VALUE ENGINEERING/CONSTRUCTABILITY STUDY
OF
I-264 PAVEMENT AND BRIDGE
DECK REHABILITATION

JEFFERSON COUNTY, KENTUCKY

September 9-13

Prepared by:
Ventry Engineering, L.L.C.

In Association With:

Kentucky Transportation Cabinet

VALUE ENGINEERING STUDY
PROJECT MANAGER

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VALUE ENGINEERING STUDY
TEAM LEADER

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Date: 10/4/02

TABLE OF CONTENTS

I. EXECUTIVE SUMMARY

INTRODUCTION

This Value Engineering report summarizes the results of the Value Engineering study performed by Ventry Engineering for the Kentucky Transportation Cabinet. The study was performed during the week of September 9-13, 2002.

The subject of the study was the I-264 Pavement and Bridge Deck Rehabilitation in Louisville, KY. The project length is approximately 8 miles.

PROJECT DESCRIPTION

This project consist of two design contracts to develop plans to rehabilitate the pavement and bridge decks of I-264 from east of the Dixie Highway Interchange (I-264/US 31W) to north of Mohammed Ali Blvd., a distance of approximately 8 miles. Design Section A from east of the Dixie Highway Interchange to Crums Lane will reconstruct the mainline pavement with a 13" PCC pavement within the interchange and will overlay the remaining 1.03 mile of pavement continuing to the west and north with a 9" PCC pavement and a 1" bond breaker. The 12 bridges within the interchange itself will be overlaid with a 1" Latex overlay while the 3 twin mainline structures will be overlaid with a 10" concrete slab. Design Section B from Crums Lane to north of Muhammed Ali Blvd. is approximately 5.6 miles long. The mainline pavement will be overlaid with a 9" PCC pavement and a 1" bond breaker. Five of the 21 twin structures along the mainline will be overlaid with a 10" concrete slab. The superstructures on the remaining 16 twin structures will be reconstructed from the bearing pads to the deck. In the area where only 4 lanes currently exist two additional lanes will be added in the median by constructing a 13" PCC pavement.

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
4. Development
5. Presentation
6. Report Preparation

Evaluation criteria identified as a basis for the comparison of alternatives included the following:

- Time required for construction
- Impacts to motorist
- Initial cost
- Life Cycle Cost
- Constructability

RESULTS

The following areas of focus were analyzed by the Value Engineering team and from these areas the following Value Engineering alternatives were developed and are recommended for Implementation:

A. TRAFFIC AND CONSTRUCTION PHASING

Recommendation Number 1 – Value Engineering Alternative Number 1 - move traffic to outside.
(May be submitted as a VECP by the contractor after award of the project)

Recommendation Number 2 – Value Engineering Alternative Number 2 – Allow phased construction of bridges.

B. PAVEMENT DESIGN

Recommendation Number 3 – Value Engineering Alternative Number 1 –Only excavate outside shoulder 8.5 feet in lieu of 10'.

Savings $200,000

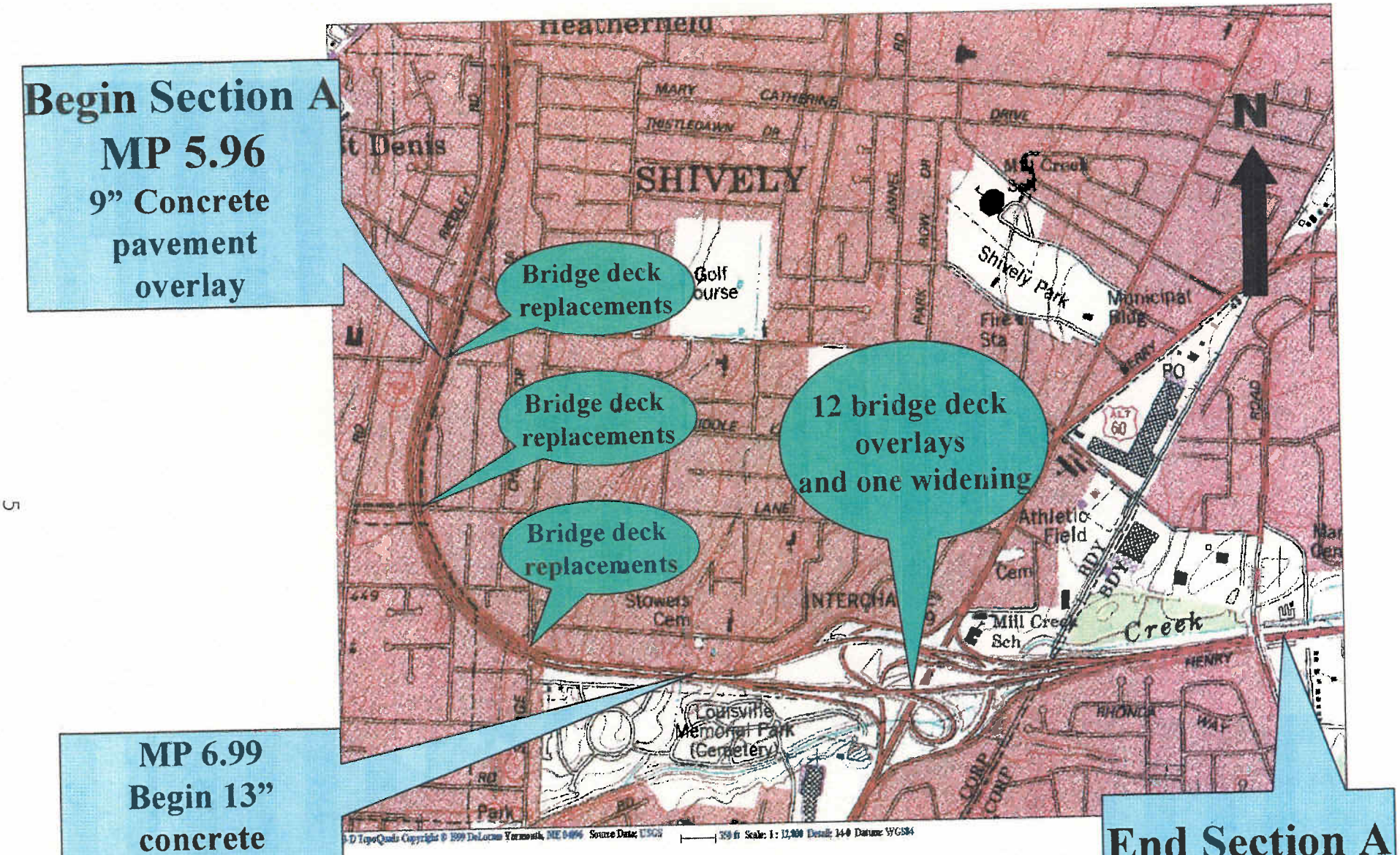
Recommendation Number 4 – Value Engineering Alternative Number 2 – Relocate the edge drains to be adjacent to the travel lane.

Recommendation Number 5 –Value Engineering Alternative Number 3 – Only mill and replace ramp shoulders with asphalt pavement within the Dixie Highway Interchange adjacent to the sections where the existing ramp pavement is to be retained.

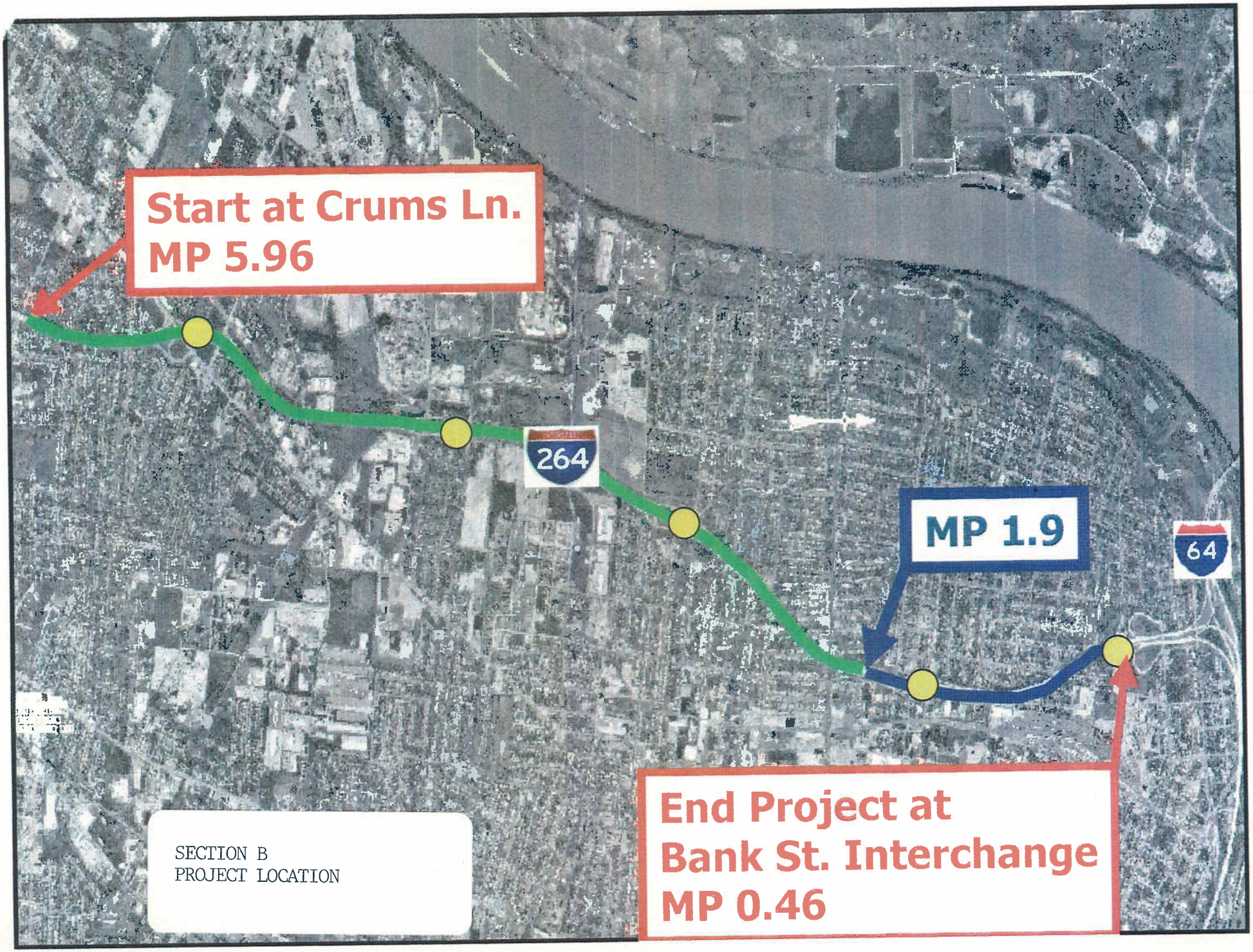
Recommendation Number 6 – Value Engineering Alternative – Only remove the bridge rails and barrier down to the existing deck evaluation.

Savings $1,200,000

II. LOCATION OF PROJECT



Project Location - Section A


Start at Crums Ln.
MP 5.96
264
MP 1.9
64
End Project at
Bank St. Interchange
MP 0.46
SECTION B
PROJECT LOCATION

III. TEAM MEMBERS AND PROJECT DESCRIPTION

TEAM MEMBERS

NAME	AFFILIATION	EXPERTISE	PHONE
William F. Ventry, P.E., C.V.S.	Ventry Engineering	V.E. Study Project Manager	850/627-3900
Jack Trickey	Ventry Engineering	V.E. Study Team Leader	850/627-3900
Nasby Stroop	KYTC, C.O. Construction	Construction	502/564-4780
T. C. Chambers	KYTC, D2 Construction	Construction	270/824-7080
Gilbert Newman	Balke Engineers	Construction Management	859/271-7545
Steven Criswell	KYTC, C. O. Construction	Construction	502/564-4780
Dudley Brown	FHWA Division	Project Management	502/223-6749
Phil Carter	KYTC, D3 Construction	Construction	270/746-7898
James Ballinger	KYTC, D7 Pre-construction	Project Management	859/246-2355

PROJECT DESCRIPTION

Length	8.0 miles (+/-)
Construction cost	$60,000,000
Design speed	70 MPH
Projected letting date	12/20/02 (Special Letting)

This project consist of two design contracts to develop plans to rehabilitate the pavement and bridge decks of I-264 from east of the Dixie Highway Interchange (I-264/US 31W) to north of Mohammed Ali Blvd., a distance of approximately 8 miles. Design Section A from east of the Dixie Highway Interchange to Crums Lane will reconstruct the mainline pavement with a 13" PCC pavement within the interchange and will overlay the remaining 1.03 mile of pavement continuing to the west and north with a 9" PCC pavement and a 1" bond breaker. The 12 bridges within the interchange itself will be overlaid with a 1" Latex overlay while the 3 twin mainline structures will be overlaid with a 10" concrete slab. Design Section B from Crums Lane to north of Muhammed Ali Blvd. is approximately 5.6 miles long. The mainline pavement will be overlaid with a 9" PCC pavement and a 1" bond breaker. Five of the 21 twin structures along the mainline will be overlaid with a 10" concrete slab. The superstructures on the remaining 16 twin structures will be reconstructed from the bearing pads to the deck. In the area where only 4 lanes currently exist two additional lanes will be added in the median by constructing a 13" PCC pavement.

IV. INVESTIGATION PHASE

I-264 PAVEMENT AND BRIDGE DECK REHABILITATION
VALUE ENGINEER STUDY BRIEFING
September 9, 2002

NAME	AFFILIATION	PHONE
Jack Trickey, P.E. C.V.S.	Ventry Engineering	850/627-3596
James Napier	WMB, Inc.	859/564-4556
Nasby R. Stroop	KYTC-Construction	502/564-4780
Mike Milligan	KYTC-Operations	502/564-4556
T.C. Chambers	KYTC-Construction	270/824-7080
Siamack Shafaghi	KYTC-Design	502/564-3280
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Gilbert Newman	Balke Engineer	859/271-7545
Art Duncan	WMB Enginners	859/299-5226
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Anaias Calvin	KYTC-CO Hgihway	502/564-3280
Joette Fields	KYTC, Highway Design	502/564-3280
Steven Criswell	KYTC-Construction	502/564-4780
Dudley Brown	FHWA	502/233-6749
Donn Hancher	University of Kentucky	859/257-4857
Dale Carpenter	Co. Bridge Design	502/564-4560
Dan Hite	C.O. Design	502/564-3280
Phil Carter	D-3 Construction	270/746-7898
James Ballinger	D-7, Pre-construction	859/246-2355

STUDY RESOURCES

NAME	AFFILIATION	PHONE
Don Herd	KYTC Operations	502/564-4556
Dale Carpenter	KY0C Bridge Design	502/564-4560
Annette Coffee	KYTC Dir. Of Planning	502/564-7183
Darryl Greer	KYTC Planning	502/564-7183

FUNCTIONAL ANALYSIS WORKSHEET, INVESTIGATION PHASE
PROJECT: I-264 PAVEMENT AND BRIDGE DECK REHABILITATION
DATE: September 9-13, 2002

ITEM	FUNCT. VERB	FUNCT. NOUN	* TYPE	COST	WORTH	VALUE INDEX
Bridges	Separate	Traffic	B	$21,400,000	$20,000,000	1.07
Pavement and Base	Support	Vehicles	B	$19,100,000	$18,500,000	1.03
Median Barrier	Redirect	Vehicle	B	$2,000,000	$1,750,000	1.15
Lighting	Enhance	Safety	B	$1,560,000	$1,560,000	1.00
Signs and Barricades	Direct	Motorist	B	$1,470,000	$1,470,000	1.00
Edge Drains	Convey	Water	B	$1,265,000	$1,265,000	1.00
Guardrail	Redirect	Traffic	B	$1,080,000	$1,080,000	1.00
Pavement Markings	Direct	Motorist	B	$794,000	$794,000	1.00

***B – Basic**
S - Secondary

INVESTIGATION

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

A. TRAFFIC AND CONSTRUCTION AND PHASING

B. BRIDGES

C. PAVEMENT DESIGN

D. CONTRACT TIME AND METHOD

E. CONSTRUCTABILITY

V. SPECULATION PHASE

SPECULATION

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

A. TRAFFIC AND CONSTRUCTION PHASING

- Move traffic to the outside in both directions, reconstruct the median or middle area then shift the westbound traffic to the median area then construct the remaining pavement along the westbound side, shift all traffic to the new pavement and reconstruct the eastbound side.

- Allow phased construction of the bridge decks where necessary to maintain access to/from the mainline pavement to the ramps

B. BRIDGES

- Replace the bridge superstructures in the Dixie Highway Interchange

- Only jack and overlay with a 1" Latex overlay the mainline twin bridges to match the new pavement elevation

C. PAVEMENT DESIGN

- Only mill and replace the ramp shoulders with asphalt pavement within the Dixie Highway Interchange adjacent to the sections where the existing ramp pavement is to be retained

- Relocate the edge-drains to be adjacent to the travel lane

- Only excavate and replace 8.5 ft. of the existing eastbound shoulder in lieu of the 10 ft currently proposed

D. CONTRACT TIME AND METHOD

- Use A + B bidding

E. CONSTRUCTABILITY

- Only remove the bridge rails and barrier down to the existing deck elevation

VI. EVALUATION PHASE

VI. (A) ALTERNATIVES

ALTERNATIVES

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

A. TRAFFIC AND CONSTRUCTION PHASING

Value Engineering Alternative No. 1- Move traffic to the outside in both directions, reconstruct the median or middle area then shift the westbound traffic to the median area then construct the remaining pavement along the westbound side, shift all traffic to the new pavement and reconstruct the eastbound side.

Value Engineering Alternative No. 2 – Allow phased construction of the bridge decks where necessary to maintain access to/from the mainline pavement to the ramps

B. BRIDGES

Value Engineering Alternative No. 1 – Replace the bridge superstructures in the Dixie Highway Interchange

Value Engineering Alternative No. 2 – Only jack and overlay with a 1" Latex overlay the mainline twin bridges to match the new pavement elevation

C. PAVEMENT DESIGN

Value Engineering Alternative No. 1 - Only excavate and replace 8.5 ft. of the existing eastbound shoulder in lieu of the 10 ft currently proposed

Value Engineering Alternative No. 2 – Relocate the edge-drains to be adjacent to the travel lane

Value Engineering Alternative No. 3 –Only mill and replace the ramp shoulders with asphalt pavement within the Dixie Highway Interchange adjacent to the sections where the existing ramp pavement is to be retained

D. CONTRACT TIME AND METHOD

Value Engineering Alternative -Use A + B bidding

E. CONSTRUCTABILITY

Value Engineering Alternative-Only removes the bridge rails and barrier down to the existing deck elevation

VI. (B) ADVANTAGES AND DISADVANTAGES

EVALUATION

The following Advantages and Disadvantages were developed for the Value Engineering Alternatives previously generated during the speculation phase. It also includes the Advantages and Disadvantages for the As Proposed.

A. TRAFFIC AND CONSTRUCTION PHASING

"As Proposed" –Strengthen the eastbound shoulder, shift all traffic to the EB side and reconstruct the westbound side. When completed shift all traffic to the WB side and reconstruct the EB side.

Advantages
- Provides large parts of project where contractor can work at one time
- Eliminates constructing of small pieces, and numerous construction joints
- Reduces the number of times that traffic will need to be shifted
- Reduces the amount of temporary barrier needed
- Does not require contractor to "work in the middle" of moving traffic

Disadvantages
- Restricts motorist access to ramps
- Cannot work on concurrent bridges because of maintaining traffic on the next ramp
- Roadway contractor must work around bridge contractor
- Requires closures of ramps for periods up to 4 weeks
- Increases the need for temporary pavement
- Median barrier wall will restrict access to work zones and inhibit traffic flow

Conclusion
Carry forward for further evaluation

Value Engineering Alternative No. 1 - Move traffic to the outside in both directions, reconstruct the median or middle area then shift the westbound traffic to the median area, then construct the remaining pavement along the westbound side, shift all traffic to the new pavement and reconstruct the eastbound side.

Advantages
- Allows for 40 ft median pavement to be completed with no traffic involved
- Allows traffic to use all ramps without changing any existing traffic movements
- Eliminates some quantity of the asphalt wedges
- Reduces the amount of temporary bridge work required
- Improves traffic movements in Phase 2 and 3
- May speed up construction work

Disadvantages
- Requires strengthen of both outside shoulders for vehicular traffic
- Eliminates some of the temporary median pavement in the four lane section
- Drainage from the median in super-elevated sections may be more complicated

Conclusion
Carry forward for further evaluation

Value Engineering Alternative No. 2 - Allow phased construction of the bridge decks where necessary to maintain access to/from the mainline pavement to the ramps

Advantages
- Maintains ramp traffic as much as possible
- Relieves contractor of tight " 2 to 4 week " closure schedules
- Allows contractor to work on several bridges at once
- Opens up project. Contractor can use phased work as access to other parts of project
- Emergency vehicles access to neighborhoods will not be impacted

Disadvantages
- Introduces a longituditional construction joint in the deck
- Contractor must deal with moving traffic on both sides of work zones
- Adds an additional construction phase to the work
- Increases the amount of temporary barrier needed

Conclusion
Carry forward for further evaluation

B. BRIDGES

"As Proposed" – The 12 bridges in the Dixie Highway Interchange will receive a 1" Latex overlay and barrier upgrade, 16 steel girder bridges will have their superstructures replaced, and 8 twin RCDG structures will receive a 10 " deck overlay and barrier upgrade

Advantages
- All bridges except those 12 within the Dixie Highway Interchange will be rehabilitated along with the mainline pavement

Disadvantages
- The 12 bridges may have to be rehabilitated again before the mainline pavement service life ends

Conclusion
Carry forward for further evaluation

Value Engineering Alternative No.1 - Replace the bridge superstructures in the Dixie Highway Interchange

Advantages
- Would be consistent with bridge rehabilitation on the remaining part of the project
- All structures on this project would have the same remaining service life

Disadvantages
- Increases the impacts to motorist
- Not necessary to replace the bridge superstructures at this time
- Work can be deferred to a future date

Conclusion
Carry forward for further evaluation

Value Engineering Alternative No 2 - Only jack and overlay with a 1" Latex overlay the mainline twin bridges to match the new pavement elevation

Advantages
- Would reduce the time required for construction
- Reduces the initial cost of the project

Disadvantages
- Bridge superstructure service life would be less than the roadway pavement service life
- Initial cost would still be significant
- Future replacement of girders would require major impacts to motorist again

Conclusion
DROP FROM FURTHER CONSIDERATION

C. PAVEMENT DESIGN

"As Proposed" – Excavate and replace the existing 10 ft. paved shoulder on the eastbound side with 10" of asphalt, trench and install the new edge drain at the outside of the paved shoulder, overlay all asphalt shoulders with a 9" PCC pavement

Advantages
- None apparent

Disadvantages
- Does not provide efficient draining of the area beneath the travel lanes
- Excavation and paving a 10 ft. width may conflict with the existing guardrail
- The full 10 ft. paved shoulder does not have to be strengthened for maintenance of traffic
- The outside 16" will be removed and replaced for placement of the edge drain anyhow
- Within the Dixie Highway Interchange some of the existing ramp pavements will be repaired and left in place, new 9" PCC overlays of shoulders may not be appropriate at these locations
- New shoulder pavement life will exceed the travel lane service life
- High type pavement not necessary for the reduced life of the ramp pavement

Conclusion
Carry forward for further evaluation

Value Engineering Alternative No. 1 -Only excavate and replace 8.5 ft. of the existing eastbound shoulder in lieu of the 10 ft currently proposed

Advantages
- Will eliminate duplication of work between shoulder strengthening and installing new edge drain
- Eliminates potential conflicts between excavation and paving operations and existing guardrail

Disadvantages
- May experience some shoulder raveling during Phase 1 construction

Conclusion
Carry forward for further evaluation

Value Engineering Alternative No. 2 – Relocate the edge-drains to be adjacent to the mainline travel lanes

Advantages
- Increases the efficiency of the edge drain in removing water from beneath the travel lanes

Disadvantages
- None apparent

Conclusion
Carry forward for further evaluation

Value Engineering Alternative No.3 - Only mill and replace the ramp shoulders with asphalt pavement within the Dixie Highway Interchange adjacent to the sections where the existing ramp pavement is to be retained

Advantages
- Matches the existing ramp pavement design

Disadvantages
- None apparent

Conclusion
Carry forward for further evaluation

D. CONTRACT TIME AND METHOD

"As Proposed" – Fixed completion date with time limitations for ramp closures

Advantages
- Establishes a fixed date for completion of the project
- Public is informed of when normal traffic movements may resumed

Disadvantages
- Contractor has risk of poor weather conditions
- Contractor has greater risk for changed conditions, quick approvals and project coordination

Conclusion
Carry forward for further evaluation

Value Engineering Alternative – Use A + B bidding

Advantages
- Assures appropriate balance between cost and contract time
- Allows contractor to tailor project to his strengths
- May reduce the contract time compared to a fixed date contract

Disadvantages
- May not be enough competition to fully capture benefits of this type contract

Conclusion
DROP FROM FURTHER EVALUATION

E. CONSTRUCTABILITY

"As Proposed" – The eight twin RCDG bridges to receive the 10 " deck overlay shows concrete to be removed to the top of the girders in both the median area and the overhang area. A top and bottom mat of epoxy-coated rebar is planned for the deck overlay.

Advantages
- None apparent

Disadvantages
- More difficult for workers to move about due to exposed rebar
- Increases the amount of concrete removal
- Increase the amount of new concrete required
- Requires forms underneath the slab to hold new concrete
- Increases time required for construction

Conclusion
Carry forward for further evaluation

Value Engineering Alternative -Only remove the bridge rails and barrier down to the existing deck elevation

Advantages
- Reduces fall potential for workers
- Reduces amount of concrete removal
- Reduces amount of AA concrete
- Simplifies form work and subsequent removal
- May allow removal of the top and bottom mat of epoxy steel in the deck overlay

Disadvantages

- None apparent

Conclusion

Carry forward for further evaluation

VII. DEVELOPMENT PHASE

VII. (A) TRAFFIC AND CONSTRUCTION PHASING

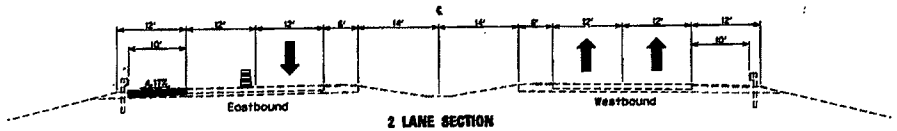
VII. (A)(1) AS PROPOSED

"As Proposed"

Strengthen the eastbound shoulder, shift all traffic to the eastbound side and reconstruct the westbound side. When completed shift all traffic to the westbound side and reconstruct the eastbound side.

COUNTY OF	ITEM NO.	SH
JEFFERSON	5-2000.00	

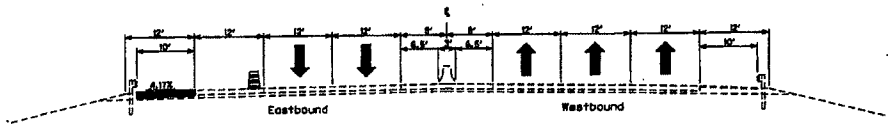
I-264 MAINTENANCE OF TRAFFIC PHASE 1 CONSTRUCTION



2 LANE SECTION

1) REMOVE THE EXISTING OUTSIDE SHOULDER TO A DEPTH OF 10 INCHES ON THE EASTBOUND SIDE OF I-264
2) CONSTRUCT A ASPHALT OUTSIDE SHOULDER AT LOCATIONS WHERE THE EXISTING OUTSIDE SHOULDER WAS REMOVED ON THE EASTBOUND SIDE OF I-264
3) CONSTRUCT TEMPORARY PAVEMENT AND SHOULDER FROM APPROXIMATE STATION 414+00 TO APPROXIMATE STATION 428+00 ON THE EASTBOUND SIDE OF I-264
4) CONSTRUCT THE OUTSIDE OF THE ASPHALT WEDGES ON THE EASTBOUND SIDE OF I-264

STANDARD DRAWINGS LANE CLOSURE CASE II WILL APPLY



3 LANE SECTION

1) REMOVE THE EXISTING OUTSIDE SHOULDER TO A DEPTH OF 10 INCHES ON THE EASTBOUND SIDE OF I-264
2) CONSTRUCT A ASPHALT OUTSIDE SHOULDER AT LOCATIONS WHERE THE EXISTING OUTSIDE SHOULDER WAS REMOVED ON THE EASTBOUND SIDE OF I-264
3) CONSTRUCT ASPHALT WEDGES ON THE EASTBOUND SIDE OF I-264

STANDARD DRAWINGS LANE CLOSURE CASE II WILL APPLY

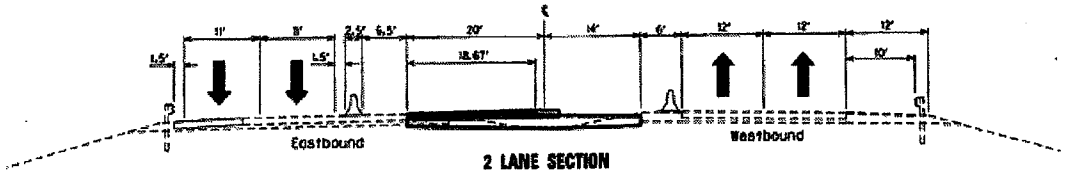
"AS PROPOSED"

Not to Scal

I-264 MAINTENANCE OF TRAFF
PHASE 1 CONSTRUCTION

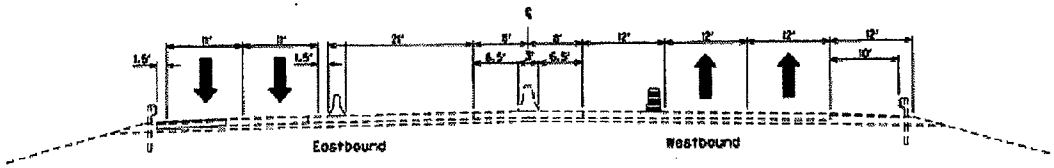
COUNTY OF	ITEM
JEFFERSON	5-2000.

I-264 MAINTENANCE OF TRAFFIC PHASE 1A CONSTRUCTION



2 LANE SECTION

1) SHIFT EASTBOUND I-264 TRAFFIC TO THE OUTSIDE ON THE EASTBOUND SIDE OF I-264
PLACE TEMPORARY CONCRETE MEDIAN BARRIER WALL TYPE 9M ON THE EASTBOUND AND WESTBOUND SIDE OF I-264
2) PLACE CRUSHED AGGREGATE AND CONSTRUCT 6" PERFORATED PIPE
3) CONSTRUCT TEMPORARY PAVEMENT TO THE LEFT OF THE CENTERLINE
4) CONSTRUCT THE INSIDE OF THE ASPHALT WEDGES ON THE EASTBOUND SIDE OF I-264
5) CONSTRUCT MEDIAN CROSSOVER 1 AND SLIP RAMPS
6) CONSTRUCTION OF EASTBOUND BRIDGE WORK TO CLOSE BRIDGES IN THE MEDIAN



3 LANE SECTION

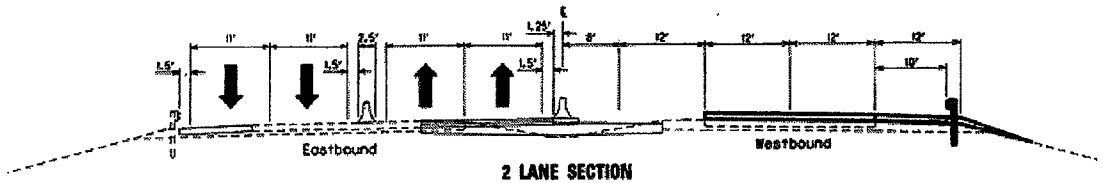
1) SHIFT EASTBOUND I-264 TRAFFIC TO THE OUTSIDE ON THE EASTBOUND SIDE OF I-264
SHIFT WESTBOUND I-264 TRAFFIC TO THE OUTSIDE LANES ON THE WESTBOUND SIDE OF I-264
PLACE TEMPORARY CONCRETE MEDIAN BARRIER WALL TYPE 9M ON THE EASTBOUND SIDE OF I-264
PLACE PLASTIC DRUMS ON THE WESTBOUND SIDE OF I-264
2) CONSTRUCT SLIP RAMPS

"AS PROPOSED"

Not to Scale

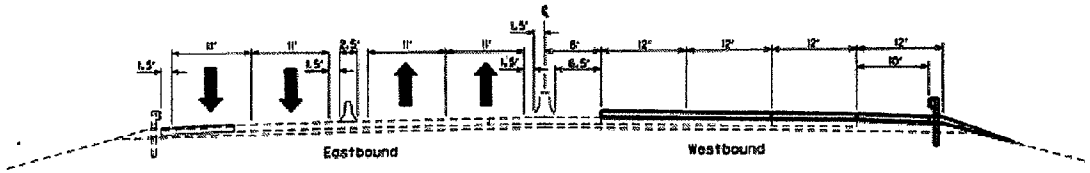
COUNTY OF	ITEM NO.	SHEET
JEFFERSON	5-2000.00	87

I-264 MAINTENANCE OF TRAFFIC PHASE 2 CONSTRUCTION



2 LANE SECTION

1) SHIFT WESTBOUND I-264 TRAFFIC TO THE INSIDE ON THE EASTBOUND SIDE OF I-264
RELOCATE TEMPORARY CONCRETE MEDIAN BARRIER WALL TYPE 9M
2) CONSTRUCT THE 9 INCH PCC PAVEMENT OVERLAY IN THE DRIVING LANES AND OUTSIDE SHOULDER
ON THE WESTBOUND SIDE OF I-264
3) COMPLETE BRIDGE CONSTRUCTION ON THE WESTBOUND SIDE OF I-264



3 LANE SECTION

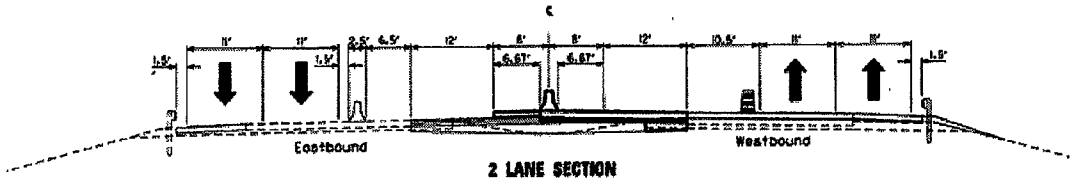
1) SHIFT WESTBOUND I-264 TRAFFIC TO THE INSIDE ON THE EASTBOUND SIDE OF I-264
2) CONSTRUCT THE 9 INCH PCC PAVEMENT OVERLAY IN THE DRIVING LANES AND OUTSIDE SHOULDER
ON THE WESTBOUND SIDE OF I-264
3) CONSTRUCT BRIDGE DECK REPLACEMENTS OR BRIDGE DECK OVERLAYS ON THE WESTBOUND SIDE OF I-264

"AS PROPOSED"

Not to Scale

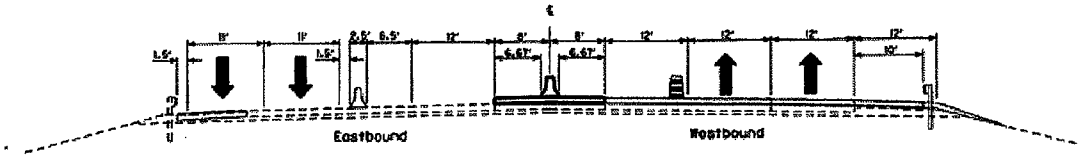
COUNTY OF	ITEM NO.
JEFFERSON	5-2000.00

I–264 MAINTENANCE OF TRAFFIC
PHASE 3 CONSTRUCTION



2 LANE SECTION

1) PLACE PLASTIC DRUMS ON THE WESTBOUND SIDE OF I–264
SHIFT WESTBOUND I–264 TRAFFIC TO THE OUTSIDE ON THE WESTBOUND SIDE OF I–264
2) CONSTRUCT THE 9 INCH PCC PAVEMENT OVERLAY ON THE INSIDE SHOULDER OF THE EASTBOUND AND WESTBOUND SIDES AND MEDIAN OF I–264
3) CONSTRUCT CONCRETE MEDIAN BARRIER TYPE 14B
4) CONSTRUCT MEDIAN CROSSOVER 2



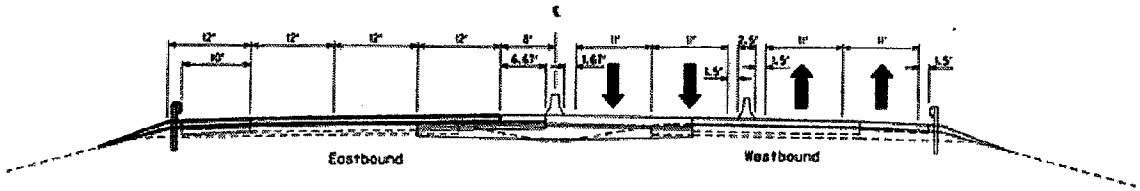
3 LANE SECTION

1) PLACE PLASTIC DRUMS ON THE WESTBOUND SIDE OF I–264
SHIFT WESTBOUND I–264 TRAFFIC TO THE OUTSIDE LANES ON THE WESTBOUND SIDE OF I–264
2) REMOVE THE EXISTING CONCRETE MEDIAN BARRIER
3) CONSTRUCT THE 9 INCH PCC PAVEMENT OVERLAY ON THE INSIDE SHOULDER OF THE EASTBOUND AND WESTBOUND SIDES OF I–264
4) CONSTRUCT CONCRETE MEDIAN BARRIER TYPE 14B

"AS PROPOSED"

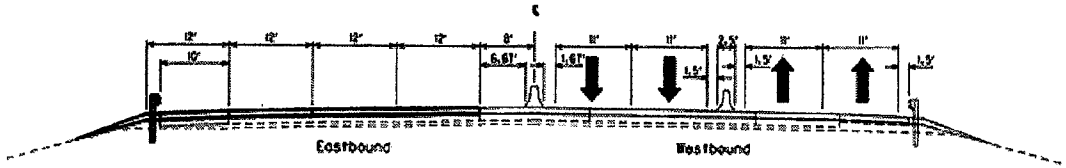
Not to Scale

I–264 MAINTENANCE OF TRAFFIC PHASE 4 CONSTRUCTION



2 LANE SECTION

1) RELOCATE TEMPORARY CONCRETE MEDIAN BARRIER WALL TYPE 9M ON THE EASTBOUND SIDE OF I–264 TO THE WESTBOUND SIDE OF I–264
SHIFT EASTBOUND I–264 TRAFFIC TO THE INSIDE ON THE WESTBOUND SIDE OF I–264
SHIFT WESTBOUND I–264 TRAFFIC TO THE OUTSIDE ON THE WESTBOUND SIDE OF I–264
2) CONSTRUCT THE 9 INCH PCC PAVEMENT OVERLAY IN THE DRIVING LANES AND OUTSIDE SHOULDER ON THE EASTRBOUND SIDE OF I–264
3) COMPLETE BRIDGE CONSTRUCTION ON THE EASTBOUND SIDE OF I–264



3 LANE SECTION

1) RELOCATE TEMPORARY CONCRETE MEDIAN BARRIER WALL TYPE 9M ON THE EASTBOUND SIDE OF I–264 TO THE WESTBOUND SIDE OF I–264
SHIFT EASTBOUND I–264 TRAFFIC TO THE INSIDE ON THE WESTBOUND SIDE OF I–264
SHIFT WESTBOUND I–264 TRAFFIC TO THE OUTSIDE ON THE WESTBOUND SIDE OF I–264
2) CONSTRUCT THE 9 INCH PCC PAVEMENT OVERLAY IN THE DRIVING LANES AND OUTSIDE SHOULDER ON THE EASTRBOUND SIDE OF I–264
3) CONSTRUCT BRIDGE DECK REPLACEMENTS OR BRIDGE DECK OVERLAYS ON THE EASTBOUND SIDE OF I–264

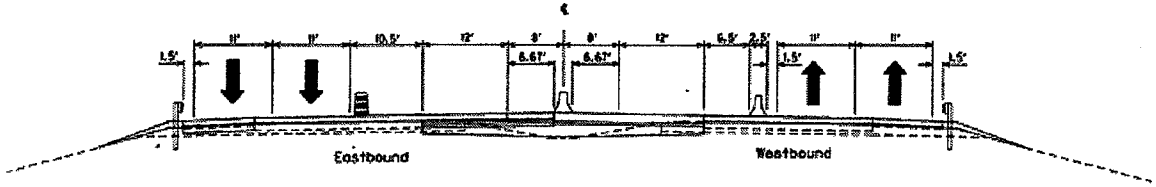
"AS PROPOSED"

Not to Sca

I-264 MAINTENANCE OF TRAF
PHASE 4 CONSTRUCTION

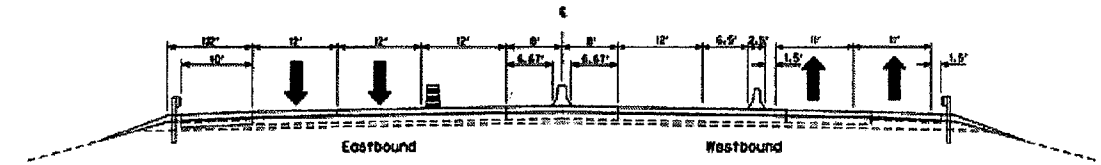
COUNTY OF	ITEM NO.
JEFFERSON	5-2000.00

I–264 MAINTENANCE OF TRAFFIC
PHASE 5 CONSTRUCTION



2 LANE SECTION

1) PLACE PLASTIC DRUMS ON THE EASTBOUND SIDE OF I–264
SHIFT EASTBOUND I–264 TRAFFIC TO THE OUTSIDE ON THE EASTBOUND SIDE OF I–264
2) REMOVE SLIP RAMPS AND MEDIAN CROSSOVER 2
3) CONSTRUCT CONCRETE MEDIAN BARRIER TYPE 14B AT SLIP RAMP LOCATIONS
4) PLACE LIGHTING ON THE CONCRETE MEDIAN BARRIER
5) REMOVE TEMPORARY CONCRETE MEDIAN BARRIER WALL TYPE 9M ON THE WESTBOUND SIDE OF I–264
SHIFT WESTBOUND I–264 TRAFFIC TO NORMAL TWO LANE PATTERN
REMOVE PLASTIC DRUMS ON THE EASTBOUND SIDE OF I–264
SHIFT EASTBOUND I–264 TRAFFIC TO NORMAL TWO LANE PATTERN



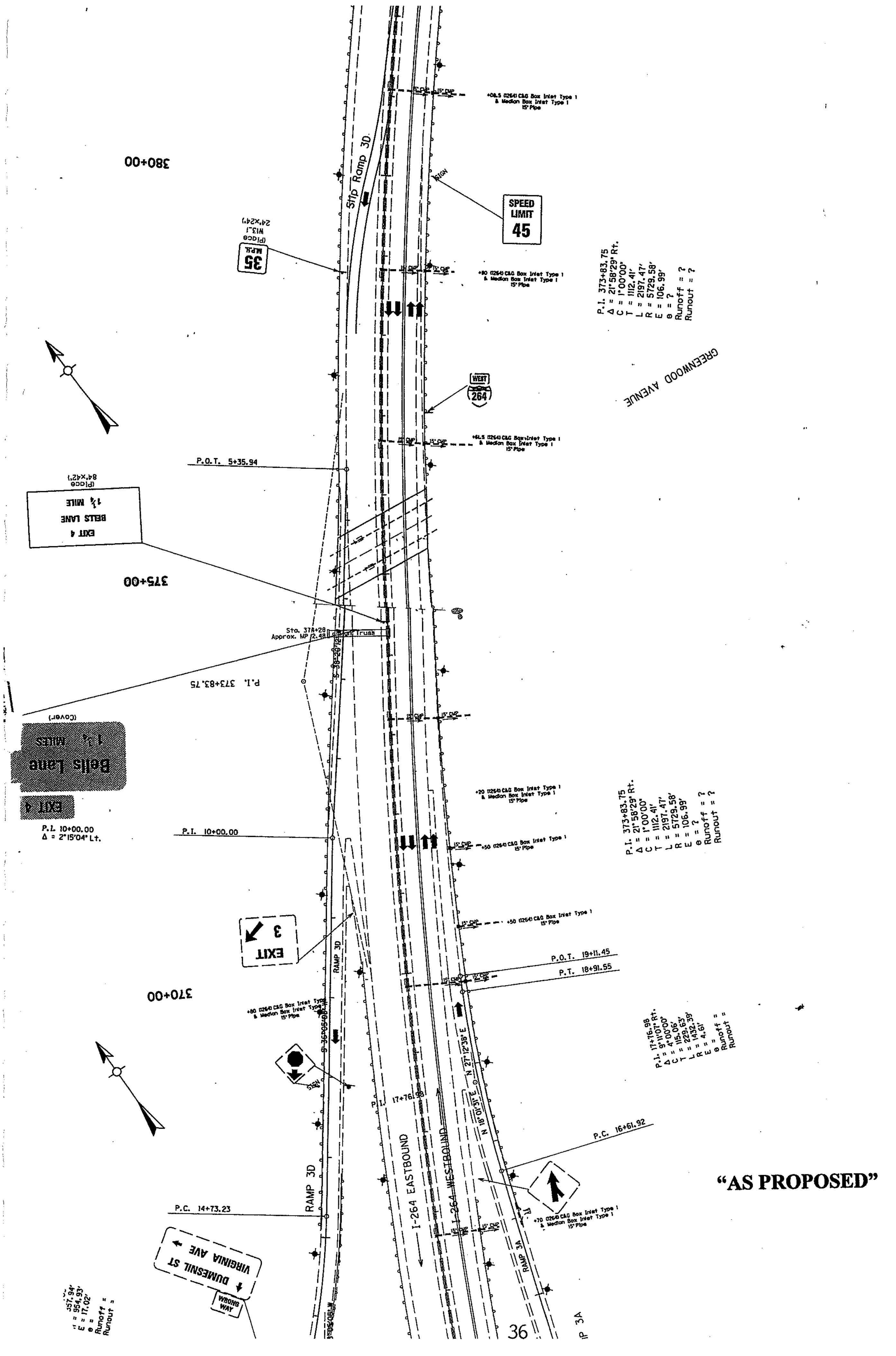
3 LANE SECTION

1) PLACE PLASTIC DRUMS ON THE EASTBOUND SIDE OF I–264
SHIFT EASTBOUND I–264 TRAFFIC TO THE OUTSIDE ON THE EASTBOUND SIDE OF I–264
2) REMOVE SLIP RAMPS
3) CONSTRUCT CONCRETE MEDIAN BARRIER TYPE 14B AT SLIP RAMP LOCATIONS
4) PLACE LIGHTING ON THE CONCRETE MEDIAN BARRIER
5) REMOVE TEMPORARY CONCRETE MEDIAN BARRIER WALL TYPE 9M ON THE WESTBOUND SIDE OF I–264
SHIFT WESTBOUND I–264 TRAFFIC TO NORMAL THREE LANE PATTERN
REMOVE PLASTIC DRUMS ON THE EASTBOUND SIDE OF I–264
SHIFT EASTBOUND I–264 TRAFFIC TO NORMAL THREE LANE PATTERN

"AS PROPOSED"

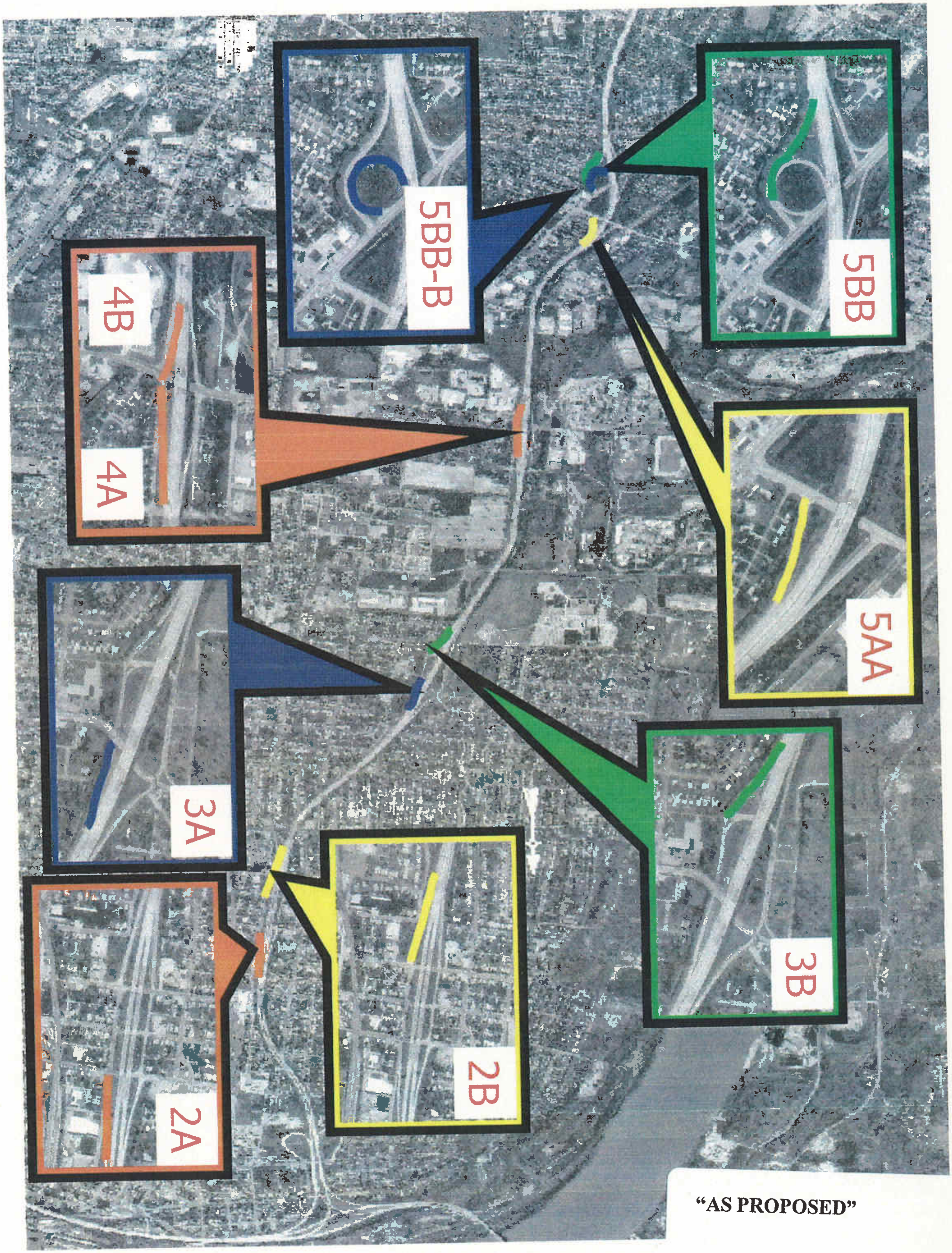
Not to Scale

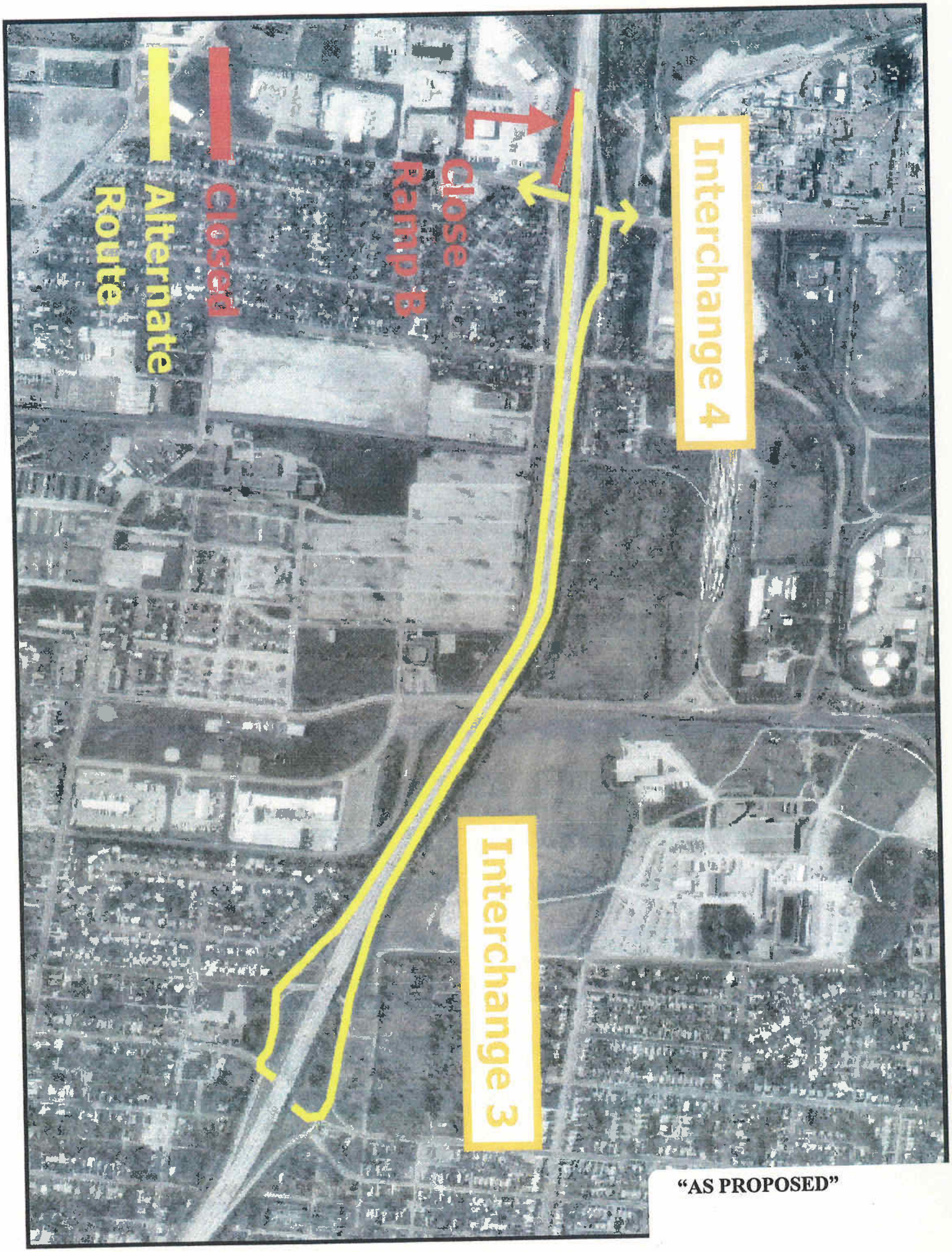
I-264 MAINTENANCE OF TRAFF
PHASE 5 CONSTRUCTION



Slip Ramp 3D
SPEED LIMIT 45
35 M.P.H.
(Place W13_1 24"x24")
380+00
P.I. 373+83.75
Δ = 21°58'29" Rt.
C = 1°00'00"
T = 1112.41'
L = 2197.47'
R = 5729.58'
E = 106.99'
e = ?
Runoff = ?
Runout = ?
GREENWOOD AVENUE
WEST 264
P.O.T. 5+35.94
EXIT 4
BELLS LANE
1¼ MILE
(Place 84"x42")
375+00
Sta. 374+28
Approx. MP 2.48
P.I. 373+83.75
EXIT 4
Bells Lane
1¼ MILES
(Cover)
P.I. 10+00.00
Δ = 2°15'04" Lt.
P.I. 10+00.00
EXIT 3
RAMP 3D
P.O.T. 19+11.45
P.T. 18+91.55
370+00
N 27°12'38" E
N 18°01'31" E
P.I. 17+76.98
P.C. 16+61.92
I-264 EASTBOUND
I-264 WESTBOUND
RAMP 3D
P.C. 14+73.23
RAMP 3A
VIRGINIA AVE
DUMESNIL ST
WRONG WAY

"AS PROPOSED"

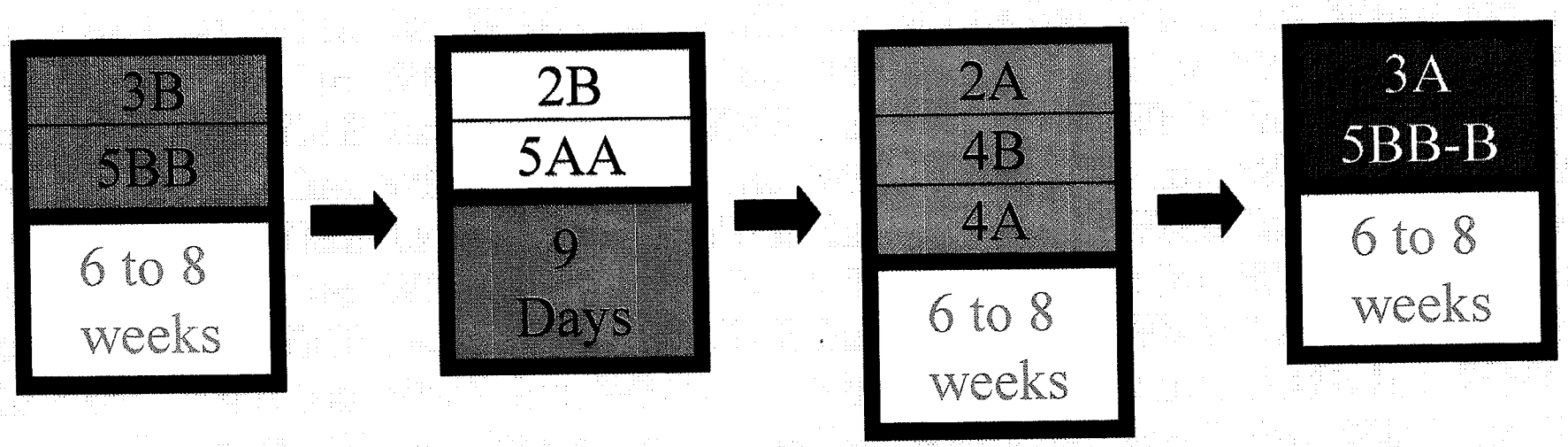

5BB-B
5BB
4B
4A
5AA
3A
3B
2A
2B
"AS PROPOSED"


Close
Ramp B
Closed
Alternate
Route
Interchange 4
Interchange 3

"AS PROPOSED"

Ramp Closures Phase 2

Concurrent Ramp Closures WB Direction



"AS PROPOSED"

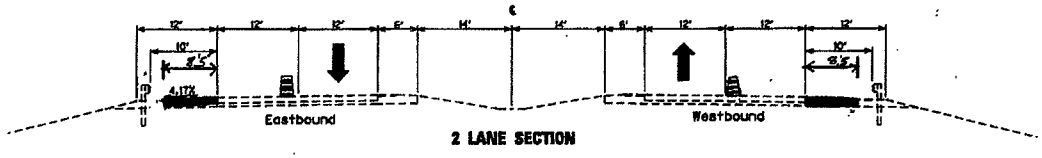
VII. (A)(2) VALUE ENGINEERING ALTERNATIVE NUMBER 1

Value Engineering Alternative Number 1

Move traffic to the outside in both directions, reconstruct the median or middle area then shift the westbound traffic to the median area, then construct the remaining pavement along the westbound side, shift all traffic to the new pavement and reconstruct the eastbound side.

"Move All Traffic To Outside In Phase 1"

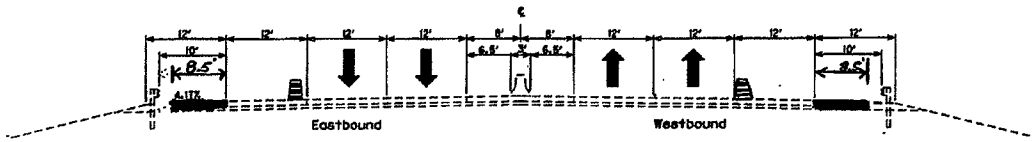
I–264 MAINTENANCE OF TRAFFIC PHASE 1 CONSTRUCTION



2 LANE SECTION

1) REMOVE THE EXISTING OUTSIDE SHOULDER TO A DEPTH OF 10 INCHES ON ~~THE EASTBOUND~~ SIDE OF I–264
2) CONSTRUCT A ASPHALT OUTSIDE SHOULDER AT LOCATIONS WHERE THE EXISTING OUTSIDE SHOULDER WAS REMOVED ON ~~THE EASTBOUND~~ SIDE OF I–264
3) CONSTRUCT TEMPORARY PAVEMENT AND SHOULDER FROM APPROXIMATE STATION 414+00 TO APPROXIMATE STATION 420+00 ON THE EASTBOUND SIDE OF I–264
~~4) CONSTRUCT THE OUTSIDE OF THE ASPHALT WEDGES ON THE EASTBOUND SIDE OF I-264~~

STANDARD DRAWINGS LANE CLOSURE CASE II WILL APPLY

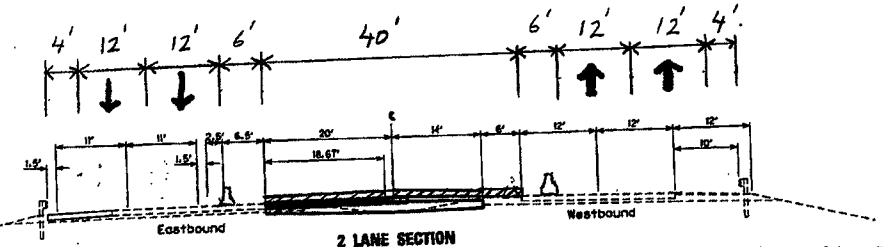


3 LANE SECTION

1) REMOVE THE EXISTING OUTSIDE SHOULDER TO A DEPTH OF 10 INCHES ON ~~THE EASTBOUND~~ SIDE OF I–264
2) CONSTRUCT A ASPHALT OUTSIDE SHOULDER AT LOCATIONS WHERE THE EXISTING OUTSIDE SHOULDER WAS REMOVED ON ~~THE EASTBOUND~~ SIDE OF I–264
~~3) CONSTRUCT ASPHALT WEDGES ON THE EASTBOUND SIDE OF I-264~~

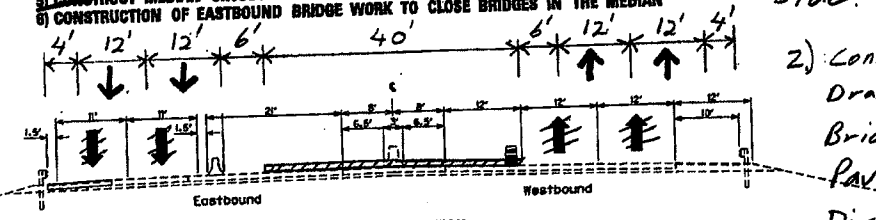
STANDARD DRAWINGS LANE CLOSURE CASE II WILL APPLY

I-264 MAINTENANCE OF TRAFFIC PHASE 2 CONSTRUCTION



2 LANE SECTION
+ 3 LANE SECTION

1) ~~SHIFT EASTBOUND I-264 TRAFFIC TO THE OUTSIDE ON THE EASTBOUND SIDE OF I-264~~
~~PLACE TEMPORARY CONCRETE MEDIAN BARRIER WALL TYPE 9M ON THE EASTBOUND AND~~
~~WESTBOUND SIDE OF I-264~~
2) PLACE CRUSHED AGGREGATE AND ~~CONSTRUCT~~ PERFORATED PIPE
3) CONSTRUCT TEMPORARY PAVEMENT TO THE ~~LEFT~~ OF THE CENTERLINE
4) CONSTRUCT THE ~~INSIDE~~ OF THE ASPHALT WEDGES ON ~~THE EASTBOUND~~ SIDE OF I-264
5) ~~CONSTRUCT~~ MEDIAN CROSSOVER 1 AND SLIP RAMPS
6) CONSTRUCTION OF EASTBOUND BRIDGE WORK TO CLOSE BRIDGES IN THE MEDIAN



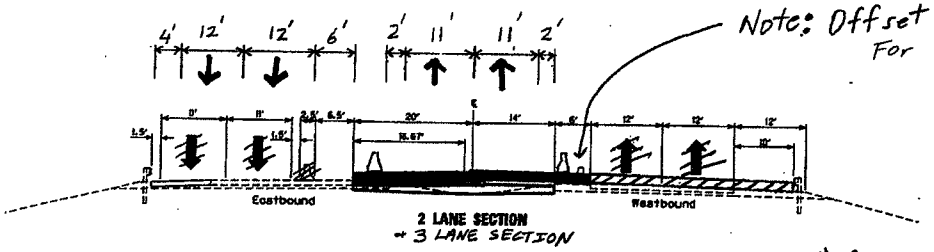
3 LANE SECTION

1) ~~SHIFT EASTBOUND I-264 TRAFFIC TO THE OUTSIDE ON THE EASTBOUND SIDE OF I-264~~
SHIFT WESTBOUND I-264 TRAFFIC ~~TO THE OUTSIDE LANES ON~~ THE WESTBOUND SIDE OF I-264
PLACE TEMPORARY CONCRETE ~~MEDIAN BARRIER~~ WALL TYPE 9M ~~ON THE EASTBOUND~~ SIDE OF I-264
PLACE ~~PLASTIC DRUMS~~ ON THE WESTBOUND SIDE OF I-264
2) ~~CONSTRUCT~~ SLIP RAMPS

1) Shift I-264 Traffic To The Outside In Both Directions And Place Temporary Barrier Wall On The East bound And Westbound side.

2) Construct All Median Drainage, Embankment, Bridges, And Permanent Pavement In Both Directions. Temporary Top Phase With Welded Grates or slotted Drain Pipes will be Utilized for Median Boxes.

I-264 MAINTENANCE OF TRAFFIC
PHASE 3 CONSTRUCTION



Note: Offset Wall As Needed For Paving Equipment

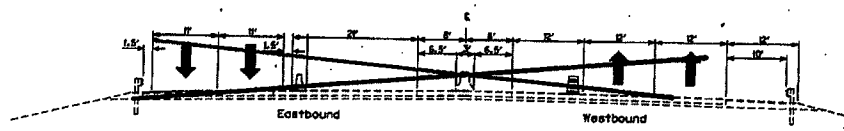
2 LANE SECTION
= 3 LANE SECTION

1) SHIFT EASTBOUND I-264 TRAFFIC TO THE OUTSIDE ON THE EASTBOUND SIDE OF I-264
PLACE TEMPORARY CONCRETE MEDIAN BARRIER WALL TYPE 9M ON THE EASTBOUND AND WESTBOUND SIDE OF I-264
2) PLACE CRUSHED AGGREGATE AND CONSTRUCT 6" PERFORATED PIPE
3) CONSTRUCT TEMPORARY PAVEMENT TO THE LEFT OF THE CENTERLINE
4) CONSTRUCT THE INSIDE OF THE ASPHALT WEDGES ON THE EASTBOUND SIDE OF I-264
5) CONSTRUCT MEDIAN CROSSOVER 1 AND SLIP RAMPS
6) CONSTRUCTION OF EASTBOUND BRIDGE WORK TO CLOSE BRIDGES IN THE MEDIAN

1) Re-Locate Temporary Barrier Wall To The Newly Constructed Pavement And Shift Westbound Traffic To The Inside.

2) During A Short Time Duration (24 - 36 Hrs.), Close Westbound Ramps And Place Asphalt Wedge, Open Barrier Wall And Place Crash Cushions For Order To Maintain Ramp Traffic.

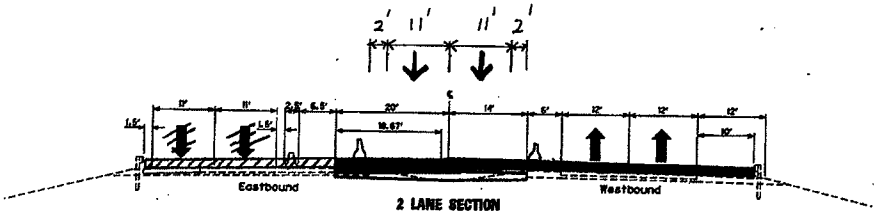
3) Construct Westbound I-264 Pavement, Bridges and Ramps.



3 LANE SECTION

1) SHIFT EASTBOUND I-264 TRAFFIC TO THE OUTSIDE ON THE EASTBOUND SIDE OF I-264
SHIFT WESTBOUND I-264 TRAFFIC TO THE OUTSIDE LANES ON THE WESTBOUND SIDE OF I-264
PLACE TEMPORARY CONCRETE MEDIAN BARRIER WALL TYPE 9M ON THE EASTBOUND SIDE OF I-264
PLACE PLASTIC DRUMS ON THE WESTBOUND SIDE OF I-264
2) CONSTRUCT SLIP RAMPS

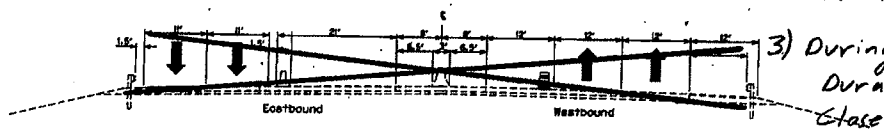
I-264 MAINTENANCE OF TRAFFIC
PHASE 4 CONSTRUCTION



2 LANE SECTION

+ 3 Lane Section

1) SHIFT EASTBOUND I-264 TRAFFIC TO THE OUTSIDE ON THE EASTBOUND SIDE OF I-264
PLACE TEMPORARY CONCRETE MEDIAN BARRIER WALL TYPE 9M ON THE EASTBOUND AND WESTBOUND SIDE OF I-264
2) PLACE CRUSHED AGGREGATE AND CONSTRUCT 8" PERFORATED PIPE
3) CONSTRUCT TEMPORARY PAVEMENT TO THE LEFT OF THE CENTERLINE
4) CONSTRUCT THE INSIDE OF THE ASPHALT WEDGES ON THE EASTBOUND SIDE OF I-264
5) CONSTRUCT MEDIAN CROSSOVER 1 AND SLIP RAMPS
6) CONSTRUCTION OF EASTBOUND BRIDGE WORK TO CLOSE BRIDGES IN THE MEDIAN



3 LANE SECTION

1) SHIFT EASTBOUND I-264 TRAFFIC TO THE OUTSIDE ON THE EASTBOUND SIDE OF I-264
SHIFT WESTBOUND I-264 TRAFFIC TO THE OUTSIDE LANES ON THE WESTBOUND SIDE OF I-264
PLACE TEMPORARY CONCRETE MEDIAN BARRIER WALL TYPE 9M ON THE EASTBOUND SIDE OF I-264
PLACE PLASTIC DRUMS ON THE WESTBOUND SIDE OF I-264
4) CONSTRUCT SLIP RAMPS

1) Shift West bound I-264 Traffic To Completed Westbound middle and Right Lane.

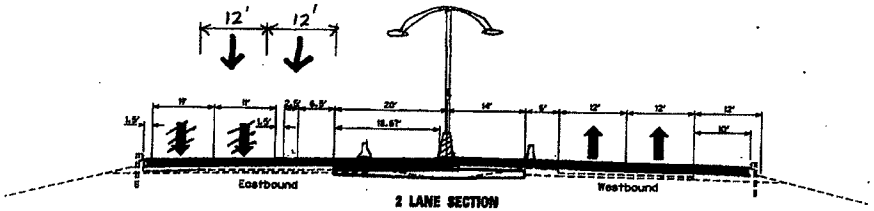
2) Shift East bound Traffic To The Inside.

3) During A Short Time Duration (24-36 Hrs) Close Eastbound Ramps And Place Asphalt Wedge, Open Barrier Wall, And Place Crash Cushions In Order To Maintain Ramp Traffic.

4) Construct East bound I-264 Pavement, Ramps, And Bridges.

VALUE ENGINEERING
ALTERNATIVE

I–264 MAINTENANCE OF TRAFFIC
PHASE 5 CONSTRUCTION

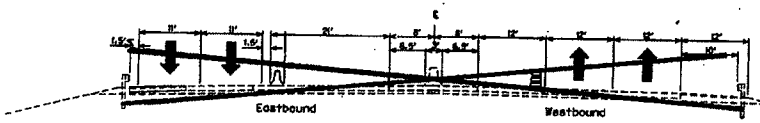


2 LANE SECTION

+ 3 LANE SECTION

1) ~~SHIFT EASTBOUND I-264 TRAFFIC TO THE OUTSIDE ON THE EASTBOUND SIDE OF I-264~~
~~PLACE TEMPORARY CONCRETE MEDIAN BARRIER WALL TYPE 9M ON THE EASTBOUND AND~~
~~WESTBOUND SIDE OF I-264~~
2) ~~PLACE CRUSHED AGGREGATE AND CONSTRUCT 6" PERFORATED PIPE~~
3) ~~CONSTRUCT TEMPORARY PAVEMENT TO THE LEFT OF THE CENTERLINE~~
4) ~~CONSTRUCT THE INSIDE OF THE ASPHALT WEDGES ON THE EASTBOUND SIDE OF I-264~~
5) ~~CONSTRUCT MEDIAN CROSSOVER 1 AND SLIP RAMPS~~
6) ~~CONSTRUCTION OF EASTBOUND BRIDGE WORK TO CLOSE BRIDGES IN THE MEDIAN~~

1) Shift Eastbound I-264 Traffic To Completed Eastbound Middle And Right Lane.



3 LANE SECTION

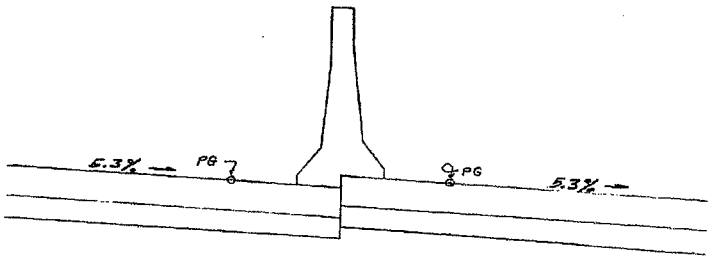
2) Construct Permanent Barrier Wall, Lighting, And Drainage In The Median.

1) ~~SHIFT EASTBOUND I-264 TRAFFIC TO THE OUTSIDE ON THE EASTBOUND SIDE OF I-264~~
~~SHIFT WESTBOUND I-264 TRAFFIC TO THE OUTSIDE LANES ON THE WESTBOUND SIDE OF I-264~~
~~PLACE TEMPORARY CONCRETE MEDIAN BARRIER WALL TYPE 9M ON THE EASTBOUND SIDE OF I-264~~
~~PLACE PLASTIC DRUMS ON THE WESTBOUND SIDE OF I-264~~
2) ~~CONSTRUCT SLIP RAMPS~~

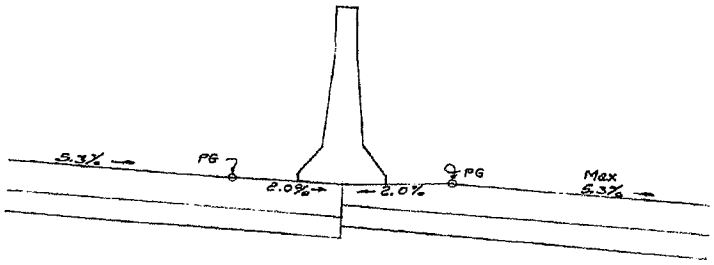
3) Remove Temporary Concrete Barrier Wall

MODIFY TRAFFIC PHASING

Permanent Barrier Wall As Designed



Proposed Permanent Barrier Wall And Inside Sh.



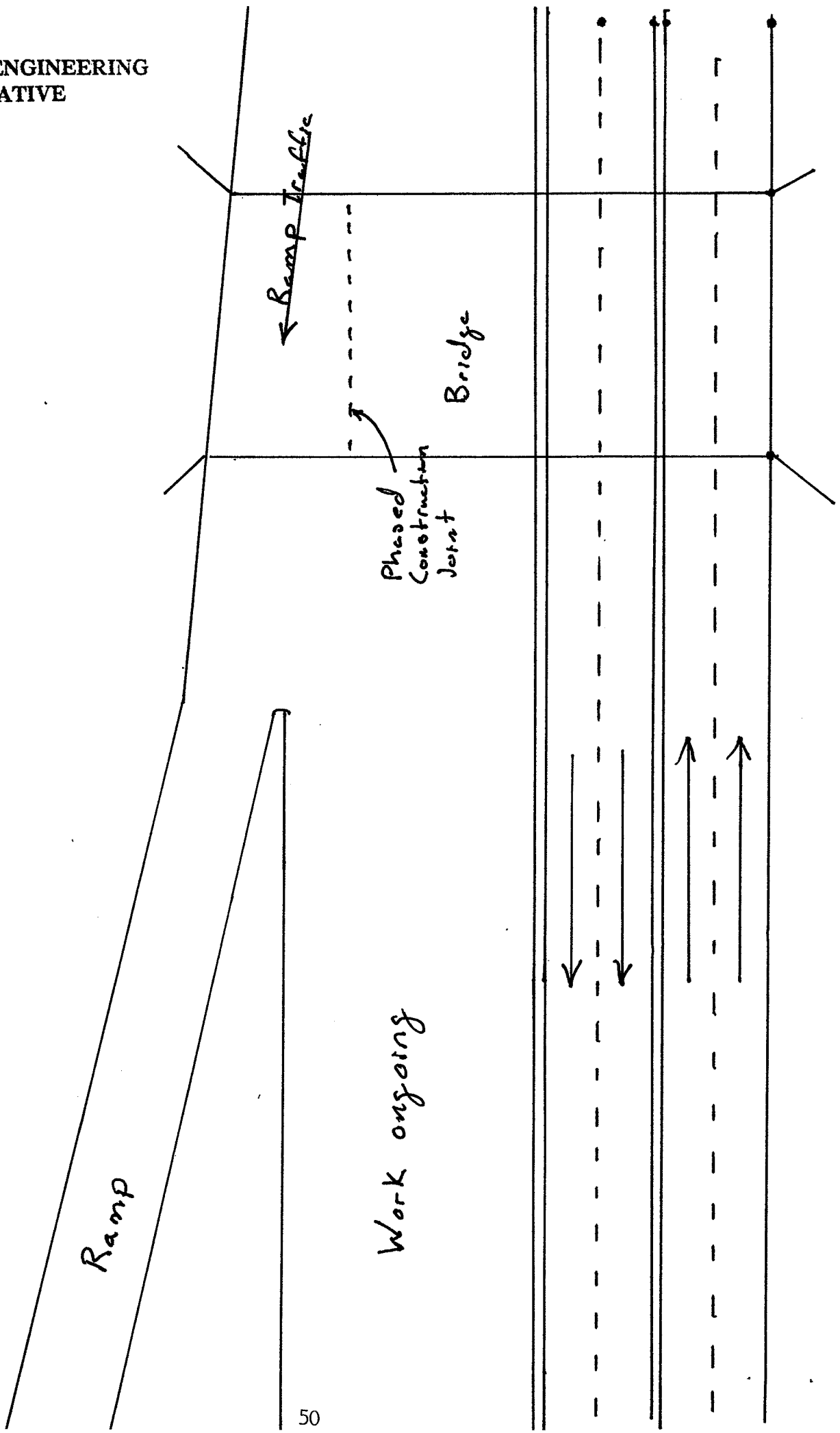
VALUE ENGINEERING ALTERNATIVE

VII. (A)(3) VALUE ENGINEERING ALTERNATIVE NUMBER 2

Value Engineering Alternative Number 2

Construct any bridge affecting a ramp, and thus ramp closures, part width. Maintain traffic on all ramps except during actual ramp work. Other main line bridges may be constructed "As Proposed".

VALUE ENGINEERING ALTERNATIVE



VII. (B) PAVEMENT DESIGN

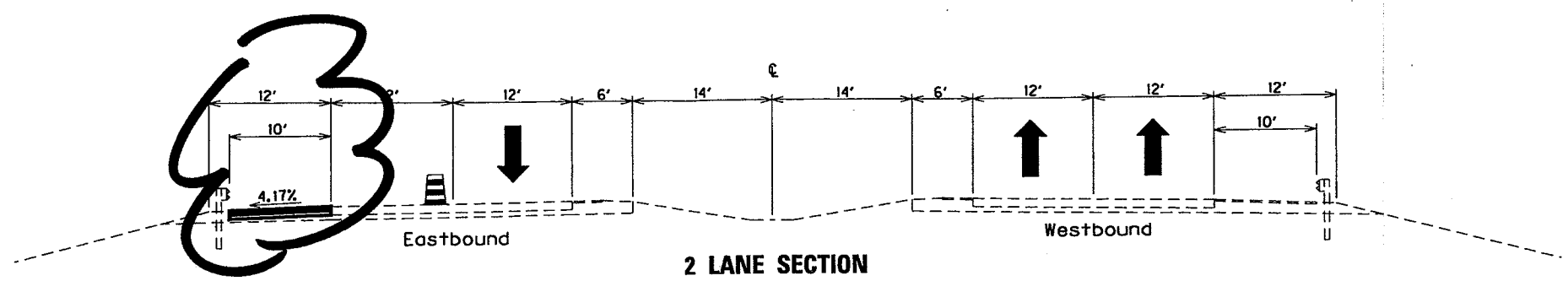
VII. (B)(1) AS PROPOSED

"As Proposed"

Excavate and replace the existing 10 ft. paved shoulder on the eastbound side with 10" of asphalt, trench and install the new edge drain at the outside of the paved shoulder, overlay all asphalt shoulders with a 9" PCC pavement.

COUNTY OF	ITEM NO.	S
JEFFERSON	5-2000.00	

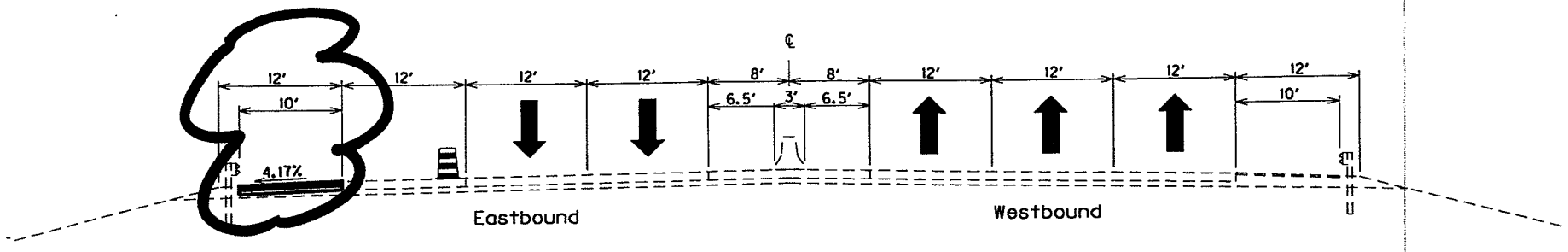
I–264 MAINTENANCE OF TRAFFIC PHASE 1 CONSTRUCTION



2 LANE SECTION

1) REMOVE THE EXISTING OUTSIDE SHOULDER TO A DEPTH OF 10 INCHES ON THE EASTBOUND SIDE OF I–264
2) CONSTRUCT A ASPHALT OUTSIDE SHOULDER AT LOCATIONS WHERE THE EXISTING OUTSIDE SHOULDER WAS REMOVED ON THE EASTBOUND SIDE OF I–264
3) CONSTRUCT TEMPORARY PAVEMENT AND SHOULDER FROM APPROXIMATE STATION 414+00 TO APPROXIMATE STATION 420+00 ON THE EASTBOUND SIDE OF I–264
4) CONSTRUCT THE OUTSIDE OF THE ASPHALT WEDGES ON THE EASTBOUND SIDE OF I–264

STANDARD DRAWINGS LANE CLOSURE CASE II WILL APPLY



3 LANE SECTION

1) REMOVE THE EXISTING OUTSIDE SHOULDER TO A DEPTH OF 10 INCHES ON THE EASTBOUND SIDE OF I–264
2) CONSTRUCT A ASPHALT OUTSIDE SHOULDER AT LOCATIONS WHERE THE EXISTING OUTSIDE SHOULDER WAS REMOVED ON THE EASTBOUND SIDE OF I–264
3) CONSTRUCT ASPHALT WEDGES ON THE EASTBOUND SIDE OF I–264

STANDARD DRAWINGS LANE CLOSURE CASE II WILL APPLY

"AS PROPOSED"

PREPARED BY _____ DATE _____
CHECKED BY _____ DATE _____
APPROVED BY _____ DATE _____

FILE: MOTPL.DGN
DATE: 08-Sep-02 13:59
USERNAME: civ-digger

Not to Sca

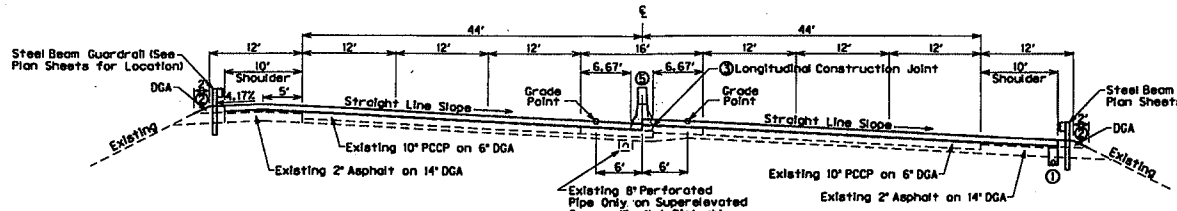
I-264 MAINTENANCE OF TRAFF

COUNTY OF	ITEM NO.	SHEET NO.
JEFFERSON	5-2000.00	82

TYPICAL SECTIONS

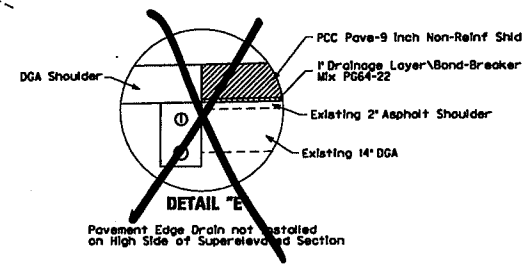
PCC OVERLAY ON EXISTING PCC PAVEMENT
USE FOR EXISTING 6 LANE SECTION

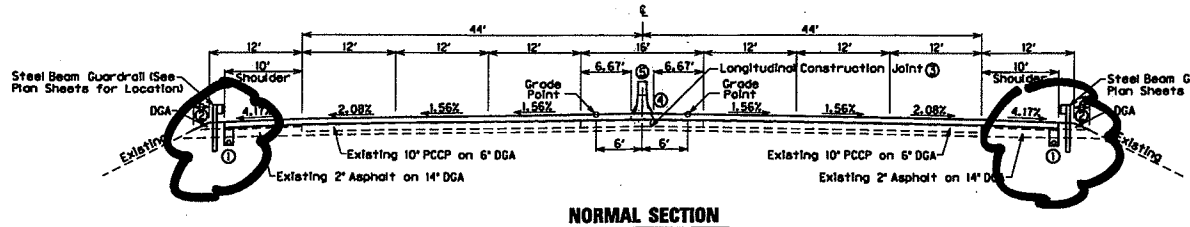
"AS PROPOSED"



NOTE: (Mainline & Ramps)
The slope of superelevated shoulders shall be equal to the rate of PAVEMENT Superelevation but shall not be flatter than 4.17%.

SUPERELEVATED SECTION





NORMAL SECTION

NOTE

The Contractor shall remove all asphalt patching material prior to placement of bond-breaker. The materials removed shall become the property of the Contractor. The cost of removal and disposal of the materials shall be incidental to "Drainage Layer\Bond-Break Mix". The removal of patches in excess of 5" in depth shall be determined by the Engineer on Construction.

PAVEMENT OVERLAY

Traffic Lanes	Shoulders
Approximately 1" ····Drainage Layer\Bond-Breaker Mix PG64-22	Approximately 1" ····Drainage Layer\Bond-Breaker Mix PG64-22
Approximately 9"····PCC Pavement-9 Inch Non-Reinf	Approximately 9"····PCC Pavement-9 Inch Non-Reinf Shld

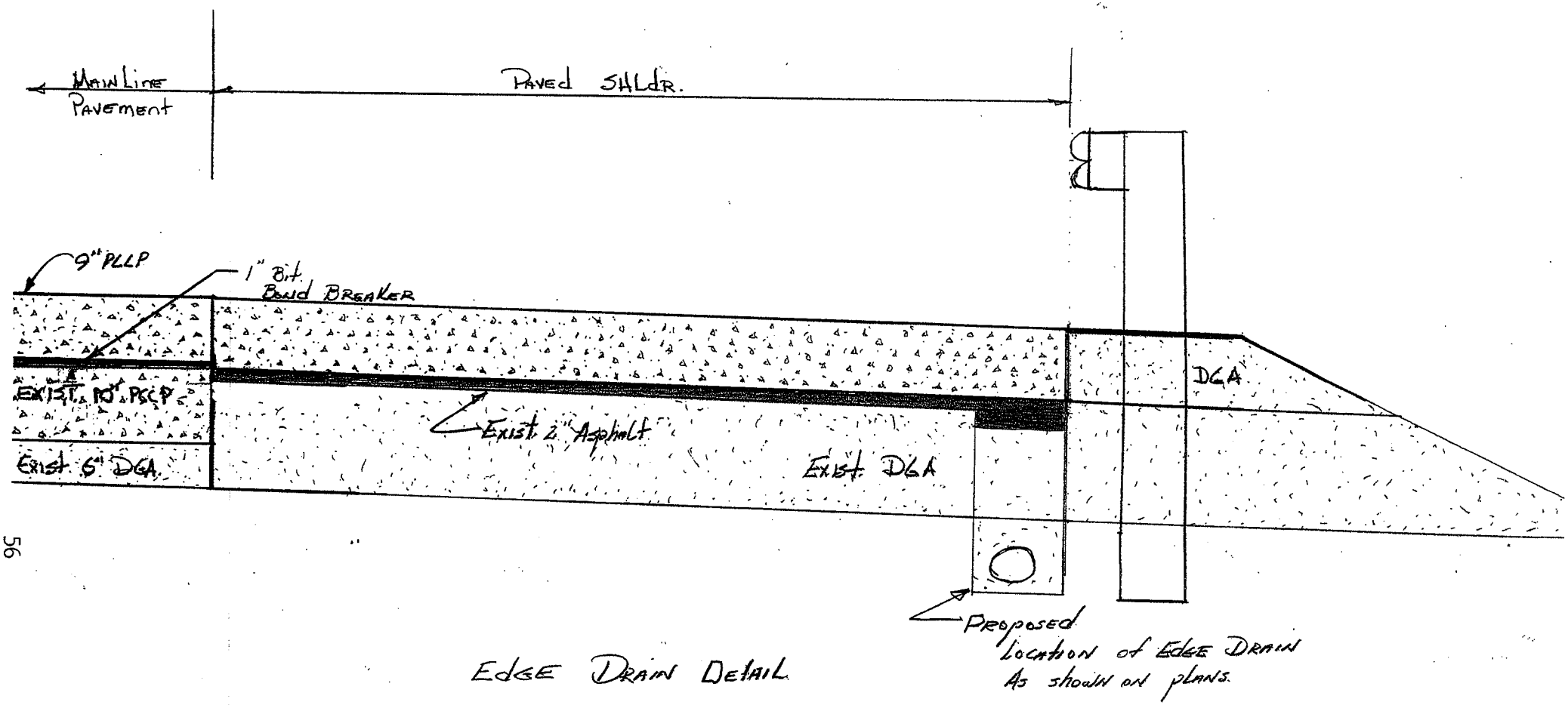
NOTES

① Longitudinal Pavement Edge Drain Detail (See Sheet B27)

② Asphalt Seal Coat Required from the Outside Edge of the Paved Shoulder to a Point 2' Down the Ditch or Fill Slope. Two (2) Applications at the rate of:
2.40 lbs/sq yd Item 291 Emulsified Asphalt RS-2
20 lbs/sq yd Item 100 Asphalt Seal Aggregate (Size No. 8 or 9M)

③ The longitudinal construction joint shall be placed at this location when the superelevation is banked as shown (left to right) When the superelevation is reversed (right to left) the longitudinal construction joint shall be placed on the opposite side of the Concrete Barrier Median. No tie steel shall be required.

④ The longitudinal construction joint shall be placed at the location shown or at similar position on the opposite side of the barrier at the option of the contractor. No tie



Edge Drain Detail

"AS PROPOSED"

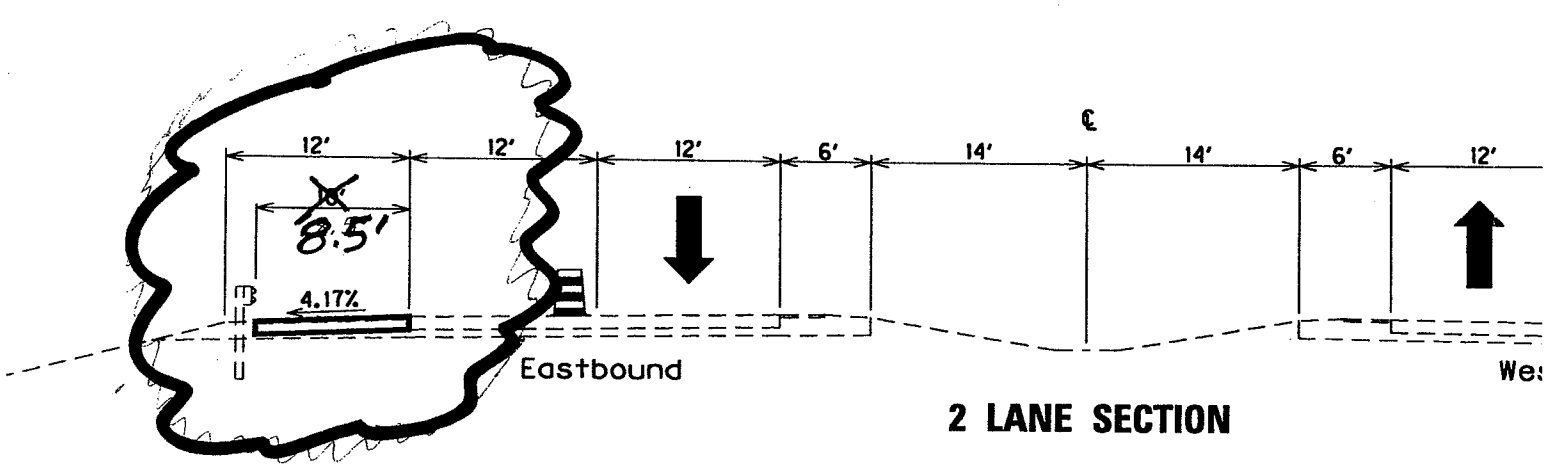
VII. (B)(2) VALUE ENGINEERING ALTERNATIVE NUMBER 1

Value Engineering Alternative Number 1

In lieu of 10 foot of the asphalt shoulder, only remove approximately 8.5 feet of shoulder width and allow the guardrail to remain in place without any interference. The traffic will not be running on this 1.5 ft. strip of shoulder. Before this shoulder is overlaid with full depth concrete on the subsequent phase, the edge drain installation would remove and replace this strip of shoulder.

I–264 MAINTENANCE OF
PHASE 1 CONSTRUC

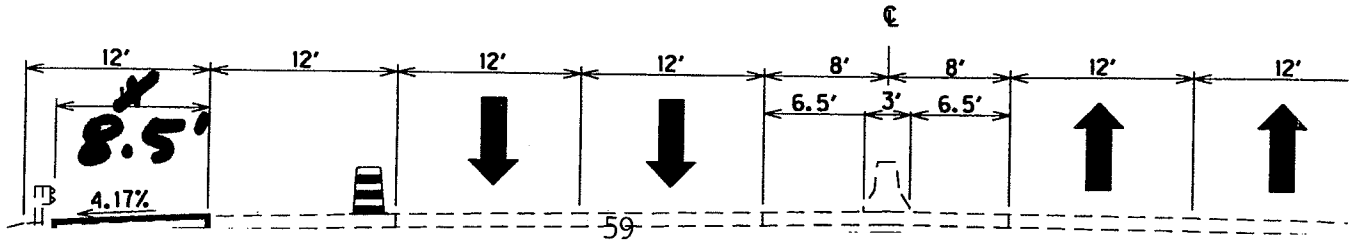
VALUE ENGINEERING
ALTERNATIVE



2 LANE SECTION

1) REMOVE THE EXISTING OUTSIDE SHOULDER TO A DEPTH OF 10 INCHES ON T
2) CONSTRUCT A ASPHALT OUTSIDE SHOULDER AT LOCATIONS WHERE THE EXIS
REMOVED ON THE EASTBOUND SIDE OF I–264
3) CONSTRUCT TEMPORARY PAVEMENT AND SHOULDER FROM APPROXIMATE ST
APPROXIMATE STATION 420+00 ON THE EASTBOUND SIDE OF I–264
4) CONSTRUCT THE OUTSIDE OF THE ASPHALT WEDGES ON THE EASTBOUND SI

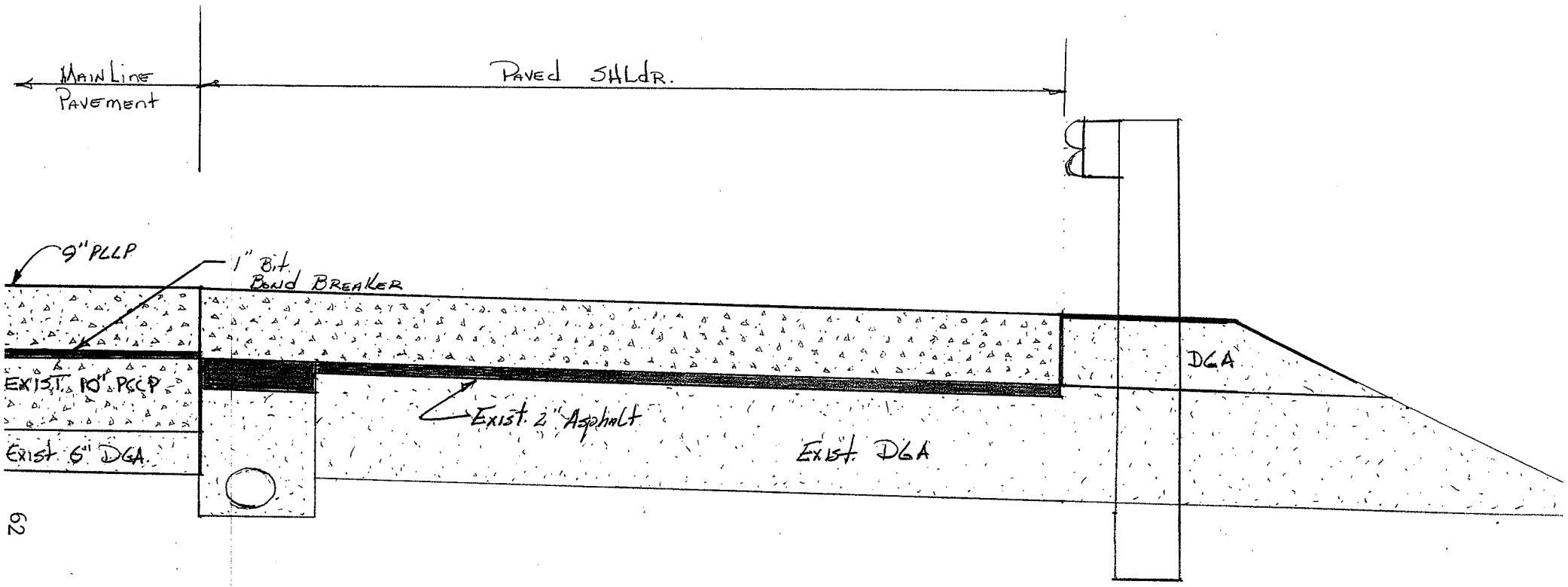
STANDARD DRAWINGS LANE CLOSURE CASE II WILL APPLY



VII. (B)(3) VALUE ENGINEERING ALTERNATIVE NUMBER 2

Value Engineering Alternative Number 2

Relocate the edge-drains to be adjacent to the mainline travel lanes.

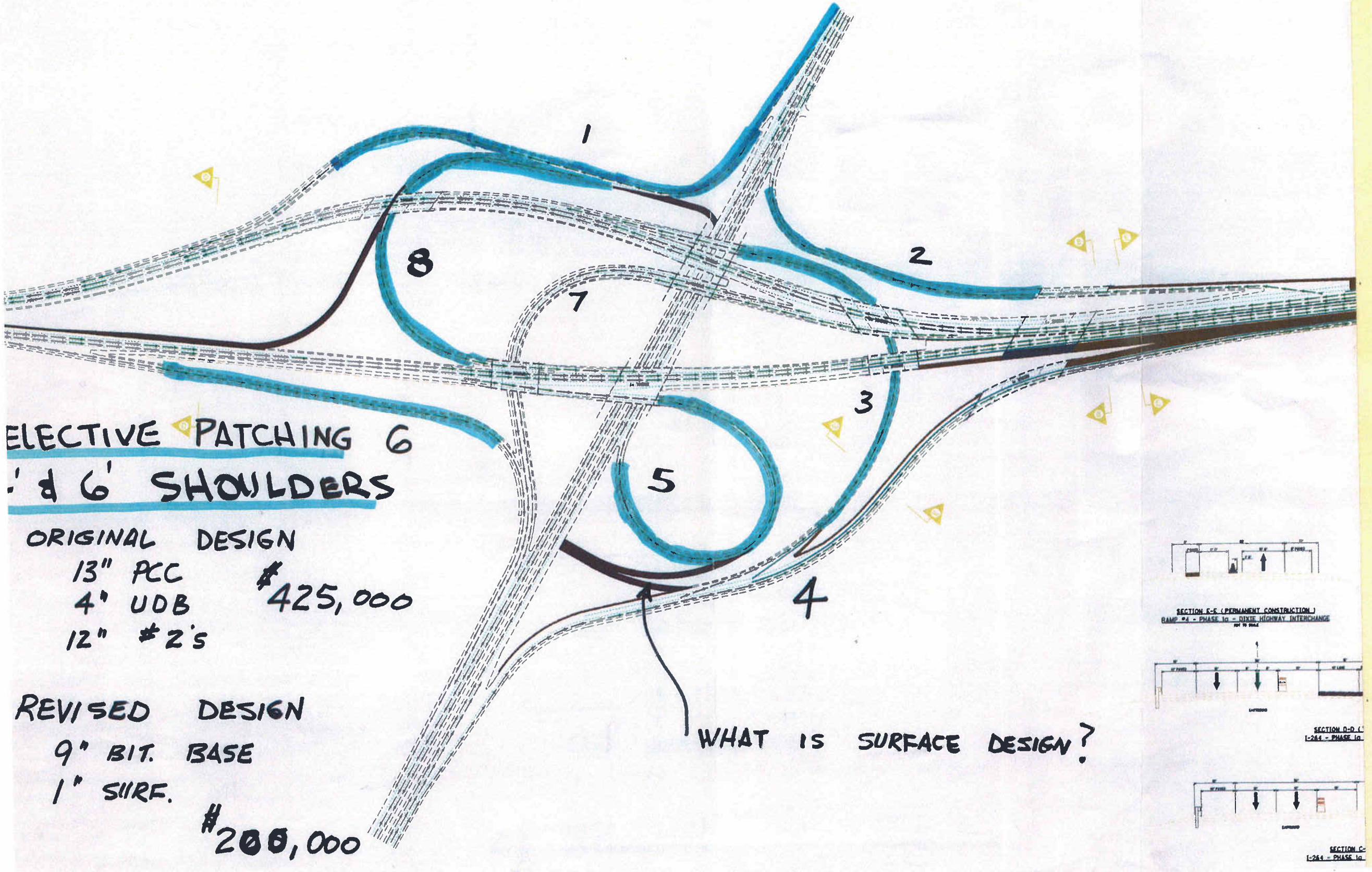


Edge Drain Relocation Detail

VII. (B)(4) VALUE ENGINEERING ALTERNATIVE NUMBER 3

Value Engineering Alternative Number3

Only mill and replace the ramp shoulders with asphalt pavement within the Dixie Highway Interchange adjacent to the sections where the existing ramp pavement is to be retained.



ELECTIVE PATCHING 6
'd 6' SHOULDERS

ORIGINAL DESIGN
13" PCC
4" UDB
12" #2's
#425,000

REVISED DESIGN
9" BIT. BASE
1" SURF.
#200,000

VALUE ENGINEERING ALTERNATIVE
PAVEMENT DESIGN
COST COMPARISON

DESCRIPTION	UNITS	UNIT COST	PROP'D QTY.	PROP'D COST	V.E. QTY.	V.E. COST
13" PCCP	SY	$37.00	7050.0	$260,850	0.0	$0
4"UDB	TN	$16.00	1620.0	$25,920	0.0	$0
12" #2	TN	$14.00	4865.0	$68,110	0.0	$0
EXCAVATION	CY	$12.00	5900.0	$70,800	2350.0	$28,200
9" BASE		$40.00	0.0	$0	3650.0	$146,000
1" SURFACE		$60.00	0.0	$0	410.0	$24,600
GRAND TOTAL				**$425,680**		**$198,800**

POSSIBLE SAVINGS

$226,880

Supporting documentation/engineering analysis/back-up calculations as needed

		4' Lt.	6' RT
RAMP	1	1370'	1370
	2	1100	850
	3	1100	1160
	4	0	0
	5	1180	1180
	6	800	800
	7	—	—
	8	950	950
		6500'	6250'

7050 SY

VALUE ENGINEERING ALTERNATIVE

VII. (C) CONTRACT TIME AND METHOD

VII. (C)(1) AS PROPOSED

"As Proposed"

Specify fixed completion date with an incentive/ disincentive adjustment for early or late completion.

Specify maximum ramp closure time with I/D adjustment for early or late completions. The I/D amount should be based on traffic volumes, length of detours and neighborhood impact.

Two lanes of traffic are going to be maintained throughout the project, but there may be times that a lane may need to be closed. Need to specify hours that temporary mainline lane closures may be used for delivery of bridge beams, setting, relocating median barrier wall. Penalty for not opening by designated hour needs to be specified.

CONTRACT TIME

- Fixed Coml. Date with I/D Adjustment
  - Cap for early completion
  - Two years (CPM Schedule Needed)
- Specify Max Closure Time for Ramps with I/D.
  - I/D Ramp Specific
- For Dixie Hwy. Interchange part specify time for completing with I/D.
- For maintaining two lanes for ML specify hours that lane may be closed without penalty for exceeding.

CONCERNS

- Not an attractive project to many
- Good coordination and cooperation are critical
- Contractor sees high risks
- Access to Work Site/Materials/Storage Areas
- Night-time work
- High cost

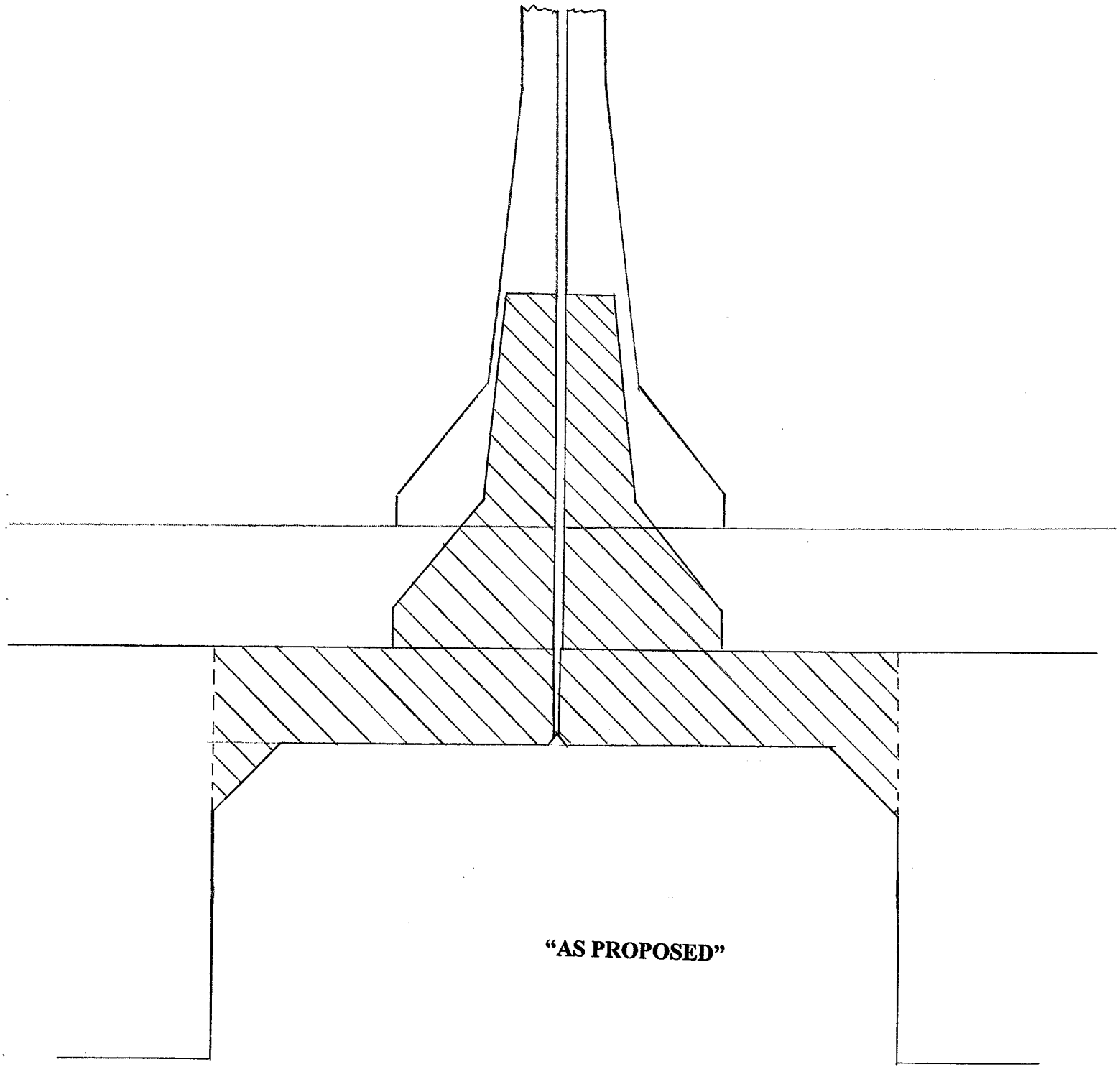
VII. (D) CONSTRUCTABILITY

VII. (D)(1) AS PROPOSED

"As Proposed"

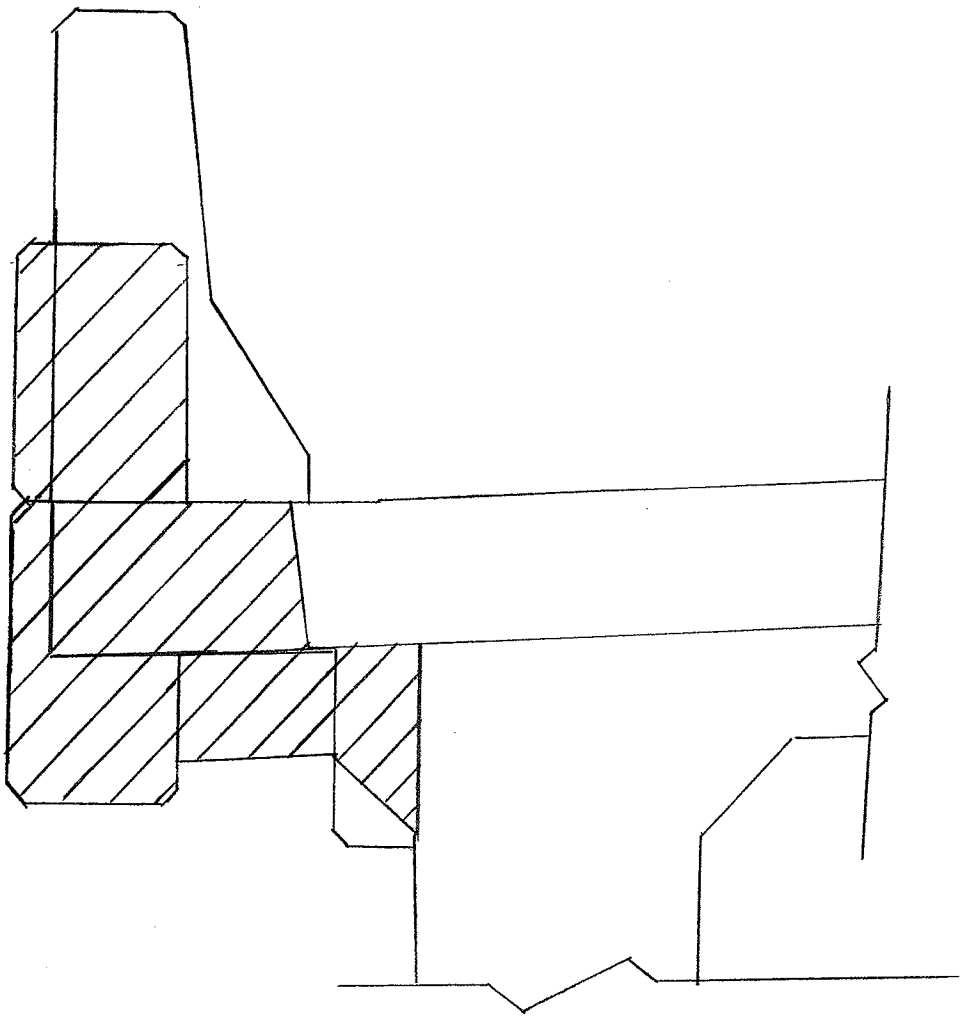
The eight twin-RCDG bridges to receive the ten-inch overlay shows existing concrete to be removed to the top of the girders in both the median area and over hang area. There is a top and bottom mat of epoxy rebar in the ten-inch overlay slab.

As Proposed



"AS PROPOSED"

As Proposed



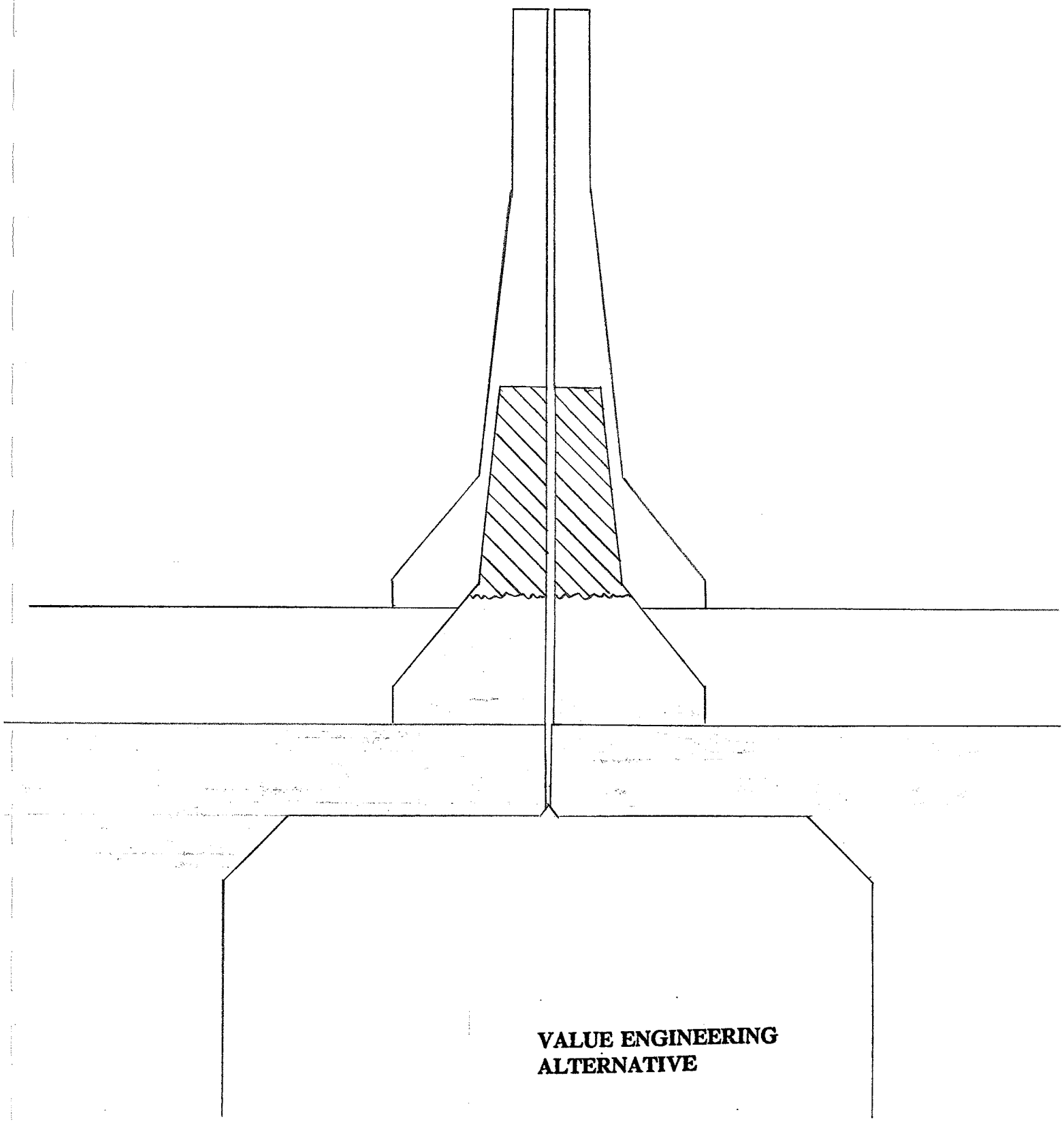
"AS PROPOSED"

VII. (D)(2) VALUE ENGINEERING ALTERNATIVE

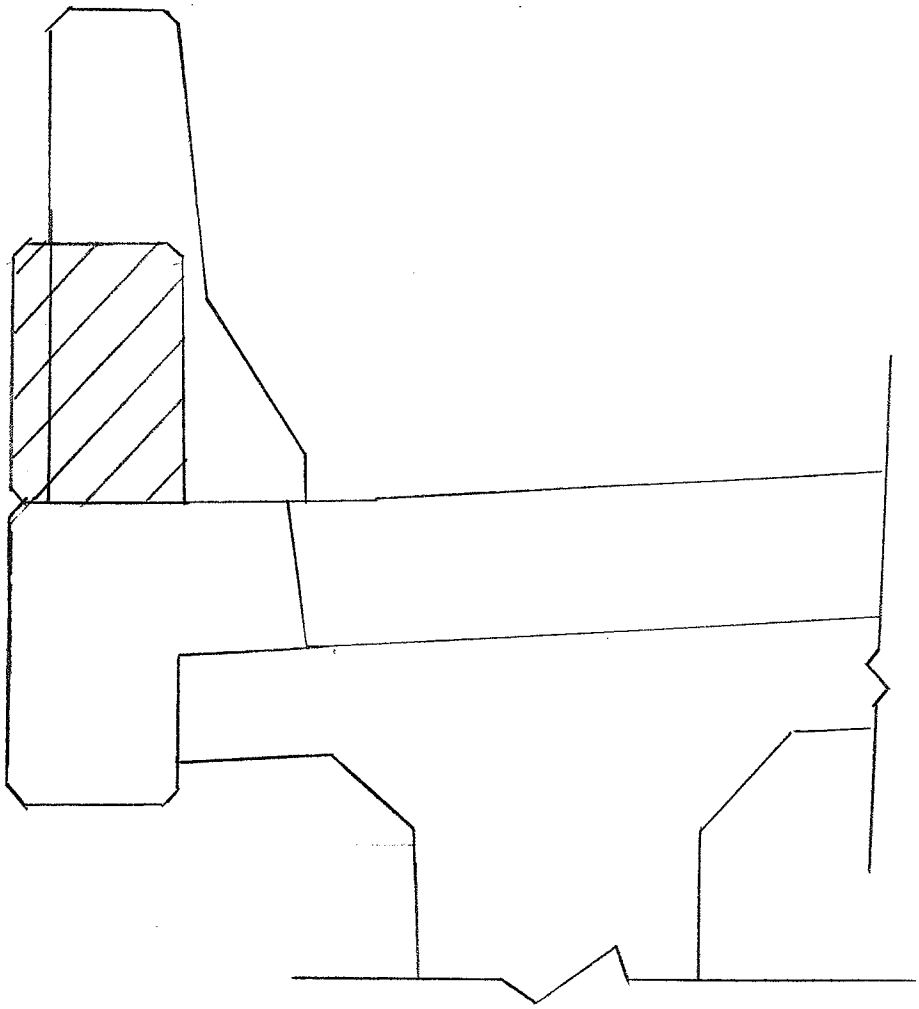
Value Engineering Alternative

Remove only the concrete above the brush block on the overhang and above the overlay in the median area. If the two mats of epoxy rebar are needed for the overhang only, omit and use fiber reinforced concrete.

V E ALTERNATIVE



V. E. ALTERNATIVE



VALUE ENGINEERING ALTERNATIVE

Savings

Epoxy Coated Rebar	1513816 lbs @ 0.63	= $953704.00
Remove Conc. Masonry	544 CY @ 300.00	= 163200.00
"AA" Concrete	357 CY @ 350.00	= 124950.00
		$1,241,854.00
5197 CY @ 5.00	- Fiber Reinf.	25985.00
	Net Saving	$1,215,869.00

Time savings ≈ 1 week/bridge (single)*

* This will not extend to 16 weeks because of concurrent activities

VIII. DESIGN COMMENTS

DESIGN COMMENTS

- Need to consider trimming trees and shrubs along ramps and mainline
- Consider diamond grinding of the mainline and grooving and grinding of the bridge decks
- Consider replacing wedge curb at outside edge of shoulder
- Need to core shoulders to verify structure prior to letting
- Consider inspecting cross drains prior to construction
- Transition Ramp paving form mainline to existing ramp as rapidly as geometrically possible
- Should pedestrian bridges be upgraded to meet ADA requirements

IX. SUMMARY OF RECOMMENDATIONS

SUMMARY OF RECOMMENDATIONS

It is the recommendation of the Value Engineering Team that the following Value Engineering Alternatives be carried into the Project Development process for further development.

A. TRAFFIC AND CONSTRUCTION PHASING

Recommendation Number 1 – Value Engineering Alternative Number 1 - move traffic to outside.
(May be submitted as a VECP by the contractor after award of the project)

Recommendation Number 2 – Value Engineering Alternative Number 2 – Allow phased construction of bridges.

B. PAVEMENT DESIGN

Recommendation Number 3 – Value Engineering Alternative Number 1 –Only excavate outside shoulder 8.5 feet in lieu of 10'.

Savings $200,000

Recommendation Number 4 – Value Engineering Alternative Number 2 – Relocate the edge drains to be adjacent to the travel lane.

Recommendation Number 5 –Value Engineering Alternative Number 3 – Only mill and replace ramp shoulders with asphalt pavement within the Dixie Highway Interchange adjacent to the sections where the existing ramp pavement is to be retained.

Recommendation Number 6 – Value Engineering Alternative – Only remove the bridge rails and barrier down to the existing deck evaluation.

Savings $1,200,000

I-264 PAVEMENT AND BRIDGE DECK REHABILITATION
VALUE ENGINEERING STUDY PRESENTATION
SEPTEMBER 13, 2002

NAME	AFFILIATION	PHONE
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T.C. Chambers	KYTC-Construction	270/824-7080
Siamack Shafaghi	KYTC-Design	502/564-3280
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Gilbert Newman	Balke Engineer	859/271-7545
Art Duncan	WMB Enginners	859/299-5226
Phil Banton	Loolpert LLp	606/239-1948
Anaias Calvin	KYTC-CO Hgihway	502/564-3280
Joette Fields	KYTC, Highway Design	502/564-3280
Steven Criswell	KYTC-Construction	502/564-4780
Dudley Brown	FHWA	502/2336749
Dan Hite	C.O. Design	502/564-3280
Tim Layson	KYTC –Design	502/564-3280
Ken Sherry	KYTC	502/564-3730
Robert Early	FHWA	502/223-6744
Ralph Norman	Woolpert LLP	606/329-1948
Gary W. Sharpe	KYTC Design	502/564-3280
Steve Goodpastor	KYTC Bridges	502/564-4560
Charles Briggs	Operations	502/564-0556
Andre Johana	KYTC- Design	502/564-3280
Carl B. Jenkins	KYTC D-5	502/458-3432

Value Engineering Study on:

I-64 / I-265 & US-60 / I-265 Interchanges

Middletown, KY

In conjunction with:

KENTUCKY TRANSPORTATION CABINET

Presented by:

URS Group, Inc.

Summary of Recommendations

US-60 / I-265 Interchange

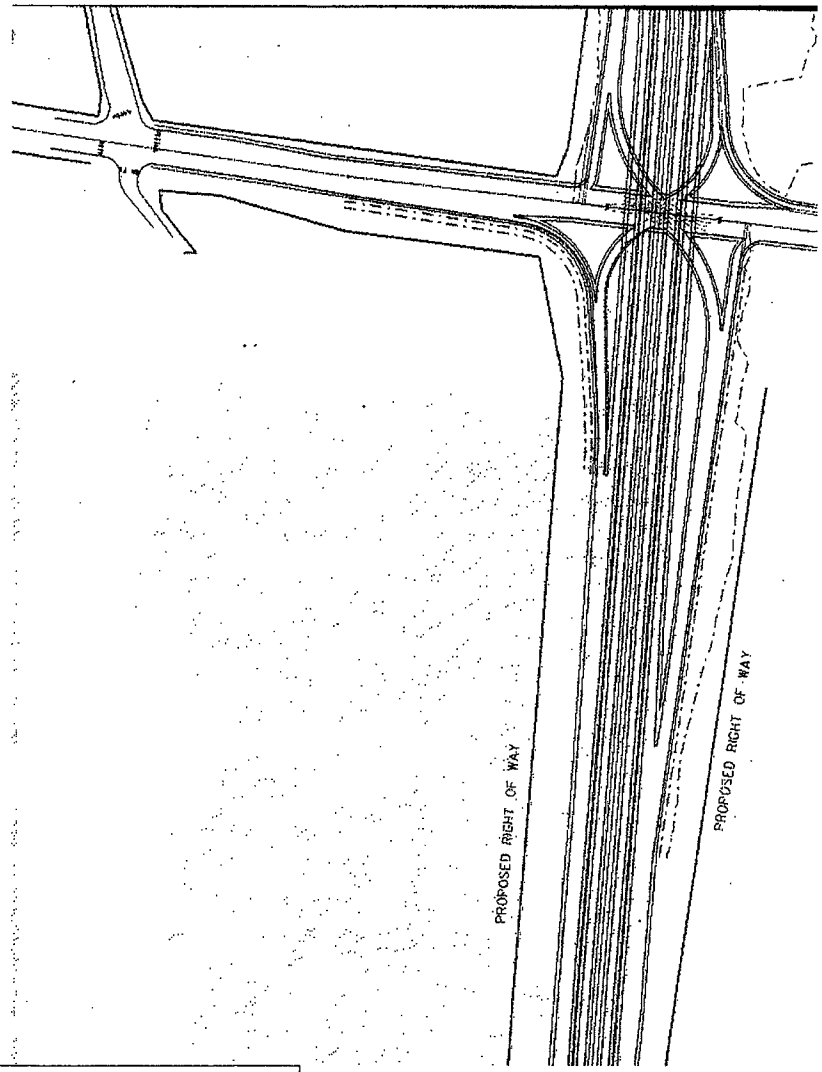
Rec.#	Recommendation Title / Description	1st cost savings (or cost)	Team Member
10	Keep existing US-60 interchange and construct an I-265 NB flyover ramp connecting to US-60 WB via Urton Lane	($123,534)	Jon C.
2	Provide alternative access to development parcels	$9,773,420	Dave W.
12	Eliminate sound wall protection on both interchanges	$5,568,000	Dave W.
1	Construct retaining walls in northwest quadrant of US-60 / I-265 Interchange to reduce ROW	$4,137,500	C.W.
18	Consider using 10' shoulder width versus 12' shoulder widths	$2,145,910	C.W.

I-64 / I-265 Interchange

Rec.#	Recommendation Title / Description	1st cost savings (or cost)	Team Member
3	Shorten Pope Lick Bridge by making it perpendicular to I-265	$414,750	C.W.
4	Realign Pope Lick Rd. to more closely parallel I-64/I-265 EB/SB ramp	$904,000	Dave W.
1	Modify ramps at the I-265 & I-64 Interchange	$12,803,499	Steve C.

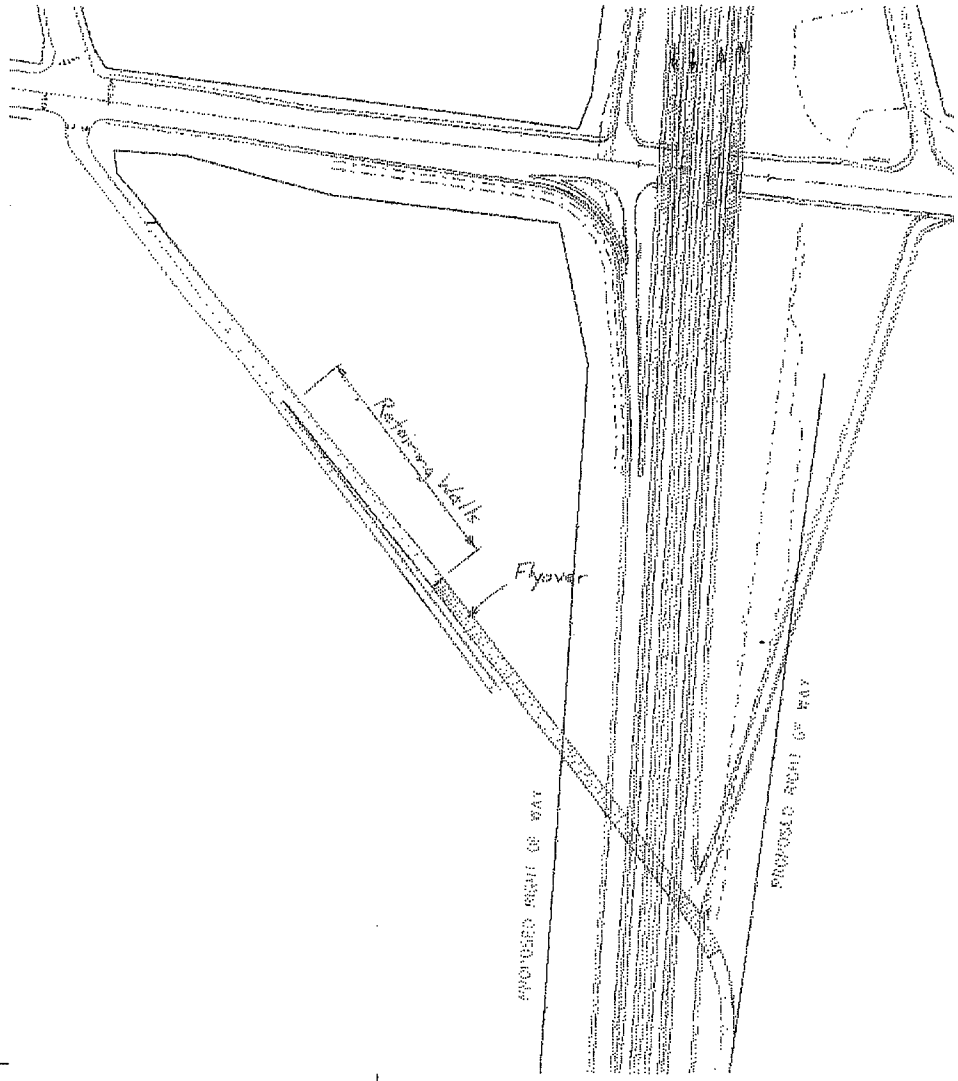
URS Group, Inc.

Provide I-265 NB to WB Flyover



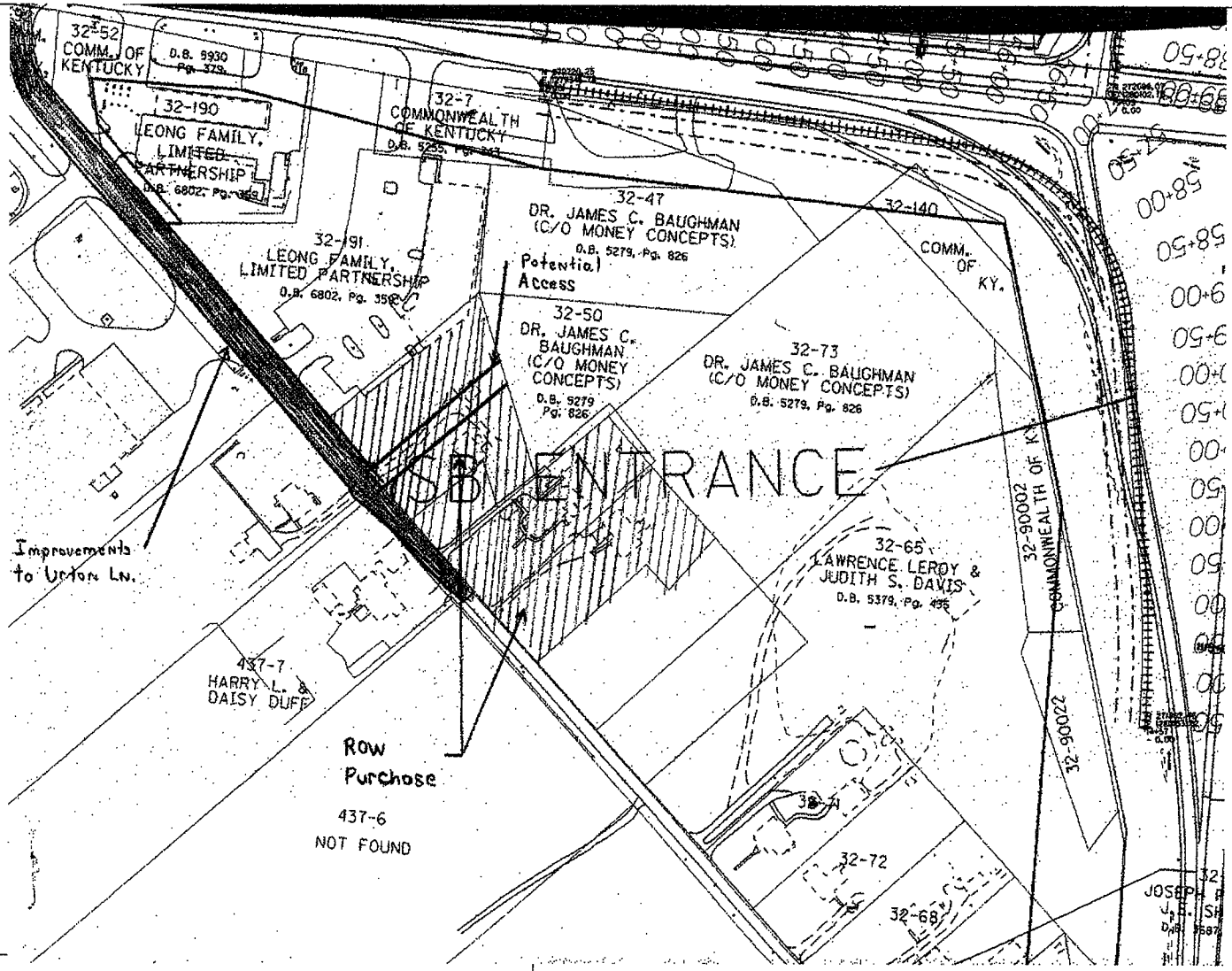
URS Group, Inc.

Provide I-265 NB to WB Flyover



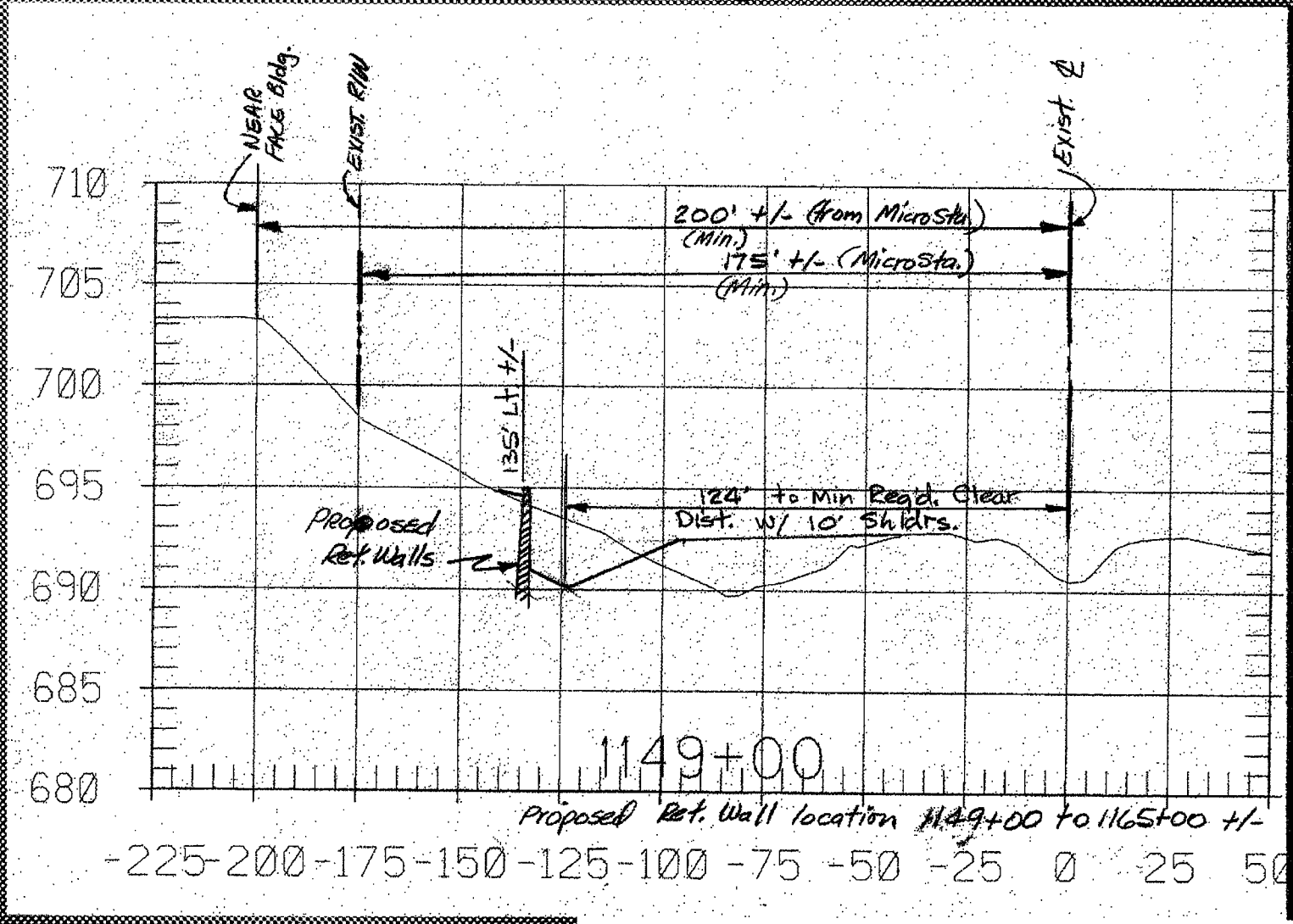
URS Group, Inc.

Provide Alternative Access



URS Group, Inc.

Construct Retaining Walls



Summary of Design Comments

I-64 / I-265 Interchange		
7	Use bituminous/asphalt for paving	Mike M.
15	Make provisions for future Urton Road underpass under I-64	Dave W.
16	Preliminary cost estimate does not reflect total construction proposed	Dave W.
17	Review specific project limits	Dave W.
US-60 / I-265 Interchange		
3	Sell state-owned excess right of way not necessary for project	Dave W.
17	Consider partial use of high mast lighting	Dave W.
5	Relocate collector/distributor roads	Jon C.
11	Control traffic flow on and off ramps with ITS system / traffic signals	Jon C.