Session 43

Kurt Lieblong

FL. Dept. of Transportation

US-98 - Installation of Permanent Hurricane Protection

Topic Description

This presentation will include 2 case studies of how Value Engineering was successfully used as a tool to improve the overall value and performance of a project. First case study will show how District 4 integrated the Value Engineering process into the PD&E process for the I-595 corridor project. The second case study will present the results of 2 Value Engineering Studies conducted in District 3. Both projects involved the installation of permanent hurricane protection on US 98.

Speaker Biography

Kurt Lieblong is the State Value Engineer for the Florida Department of Transportation. After working in the private sector, Kurt has been managing the FDOT VE program since 1999. Kurt has served on the AASHTO Value Engineering Technical Committee for the past five years. He is the current chairman of the AASHTO VE Technical Committee and has served as the Conference Chairman for the 2003 AASHTO VE Conference. He is a registered professional engineer in the State of Florida.

Session 43

Bill Ventry

VE GROUP, L.L.C.

US-98 - Installation of Permanent Hurricane Protection

Topic Description

VALUE ENGINEERING STUDIES - ESCAMBIA BAY BRIDGE/US 98 HURRICANE DAMAGE

Speaker Biography

Mr. Ventry has over 40 years of experience in the field of transportation and 25 years in Value Engineering. He is a Registered Professional Engineer in Florida, Delaware, Kentucky, Georgia Kansas, Louisiana, New Mexico, Missouri and Wisconsin, a Certified Value Specialist, and a Registered General Contractor. Mr. Ventry was with the Florida Department of Transportation for 25 years, serving in positions including Project Manager of Major Projects, Chief Value Engineer, and Deputy Assistant Secretary.

In 1988, Mr. Ventry established Ventry Engineering, L.L.C., a national Value Engineering consulting firm. To date, Ventry Engineering, now VE GROUP, has conducted over 516 Highway and Bridge Value Engineering studies. Mr. Ventry has a personal commitment to the advancement of value improvement through Value Engineering. He conducts SAVE approved, 40-Hour Module I workshop/seminars and performs project Value Engineering studies for state Departments of Transportation. He also works in conjunction with state Departments of Transportation in the development of their Value Engineering Programs.

Session 43

H.T. Waller

FL. Dept. of Transportation

US-98 - Installation of Permanent Hurricane Protection

Topic Description

Value Engineering reviews of the Hurricane damage of I-10 Escambia Bay Bridge
US 98 Okaloosa Island Causway
US 98 Franklin County

Speaker Biography

Worked in private business for 15 years prior to coming to work with the department
Served as d-3 value engineering program manager for the past 9 years

FLORIDA DEPARTMENT OF TRANSPORTATION

HURRICANE DAMAGE - VALUE ENGINEERING
Presented At FICE/FDOT Design Conference 2006
By

- **H. T. Waller, FDOT D-3 Value Engineer**
- **William F. Ventry, P.E., C.V.S., VE GROUP, LLC**
- **Kurt Lieblong, P.E., FDOT Statewide Value Engineer**

US 98 – FRANKLIN COUNTY

US 98
OKALOOSA ISLAND CAUSEWAY


16 3:37PM


7/11/05

FDOT Value Engineering

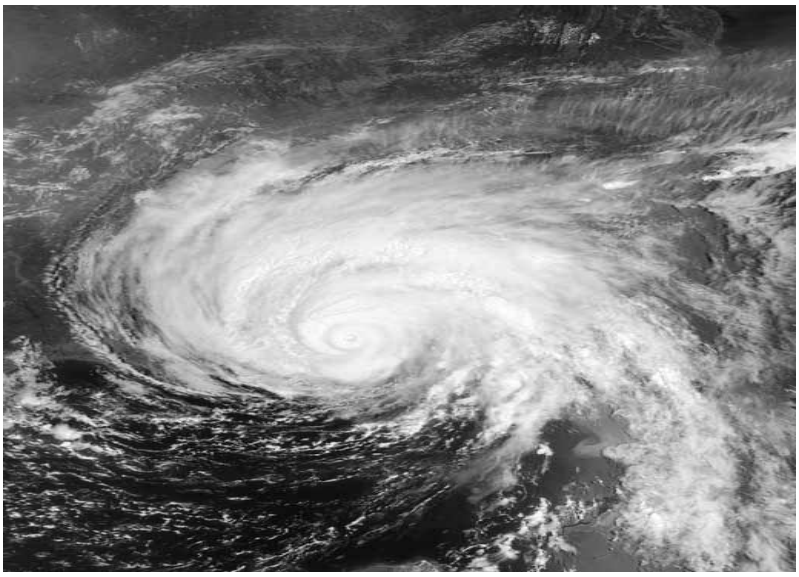
SR 30 (US 98)

Apalachicola-Carrabelle
Franklin County
(Hurricane Dennis)

VE Study # 0600306

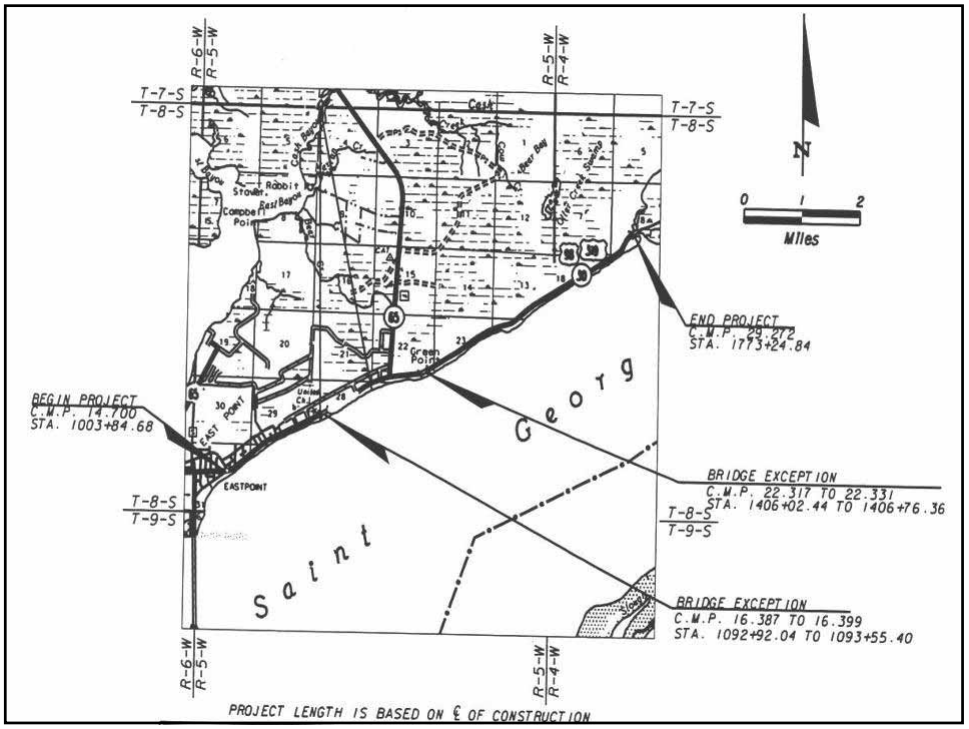
August 23, 2005 – August 25, 2005

HURRICANE DENNIS



Value Engineering Team

- **WILLIAM F. VENTRY, P.E., C.V.S. – Team Leader – Ventry Engineering**
- **BRUCE NICHILSON – Construction - Ventry Engineering**
- **SAM WEEDE – Materials**
- **BRIAN DRANSFIELD – Right-of-Way - PBS&J**
- **JIMMY SMITH – Design**
- **MIKE SAPP – Right-of-Way**
- **JUNIOR HARVEY – Midway Maintenance**
- **ROGER MUMFORD – Midway Construction**
- **COLBY CLEVELAND – DEMO**
- **DR. MAX SHEPPARD – UF-Coastal Engineering**
- **PHILLIP GAINER – Metric**
- **JEFFREY GER – FHWA**
- **BOBBY ELLIS – Design**
- **JIMMY MILLER - Construction**
- **KURT LIEBLONG – FDOT Value Engineer**
- **H. T. WALLER – FDOT D3 Value Engineer**
- **DEBRA SASSER – FDOT D3 Value Engineer**

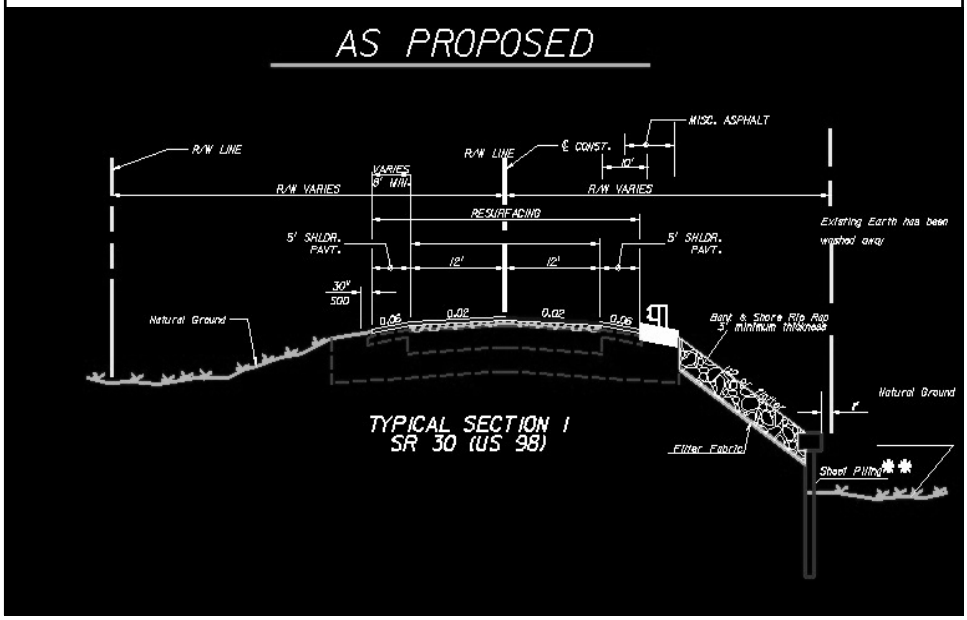


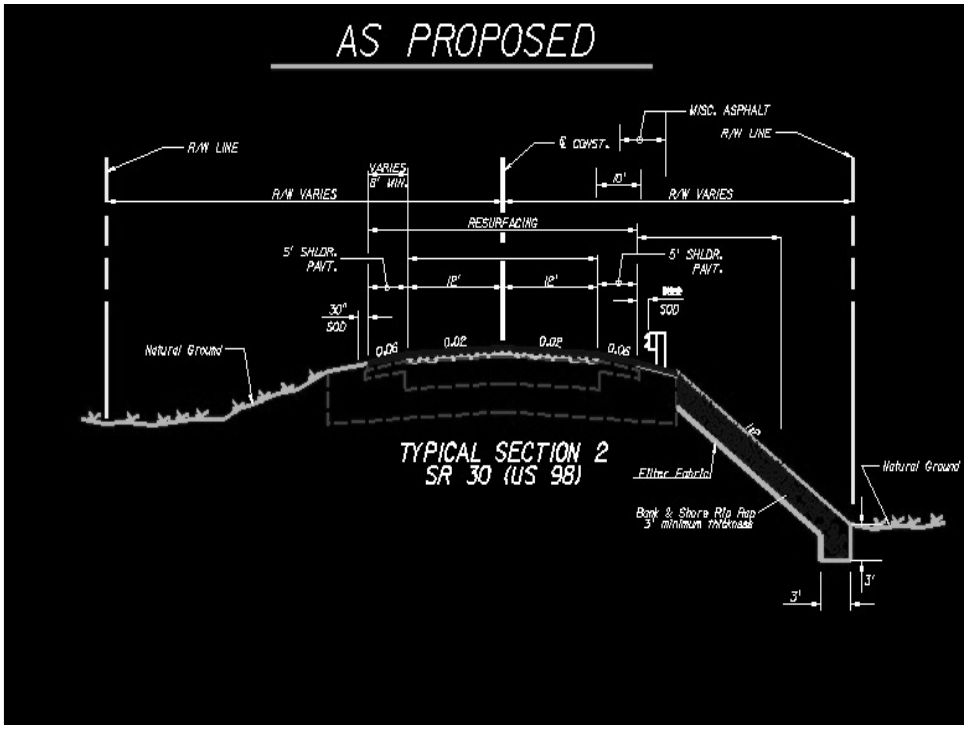
AREAS OF FOCUS

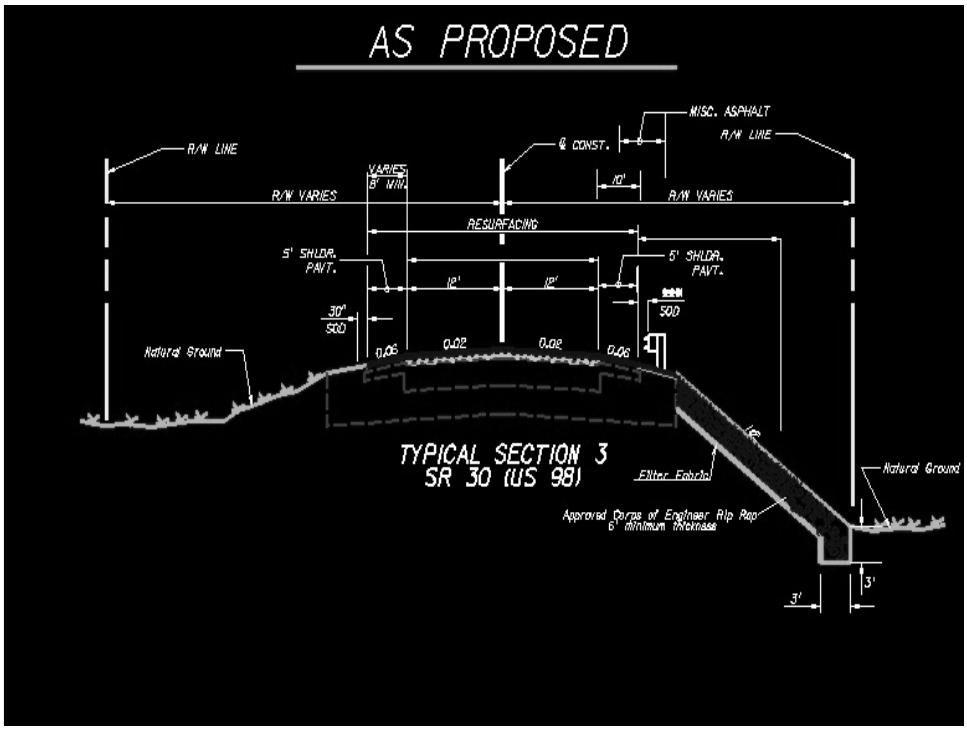
- **Current Design for Permanent Restoration**
- **Long Term Alternative for Permanent Restoration**
- **Existing design and alignment restoration**

Current Design for Permanent Restoration

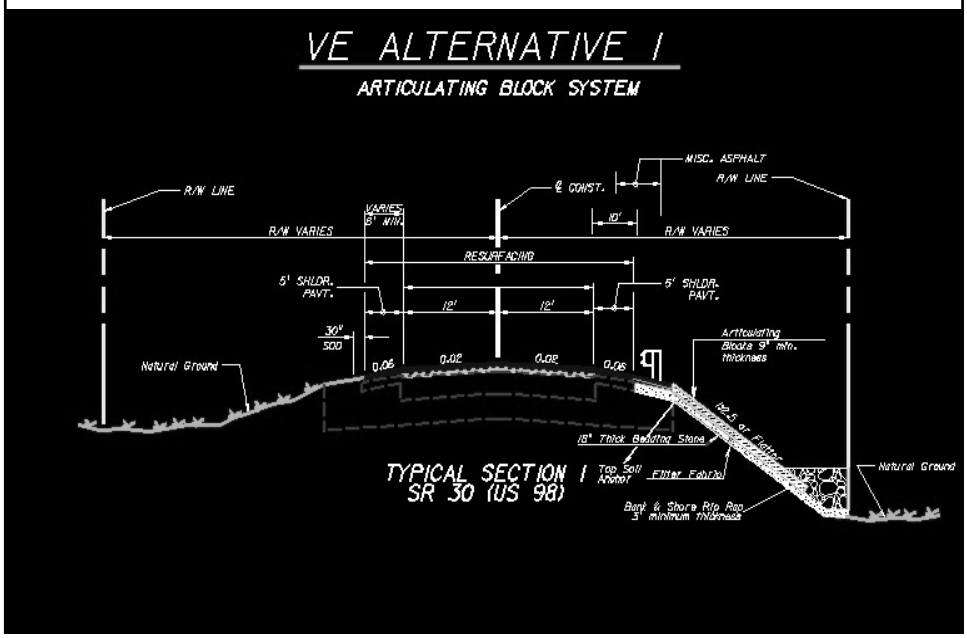
Current Design for Permanent Restoration

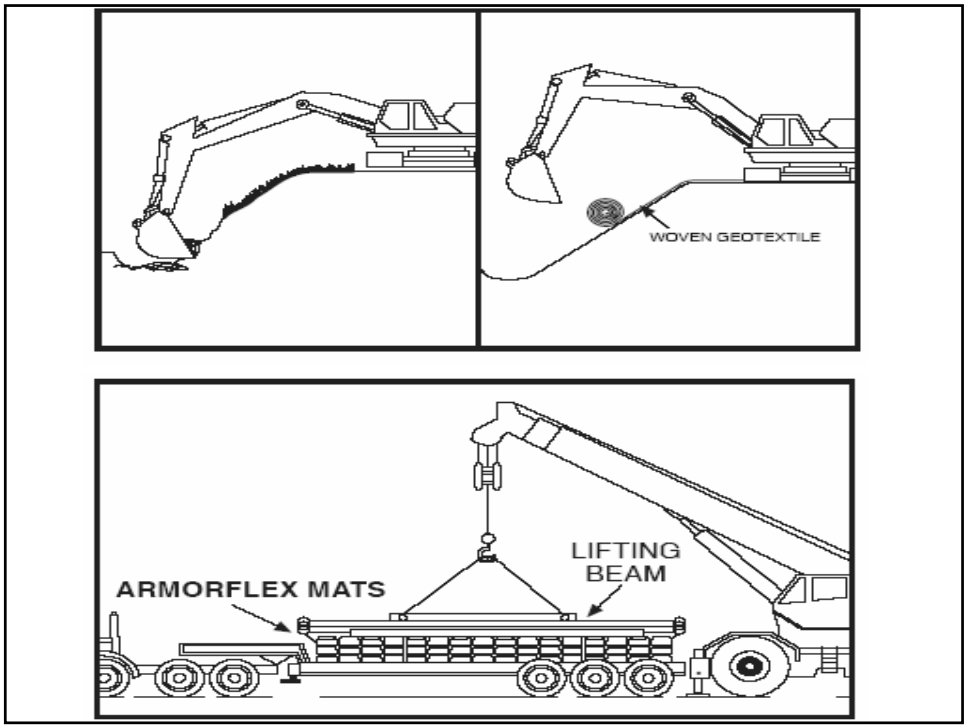


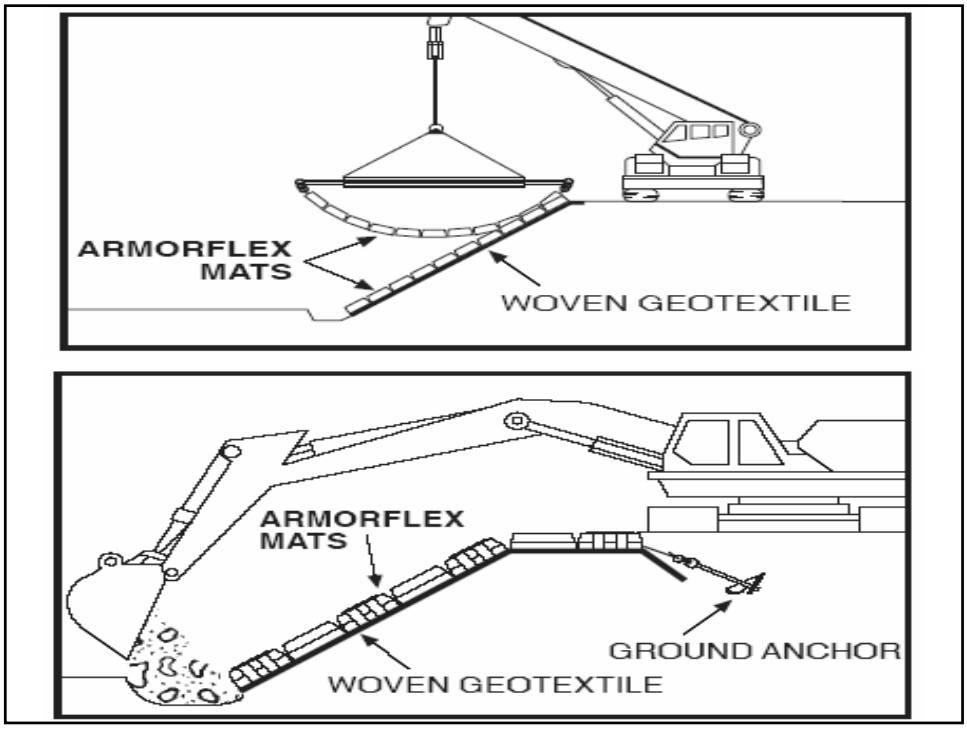

AS PROPOSED
MISC. ASPHALT
R/W LINE
℄ CONST.
R/W LINE
VARIES 8' MIN.
10'
R/W VARIES
R/W VARIES
RESURFACING
5' SHLDR. PAVT.
5' SHLDR. PAVT.
12'
12'
30" SOD
SOD
Natural Ground
0.06
0.02
0.02
0.06
TYPICAL SECTION 2
SR 30 (US 98)
Filter Fabric
Natural Ground
Bank & Shore Rip Rap
3' minimum thickness
3'
3'


AS PROPOSED
MISC. ASPHALT
R/W LINE
℄ CONST.
R/W LINE
VARIES 8' MIN.
10'
R/W VARIES
R/W VARIES
RESURFACING
5' SHLDR. PAVT.
5' SHLDR. PAVT.
12'
12'
30" SOD
SOD
Natural Ground
0.06
0.02
0.02
0.06
TYPICAL SECTION 3
SR 30 (US 98)
Filter Fabric
Natural Ground
Approved Corps of Engineer Rip Rap
6" minimum thickness
3'
3'

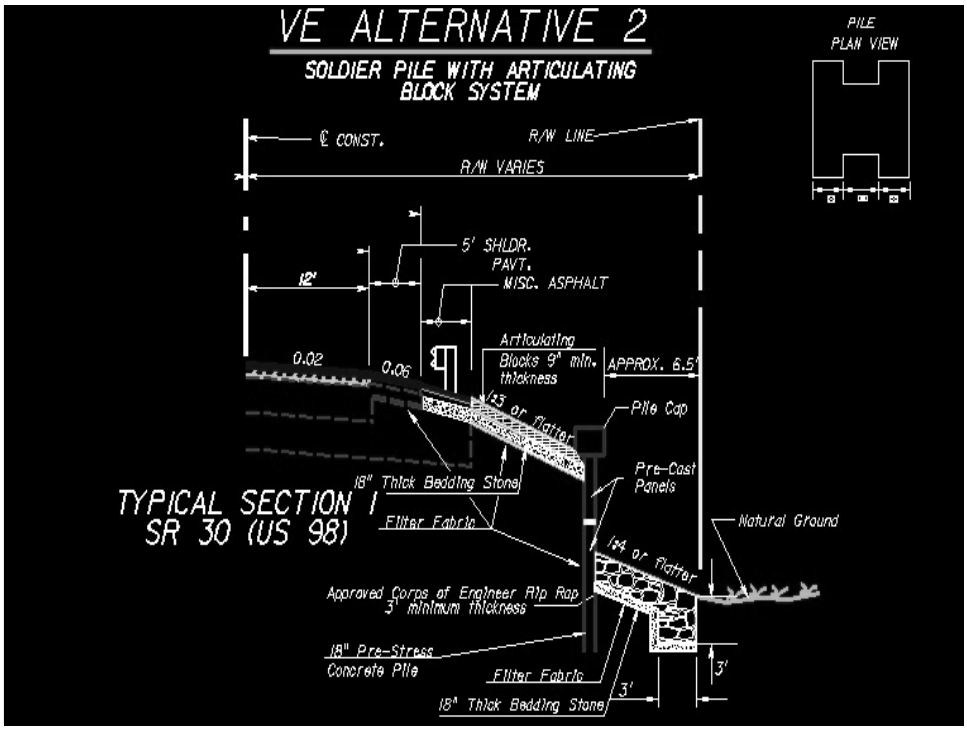
Current Design for Permanent Restoration

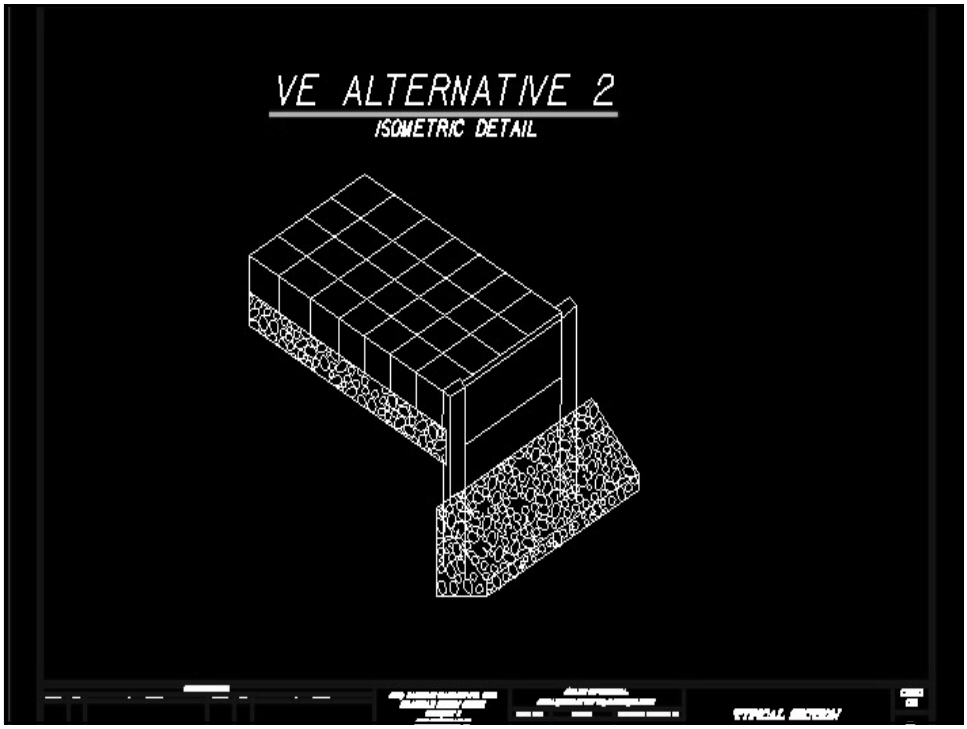





ARMORFLEX
MATS
WOVEN GEOTEXTILE
ARMORFLEX
MATS
GROUND ANCHOR
WOVEN GEOTEXTILE

CURRENT DESIGN FOR PERMANENT RESTORATION VALUE ENGINEERING ALTERNATIVE NO. 1 COST COMPARISON SHEET						
DESCRIPTION	**UNITS**	**UNIT COST**	**PROP'D QTY.**	**PROP'D COST**	**V.E. QTY.**	**V.E. COST**
CORPS OF ENGINEER RIPRAP	TN	$125.00	177500.0	$22,187,500		
BEDDING STONE	TN	$40.00	23400.0	$936,000	23400.0	$936,000
ARTICULATED CONCRETE BLOCK MATS	SF	$10.00			180000.0	$1,800,000
BANK & SHORE RIPRAP (TOE PROTECTION)	TN	$87.50	5921.0	$518,088	41170.0	$3,602,375
SUBTOTAL (VE ITEMS ONLY)				$23,123,500		$6,338,375
SUBTOTAL (ALL ITEMS)				$99,715,359		$82,412,147
MOBILIZATION			5.0%	$4,985,768	5.0%	$4,120,607
MAINTENANCE OF TRAFFIC			10.0%	$9,971,536	10.0%	$8,241,215
CONTINGENCY			5.0%	$4,985,768	5.0%	$4,120,607
GRAND TOTAL				$119,658,431		$98,894,576
POSSIBLE SAVINGS:			**$20,763,854**			





SOLDIER PILE SYSTEM VALUE ENGINEERING ALTERNATIVE NO. 2 COST COMPARISON SHEET						
DESCRIPTION	**UNITS**	**UNIT COST**	**PROP'D QTY.**	**PROP'D COST**	**V.E. QTY.**	**V.E. COST**
BULKHEAD CONCRETE	CY	$800.00	7343.0	$5,874,400		
REINF STEEL FOR BULKHEAD	LB	$1.20	325761.0	$390,913		
CONCRETE SHEET PILING (12"x30")	LF	$125.00	512434.0	$64,054,250		
BANK & SHORE RIPRAP	TN	$87.50	5921.0	$518,088		
BANK & SHORE RIPRAP (CORPS OF ENGINEER)	TN	$125.00	177500.0	$22,187,500	68000.0	$8,500,000
BANK & SHORE RIPRAP (TOE PROTECTION)	TN	$125.00			49000.0	$6,125,000
24" CONCRETE PILE	LF	$70.20			103680.0	$7,278,336
10' x 6' CONCRETE PANELS	SF	$43.70			273600.0	$11,956,320
ARTICULATED CONCRETE BLOCK MATS	SF	$17.00			74400.0	$1,264,800
BEDDING STONE	TN	$40.00	23400.0	$936,000	23400.0	$936,000
PILE CAP	CY	$800.00			2304.0	$1,843,200
SUBTOTAL				$93,961,151		$37,903,656
SUBTOTAL (ALL ITEMS)				$99,715,359		$43,657,864
MOBILIZATION			5.0%	$4,985,768	5.0%	$2,182,893
MAINTENANCE OF TRAFFIC			10.0%	$9,971,536	10.0%	$4,365,786
CONTINGENCY			5.0%	$4,985,768	5.0%	$2,182,893
GRAND TOTAL				$119,658,431		$52,389,437
POSSIBLE SAVINGS:				**$67,268,994**		

SOLDIER PILE SYSTEM -- VALUE ENGINEERING ALTERNATIVE NO. 1&2 COST COMPARISON SHEET						
DESCRIPTION	**UNITS**	**UNIT COST**	**PROP'D QTY.**	**PROP'D COST**	**V.E. QTY.**	**V.E. COST**
BULKHEAD CONCRETE	CY	$800.00	7343.0	$5,874,400		
REINF STEEL FOR BULKHEAD	LB	$1.20	325761.0	$390,913		
CONCRETE SHEET PILING (12"x30")	LF	$125.00	512434.0	$64,054,250		
BANK & SHORE RIPRAP	TN	$87.50	5921.0	$518,088		
BANK & SHORE RIPRAP (CORPS OF ENGINEER)	TN	$125.00	177500.0	$22,187,500		
BANK & SHORE RIPRAP (TOE PROTECTION)	TN	$125.00			49000.0	$6,125,000
24" CONCRETE PILE	LF	$70.20			103680.0	$7,278,336
10' x 6' CONCRETE PANELS	SF	$43.70			273600.0	$11,956,320
ARTICULATED CONCRETE BLOCK MATS	SF	$17.00			254400.0	$4,324,800
BEDDING STONE	TN	$40.00	23400.0	$936,000	23400.0	$936,000
PILE CAP	CY	$800.00			2304.0	$1,843,200
SUBTOTAL				$93,961,151		$32,463,656
SUBTOTAL (ALL ITEMS)				$99,715,359		$38,217,864
MOBILIZATION			5.0%	$4,985,768	5.0%	$1,910,893
MAINTENANCE OF TRAFFIC			10.0%	$9,971,536	10.0%	$3,821,786
CONTINGENCY			5.0%	$4,985,768	5.0%	$1,910,893
GRAND TOTAL				$119,658,431		$45,861,437
POSSIBLE SAVINGS:				**$73,796,994**		

Long Term Alternative for Permanent Restoration

Value Engineering Alternate No. 1

Advantages

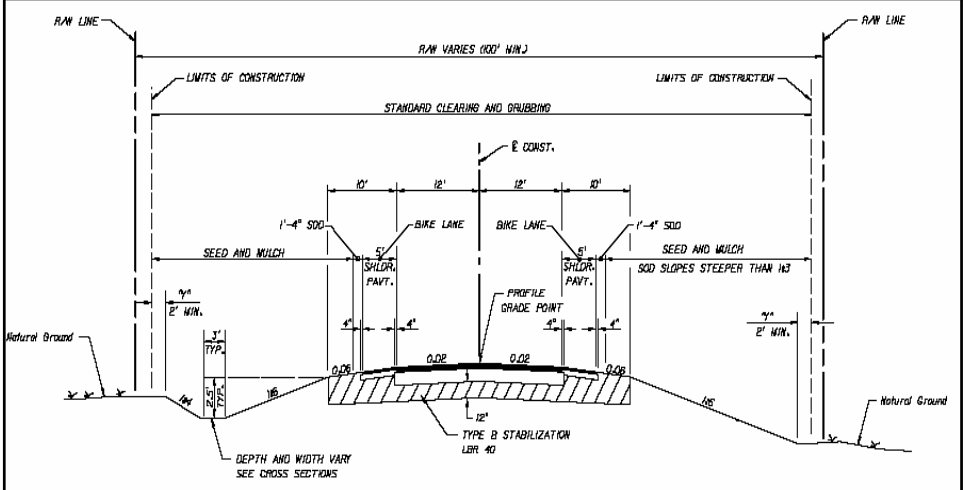
- Reduce Future Storm Damage
- Potential for future expansion
- Low Routine Maintenance
- Economic Development Opportunity
- Better Design Standards
- Lower Construction Costs

Disadvantages

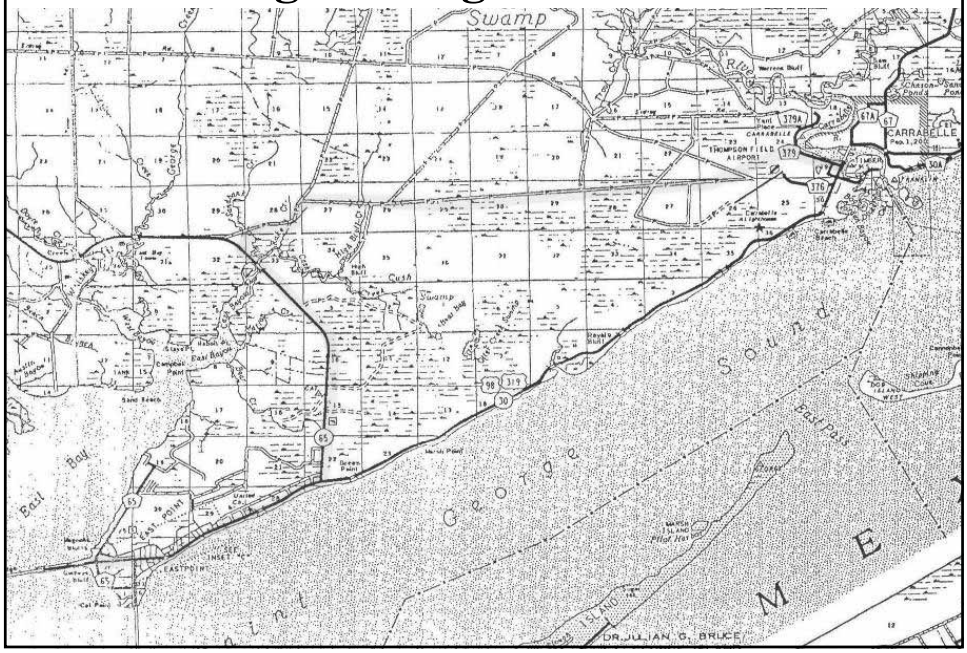
- Right of Way Acquisition
- Transfer of Roadway to County
- Environmental Impacts/Mitigation

Value Engineering Alternate No. 1A

Typical Section for Proposed Re-Alignment of SR 30 (US98)



Value Engineering Alternate No. 1A



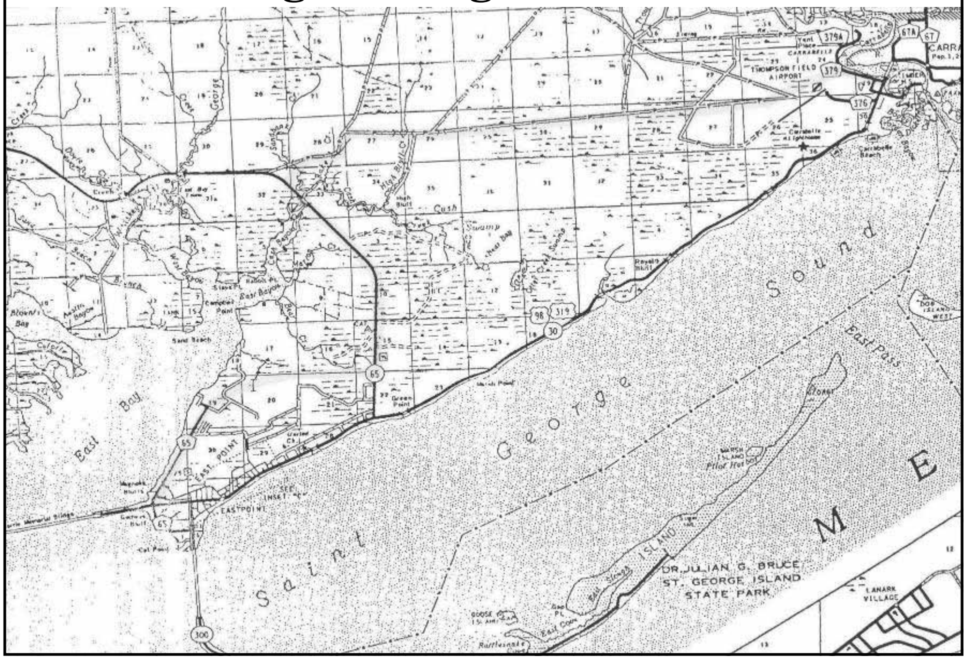
Value Engineering Alternate No. 1A

B. Long Term Alternatives for Permanent Restoration
VALUE ENGINEERING ALTERNATIVE NO. 1A
COST COMPARISON SHEET

DESCRIPTION	UNITS	UNIT COST	PROP'D QTY.	PROP'D COST	V.E. QTY.	V.E. COST
As Proposed Alternative	LS	$119,700,000	1	$119,700,000		
CONSTRUCT 2 LANE NEW CONSTRUCTION	MILE	$3,500,000		$0	8.0	$28,000,000
LOW LEVEL BRIDGES	SQ FT	$50.00			550000.0	$27,500,000
DEVELOPMENT SURVEY/MAPPING/DOCS & TITLE RESEARCH	EA	$3,000,000			1.0	$3,000,000
PERMANENT REPAIR FOR US 98 FROM CR 65 TO SR 65	LF	$1,200.00			12900.0	$15,480,000
SUBTOTAL						$73,980,000
RIGHT-OF-WAY	EA	$43,500,000			1	$57,800,000
GRAND TOTAL				$119,700,000		$131,780,000

POSSIBLE INCREASE: $12,080,000

Value Engineering Alternate No. 1B



Value Engineering Alternate No. 1B

B. LONG TERM ALTERNATIVES FOR PERMANENT RESTORATION

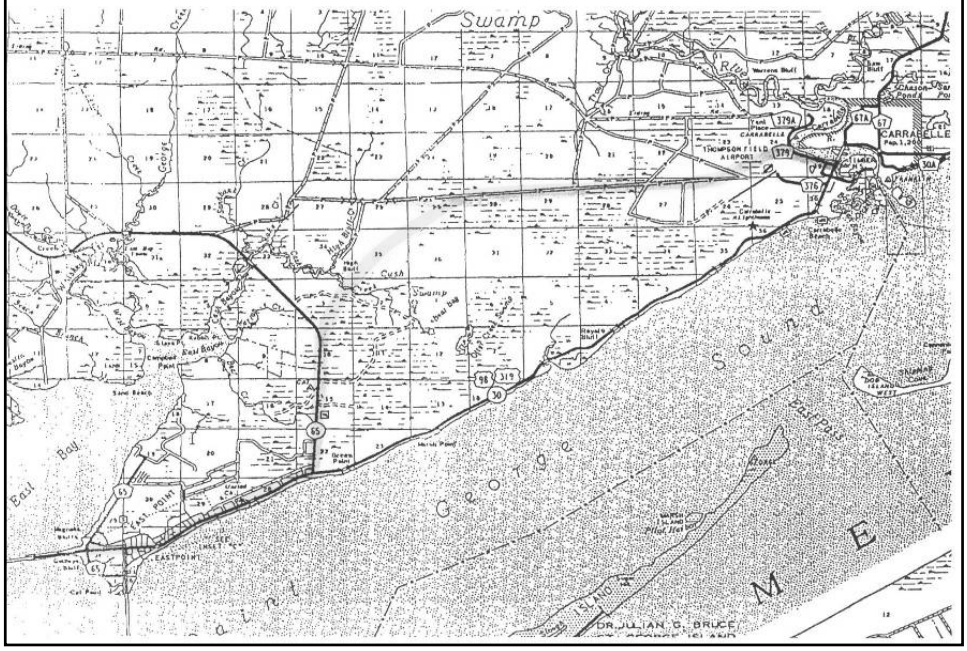
VALUE ENGINEERING ALTERNATIVE NO. 1B

COST COMPARISON SHEET

DESCRIPTION	UNITS	UNIT COST	PROP'D QTY.	PROP'D COST	V.E. QTY.	V.E. COST
As Proposed Alternative	LS	$119,700,000	1	$119,700,000		
CONSTRUCT 2 LANE NEW CONSTRUCTION	MILE	$ 3,500,000		$0	15.0	$52,500,000
LOW LEVEL BRIDGES	SQ FT	$ 50			550000.0	$27,500,000
DEVELOPMENT SURVEY/MAPPING/DOCS & TITLE RESEARCH	EA	$ 3,000,000			1.0	$3,000,000
SUBTOTAL						$83,000,000
RIGHT-OF-WAY	EA	$ 53,700,000			1	$71,500,000
GRAND TOTAL				$119,700,000		$154,500,000

POSSIBLE INCREASE: $34,800,000

Value Engineering Alternate No. 1C



Value Engineering Alternate No. 1C

B. Long Term Alternatives for Permanent Restoration
VALUE ENGINEERING ALTERNATIVE NO. 1A
COST COMPARISON SHEET

DESCRIPTION	UNITS	UNIT COST	PROP'D QTY.	PROP'D COST	V.E. QTY.	V.E. COST
As Proposed Alternative	LS	$119,700,000	1	$119,700,000		
CONSTRUCT 2 LANE NEW CONSTRUCTION	MILE	$3,500,000		$0	8.0	$28,000,000
LOW LEVEL BRIDGES	SQ FT	$50.00			550000.0	$27,500,000
DEVELOPMENT SURVEY/MAPPING/DOCS & TITLE RESEARCH	EA	$2,800,000			1.0	$2,800,000
PERMANENT REPAIR FOR US 98 FROM CR 65 TO SR 65	LF	$1,200.00			12900.0	$15,480,000
SUBTOTAL						$73,780,000
RIGHT-OF-WAY	EA	$43,500,000			1	$57,800,000
GRAND TOTAL				$119,700,000		$131,580,000
POSSIBLE INCREASE:				**$11,880,000**		

Existing Design and Alignment Restoration

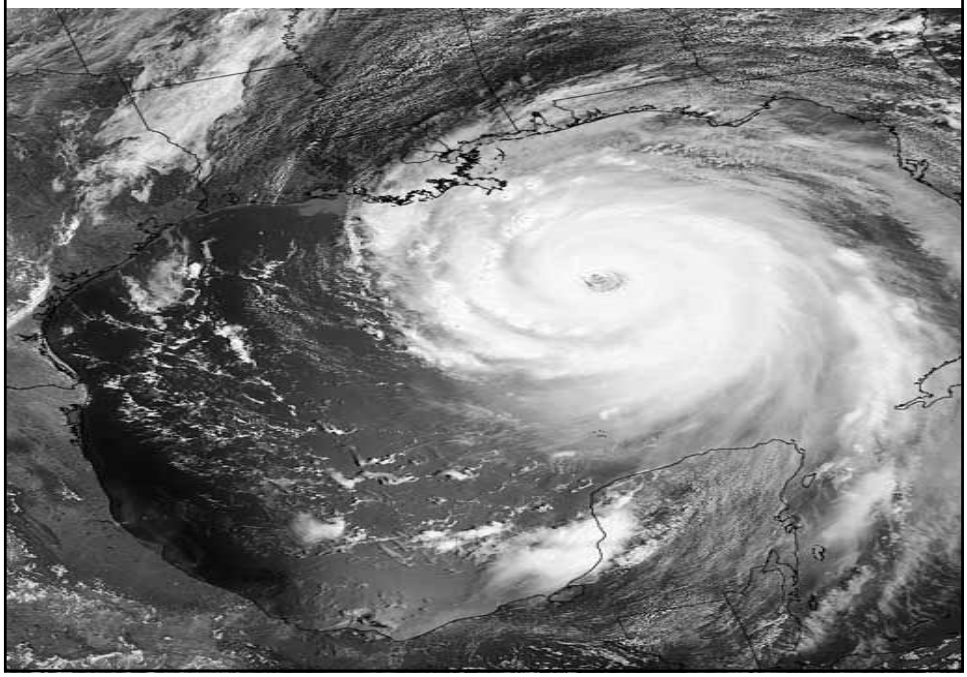
Annualized Cost Comparison		
All Alternatives		
Alternative	Present Day Cost	Annualized Cost
As Proposed	$119,783,119.00	$6,702,529.76
Alternative A - VE 1	$98,895,000.00	$5,557,860.84
Alternative A - VE 2	$52,389,437.00	$3,009,355.99
Alternative A - VE 1&2	$45,861,437.00	$2,651,621.59
Alternative B - VE 1A	$131,780,000.00	$7,359,958.84
Alternative B - VE 1B	$154,500,000.00	$8,605,014.84
Alternative B - VE 1C	$131,580,000.00	$7,348,998.84
Alternative C	$22,284,935.15	$3,067,400.03

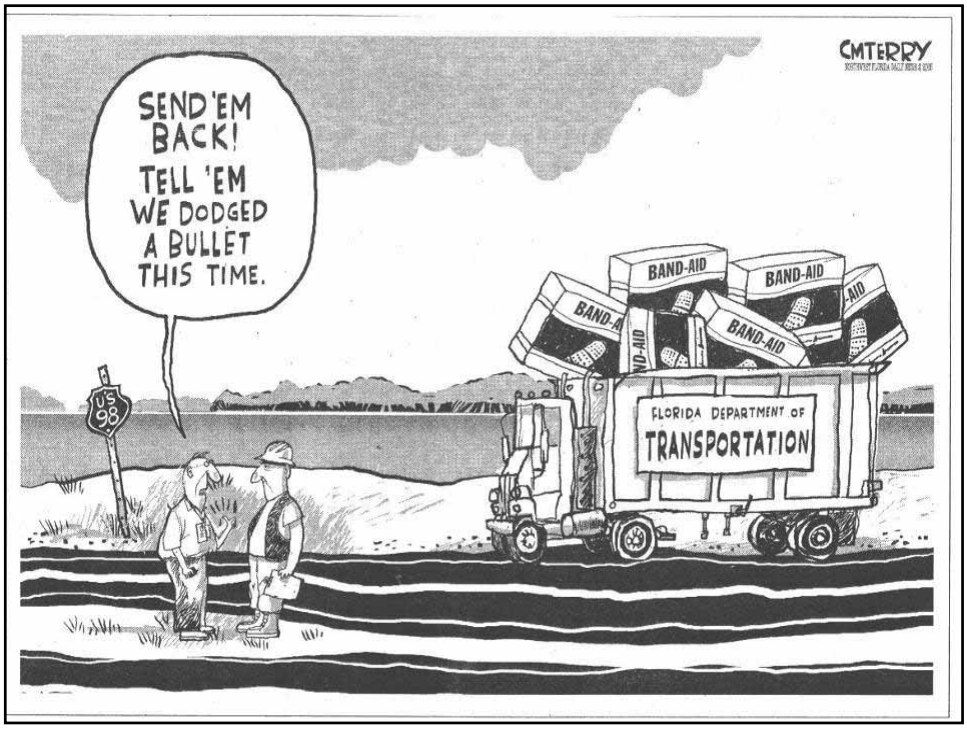
FDOT Value Engineering

SR 30 (US 98)
Brooks Bridge to East Pass Bridge
Okaloosa Island
Okaloosa County
(Hurricane Katrina)

VE Study # 0600307
September 12, 2005 – September 15, 2005

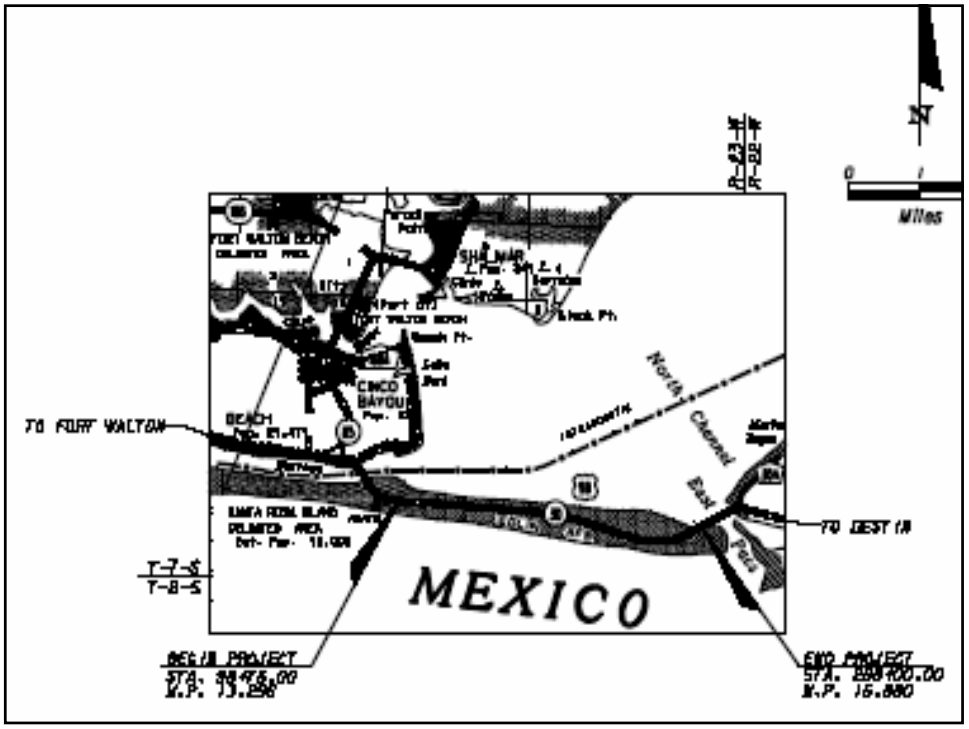
KATRINA





Value Engineering Team

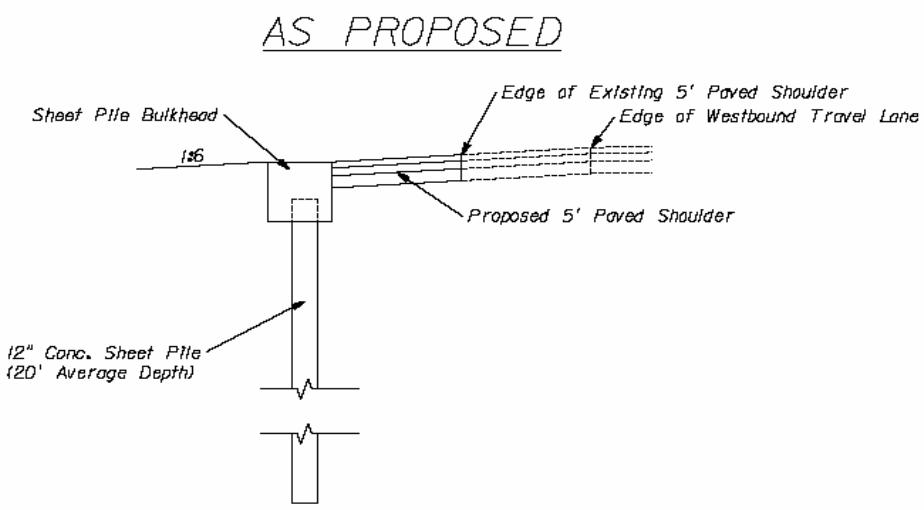
- **Bill Ventry – Team Leader – Ventry Engineering**
- **Sam Weede – Materials**
- **Hal Gore – DFS Maintenance**
- **Mark Gosselin– OEA-Coastal Engineering**
- **Miranda Glass – Design**
- **Billy Robinson – Crestview Const.**
- **John Ledbetter – Ventry Engineering**
- **Joy Giddens – DEMO**
- **Jess Bruner – Work Program**
- **James Smith – Design**
- **Colby Cleveland - DEMO**
- **Alan Hagans - Construction**
- **H. T. Waller – FDOT D3 – Value Engineer**
- **Debra Sasser – FDOT D3 – Value Engineer**



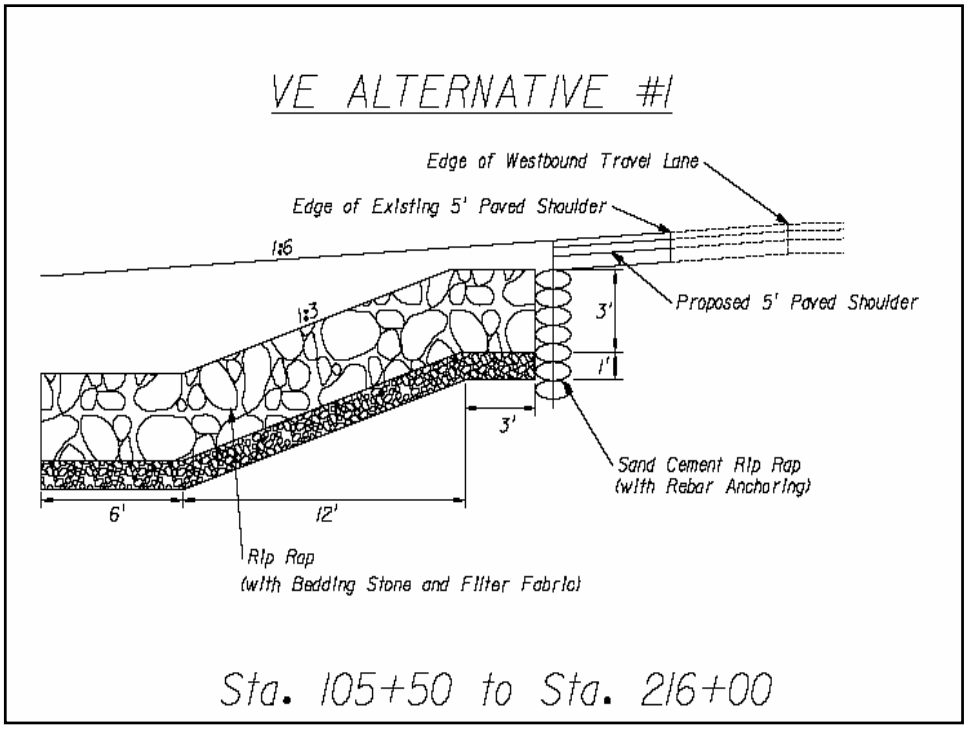
Areas of Focus

- Sheet Pile
- Gabions

Sheet Pile

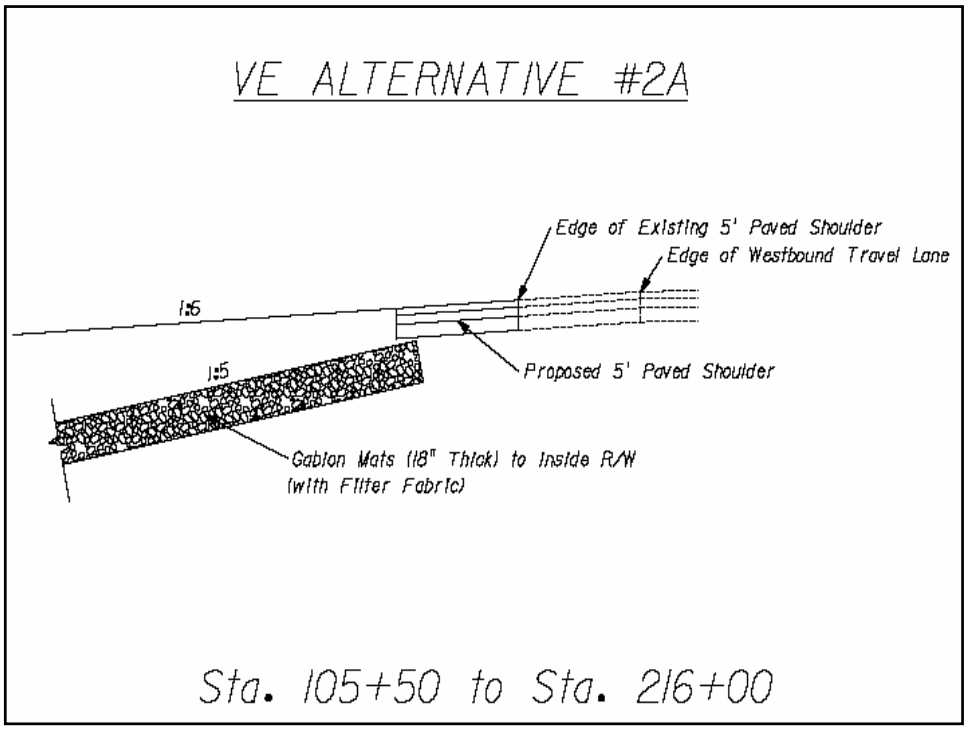


Sta. 105+50 to Sta. 216+00


VE ALTERNATIVE #1
Edge of Westbound Travel Lane
Edge of Existing 5' Paved Shoulder
1:6
1:3
3'
1'
Proposed 5' Paved Shoulder
3'
Sand Cement Rip Rap
(with Rebar Anchoring)
6'
12'
Rip Rap
(with Bedding Stone and Filter Fabric)
Sta. 105+50 to Sta. 216+00

RUBBLE RIP RAP
VALUE ENGINEERING ALTERNATIVE A-1
COST COMPARISON SHEET

DESCRIPTION	UNITS	UNIT COST	PROP'D QTY.	PROP'D COST	V.E. QTY.	V.E. COST
SHEET PILING CONC (12"X30")	LF	$175.00	88400.0	$15,470,000		
CONC CLASS IV (BULKHEAD)	CY	$800.00	2144.0	$1,715,200		
REINF STEEL (BULKHEAD)	LB	$1.20	95959.0	$115,151		
RUBBLE RIP RAP	TONS	$87.50			51714.0	$4,524,975
BEDDING STONE	TONS	$40.00			15138.0	$605,520
EXCAVATION	CY	$7.50			78578.0	$589,335
BACKFILL	CY	$7.50			39289.0	$294,668
SAND-CEMENT RIP RAP	CY	$350.00			3069.0	$1,074,150
SUBTOTAL				$17,300,351		$7,088,648
MOBILIZATION			5.0%	$865,018	5.0%	$354,432
TRAFFIC CONTROL/MOT			10.0%	$1,730,035	5.0%	$708,865
CONTINGENCY			5.0%	$865,018	5.0%	$354,432
GRAND TOTAL				$20,760,421		$8,506,377
POSSIBLE SAVINGS:				$12,254,044		

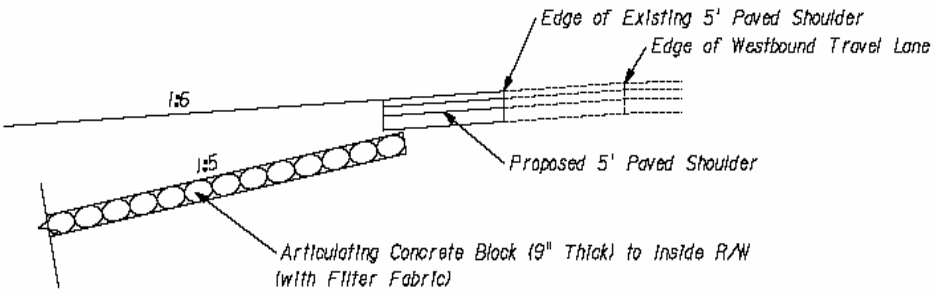


18"GABION MAT
VALUE ENGINEERING ALTERNATIVE A-2A
COST COMPARISON SHEET

DESCRIPTION	UNITS	UNIT COST	PROP'D QTY.	PROP'D COST	V.E. QTY.	V.E. COST
SHEET PILING CONC (12"X30")	LF	$125.00	88400.0	$11,050,000		
CONC CLASS IV (BULKHEAD)	CY	$800.00	2144.0	$1,715,200		
REINF STEEL (BULKHEAD)	LB	$1.20	95959.0	$115,151		
GABION MAT (18")	SY	$200.00			36833.0	$7,366,600
EXCAVATION	CY	$7.50			61389.0	$460,418
BACKFILL	CY	$7.50			36833.0	$276,248
SUBTOTAL				$12,880,351		$8,103,265
MOBILIZATION			5.0%	$644,018	5.0%	$405,163
TRAFFIC CONTROL/MOT			10.0%	$1,288,035	5.0%	$810,327
CONTINGENCY			5.0%	$644,018	5.0%	$405,163
GRAND TOTAL				$15,456,421		$9,723,918

POSSIBLE SAVINGS: $5,732,503

VE ALTERNATIVE #2B

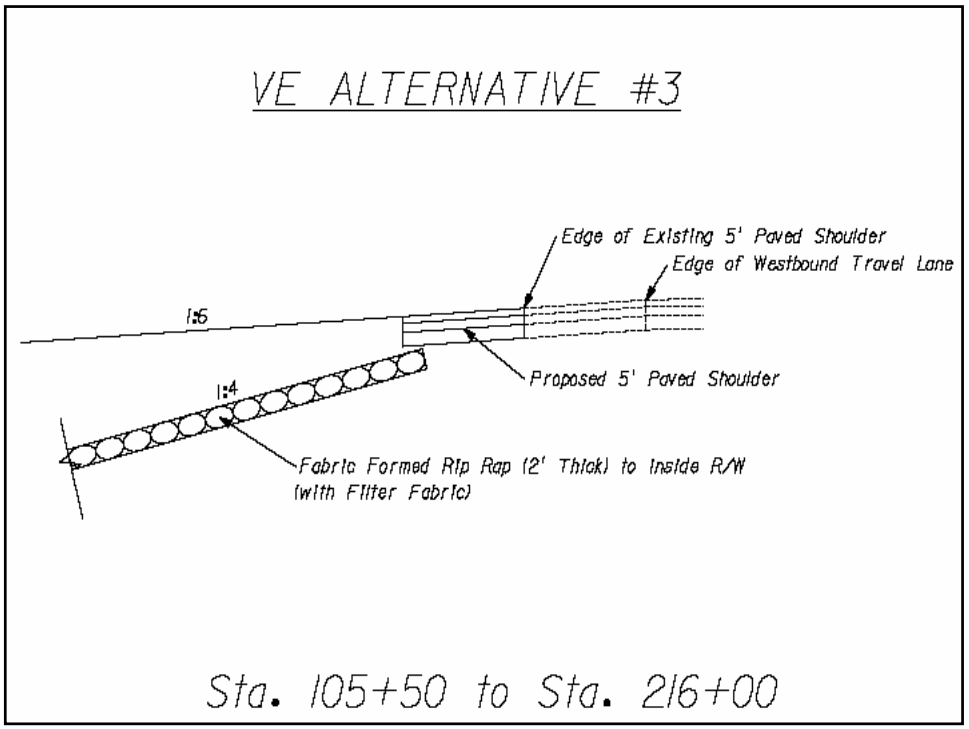


Sta. 105+50 to Sta. 216+00

ARTICULATED CONCRETE BLOCK MAT
VALUE ENGINEERING ALTERNATIVE A-2B
COST COMPARISON SHEET

DESCRIPTION	UNITS	UNIT COST	PROP'D QTY.	PROP'D COST	V.E. QTY.	V.E. COST
SHEET PILING CONC (12"X30")	LF	$125.00	88400.0	$11,050,000		
CONC CLASS IV (BULKHEAD)	CY	$800.00	2144.0	$1,715,200		
REINF STEEL (BULKHEAD)	LB	$1.20	95959.0	$115,151		
ARTICULATED CONC BLOCK MAT(9")	SF	$17.00			331500.0	$5,635,500
EXCAVATION	CY	$7.50			12278.0	$92,085
SUBTOTAL				$12,880,351		$5,727,585
MOBILIZATION			5.0%	$644,018	5.0%	$286,379
TRAFFIC CONTROL/MOT			10.0%	$1,288,035	5.0%	$572,759
CONTINGENCY			5.0%	$644,018	5.0%	$286,379
GRAND TOTAL				$15,456,421		$6,873,102

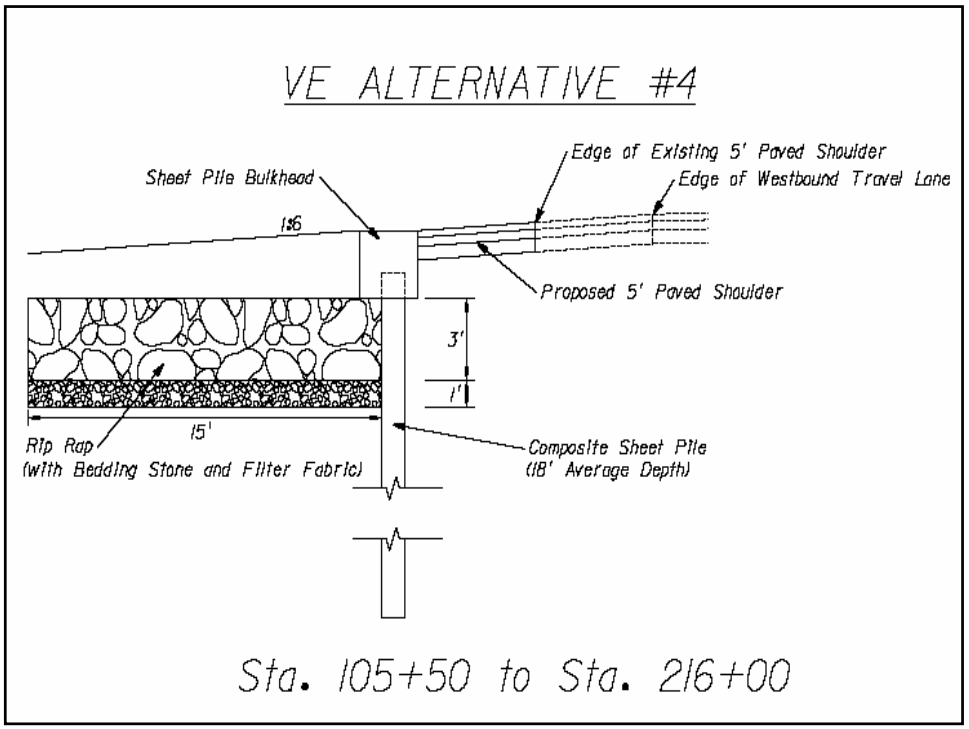
POSSIBLE SAVINGS: $8,583,319



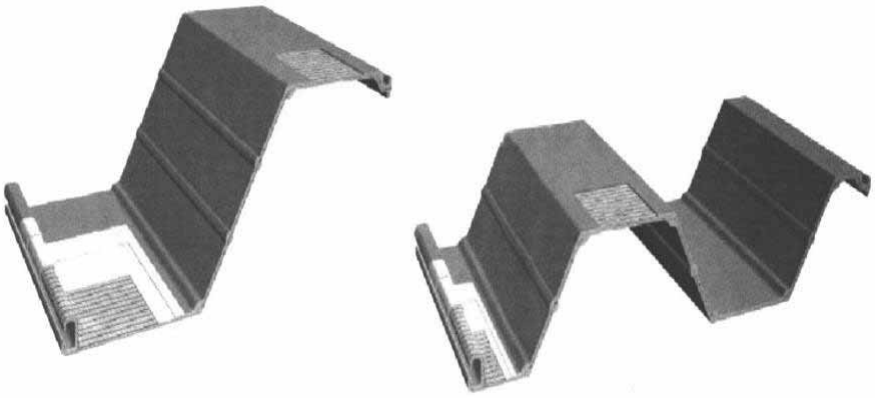
RIP RAP FABRIC FORMED
VALUE ENGINEERING ALTERNATIVE A-3
COST COMPARISON SHEET

DESCRIPTION	UNITS	UNIT COST	PROP'D QTY.	PROP'D COST	V.E. QTY.	V.E. COST
SHEET PILING CONC (12"X30")	LF	$125.00	88400.0	$11,050,000		
CONC CLASS IV (BULKHEAD)	CY	$800.00	2144.0	$1,715,200		
REINF STEEL (BULKHEAD)	LB	$1.20	95959.0	$115,151		
FABRIC FORMED RIP RAP	SY	$90.00			36833.0	$3,314,970
EXCAVATION	CY	$7.50			49111.0	$368,333
BACKFILL	CY	$7.50			30694.0	$230,205
SUBTOTAL				$12,880,351		$3,913,508
MOBILIZATION			5.0%	$644,018	5.0%	$195,675
TRAFFIC CONTROL/MOT			10.0%	$1,288,035	5.0%	$391,351
CONTINGENCY			5.0%	$644,018	5.0%	$195,675
GRAND TOTAL				$15,456,421		$4,696,209

POSSIBLE SAVINGS: $10,760,212



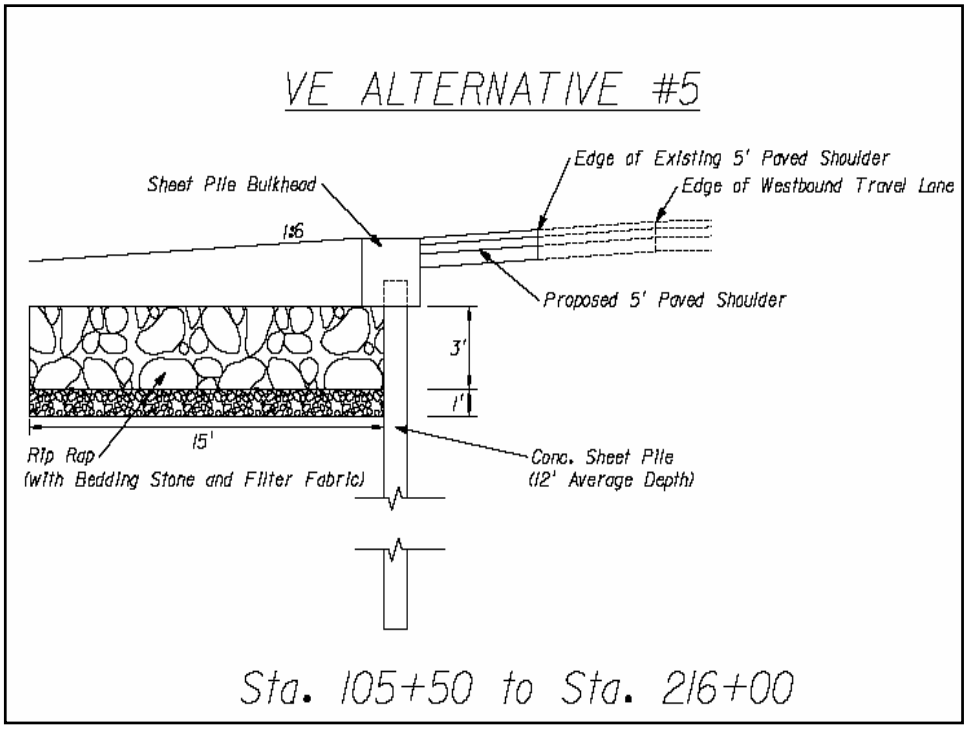
POLYMER SHEET PILING



POLYMER SHEET PILE W/BULKHEAD AND TOE PROTECTION
VALUE ENGINEERING ALTERNATIVE A-4
COST COMPARISON SHEET

DESCRIPTION	UNITS	UNIT COST	PROP'D QTY.	PROP'D COST	V.E. QTY.	V.E. COST
SHEET PILING CONC (12"X30")	LF	$175.00	88400.0	$15,470,000		
CONC CLASS IV (BULKHEAD)	CY	$800.00	2144.0	$1,715,200	2144.0	$1,715,200
REINF STEEL (BULKHEAD)	LB	$1.20	95959.0	$115,151	95959.0	$115,151
POLYMER PILES	LF	$36.00			132606.0	$4,773,816
RUBBLE TOE PROTECTION	TONS	$87.50			32321.0	$2,828,088
BEDDING STONE W/FILTER FABRIC	TONJS	$40.00			10774.0	$430,960
EXCAVATION	CY	$7.50			30694.0	$230,205
BACKFILL	CY	$7.50			6139.0	$46,043
SUBTOTAL				$17,300,351		$10,139,462
MOBILIZATION			5.0%	$865,018	5.0%	$506,973
TRAFFIC CONTROL/MOT			10.0%	$1,730,035	10.0%	$1,013,946
CONTINGENCY			5.0%	$865,018	5.0%	$506,973
GRAND TOTAL				$20,760,421		$12,167,354

POSSIBLE SAVINGS: $8,593,067


VE ALTERNATIVE #5
Edge of Existing 5' Paved Shoulder
Edge of Westbound Travel Lane
Sheet Pile Bulkhead
1:6
Proposed 5' Paved Shoulder
3'
1'
15'
Rip Rap
(with Bedding Stone and Filter Fabric)
Conc. Sheet Pile
(12' Average Depth)
Sta. 105+50 to Sta. 216+00


23 20:51

30" CONCRETE SHEET PILE W/BULKHEAD AND TOE PROTECTION AND SHORTER PILES
VALUE ENGINEERING ALTERNATIVE A-5
COST COMPARISON SHEET

DESCRIPTION	UNITS	UNIT COST	PROP'D QTY.	PROP'D COST	V.E. QTY.	V.E. COST
SHEET PILING CONC (12"X30")	LF	$175.00	88400.0	$15,470,000	53040.0	$9,282,000
CONC CLASS IV (BULKHEAD)	CY	$800.00	2144.0	$1,715,200	2144.0	$1,715,200
REINF STEEL (BULKHEAD)	LB	$1.20	95959.0	$115,151	95959.0	$115,151
RUBBLE RIP RAP	TONS	$87.50			32321.0	$2,828,088
BEDDING STONE AND FILTER FABRIC	TONS	$40.00			10774.0	$430,960
EXCAVATION	CY	$7.50			30694.0	$230,205
BACKFILL	CY	$7.50			6139.0	$46,043
SUBTOTAL				$17,300,351		$14,647,646
MOBILIZATION			5.0%	$865,018	5.0%	$732,382
TRAFFIC CONTROL/MOT			10.0%	$1,730,035	5.0%	$1,464,765
CONTINGENCY			5.0%	$865,018	5.0%	$732,382
GRAND TOTAL				$20,760,421		$17,577,175
POSSIBLE SAVINGS:				**$3,183,246**		

EVALUATION MATRIX

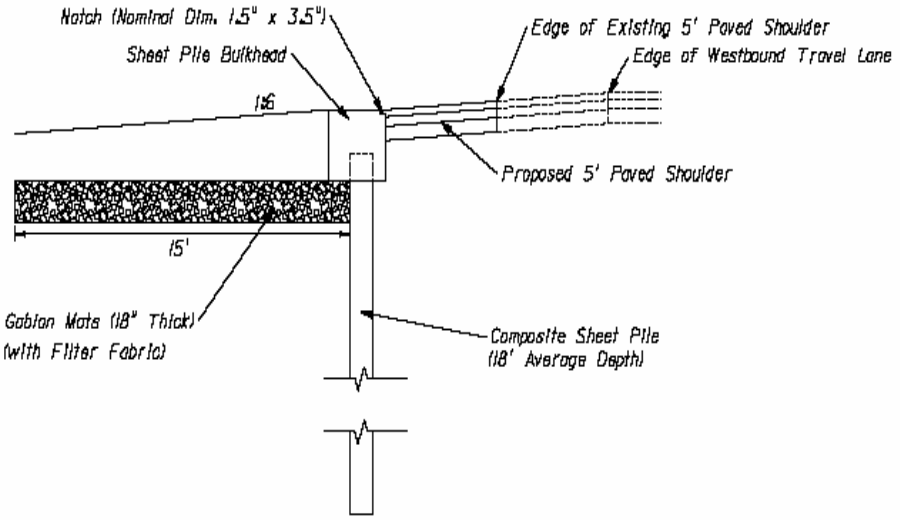
SHT. PILE WALL

TYPICAL 2

4- VERY GOOD 3 - GOOD 2 - FAIR 1 - POOR Weight / Alternative	Contract Schedule	50-year Design	Construction Cost	Environmental Impact	Maintenance Cost	Aesthetics	Constructability	Design Schedule	Future Widening	TOTAL SCORE	RANKING	TEAM RECOMMENDATION
	10	10	8	6	5	3	8	7	3			
"As Proposed"	1 / 10	2 / 20	1 / 8	2 / 12	3 / 15	3 / 9	1 / 8	4 / 28	1 / 3	**125**	**4**	
Value Engineering 1	1 / 10	2 / 20	3 / 24	1 / 6	2 / 10	3 / 9	1 / 8	1 / 7	1 / 3	**101**	**6**	
Value Engineering 2A	4 / 40	3 / 30	3 / 24	3 / 18	4 / 20	3 / 9	4 / 32	2 / 14	4 / 12	**215**	**2**	X
Value Engineering 2B	4 / 40	3 / 30	4 / 32	3 / 18	4 / 20	3 / 9	4 / 32	2 / 14	4 / 12	**223**	**1**	
Value Engineering 3	4 / 40	3 / 30	4 / 32	2 / 12	4 / 20	3 / 9	4 / 32	2 / 14	1 / 3	**208**	**3**	
Value Engineering 4	4 / 40	4 / 40	3 / 24	4 / 24	3 / 15	3 / 9	3 / 24	4 / 28	1 / 3	**215**	**2**	X
Value Engineering 5	1 / 10	3 / 30	1 / 8	2 / 12	2 / 10	3 / 9	1 / 8	3 / 21	1 / 3	**119**	**5**	

*NOTE: The Value Engineering Team recommends a combination of Value Engineering alternatives 2A and 4. The Design recommended by the Value Engineering Team will be a Polymer Wall with Gabion Toe Protection. The cost comparison sheet for this alternative is shown on the following page.

VE ALTERNATIVE #2A/4



Sta. 105+50 to Sta. 216+00

COST SUMMARY

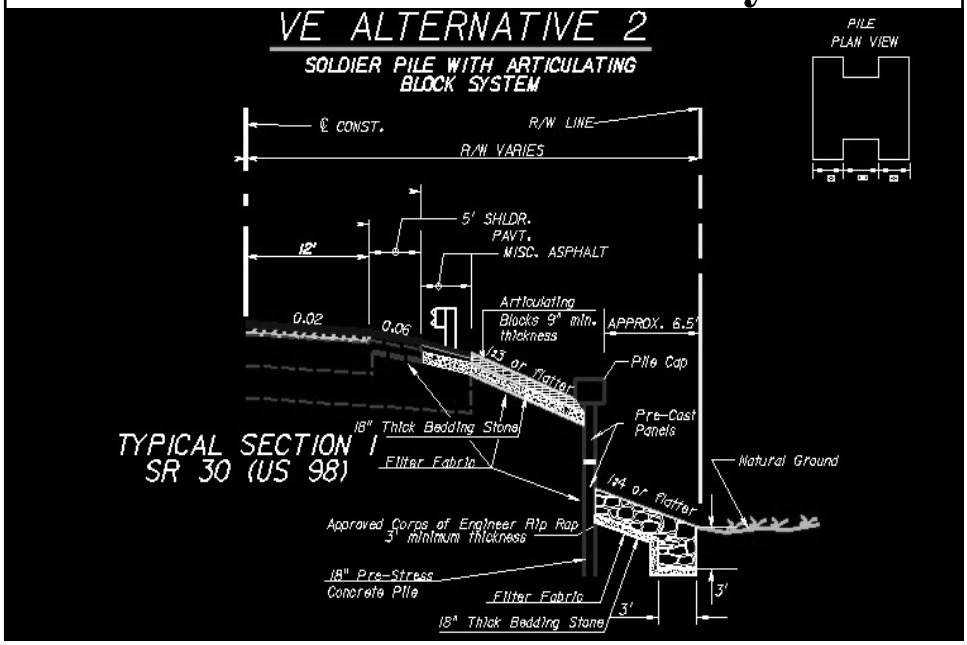
AS PROPOSED	20 FT. 30" CONC SHEET PILING	$ 20,760,421
VE #1	RUBBLE RIP RAP WITH FABRIC	$ 8,506,377
VE #2A	18" GABION MATS WITH FABRIC	$ 9,723,918
VE #2B	ARTICULATED CONC BLOCK WITH FABRIC	$ 6,873,102
VE #3	FABRIC FORMED RIP RAP	$ 4,696,209
VE #4	POLYMER SHEET PILING WITH TOE PROTECTION AND BULKHEAD	$ 12,167,354
VE #5	12 FT. 30" CONC SHEET PILING WITH TOE PROTECTION AND BULKHEAD	$ 17,577,175
VE #2A/4	18" GABION MATS WITH FABRIC AND POLYMER SHEET PILING WITH BUIKHEAD	$ 8,305,070

Implemented Recommendations

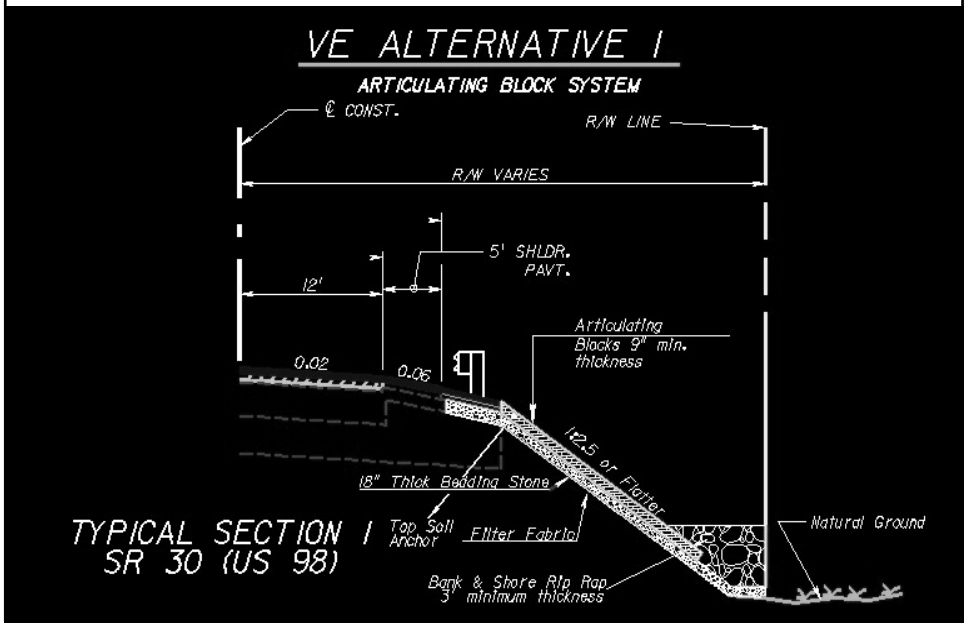
US-98 - Franklin County

- Soldier Pile Wall combined with articulated block on portion of project
- Articulated Block System on remainder
- Possible Savings - $73 million

US-98 - Franklin County



US-98 - Franklin County



US 98 – Okaloosa Island

- Combination of Polymer Sheet pile with gabion mat toe protection
- Savings - $6.5 million

US 98 – Okaloosa Island

US 98 – Okaloosa Island

US 98 – Okaloosa Island

US 98 – Okaloosa Island

ANY QUESTIONS?