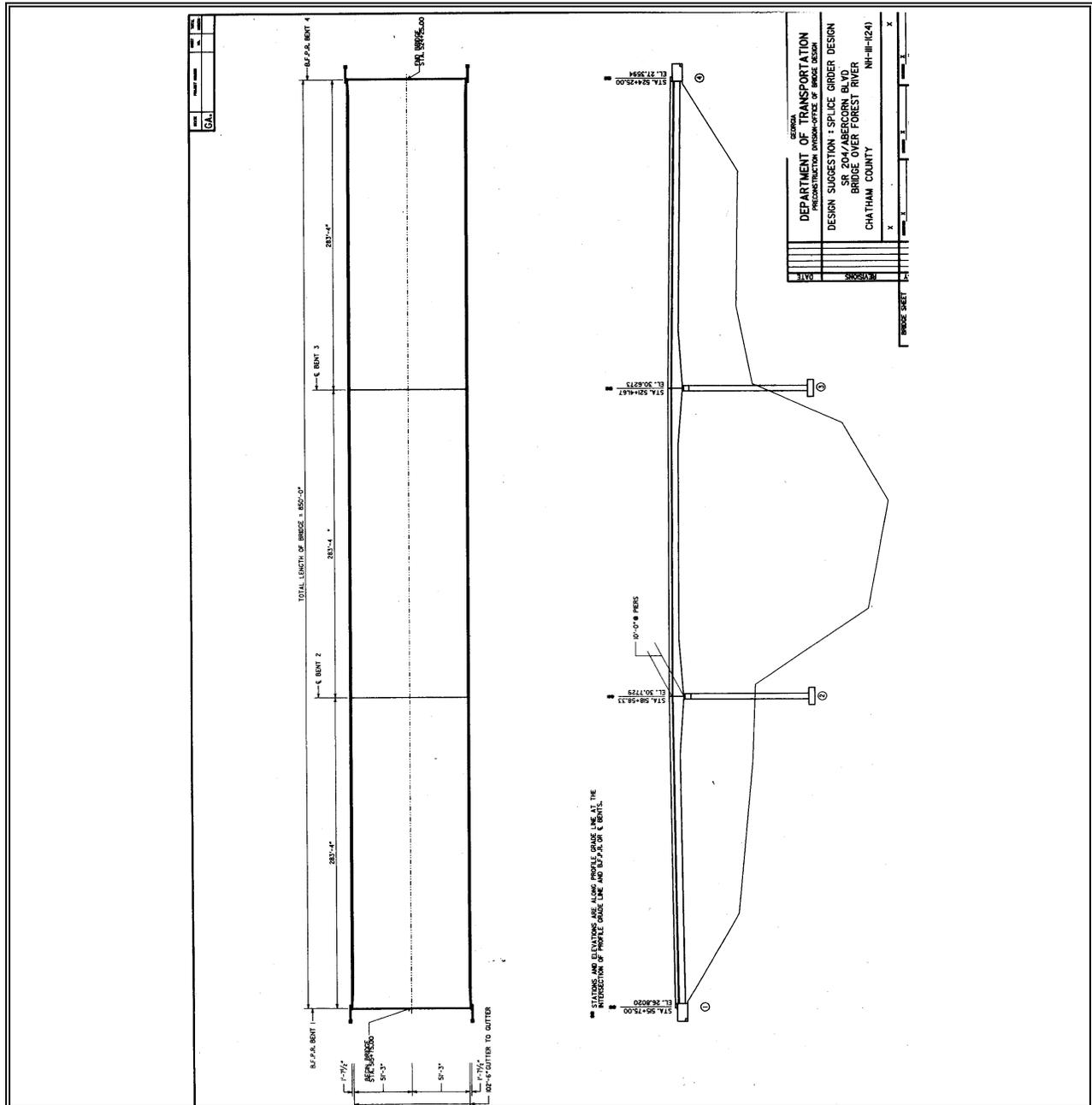
- | | |
|--|--|
| <ol style="list-style-type: none"> 1. Project Cost Estimate 2. CES Data Base 3. CACES Data Base 4. Means Estimating Manual | <ol style="list-style-type: none"> 5. Richardson's Estimating Manual 6. Vendor (Specify) 7. Other (GDOT Mean Summary) |
|--|--|

ORIGINAL DESIGN SKETCH DETAILS

PROPOSAL NUMBER:	SB-1.1
PAGE NUMBER:	4 of 7

PROJECT TITLE: ABERCORN STREET EXTENSION TO I-95

PROJECT LOCATION: GEORGIA DOT - Chatham County, Georgia



ORIGINAL DESIGN CALCULATIONS

PROPOSAL NUMBER:	SB-1.1
PAGE NUMBER:	5 of 7

PROJECT TITLE: ABERCORN STREET EXTENSION TO I-95

PROJECT LOCATION: GEORGIA DOT - Chatham County, Georgia

Cost Estimate

*Original Forest River
Approaches*

Project : SB 204 Abercorn, Chatham County
 Project Number : 04482
 Made By : HED Date : Feb-04
 Checked By: Date :

Tag	Pay Item	Description	Quantity	Unit	Unit Cost	Cost
3	500-1006	SUPERSTR CONCRETE, CL AA, BR NO-	363.4	CY	\$819.38	\$225,081
4	500-3101	CLASS A CONCRETE	13.3	CY	\$467.06	\$6,193
9	500-0100	GROOVED CONCRETE	1503.3	SY	\$4.69	\$7,050
10	525-1000	COFFERDAM	1.00	EA	\$18,000.00	\$18,000
11	500-2100	CONCRETE BARRIER	1048.0	LF	\$35.63	\$37,340
12	511-3000	SUPERSTR REINF STEEL, BR NO-	72679.6	LB	\$0.56	\$40,701
13	511-1000	BAR REINF STEEL	1325.9	LB	\$0.52	\$689
15	507-9002	PSC BEAMS, AASHTO TYPE II, BR NO -	2096.0	LF	\$92.80	\$194,509
8	522-1000	SHORING	1.0	EA	\$45,000.00	\$45,000
25	520-2218	PILING, PSC, 18 IN SQ	2400.0	LF	\$41.49	\$99,576
43	603-2024	STN DUMPED RIP RAP, TP 1, 24 IN	8959	SY	\$40.66	\$364,257
44	603-7000	PLASTIC FILTER FABRIC	8959	SY	\$4.12	\$36,909
45	515-2020	ALUM HANDRAIL, STD 3826	2096.0	LF	\$22.07	\$46,259
29	520-5000	PILOT HOLES	0.0	LF	\$600.00	\$0

Bridge Sub Total = \$1,121,565

5% Mobilization	\$56,078
5% MOT	\$56,078
2% Contingency	\$22,431

**Total Bridge Cost = \$1,256,152
per Bridge**

Deck Area (sq ft) = BL (BW) = 14890
 Unit Cost (\$ / sq ft) = \$84.36
 per bridge

PROPOSED CHANGE CALCULATIONS

PROPOSAL NUMBER:	SB-1.1
PAGE NUMBER:	6 of 7

PROJECT TITLE: ABERCORN STREET EXTENSION TO I-95

PROJECT LOCATION: GEORGIA DOT - Chatham County, Georgia

Cost Estimate

*Proposed Forest River
Main Steel girder Spans*

Project : SR 294 Abercorn, Chatham County
 Project Number : 0442
 Made By : HES Date : Feb-04
 Checked By: Date :

Tag	Pay Item	Description	Quantity	Unit	Unit Cost	Cost
3	500-1006	SUPERSTR CONCRETE, CL AA, BR NO-	286.77	CY	\$619.38	\$177,621
4	500-3101	CLASS A CONCRETE	271.15	CY	\$467.06	\$126,842
9	500-0100	GROOVED CONCRETE	1,003.90	SY	\$4.69	\$4,708
10	525-1000	COFFERDAM	1.00	EA	\$18,000.00	\$18,000
11	500-2100	CONCRETE BARRIER	990.00	LF	\$35.63	\$35,274
12	511-3000	SUPERSTR REINF STEEL, BR NO-	76,281.23	LB	\$0.58	\$42,717
13	511-1000	BAR REINF STEEL	32,537.78	LB	\$0.52	\$16,920
22	501-3000	STR STEEL, BR NO -	1,611,610.00	LB	\$1.95	\$3,142,840
8	522-1000	SHORING	1.00	EA	\$45,000.00	\$45,000
25	520-221B	PILING, PSC, 18 IN SQ	2,860.00	LF	\$41.49	\$119,491

1	540-1102	REMOVAL OF EXISTING BR, STA NO -	1.00	LS	\$90,577.00	\$90,577
45	515-2020	ALUM HANDRAIL, STD 3626	1,980.00	LF	\$22.07	\$43,699
29	520-5000	PILOT HOLES	-	LF	\$600.00	\$0

Bridge Sub Total = \$3,863,288

5% Mobilization	\$193,164
5% MOT	\$193,164
2% Contingency	\$77,266

Total Bridge Cost = \$4,326,882

Deck Area (sq ft) = BL (BW) = 9378
 Unit Cost (\$ / sq ft) = \$461.41

PROPOSED CHANGE CALCULATIONS

PROPOSAL NUMBER:	SB-1.1
PAGE NUMBER:	7 of 7

PROJECT TITLE: ABERCORN STREET EXTENSION TO I-95

PROJECT LOCATION: GEORGIA DOT - Chatham County, Georgia

Cost Estimate

Proposed 3-span
Spliced prestress
Girder Forest River

Project : SR 204/Abercorn, Chatham County	
Project Number : 04402	
Made By : TAD	Date : Feb-94
Checked By :	Date :

Tag	Pay Item	Description	Quantity	Unit	Unit Cost	Cost
3	500-1006	SUPERSTR CONCRETE, CL AA, BR NO-	2699.6	CY	\$619.38	\$1,672,074
4	500-3101	CLASS A CONCRETE	1848.5	CY	\$467.06	\$863,346
8	500-0100	GROOVED CONCRETE	10161.7	SY	\$4.69	\$47,658
10	525-1000	COFFERDAM	1.00	EA	\$18,000.00	\$18,000
11	500-2100	CONCRETE BARRIER	3400.0	LF	\$35.63	\$121,142
12	511-3000	SUPERSTR REINF STEEL, BR NO-	539818.8	LB	\$0.56	\$302,355
13	511-1000	BAR REINF STEEL	184846.9	LB	\$0.52	\$96,120
21	507-9032S	PSC BEAMS, AASHTO, SPLICED BULB TEE, 72 in, BR NO -	9350.0	LF	\$230.00	\$2,150,500
8	522-1000	SHORING	1.0	EA	\$45,000.00	\$45,000
25	520-2218	PILING, PSC, 18 IN SQ	3360	LF	\$41.49	\$139,406
43	603-2024	STN DUMPED RIP RAP, TP 1, 24 IN	8959	SY	\$40.66	\$364,257
44	603-7000	PLASTIC FILTER FABRIC	8959	SY	\$4.12	\$36,909
1	540-1102	REMOVAL OF EXISTING BR, STA NO -	1.0	LS	\$90,577.00	\$90,577
45	515-2020	ALUM HANDRAIL, STD 3626	6800.0	LF	\$22.07	\$150,076
29	520-5000	PILOT HOLES	0.0	LF	\$600.00	\$0

Bridge Sub Total = \$8,097,421

5% Mobilization	\$304,871
5% MOT	\$304,871
2% Contingency	\$121,948

**Total Bridge Cost = \$8,829,111
per bridge**

Deck Area (sq ft) = BL (BW) = 89888
Unit Cost (\$ / sq ft) = \$75.97
per bridge

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER:	SB-1.2
PAGE NUMBER:	1 of 4

PROJECT TITLE: ABERCORN STREET EXTENSION TO I-95

PROJECT LOCATION: GEORGIA DOT – Chatham County, Georgia

PROPOSAL DESCRIPTION: REDUCE SHOULDER WIDTH REQUIREMENTS AND LEAVE FOREST RIVER BRIDGE AS IS AND RE-STRIPE FOR 3 LANES IN BOTH DIRECTIONS.

ORIGINAL DESIGN: The original design contains a combination of short Type III span beams and steel girders with four 56'-0", five 60'-0" and a 330'-0" continuous steel girder span. The width of the bridge is 88'-0" gutter-to-gutter with a median barrier. The current bridge accommodates 2 lanes in both directions and 10'-0" shoulders. The bridge is to be widened to accommodate an additional lane in either direction thereby increasing the width to 56'-0" in either direction and the total width of gutter to gutter to 114'-6".

PROPOSED CHANGE: The proposed design recommends the reduction in shoulder widths to a minimum on the inside and outside shoulders and re-stripe the bridge to accommodate 3 lanes in both directions. Even the lanes on the bridge can be reduced to 11'-0" lanes thereby allowing for 7-9" inside shoulders and not reducing the safety aspects of the bridge.

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:	\$ 6,978,918		\$ 6,978,918
PROPOSED CHANGE:	\$ 62,500		\$ 62,500
		SAVINGS:	\$ 6,916,418

ADVANTAGES/DISADVANTAGES/JUSTIFICATION

PROPOSAL NUMBER:	SB-1.2
PAGE NUMBER:	2 of 4

PROJECT TITLE: ABERCORN STREET EXTENSION TO I-95

PROJECT LOCATION: GEORGIA DOT - Chatham County, Georgia

ADVANTAGES:

Total life cycle cost savings of \$6,916,418.

Faster Construction time.

Less materials.

Less maintenance area.

Less disruption time to traffic during construction.

DISADVANTAGES:

Less inside and outside shoulder.

Increased drivers' dangers due to breakdowns on the bridge.

JUSTIFICATION:

Drastic reduction in construction costs and construction time justify the need to reduce the inside and outside shoulders

COST ESTIMATING WORKSHEET

PROPOSAL NUMBER:	SB-1.2
PAGE NUMBER:	3 of 4

PROJECT TITLE: ABERCORN STREET EXTENSION TO I-95

PROJECT LOCATION: GEORGIA DOT - Chatham County, Georgia

ORIGINAL DESIGN

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Type III spans	7	LS	1	1,256,252	1,256,252
Steel Spans	7	LS	1	4,326,882	4,326,882
SUBTOTAL:					5,583,134
25 % MARK UP:					1,395,784
TOTAL:					6,978,918

PROPOSED CHANGE

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Hydro Blasting & Re-striping	7	LS	1	50,000	50,000
SUBTOTAL:					50,000
25 % MARK UP:					12,500
TOTAL:					62,500

SOURCES

- | | |
|--|--|
| <ol style="list-style-type: none"> 1. Project Cost Estimate 2. CES Data Base 3. CACES Data Base 4. Means Estimating Manual | <ol style="list-style-type: none"> 5. Richardson's Estimating Manual 6. Vendor (Specify) 7. Other (GDOT Mean Summary) |
|--|--|

ORIGINAL DESIGN CALCULATIONS

PROPOSAL NUMBER:	SB-1.2
PAGE NUMBER:	4 of 5

PROJECT TITLE: ABERCORN STREET EXTENSION TO I-95

PROJECT LOCATION: GEORGIA DOT - Chatham County, Georgia

Cost Estimate

*Original Forest River
Approaches*

Project : SR 304/Abercorn, Chatham County	
Project Number : 04402	
Made By : TFD	Date : Feb 04
Checked By :	Date :

Tag	Pay Item	Description	Quantity	Unit	Unit Cost	Cost
3	500-1006	SUPERSTR CONCRETE, CL AA, BR NO-	363.4	CY	\$619.38	\$225,081
4	500-3101	CLASS A CONCRETE	13.3	CY	\$467.06	\$6,193
9	500-0100	GROOVED CONCRETE	1503.3	SY	\$4.69	\$7,050
10	525-1000	COFFERDAM	1.00	EA	\$18,000.00	\$18,000
11	500-2100	CONCRETE BARRIER	1048.0	LF	\$35.63	\$37,340
12	511-3000	SUPERSTR REINF STEEL, BR NO-	72879.6	LB	\$0.56	\$40,701
13	511-1000	BAR REINF STEEL	1325.9	LB	\$0.52	\$689
15	507-9002	PSC BEAMS, AASHTO TYPE II, BR NO -	2096.0	LF	\$92.80	\$194,509
8	522-1000	SHORING	1.0	EA	\$45,000.00	\$45,000
25	520-2218	PILING, PSC, 18 IN SQ	2400.0	LF	\$41.49	\$99,576
43	603-2024	STN DUMPED RIP RAP, TP 1, 24 IN	8959	SY	\$40.66	\$364,257
44	603-7000	PLASTIC FILTER FABRIC	8959	SY	\$4.12	\$36,909
45	515-2020	ALUM HANDRAIL, STD 3626	2096.0	LF	\$22.07	\$46,259
28	520-5000	PILOT HOLES	0.0	LF	\$800.00	\$0

Bridge Sub Total = \$1,121,585

5% Mobilization	\$56,078
5% MOT	\$56,078
2% Contingency	\$22,431

**Total Bridge Cost = \$1,256,152
per Bridge**

Deck Area (sq ft) = BL (BW) = 14890
Unit Cost (\$ / sq ft) = \$84.36
per bridge

ORIGINAL DESIGN CALCULATIONS

PROPOSAL NUMBER:	SB-1.2
PAGE NUMBER:	5 of 5

PROJECT TITLE: ABERCORN STREET EXTENSION TO I-95

PROJECT LOCATION: GEORGIA DOT - Chatham County, Georgia

ORIGINAL **Cost Estimate**
Proposed Forest River
Main Steel girder Spans

Project : SR 204/Abercorn, Chatham County
Project Number : 04462
Made By : HES **Date :** Feb-04
Checked By : **Date :**

Seq	Pay Item	Description	Quantity	Unit	Unit Cost	Cost
3	500-1006	SUPERSTR CONCRETE, CL AA, BR NO-	286.77	CY	\$619.38	\$177,621
4	500-3101	CLASS A CONCRETE	271.15	CY	\$467.06	\$126,642
9	500-0100	GROOVED CONCRETE	1,003.90	SY	\$4.69	\$4,708
10	525-1000	COFFERDAM	1.00	EA	\$18,000.00	\$18,000
11	500-2100	CONCRETE BARRIER	990.00	LF	\$35.63	\$35,274
12	511-3000	SUPERSTR REINF STEEL, BR NO-	76,281.23	LB	\$0.56	\$42,717
13	511-1000	BAR REINF STEEL	32,537.78	LB	\$0.52	\$16,920
22	501-3000	STR STEEL, BR NO -	1,611,610.00	LB	\$1.95	\$3,142,640
8	522-1000	SHORING	1.00	EA	\$45,000.00	\$45,000
25	520-2218	PILING, PSC, 18 IN SQ	2,880.00	LF	\$41.49	\$119,491
1	540-1102	REMOVAL OF EXISTING BR, STA NO -	1.00	LS	\$90,577.00	\$90,577
45	515-2020	ALUM HANDRAIL, STD 3626	1,980.00	LF	\$22.07	\$43,699
29	520-5000	PILOT HOLES	-	LF	\$800.00	\$0

Bridge Sub Total = \$3,863,288

5% Mobilization	\$193,164
5% MOT	\$193,164
2% Contingency	\$77,266

Total Bridge Cost = \$4,326,832

Deck Area (sq ft) = BL (BW) = 9378
Unit Cost (\$ / sq ft) = \$461.41

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER:	SB-2.0
PAGE NUMBER:	1 of 5

PROJECT TITLE: ABERCORN STREET EXTENSION TO I-95

PROJECT LOCATION: GEORGIA DOT – Chatham County, Georgia

PROPOSAL DESCRIPTION: UTILIZE HSS (50 KSI) AND REDUCE MEDIAN WIDTH SECTION ON CSX RR BRIDGE FROM 20’-0” TO 10’- 6” (NEW SECTION 4’-0”INSIDE SHOULDERS+2’-6” MEDIAN BARRIER) TO AVOID POSSIBLE CLEARANCE PROBLEMS OVER THE CSX RAILROAD.

ORIGINAL DESIGN: The original design consists of widening a 3 span bridge over CSX Rail Road that consists of three 73’-6”, 76’-0” and 60’-0” steel beams span configuration. The width of the bridge is 88’-0” gutter-to-gutter with a median barrier. The current bridge accommodates 2 lanes in both directions and 10’-0” shoulders. The bridge is to be widened to accommodate an additional lane in either direction thereby increasing the width to 56’-0” in either direction and the total width of gutter to gutter to 114’-6”.

PROPOSED CHANGE: The proposed design recommends the utilization of HSS possible 70 ksi even to minimize the depth of the widened structure to a minimum to avoid possible railroad clearance problems as well as reduce the shoulder widths to 4’-0” inside and 10’-0” outside shoulders thereby reducing the widening to a minimum and a total width of 51’-3” in either direction and a total width of gutter to gutter of 102’-0”.

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:	\$ 1,033,568		\$ 1,033,568
PROPOSED CHANGE:	\$ 741,129		\$ 741,129
		SAVINGS:	\$ 292,439

ADVANTAGES/DISADVANTAGES/JUSTIFICATION

PROPOSAL NUMBER:	SB-2.0
PAGE NUMBER:	2 of 5

PROJECT TITLE: ABERCORN STREET EXTENSION TO I-95
PROJECT LOCATION: GEORGIA DOT - Chatham County, Georgia

ADVANTAGES:

Total life cycle cost savings of \$292,439.

Faster Construction time.

Less materials.

Less maintenance area.

Less disruption time to traffic during construction.

DISADVANTAGES:

Less inside shoulder.

JUSTIFICATION:

Drastic reduction in construction costs and construction time justify the need to reduce the inside shoulders.

COST ESTIMATING WORKSHEET

PROPOSAL NUMBER:	SB-2.0
PAGE NUMBER:	3 of 5

PROJECT TITLE: ABERCORN STREET EXTENSION TO I-95

PROJECT LOCATION: GEORGIA DOT - Chatham County, Georgia

ORIGINAL DESIGN

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
3-Span Steel bridge	7	LS	1	853,794	853,794
SUBTOTAL:					853,794
25 % MARK UP:					213,448
TOTAL:					1,067,242

PROPOSED CHANGE

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
3-Span Steel bridge	7	LS	1	619,823	619,823
SUBTOTAL:					619,823
25 % MARK UP:					154,996
TOTAL:					774,819

SOURCES

- | | |
|--|--|
| <ol style="list-style-type: none"> 1. Project Cost Estimate 2. CES Data Base 3. CACES Data Base 4. Means Estimating Manual | <ol style="list-style-type: none"> 5. Richardson's Estimating Manual 6. Vendor (Specify) 7. Other (GDOT Mean Summary) |
|--|--|

ORIGINAL DESIGN CALCULATIONS

PROPOSAL NUMBER:	SB-2.0
PAGE NUMBER:	4 of 5

PROJECT TITLE: ABERCORN STREET EXTENSION TO I-95

PROJECT LOCATION: GEORGIA DOT - Chatham County, Georgia

Cost Estimate

Original 3-span
Steel RR Bridge

Project : SR 2147/Abcorn, Chatham County
 Project Number : 2147
 Made By : HFD Date : Feb-04
 Checked By : Date :

Tag	Pay Item	Description	Quantity	Unit	Unit Cost	Cost
3	500-1006	SUPERSTR CONCRETE, CL AA, BR NO-	137.40	CY	\$819.38	\$85,104
4	500-3101	CLASS A CONCRETE	138.07	CY	\$467.06	\$64,486
9	500-0100	GROOVED CONCRETE	658.78	SY	\$4.69	\$3,090
11	500-2100	CONCRETE BARRIER	838.00	LF	\$35.63	\$29,858
12	511-3000	SUPERSTR REINF STEEL, BR NO-	36,548.76	LB	\$0.56	\$20,467
13	511-1000	BAR REINF STEEL	16,568.14	LB	\$0.52	\$8,615
22	501-3000	STR STEEL, BR NO -	164,565.00	LB	\$1.95	\$320,902
8	522-1000	SHORING	1.00	EA	\$45,000.00	\$45,000
25	520-2218	PILING, PSC, 18 IN SQ	800.00	LF	\$41.49	\$33,192
1	540-1102	REMOVAL OF EXISTING BR, STA NO -	1.00	LS	\$90,577.00	\$90,577
41	441-0204	PLAIN CONC DITCH PAVING, 4 IN	895.86	SF	\$26.83	\$24,038
45	515-2020	ALUM HANDRAIL, STD 3626	1,676.00	LF	\$22.07	\$36,989
29	520-5000	PILOT HOLES	-	LF	\$600.00	\$0

Bridge Sub Total = \$762,316

5% Mobilization	\$38,116
5% MOT	\$38,116
2% Contingency	\$15,248

Total Bridge Cost = \$853,794

Deck Area (sq ft) = BL (BW) = 5709
 Unit Cost (\$ / sq ft) = \$149.56

PROPOSED CHANGE CALCULATIONS

PROPOSAL NUMBER:	SB-2.0
PAGE NUMBER:	5 of 5

PROJECT TITLE: ABERCORN STREET EXTENSION TO I-95

PROJECT LOCATION: GEORGIA DOT - Chatham County, Georgia

Cost Estimate

*Proposed 3-span
Steel RR Bridge*

Project : SR 204 Abercorn, Chatham County
 Project Number : 24202
 Made By : HHS Date : Feb-04
 Checked By : Date :

Tag	Pay Item	Description	Quantity	Unit	Unit Cost	Cost
3	500-1006	SUPERSTR CONCRETE, CL AA, BR NO-	88.68	CY	\$619.38	\$54,929
4	500-3101	CLASS A CONCRETE	119.77	CY	\$467.06	\$55,940
9	500-0100	GROOVED CONCRETE	374.31	SY	\$4.69	\$1,755
11	500-2100	CONCRETE BARRIER	838.00	LF	\$35.63	\$29,858
12	511-3000	SUPERSTR REINF STEEL, BR NO-	23,590.05	LB	\$0.56	\$13,210
13	511-1000	BAR REINF STEEL	14,372.58	LB	\$0.52	\$7,474
22	501-3000	STR STEEL, BR NO -	82,282.50	LB	\$1.95	\$160,451
8	522-1000	SHORING	1.00	EA	\$45,000.00	\$45,000
25	520-2218	PILING, PSC, 18 IN SQ	800.00	LF	\$41.49	\$33,192
1	540-1102	REMOVAL OF EXISTING BR, STA NO -	1.00	LS	\$90,577.00	\$90,577
41	441-0204	PLAIN CONC DITCH PAVING, 4 IN	895.86	SF	\$26.83	\$24,036
45	515-2020	ALUM HANDRAIL, STD 3626	1,676.00	LF	\$22.07	\$36,989
29	520-5000	PILOT HOLES	-	LF	\$800.00	\$0

Bridge Sub Total = \$553,413

5% Mobilization	\$27,671
5% MOT	\$27,671
2% Contingency	\$11,068

Total Bridge Cost = \$619,823

Deck Area (sq ft) = BL (BW) = 3719
 Unit Cost (\$ / sq ft) = \$166.68

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER:	SB-2.1
PAGE NUMBER:	1 of 3

PROJECT TITLE: ABERCORN STREET EXTENSION TO I-95

PROJECT LOCATION: GEORGIA DOT – Chatham County, Georgia

PROPOSAL DESCRIPTION: REDUCE INSIDE SHOULDERS SECTION ON CSX RR BRIDGE FROM 20'-0" TO 10'- 6" NEW SECTION (4'-0" INSIDE SHOULDERS+2'-6" MEDIAN BARRIER).

ORIGINAL DESIGN: The original design consists of widening a 3 span bridge over CSX Rail Road that consists of three 73'-6", 76'-0" and 60'-0" steel beams span configuration. The width of the bridge is 88'-0" gutter-to-gutter with a median barrier. The current bridge accommodates 2 lanes in both directions and 10'-0" shoulders. The bridge is to be widened to accommodate an additional lane in either direction thereby increasing the width to 56'-0" in either direction and the total width of gutter to gutter to 114'-6".

PROPOSED CHANGE: The proposed design recommends the reduction in shoulder widths to 4'-0" inside and 10'-0" outside shoulders thereby reducing the widening to a minimum and a total width of 51'-3" in either direction and a total width of gutter to gutter of 102'-0".

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:	\$ 1,033,568		\$ 1,033,568
PROPOSED CHANGE:	\$ 741,129		\$ 741,129
		SAVINGS:	\$ 292,439

ADVANTAGES/DISADVANTAGES/JUSTIFICATION

PROPOSAL NUMBER:	SB-2.1
PAGE NUMBER:	2 of 3

PROJECT TITLE: ABERCORN STREET EXTENSION TO I-95

PROJECT LOCATION: GEORGIA DOT - Chatham County, Georgia

ADVANTAGES:

Total life cycle cost savings of \$292,439.

Faster Construction time.

Less material.

Less maintenance area.

Less disruption time to traffic during construction.

DISADVANTAGES:

Less inside shoulder.

JUSTIFICATION:

Drastic reduction in construction costs and construction time justify the need to reduce the inside shoulders

COST ESTIMATING WORKSHEET

PROPOSAL NUMBER:	SB-2.1
PAGE NUMBER:	3 of 3

PROJECT TITLE: ABERCORN STREET EXTENSION TO I-95 PROJECT LOCATION: GEORGIA DOT - Chatham County, Georgia

ORIGINAL DESIGN

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
3-Span Steel bridge	7	LS	1	826,854	826,854
SUBTOTAL:					826,854
25 % MARK UP:					206,714
TOTAL:					1,033,568

PROPOSED CHANGE

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
3-Span Steel bridge	7	LS	1	592,903	592,903
SUBTOTAL:					592,903
25 % MARK UP:					148,226
TOTAL:					741,129

SOURCES

- | | |
|--|--|
| <ol style="list-style-type: none"> 1. Project Cost Estimate 2. CES Data Base 3. CACES Data Base 4. Means Estimating Manual | <ol style="list-style-type: none"> 5. Richardson's Estimating Manual 6. Vendor (Specify) 7. Other (GDOT Mean Summary) |
|--|--|

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER:	SB-3.0
PAGE NUMBER:	1 of 5

PROJECT TITLE: ABERCORN STREET EXTENSION TO I-95

PROJECT LOCATION: GEORGIA DOT – Chatham County, Georgia

PROPOSAL DESCRIPTION: REDUCE INSIDE SHOULDERS SECTION ON CSX RR BRIDGE FROM 20'-0" TO 10'- 6" (NEW SECTION 4'-0" INSIDE SHOULDERS+2'-6" MEDIAN BARRIER) AND REPLACE BRIDGE WITH TYPE III BEAMS IF CLEARANCE PROBLEMS EXIST INSTEAD OF JACKING AND WIDENING.

ORIGINAL DESIGN: The original design consists of widening a 3 span bridge over CSX Rail Road that consists of three 73'-6", 76'-0" and 60'-0" steel beams span configuration. The width of the bridge is 88'-0" gutter-to-gutter with a median barrier. The current bridge accommodates 2 lanes in both directions and 10'-0" shoulders. The bridge is to be widened to accommodate an additional lane in either direction thereby increasing the width to 56'-0" in either direction and the total width of gutter to gutter to 114'-6".

PROPOSED CHANGE: The proposed design recommends the reduction in shoulder widths to 4'-0" inside and 10'-0" outside shoulders thereby reducing the widening to a minimum and a total width of 51'-3" in either direction and a total width of gutter to gutter of 102'-0". Moreover, a replacement of the bridge with Type III beams and new deck instead of Jacking to eliminate clearance problems.

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:	\$ 1,452,243		\$ 1,452,243
PROPOSED CHANGE:	\$ 1,845,262		\$ 1,845,262
		SAVINGS:	\$ (393,000)

ADVANTAGES/DISADVANTAGES/JUSTIFICATION

PROPOSAL NUMBER:	SB-3.0
PAGE NUMBER:	2 of 5

PROJECT TITLE: ABERCORN STREET EXTENSION TO I-95
PROJECT LOCATION: GEORGIA DOT - Chatham County, Georgia

ADVANTAGES:

Enhance Clearances.

Less maintenance area.

Present Value of construction exceeds Future value for complete replacement.

DISADVANTAGES:

Total life cycle cost increase of \$393,000.

Less inside shoulder.

More disruption time to traffic during construction.

More materials.

Longer Construction time.

JUSTIFICATION:

Drastic reduction in construction costs and construction time justify the need to reduce the inside shoulders.

COST ESTIMATING WORKSHEET

PROPOSAL NUMBER:	SB-3.0
PAGE NUMBER:	3 of 5

PROJECT TITLE: ABERCORN STREET EXTENSION TO I-95
PROJECT LOCATION: GEORGIA DOT - Chatham County, Georgia

ORIGINAL DESIGN

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
3-Span Steel bridge Widening	7	LS	1	826,854	853,794
RR Bridge jacking	7	LS	1	208,000	208,000
Maintenance	7	LS	1	100,000	100,000
SUBTOTAL:					1,161,794
25 % MARK UP:					290,449
TOTAL:					1,452,243

PROPOSED CHANGE

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
3-Span Concrete bridge	7	LS	1	1,476,210	1,476,210
SUBTOTAL:					1,476,210
25 % MARK UP:					369,052
TOTAL:					1,845,262

SOURCES

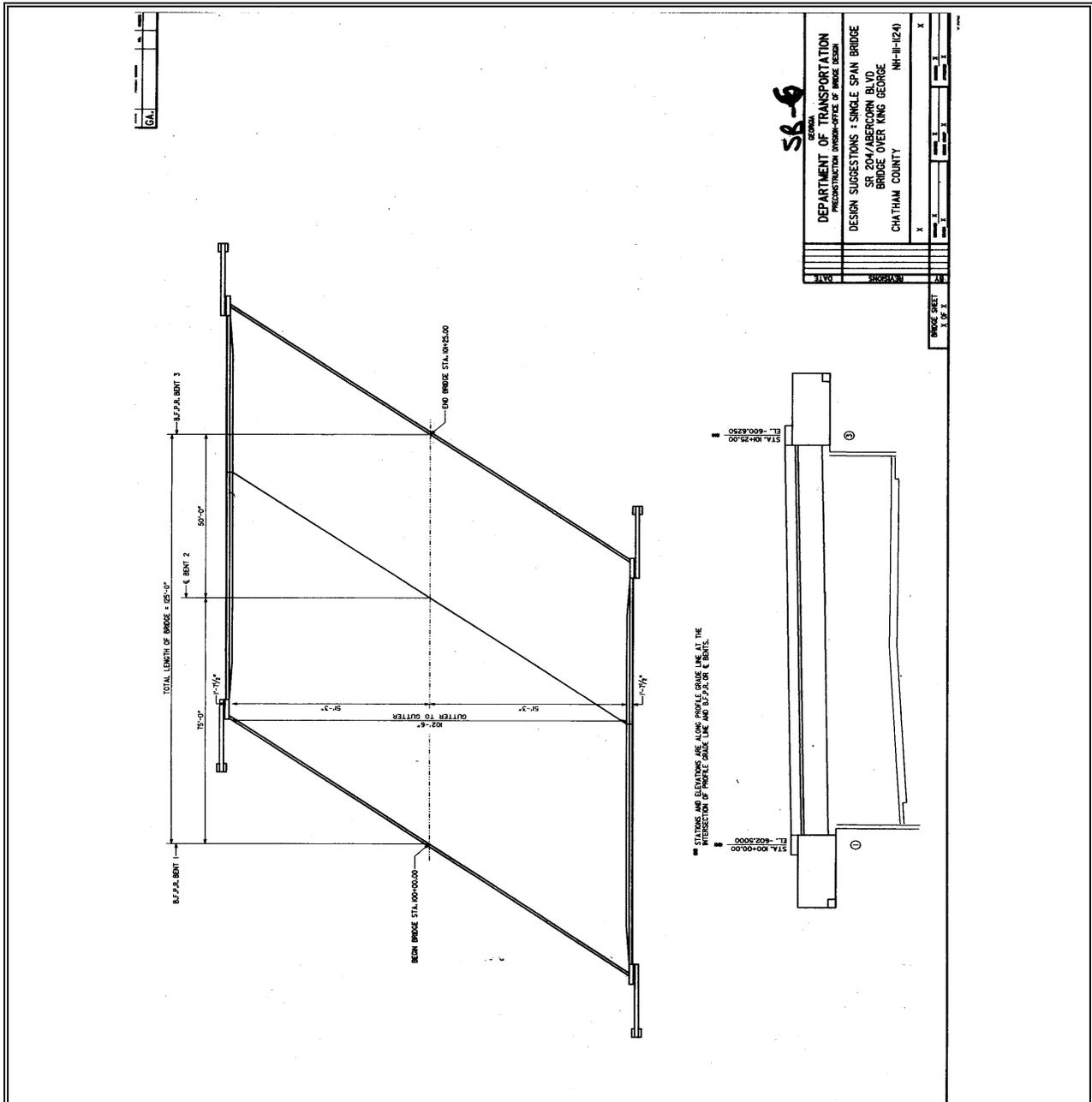
- | | |
|--|--|
| <ol style="list-style-type: none"> 1. Project Cost Estimate 2. CES Data Base 3. CACES Data Base 4. Means Estimating Manual | <ol style="list-style-type: none"> 5. Richardson's Estimating Manual 6. Vendor (Specify) 7. Other (GDOT Mean Summary) |
|--|--|

ORIGINAL DESIGN SKETCH DETAILS

PROPOSAL NUMBER:	SB-3.0
PAGE NUMBER:	4 of 6

PROJECT TITLE: ABERCORN STREET EXTENSION TO I-95

PROJECT LOCATION: GEORGIA DOT - Chatham County, Georgia



ORIGINAL DESIGN CALCULATIONS

PROPOSAL NUMBER:	SB-3.0
PAGE NUMBER:	5 of 6

PROJECT TITLE: ABERCORN STREET EXTENSION TO I-95

PROJECT LOCATION: GEORGIA DOT - Chatham County, Georgia

Cost Estimate

*Original 3-span
Steel RR Bridge*

Project : SB 2041 Abercorn, Chatham County
 Project Number : 04402
 Made By : FFD Date : Feb-04
 Checked By : Date :

Tag	Pay Item	Description	Quantity	Unit	Unit Cost	Cost
3	500-1006	SUPERSTR CONCRETE, CL AA, BR NO-	137.40	CY	\$619.38	\$85,104
4	500-3101	CLASS A CONCRETE	138.07	CY	\$467.06	\$64,486
9	500-0100	GROOVED CONCRETE	658.78	SY	\$4.69	\$3,090
11	500-2100	CONCRETE BARRIER	838.00	LF	\$35.63	\$29,858
12	511-3000	SUPERSTR REINF STEEL, BR NO-	36,548.76	LB	\$0.56	\$20,467
13	511-1000	BAR REINF STEEL	16,568.14	LB	\$0.52	\$8,615
22	501-3000	STR STEEL, BR NO -	164,565.00	LB	\$1.95	\$320,902
8	522-1000	SHORING	1.00	EA	\$45,000.00	\$45,000
25	520-2218	PILING, PSC, 18 IN SQ	800.00	LF	\$41.49	\$33,192
1	540-1102	REMOVAL OF EXISTING BR, STA NO -	1.00	LS	\$90,577.00	\$90,577
41	441-0204	PLAIN CONC DITCH PAVING, 4 IN	895.86	SF	\$26.83	\$24,036
45	515-2020	ALUM HANDRAIL, STD 3626	1,676.00	LF	\$22.07	\$36,989
29	520-5000	PILOT HOLES	-	LF	\$600.00	\$0

Bridge Sub Total = \$782,316

5% Mobilization	\$38,116
5% MOT	\$38,116
2% Contingency	\$15,246

Total Bridge Cost = \$853,794

Deck Area (sq ft) = BL (BW) = 5709
 Unit Cost (\$ / sq ft) = \$149.56

PROPOSED CHANGE CALCULATIONS

PROPOSAL NUMBER:	SB-3.0
PAGE NUMBER:	6 of 6

PROJECT TITLE: ABERCORN STREET EXTENSION TO I-95

PROJECT LOCATION: GEORGIA DOT - Chatham County, Georgia

Cost Estimate

Replacement 3-span
Concrete RR Bridge

Project : SR 304/Abercorn, Chatham County	
Project Number : 04432	
Made By : (SAD)	Date : Feb-04
Checked By :	Date :

Tag	Pay Item	Description	Quantity	Unit	Unit Cost	Cost
3	500-1006	SUPERSTR CONCRETE, CL AA, BR NO-	546.9	CY	\$619.38	\$338,745
4	500-3101	CLASS A CONCRETE	263.1	CY	\$467.06	\$122,883
9	500-0100	GROOVED CONCRETE	3015.0	SY	\$4.69	\$14,140
11	500-2100	CONCRETE BARRIER	840.0	LF	\$35.63	\$29,929
12	511-3000	SUPERSTR REINF STEEL, BR NO-	109381.9	LB	\$0.58	\$61,254
13	511-1000	BAR REINF STEEL	26309.9	LB	\$0.52	\$13,681
16	507-9003	PSC BEAMS, AASHTO TYPE III, BR NO -	2940.0	LF	\$99.05	\$291,207
8	522-1000	SHORING	1.0	EA	\$45,000.00	\$45,000
25	520-2218	PILING, PSC, 18 IN SQ	800.0	LF	\$41.49	\$33,192
1	540-1102	REMOVAL OF EXISTING BR, STA NO -	1.0	LS	\$90,577.00	\$90,577
41	441-0204	PLAIN CONC DITCH PAVING, 4 IN	8958.6	SF	\$26.83	\$240,359
45	515-2020	ALUM HANDRAIL, STD 3626	1680.0	LF	\$22.07	\$37,078
29	520-5000	PILOT HOLES	0.0	LF	\$600.00	\$0

Bridge Sub Total = \$1,318,045

5% Mobilization	\$85,902
5% MOT	\$85,902
2% Contingency	\$26,361

Total Bridge Cost = \$1,476,210
per Bridge

Deck Area (sq ft) = BL (BW) = 22208
Unit Cost (\$ / sq ft) = \$66.47
per bridge

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER:	SB-6.0
PAGE NUMBER:	1 of 5

PROJECT TITLE: ABERCORN STREET EXTENSION TO I-95

PROJECT LOCATION: GEORGIA DOT – Chatham County, Georgia

PROPOSAL DESCRIPTION: REDUCE MEDIAN WIDTH SECTION ON KING GEORGE BRIDGE FROM 20'-0" TO 10'-6" AND UTILIZE MSE WALLS NEW SECTION (4'-0" INSIDE SHOULDERS+2'-6" MEDIAN BARRIER).

ORIGINAL DESIGN: The original design suggests the use of a 3-span bridge with endrolls and a width of the bridge of 114'-6" gutter-to-gutter with a median barrier to accommodate 3 lanes in both directions and 10'-0" inside and outside shoulders.

PROPOSED CHANGE: The proposed design recommends the reduction in shoulder widths to 4'-0" inside and 10'-0" outside shoulders thereby reducing the bridge width to a minimum with a width of 51'-3" in both directions and a total width of gutter to gutter of 102'-0". Moreover, eliminate the endrolls and utilize MSE walls thereby reducing the bridge length to a single span only.

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:	\$ 2,278,585		\$ 2,278,585
PROPOSED CHANGE:	\$ 1,217,645		\$ 1,217,645
		SAVINGS:	\$ 1,030,041

ADVANTAGES/DISADVANTAGES/JUSTIFICATION

PROPOSAL NUMBER:	SB-6.0
PAGE NUMBER:	2 of 5

PROJECT TITLE: ABERCORN STREET EXTENSION TO I-95

PROJECT LOCATION: GEORGIA DOT - Chatham County, Georgia

ADVANTAGES:

Total life cycle cost savings of \$1,030,041.

Faster Construction time.

Less materials.

Less maintenance area.

Fewer spans.

Less disruption time to traffic during construction.

DISADVANTAGES:

Less inside shoulder.

No future expansion on King George possible due to MSE walls.

JUSTIFICATION:

Drastic reduction in construction costs and construction time justify the need to reduce the inside shoulders and a single span bridge configuration.

COST ESTIMATING WORKSHEET

PROPOSAL NUMBER:	SB-6.0
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PAGE NUMBER:	3 of 5
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PROJECT TITLE: ABERCORN STREET EXTENSION TO I-95

PROJECT LOCATION: GEORGIA DOT - Chatham County, Georgia

ORIGINAL DESIGN

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
3-Span Bridge	7	LS	1	1,822,868	1,822,868
SUBTOTAL:					1,822,868
25 % MARK UP:					455,717
TOTAL:					2,278,585

PROPOSED CHANGE

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
1-Span Bridge	7	LS	1	998,835	998,835
SUBTOTAL:					998,835
25 % MARK UP:					249,709
TOTAL:					1,248,544

SOURCES

- | | |
|--|--|
| <ol style="list-style-type: none"> 1. Project Cost Estimate 2. CES Data Base 3. CACES Data Base 4. Means Estimating Manual | <ol style="list-style-type: none"> 5. Richardson's Estimating Manual 6. Vendor (Specify) 7. Other (GDOT Mean Summary) |
|--|--|

ORIGINAL DESIGN CALCULATIONS

PROPOSAL NUMBER:	SB-6.0
PAGE NUMBER:	4 of 5

PROJECT TITLE: ABERCORN STREET EXTENSION TO I-95

PROJECT LOCATION: GEORGIA DOT - Chatham County, Georgia

Cost Estimate

Original King George 3
Span Bridge

Project : SB 250/Abercorn, Chatham County
 Project Number : 04402
 Made By : [Signature] Date : Feb-04
 Checked By : [Signature] Date :

Tag	Pay Item	Description	Quantity	Unit	Unit Cost	Cost
3	500-1006	SUPERSTR CONCRETE, CL AA, BR NO-	723.1	CY	\$619.38	\$447,852
4	500-3101	CLASS A CONCRETE	332.3	CY	\$467.06	\$155,183
9	500-0100	GROOVED CONCRETE	3483.3	SY	\$4.69	\$16,337
11	500-2100	CONCRETE BARRIER	900.0	LF	\$35.63	\$32,067
12	511-3000	SUPERSTR REINF STEEL, BR NO-	144612.9	LB	\$0.56	\$80,983
13	511-1000	BAR REINF STEEL	33225.4	LB	\$0.52	\$17,277
20	507-9032	PSC BEAMS, AASHTO, BULB TEE, 72 in, BR NO -	3825.0	LF	\$147.17	\$562,925
25	520-2218	PILING, PSC, 18 IN SQ	840.0	LF	\$41.49	\$34,852
41	441-0204	PLAIN CONC DITCH PAVING, 4 IN	8958.6	SF	\$26.83	\$240,359
45	515-2020	ALUM HANDRAIL, STD 3626	1800.0	LF	\$22.07	\$39,726
29	520-5000	PILOT HOLES	0.0	LF	\$600.00	\$0

Bridge Sub Total = \$1,627,561

5% Mobilization	\$81,378
5% MOT	\$81,378
2% Contingency	\$32,551

**Total Bridge Cost = \$1,822,868
per Bridge**

Deck Area (sq ft) = BL (BW) = 25931
 Unit Cost (\$ / sq ft) = \$70.30
 per Bridge

PROPOSED CHANGE CALCULATIONS

PROPOSAL NUMBER:	SB-6.0
PAGE NUMBER:	5 of 5

PROJECT TITLE: ABERCORN STREET EXTENSION TO I-95

PROJECT LOCATION: GEORGIA DOT - Chatham County, Georgia

Cost Estimate

*Proposed King George
1-Span/ MSE Bridge*

Project : SR 204/Abercorn, Chatham County
 Project Number : 14493
 Made By : HFD Date : Feb-04
 Checked By: Date :

Tag	Pay Item	Description	Quantity	Unit	Unit Cost	Cost
3	500-1006	SUPERSTR CONCRETE, CL AA, BR NO-	372.3	CY	\$619.38	\$230,625
4	500-3101	CLASS A CONCRETE	47.9	CY	\$467.06	\$22,368
9	500-0100	GROOVED CONCRETE	2065.8	SY	\$4.69	\$9,689
11	500-2100	CONCRETE BARRIER	500.0	LF	\$35.63	\$17,815
12	511-3000	SUPERSTR REINF STEEL, BR NO-	74469.7	LB	\$0.56	\$41,703
13	511-1000	BAR REINF STEEL	4789.1	LB	\$0.52	\$2,490
20	507-9032	PSC BEAMS, AASHTO, BULB TEE, 72 in, BR NO -	2125.0	LF	\$147.17	\$312,736
25	520-2218	PILING, PSC, 18 IN SQ	1020.0	LF	\$41.49	\$42,320
42	627-1020	MSE WALL FACE, 20 - 30 FT HT, WALL NO -	5000.0	SF	\$38.00	\$180,000
45	515-2020	ALUM HANDRAIL, STD 3626	1000.0	LF	\$22.07	\$22,070
29	520-5000	PILOT HOLES	0.0	LF	\$600.00	\$0

Bridge Sub Total = \$891,817

5% Mobilization	\$44,591
5% MOT	\$44,591
2% Contingency	\$17,836

**Total Bridge Cost = \$988,835
per Bridge**

Deck Area (sq ft) = BL (BW) = 13219
 Unit Cost (\$ / sq ft) = \$75.56
 per Bridge

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER:	RW-2.0
PAGE NUMBER:	1 of 4

PROJECT TITLE: ABERCORN STREET EXTENSION TO I-95

PROJECT LOCATION: GEORGIA DOT – Chatham County, Georgia

PROPOSAL DESCRIPTION: CONSTRUCT A SINGLE-POINT URBAN INTERCHANGE AT KING GEORGE BLVD. / SR 204.

ORIGINAL DESIGN: The original design includes a diamond interchange with SR 204 bridging over King George. The proposed ramps are spaced 660’ apart from each other. As a result, the next median openings away from the ramp terminals must be located no closer than 660’ away. Thus, Mariners Way will have to be relocated and the existing Piggly Wiggly property will have no median opening.

PROPOSED CHANGE: The proposed change includes construction a Single Point Urban Interchange (SPUI). This will allow the ramps to be compressed against the mainline, and only one signal is needed for all ramp terminals. Mariners Way will not need to be relocated, and the median opening to the north could be placed at the Piggly Wiggly development.

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:	\$ 33,723,867		\$ 33,723,867
PROPOSED CHANGE:	\$ 31,522,170		\$ 31,522,170
		SAVINGS:	\$ 2,201,697

ADVANTAGES/DISADVANTAGES/JUSTIFICATION

PROPOSAL NUMBER:	RW-2.0
PAGE NUMBER:	2 of 4

PROJECT TITLE: ABERCORN STREET EXTENSION TO I-95

PROJECT LOCATION: GEORGIA DOT - Chatham County, Georgia

ADVANTAGES:

Total life cycle cost savings of \$2,201,697.

Ramps will be constructed very close to the mainline of the bridge, thus lessening the ROW impacts to the Piggly Wiggly development, Waterford Plantation Apartments, Waffle House, and BP gas station.

One signal under the proposed bridge versus two signals will help traffic flow and will lessen the length of widening of King George Blvd. South and north of the interchange.

Proposed medians can be shortened, allowing for more access to/from existing developments south and north of interchange.

Can avoid the relocation of Mariners Way and Entrance to Waterford Plantation Apartments.

Design could account for a future 8 lane sections on SR 204 to avoid reconstruction of the proposed ramps in the future.

DISADVANTAGES:

SPUI's are not common, and thus will not meet driver expectations. Safety will be decreased until local drivers can get acclimated with the layout.

Ramps will be located next to proposed bridge and its approaches. This will not allow for major reconfigurations to take place in the future without reconstruction of the ramps.

JUSTIFICATION:

A Single-Point Urban interchange will allow for better traffic flow, lesser impacts to the local business community, less impacts to the King George Blvd. Corridor. The only additional costs associated with this alternate will be the proposed retaining walls needed for the bridge approaches, and this cost will be more than superceded by the Right-of-way cost savings.

ORIGINAL DESIGN CALCULATIONS

PROPOSAL NUMBER: RW-2.0

PAGE NUMBER: 4 of 4

PROJECT TITLE: ABERCORN STREET EXTENSION TO I-95

PROJECT LOCATION: GEORGIA DOT - Chatham County, Georgia

Cost Comparison - SPUI vs. Proposed Diamond Interchange

Retaining Walls						
*In addition to the walls proposed in the concept report						
#Walls	Length	Bottom H	Top H	Total SF	Unit Cost	Total Cost
2	780	6	30	29250	\$40	\$1,060,000
Bridges						
Add'l Length	Width	Total SF		Unit Cost	Total Cost	
80	117.76	8897.6		88	\$341,476	
Barrier						
Length (LF)	Unit Cost				Total Cost	
890.00	\$45.00				\$390,000	
Earthwork - Bridge Approaches						
Area (SY)	Length (yds)	Unit Cost			Total Cost	
34.03	444.44	\$24			\$362,963	
Right-Of-Way						
Waterford Apartments						
ROW (Ac)	Unit Cost	Displacements	Unit Cost		Total Cost	
1.80	\$25,000	24	\$15,000		\$404,986	
Piggy Wiggy Development						
ROW (Ac)	Unit Cost	Additional Damages			Total Cost	
2.13	\$150,000	\$750,000			\$1,070,248	
BP Gas Station						
Total Take		Waffle House			Total Cost	
\$600,000		Total Take			\$1,000,000	
\$400,000						
Ball Properties						
ROW (Ac)	Unit Cost				Total Cost	
0.46	\$150,000				\$69,871	
King George Associates						
ROW (Ac)	Unit Cost				Total Cost	
0.52	\$150,000				\$77,478	
Food Lion Development						
ROW (Ac)	Unit Cost	Additional Damages			Total Cost	
0.88	\$150,000	\$150,000			\$279,132	
Mariners Way Relocation						
ROW (Ac)	Unit Cost	Displacements			Total Cost	
1.36	\$150,000	\$30,000			\$236,612	
TOTAL ROW COSTS						\$3,137,337
Clearing and Grubbing						
Total Cost						\$100,000
Roadway Costs						
Median Length	Width	Unit Cost			Total Cost	
500	4	\$25			\$60,000	
Header Curb						
Length	Unit Cost				Total Cost	
7500	\$12				\$90,000	
Roadway - Mariners and Grove Point						
Length	Unit Cost	Length	Unit Cost		Total Cost	
1500	\$200	500	\$100		\$350,000	
Signals						\$80,000
Total Const. Cost: Roadway / Clearing / EW/ Signals - Walls, Barrier and Bridges						(\$748,612)
25% Markup						(\$187,128)
Subtotal						(\$835,640)
Right-Of-Way						\$3,137,337
GRAND TOTAL						\$2,201,697

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER:	RW-2.1
PAGE NUMBER:	1 of 2

PROJECT TITLE: ABERCORN STREET EXTENSION TO I-95

PROJECT LOCATION: GEORGIA DOT – Chatham County, Georgia

PROPOSAL DESCRIPTION: REPLACE DIAMOND INTERCHANGE WITH PARTIAL CLOVERLEAF RAMPS AT THE NW AND SE CORNERS.

ORIGINAL DESIGN: The original design includes a diamond interchange with SR 204 bridging over King George. The proposed ramps are spaced 660’ apart from each other. Three of the four corners will have significant Right-of-Way impacts.

PROPOSED CHANGE: The proposed change includes partial cloverleaf with ramps in the NW and SE corners of the interchange.

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:			
PROPOSED CHANGE:			
SAVINGS:			Design Suggestion

ADVANTAGES/DISADVANTAGES/JUSTIFICATION

PROPOSAL NUMBER:	RW-2.1
PAGE NUMBER:	2 of 2

PROJECT TITLE: ABERCORN STREET EXTENSION TO I-95
PROJECT LOCATION: GEORGIA DOT - Chatham County, Georgia

ADVANTAGES:

Right-of-way impacts will be concentrated on mostly undeveloped tracts.

Less impact on existing businesses and community.

DISADVANTAGES:

Possible wrong-way movements onto exit ramps.

WB entrance ramp will need to be longer and will require a wider bridge over CSX Railroad.

SR 204 Bridge over King George Blvd. will need to be widened to accommodate exit loop ramps.

Stage construction will be more difficult, the detour profile will have to match the ramp grades in order to construct the proposed bridge in 2 stages.

More expensive construction costs.

JUSTIFICATION:

Although construction costs will be higher, the ramps will be located on land that is largely undeveloped at this time. Thus, the local businesses will stay intact and undamaged by the proposed footprint of the interchange. This will benefit the local community and will offset the additional construction costs.

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER:	RW-2.2
PAGE NUMBER:	1 of 2

PROJECT TITLE: ABERCORN STREET EXTENSION TO I-95

PROJECT LOCATION: GEORGIA DOT – Chatham County, Georgia

PROPOSAL DESCRIPTION: REALIGN RAMP “C” TO AVOID IMPACTS TO WATERFORD PLANTATION APARTMENTS.

ORIGINAL DESIGN: The original design includes a diamond interchange with SR 204 bridging over King George.

PROPOSED CHANGE: The proposed change will re-align Ramp “C” to avoid Right-of-way impacts.

	INITIAL COST	OPERATING COST	TOTAL LIFE- CYCLE COST
ORIGINAL DESIGN:	\$ 33,723,167		\$ 33,723,167
PROPOSED CHANGE:	\$ 33,183,167		\$ 33,183,167
SAVINGS:			\$ 540,000

ADVANTAGES/DISADVANTAGES/JUSTIFICATION

PROPOSAL NUMBER:	RW-2.2
PAGE NUMBER:	2 of 2

PROJECT TITLE: ABERCORN STREET EXTENSION TO I-95

PROJECT LOCATION: GEORGIA DOT - Chatham County, Georgia

ADVANTAGES:

Total life cycle cost savings of \$540,000.

Avoids impacts to apartment buildings.

Avoids residential relocations.

Reduces impacts to Piggly Wiggly development.

Better intersection angle with King George Blvd.

DISADVANTAGES:

Ramp "C" will be pushed closer to the mainline; thus, a short retaining wall and/or v-gutter will be needed for this area.

JUSTIFICATION:

The cost savings and the benefit of not impacting the apartment complex justify realignment of this ramp.

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER:	RW-2.3
PAGE NUMBER:	1 of 2

PROJECT TITLE: ABERCORN STREET EXTENSION TO I-95

PROJECT LOCATION: GEORGIA DOT – Chatham County, Georgia

PROPOSAL DESCRIPTION: REPLACE DIAMOND INTERCHANGE WITH PARTIAL CLOVERLEAF RAMPS AT THE NW CORNER.

ORIGINAL DESIGN: The original design includes a diamond interchange with SR 204 bridging over King George. The proposed ramps are spaced 660’ apart from each other. Three of the four corners will have significant Right-of-Way impacts.

PROPOSED CHANGE: The proposed change includes a partial cloverleaf with loop ramps in the NW corner of the interchange.

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:			
PROPOSED CHANGE:			
SAVINGS:			Design Suggestion

ADVANTAGES/DISADVANTAGES/JUSTIFICATION

PROPOSAL NUMBER:	RW-2.3
PAGE NUMBER:	2 of 2

PROJECT TITLE: ABERCORN STREET EXTENSION TO I-95
PROJECT LOCATION: GEORGIA DOT - Chatham County, Georgia

ADVANTAGES:

Right-of-way impacts will be concentrated on mostly undeveloped tracts.

Less impact on existing businesses and community.

DISADVANTAGES:

Possible wrong-way movements onto exit ramps.

WB entrance ramp will need to be longer and will require a wider bridge over CSX Railroad.

SR 204 Bridge over King George Blvd. will need to be widened to accommodate exit loop ramps.

Stage construction will be more difficult, the detour profile will have to match the ramp grades in order to construct the proposed bridge in 2 stages.

JUSTIFICATION:

Although the total costs are approximately the same, the loop ramp will be located on land that is largely undeveloped at this time. Thus, the local businesses and residences on the NE corner will stay intact and undamaged by the proposed footprint of the interchange. This will benefit the local community.

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER:	RW-3.0
PAGE NUMBER:	1 of 3

PROJECT TITLE: ABERCORN STREET EXTENSION TO I-95

PROJECT LOCATION: GEORGIA DOT – Chatham County, Georgia

PROPOSAL DESCRIPTION: DO NOT CONSTRUCT MSE WALLS ON THE NORTH SIDE OF ABERCORN AND SHIFT TRAFFIC TO ONE SIDE.

ORIGINAL DESIGN: The original design is to temporarily shift Abercorn north to accommodate bridge construct requiring retaining walls between the main line and ramps B&C.

PROPOSED CHANGE: The proposed change recommendation is to construct all four ramps in their permanent location at sufficient width to accommodate two lanes in each direction and route thru traffic along ramps making the MSE walls unnecessary.

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:	\$ 0		\$ 0
PROPOSED CHANGE:	\$ (560,000)		\$ (560,000)
		SAVINGS:	\$ 560,000

ADVANTAGES/DISADVANTAGES/JUSTIFICATION

PROPOSAL NUMBER:	RW-3.0
PAGE NUMBER:	2 of 3

PROJECT TITLE: ABERCORN STREET EXTENSION TO I-95

PROJECT LOCATION: GEORGIA DOT - Chatham County, Georgia

ADVANTAGES:

Total life cycle cost savings of \$560,000.

Creates more work area for bridge construction.

Abercorn Area does not require temporary widening.

No shoring required mainline detour and bridge approaches.

Does not require breaching existing median barrier on Abercorn Ave. east & west of King George Blvd.

DISADVANTAGES:

Creates two intersections with King George Blvd.

Increases travel time along Abercorn Ave.

Requires two temporary traffic signals.

Requires additional ramp pavement.

Violates driver expectancy.

JUSTIFICATION:

This technique has been used successfully on interstate bridge projects for demolition and setting bridge beams. Abercorn Ave. traffic is largely commuter traffic and could be conditioned to accept work zone traffic operations as proposed.

COST ESTIMATING WORKSHEET

PROPOSAL NUMBER:	RW-3.0
PAGE NUMBER:	3 of 3

PROJECT TITLE: ABERCORN STREET EXTENSION TO I-95
PROJECT LOCATION: GEORGIA DOT - Chatham County, Georgia

ORIGINAL DESIGN

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
SUBTOTAL:					
MARK UP:					
TOTAL:					

PROPOSED CHANGE

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
MSE Walls (Deduction)	7	SF	11,200	40.00	(448,000)
SUBTOTAL:					(448,000)
25 % MARK UP:					(112,00)
TOTAL:					(560,000)

SOURCES

- | | |
|--|--|
| <ol style="list-style-type: none"> 1. Project Cost Estimate 2. CES Data Base 3. CACES Data Base 4. Means Estimating Manual | <ol style="list-style-type: none"> 5. Richardson's Estimating Manual 6. Vendor (Specify) 7. Other (GDOT Mean Summary) |
|--|--|

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER:	RW-3.1
PAGE NUMBER:	1 of 2

PROJECT TITLE: ABERCORN STREET EXTENSION TO I-95
PROJECT LOCATION: GEORGIA DOT – Chatham County, Georgia

PROPOSAL DESCRIPTION: STAGE CONSTRUCT BRIDGE OVER KING GEORGE BLVD. ONE HALF AT A TIME AND DIRECT TRAFFIC IN COMPLETED SECTIONS.

ORIGINAL DESIGN: The original sequence is to construct sufficient roadway capacity to the north to detour all four lanes away from the bridge site. The entire bridge would then be constructed. The detour would be constructed in such manner as to incorporate significant portions of the detour into ramps B&C.

PROPOSED CHANGE: The proposed change recommendation is to widen Abercorn Ave. by two lanes immediately adjacent to the north side and divert westbound traffic onto these lanes while diverting eastbound traffic onto the existing westbound lanes. Next the southern half of the Abercorn bridge would be constructed along with ramps A&D. Next divert both eastbound and westbound traffic onto the completed southern half while finishing the northern half and typing in ramps B&C.

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:			
PROPOSED CHANGE:			
SAVINGS:			Design Suggestion

ADVANTAGES/DISADVANTAGES/JUSTIFICATION

PROPOSAL NUMBER:	RW-3.1
PAGE NUMBER:	2 of 2

PROJECT TITLE: ABERCORN STREET EXTENSION TO I-95
PROJECT LOCATION: GEORGIA DOT - Chatham County, Georgia

ADVANTAGES:

Reduces amount of temporary pavement.

Opens southern half of interchange earlier (public perception).

Allows ramps B&C to be completed in their final footprint.

DISADVANTAGES:

Requires shoring of bridge approaches.

Increased traffic control.

Provides less work area for contractor.

Bridge would require closure pour (see DOT standard).

JUSTIFICATION:

The proposed recommendation would establish the permanent traffic pattern quicker for eastbound motorist and result in a positive perception that significant work was being accomplished.

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER:	RW-6.0
PAGE NUMBER:	1 of 4

PROJECT TITLE: ABERCORN STREET EXTENSION TO I-95

PROJECT LOCATION: GEORGIA DOT – Chatham County, Georgia

PROPOSAL DESCRIPTION: REDUCE THE INSIDE SHOULDER WIDTH TO 4 FEET.

ORIGINAL DESIGN: The project typical section provides for a 10 feet paved inside shoulder on roadway and bridges.

PROPOSED CHANGE: The proposed change recommendation is to reduced the typical section by 6 feet by reducing the inside shoulder width from 10 feet to 4 feet.

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:	\$ 0		\$ 0
PROPOSED CHANGE:	\$ 1,751,640		\$ 1,751,640
		SAVINGS:	\$ 1,751,640

ADVANTAGES/DISADVANTAGES/JUSTIFICATION

PROPOSAL NUMBER:	RW-6.0
PAGE NUMBER:	2 of 4

PROJECT TITLE: ABERCORN STREET EXTENSION TO I-95
PROJECT LOCATION: GEORGIA DOT - Chatham County, Georgia

ADVANTAGES:

Total life cycle cost savings of \$1,751,640.

Reduces wetland impacts.

DISADVANTAGES:

Would require design exception.

Lowers speed design.

Does not provide refuge for disabled vehicles.

Mainline improvements that were made inclusive to the Veterans Parkway project would not be fully utilize.

Vehicular retention characteristics of barrier wall would be compromised.

JUSTIFICATION:

The proposed typical section operates adequately in other urban settings.

COST ESTIMATING WORKSHEET

PROPOSAL NUMBER:	RW-6.0
PAGE NUMBER:	3 of 4

PROJECT TITLE: ABERCORN STREET EXTENSION TO I-95

PROJECT LOCATION: GEORGIA DOT - Chatham County, Georgia

ORIGINAL DESIGN

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
SUBTOTAL:					
MARK UP:					
TOTAL:					

PROPOSED CHANGE

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Full depth pavement	1	SY	9,294	22.90	212,833
Earthwork	1	CY	18,541	24.00	444,984
Bridges	1	SF	7,210	103.12	743,495
SUBTOTAL:					1,401,312
25 % MARK UP:					350,328
TOTAL:					1,751,640

SOURCES

- | | |
|--|--|
| <ol style="list-style-type: none"> 1. Project Cost Estimate 2. CES Data Base 3. CACES Data Base 4. Means Estimating Manual | <ol style="list-style-type: none"> 5. Richardson's Estimating Manual 6. Vendor (Specify) 7. Other (GDOT Mean Summary) |
|--|--|

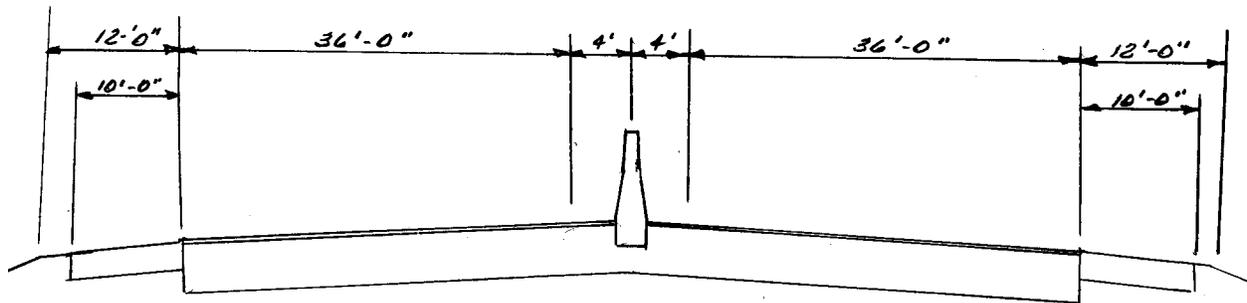
PROPOSED CHANGE SKETCH/DETAIL

PROPOSAL NUMBER: RW-6.0

PAGE NUMBER: 4 of 4

PROJECT TITLE: ABERCORN STREET EXTENSION TO I-95

PROJECT LOCATION: GEORGIA DOT – Chatham County, Georgia



Typical Section

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER:	RW-7.0
PAGE NUMBER:	1 of 2

PROJECT TITLE: ABERCORN STREET EXTENSION TO I-95

PROJECT LOCATION: GEORGIA DOT – Chatham County, Georgia

PROPOSAL DESCRIPTION: PAVEMENT DESIGN TO ALLOW SOIL CEMENT BASE AS AN ALTERNATE TO GRADED AGGREGATE BASE.

ORIGINAL DESIGN: The preliminary cost estimate includes only graded aggregate base.

PROPOSED CHANGE: The proposed change recommendation is to provide the contractor an option to choose between soil cement base and graded aggregate base.

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:			
PROPOSED CHANGE:			
SAVINGS:			Design Suggestion

ADVANTAGES/DISADVANTAGES/JUSTIFICATION

PROPOSAL NUMBER:	RW-7.0
PAGE NUMBER:	2 of 2

PROJECT TITLE: ABERCORN STREET EXTENSION TO I-95
PROJECT LOCATION: GEORGIA DOT - Chatham County, Georgia

ADVANTAGES:

Could make budding process more competitive.

Requires less processed material.

Cost savings might be in 5-10% range.

DISADVANTAGES:

None.

JUSTIFICATION:

Availability of construction materials and contractor expertise can result in achieving the same structural number at a lower cost.

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER:	RW-8.0
PAGE NUMBER:	1 of 3

PROJECT TITLE: ABERCORN STREET EXTENSION TO I-95

PROJECT LOCATION: GEORGIA DOT – Chatham County, Georgia

PROPOSAL DESCRIPTION: USE PCC PAVEMENT ON RAMPS INSTEAD OF ASPHALTIC CONCRETE.

ORIGINAL DESIGN: The preliminary cost estimate includes only quantities for asphaltic concrete pavement and preliminary ramp typical sections do not include PCC pavement.

PROPOSED CHANGE: The proposed change recommendation is to specify PCC pavement for ramps.

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:			
PROPOSED CHANGE:			
SAVINGS:			Design Suggestion

ADVANTAGES/DISADVANTAGES/JUSTIFICATION

PROPOSAL NUMBER:	RW-8.0
PAGE NUMBER:	2 of 2

PROJECT TITLE: ABERCORN STREET EXTENSION TO I-95
PROJECT LOCATION: GEORGIA DOT - Chatham County, Georgia

ADVANTAGES:

PCC pavements are more resistant to rutting, pushing and shoring.

PCC pavements have a longer life without maintenance.

PCC pavements resist raveling and polishing.

DISADVANTAGES:

Initial installation of PCC pavement is more costly than asphaltic concrete pavements.

PCC pavement is difficult to construct & maintain traffic.

PCC pavement is difficult to repair under traffic.

Installation of PCC pavement introduces an additional type of construction to the contract.

More difficult to change pavement markings.

JUSTIFICATION:

Future interruption of traffic for maintenance can be reduced by designing maximum pavement life into initial construction. Pavement deformation reduction by PCC pavement provides for smooth ride and positive drainage.

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER:	RW-13.0
PAGE NUMBER:	1 of 4

PROJECT TITLE: ABERCORN STREET EXTENSION TO I-95

PROJECT LOCATION: GEORGIA DOT – Chatham County, Georgia

PROPOSAL DESCRIPTION: MOVE MARINERS WAY RELOCATION ONTO COVE COURT, AND EXTEND SOUTH TO PINE GROVE ROAD.

ORIGINAL DESIGN: The original design relocated Mariners Way to run south, between the neighborhood and apartment complex, to Pine Grove Road.

PROPOSED CHANGE: The proposed change recommends using an existing neighborhood street, Cove Court. The road would then be extended south to Pine Grove Road.

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:	\$ 33,723,867		\$ 33,723,867
PROPOSED CHANGE:	\$ 33,469,755		\$ 33,469,755
SAVINGS:			\$ 254,122

ADVANTAGES/DISADVANTAGES/JUSTIFICATION

PROPOSAL NUMBER:	RW-13.0
PAGE NUMBER:	2 of 4

PROJECT TITLE: ABERCORN STREET EXTENSION TO I-95
PROJECT LOCATION: GEORGIA DOT - Chatham County, Georgia

ADVANTAGES:

- Total life cycle cost savings of \$254,112.
- Uses more existing streets, thus saving ROW impacts.
- Avoids impacts to wooded area between neighborhood and apartments, leaving buffer.
- Less environmental impact.

DISADVANTAGES:

Cove Court would become part of the entrance road to the subdivision, increasing traffic along this street.

JUSTIFICATION:

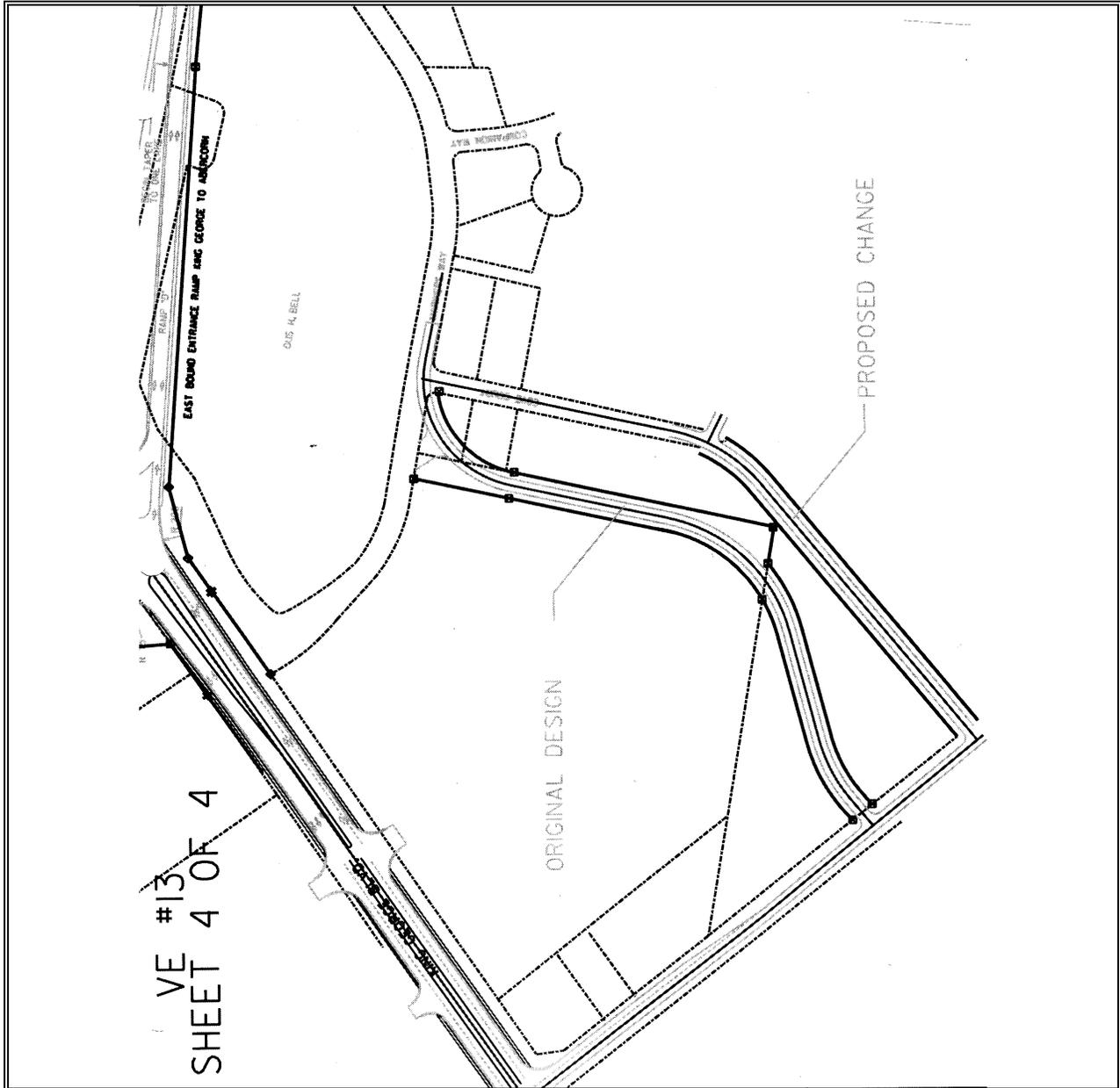
The impact to the residences along Cove Court would be felt in either case: The original design will impact the backyards of both the apartments and neighborhood, and the proposed change will change the traffic patterns along Cove Court. However, the proposed change has less environmental impact and has a significant cost savings.

ORIGINAL DESIGN SKETCH/DETAIL

PROPOSAL NUMBER:	RW-13.0
PAGE NUMBER:	3 of 4

PROJECT TITLE: ABERCORN STREET EXTENSION TO I-95

PROJECT LOCATION: GEORGIA DOT – Chatham County, Georgia



ORIGINAL DESIGN CALCULATIONS

PROPOSAL NUMBER:	RW-13.0
PAGE NUMBER:	4 of 4

PROJECT TITLE: ABERCORN STREET EXTENSION TO I-95

PROJECT LOCATION: GEORGIA DOT – Chatham County, Georgia

Realignment of Mariners Way

Right-Of-Way				
Mariners Way Relocation-original design				
ROW (Ac)	Unit Cost	Displacements	Unit Cost	Total Cost
1.38	\$150,000	2	\$150,000	\$506,612
Mariners Way Relocation-proposed change				
ROW (Ac)	Unit Cost	Displacements	Unit Cost	Total Cost
0.85	\$150,000	2	\$150,000	\$427,600
TOTAL ROW COSTS				\$79,112
Roadway				
Roadway - Original Design				
Length	Unit Cost			Total Cost
1500	\$200			\$300,000
Roadway - Proposed Change				
Length	Unit Cost			Total Cost
800	\$200			\$160,000
TOTAL CONSTRUCTION COSTS				\$140,000
20% Markup				\$35,000
Subtotal				\$175,000
Right-Of-Way				\$79,112
GRAND TOTAL				\$254,112

VALUE ENGINEERING TEAM STUDY

CONTACT DIRECTORY

NAME	DOT OFFICE OR COMPANY	PHONE NUMBER	EMAIL ADDRESS
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Jerry Milligan	Right of Way	404-463-2575	jerry.milligan@dot.state.ga.us
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Troy Patterson	Engineering Services	404-656-6845	troy.patterson@dot.state.ga.us
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VALUE ENGINEERING TEAM STUDY

COST MODEL

TRUMAN PARKWAY	COST \$	% OF TOTAL
RIGHT-OF-WAY (LAND, IMPROVEMENTS, DISPLACE EARTHWORK (IN PLACE EMBANKMENT)	\$11,410,700	33.84%
THREE BRIDGES (\$1.4M, \$4.9M, & \$1.0M)	\$6,360,000	18.86%
BASE COURSE AND PAVING	\$6,333,552	18.78%
3 YEARS OF INFLATION @ 5%	\$3,060,000	9.07%
10% ENGINEERING AND CONTINGENCES	\$2,744,683	8.14%
CONCRETE WORK	\$2,015,742	5.98%
SIGNS, STRIPS, SIGNALS & LIGHTS	\$875,250	2.60%
TRAFFIC CONTROL	\$246,000	0.73%
EROSION CONTROL	\$165,000	0.49%
UTILITIES	\$150,000	0.44%
MISCELLANEOUS	\$140,000	0.42%
GRASSING AND LANDSCAPING	\$75,139	0.22%
CLEARING AND GRUBBING	\$60,000	0.18%
STORM DRAINAGE	\$50,000	0.15%
GUARDRAIL	\$48,500	0.14%
TOTALS (\$)	\$33,747,866	100.00%

VALUE ENGINEERING TEAM STUDY

FUNCTION ANALYSIS

The following functions for Abercorn Street Extension to I-95 were identified during discussions with the Georgia DOT and Georgia DOT Design representatives on the first day of the study. These two word functions consist of an active verb, and a quantifiable (measurable) noun. The functions represent the proposed capital improvement expenditures of Abercorn Street Extension to I-95, and assist the V.E. team in becoming familiar with the needs of the project and the long-term goals for this expansion of the Abercorn Street Extension to I-95. The Basic Function of the project is to “Enhance Economy”. The following are considered by the V.E. team to be Secondary and Supporting Functions.

Verb	Noun	Verb	Noun
Meet	Budget	Improve	Commuting
Widen	Bridges	Construct	Interchange
Widen	Road	Reduce	Accidents
Add	Lanes	Expand	Economy
Purchase	ROW	Enhance	Economy
Reduce	Cost	Maintain	Surface
Optimize	Resources	Reduce	Risk
Expand	Development	Identify	Centerline
Adjust	Grade	Identify	Edge
Serve	Communities	Reuse	Materials
Serve	Public	Package	Contracts
Protect	Rivers	Develop	Options
Satisfy	Users	Develop	Alternatives
Support	County	Define	Performance
Minimize	Lawsuits	Develop	Specification
Improve	Access	Reduce	Liability
Enhance	Image	Re-cycle	Materials
Enhance	Signage	Drain	Median
Reduce	Risk	Enhance	Maintainability
Relieve	Traffic	Minimize	Relocations
Enhance	Economy	Expedite	Travel
Reduce	Delays	Improve	Functions
Maintain	Passage	Improve	Drainage
Improve	Constructibility	Correct	Drainage
Benefit	Community	Protect	Environment

VALUE ENGINEERING TEAM STUDY

FUNCTION ANALYSIS

Verb	Noun	Verb	Noun
Improve	Flow	Reduce	Accidents
Increase	Capacity	Reduce	Risks
Add	Lanes	Accommodate	Breakdowns
Increase	Speeds	Protect	Species
Reduce	Delays	Minimize	Mitigation
Straighten	Alignment	Segregate	Materials
Improve	Line-of-Sight	Store	Materials
Improve	Visibility	Access	Materials
Enhance	Visibility	Access	Storage
Straighten	Road	Remove	Soils
Reduce	Interruptions	Protect	Wetlands
Reduce	Delays	Relocate	Soils
Identify	Passing	Protect	Railroad
Accommodate	Passing	Minimize	Erosion
Minimize	Intersections	Contain	Flow
Improve	Intersections	Control	Flow
Reduce	Accidents	Stage	Materials
Improve	Safety	Complete	Corridor
Separate	Lanes	Reduce	Congestion
Add	Lanes	Satisfy	Codes
Install	Medians	Meet	Schedules
Enhance	Definition	Meet	Budget
Communicate	Changes	Reduce	Cost
Assure	Safety	Improve	Functions
Accommodate	Hauling	Satisfy	Agencies
Expedite	Hauling	Utilize	Guidelines
Minimize	Hauling	Construct	Bridge
Control	Traffic	Widen	Bridge
Maintain	Passage	Support	Tourism
Phase	Construction	Access	Recreation
Utilize	Resources	Protect	Species
Maximize	Utilization	Improve	Weaving
Protect	Public	Help	Commuters
Guide	Traffic	Satisfy	Public
Transmit	Information	Satisfy	Commuters
Manage	Traffic	Support	Weight

VALUE ENGINEERING TEAM STUDY

COST DRIVER ANALYSIS

The V.E. team reviewed the project cost elements and identified the controlling element or cost driver for the Abercorn Street Extension to I-95, Project NH-111-1(24). The cost drivers are used in the brainstorming process as a focal point of discussion and for idea generation.

Element	Function	Cost Driver
Excavation (\$6,400,000)	Widen Streets Relieve Congestion Adjust Grade Improve Alignment Improve Drainage	Disposal Sites Demolition/Removal Road Width Shoulder Width Road Length Haul distance
Road Section (\$3,000,000)	Support Weight Maintain Surface Support Vehicles Distribute Load Overlay Road Widen Road	Base Course Materials Source of Materials Wearing Surface Drainage System Road Length Road Width Median Width Shoulder Width
Bridges (\$6,300,000)	Bridge Blvd. Bridge Roads Improve Safety Support Weight Support Vehicles Widen Bridges	Bridge Heights Foundation Protection Materials Used Structural Design Length of Beam Lengths of Bridge Number of Spans
Earth Stabilization @ King George	Insure Safety Reduce Risk Minimize Lawsuits	Require Methods Material Types Material Quantities Areas of Application Frequency of Use
Traffic Management (\$165,000)	Insure Safety Maintain Passage Avoid Delays Assist Commuters Assist Tourist	Methods of Control Frequency of Control Duration of Control

BRAINSTORMING OR SPECULATION

PROJECT TITLE: ABERCORN STREET EXTENSION TO I-95

PROJECT LOCATION: Georgia DOT, Chatham County, Georgia

NUMBER	IDEA	RANK
	STRUCTURAL/BRIDGE (SB)	
1.0	Reduce shoulder width on Forest River Bridge	5/5
2.0	Specify high strength (50ksi) steel when widening CSX RR bridge	DS
3.0	Replace CSX RR bridge if bridge has to be jacked to meet required clearances	DS
4.0	Construct single span bridge @ King George Blvd with MSE walls	5/2
5.0	Install shorter straps on MSE walls @ lower elevations	Drop
6.0	Reduce width of shoulders on King George Bridge	5/4
7.0	Reduce width of shoulders on CSX RR bridge when widening	5/3
8.0	Replace Forest River Bridge with a more aesthetically pleasing bridge	DS
9.0	Do not widen Forest River Bridge, just re-strip as a three lane bridge	5/5
	ROADWAY (RW)	
1.0	Realign baseline	Drop
2.0	Consider single point interchange at King George Blvd	5/5
2.1	Also: Delete work on Mariners Way	
2.2	Also: Delete/reduce median work on King George Blvd.	
2.3	Also: Delete re-alignment to Waterford Plantation Apartments	
3.0	Do not construct MSE retaining walls during construction by splitting traffic	4/4
4.0	Stage construction by building ½ of King George bridge at a time; therefore directing traffic over the newly constructed bridge	DS
5.0	Construct MSE retaining walls and eliminate earth embankment	DS
6.0	Reduce inside shoulder width on roadway to 4'-0" to 10'-0"	3/5
7.0	Allow the contractor the option to use soil cement base instead of GAB	DS
8.0	Construct concrete off ramps instead of asphalt concrete ramps	DS
9.0	Design as right-in and right out @ Pine Grove Dr. instead of signal light	DS
10.0	Reduce outside shoulder width for entire length from 12' to 10'	Drop
11.0	Construct loop ramp at NW quadrant King George Blvd	5/4
12.0	Realign ramp "C" to avoid impact to apartments	4/3
13.0	Move Mariners Way –relocate onto Cove Court, and extend South to Pine Grove Road	4/1
14.0	Construct loop ramp @ NW corner only	DS

VALUE ENGINEERING WORKSHOP AGENDA

ABERCORN STREET EXTENSION TO I-95

CHATHAM COUNTY, GEORGIA

24 HOUR - V.E. STUDY

24-26 February 2004

The value engineering workshop for the subject project will be conducted for three (3) days from 24-26 February 2004, **at the Georgia Department of Transportation General Office, Planning Conference Room #280 (Bridge Design Conference Room), #2 Capitol Square, Atlanta, GA; POC – Lisa Myers @ (404) 651-7468 voice, (404) 463-6161 Fax**

TUESDAY 0800 - 0815 **Introduction Phase** Lindsey Gardner, P.E., CVS
Team Leader, U.S. Cost, Inc.
(V.E. Team Only)

The VETL will review previous events along with activities planned for the week and outline several areas which may be investigated by the V.E. team.

0815 - 1000 **Review of Project Plans** V.E. Team Only

The team members will review the project plans, cost estimates, available calculations, cost models, and cost bar graphs to gain a working knowledge of the project.

1000 - 1200 **Project Design Briefing** V.E. Team; (A/E), GDOT

The A/E project design manager will discuss the project requirements and the proposed design solution(s) in some detail. The V.E. team members will ask questions as appropriate to completely understand the GDOT project requirements as established by the user and the proposed design solution (both alternatives considered and those recommended by the design team).

1200-1300 **Lunch**

TUES. (cont.) 1300 - 1700

Creative Phase

V.E. Team

The V.E. team will creatively review, (Brainstorm), and tabulate possible design alternatives for the project. While the designer's solution will serve as the "baseline", the team will identify alternatives not in the recommended solution, but deserving of further investigation. Generally, a brainstorming session will produce between 75 and 100 creative design alternatives. Each system will be carefully analyzed with the basic questions in mind:

What is the system/item?

What does it do (what is its basic function)?

What must it do?

What does it cost?

What is the item worth?

What else will do the same, or a better job?

What does that alternative cost?

During the creative phase, the team will not judge the ideas. The essential requirements for the project, however, must always be considered.

WEDNESDAY 0800 - 1000

Analysis Phase

V.E. Team, GDOT Reps

During this phase, all of the ideas or alternatives will be ranked according to their potential for life-cycle (25-year) cost reduction and the potential for acceptance by the user, designers, and other appropriate parties.

1000 - 1200

Project Assignments

VETL

Each team member will be assigned a number of ideas for further development. The ideas will be those with the highest rankings. In general, the ideas will be assigned according to technical discipline; road design, structures, and constructability.

1200 – 1300

Lunch

WEDS (cont.) 1300 - 1700 **Development Phase** V.E. Team

During the development phase, each team member will gather information and prepare written proposals for those ideas assigned to him/her. These may require additional discussions with the A/E, outside contractors and suppliers, and other specialists to fully define the alternative. The team members will prepare sketches, perform calculations and develop other data to support each proposal. In addition, costs will be prepared for each alternative as originally designed, and as proposed by the V.E. team. Life-cycle costs for operation, maintenance and related annual costs will also be considered.

THURSDAY 0800 - 1200 **Development Phase (Continued)**

1200 - 1300 **Lunch**

1300 - 1630 **Development Phase (Continued)**

1630 - 1700 **Summary of Results/Workshop Conclusion VETL**

The study will be concluded. The final report will be delivered within eight working days of the study's conclusion.

NOTES: LAPTOP COMPUTERS ARE REQUIRED FOR VE DEVELOPMENT

1. V.E. team members should bring to the workshop any technical and pricing reference manuals which may be used during the study. These may include design handbooks, code documents, estimating price guides, and related documents. Calculators, pencils, sketch paper, scales, and other similar items will also be useful.
2. It is critical that outside telephone calls and other interruptions of the study team members be held to an absolute minimum during the week to allow for efficient, uninterrupted concentration on the Value Engineering Study.
3. Questions concerning the proposed study should be directed to Lindsey Gardner at (757) 496-3055 or;

U.S. Cost Incorporated
Mr. Tom Orr, P.E.
1200 Abernathy Road
Atlanta, GA 30328
(770) 481-1600
e-mail: torr@uscost.com

PRELIMINARY COST ESTIMATE
URBAN DESIGN OFFICE

DATE: 10/03/03 PREPARED BY: T. Holder
PROJECT NO: NH-111-1(24) FILE NAME: Concept Cost Estimate
P.I. NO: 522870 LENGTH: 2.36 miles
PROJECT DESCRIPTION/CONCEPT: SR 204/Abercorn fm King George Blvd to Rio Road
EXISTING ROADWAY: SR 204/ Abercorn

TRAFFIC: CURRENT AADT PROJECTED AADT
54,000 (2006) 84,000 (2026)

- () PROGRAMMING PROCESS
(x) CONCEPT DEVELOPMENT
() DURING PROJECT DEVELOPMENT

PROJECT COSTS

A. RIGHT OF WAY		lump sum		\$11,410,700.00
			SUBTOTAL	\$11,410,700.00
B. UTILITIES		lump sum		\$140,000.00
			SUBTOTAL	\$140,000.00
C. CLEARING AND GRUBBING		lump sum		\$50,000.00
			SUBTOTAL	\$50,000.00
D. EARTHWORK				
<u>In Place Embankment</u>				
Borrow Incl Haul	265,000 yd ³ @	\$24.00		\$6,360,000.00
			SUBTOTAL	\$6,360,000.00
E. BASE AND PAVING				
<u>Aggregate Base</u>				
GAB	65000 yd ² @	\$20.00		\$1,300,000.00
<u>Asphalt Paving</u>				
Asph Conc 12.5 mm Superpave	8700 tons @	\$50.00		\$435,000.00
Asph Conc 19 mm Superpave	12000 tons @	\$40.00		\$480,000.00
Asph Conc 25 mm Superpave	23000 tons @	\$35.00		\$805,000.00
Tack Coat	16000 gal @	\$1.00		\$16,000.00
			SUBTOTAL	\$3,036,000.00

F. DRAINAGE				
Catch Basin	20 each @	\$1,600.00	\$32,000.00	
Storm Drainage Pipe 18 IN	500 linear feet @	\$25.00	\$12,500.00	
Flared End Section 18 IN (FES)	10 each @	\$400.00	\$4,000.00	
		SUBTOTAL	\$48,500.00	
G. CONCRETE WORK				
Approach Slabs	460 yd ² @	\$125.00	\$57,500.00	
Raised Median	3050 yd ² @	\$55.00	\$167,750.00	
Curb and Gutter	7500 linear feet @	\$60.00	\$450,000.00	
Concrete Barrier	5000 linear feet @	\$40.00	\$200,000.00	
Sidewalk	2800 yd ² @	\$35.00	\$98,000.00	
		SUBTOTAL	\$875,250.00	
H. TRAFFIC CONTROL				
	lump sum		\$165,000.00	
		SUBTOTAL	\$165,000.00	
I. EROSION CONTROL				
	lump sum		\$150,000.00	
		SUBTOTAL	\$150,000.00	
J. GUARDRAIL				
W-Beam Rail	80 linear feet @	\$10.00	\$800.00	
T-Beam Rail	160 linear feet @	\$25.00	\$4,000.00	
Type 1 Anchors	4 each @	\$375.00	\$1,500.00	
Type 12 Anch	6 each @	\$1,300.00	\$7,800.00	
		SUBTOTAL	\$13,300.00	
K. SIGNS, STRIPING, SIGNALS, LIGHTING				
Striping	lump sum		\$66,000.00	
Roadside Signs	lump sum		\$100,000.00	
Traffic Signals	lump sum		\$80,000.00	
		SUBTOTAL	\$246,000.00	
L. GRASSING/LANDSCAPING				
	lump sum		\$60,000.00	
		SUBTOTAL	\$60,000.00	
M. MISCELLANEOUS				
Field Engineer Office	1 each @	\$48,000.00	\$48,000.00	
Right-of-Way Markers	31 each @	\$69.00	\$2,139.00	
Fence	2500 linear feet	\$10.00	\$25,000.00	
		SUBTOTAL	\$75,139.00	
N. MAJOR STRUCTURES				
Bridges	King George Blvd.	24816 ft ² @	\$57.00	\$1,414,512.00
Bridges	Forest River (Widen)	40992 ft ² @	\$120.00	\$4,919,040.00
Bridges	CSX RailRoad (Wider)	8544 ft ² @	\$120.00	\$1,025,280.00
		SUBTOTAL	\$6,333,552.00	

ESTIMATE SUMMARY

A. Right of Way	\$11,410,700.00
B. Reimbursable Utilities	\$140,000.00

CONSTRUCTION COST SUMMARY

C. Clearing and Grubbing	\$50,000.00
D. Earthwork	\$6,360,000.00
E. Base and Paving	\$3,036,000.00
F. Drainage	\$48,500.00
G. Concrete Work	\$875,250.00
H. Traffic Control	\$165,000.00
I. Erosion Control	\$150,000.00
J. Guardrail	\$13,300.00
K. Signs, Striping, Signals, Lighting	\$246,000.00
L. Grassing/Landscaping	\$60,000.00
M. Miscellaneous	\$75,139.00
N. Major Structures	\$6,333,552.00

SUBTOTAL CONSTRUCTION \$17,412,741.00

3 Years of			
	Inflation at	5 %	\$2,744,683.30
10 % E & C			\$2,015,742.43

TOTAL CONSTRUCTION ESTIMATE \$22,173,166.73

TOTAL PROJECT COST ESTIMATE \$33,723,866.73