VALUE ENGINEERING CONSTRUCTABILITY STUDY

OF

I-64 MAJOR WIDENING from EAST of VAN METER ROAD to EAST of the MOUNTAIN PARKWAY

ITEM NUMBER: 7-33.00

Clark County, Kentucky

Frankfort, Kentucky

January 26-29, 2010

Prepared by:
VE GROUP, L.L.C.

In Association With:

KENTUCKY TRANSPORTATION CABINET

VALUE ENGINEERING STUDY TEAM LEADER

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C.V.S. Registration No. 840603(LIFE)

Date: _____

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I. INTRODUCTION

GENERAL

This Value Engineering report summarizes the results of the Constructability Value Engineering study performed by VE GROUP, L.L.C. for the Kentucky Transportation Cabinet. The study was performed January 26-29, 2009.

VALUE ENGINEERING METHODOLOGY

The Value Engineering Team followed the basic Value Engineering procedure for conducting this type of analysis.

This process included the following phases:

1. Investigation
2. Speculation
3. Evaluation/Development
4. Report Preparation

I. INTRODUCTION

SUMMARY OF ALTERNATIVES & SUGGESTIONS

It is the recommendation of the Value Engineering Team that the following Value Engineering Alternatives be carried into the Project Development process for the final plans and specifications.

Alternative Number 1- CONSTRUCTABILITY, 16'x3' Cast-in-Place Box Culvert

The Value Engineering Team recommends that the Value Engineering Alternative be implemented. This alternative uses a perpendicular crossing at approximate Station 1316.

If this alternative can be implemented, there is a possible savings of ***$ 75,729.***

Alternative Number 2- CONSTRUCTABILITY, 36" Pipe at approximate Station 1337+00

The Value Engineering Team recommends that the Value Engineering Alternative be implemented. This alternative extends the pipe to the existing double 12' x 6' box culvert.

If this alternative can be implemented, there is a possible savings of ***$2,872.***

Alternative Number 3- CONSTRUCTABILITY, Overhead sign at approximate Station 1400+00

The Value Engineering Team recommends that the Value Engineering Alternative be implemented. This alternative replaces the median foundation and insures that access to the existing ladder can be maintained.

If this alternative can be implemented, there is a possible INCREASE of ***$31,915.***

Alternative Number 4- CONTRACTOR WORK HOURS, Lane Closures

The Value Engineering Team recommends that the Value Engineering Alternative be implemented. This alternative provides wording for restricting certain lane closures.

Alternative Number 5- MATERIAL REQUIREMENTS/ISSUES, Pavement

The Value Engineering Team recommends that the Value Engineering Alternative be implemented. This alternative mills the existing pavement and uses full depth asphalt to achieve the required vertical clearance.

If this alternative can be implemented, there is a possible savings of ***$ 163,607.***

I. INTRODUCTION

SUMMARY OF ALTERNATIVES & SUGGESTIONS

Alternative Number 6- MATERIAL REQUIREMENTS/ISSUES, US 60 Bridge

The Value Engineering Team recommends that the Value Engineering Alternative be implemented. This alternative eliminates the end spans by using walls with vertical abutments.

If this alternative can be implemented, there is a possible savings of ***$ 220,260.***

Alternative Number 7- MATERIAL REQUIREMENTS/ISSUES, Median Lighting

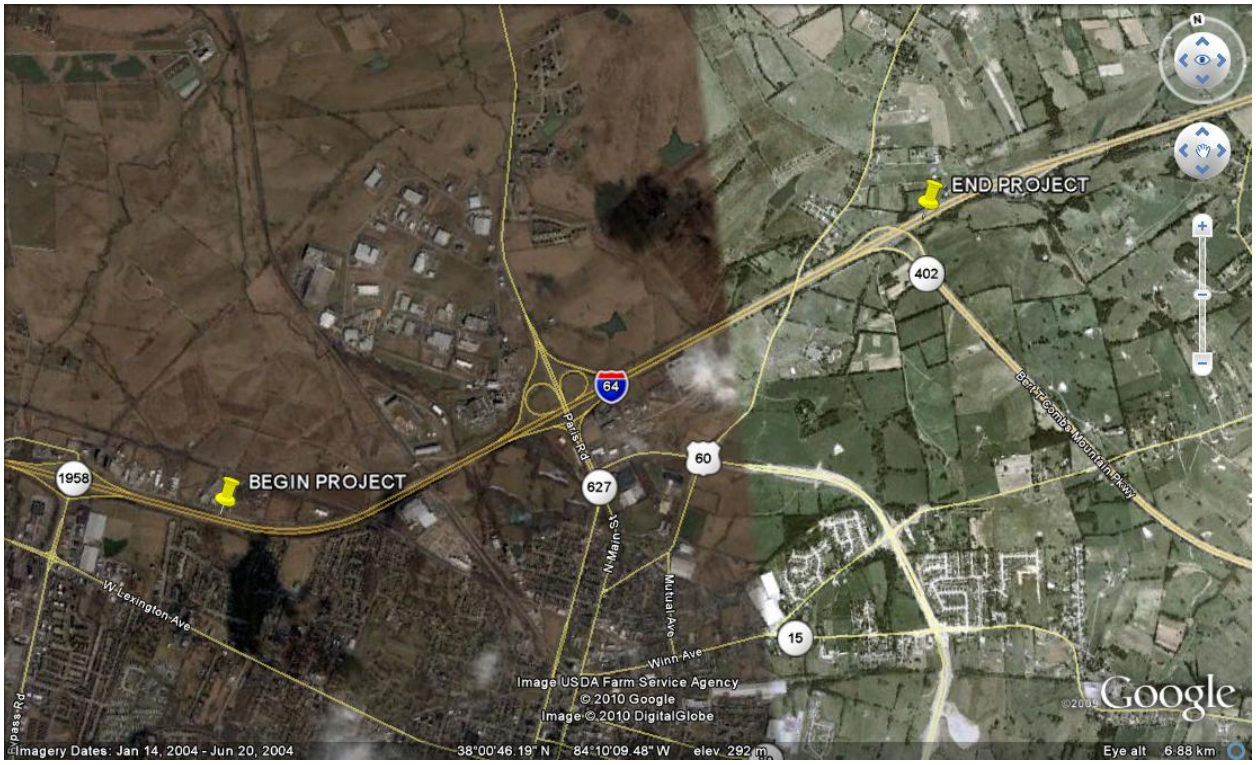
The Value Engineering Team recommends that the Value Engineering Alternative be implemented. This alternative provides lighting in the median up to the Mountain Parkway gores.

Suggestion Number 1- EQUIPMENT INGRESS /EGRESS /PLACEMENT
Contractor Access

The Value Engineering Team recommends that the Value Engineering Suggestion be implemented. This alternative clarifies the note that allows the contractor direct access to the interstate.

Federal Highway Administration (FHWA) CATEGORIES						
	Safety	**Mobility**	**Operations**	**Environment**	**Innovative Construction**	**Other Features**
ALTERNATIVES & SUGGESTIONS						
Alternative Number 1: CONSTRUCTABILITY, 16'x3' Cast-in-Place Box Culvert- *This alternative uses a perpendicular crossing at approximate Station 1316+00.*						X
Alternative Number 2: CONSTRUCTABILITY, 36" Pipe at Station 1337+00- *This alternative extends the pipe to the double 12x6 box culvert.*						X
Alternative Number 3: CONSTRUCTABILITY, Overhead sign at Station 1400+00- *This alternative replaces the median foundation and insures that access to the existing ladder can be maintained.*						X
Alternative Number 4: **CONTRACTOR WORK HOURS, Lane Closures-** *This alternative provides wording for restricting certain lane closures*		X				
Alternative Number 5: MATERIAL REQUIREMENTS/ISSUES, Pavement- *This alternative mills the existing pavement and uses full depth asphalt to achieve the required vertical clearance*						X
Alternative Number 6: MATERIAL REQUIREMENTS/ISSUES, US 60 Bridge- *This alternative eliminates the end spans by using walls with vertical abutments.*						X
Alternative Number 7: MATERIAL REQUIREMENTS/ISSUES, Median Lighting- *This alternative provides lighting in the median up to the Mountain Parkway gores.*	X					
Suggestion Number 1: EQUIPMENT INGRESS/EGRESS/PLACEMENT, Contractor Access- *This suggestion clarifies the note that allows the contractor direct access to the interstate.*			X			
TOTAL	**1**	**1**	**1**	**0**	**0**	**5**

II. LOCATION OF PROJECT & PROJECT DESCRIPTION



PROJECT DESCRIPTION

The proposed project is a major widening of I-64 from east of Van Meter Road to east of the Mountain Parkway. The proposed widening will bring the existing four-lane roadway up to a new six–lane facility. The existing I-64/KY 627 interchange will be reconstructed and the existing loop ramp in the northwest quadrant will be eliminated to improve the existing merge/weave conflicts. The existing four-lanes of pavement will be reconstructed and two new lanes of pavement will be added. In addition, several drainage structures will be replaced or improved and the existing US 60 grade separated bridge will be replaced with a new bridge.

The estimated construction cost for the project is **$ 26,483,962.63.**

III. TEAM MEMBERS

TEAM MEMBERS

NAME	AFFILIATION	EXPERTISE	PHONE/EMAIL
Bill Ventry, P.E., C.V.S.	VE GROUP	Team Leader	850/627-3900 bill@ventryengineering.com
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Siamak Shafaghi, P. E.	KYTC	Quality Assurance	502/564-3280 Siamak.Shafaghi@ky.gov

IV. INVESTIGATION PHASE

VALUE ENGINEERING STUDY BRIEFING

I-64 MAJOR WIDENING
January 26-29, 2010

NAME	AFFILIATION	PHONE
Bill Ventry	VE GROUP, L.L.C.	850/627-3900
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Andre Johannes	KYTC, Design	502/564-3280
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Sreenu Gutti	KYTC, Planning	502/564-7183
Siamak Shafaghi	KYTC, QAB	502/564-3280
Mary Murray	FHWA, Project Delivery Team (PDT)	502/223-6745

STUDY RESOURCES

I-64 MAJOR WIDENING
January 26-29, 2010

NAME	AFFILIATION	PHONE
Ted Swansegar	KYTC, Traffic	502/564-3020
Nasby Stroop	KYTC, Construction	502/564-4780
Lynn Witmer	KYTC, Traffic	502/564-3020
Tim Pyles	KYTC, Structures	502/564-4560

IV. INVESTIGATION PHASE

The following areas have been identified by the Value Engineering Team as areas of focus and investigation for the Value Engineering process:

A. CONSTRUCTABILITY

B. CONSTRUCTION SEQUENCING/STAGING

C. CONTRACTOR WORK HOURS

D. MAINTENANCE OF TRAFFIC

E. CONTRACT TIME

F. MATERIAL REQUIREMENTS/ISSUES

G. UTILITY CONFLICTS

H. PERMIT REQUIREMENTS

I. TEMPORARY CONSTRUCTION

J. EQUIPMENT INGRESS/EGRESS/PLACEMENT

V. SPECULATION PHASE

Ideas generated, utilizing the brainstorming method, for performing the functions of previously identified areas of focus.

A. CONSTRUCTABILITY

- **16’ x 3’ CAST-IN-PLACE BOX CULVERT**
- **36” PIPE AT APPROXIMATE STATION 1337+00**
- **OVERHEAD SIGN AT APPROXIMATE STATION 1400+00**

B. CONSTRUCTION SEQUENCING/STAGING

NO ISSUES

C. CONTRACTOR WORK HOURS

- **LANE CLOSURES**

D. MAINTENANCE OF TRAFFIC

NO ISSUES

E. CONTRACT TIME

NO ISSUES

F. MATERIAL REQUIREMENTS/ISSUES

- **PAVEMENT**
- **US 60 BRIDGE**
- **MEDIAN LIGHTING**

G. UTILITY CONFLICTS

NO ISSUES

H. PERMIT REQUIREMENTS

NO ISSUES

I. TEMPORARY CONSTRUCTION

NO ISSUES

J. EQUIPMENT INGRESS/EGRESS/PLACEMENT

- **CONTRACTOR ACCESS**

VI. EVALUATION PHASE

A. ALTERNATIVES & SUGGESTIONS

The following alternatives were formulated during the "eliminate and combine" portion of the Evaluation/Development Phase.

A. CONSTRUCTABILITY

1. 16’ x 3’ CAST-IN-PLACE BOX CULVERT

Value Engineering Alternative: ***Use a perpendicular crossing at approximate Station 1316+00.***

2. 36” PIPE AT APPROXIMATE STATION 1337+00

Value Engineering Alternative: ***Extend the pipe to the double 12’ x 6’ box culvert.***

3. OVERHEAD SIGN AT APPROXIMATE STATION 1400+00

Value Engineering Alternative: ***Replace the median foundation and insure that access to the existing ladder can be maintained.***

B. CONSTRUCTION SEQUENCING/STAGING

NO ISSUES

C. CONTRACTOR WORK HOURS

1. LANE CLOSURES

Value Engineering Alternative: ***Provide wording for restricting certain lane closures***.

D. MAINTENANCE OF TRAFFIC

NO ISSUES

E. CONTRACT TIME

NO ISSUES

VI. EVALUATION PHASE

A. ALTERNATIVES & SUGGESTIONS

F. MATERIAL REQUIREMENTS/ISSUES

1. PAVEMENT

Value Engineering Alternative: ***Mill and use full depth asphalt to achieve the required vertical clearance.***

2. US 60 BRIDGE

Value Engineering Alternative: ***Eliminate the end spans by using walls with vertical abutments.***

3. MEDIAN LIGHTING

Value Engineering Alternative: ***Place lighting in the median at the Mountain Parkway gores.***

G. UTILITY CONFLICTS

NO ISSUES

H. PERMIT REQUIREMENTS

NO ISSUES

I. TEMPORARY CONSTRUCTION

NO ISSUES

J. EQUIPMENT INGRESS/EGRESS/PLACEMENT

1. CONTRACTOR ACCESS

Value Engineering Suggestion: ***Clarify the note that allows the contractor direct access to the interstate.***

B. ADVANTAGES AND DISADVANTAGES

The following Advantages and Disadvantages as well as other pertinent information was developed for the Value Engineering Alternatives previously generated during the speculation phase.

A. CONSTRUCTABILITY

1. 16' x 3' CAST-IN-PLACE BOX CULVERTS

Value Engineering Alternative: ***Use a perpendicular crossing at approximate Station 1316+00.***

Advantages

- Less culvert construction cost
- Less involvement with the railroad
- Existing culvert could be left in place during construction to maintain water flow
- Does not require removal of the existing box culvert

Disadvantages

- Requires paved ditch adjacent to roadway

Conclusion

CARRY FORWARD FOR FURTHER EVALUATION

2. 36" PIPE AT APPROXIMATE STATION 1337+00

Value Engineering Alternative: ***Extend the pipe to the double 12x6 box culvert.***

Advantages

- Less construction cost
- Less disruption of interstate traffic
- All construction can be done in median

Disadvantages

- Comingles water

Conclusion

CARRY FORWARD FOR FURTHER EVALUATION

3. OVERHEAD SIGN AT APPROXIMATE STATION 1400+00

Value Engineering Alternative: ***Replace the median foundation and insure that access to the existing ladder can be maintained.***

Advantages

- Corrects previous construction error
- Avoids future maintenance of retrofit structure

Disadvantages

- May be higher cost

Conclusion

CARRY FORWARD FOR FURTHER EVALUATION

B. CONSTRUCTION SEQUENCING/STAGING

NO ISSUES WERE IDENTIFIED FOR THIS AREA OF FOCUS

C. CONTRACTOR WORK HOURS

1. LANE CLOSURES

Value Engineering Alternative: ***Provide wording for restricting certain lane closures***.

Advantages

- Adds dates to existing lists in MOT Plans to avoid closures
- Less disruption to motorist during certain events

Disadvantages

- None apparent

Conclusion

CARRY FORWARD FOR FURTHER EVALUATION

D. MAINTENANCE OF TRAFFIC

NO ISSUES WERE IDENTIFIED FOR THIS AREA OF FOCUS

E. CONTRACT TIME

NO ISSUES WERE IDENTIFIED FOR THIS AREA OF FOCUS

F. MATERIAL REQUIREMENTS/ISSUES

1. PAVEMENT

Value Engineering Alternative: ***Mill and use full depth asphalt to achieve the required vertical clearance.***

Advantages

- Less removal of roadway
- May be less construction time
- May be less construction cost

Disadvantages

- None apparent

Conclusion

CARRY FORWARD FOR FURTHER EVALUATION

2. US 60 BRIDGE

Value Engineering Alternative: ***Eliminate the end spans by using walls with vertical abutments.***

Advantages

- Less construction cost
- Less construction time

Disadvantages

- None apparent

Conclusion

CARRY FORWARD FOR FURTHER EVALUATION

3. MEDIAN LIGHTING

Value Engineering Alternative: ***Place lighting in the median at the Mountain Parkway gores.***

Advantages

- Lights area where traffic is entering and leaving the interstate

Disadvantages

- None apparent

Conclusion

CARRY FORWARD FOR FURTHER EVALUATION

G. UTILITY CONFLICTS

NO ISSUES WERE IDENTIFIED FOR THIS AREA OF FOCUS

H. PERMIT REQUIREMENTS

NO ISSUES WERE IDENTIFIED FOR THIS AREA OF FOCUS

I. TEMPORARY CONSTRUCTION

NO ISSUES WERE IDENTIFIED FOR THIS AREA OF FOCUS

J. EQUIPMENT INGRESS/EGRESS/PLACEMENT

1. CONTRACTOR ACCESS

Value Engineering Suggestion: ***Clarify the note that allows the contractor direct access to the interstate.***

Advantages

- May avoid incidents involving contractor personnel entering interstate traffic

Disadvantages

- None apparent

Conclusion

CARRY FORWARD FOR FURTHER EVALUATION

VII. DEVELOPMENT PHASE

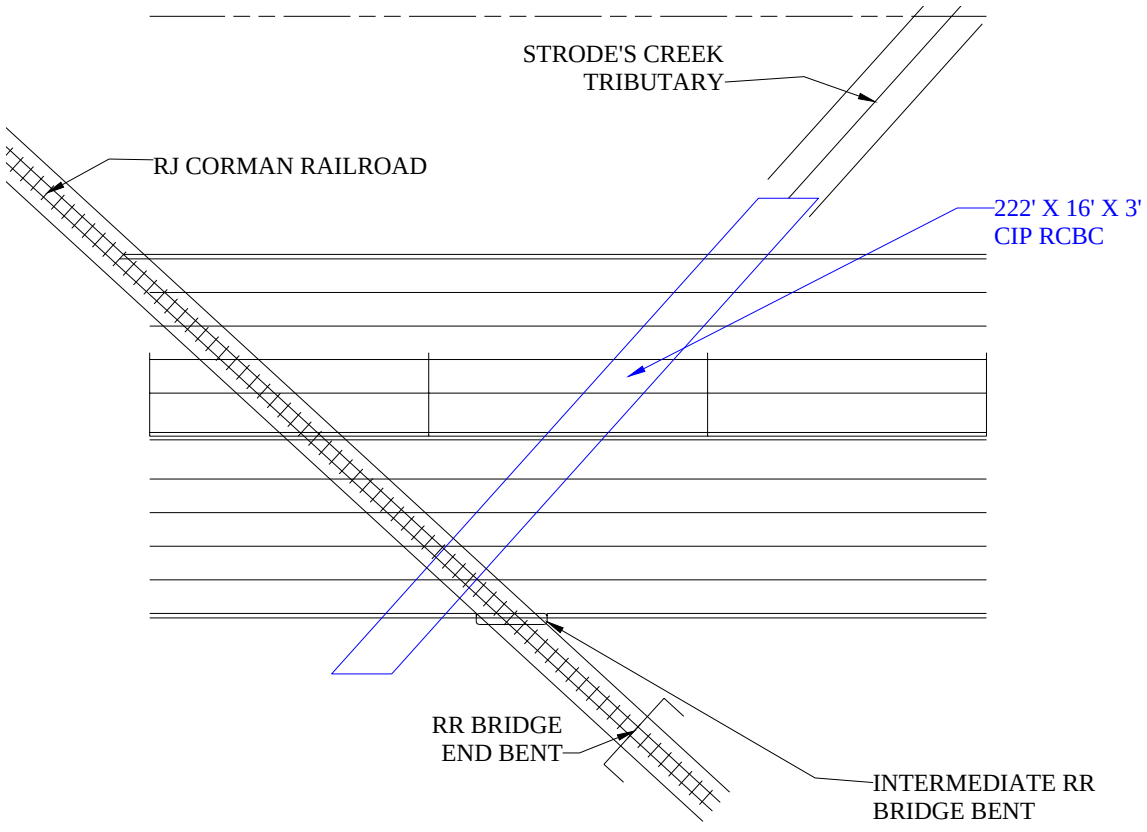
A. CONSTRUCTABILITY

1. 16’ x 3’ Cast-in-Place Box Culvert

1. “As Proposed”

The current design calls for the replacement of a 12’ x 4’ Reinforce Concrete Box Culvert (RCBC) at Station 1315+50 with a 222’ x 16’ x 3’ cast-in-place RCBC in the same location. The lowering of the profile grade in this location to provide the necessary vertical clearance under the RJ Corman Railroad (RR) Bridge requires the new culvert to have a reduced height of 3’ and to maintain the existing cross sectional area the width is increased from 12’ to 16’. The culvert is on a +/- 45° skew. The construction of the new culvert will require maintaining sporadic storm water flows from the south to the north of I-64.

The assumed sequencing of the construction will be removal and replacement of the median section, shifting traffic to the median and removal and replacement to outside. During the construction the storm water capacity of the existing and new culvert will be reduced because of temporary construction joints. The culvert under the eastbound roadway is also under the RJ Corman Railroad Bridge. The construction of the 16’ x 3’ culvert under the railroad bridge will require special attention in order to avoid the railroad structure.



AS PROPOSED LOCATION OF 16’ x 3’ RCBC UNDER RJ CORMAN RR BRIDGE

VII. DEVELOPMENT PHASE

A. CONSTRUCTABILITY

1. 16’ x 3’ Cast-in-Place Box Culvert

1. “As Proposed”

AS PROPOSED LOCATION OF 16’ x 3’ RCBC UNDER RJ CORMAN RR BRIDGE (Looking west)

VII. DEVELOPMENT PHASE

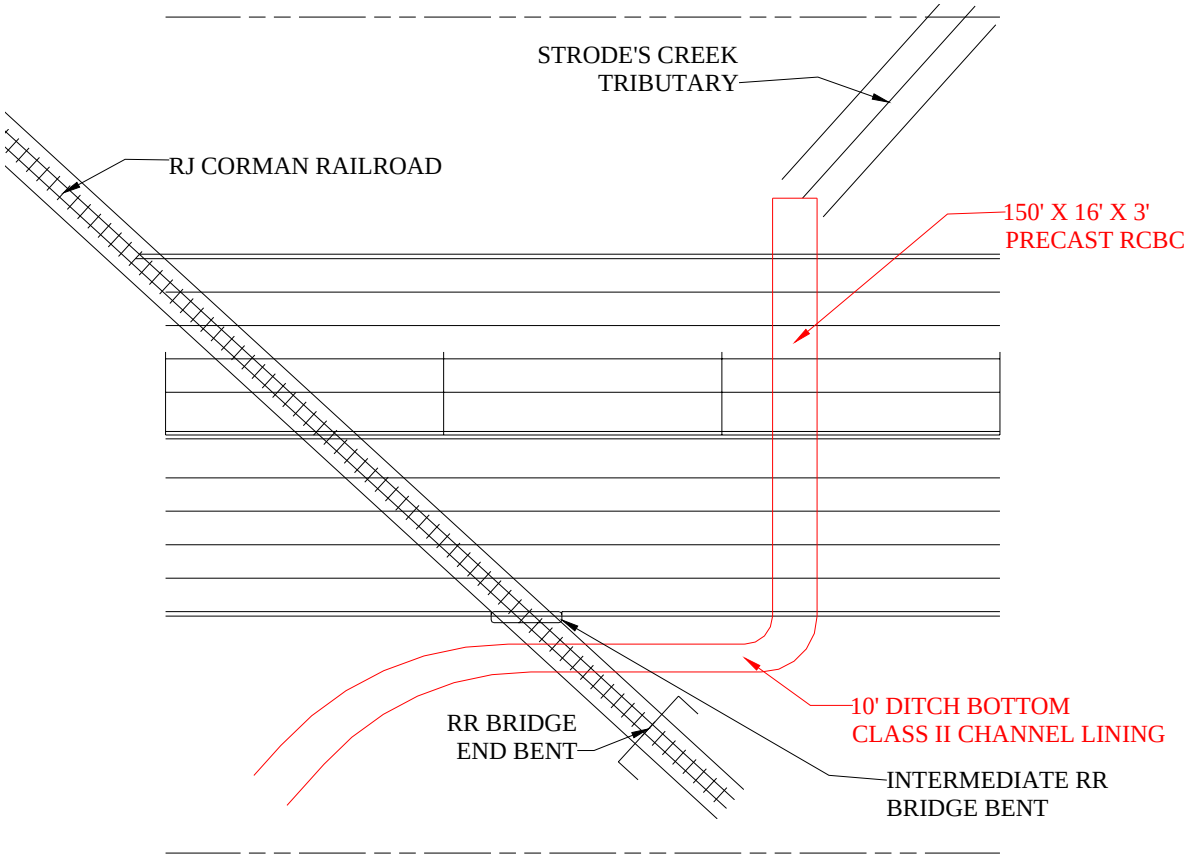
A. CONSTRUCTABILITY

1. 16’ x 3’ Cast-in-Place Box Culvert

2. Value Engineering Alternative

The Value Engineering Team recommends constructing the 16’ x 3’ RCBC perpendicular to the centerline of construction at approximately Station 1316+20 using precast sections. The storm water will be conveyed to the new box culvert via a ditch with a 10’ bottom and class II Channel lining. This will shorten the culvert to approximately 150 LF. The paved ditch will be approximately 200’ long with 1.5:1 and 1.2:1 side slopes.

The two major advantages of constructing the culvert on a new location are: 1) the existing culvert will maintain any storm water flows that may occur without any additional work and 2) when the new culvert is operational the existing culvert will not have to be torn out since it can be back filled with Safe loading.



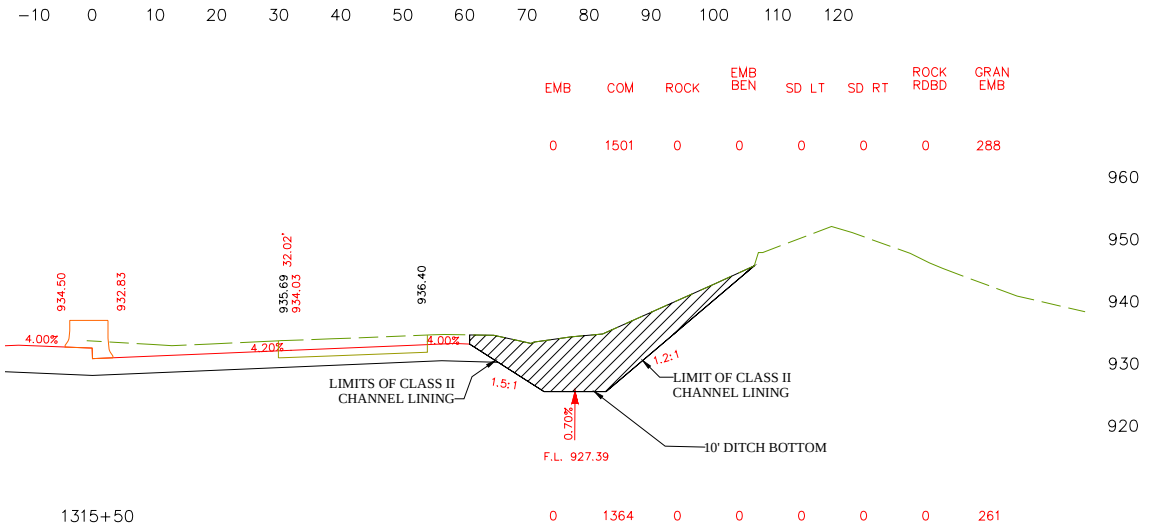
VALUE ENGINEERING ALTERNATIVE 16’ x 3’ RCBC

VII. DEVELOPMENT PHASE

A. CONSTRUCTABILITY

1. 16’ x 3’ Cast-in-Place Box Culvert

2. Value Engineering Alternative



VALUE ENGINEERING ALTERNATIVE ROADSIDE DITCH TO CULVERT

SOUTH SPAN OF RJ CORMAN RR BRIDGE STA 1315+50 (+/-)

The paved ditch would be constructed under the south span of the RR Bridge and continue to the headwall of the headwall of the new location of the precast culvert. The outfall of the culvert will be in approximately the same location as the existing/proposed.

CONSTRUCTIBILITY - 16' x 3' RCBC
VALUE ENGINEERING ALTERNATIVE
COST COMPARISON SHEET

DESCRIPTION	UNITS	UNIT COST	PROP'D QTY.	PROP'D COST	V.E. QTY.	V.E. COST
16' x 3' CIP RCBC	LF	$1,452.06	222.0	$322,357	150.0	$217,809
REMOVE EXISTING 12' x 4' RCBC	LS	$100,000.00	1.0	$100,000	0.0	$0
SAFELOADING	CY	$214.60	0.0	$0	394.7	$84,695
ROADWAY EXCAVATION	CY	$5.67	0.0	$0	5,555.6	$31,500
CHANNEL LINING	TN	$25.39	0.0	$0	810.0	$20,566
GUARDRAIL	LF	$15.15	0.0	$0	200.0	$3,030
GUARDRAIL TERMINAL	EA	$53.43	0.0	$0	1.0	$53
SUBTOTAL				**$422,357**		**$357,654**
MOBILIZATION (THIS IS SUB+CONTIN. X % =)		6.4%		$29,734		$25,179
TRAFFIC CONTROL/MOT		0.0%		$0		$0
UNKNOWNS		10.0%		$42,236		$35,765
GRAND TOTAL				**$494,327**		**$418,598**

POSSIBLE SAVINGS: $75,729

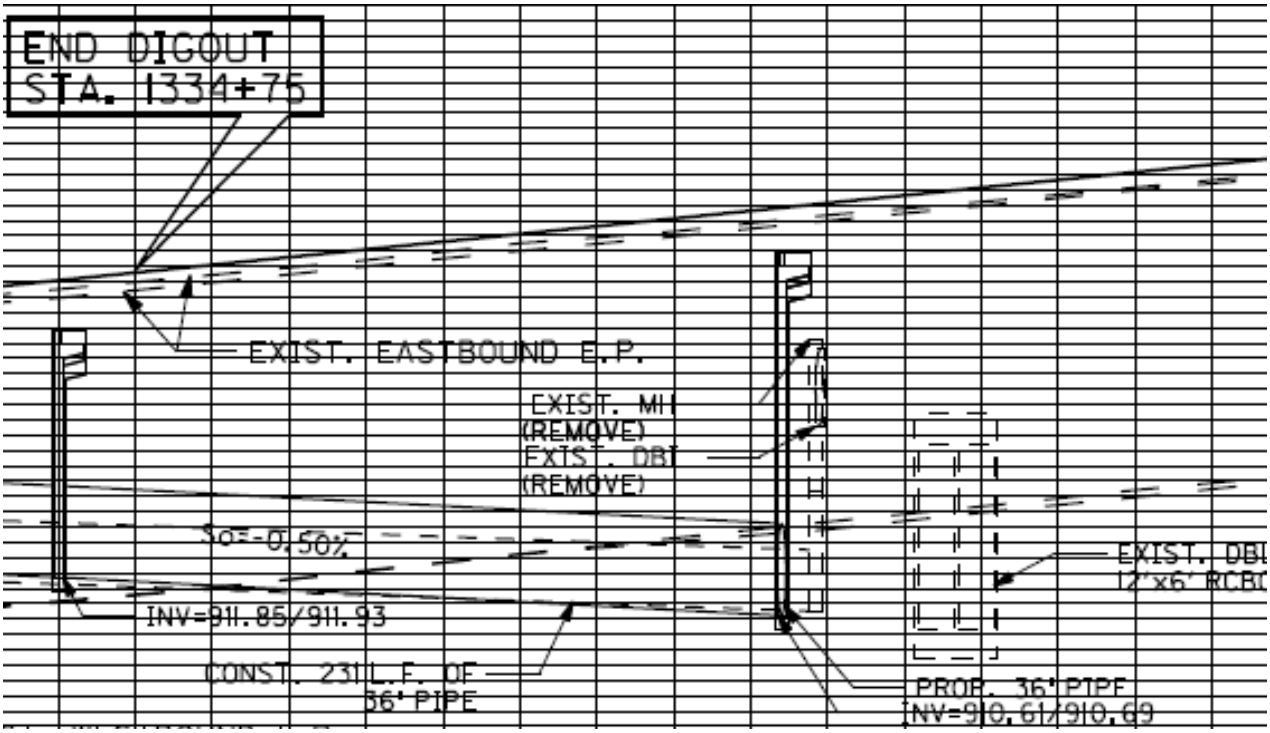
VII. DEVELOPMENT PHASE

A. CONSTRUCTABILITY

2. 36” Pipe at Station 1336+90

1. “As Proposed”

The outfall for the median drainage system between STA1326+00 and STA 1337+00 is located at STA 1336+90. It is 104 LF of 30” pipe that is perpendicular to the centerline and outfalls on the north side of the roadway. The end treatment is a cast in place concrete headwall.

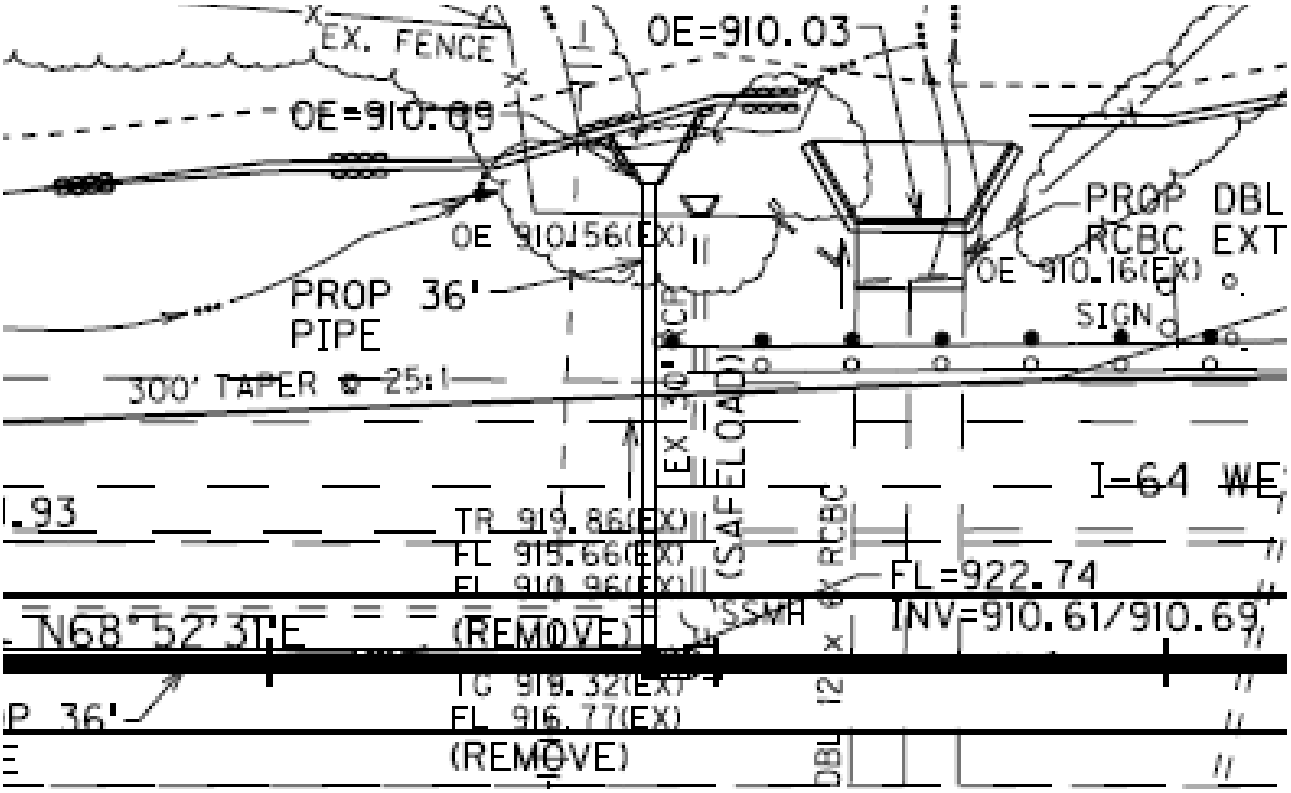


VII. DEVELOPMENT PHASE

A. CONSTRUCTABILITY

2. 36” Pipe at Station 1336+90

1. “As Proposed”



VII. DEVELOPMENT PHASE

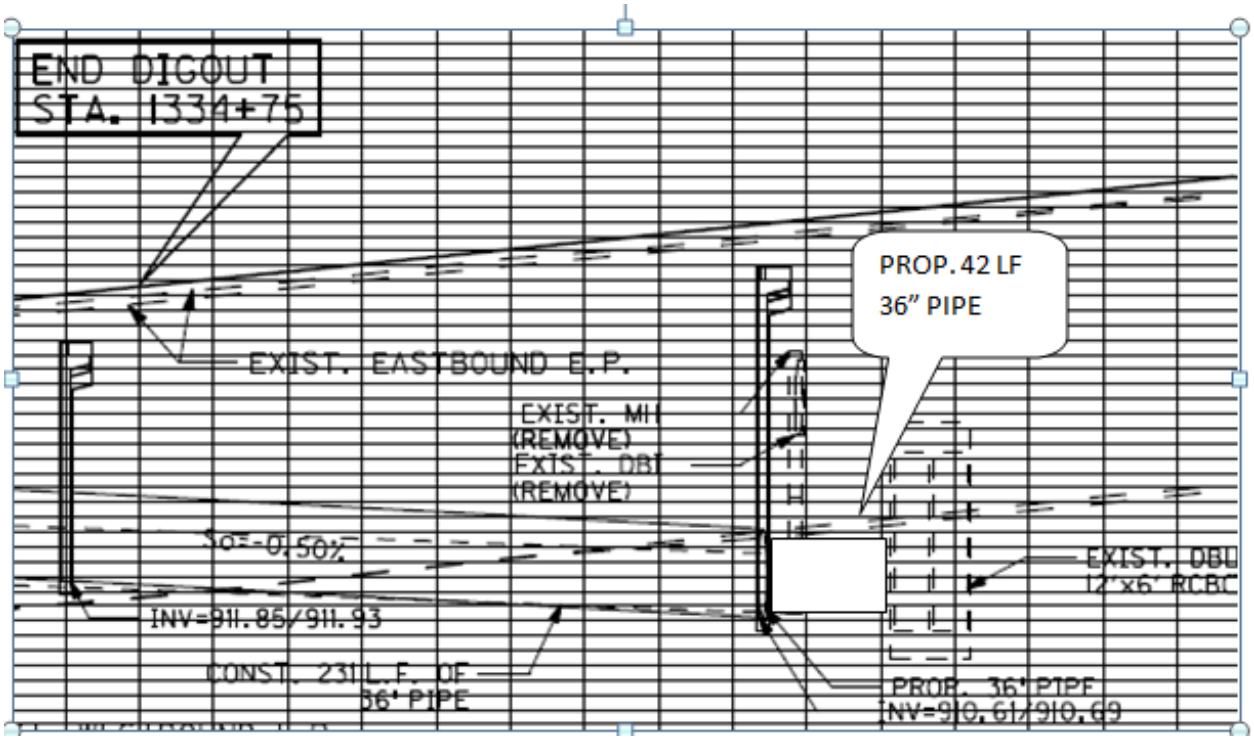
A. CONSTRUCTABILITY

2. 36” Pipe at Station 1336+90

2. Value Engineering Alternative

The Value Engineering Team recommends cutting into the double 12’ x 6’ RCBC and tie in the median drainage to the box culvert that is only +/- 42’ from the junction box.

The two major constructability aspects of this are: 1) all the construction can be done in the median and 2) the interstate would not have to be dug out for the pipe which would lessen the impact to motorist.

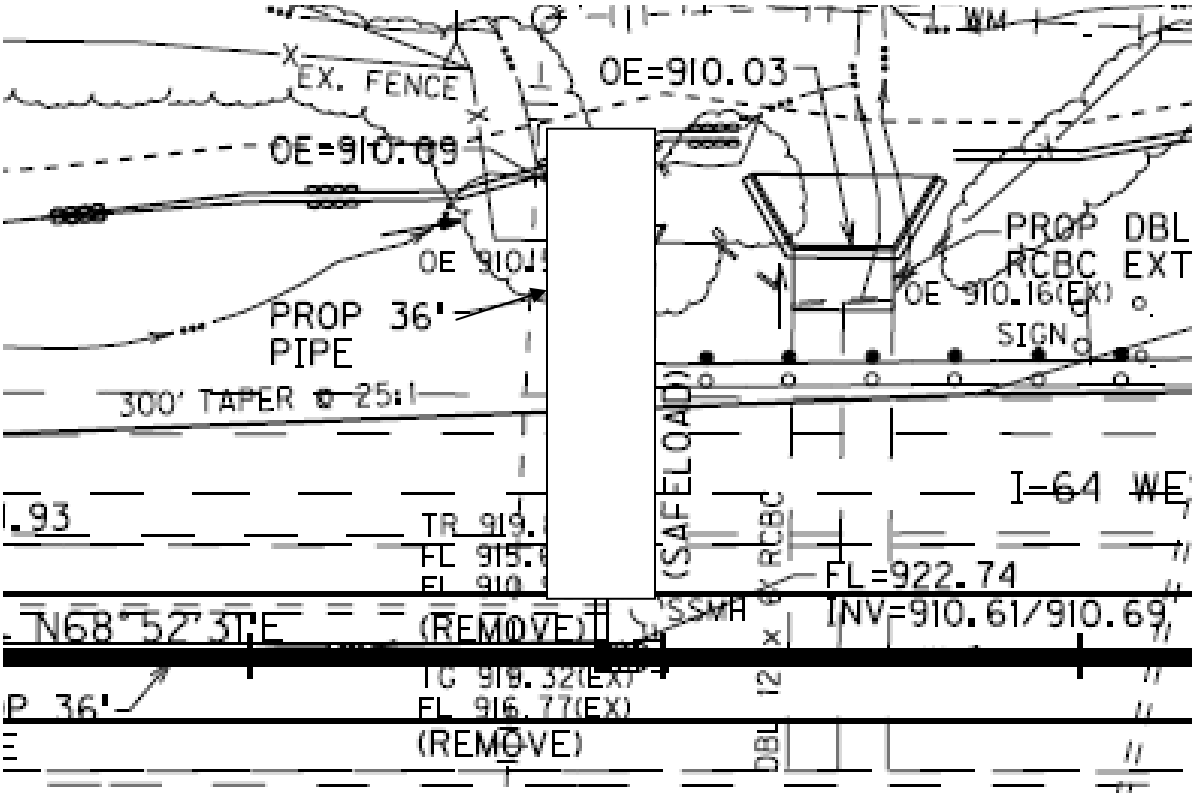


VII. DEVELOPMENT PHASE

A. CONSTRUCTABILITY

2. 36” Pipe at Station 1336+90

2. Value Engineering Alternative



CONSTRUCTIBILITY - 36" PIPE AT STA 1336+90
VALUE ENGINEERING ALTERNATIVE
COST COMPARISON SHEET

DESCRIPTION	UNITS	UNIT COST	PROP'D QTY.	PROP'D COST	V.E. QTY.	V.E. COST
36" PIPE	LF	$65.00	104.0	$6,760	43.0	$2,795
CLASS A CONCRETE	CY	$95.14	2.2	$205	0.0	$0
STEEL REINF.	LB	$1.56	182.0	$284	0.0	$0
SAWCUT BOX CULVERT	LS	$2,000.00	0.0	$0	1.0	$2,000
SUBTOTAL				**$7,248**		**$4,795**
MOBILIZATION (THIS IS SUB+CONTIN. X % =)		6.4%		$510		$338
TRAFFIC CONTROL/MOT		0.0%		$0		$0
UNKNOWNS		10.0%		$725		$480
GRAND TOTAL				**$8,484**		**$5,612**

POSSIBLE SAVINGS: $2,872

VII. DEVELOPMENT PHASE

A. CONSTRUCTABILITY

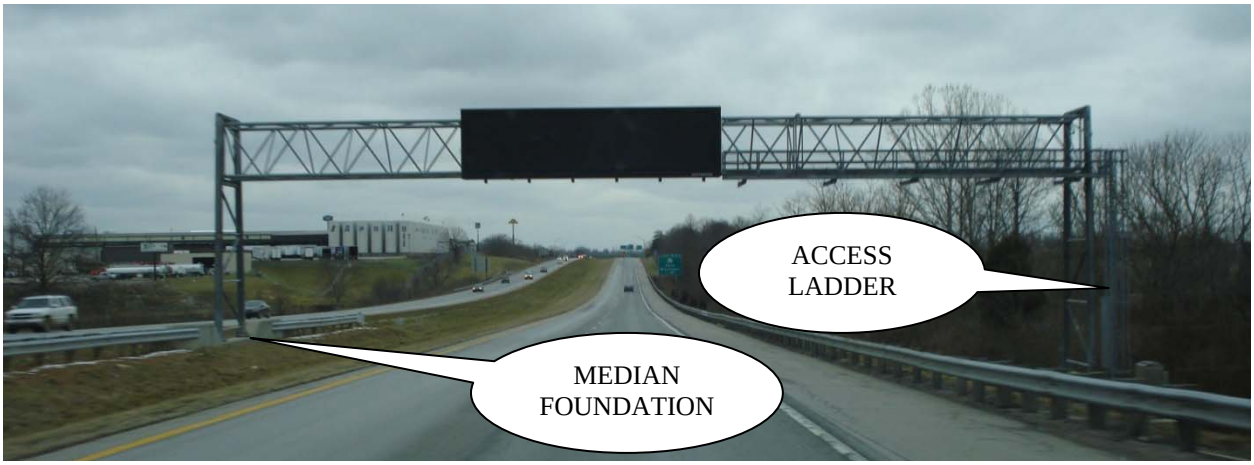
3. Overhead sign at Approximate Station 1400+00

1. "As Proposed"

The foundation for the westbound ITS sign at STA 1400+00 will require a special design to tie in with the proposed median barrier. The median vertical support foundation is too low and will create a gap in the barrier system.

The As Proposed design will place approximately 50' of Tall Wall Transition Barriers on both sides of the existing foundation, creating a sump that will collect trash and water. To reduce the trash collection, 16 ga. galvanized steel sheets are placed over the sump and weep holes through the new barrier provide drainage.

In addition to correcting the median foundation, it was pointed out to the Value Engineering Team the need to maintain access to the maintenance ladder during and after construction.



EXISTING ITS SIGN TRUSS SUPPORT

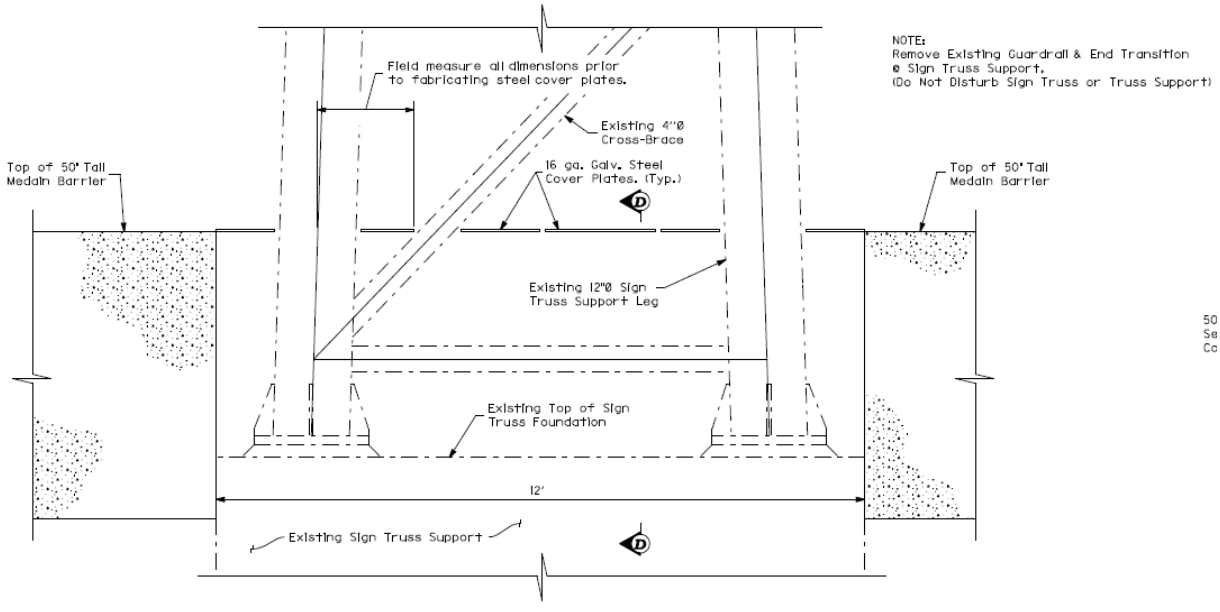
VII. DEVELOPMENT PHASE

A. CONSTRUCTABILITY

3. Overhead sign at Approximate Station 1400+00

1. "As Proposed"

GAP IN SIGN TRUSS SUPPORT



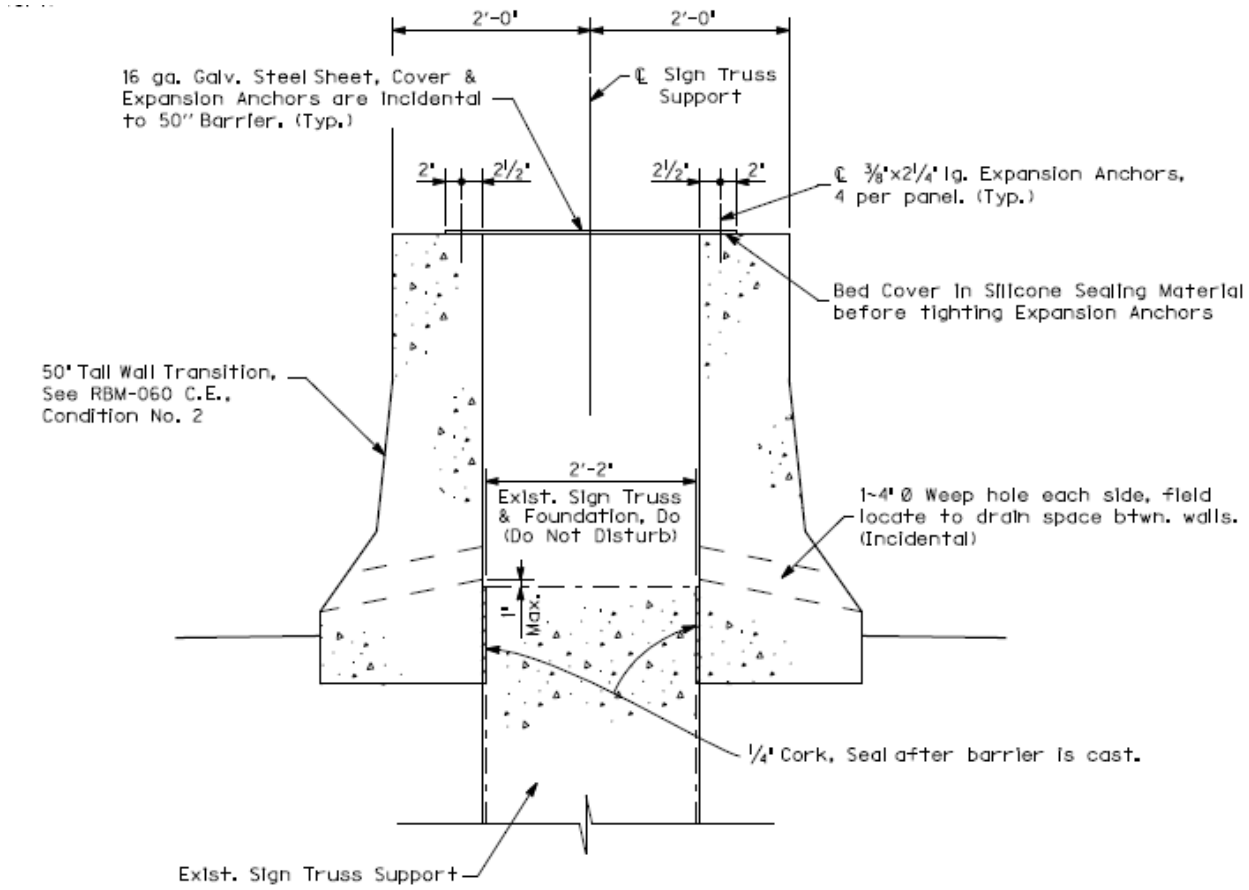
SECTION @ EXISTING SIGN TRUSS SUPPORT

VII. DEVELOPMENT PHASE

A. CONSTRUCTABILITY

3. Overhead sign at Approximate Station 1400+00

1. "As Proposed"



SECTION D-D

(See also RBM-060 C.E., Condition No. 2)

VII. DEVELOPMENT PHASE

A. CONSTRUCTABILITY

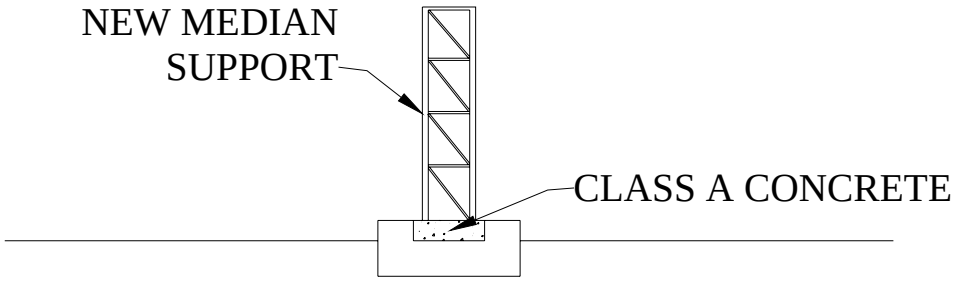
3. Overhead sign at Approximate Station 1400+00

2. Value Engineering Alternative

The Value Engineering Team recommends filling the gap between the Concrete Median Barriers type 12C (50) with concrete to eliminate the void and the possibility of collecting trash, dirt and moisture.

In order to accomplish this, the median support will be removed and replaced with a shorter support. Temporary support of the sign truss will be used to maintain operation of the ITS Sign.

This Value Engineering Alternative will eliminate the possibility of dirt, water or trash collecting in the void between the concrete barriers placed along the foundation.



VALUE ENGINEERING ALTERNATIVE
MODIFIED SIGN TRUSS FOUNDATION

There should also be a note in the plans to ensure access to the maintenance ladder during and after construction.

CONSTRUCTIBILITY - OVERHEAD ITS SIGN STA 1400+00
VALUE ENGINEERING ALTERNATIVE
COST COMPARISON SHEET

DESCRIPTION	UNITS	UNIT COST	PROP'D QTY.	PROP'D COST	V.E. QTY.	V.E. COST
REMOVE AND REPLACE MEDIAN SUPPORT STRUT	LS	$25,000.00	0.0	$0	1.0	$25,000
CONCRETE MEDIAN BARRIER TY 12C(50)	LF	$60.00	72.0	$4,320	72.0	$4,320
CLASS A CONCRETE	CY	$950.14	0.0	$0	2.3	$2,217
STEEL REINF.	LB	$1.56	0.0	$0	32.9	$51
SUBTOTAL				**$4,320**		**$31,588**
MOBILIZATION (THIS IS SUB+CONTIN. X % =)		6.4%		$304		$2,224
TRAFFIC CONTROL/MOT		0.0%		$0		$0
UNKNOWNS		10.0%		$432		$3,159
GRAND TOTAL				**$5,056**		**$36,971**

POSSIBLE ADDED COST: $31,915

VII. DEVELOPMENT PHASE

B. CONSTRUCTION SEQUENCING/STAGING

NO ISSUES WERE IDENTIFIED FOR THIS AREA OF FOCUS

VII. DEVELOPMENT PHASE

C. CONTRACTOR WORK HOURS

1. Lane Closures

1. "As Proposed"

Hours of Lane Closures

The hours of lane closures for Holidays are listed on page R72 of the Maintenance of Traffic plans.

VII. DEVELOPMENT PHASE

C. CONTRACTOR WORK HOURS

1. Lane Closures

2. Value Engineering Alternative

The Value Engineering Alternative would add the following to the list of events when lane closures would not be permitted.

1. NO LANE CLOSURES WILL BE PERMITTED FROM THE DAY BEFORE THE KENTUCKY DERBY THROUGH THE DAY AFTER THE KENTUCKY DERBY.

2. NO LANE CLOSURES WILL BE PERMITTED FROM THE DAY BEFORE THE WORLD EQUESTRIAN GAMES THROUGH THE DAY AFTER THE WORLD EQUESTRIAN GAMES.

VII. DEVELOPMENT PHASE

D. MAINTENANCE OF TRAFFIC

NO ISSUES WERE IDENTIFIED FOR THIS AREA OF FOCUS

VII. DEVELOPMENT PHASE

E. CONTRACT TIME

NO ISSUES WERE IDENTIFIED FOR THIS AREA OF FOCUS

VII. DEVELOPMENT PHASE

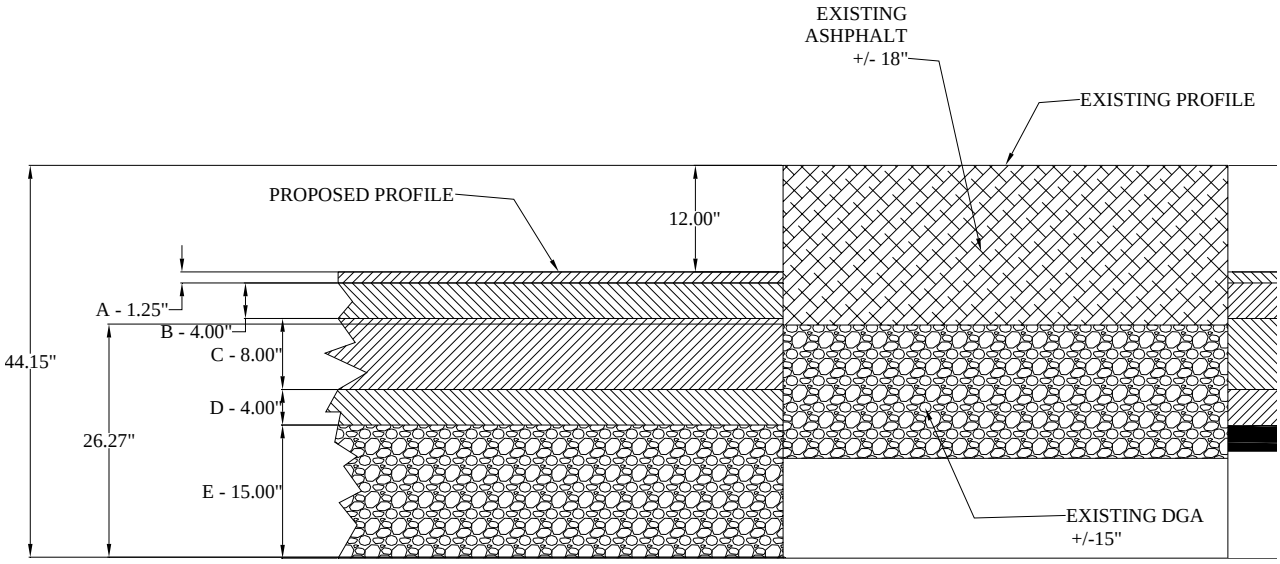
F. MATERIAL REQUIREMENTS/ISSUES

1. Pavement

1. "As Proposed"

The existing pavement will be removed and the sub-grade will be removed to provide the necessary vertical clearance under the two railroad overpasses.

The pavement will be replaced with the pavement section as shown below. This work begins at STA 1306+00 and ends at STA 1334+75.



AS PROPOSED PAVEMENT

EXISTING PAVEMENT

A - CL4 ASPH. SURF. 0.38A PG 76-22
B - CL4 ASPH. BASE 1.0D PG 76-22
C - CL4 ASPH. BASE 1.0D PG 64-22
D - DRAINAGE BLANKET
E - DGA BASE
F - ASPHALT BASE

VII. DEVELOPMENT PHASE

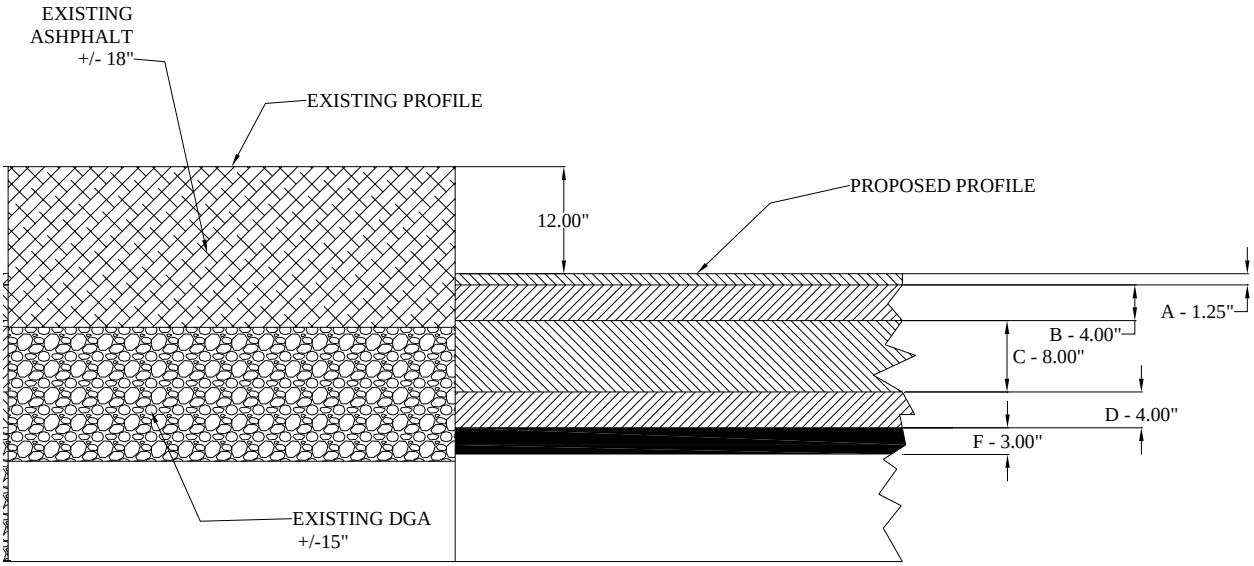
F. MATERIAL REQUIREMENTS/ISSUES

1. Pavement

2. Value Engineering Alternative

The Value Engineering Team recommends replacing the 15’ DGA with a 3” black base layer.

This alternative will reduce the amount of earthwork and will be quicker construction.



EXISTING PAVEMENT

VE ALTERNATIVE PAVEMENT

A - CL4 ASPH. SURF. 0.38A PG 76-22
B - CL4 ASPH. BASE 1.0D PG 76-22
C - CL4 ASPH. BASE 1.0D PG 64-22
D - DRAINAGE BLANKET
E - DGA BASE
F - ASPHALT BASE

MATERIALS - PAVEMENT
VALUE ENGINEERING ALTERNATIVE
COST COMPARISON SHEET

DESCRIPTION	UNITS	UNIT COST	PROP'D QTY.	PROP'D COST	V.E. QTY.	V.E. COST
DGA	TN	$14.74	29,708.3	$437,901	-	$0
ASPHALT BASE	TN	$50.00	-	$0	6,535.8	$326,792
ROADWAY EXCAVATION	CY	$5.67	11,713.0	$66,413	6,655.1	$37,734
SUBTOTAL				**$504,313**		**$364,526**
MOBILIZATION (THIS IS SUB+CONTIN. X % =)		6.4%		$35,504		$25,663
TRAFFIC CONTROL/MOT		0.0%		$0		$0
UNKNOWNS		10.0%		$50,431		$36,453
GRAND TOTAL				**$590,248**		**$426,641**

POSSIBLE SAVINGS: $163,607

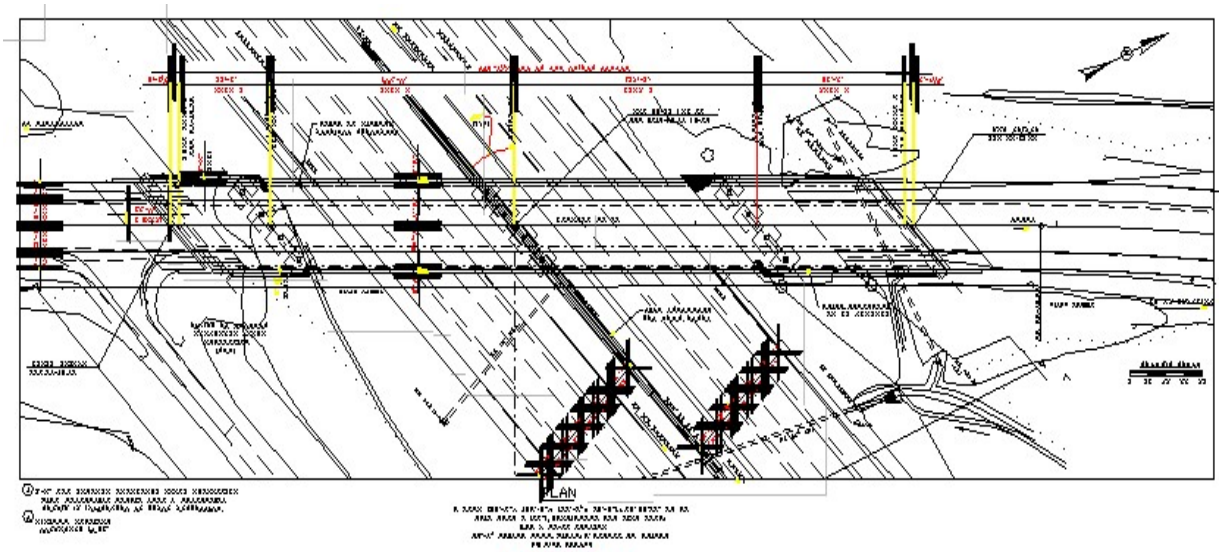
VII. DEVELOPMENT PHASE

F. MATERIAL REQUIREMENTS/ISSUES

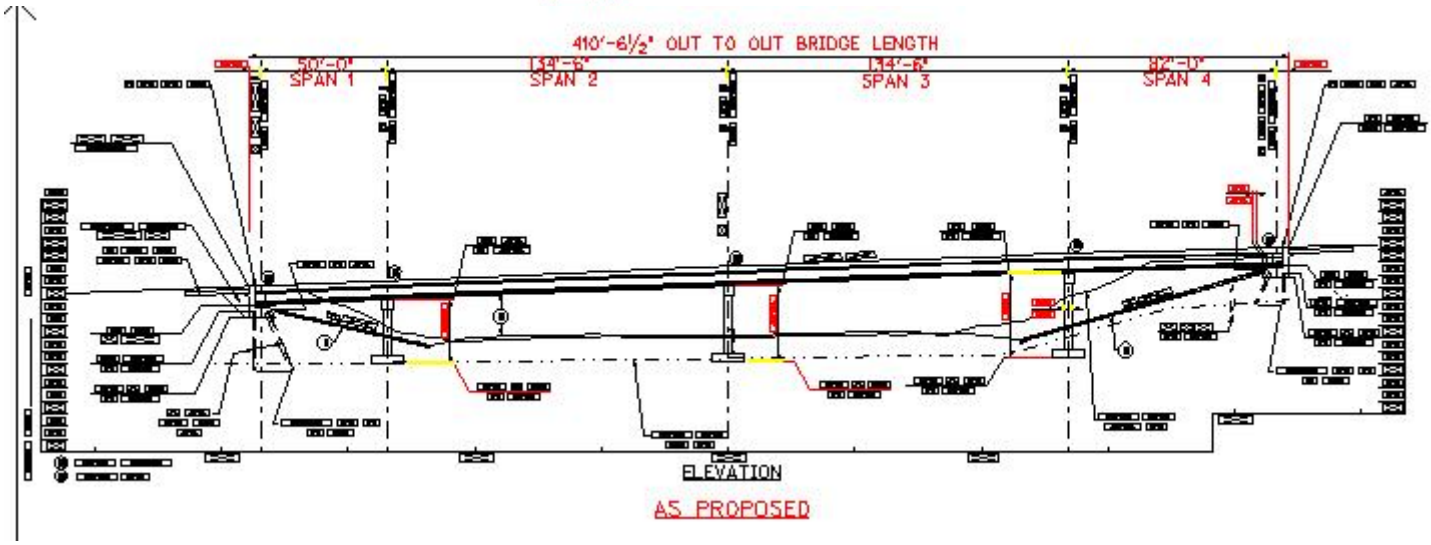
2. US 60 Bridge

1. "As Proposed"

The As Proposed structure is a four span (50'-0", 134'-6", 134'-6", 82'-0"), Type 6 (66" deep) Precast I-Beam (PCIB) bridge with piers on spread footings and pile end bents, 43'-0" out to out width, on a 45°Left skew.



AS PROPOSED
PLAN VIEW



AS PROPOSED

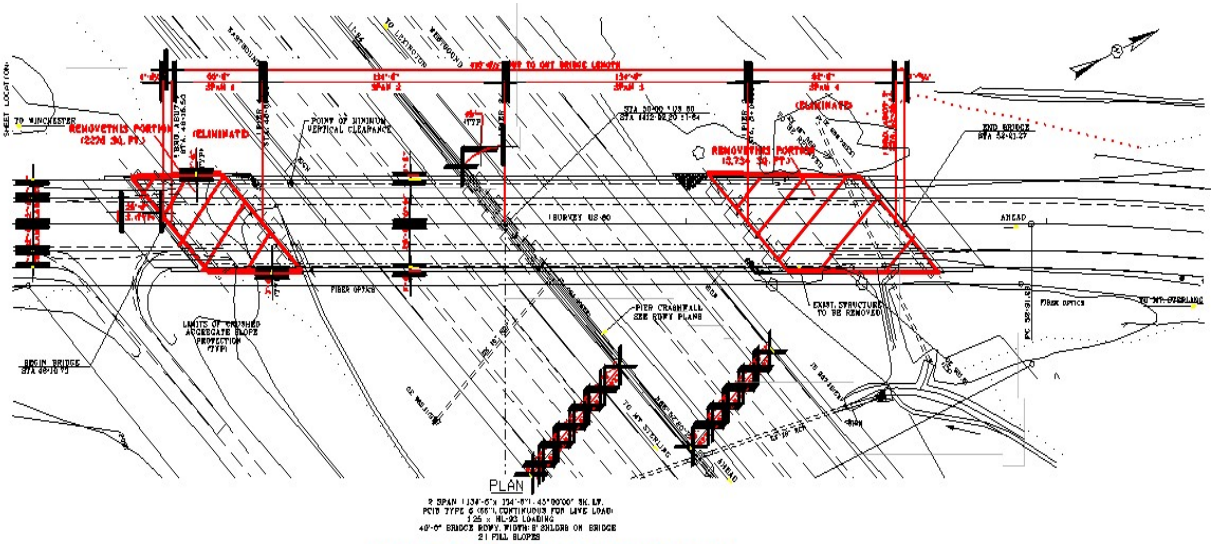
F. MATERIAL REQUIREMENTS/ISSUES

2. US 60 Bridge

2. Value Engineering Alternative

The value engineering alternative consists of eliminating the end spans, span 1 (50'-0") and span 4 (82'-0"). The alternative would use MSE walls with a vertical abutment that would follow the side slopes.

This would eliminate 132 LF of bridge and approximately 6,010 square feet of deck area.



F. MATERIAL REQUIREMENTS/ISSUES

2. US 60 Bridge

2. Value Engineering Alternative

MSE WALLS SIMILAR TO THESE WOULD BE USED AND FOLLOW THE SIDE SLOPES.

US 60 BRIDGE OVER I-64
VALUE ENGINEERING ALTERNATIVE
COST COMPARISON SHEET

DESCRIPTION	UNITS	UNIT COST	PROP'D QTY.	PROP'D COST	V.E. QTY.	V.E. COST
Eliminate 660 LF beams	LF	$325.82	660.0	$215,041	0.0	$0
Eliminate Crushed Agg. Slope	TON	$31.25	344.0	$10,750	0.0	$0
Eliminate "AA" Concrete	CY	$506.49	140.0	$70,909	0.0	$0
Additional Base & Pavement	LF	$220.00	114.0	$25,080	0.0	$0
Eliminate Pier #1	CY	$473.73	120.2	$56,942	0.0	$0
Eliminate Pier # 3	CY	$473.73	129.6	$61,395	0.0	$0
Vertical End Bents	SF	$45.00	0.0	$0	4,234.0	$190,530
SUBTOTAL				**$378,722**		**$190,530**
MOBILIZATION (THIS IS SUB+CONTIN. X % =)			6.4%	$26,662	6.4%	$13,413
CONTINGENCY			10.0%	$37,872	10.0%	$19,053
GRAND TOTAL				**$443,256**		**$222,996**

POSSIBLE SAVINGS: $220,260

VII. DEVELOPMENT PHASE

F. MATERIAL REQUIREMENTS/ISSUES

3. Median Lighting

1. "As Proposed"

The As Proposed consists of terminating the base plates for the median barrier lighting at Station 1575+00. The As Proposed provides lighting beyond the tapers for the ramps onto the Mountain Parkway.

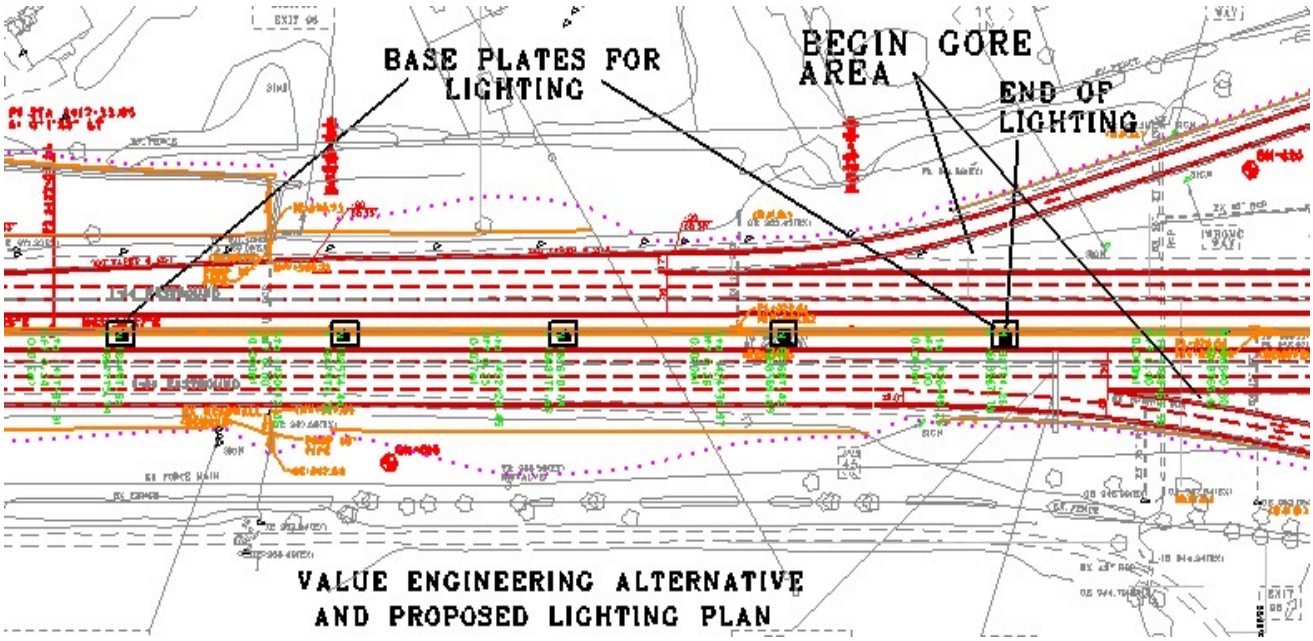
VII. DEVELOPMENT PHASE

F. MATERIAL REQUIREMENTS/ISSUES

3. Median Lighting

2. Value Engineering Alternative

The Value Engineering Alternative is in agreement with the As Proposed plans.



VII. DEVELOPMENT PHASE

G. UTILITY CONFLICTS

NO ISSUES WERE IDENTIFIED FOR THIS AREA OF FOCUS

VII. DEVELOPMENT PHASE

H. PERMIT REQUIREMENTS

NO ISSUES WERE IDENTIFIED FOR THIS AREA OF FOCUS

VII. DEVELOPMENT PHASE

I. TEMPORARY CONSTRUCTION

NO ISSUES WERE IDENTIFIED FOR THIS AREA OF FOCUS

VII. DEVELOPMENT PHASE

J. EQUIPMENT INGRESS/EGRESS/PLACEMENT

1. Contractor Access

1. "As Proposed"

The As Proposed consists of utilizing notes pertaining to the movement of construction equipment from certain staging areas.

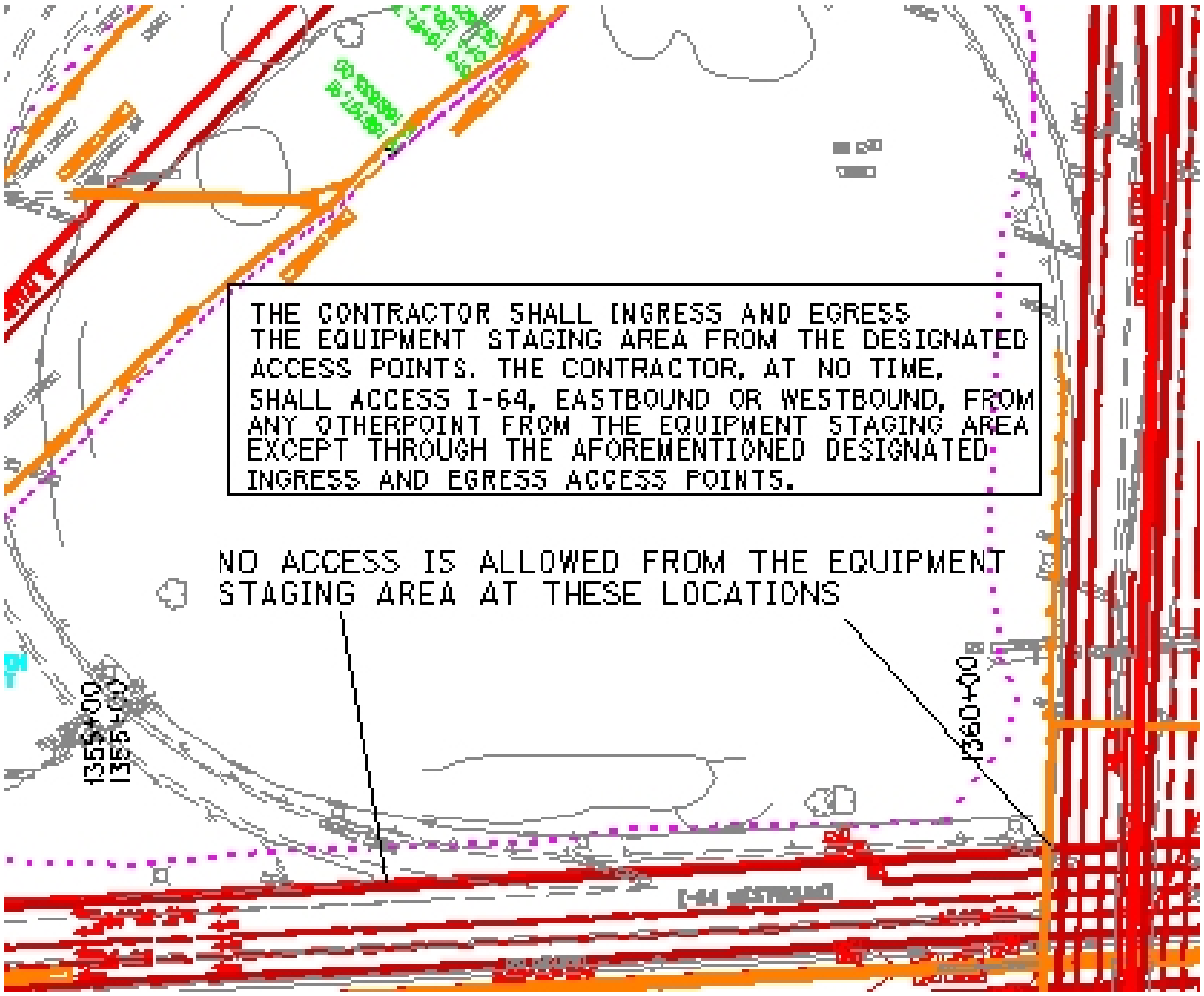
VII. DEVELOPMENT PHASE

J. EQUIPMENT INGRESS/EGRESS/PLACEMENT

1. Contractor Access

2. Value Engineering Suggestion

The Value Engineering Alternative consists of using a plan sheet in conjunction with notes to show equipment movement from the staging areas.



VIII. PRESENTATION ATTENDEE SHEET

I-64 MAJOR WIDENING VALUE ENGINEERING CONSTRUCTABILITY STUDY PRESENTATION January 26-29, 2010		
NAME	AFFILIATION	PHONE
Bill Ventry	VE GROUP, L.L.C.	850/627-3900
Robert Semones	VE GROUP, L.L.C.	850-627-3900
Siamak Shafaghi	KYTC, QAB	502/564-3280
Tom Hartley	VE GROUP. L.L.C.	850-627-3900
Andre Johannes	KYTC, Design	502/564-3280
Dan Hite	KYTC, Design	502/564-3280
Jerry Cottingham	EA Partners	859/221-6531
Boday Borres	KYTC, QAB	502/564-3280
Mary Murray	FHWA, PDT	502/223-6745

IX. APPENDIX

A. ITEMIZED PROJECT COST ESTIMATE

Estimate 7-33_VE

Estimated Cost:$24,076,329.66

Contingency: 10.00%

Estimated Total: $26,483,962.63

Base Date: 01/22/10

Spec Year: 08

Unit System: E

Work Type: GRADE & DRAIN WITH ASPHALT SURFACE

Highway Type: INTERSTATE

Urban/Rural Type: URBAN

Season: SPRING

County: CLARK

Midpoint of Latitude: 841011

Midpoint of Longitude: 0380047

District: 7

Federal/State Project Number: FD52 025 0064 095-098

Estimate Type: Value Engineering

Prepared by R. DARIN HENSLEY, P.E. on 01/22/10

IX. APPENDIX

A. ITEMIZED PROJECT COST ESTIMATE

Estimate: 7-33_VE

Line #	Item Number / Description / *Supplemental Description*	Quantity	Units	Unit Price	Extension
Group 0001: PAVING					
0005	00001 DGA BASE	184,162.000	TON	$14.74022	$2,714,588.40
0006	00018 DRAINAGE BLANKET-TYPE II-ASPH	43,355.000	TON	$33.71422	$1,461,680.01
0007	00100 ASPHALT SEAL AGGREGATE	339.200	TON	$61.82663	$20,971.59
0008	00190 LEVELING & WEDGING PG64-22	7,793.000	TON	$50.00000	$389,650.00
0010	00205 CL3 ASPH BASE 1.50D PG64-22	3,556.000	TON	$50.00000	$177,800.00
0012	00214 CL3 ASPH BASE 1.00D PG64-22	65,821.000	TON	$50.00000	$3,291,050.00
0013	00217 CL4 ASPH BASE 1.00D PG64-22	43,606.000	TON	$50.00000	$2,180,300.00
0014	00219 CL4 ASPH BASE 1.00D PG76-22	33,871.000	TON	$50.00000	$1,693,550.00
0015	00291 EMULSIFIED ASPHALT RS-2	40.800	TON	$549.91615	$22,436.58
0020	00339 CL3 ASPH SURF 0.38D PG64-22	8,351.000	TON	$65.00000	$542,815.00
0021	00342 CL4 ASPH SURF 0.38A PG76-22	10,958.000	TON	$65.00000	$712,270.00
0022	00358 ASPHALT CURING SEAL	156.500	TON	$444.54308	$69,570.99
0024	02677 ASPHALT PAVE MILLING & TEXTURING	1,766.000	TON	$21.04862	$37,171.86
0025	02676 MOBILIZATION FOR MILL & TEXT	1.000	LS	$20,000.00000	$20,000.00
0026	02702 SAND FOR BLOTTER	489.500	TON	$19.96730	$9,773.99
0027	20430ED SAW CUT	33,764.000	LF	$2.65000	$89,474.60
0185	00391 CL4 ASPH SURF 0.38D PG64-22	6,311.000	TON	$65.00000	$410,215.00
				Total for Group 0001:	$13,843,318.02
Group 0002: ROADWAY					
0028	01015 INSPECT & CERTIFY EDGE DRAIN SYSTEM	1.000	LS	$10,000.00000	$10,000.00
0029	01691 FLUME INLET TYPE 2	5.000	EACH	$4,400.00000	$22,000.00
0031	01984 DELINEATOR FOR BARRIER-WHITE	64.000	EACH	$8.77509	$561.61
0032	01985 DELINEATOR FOR BARRIER-YELLOW	172.000	EACH	$7.76521	$1,335.62
0033	01988 CONC MEDIAN BARRIER TYPE 14C1	1,224.000	LF	$150.00000	$183,600.00
0035	02003 RELOCATE TEMP CONC BARRIER	11,540.000	LF	$3.42670	$39,544.12
0036	02014 BARRICADE-TYPE III	11.000	EACH	$191.43550	$2,105.79
0037	02081 JPC PAVEMENT-8 IN SHLD	181.000	SQYD	$30.00000	$5,430.00
0038	02091 REMOVE PAVEMENT	636.000	SQYD	$6.11785	$3,890.95

IX. APPENDIX

A. ITEMIZED PROJECT COST ESTIMATE

Estimate: 7-33_VE

Line #	Item Number	Description / *Supplemental Description*	Quantity	Units	Unit Price	Extension
0041	02200	ROADWAY EXCAVATION	278,430.000	CUYD	$5.66545	$1,577,431.24
0042	02242	WATER	4,082.000	MGAL	$0.11835	$483.10
0043	02262	FENCE-WOVEN WIRE TYPE 1	870.000	LF	$7.33011	$6,377.20
0044	02268	REMOVE & REPLACE FENCE	21,995.000	LF	$10.00000	$219,950.00
0045	02350	ADJUST GUARDRAIL	631.000	LF	$10.00000	$6,310.00
0046	02351	GUARDRAIL-STEEL W BEAM-S FACE	12,943.500	LF	$15.17531	$196,421.62
0047	02360	GUARDRAIL TERMINAL SECTION NO 1	3.000	EACH	$53.43713	$160.31
0048	02363	GUARDRAIL CONNECTOR TO BRIDGE END TY A	13.000	EACH	$2,231.26695	$29,006.47
0049	02367	GUARDRAIL END TREATMENT TYPE 1	1.000	EACH	$2,522.92023	$2,522.92
0050	02369	GUARDRAIL END TREATMENT TYPE 2A	10.000	EACH	$656.01756	$6,560.18
0051	02373	GUARDRAIL END TREATMENT TYPE 3	3.000	EACH	$720.62204	$2,161.87
0052	02381	REMOVE GUARDRAIL	13,649.500	LF	$1.50887	$20,595.32
0053	02387	GUARDRAIL CONNECTOR TO BRIDGE END TY A-1	2.000	EACH	$361.97106	$723.94
0054	02391	GUARDRAIL END TREATMENT TYPE 4A	15.000	EACH	$2,167.15614	$32,507.34
0055	02397	TEMP GUARDRAIL	750.000	LF	$9.79204	$7,344.03
0056	02429	RIGHT-OF-WAY MONUMENT TYPE 1	5.000	EACH	$121.63718	$608.19
0057	02432	WITNESS POST	5.000	EACH	$55.55503	$277.78
0058	02483	CHANNEL LINING CLASS II	1,689.000	TON	$25.39253	$42,887.98
0059	02484	CHANNEL LINING CLASS III	2,023.000	TON	$26.00960	$52,617.42
0060	02545	CLEARING AND GRUBBING	1.000	LS	$95,000.00000	$95,000.00
0061	02562	SIGNS	1,085.500	SQFT	$7.18685	$7,801.33
0062	02585	EDGE KEY	200.000	LF	$26.91617	$5,383.23
0063	02600	FABRIC GEOTEXTILE TY IV FOR PIPE	18,401.000	SQYD	$2.00741	$36,938.35
0064	02650	MAINTAIN & CONTROL TRAFFIC	1.000	LS	$150,000.00000	$150,000.00
0065	02690	SAFELOADING	16.000	CUYD	$214.60376	$3,433.66
0066	02720	SIDEWALK-4 IN CONCRETE	905.000	SQYD	$37.90333	$34,302.51
0071	02696	SHOULDER RUMBLE STRIPS-SAWED	34,274.000	LF	$0.43000	$14,737.82
0076	02726	STAKING *$10000 per mile*	1.000	LS	$55,000.00000	$55,000.00
0077	02731		1.000	LS	$300,000.00000	$300,000.00

1:33:52PM
Friday, January 22, 2010

Page 3 of 7

IX. APPENDIX

A. ITEMIZED PROJECT COST ESTIMATE

Estimate: 7-33_VE

Line #	Item Number / Description / *Supplemental Description*	Quantity	Units	Unit Price	Extension
	REMOVE STRUCTURE				
0078	02775 ARROW PANEL	4.000	EACH	$884.63457	$3,538.54
0079	02894 CRASH CUSHION TYPE VI-T	10.000	EACH	$5,969.01051	$59,690.11
0080	02898 RELOCATE CRASH CUSHION	12.000	EACH	$1,792.93149	$21,515.18
0081	02929 CRASH CUSHION TYPE IX	1.000	EACH	$5,534.52022	$5,534.52
0082	03171 CONCRETE BARRIER WALL TYPE 9T	40,374.000	LF	$29.18316	$1,178,240.90
0083	05950 EROSION CONTROL BLANKET	24,209.000	SQYD	$1.10106	$26,655.56
0086	05966 TOPDRESSING FERTILIZER	40.000	TON	$555.91567	$22,236.63
0087	05985 SEEDING AND PROTECTION	767,479.000	SQYD	$0.27681	$212,445.86
0088	05989 SPECIAL SEEDING CROWN VETCH	32,230.000	SQYD	$0.20123	$6,485.64
0089	06417 FLEXIBLE DELINEATOR POST-W	199.000	EACH	$30.01405	$5,972.80
0090	06418 FLEXIBLE DELINEATOR POST-Y	73.000	EACH	$27.25853	$1,989.87
0091	06510 PAVE STRIPING-TEMP PAINT-4 IN	115,500.000	LF	$0.14912	$17,223.36
0092	06511 PAVE STRIPING-TEMP PAINT-6 IN	84,546.000	LF	$0.19209	$16,240.44
0093	06513 PAVE STRIPING-TEMP PAINT-12 IN	96.000	LF	$0.20000	$19.20
0094	06514 PAVE STRIPING-PERM PAINT-4 IN	26,557.000	LF	$0.23775	$6,313.93
0098	06568 PAVE MARKING-THERMO STOP BAR-24IN	210.000	LF	$9.07089	$1,904.89
0099	06574 PAVE MARKING-THERMO CURV ARROW	25.000	EACH	$92.26166	$2,306.54
0100	06583 PAVEMENT MARKER TYPE IV-B W/R	1,077.000	EACH	$24.00000	$25,848.00
0101	06584 PAVEMENT MARKER TYPE IV-B Y/R	170.000	EACH	$24.00000	$4,080.00
0102	06589 PAVEMENT MARKER TYPE V-MW	157.000	EACH	$24.82204	$3,897.06
0103	06591 PAVEMENT MARKER TYPE V-BY	31.000	EACH	$34.58108	$1,072.01
0104	06600 REMOVE PAVEMENT MARKER TYPE V	612.000	EACH	$7.08830	$4,338.04
0105	08100 CONCRETE-CLASS A	9.160	CUYD	$950.13907	$8,703.27
0106	08150 STEEL REINFORCEMENT	568.000	LB	$1.55990	$886.02
0107	21117ND VARIABLE MESSAGE SIGN-DYNAMIC	6.000	EACH	$6,000.00000	$36,000.00
0108	23044ES508 CONCRETE MEDIAN BARRIER TY 14C(50)	13,634.000	LF	$60.00000	$818,040.00
0109	21661ES706 BORE AND JACK PIPE *36" Storm Sewer*	40.000	LF	$400.00000	$16,000.00
0110	23131ER701 PIPELINE VIDEO INSPECTION	2,444.000	LF	$4.77352	$11,666.48

1:33:52PM
Friday, January 22, 2010 Page 4 of 7

IX. APPENDIX

A. ITEMIZED PROJECT COST ESTIMATE

Estimate: 7-33_VE

Line #	Item Number Description *Supplemental Description*	Quantity	Units	Unit Price	Extension
0111	23086EN CONCRETE MEDIAN BARRIER TY 9C *9C2-50 at Bridge Piers*	1,032.000	LF	$150.00000	$154,800.00
0112	01891 ISLAND HEADER CURB TYPE 2	150.000	LF	$35.67932	$5,351.90
0141	00078 CRUSHED AGGREGATE SIZE NO 2	73.000	TON	$46.85434	$3,420.37
0142	01000 PERFORATED PIPE-4 IN	22,267.000	LF	$6.50880	$144,931.45
0143	01001 PERFORATED PIPE-6 IN	22,234.000	LF	$5.00950	$111,381.22
0144	01010 NON-PERFORATED PIPE-4 IN	2,257.000	LF	$10.52512	$23,755.20
0145	01011 NON-PERFORATED PIPE-6 IN	166.000	LF	$13.00000	$2,158.00
0146	01020 PERF PIPE HEADWALL TY 1-4 IN	9.000	EACH	$400.13077	$3,601.18
0147	01021 PERF PIPE HEADWALL TY 1-6 IN	1.000	EACH	$300.00000	$300.00
0148	01028 PERF PIPE HEADWALL TY 3-4 IN	46.000	EACH	$473.16607	$21,765.64
0149	01029 PERF PIPE HEADWALL TY 3-6 IN	3.000	EACH	$470.00000	$1,410.00
0150	01032 PERF PIPE HEADWALL TY 4-4 IN	12.000	EACH	$471.77146	$5,661.26
0151	01033 PERF PIPE HEADWALL TY 4-6 IN	1.000	EACH	$470.00000	$470.00
0156	01024 PERF PIPE HEADWALL TY 2-4 IN	1.000	EACH	$548.08633	$548.09
0163	02651 DIVERSIONS (BY-PASS DETOURS)	1.000	LS	$56,000.00000	$56,000.00
0164	02223 GRANULAR EMBANKMENT	23,265.000	CUYD	$20.60939	$479,477.46
0165	02399 EXTRA LENGTH GUARDRAIL POST	358.000	EACH	$42.99215	$15,391.19
0166	02570 PROJECT CPM SCHEDULE	1.000	LS	$10,000.00000	$10,000.00
0167	02599 FABRIC-GEOTEXTILE TYPE IV	137,750.000	SQYD	$1.44544	$199,109.36
0168	06549 PAVE STRIPING-TEMP REM TAPE-B	800.000	LF	$2.23733	$1,789.86
0169	06550 PAVE STRIPING-TEMP REM TAPE-W	800.000	LF	$1.42521	$1,140.17
0170	06551 PAVE STRIPING-TEMP REM TAPE-Y	800.000	LF	$1.37547	$1,100.38
0171	06569 PAVE MARKING-THERMO CROSS-HATCH *WHITE*	880.000	SQFT	$2.55930	$2,252.18
0172	06569 PAVE MARKING-THERMO CROSS-HATCH *YELLOW*	5,800.000	SQFT	$2.55930	$14,843.94
0173	20100ES842 PAVE MARK TEMP PAINT LINE ARROW	12.000	EACH	$100.00000	$1,200.00
0174	22854EN PAVE STRIPE PERM-6 IN HD21-WHITE	62,819.000	LF	$0.20000	$12,563.80
0175	22855EN PAVE STRIPE PERM-6 IN HD21-YELLOW	41,269.000	LF	$0.20000	$8,253.80
0176	22856EN	3,247.000	LF	$0.20000	$649.40

IX. APPENDIX

A. ITEMIZED PROJECT COST ESTIMATE

Estimate: 7-33_VE

Line #	Item Number / Description / *Supplemental Description*	Quantity	Units	Unit Price	Extension
	PAVE STRIPE PERM-12 IN HD21-WHITE				
0177	23143ED KPDES PERMIT AND TEMP EROSION CONTROL	1.000	LS	$223,965.85720	$223,965.86
0179	20394ES835 PVC CONDUIT-3 IN- IN MEDIAN BARRIER WALL	16,785.000	LF	$10.00000	$167,850.00
0180	10020NS FUEL ADJUSTMENT	1.000	DOLL	$358,261.00000	$358,261.00
0181	10030NS ASPHALT ADJUSTMENT	1.000	DOLL	$434,288.00000	$434,288.00
0182	01845 ISLAND INTEGRAL CURB	96.750	LF	$35.00000	$3,386.25
0183	21430ES508 CONC MEDIAN BARRIER TY 12C(50)	12.000	LF	$60.00000	$720.00
0184	02265 REMOVE FENCE	852.000	LF	$1.00000	$852.00
				Total for Group 0002:	$8,167,505.71

Group 0003: DRAINAGE

0115	00461 CULVERT PIPE-15 IN	28.000	LF	$47.59985	$1,332.80
0116	00462 CULVERT PIPE-18 IN	99.000	LF	$54.69765	$5,415.07
0117	00462 CULVERT PIPE-18 IN	98.000	LF	$54.69765	$5,360.37
0118	00464 CULVERT PIPE-24 IN	118.000	LF	$67.98021	$8,021.66
0119	00469 CULVERT PIPE-42 IN	14.000	LF	$157.72631	$2,208.17
0120	00522 STORM SEWER PIPE-18 IN	986.000	LF	$58.02799	$57,215.60
0121	00552 STORM SEWER PIPE-18 IN EQUIV	78.000	LF	$57.00000	$4,446.00
0122	00524 STORM SEWER PIPE-24 IN	1,697.000	LF	$74.19961	$125,916.74
0123	00556 STORM SEWER PIPE-30 IN EQUIV	824.000	LF	$65.00000	$53,560.00
0124	00558 STORM SEWER PIPE-36 IN EQUIV	911.000	LF	$65.00000	$59,215.00
0125	00440 ENTRANCE PIPE-15 IN	28.000	LF	$32.11214	$899.14
0126	4.000 *CONC MED BARR BOX INLET 14 A1*	4.000		$5,000.00000	$20,000.00
0127	01614 CONC MED BARR BOX INLET TY 14A2	1.000	EACH	$5,000.00000	$5,000.00
0128	01616 CONC MED BARR BOX INLET TY 14B1	8.000	EACH	$5,000.00000	$40,000.00
0129	01615 CONC MED BARR BOX INLET TY 14B2	23.000	EACH	$5,000.00000	$115,000.00
0130	01650 JUNCTION BOX	10.000	EACH	$2,000.00000	$20,000.00
0131	01490 DROP BOX INLET TYPE 1	2.000	EACH	$2,880.84125	$5,761.68
0132	01490 DROP BOX INLET TYPE 1 *NO APRON*	13.000	EACH	$2,880.84125	$37,450.94
0133	01517 DROP BOX INLET TYPE 5F	1.000	EACH	$2,800.00000	$2,800.00

IX. APPENDIX

A. ITEMIZED PROJECT COST ESTIMATE

Estimate: 7-33_VE

Line #	Item Number / Description / *Supplemental Description*	Quantity	Units	Unit Price	Extension
0134	01559 DROP BOX INLET TYPE 13G	1.000	EACH	$2,800.00000	$2,800.00
0135	01440 SLOPED BOX INLET-OUTLET TYPE 1 *15 INCH*	2.000	EACH	$2,000.00000	$4,000.00
0136	01440 SLOPED BOX INLET-OUTLET TYPE 1 *18 INCH*	1.000	EACH	$2,000.00000	$2,000.00
0137	01450 S & F BOX INLET-OUTLET-18 IN	4.000	EACH	$2,059.77866	$8,239.11
0138	01451 S & F BOX INLET-OUTLET-24 IN	4.000	EACH	$2,771.39265	$11,085.57
0139	01767 MANHOLE TYPE C	2.000	EACH	$3,000.00000	$6,000.00
0140	01791 ADJUST MANHOLE FRAME TO GRADE	3.000	EACH	$2,000.00000	$6,000.00

Total for Group 0003:$609,727.85

Group 0019: DEMOBILIZATION &/OR MOBILIZATION

0113	02568 MOBILIZATION	1.000	LS	$1,119,829.28600	$1,119,829.29
0114	02569 DEMOBILIZATION	1.000	LS	$335,948.78580	$335,948.79

Total for Group 0019:$1,455,778.08

IX. APPENDIX

B. POWER POINT PRESENTATION