VALUE ENGINEERING CONSTRUCTABILITY STUDY
OF THE

SR 92/FAIRBURN ROAD INTERCHANGE WITH I-20

PROJECT NUMBER: IM-NH-20-1(73)

PI NUMBER: 712930

DOUGLAS COUNTY, GEORGIA

ATLANTA, GEORGIA

August 14-15, 2006

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

In Association With:

Georgia Department of Transportation

VALUE ENGINEERING STUDY
TEAM LEADER

_____

William F. Ventry, P.E., C.V.S.
C.V.S. Registration No. 840603(LIFE)

Date: _____

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I. INTRODUCTION

GENERAL

This Value Engineering report summarizes the results of the Value Engineering study performed by VE GROUP for the Georgia Department of Transportation. The study was performed on August 14-15, 2006.

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

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

- Traffic Control
- Length of Construction
- Ease of Construction
- Impact to Businesses
- Impact to Local Traffic
- Impact to I-20 Traffic

I. INTRODUCTION

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 the final plans and specifications.

RECOMMENDATION NUMBER 1- STAGE CONSTRUCTION

The Value Engineering Team recommends that the Value Engineering Alternative be implemented. ***This alternative builds the right side of the proposed new bridge to maintain traffic, eliminates the temporary bridge, uses MSE walls to facilitate construction of the bridge and uses drill shaft foundations.***

If this recommendation can be implemented, there is a possible savings of ***$2,894,120.***

RECOMMENDATION NUMBER 2- CONSTRUCTION TIME

The Value Engineering Team recommends that the Value Engineering Alternative be implemented. ***This alternative reduces the construction time to 24 months.***

RECOMMENDATION NUMBER 3- CONTRACTOR WORK HOURS

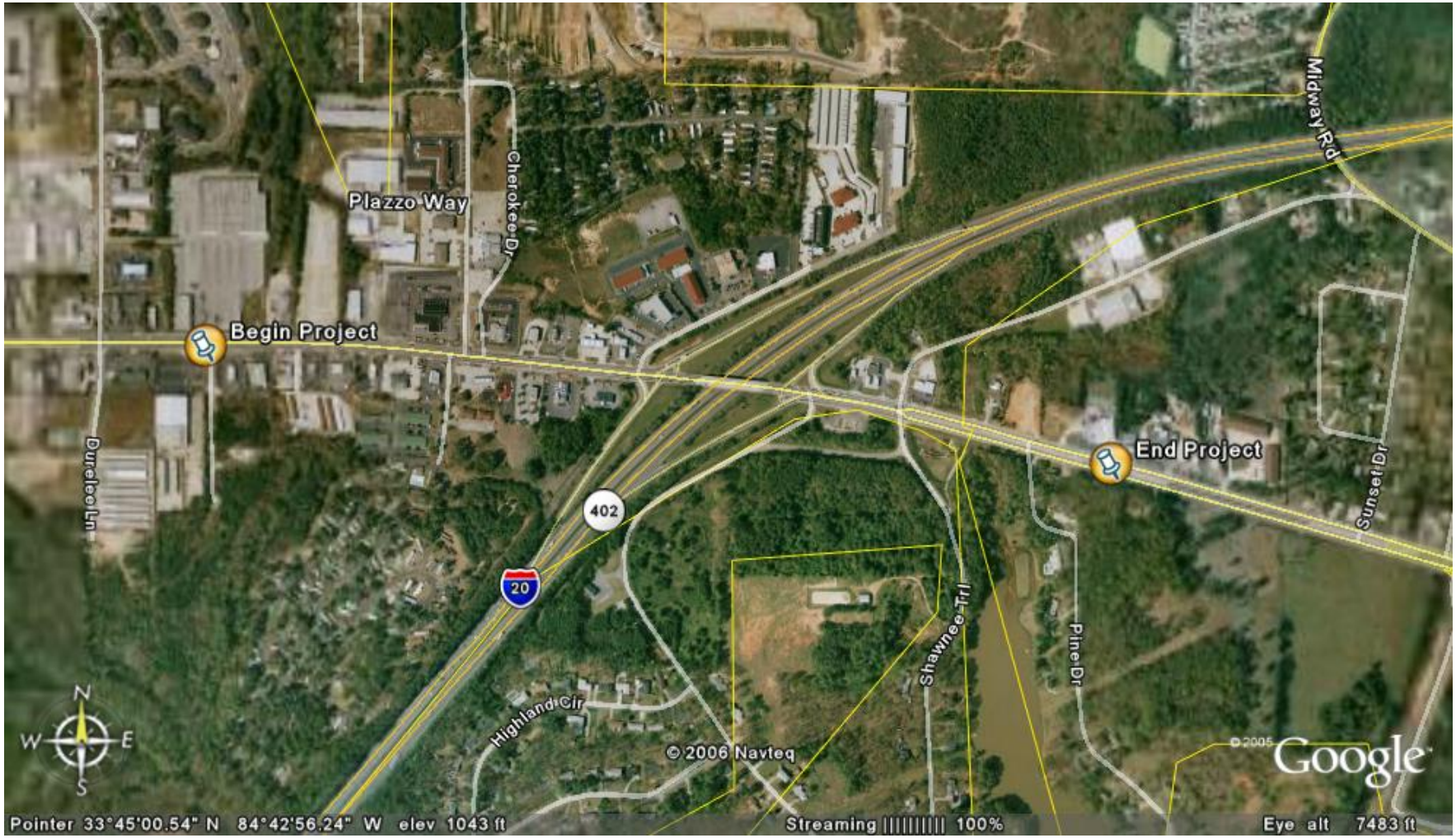
The Value Engineering Team recommends that the Value Engineering Alternative be implemented. ***This alternative clarifies lanes closures on I-20.***

RECOMMENDATION NUMBER 4- CONSTRUCTABILITY

The Value Engineering Team recommends that the Value Engineering Alternative be implemented. ***This alternative uses drill shaft foundations.***

If this recommendation can be implemented, there is a possible savings of ***$102,735.***

II. LOCATION OF PROJECT



III. TEAM MEMBERS AND PROJECT DESCRIPTION

TEAM MEMBERS

NAME	AFFILIATION	EXPERTISE	PHONE
William F. Ventry, P.E., C.V.S.	VE Group	Team Leader	850/627-3900
Dickey Forrester	VE Group	Construction	850-627-3900
Tom Hartley, P.E., C.V.S.	VE Group	Roadway Design/Traffic	850/627-3900
John Ledbetter, Jr., P.E., R.L.S.	VE Group	Structures	850/627-3900

PROJECT DESCRIPTION

This project consists of the improvement of SR 92/Fairburn Road interchange with I-20 in Douglas County. The proposed typical section will consist of six 12 ft. lanes with a 20 ft. raised median. In addition, two future lanes will be added and striped out. The improvements will include dual left turn lanes onto both eastbound and westbound I-20. The existing bridge over I-20 will be widened to accommodate 10 lanes of traffic; this will include the four through lanes, four left turn lanes, and the two future lanes. In addition to the upgrades on the SR 92, Westmorland Plaza Frontage Road will be closed at SR 92 and relocated northerly to Cherokee Boulevard. The total project length is approximately 1 mile.

IV. INVESTIGATION PHASE

VALUE ENGINEERING STUDY BRIEFING

SR 92/FAIRBURN ROAD INTERCHANGE WITH I-20 **August 14-15, 2006**		
NAME	AFFILIATION	PHONE
William F. Ventry, P.E., C.V.S.	VE Group	850/627-3900
Dickey Forrester	VE Group	850/627-3900
Tom Hartley, P.E., C.V.S.	VE Group	850/627-3900
John Ledbetter, Jr., P.E., R.L.S.	VE Group	850/627-3900
Andy Casey	Road Design	404/656-5406
Chris Rudd	Road Design	404/656-9757
Lionel Alexander	Bridge	404/656-5195
Laura Rish	OEL	404/699-4439
Tim Matthews	Road Design	404/656-5406
Michael Lankford	D-7 Construction	404/599-6699
Lisa Myers	Engineering Services	404/651-7468

STUDY RESOURCES

NAME	AFFILIATION	PHONE
Troy Paterson	GDOT	404/656-6845
Gene McKissick	GDOT	404/656-6849
Tim Mathews	GDOT	404/656-5406
Andy Casey	GDOT	404/656-5406
Joe Bailey	Tensar	800/836-7271

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:

I. STAGE CONSTRUCTION

A. TEMPORARY DETOUR

II. CONSTRUCTION TIME

A. LENGTH OF TIME

III. CONTRACTOR WORK HOURS

A. LANE CLOSURES

IV. CONSTRUCTABILITY

A. BRIDGE FOUNDATIONS

V. SPECULATION PHASE

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

I. STAGE CONSTRUCTION

A. TEMPORARY DETOUR

- Build right side of proposed new bridge to maintain traffic.
- Eliminate the temporary bridge.
- Use MSE walls to facilitate construction of bridge.
- Use drill shaft foundations.

II. CONSTRUCTION TIME

A. LENGTH OF TIME

- Reduce the construction time to 24 months.

III. CONTRACTOR WORK HOURS

A. LANE CLOSURES

- Reduce or clarify lanes closures on I-20.

IV. CONSTRUCTABILITY

A. BRIDGE FOUNDATIONS

- Use drill shaft foundations.

VI. EVALUATION PHASE

A. ALTERNATIVES

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

I. STAGE CONSTRUCTION

A. TEMPORARY DETOUR

Value Engineering Alternative: ***Build right side of the proposed new bridge to maintain traffic, eliminate the temporary bridge, and use MSE walls to facilitate construction of bridge and use drill shaft foundations.***

II. CONSTRUCTION TIME

A. LENGTH OF TIME

Value Engineering Alternative: ***Reduce the construction time to 24 months.***

III. CONTRACTOR WORK HOURS

A. LANE CLOSURES

Value Engineering Alternative: ***Reduce or clarify lanes closures on I-20.***

IV. CONSTRUCTABILITY

A. BRIDGE FOUNDATIONS

Value Engineering Alternative: ***Use drill shaft foundations.***

VII. DEVELOPMENT PHASE

I. STAGE CONSTRUCTION

A. TEMPORARY DETOUR

(1) AS PROPOSED
(2) VALUE ENGINEERING ALTERNATIVE

II. CONSTRUCTION TIME

A. LENGTH OF TIME

(1) AS PROPOSED
(2) VALUE ENGINEERING ALTERNATIVE

III. CONTRACTOR WORK HOURS

A. LANE CLOSURES

(1) AS PROPOSED
(2) VALUE ENGINEERING ALTERNATIVE

IV. CONSTRUCTABILITY

A. BRIDGE FOUNDATIONS

(1) AS PROPOSED
(2) VALUE ENGINEERING ALTERNATIVE

VII. DEVELOPMENT PHASE

I. STAGE CONSTRUCTION

A. TEMPORARY DETOUR

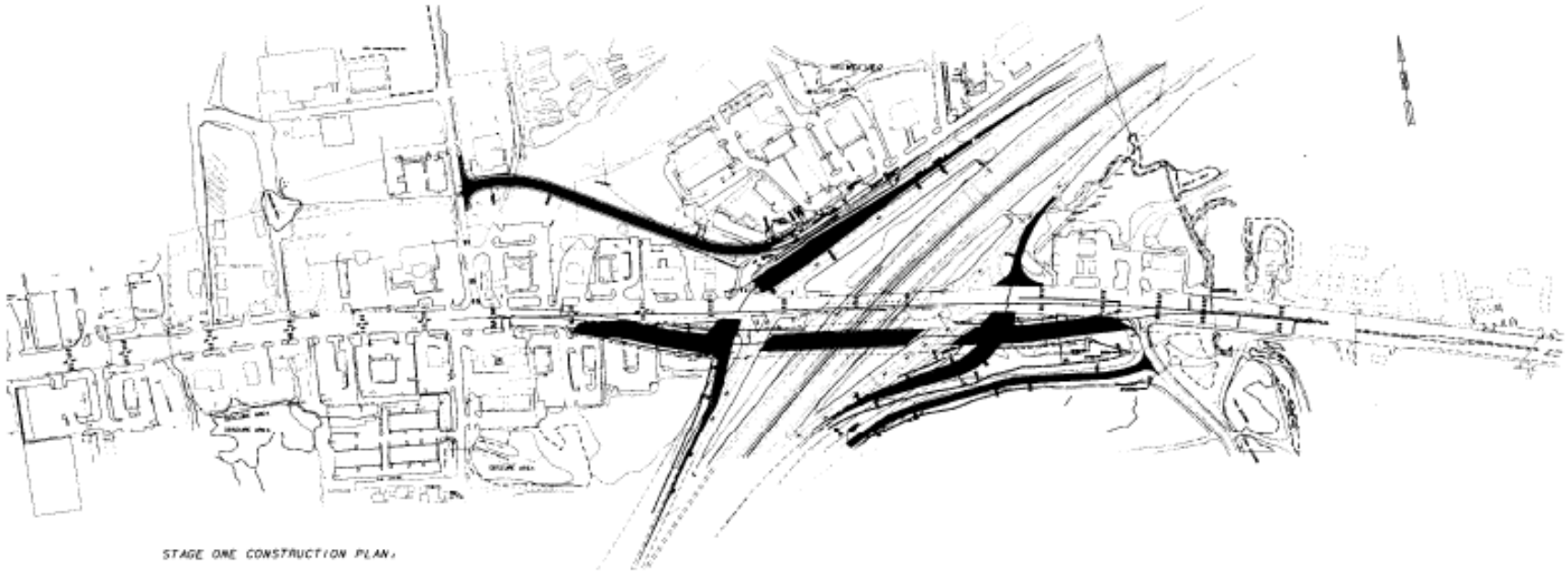
1. "As Proposed"

I. Stage Construction/Constructability: Six Stages with Temporary Detour Bridge.

The profile grade along SR 92 will be raised approximately 8 ft. at each end of the proposed new bridge. This difference in elevation is the major reason for the proposed construction plans containing six individual steps in the construction staging sequence. The staging requires the construction of a temporary detour bridge along the right side of the existing SR 92 Bridge over I-20. The proposed temporary bridge is estimated to cost between $700,000 and $900,000 to install and remove as part of the staging plan. The temporary bridge will shift the traffic farther to the right along existing SR 92 and will reduce the profile grade of the detour only slightly less than 1 ft. compared to the as-planned final elevation of the permanent SR 92 Bridge. The only flexibility that is gained is from the temporary bridge being moved farther away from the existing bridge for side slope and lateral clearance, total demolition of the existing bridge and the ability to break the roadway into smaller segments.

The new bridge is 439 ft. long and 140 ft. wide, and the grade is raised approximately 8 ft. The span lengths are 2 end spans at 49 ft. and a 2 span continuous plate girder at 170 ft. each. The end bents are pile supported while the 3 interior bents are on deep spread footings. The end abutments are of the spill through type with 2 to 1 end slopes. The detour bridge is shown as a 63 ft. wide, 4 span 346 ft. long structure. The Contractor will design, construct and remove the detour bridge.

STATE	PROJECT NUMBER		
GA.	IM-NH-20-1(73)	52	625



STAGE ONE CONSTRUCTION PLAN:

1) BEGIN CONSTRUCTION ON THE NEW TEMP DETOUR BRIDGE

2) BEGIN CONSTRUCTION OF WESTMORELAND PLAZA NEW LOCATION STATION 10+00 TO STATION 21+00 WHILE MAINTAINING TRAFFIC ON EXISTING WESTMORELAND PLAZA (SEE STAGE ONE XS)

3) BEGIN CONSTRUCTION OF TEMP DETOUR SOUTH OF EXISTING SR 92 FROM STATION 12+50 TO STATION 18+00 AND STATION 25+50 TO 31+50 WHILE MAINTAINING ACCESS ON EXISTING RAMPS (SEE STAGE ONE XS)

4) CLOSE SECTIONS OF SHAWNEE TRAIL AND SLATER MILL WHERE CONSTRUCTION IS TO OCCUR (SEE STAGE ONE XS)

5) CONSTRUCT NEW SECTION OF SLATER MILL RD FROM STATION 10+00 TO STATION 20+50 WHILE MAINTAINING TRAFFIC ON EXISTING SHAWNEE TRAIL RD (SEE STAGE ONE XS)

6) CONSTRUCT RAMP C FROM STATION 10+00 TO STATION 24+00 WHILE MAINTAINING TRAFFIC ON EXISTING RAMP C. GRADE SHALL BE AT AN ELEVATION TO ACCESS NEW TEMP DETOUR.

7) CONSTRUCT RAMP A FROM STATION 12+00 TO NEW DETOUR WHILE MAINTAINING TRAFFIC ON EXISTING RAMP A. GRADE SHALL BE AT AN ELEVATION TO ACCESS NEW TEMP DETOUR.

8) CONSTRUCT RAMP D FROM NEW TEMP DETOUR TO 19+00 WHILE MAINTAINING TRAFFIC ON EXISTING RAMP D. GRADE SHALL BE AT AN ELEVATION TO ACCESS NEW TEMP DETOUR.

9) CONSTRUCT RAMP B FROM STATION 10+50 TO STATION 18+00 WHILE MAINTAINING TRAFFIC ON EXISTING RAMP B. GRADE SHALL BE AT AN ELEVATION TO ACCESS NEW TEMP DETOUR.

NOT TO SCALE

STAGE ONE CONSTRUCTION

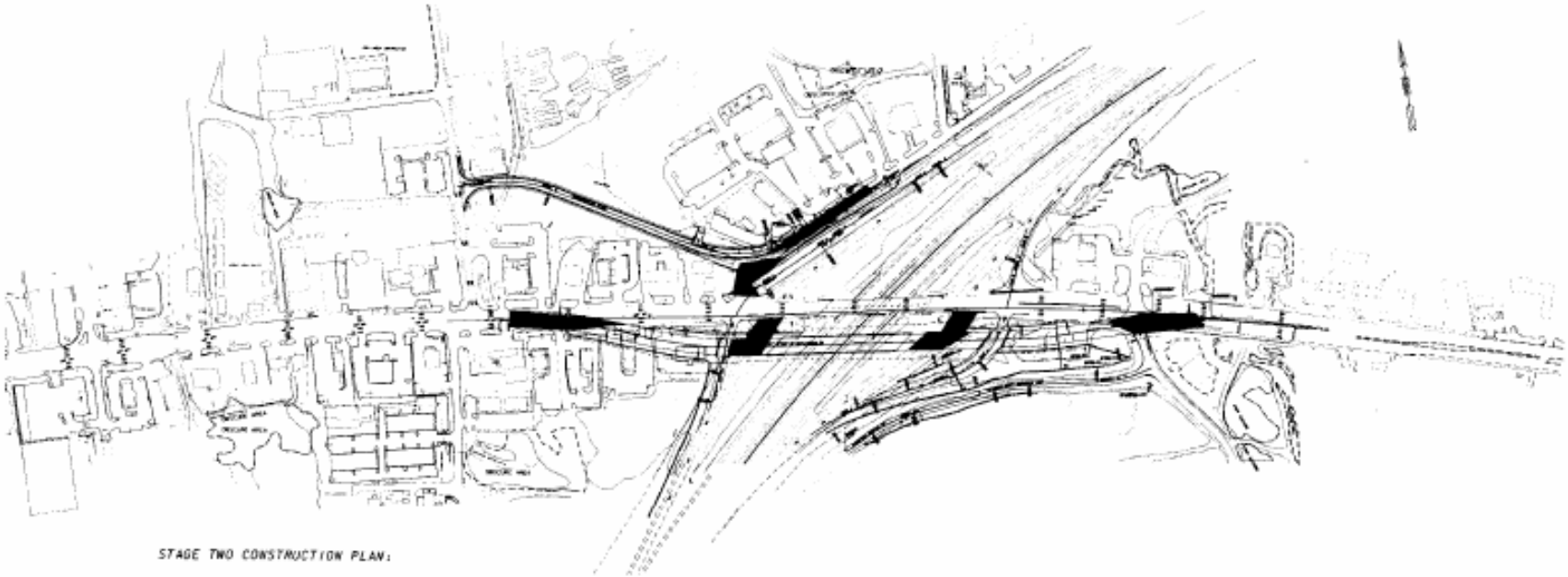
STAGE ONE TRAFFIC

DATE	REVISIONS	DATE	REVISIONS

GEORGIA
DEPARTMENT OF TRANSPORTATION
STAGING PLAN SHEET
STAGE ONE

VII. DEVELOPMENT SECTION
I. STAGE CONSTRUCTION
A. TEMPORARY DETOUR
1. "AS PROPOSED"

STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
GA.	(M-NH-20-117.5)	133	015



STAGE TWO CONSTRUCTION PLAN:

1) SHIFT RAMP A & D ONTO NEW RAMPS AS SHOWN.

2) SHIFT TRAFFIC ON TO NEW WESTMORELAND PLAZA AND CONTINUE WORKING ON RAMP C FOR FUTURE TIE IN TO TEMP DETOUR.

3) FINISH CONSTRUCTION OF THE TEMP DETOUR AT THE EXISTING RAMP LOCATIONS FROM STATIONS 18+00-19+00 & 24+00-25+50

4) COMPLETE OVERLAY SECTIONS AT BEG AND END OF TEMP DETOUR DURING NON-PEAK HOURS OR NIGHTS USING TRAFFIC CONTROL (SEE STAGE TWO XS)

5) THE REMAINDER OF WESTMORELAND PLAZA CONSTRUCTION SHALL BE COMPLETED USING NIGHT TIME STAGING AND TRAFFIC CONTROL

NOT TO SCALE

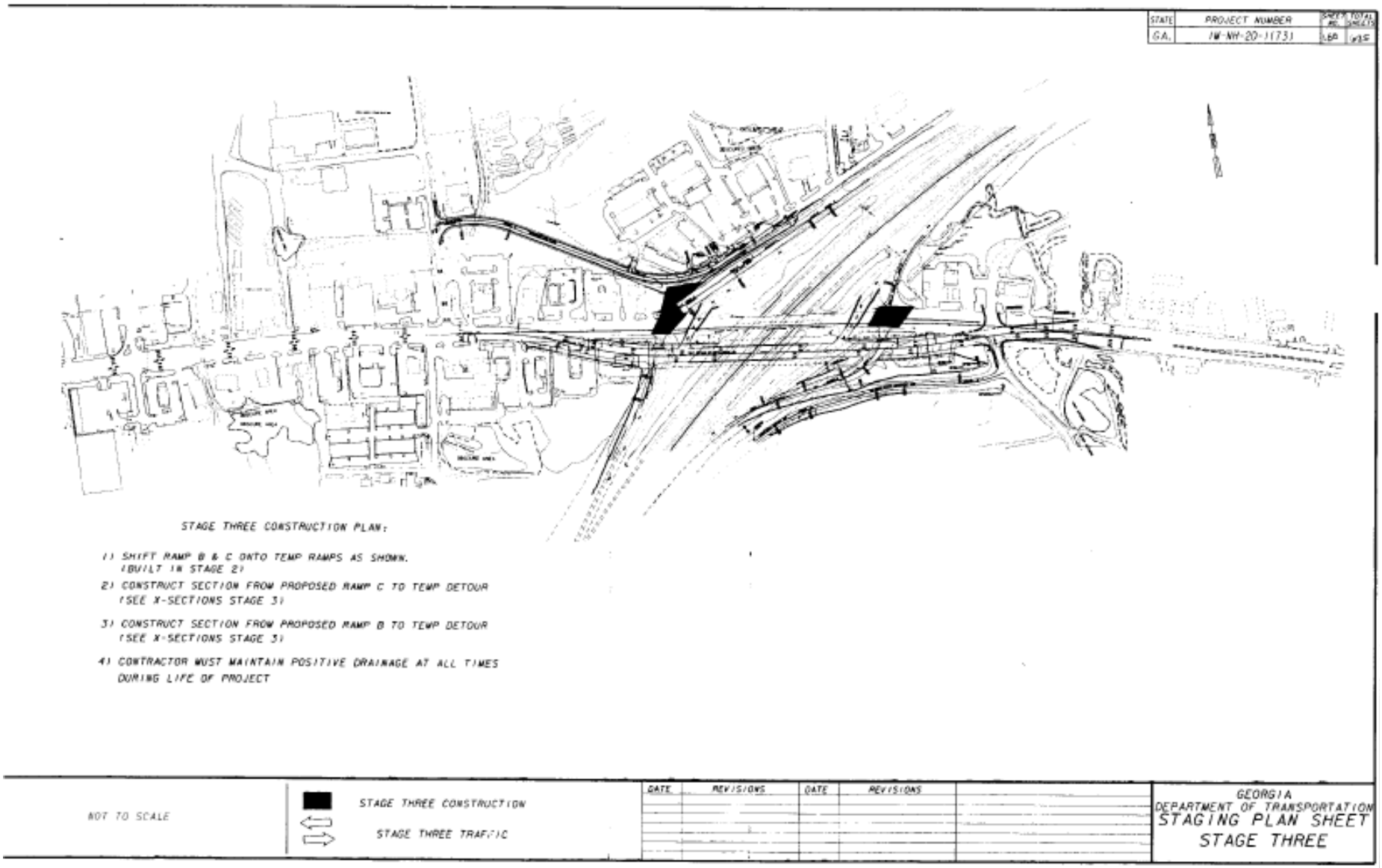
STAGE TWO CONSTRUCTION

STAGE TWO TRAFFIC

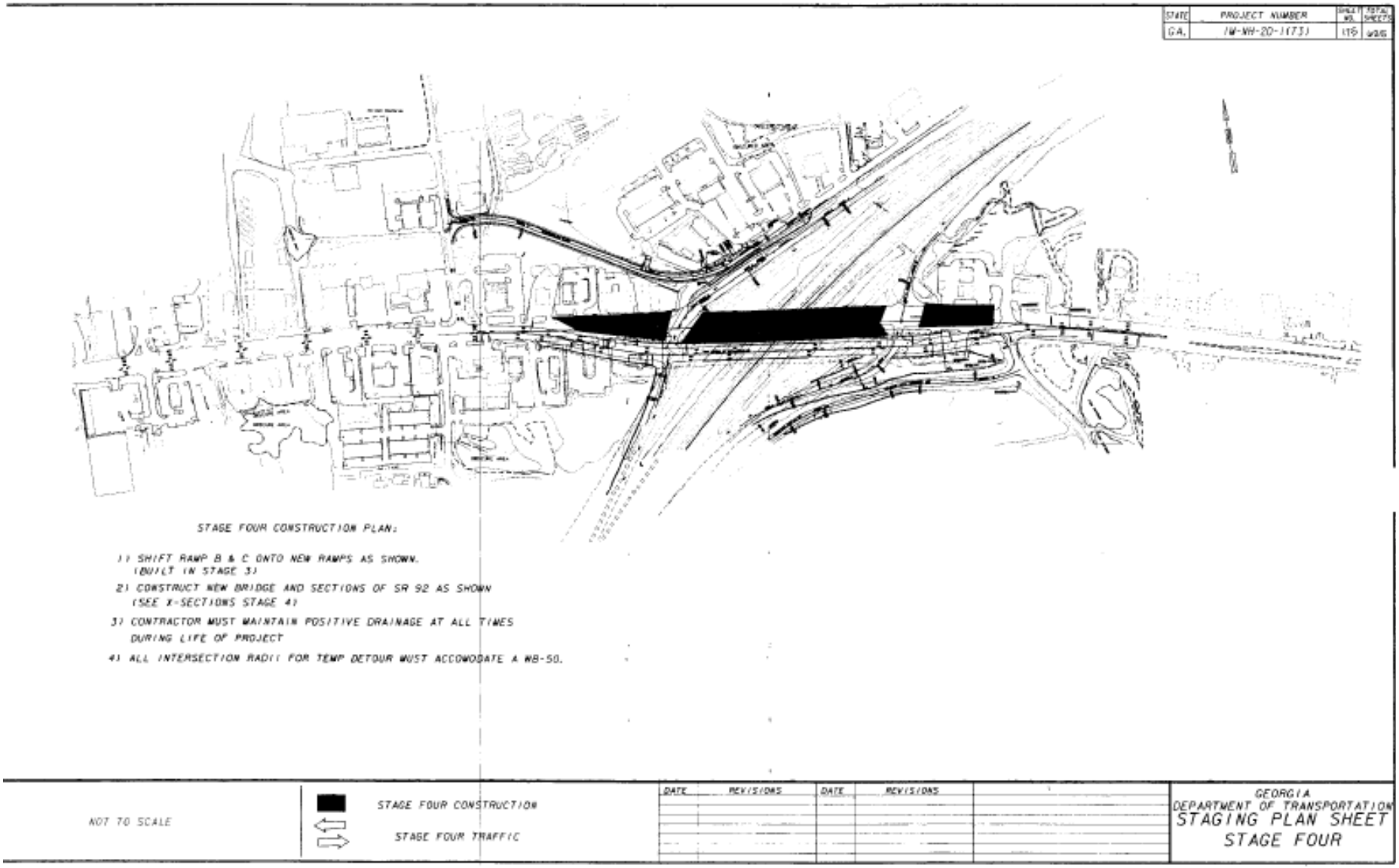
DATE	REVISIONS	DATE	REVISIONS

GEORGIA
DEPARTMENT OF TRANSPORTATION
STAGING PLAN SHEET
STAGE TWO

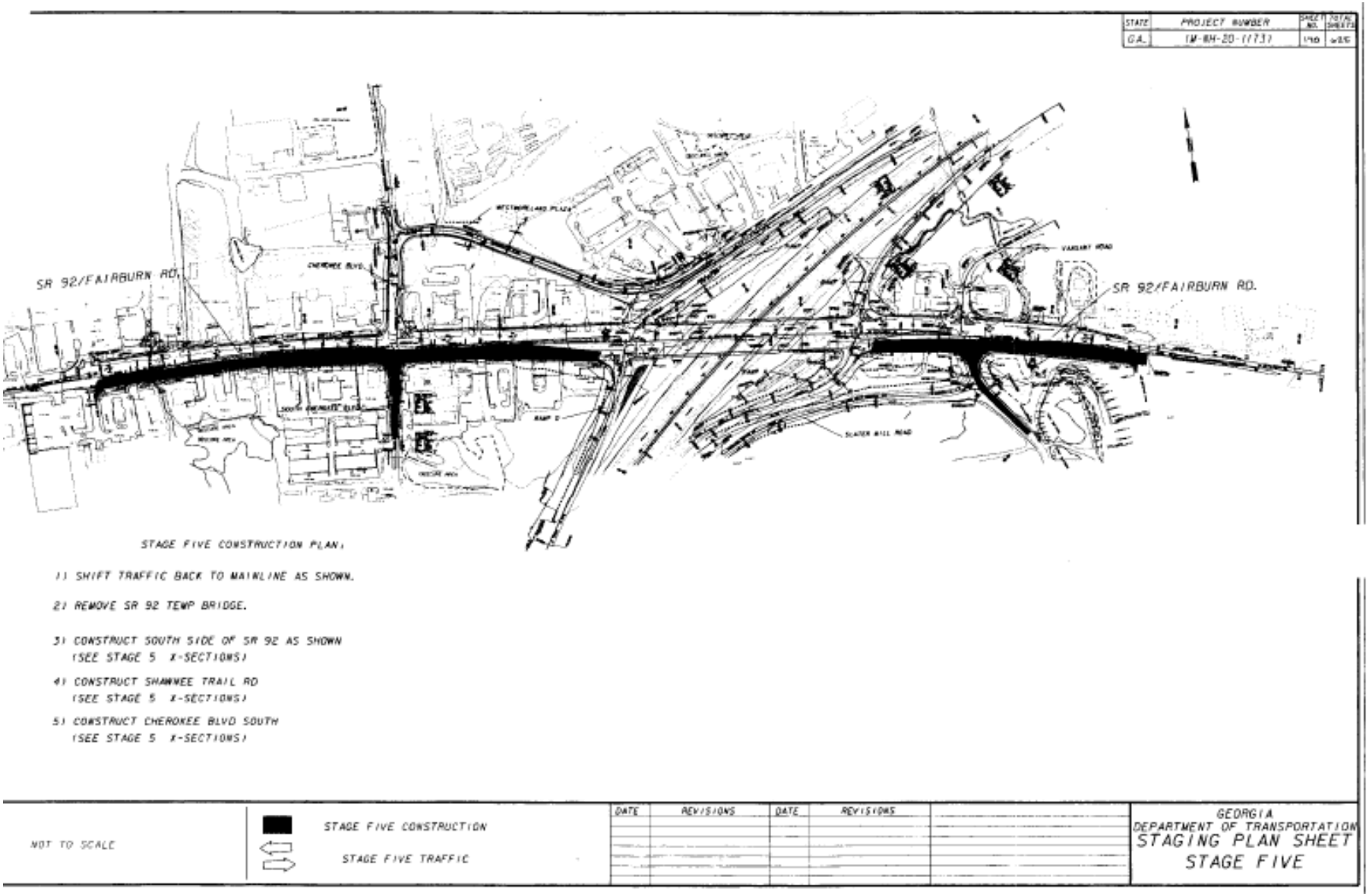
VII. DEVELOPMENT SECTION
I. STAGE CONSTRUCTION
A. TEMPORARY DETOUR
1. "AS PROPOSED"



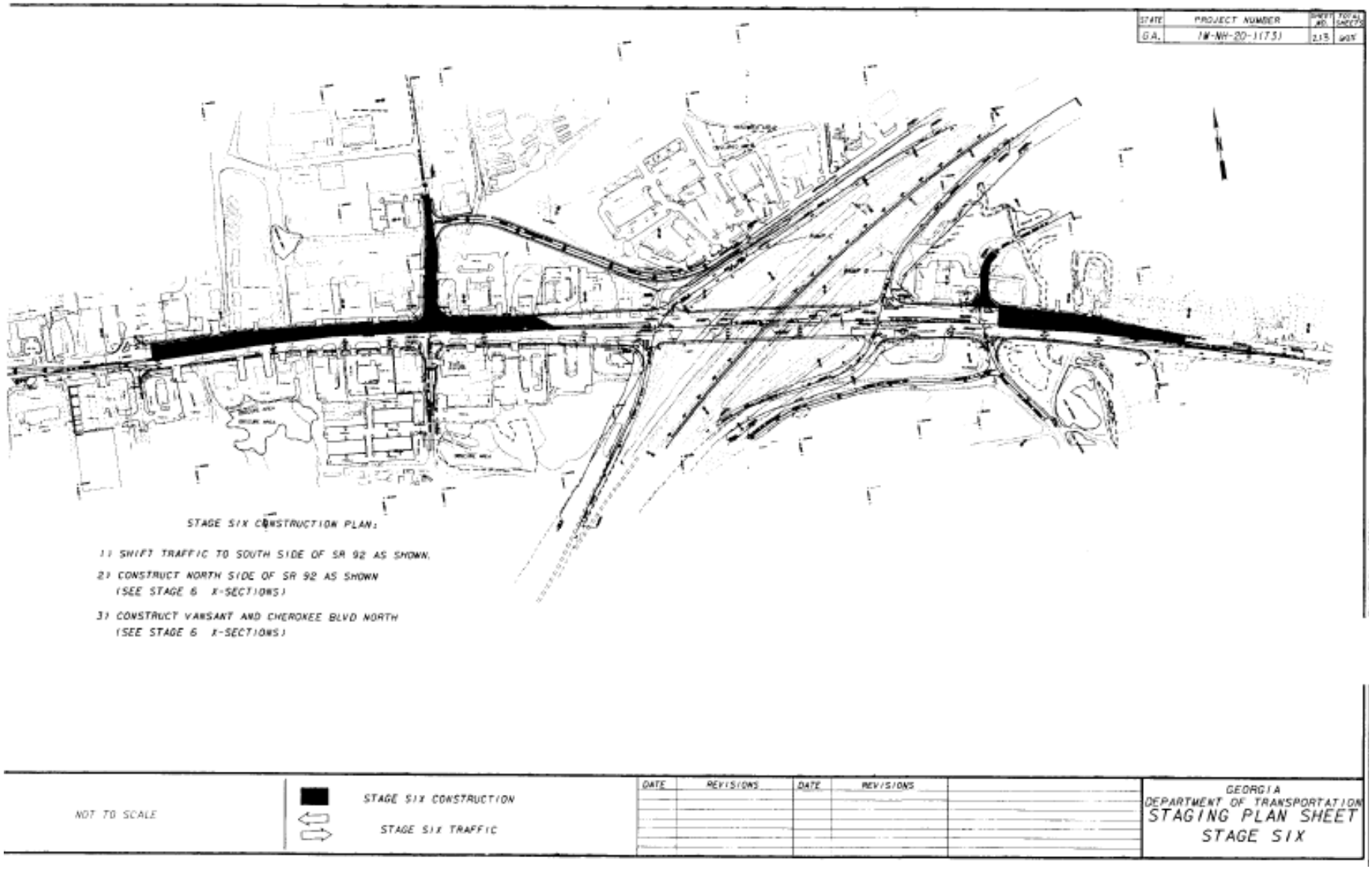
VII. DEVELOPMENT SECTION
I. STAGE CONSTRUCTION
A. TEMPORARY DETOUR
1. "AS PROPOSED"



VII. DEVELOPMENT SECTION
I. STAGE CONSTRUCTION
A. TEMPORARY DETOUR
1. "AS PROPOSED"



VII. DEVELOPMENT SECTION
I. STAGE CONSTRUCTION
A. TEMPORARY DETOUR
1. "AS PROPOSED"



VII. DEVELOPMENT SECTION
I. STAGE CONSTRUCTION
A. TEMPORARY DETOUR
1. "AS PROPOSED"

VII. DEVELOPMENT PHASE

I. STAGE CONSTRUCTION

A. TEMPORARY DETOUR

2. Value Engineering Alternative

The Value Engineering Alternative will construct the project in two stages. This will require shifting the centerline to the right so the left side of the proposed bridge and the left side of existing bridge match. The change will also eliminate the need for the detour bridge.

DURING THE STAGE 1:

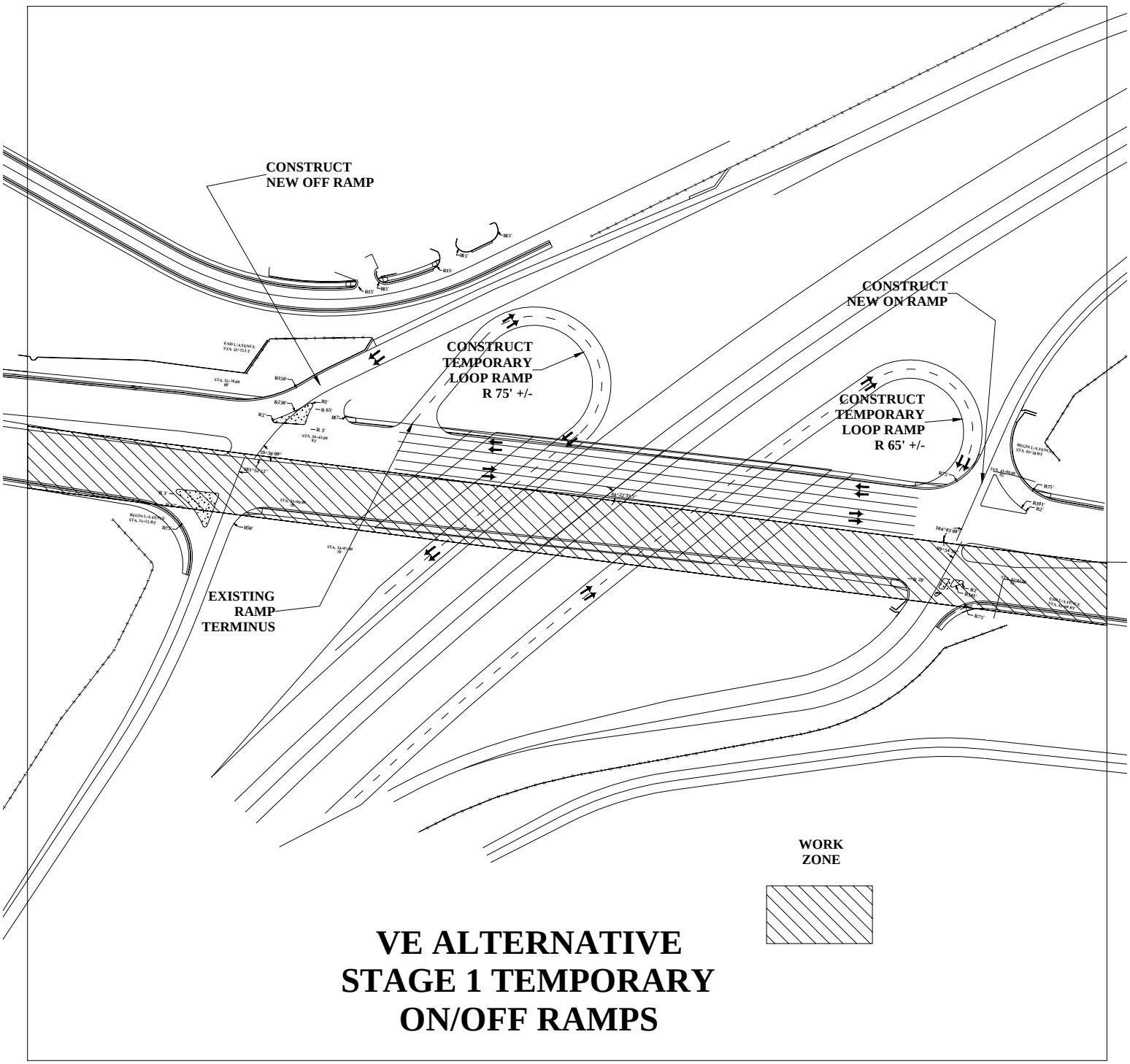
- The traffic will be maintained on the existing roadway.
- Construct westbound off ramp.
- Construct eastbound on ramp.
- Construct temporary loop ramps for the westbound on ramp and the eastbound off ramp.
- Construct 77 ft. +/- of the right side of the new SR 92 Bridge.
- Construct the right side of the project.

VII. DEVELOPMENT PHASE

I. STAGE CONSTRUCTION

A. TEMPORARY DETOUR

2. *Value Engineering Alternative* *(continued)*



VII. DEVELOPMENT PHASE

I. STAGE CONSTRUCTION

A. TEMPORARY DETOUR

2. Value Engineering Alternative *(continued)*

STAGE 2:

- Shift traffic to newly constructed SR 92 roadway and bridge.
- Demolition existing bridge.
- Construct remaining bridge.
- Construct left side of project.

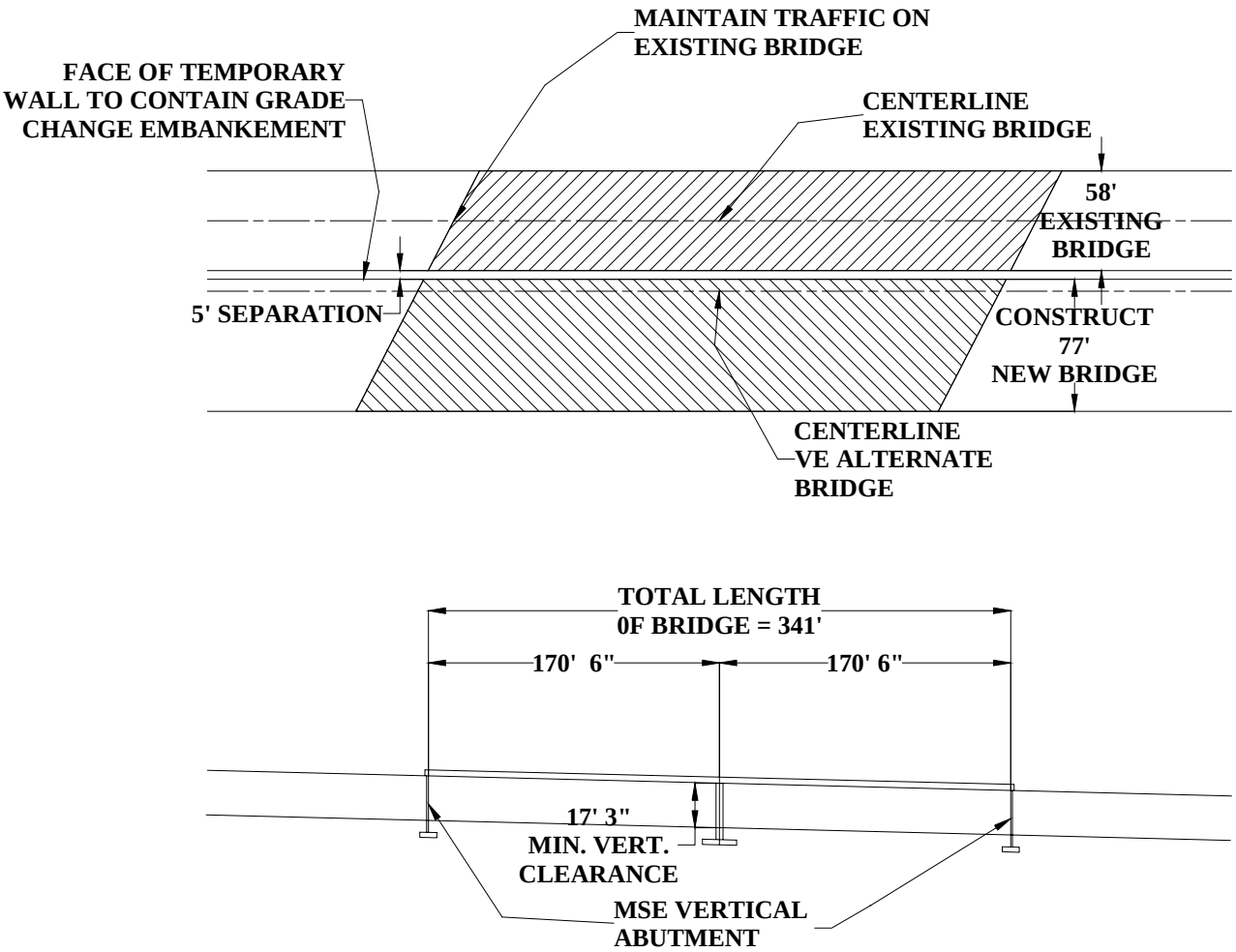
There are no existing sidewalks on the old bridge or any sidewalks along either side of the existing SR 92 roadway. The Value Engineering Stage I constructed portion of the new bridge will be able to carry five lanes at 11 ft. in width along with the appropriate positive barrier protection to separate the raised portion of the right side roadway from the existing travel lanes. This configuration matches the basic lane layout on the existing bridge.

The Value Engineering Alternative will construct the end abutments using MSE vertical abutments to eliminate the short end spans and will also incorporate 6 ft. diameter drilled shafts to replace the spread footings.

I. STAGE CONSTRUCTION

A. TEMPORARY DETOUR

2. Value Engineering Alternative *(continued)*



VALUE ENGINEERING ALTERNATIVE ALIGNMENT

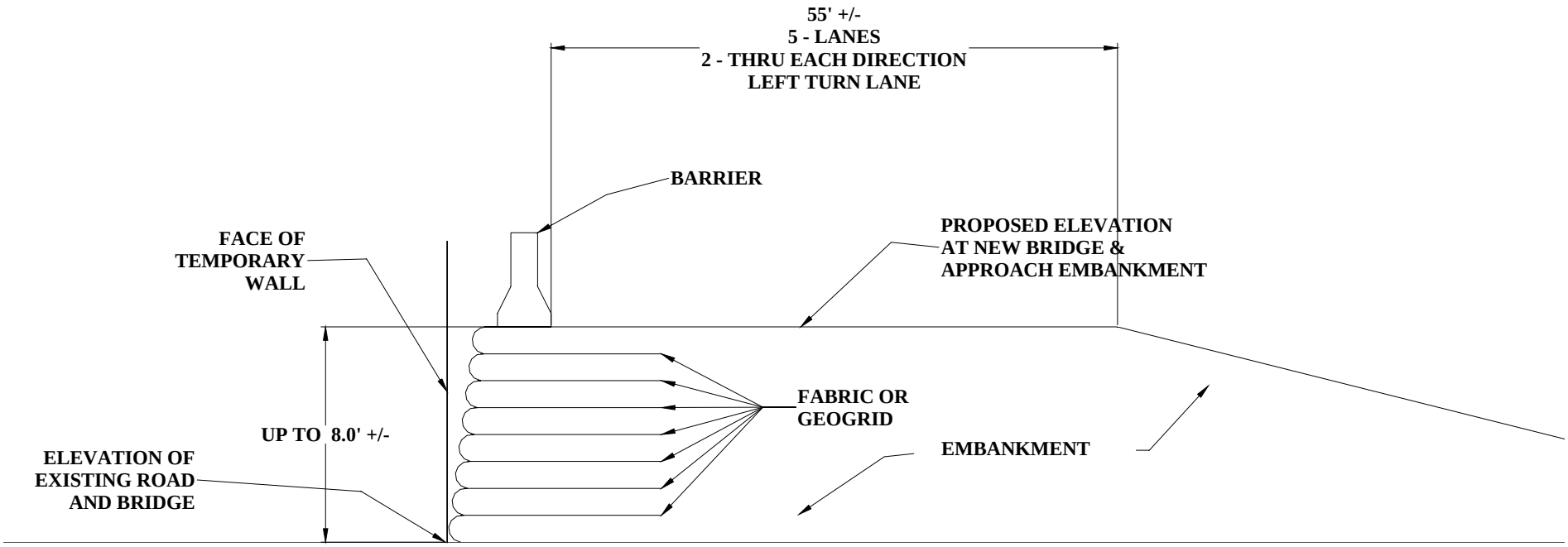
VII. DEVELOPMENT PHASE

I. STAGE CONSTRUCTION

A. TEMPORARY DETOUR

2. Value Engineering Alternative *(continued)*

The Value Engineering Alternative proposes the use of reinforced earth walls to contain the vertical 8 ft. difference in elevation. These walls will be left in place as the traffic is shifted to the right side of the roadway and the left side of the roadway is raised to the final profile grade with fill material. It is believed that a fabric or geo-grid temporary wall will provide the most economical retaining wall and the shortest construction time.



VE ALTERNATIVE
STAGE 1 CONSTRUCTION

VII. DEVELOPMENT SECTION
I. STAGE CONSTRUCTION
A. TEMPORARY DETOUR
2. VALUE ENGINEERING ALTERNATIVE ***(continued)***

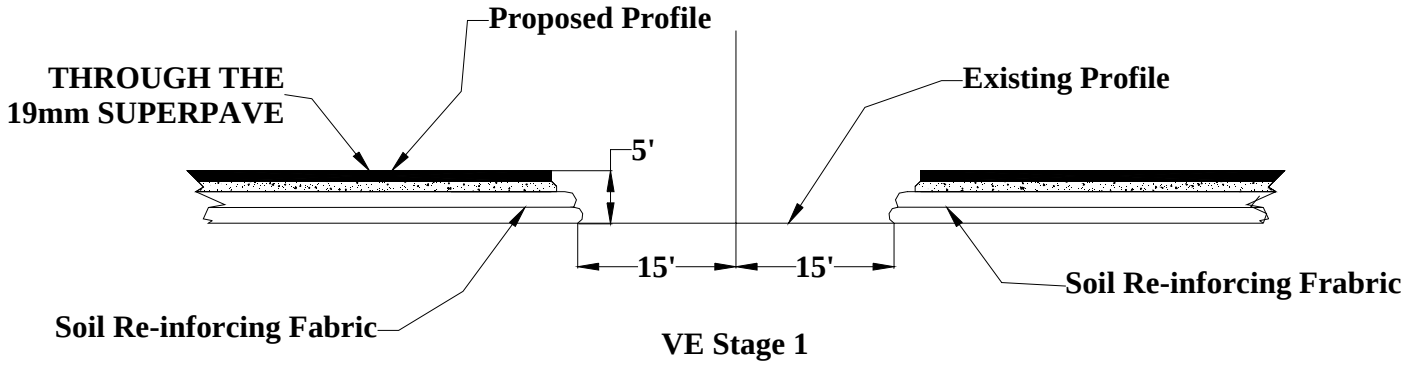
VII. DEVELOPMENT PHASE

I. STAGE CONSTRUCTION

A. TEMPORARY DETOUR

2. Value Engineering Alternative *(continued)*

This Value Engineering Alternative proposes to construct the permanent pavement through the 19 mm Superpave along with the curb and gutter from Cherokee Blvd. to the existing Ramp "D". The existing Ramp "D" will be held at its current location and elevation. The new right side lanes through the 19 mm Superpave, along with the curb and gutter, will be constructed from existing Ramp "D" to the approach slab of the new bridge. Perform the same operation on the new right side lanes from the approach slab to the existing Ramp "A". The existing Ramp "A" will be held at its current location and elevation. Construct the right side of SR 92 from existing Ramp "A" to Shawnee Trail Road through the 19mm Superpave along with the curb and gutter. Leave Shawnee Trail Road open to traffic on the existing pavement. Construct the right side of SR 92 from Shawnee Trail Road to Pine Drive through the 19 mm Superpave along with the curb and gutter.



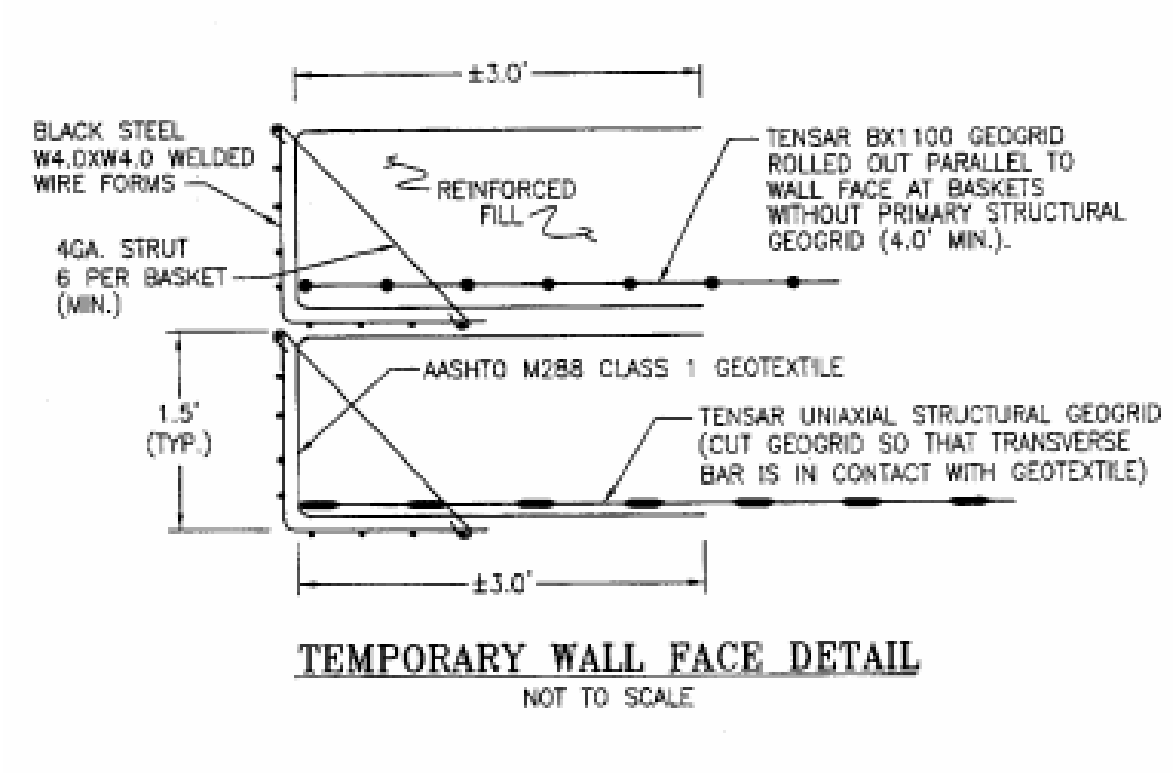
VE Stage 1
Right Side Notch for
Shawnee Trail/Vansant Road

I. STAGE CONSTRUCTION

A. TEMPORARY DETOUR

2. *Value Engineering Alternative* *(continued)*

VALUE ENGINEERING ALTERNATIVE PLAN VIEW



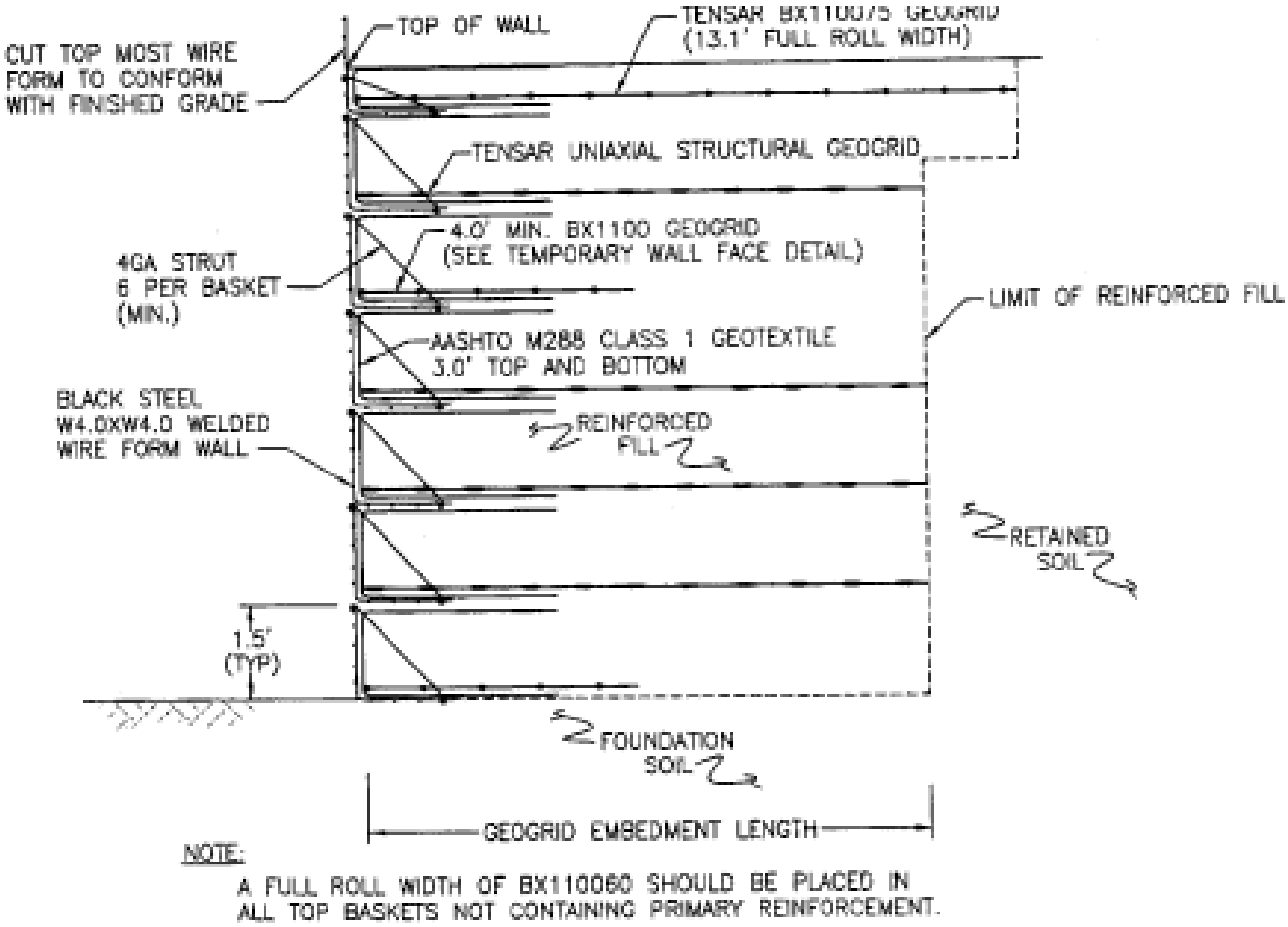
TEMPORARY WALL FACE DETAIL
NOT TO SCALE

VII. DEVELOPMENT PHASE

I. STAGE CONSTRUCTION

A. TEMPORARY DETOUR

2. Value Engineering Alternative *(continued)*



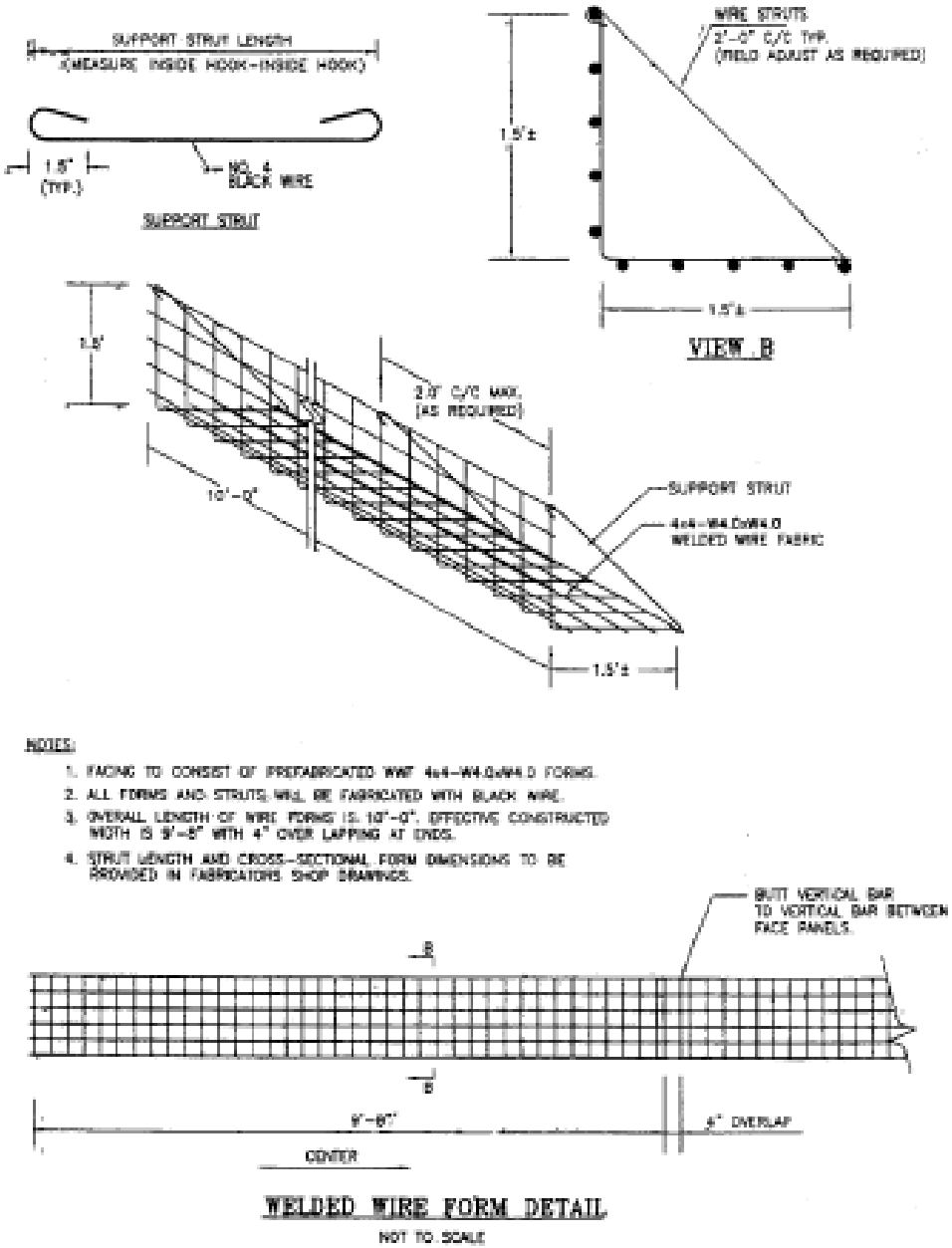
TYPICAL TEMPORARY WALL CROSS-SECTION

VII. DEVELOPMENT PHASE

I. STAGE CONSTRUCTION

A. TEMPORARY DETOUR

2. Value Engineering Alternative *(continued)*



VII. DEVELOPMENT PHASE

I. STAGE CONSTRUCTION

A. TEMPORARY DETOUR

2. Value Engineering Alternative *(continued)*

When traffic is ready to be shifted to the new lanes along the right side of SR 92, consider detouring the ramp traffic on Ramps "A" and "D" to Chapel Hill Road interchange with the appropriate detours signed and advertised to the public in advance of the operation. Start after Friday evening rush hour and fill in the gaps at the existing Ramps "A" and "D" on the new right side lanes. Shift traffic to the new lanes and open new Ramps "A" and "D" to traffic while at the same time closing existing Ramps "B" and "C" and detouring this traffic to the Chapel Hill Road interchange. Immediately raise the grade of the new Ramps "B" and "C" to the new profile grade of SR 92. Concentrate on completing the tie-in with the new Ramp "B" so that it will be ready for traffic on Monday morning. Ramp "C" could remain detoured until the rush hour traffic on Monday afternoon. A favorable weather forecast for the whole weekend is necessary before implementing this plan. A special condition should be included in Section 150 to limit this work to the weekend starting on Friday evening and ending on Monday at 3:00 P.M. on Ramp "C" and on Monday at 5:00 A.M. for opening Ramp "B". Section 108 should be included to apply liquidated damages to cover exceeding the time frame allowed in Section 150.

Shawnee Trail Road will require another detour as part of this staging. The work on raising the intersection of Shawnee Trail Road 5 ft. to tie-in with the new profile grade of SR 92 can be done in advance of the weekend work at the ramps. Pope Road (CR 93) or Prestley Mill Road (CR 142) can be signed as appropriate for a detour that could allow this work to be done several weeks in advance of the traffic shift. A special condition should be included in Section 150 to limit the amount of time that the detour could remain in place. Section 108 should be included to apply liquidated damages to minimize the possibility of exceeding the time allowed for completing the work. It appears that this detour could function for several weeks with minimal disruption.

Vansant Road intersection with SR 92 will require the elevation to be raised 5 ft. when traffic is shifted to the new right side lanes. Due to the presence of the Texaco Station at this intersection, the disruption to traffic ingress and egress from SR 92 will need to be held to a minimum. It appears that a night time detour would work on the weekend of the traffic shift on SR 92 or ingress and egress could be maintained on existing SR 92 while traffic on Vansant Road is detoured to CR 91 and back to SR 92 while the elevation of Vansant Road is raised prior to the shifting of traffic on SR 92. If traffic is detoured onto CR 91 the amount of time should not exceed approximately two weeks. A special condition should be included in Section 150 along with Section 108 to cover liquidated damages for exceeding the amount of time allowed.

An added benefit of reducing the steps in the staging would be the reduction in the amount of times that the traffic signal would require relocations or adjustments. It appears that most of the signal poles could be placed in their permanent locations and the vehicle detection equipment and the signal heads could be installed with fewer changes in their locations.

VII. DEVELOPMENT PHASE

I. STAGE CONSTRUCTION

A. TEMPORARY DETOUR

2. Value Engineering Alternative *(continued)*

ALTERNATE A TO DETOURING SHAWNEE TRAIL ROAD:

To avoid any disruption to traffic as part of the staging for raising the grade (5 ft.) to the new profile grade of SR 92, Slater Mill Road could be extended from Shawnee Trail Road to Pine Drive. The Pine Drive intersection is already at the final profile grade of SR 92. This would allow for the elimination of the Shawnee Trail Road intersection with SR 92 and at the same time allow for the elimination of the existing traffic signal at this location. This traffic signal could be moved to the intersection of Pine Drive and SR 92. The extension of Slater Mill Road could be done with minimal disruption to traffic. This would require extending an existing 10 ft. X 10 ft. box culvert at Station 49+50 right on SR 92 an extra distance farther than the as-planned dimensions. GDOT already owns one of the two parcels required to construct this extension. One parcel would need to be acquired. There is a lake just off the right-of-way at this location between Shawnee Trail Road and Pine Drive. It is recommended that the fill section to extent the existing box culvert and to build the fill section to extend Slater Mill Road be constructed of rock embankment to a minimum of 2 ft. above the level of the lake and that appropriate erosion control items be included to prevent siltation of the lake at Station 49+50 on the right side of SR 92.

By extending Slater Mill Road to Pine Drive, the intersection of Shawnee Trail Road with SR 92 can be eliminated and that section of Shawnee Trail Road between Slater Mill Road and SR 92 removed. With the Shawnee Trail Road intersection eliminated (and the existing traffic signal eliminated). the median crossover at Vansant Road could also be eliminated and Vansant Road could be made into a right turn in and a right turn out situation. This would increase the distance between the new ramps traffic signal and the new traffic signal at Pine Drive verses the distance between the new ramp signal and the existing signal at Shawnee Trail Road and SR 92. This should provide for smoother traffic flow.

ALTERNATE B TO DETOURING SHAWNEE TRAIL ROAD:

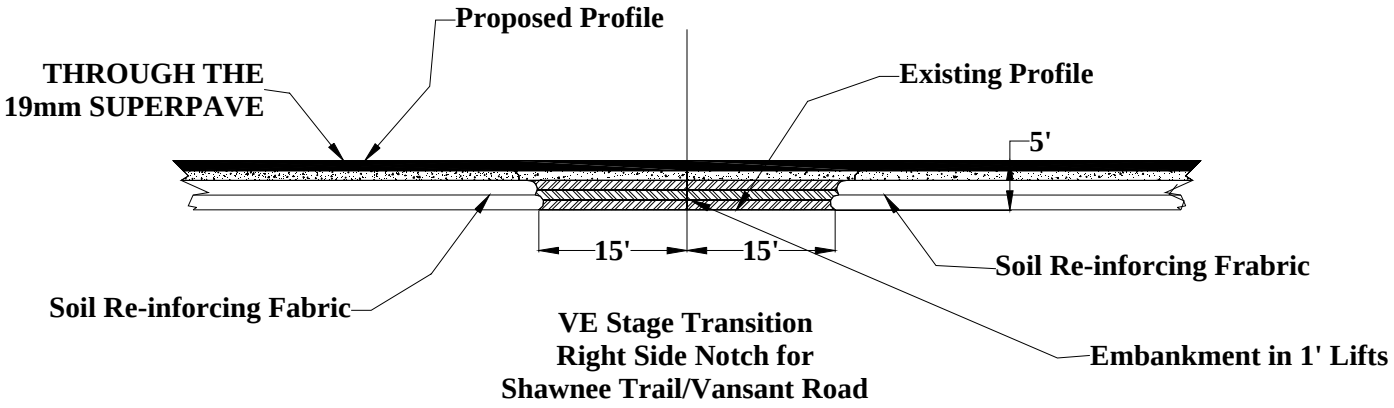
Over a weekend, raise the grade of the left side, of Vansant Road and Shawnee Trail to the proposed grades. This is accomplished by removing the existing asphalt and placing embankment in 1 ft. lifts until the appropriate grade is reached to place base and asphalt. Flagmen and lane closures would be required in order to place fill and pavement

VII. DEVELOPMENT PHASE

I. STAGE CONSTRUCTION

A. TEMPORARY DETOUR

2. Value Engineering Alternative *(continued)*

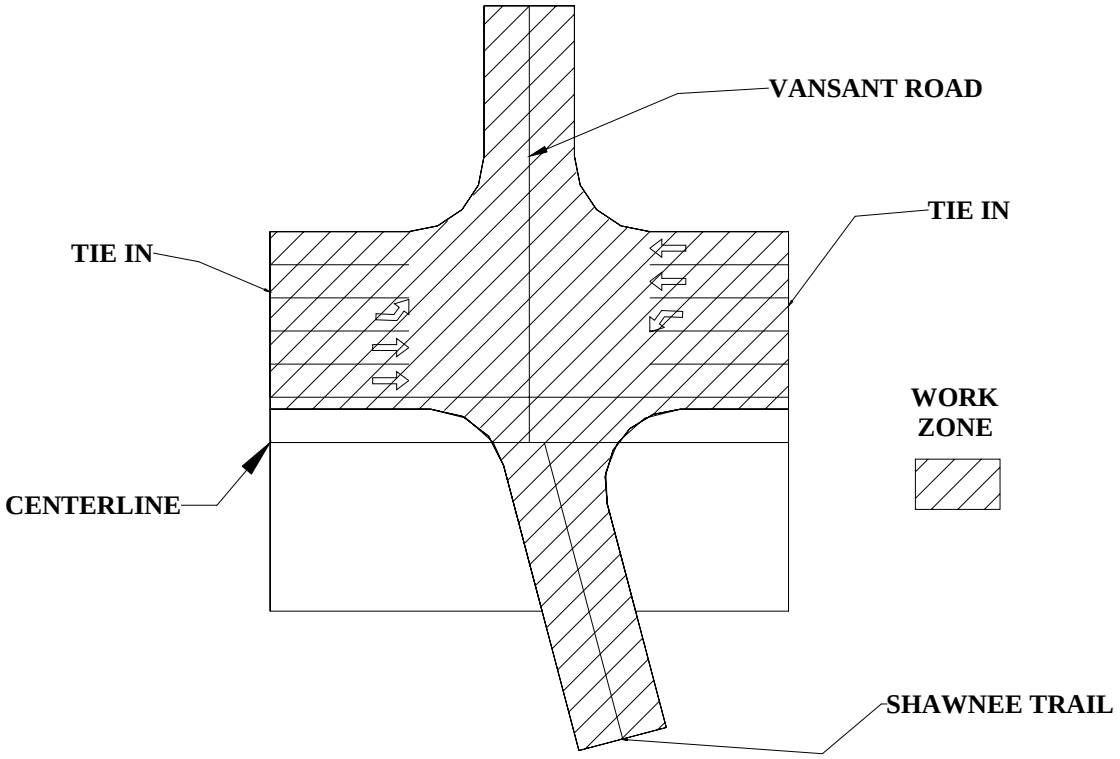


FILLING THE NOTCH

I. STAGE CONSTRUCTION

A. TEMPORARY DETOUR

2. *Value Engineering Alternative* *(continued)*



VE Stage Transition
Right Side Notch for
Shawnee Trail/Vansant Road

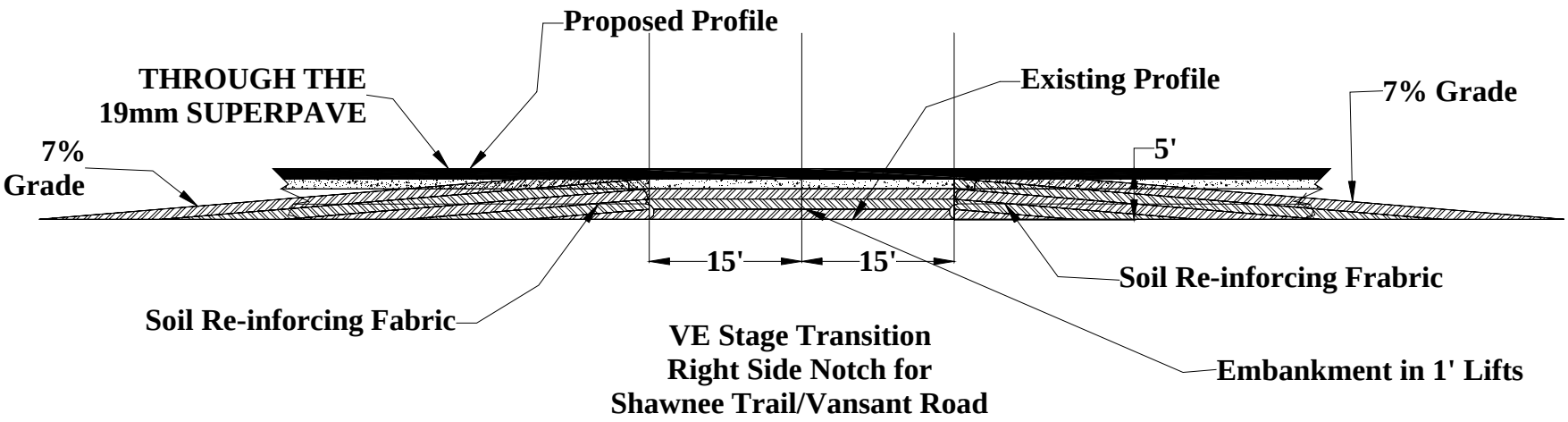
FILLING THE NOTCH PLAN VIEW

VII. DEVELOPMENT PHASE

I. STAGE CONSTRUCTION

A. TEMPORARY DETOUR

2. Value Engineering Alternative *(continued)*



FEATHERING CONNECTIONS TO SHAWNEE TRAIL AND VANSANT ROAD

I. STAGE CONSTRUCTION
A. TEMPORARY DETOUR
VALUE ENGINEERING ALTERNATIVE
COST COMPARISON SHEET

DESCRIPTION	UNITS	UNIT COST	PROP'D QTY.	PROP'D COST	V.E. QTY.	V.E. COST
BENT 2 COLUMNS	CY	$750	82	$61,500	0	$0
BENT 2 FOOTINGS	CY	$750	258	$193,500	0	$0
BENT 2 EXCAVATION	CY	$45	2,222	$99,990	0	$0
BENT 2 DRILLED SHAFTS IN SOIL	LF	$1,500	0	$0	120	$180,000
BENT 2 DRILLED SHAFTS IN ROCK	LF	$2,000	0	$0	80	$160,000
BENT 3 COLUMNS	CY	$750	119	$89,250	0	$0
BENT 3 FOOTINGS	CY	$750	324	$243,000	0	$0
BENT 3 EXCAVATION	CY	$45	2,726	$122,670	0	$0
BENT 3 DRILLED SHAFTS IN SOIL	LF	$1,500	0	$0	128	$192,000
BENT 3 DRILLED SHAFTS IN ROCK	LF	$2,000	0	$0	80	$160,000
BENT 4 COLUMNS	CY	$750	37	$27,750	0	$0
BENT 4 FOOTINGS	CY	$750	293	$219,750	0	$0
BENT 4 EXCAVATION	CY	$45	3,585	$161,325	0	$0
BENT 4 DRILLED SHAFTS IN SOIL	LF	$1,500	0	$0	176	$264,000
BENT 4 DRILLED SHAFTS IN ROCK	LF	$2,000	0	$0	80	$160,000
TRAFFIC CONTROL/MOT	LS	$1,600,000	1	$1,600,000	0	$0
VE TRAFFIC CONTROL	LS	$1,200,000	0	$0	1	$1,200,000
PORTABLE IMPACT ATTENUATOR	EA	$10,755.67	14	$150,579	8	$86,045
VARIABLE MESSAGE BOARD	EA	$25,000	14	$350,000	10	$250,000
TEMPORARY EROSION CONTROL	LS	$162,085.14	1	$162,085	0	$0
SUBTOTAL				**$3,481,399**		**$2,652,045**

continued

continued

I. STAGE CONSTRUCTION

A. TEMPORARY DETOUR

VALUE ENGINEERING ALTERNATIVE

COST COMPARISON SHEET

DESCRIPTION	UNITS	UNIT COST	PROP'D QTY.	PROP'D COST	V.E. QTY.	V.E. COST
SUBTOTAL				**$3,481,399**		**$2,652,045**
VE TEMPORARY EROSION CONTROL	LS	$100,000	0	$0	1	$100,000
DETOUR BRIDGE (FURNISH-INSTALL-REMOVE)	SF	$35	21,798	$762,930	0	$0
DETOUR BRIDGE APPROACH EMBANKMENT	CY	$6	2,000	$12,000	0	$0
DETOUR BRIDGE APPROACH BASE & PAVING	SY	$40	16,356	$654,240	0	$0
TEMPORARY RE-ENFORCED EARTH WALLS (FACE)	SF	$20	0	$0	8,400	$168,000
TEMPORARY TRAFFIC BARRIER	LF	$40	0	$0	2,199	$87,960
BASE AND PAVING	SY	$40	0	$0	1,524	$60,960
MSE VERTICAL ABUTMENTS	SF	$60	0	$0	10,474	$628,440
TRAFFIC BARRIER ON BRIDGE	LF	$95	0	$0	341	$32,395
BRIDGE OVER I-20	SF	$150	61,679.5	$9,251,925	47,910.5	$7,186,575
REMOVE TEMPORARY PAVEMENT	CY	$10	0	$0	3,200	$32,000
TEMPORARY RAMP PAVEMENT	SY	$40	0	$0	8,000	$320,000
GRAND TOTAL				**$14,162,495**		**$11,268,375**

POSSIBLE SAVINGS: $2,894,120

VII. DEVELOPMENT PHASE

II. CONSTRUCTION TIME

A. LENGTH OF TIME

1. "As Proposed"

The current estimated construction time for the "As Proposed" design is 36 months.

VII. DEVELOPMENT PHASE

II. CONSTRUCTION TIME

A. LENGTH OF TIME

2. Value Engineering Alternative

With the elimination of the temporary bridge and the reduction of the number of construction stages, this project should be completed with in 24 months.

VII. DEVELOPMENT PHASE

III. CONTRACTOR WORK HOURS

A. LANE CLOSURES

1. "As Proposed"

The special conditions allow the contractor double lane closures in both directions on I-20 beginning on Friday night at 9:00 P.M. until Monday morning at 5:00 A.M.

VII. DEVELOPMENT PHASE

III. CONTRACTOR WORK HOURS

A. LANE CLOSURES

2. Value Engineering Alternative

The Value Engineering Team recommends that the special conditions be revised to allow a double lane closure in one direction but only allow a single lane closure in the other direction at the same time during the daylight hours of the weekend. The double lane closures in both directions during the late night hours would be acceptable. On a section of interstate that warrants three lanes in each direction it is advisable to restrict double lane closures in both directions to the minimum. Approval of the engineer should be a requirement of double lane closures in both directions during the daylight hours on the weekends.

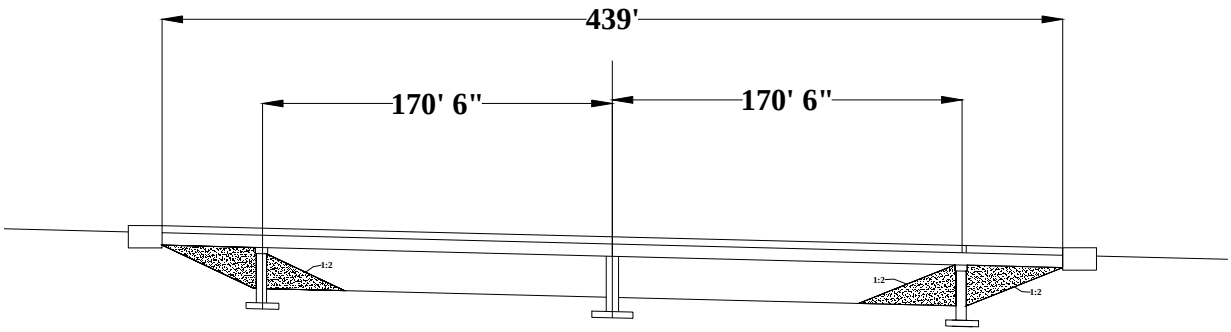
VII. DEVELOPMENT PHASE

IV. CONSTRUCTABILITY

A. BRIDGE FOUNDATIONS

1. "As Proposed"

The as proposed consists of spread footing foundations at all interior bents. The footings for bent 3 are up to 22.5 ft. in the direction parallel to the centerline of the bridge. In the 40 ft. wide median, this leaves 9 ft. +/- from the edge of the footing excavation to the travel lane. These footings are 16 ft. below natural ground; so shoring will be required to protect traffic. Each bent consists of 8-columns on 3.5 ft. thick spread footings founded on rock or weathered rock.



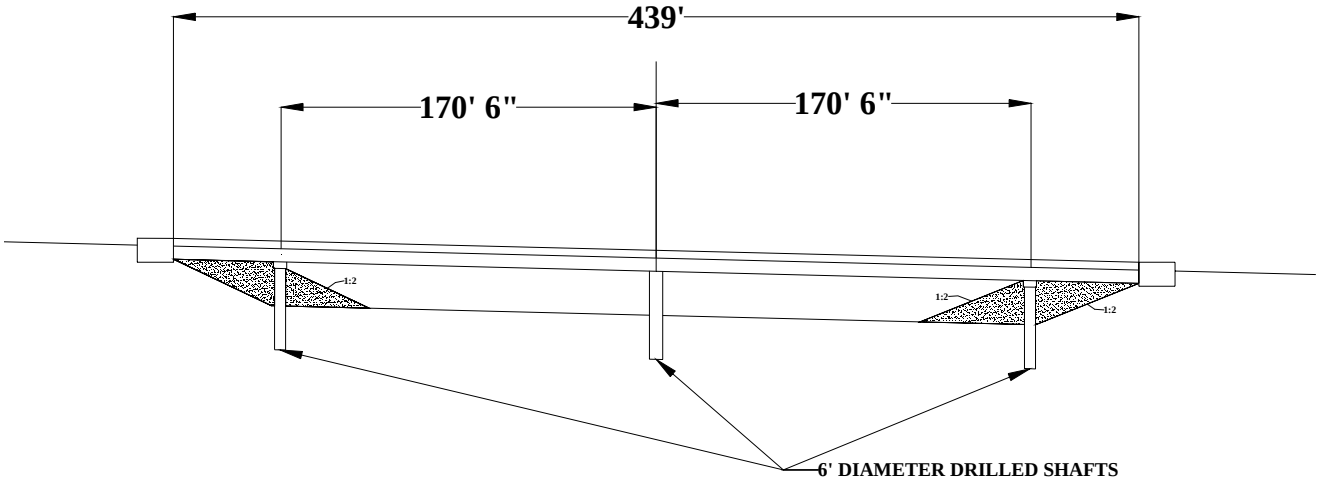
AS PROPOSED
SPREAD FOOTINGS

IV. CONSTRUCTABILITY

A. BRIDGE FOUNDATIONS

2. Value Engineering Alternative

The Value Engineering Alternative is to use drilled shafts under all columns at each bent. The shaft lengths include 10 ft. into rock or weathered rock. The top of rock elevation is taken as the bottom of the as proposed spread footings. The shaft diameter is estimated at 6 ft. +/-. The length of the shafts is based on the top of the shaft being at the ground line. Using round columns will facilitate the use of shafts. If the columns are slightly smaller than the drilled shafts, construction of the column on the shaft will be simpler and faster.



VE ALTERNATIVE
DRILL SHAFT

IV. CONSTRUCTABILITY
A. BRIDGE FOUNDATIONS
VALUE ENGINEERING ALTERNATIVE
COST COMPARISON SHEET

DESCRIPTION	UNITS	UNIT COST	PROP'D QTY.	PROP'D COST	V.E. QTY.	V.E. COST
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BENT 4 DRILLED SHAFTS IN SOIL	LF	$1,500	0	$0	176	$264,000
BENT 4 DRILLED SHAFTS IN ROCK	LF	$2,000	0	$0	80	$160,000
GRAND TOTAL				**$1,218,735**		**$1,116,000**

POSSIBLE SAVINGS: $102,735