

VALUE ENGINEERING STUDY

Project # CSSTP-0009-00(396)

PI No. 0009396

Project # CSSTP-0009-00(397)

PI No. 0009397

Atlanta Beltline Southwest and Southeast Corridors Fulton County, Georgia

Prepared for:



One Georgia Center
600 West Peachtree NW
Atlanta, Georgia 30308

20 June 2013



1200 Abernathy Road, Building 600, Suite 950
Atlanta, Georgia 30328
770-481-1600 Fax 770-481-1640

20 June 2013

Mr. Matt Sanders, AVS
Value Engineering Specialist
GDOT - Engineering Services
One Georgia Center - 5th Floor
600 W. Peachtree Street NW
Atlanta, GA 30308

Re: V.E. Workshop – Atlanta Beltline Southwest and Southeast Corridors, Fulton County, GA
Project #'s: CSSTP-0009-00(396) – PI#: 0009396; CSSTP-0009-00(397) – PI#: 0009397

Dear Mr. Sanders:

U.S. Cost, Inc. is pleased to submit two (2) hard copies and one (1) CD of the Value Engineering Study Report on the above referenced projects. We appreciate the assistance and participation of the GDOT and Atlanta Beltline management personnel as well as the Perkins and Will design team.

This Workshop resulted in the development of eighteen (18) value-enhancing proposals. We hope that incorporation of some of these value improvement alternatives provided herein results in an enhanced project in relation to cost, constructability and long-term performance of the project features.

Please feel free to contact me to discuss any information within this report. We look forward to the next opportunity to be of service to the Georgia Department of Transportation.

Sincerely,

U.S. COST INCORPORATED



Tom Orr, P.E., CVS
V.E. Team Leader

CC: L. Myers, GDOT

VALUE ENGINEERING TEAM STUDY

TABLE OF CONTENTS

Executive Summary

Project Description and Background	4
Key Information/Notes.....	5
Value Engineering Results.....	11
Southwest Corridor Summary of Value Engineering Proposals.....	15
Southeast Corridor Summary of Value Engineering Proposals.....	17

Proposals

Southwest Corridor (9396) Bridge/Structures (B6).....	18
Southwest Corridor (9396) Trail (T6).....	60
Southeast Corridor (9397) Bridge/Structures (B7).....	103
Southeast Corridor (9397) Trail (T7).....	108

Appendix

Sign-in Sheet	118
Function Analysis.....	119
Cost Model	120
Brainstorming or Speculation Ideas	122
Team Study Agenda.....	126

VALUE ENGINEERING STUDY

PROJECT DESCRIPTION

This workshop evaluated 2 projects which involve construction of portions of the Atlanta Beltline in Fulton County. Both projects involve construction of a corridor that will include a multi-use trail and transit – this study was limited to the features required for construction of the multi-use trail. The projects will convert existing railroads into a combined multi-use trail and light rail corridor. Additional information on the 2 projects follows:

Atlanta Beltline Southwest Corridor from Allene Avenue to Lena Street, Fulton County
Project #CSSTP-0009-00(396)/PI #0009396, known as the “Southwest Corridor”, begins at Washington Park in Southwest Atlanta at the terminus of Lena Street and continues to the southeast along existing former railroad right-of-way for approximately 2.87 miles to Allene Avenue near its intersection with Catherine Street in the Adair Park neighborhood within Fulton County. The project will construct a 14’ wide concrete multi-use trail and establish a right-of-way corridor for future build-out of the adjacent transit line. The project includes modification or replacement work on the following major structures:

- Railroad Bridge over Martin Luther King, Jr. Drive
- Underpass beneath Westview Avenue
- Underpass beneath Interstate 20
- Underpass beneath Lucille Avenue
- Underpass beneath Ralph David Abernathy Blvd
- Underpass beneath Lawton Street
- Tunnel beneath Lee Street, Murphy Avenue and the Railroad/MARTA

Atlanta Beltline Southeast Corridor from Glenwood Park to Allene Avenue, Fulton County
Project #CSSTP-0009-00(397)/PI #0009397, known as the “Southeast Corridor”, begins in the Adair Park neighborhood near the intersection of Allene Street and Catherine Street, and continues to the east along existing railroad right-of-way for approximately 4.08 miles to the intersection of Glenwood Avenue and Chester Avenue in the Glenwood Park neighborhood within Fulton County. The project will construct a 14’ wide concrete multi-use trail and establish a right-of-way corridor for future build-out of the adjacent transit line. The project includes modification or replacement work on the following major structures:

- Railroad Bridge over Metropolitan Parkway
- Railroad Bridge over Pryor Road
- Rail tunnel beneath McDonough Blvd
- Rail bridge over Hill Street
- Rail bridge over Confederate Avenue
- Rail bridge over Ormewood Avenue
- I-75/I-85 Overpass, trail passes beneath Interstate

VALUE ENGINEERING STUDY

KEY INFORMATION/NOTES

Introduction

U.S. Cost conducted the Value Engineering Team Study on Atlanta Beltline Southwest and Southeast Corridor projects. The V.E. study was conducted for three and ½ days, 17 - 20 June 2013, at the Georgia Department of Transportation 5th floor Conference Room in Atlanta, GA. The study team was furnished with Concept reports for both projects and 25% Preliminary Design plans for the Southwest Corridor. Additional reference documents were made available for the V.E. Team's use in conducting the workshop. The following individuals were members of the V.E. team:

Name	Firm	Discipline
Tom Orr, P.E., CVS	U.S. Cost, Inc.	VE Team Leader (VETL)
Greg Grant, P.E.	RS&H	Bridge/Structures
Chris Haggard, P.E.	Wolverton	Roadway/Trail Engineer
Lenor Bromberg, P.E.	KEA Group	Construction

Value Engineering Study Process

The Value Engineering Study followed the Value Engineering Job Plan as certified by SAVE International as follows:

- Information Phase (Monday)
- Function Analysis Phase (Monday)
- Creative Phase (Monday)
- Evaluation Phase (Tuesday)
- Development Phase (Tuesday - Wednesday)
- Presentation Phase (Thursday AM)

Information Phase

The V.E. team was first briefed on the project design by Atlanta Beltline management and Perkins & Will design team representatives in a Design Presentation the morning of the first day of the V.E. Study. The briefing included a review of the design requirements and rationale for the selection and arrangement of the major project features. Discussions regarding alternatives considered, adjacent properties/facilities, and project criteria and constraints were included in the design presentation.

VALUE ENGINEERING STUDY

KEY INFORMATION/NOTES

Project Design Criteria

During the meeting, project design criteria were identified. The following listing identifies the design criteria with which the project must comply:

- AASHTO Design Policies
- GDOT Design Policies
- Other Environmental Restrictions (EA Requirements TBD)

Project Constraints

Materials and finishes utilized in recent and ongoing construction of the Beltline Eastside Trail (a privately-funded segment) are requested to remain consistent throughout all portions of the Atlanta Beltline Corridor. These features include granite-clad retaining walls, stainless steel handrails/guardrails/fences, and coloring and sandblasting of concrete trail surfaces.

Function Analysis

As a basic part of the V.E. process, the team conducted a Function Analysis session on the Atlanta Beltline projects to identify the needs and goals of the project and facilitate the creative idea session, by addressing functions as opposed to the specific design elements.

The Basic Function of the project is to “*Enhance Transportation (Options)*”. A detailed project function analysis of the characteristics of the project and the project features is presented in the Appendix.

VALUE ENGINEERING STUDY

KEY INFORMATION/NOTES

Risk Analysis

The group identified the following project risk elements, which may impact the Atlanta Beltline projects. This exercise served as a catalyst for the Creative Phase of the study when several ideas were suggested which would mitigate these project risks.

Risk Elements/Concerns

- Protection of Pedestrians/Cyclists
- Impacts to Adjacent Properties
- Construction of Perched Retaining Walls
- Construction on Bridges in Heavy Traffic Areas
- Adverse Environmental Impacts
- Remediation of Lead Paint and Soils
- Adequate Bioretention Ponds
- Construction of Significant Quantities of Retaining Walls

VALUE ENGINEERING STUDY

KEY INFORMATION/NOTES

Creative Phase

The Creative Phase of the V.E. study was initiated the afternoon of the first day of the study. A total of twenty-six (26) unique creative ideas were generated for further investigation by the team; some of these applied to both projects. The creative ideas focused on areas of the project which the VE Team felt had the most opportunity for value improvement, including:

- Reducing right-of-way acquisition required and associated costs
- Reducing impact to property owners
- Reducing or eliminating retaining wall structures
- Utilizing existing multi-use trails where possible
- Allocating costs of features appropriately
- Simplifying Bridge Rehabilitation/Construction

Additional ideas were generated reflecting alternative project components based on an understanding of local construction products and materials and the relative costs of installing them.

A listing of all creative ideas on this project is included in the Appendix.

Alternative Idea Evaluation Criteria

The session participants identified the characteristics for evaluating the V.E. ideas for which alternatives would be the most acceptable for incorporation in the project. The highest ranked ideas would satisfy several of these criteria. The evaluation criteria for V.E. ideas are as follows:

V.E. Idea Evaluation Criteria

Reduces Construction Time
Improves Constructability
Reduces Impacts
Reduces Costs
Improves Service Life/Reduces Maintenance
Enhances User Experience

VALUE ENGINEERING STUDY

KEY INFORMATION/NOTES

Evaluation Phase

The ideas generated during the Creative Phase were reviewed and evaluated by the VE session participants during an Analysis/Judgment Phase session at the beginning of the second study day. The intent of the meeting was to allow the participants an opportunity to discuss and evaluate the ideas. A few of the V.E. ideas were dropped at that time as being conceptually unacceptable. The ranking session consisted of the VE team members assigning a ranking for each idea. The Acceptability ranking was based on how each idea improves the value of the project when considered against the evaluation criteria listed previously. Those ideas, which the V.E. Team felt had the most promise were given a designation of 1-5 on acceptability. This is a time management tool to identify those proposals that have the greatest potential. Approximately fifteen (15) out of the original twenty-six (26) unique creative ideas were deemed promising for further investigation and analysis by the V.E. team.

The time management ranking system used by the V.E. team is as follows:

ACCEPTABILITY OF IDEA

- 5 points - Excellent Idea
- 4 points – Very Good Idea
- 3 points - Good Idea
- 2 points - Fair Idea
- 1 point - Do Not Develop

VALUE ENGINEERING STUDY

KEY INFORMATION/NOTES

Development & Presentation Phase

The specific proposals found in the body of this report represent the positive results of investigations by the V.E. team on the Atlanta Beltline projects. Each proposal represents a quality enhancing or cost saving alternative, which is documented by words, drawings and numbers. The proposal format presents the idea, describes the original design element proposed for change and the proposed change, lists the perceived advantages and disadvantages of the proposed change and supports the idea with a detailed cost estimate for the original and proposed design. Where necessary for clarity, the proposal also includes thumbnail design drawings and supporting engineering calculations.

A presentation to the Atlanta Beltline and Design Team representatives was conducted on 20 June 2013 at 9 AM.

Basis of V.E. Cost Savings

The cost information for proposals in this report are based on the cost data prepared by the design team, GDOT Item Mean Summary (Jan. 9, 2012), VE Team member experience, and discussions with vendors/Contractors. Where line items were used from the GDOT CES estimate, overhead and profit are included in these items; therefore, no additional markups are applied. However, where the design team's "Expanded Component Estimate" was utilized for cost items, a 26.0% markup is applied to include Contractor Overhead & General Conditions (8%), Contractor Fee (6%), and Design Contingency (10%); this mark-up aligns with the design team's estimate. The savings presented in the proposals is a general order of magnitude (estimate of the potential savings) if the idea were to be accepted. These figures are solely intended to identify the most attractive design solution, and are not prepared to represent a net deduction to the overall project budget. The costs are in 2013 dollars.

Evaluation of Alternatives

When reviewing the value engineering proposals, consider each part of an alternative on its own merit. There may be a tendency to disregard an entire alternative because of a concern about one aspect of it. We encourage partial acceptance of ideas; thus, each aspect of an alternative should be considered for incorporation into the design, even if the entire alternative is not implemented. Variations of these proposed alternatives are encouraged.

Several of these alternatives are either "mutually exclusive"/or have overlapping cost savings with other alternatives. These are indicated in the Proposal Summary Table. Items indicated as mutually exclusive indicates that acceptance of one alternative, precludes acceptance of the related proposal. Decision-makers are encouraged to evaluate these alternatives carefully in order to select the combination of alternatives that provides the greatest benefits to the project.

VALUE ENGINEERING STUDY

VALUE ENGINEERING RESULTS

The V.E. Team generated 26 creative ideas and developed 18 proposals for consideration. Brief outlines of the V.E. proposals are as follows:

Proposal Highlights for PI #0009396, Atlanta Beltline Southwest Corridor:

B6-2 – At MLK Overpass Bridge, use Prestressed Beams in lieu of Steel Beams. The current design replaces the existing MLK bridge with a similar single span bridge with vertical abutments. The bridge is projected to be a steel beam with cast-in-place concrete deck. Bridge Proposal B6-2 proposes to replace the bridge with a single span prestressed concrete beam bridge. This alternative will save \$105,000 in construction costs and will also reduce required bridge maintenance over the life of the structure.

B6-3.1 – Use Geogrid Slopes for Walls up to 6 feet high in lieu of Granite Clad Concrete Retaining Walls. The current design uses cantilever retaining walls for breaks in grade. The retaining walls are clad with granite and have fencing fastened to them. Bridge/Structures Proposal B6-3.1 proposes to eliminate concrete walls in areas where there is sufficient right of way to use a geo-grid slope at 1:1. The geo-grid walls are only proposed to be used in fill conditions. This alternative will save \$834,000 in construction costs and reduces maintenance.

B6-3.2 – Use Wire Basket Walls for Walls up to 6 feet high in lieu of Granite Clad Concrete Retaining Walls. As an alternative to B6-3.1, Proposal B6-3.2 proposes to eliminate concrete walls in areas where there is sufficient right of way to use wire basket walls with plant-able facing and 70 degree slopes. These are proposed for use in fill walls with heights under 6 feet. This alternative will save \$808,000 in construction costs and reduces maintenance.

B6-3.3 – Use MSE Retaining Walls with Vegetative Plantings for Walls up to 6 feet high in lieu of Granite Clad Concrete Retaining Walls. As an alternative to B6-3.1 and B6-3.2, Proposal B6-3.3 proposes to eliminate concrete walls in areas where there is sufficient right of way to use an MSE wall that is able to be vegetated. These are proposed for walls under 6 feet in height. This alternative will save \$448,000 in construction costs and reduces maintenance.

B6-4 – Use 2:1 Slopes and Eliminate Retaining Walls at Specific Locations. The current design utilizes over 14,000 linear feet of granite clad cast-in-place concrete retaining wall located between the trail and transit alignment, as well as to the outside of the trail alignment. Proposal B6-4 proposes to utilize a 5-foot graded shoulder with 2:1 slopes in lieu of retaining walls in locations where wall removal and use of slope will not adversely affect right-of-way or easement limits or adjoining properties. This alternative will save \$2,985,000 in construction costs and reduces maintenance of wall structures.

VALUE ENGINEERING STUDY

VALUE ENGINEERING RESULTS

Proposal Highlights for PI #0009396 (continued):

T6-1 - At Retaining Walls, Set Permanent Easement at Appropriate Distance Based on Wall Height with Temporary Easement Beyond. The current design utilizes permanent easement to accommodate most of the limit of work area that is beyond the right-of-way boundary, with some small areas of temporary easements as well. Proposal T6-1 proposes to utilize a permanent easement beyond the face of any retaining walls at a width of 10-feet for fill walls and a width of 1.5 times the height of cut walls. This proposal reduces impacts to adjacent properties and results in a savings of \$241,000.

T6-2 - Where No Retaining Walls, Set Permanent Easement at Clear Zone with Temporary Easement Beyond. The current design utilizes permanent easement to accommodate most of the limit of work area that is beyond the right-of-way boundary, with some small areas of temporary easements as well. Proposal T6-2 proposes to utilize a permanent easement to the clear zone (3-foot from trail edge) in areas where cut or fill slopes are to be implemented. Utilize temporary easements to accommodate the remainder of the limit of work area beyond these permanent easements. This proposal reduces impacts to adjacent properties and results in a savings of \$85,000.

T6-3 - Reduce Limit of Work Boundary at Specific Locations. The current design shows a limit of work required to construct the trail and transit plus additional easement to be acquired. Proposal T6-3 proposes to reduce the limit of work to the area of grading and reduce unnecessary easements to be acquired outside of right-of-way. This proposal allows use of minimum right-of-way, and results in a savings of \$44,000.

T6-4 - Eliminate Stairs Where Ramp is Nearby. The current design includes constructing stairs to access the trail at various locations where ramps are also being provided. Proposal T6-4 eliminates stair access where ramps are also provided and allows all users to enter trail via ramps. This proposal provides a savings of \$363,000.

T6-5 - Connect to Existing West End Trail at I-20 and Defer New Trail from I-20 up to Lawton Street until Transit Construction. There is an existing West End Trail that runs to the South in the vicinity of the new corridor from I-20 and extends beyond Lawton Street. The current project design proposes to construct a new trail and all required improvements from I-20 to Ralph David Abernathy (RDA) and then accesses the existing trail from RDA to Lawton Street, with a new trail constructed along this portion at the time the transit corridor is constructed. Proposal T6-5 proposes to utilize the existing West End trail beginning at I-20 and extending to Lawton Street and defers construction of the new trail and all required improvements along this section until the transit line is constructed. This proposal results in a cost deferral of \$4,096,000.

VALUE ENGINEERING STUDY

VALUE ENGINEERING RESULTS

Proposal Highlights for PI #0009396 (continued):

T6-6.3 – Allocate Portion of Ductbank Costs Associated with Relocation of Telecom to this Trail Project and Obtain Funding for Excess Ductbank Capacity from Other Sources. The current design includes a ductbank with eight (8) conduits to be constructed along the trail for relocation of existing fiber optic telecom lines with excess capacity for location of future utilities within this ductbank. Proposal T6-6.3 proposes to allocate the portion of the ductbank used to house the relocated telecom lines to the trail funds, with the remaining cost of the ductbank paid for by other funds due to the excess capacity being a revenue stream from the utility when the ductbank is utilized. This proposal properly allocates costs among all parties and results in a reduction in Federal funding of \$1,145,000.

T6-8 – Obtain Funding for Upgraded Trail Construction Features from Other Funding Sources. The current design of the multi-use trail includes several features which can be considered as upgrades to a typical multi-use trail project. These components or features are as follows:

- Stainless steel fencing and rails
- Granite facing on retaining walls
- Colored concrete and sandblasting one-half of trail concrete surface

Proposal T6-8 proposes to allocate trail funds for only those basic features required to develop a functioning multi-use trail and to obtain funding of the portions of the trail project attributed to these upgraded features from other funding sources. This proposal properly allocates funds among all parties and results in a reduction in Federal funding of \$7,371,000.

T6-10 – Adjust Trail Profiles to Eliminate Interior Walls. In the current design, the trail is being constructed at a different elevation than the transit and therefore requires walls between the trail and transit. Proposal T6-10 proposes to revise the trail profile in areas to eliminate the wall between the transit and trail. This proposal simplifies construction and results in a savings of \$326,000.

T6-11 – Maintain 5' Separation Between Trail and Transit and Eliminate Separation Fence. In the current design, the trail is being constructed within 5' of transit with fencing around Stations 750+00 and 760+00. Proposal T6-11 proposes to separate the trail from the transit by the 5' minimum distance in order to eliminate fencing between the trail and transit. This proposal results in a savings of \$290,000.

VALUE ENGINEERING STUDY

VALUE ENGINEERING RESULTS

Proposal Highlights for PI #0009397, Atlanta Beltline Southeast Corridor:

B7-8 – Use Lead Encapsulating Paint in lieu of Jacking Existing Bridges and Sandblasting and Repainting the Superstructure. The current design will jack the existing bridges at Pryor Street and Metropolitan Parkway to provide adequate clearance to allow for the installation of a protective barrier while allowing vehicular traffic beneath the bridge. Once the rehabilitation and painting is complete, the bridges will be lowered back into their original position. Bridge Proposal B7-8 proposes to use a lead encapsulating paint and omit jacking the bridges to maintain them. This alternative will save \$203,000 in construction costs and simplifies construction by eliminating jacking of the bridges.

T7-1 – At Retaining Walls, Set Permanent Easement at Appropriate Distance Based on Wall Height with Temporary Easement Beyond. The current design utilizes permanent easement to accommodate most of the limit of work area that is beyond the right-of-way boundary, with some small areas of temporary easements as well. Proposal T7-1 proposes to utilize a permanent easement beyond the face of the walls at a width of 10-feet for fill walls and a width of 1.5 times the height behind the face of cut walls, in areas where retaining walls are to be implemented. Utilize temporary easements to accommodate the remainder of the limit of work area beyond these permanent easements. This proposal reduces impacts to adjacent properties and results in a savings of \$357,000.

T7-2 - Where No Retaining Walls, Set Permanent Easement at Clear Zone with Temporary Easement Beyond. The current design utilizes permanent easement to accommodate most of the limit of work area that is beyond the right-of-way boundary, with some small areas of temporary easements as well. Proposal T7-2 proposes to utilize a permanent easement to the clear zone (3-foot from trail edge) in areas where cut or fill slopes are to be implemented. Utilize temporary easements to accommodate the remainder of the limit of work area beyond these permanent easements. This proposal reduces impacts to adjacent properties and results in a savings of \$375,000.

T7-6.3 - Allocate Portion of Ductbank Costs Associated with Relocation of Telecom to this Project and Obtain Funding for Excess Ductbank Capacity from Other Funding Sources. The current design includes a ductbank with eight (8) conduits to be constructed along the trail for relocation of existing fiber optic telecom lines with excess capacity for location of future utilities within this ductbank. Proposal T7-6.3 proposes to allocate the portion of the ductbank used to house the relocated telecom lines to the trail funds, with the remaining cost of the ductbank paid for by other funds due to the excess capacity being a revenue stream from the utility when the ductbank is utilized. This proposal properly allocates costs among all parties and results in a reduction in Federal funding of \$1,625,000.

SUMMARY OF VALUE ENGINEERING PROPOSALS

**Project # CSSTP-0009-00(396) PI No. 0009396
Atlanta Beltline Southwest Corridor from Allene Avenue to Lena Street
FULTON COUNTY, GEORGIA**

IDEA NO.	PROPOSAL DESCRIPTION	CONSTRUCTION SAVINGS	COMMENTS
	Note: Brackets mean additional cost		
	BRIDGES/STRUCTURES (B)		
B6-2	At MLK Overpass Bridge, use Prestressed Beams in lieu of Steel Beams	105,642	
B6-3.1	Use Geogrid Slopes for Walls up to 6 feet high in lieu of Granite Clad Concrete Retaining Walls	834,314	Mutually exclusive with B6-3.2 and B6-3.3; savings overlap with B6-4, T6-5 & T6-10
B6-3.2	Use Wire Basket Walls for Walls up to 6 feet high in lieu of Granite Clad Concrete Retaining Walls	807,698	Mutually exclusive with 3.1 and 3.3; savings overlap with B6-4, T6-5 & T6-10
B6-3.3	Use MSE Retaining Walls with Vegetative Plantings for walls up to 6 feet high in lieu of Granite Clad Concrete Retaining Walls	448,378	Mutually exclusive with 3.1 and 3.2; savings overlap with B6-4, T6-5 & T6-10
B6-4	Use 2:1 Slopes and Eliminate Retaining Walls at Specific Locations	2,985,675	Cost savings overlap with B6-3.1, B6-3.2, B6-3.3, T6-5 & T6-10
	TRAIL (T)		
T6-1	At Retaining Walls, Set Permanent Easement at Appropriate Distance Based on Wall Height with Temporary Easement Beyond	241,388	

SUMMARY OF VALUE ENGINEERING PROPOSALS

**Project # CSSTP-0009-00(396) PI No. 0009396
Atlanta Beltline Southwest Corridor from Allene Avenue to Lena Street
FULTON COUNTY, GEORGIA**

IDEA NO.	PROPOSAL DESCRIPTION	CONSTRUCTION SAVINGS	COMMENTS
	TRAIL (T) - continued		
T6-2	Where No Retaining Walls, Set Permanent Easement at Clear Zone with Temporary Easement Beyond	85,901	
T6-3	Reduce Limit of Work Boundary at Specific Locations	43,724	
T6-4	Eliminate Stairs Where Ramp is Nearby	363,535	
T6-5	Connect to Existing West End Trail at I-20 and Defer New Trail from I-20 up to Lawton Street until Transit Construction	4,096,778	Cost deferral to Transit Project; savings overlap with B6-3.1, B6-3.2, B6-3.3, B6-4 & T6-10
T6-6.3	Allocate Portion of Ductbank Costs Associated with Relocation of Telecom to this Trail Project and Obtain Funding for Excess Ductbank Capacity from Other Sources	1,145,340	
T6-8	Obtain Funding for Upgraded Trail Construction Features from Other Funding Sources	7,371,207	Recommend same approach for 9397 when design further defined
T6-10	Adjust Trail Profiles to Eliminate Interior Walls	326,403	Cost savings overlap with B6-3.1, B6-3.2, B6-3.3 & B6-4
T6-11	Maintain 5' Separation Between Trail and Transit and Eliminate Separation Fence	289,800	

SUMMARY OF VALUE ENGINEERING PROPOSALS

Project # CSSTP-0009-00(397) PI No. 0009397
Atlanta Beltline Southeast Corridor from Glenwood Park to Allene Avenue
FULTON COUNTY, GEORGIA

IDEA NO.	PROPOSAL DESCRIPTION	CONSTRUCTION SAVINGS	RELATED PROPOSALS
	Note: Brackets mean additional cost		
	BRIDGES/STRUCTURES (B)		
B7-8	Use Lead Encapsulating Paint in lieu of Jacking Existing Bridges and Sandblasting and Repainting the Superstructure	202,958	
	TRAIL (T)		
T7-1	At Retaining Walls, Set Permanent Easement at Appropriate Distance Based on Wall Height with Temporary Easement Beyond	357,710	
T7-2	Where No Retaining Walls, Set Permanent Easement at Clear Zone with Temporary Easement Beyond	375,127	
T7-6.3	Allocate Portion of Ductbank Costs Associated with Relocation of Telecom to this Project and Obtain Funding for Excess Ductbank Capacity from Other Funding Sources	1,625,400	

Note: other design alternatives outlined for PI No. 0009396 should be considered for this project as design progresses.

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER: B6-2	PAGE NUMBER: 1 of 7
------------------------------	----------------------------

PROJECT #/PI #:	CSSTP-0009-00(396) / 0009396
PROJECT TITLE:	Atlanta Beltline Corridor from Allene Avenue to Lena Street Fulton County

PROPOSAL DESCRIPTION: AT MLK OVERPASS BRIDGE, USE PRESTRESSED BEAMS IN LIEU OF STEEL BEAMS.

ORIGINAL DESIGN: The current design replaces the existing MLK bridge with a similar single span bridge with vertical abutments. The bridge is projected to be a steel beam with cast-in-place concrete deck. The abutment walls are granite clad on all exposed surfaces.

PROPOSED CHANGE: It is proposed to replace the bridge with a single span prestressed beam bridge.

JUSTIFICATION: The prestressed concrete beam bridge reduces construction costs over a steel bridge while also reducing maintenance efforts and costs over the life of the bridge.

ADVANTAGES:

- Reduces construction costs
- Reduces maintenance

DISADVANTAGES:

- None apparent

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:	\$ 250,000		\$ 250,000
PROPOSED CHANGE:	\$ 144,358		\$ 144,358
SAVINGS:	\$ 105,642		\$ 105,642

COST ESTIMATING WORKSHEET

PROPOSAL NUMBER:	B6-2	PAGE NUMBER:	2 of 7
-------------------------	------	---------------------	--------

PROJECT #/PI #:	CSSTP-0009-00(396) / 0009396
------------------------	------------------------------

ORIGINAL DESIGN

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
MLK Steel Bridge	1	LS	1	250,000	250,000
SUBTOTAL – COST TO PRIME					250,000
MARKUP					Incl.
TOTAL CONTRACT COST					250,000

PROPOSED CHANGE

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
MLK Prestressed Beam Bridge	7	SF	1,206	95	114,570
SUBTOTAL – COST TO PRIME					114,570
MARKUP					26%
TOTAL CONTRACT COST					144,358

Difference [Original-Proposed] **\$105,642**

SOURCES

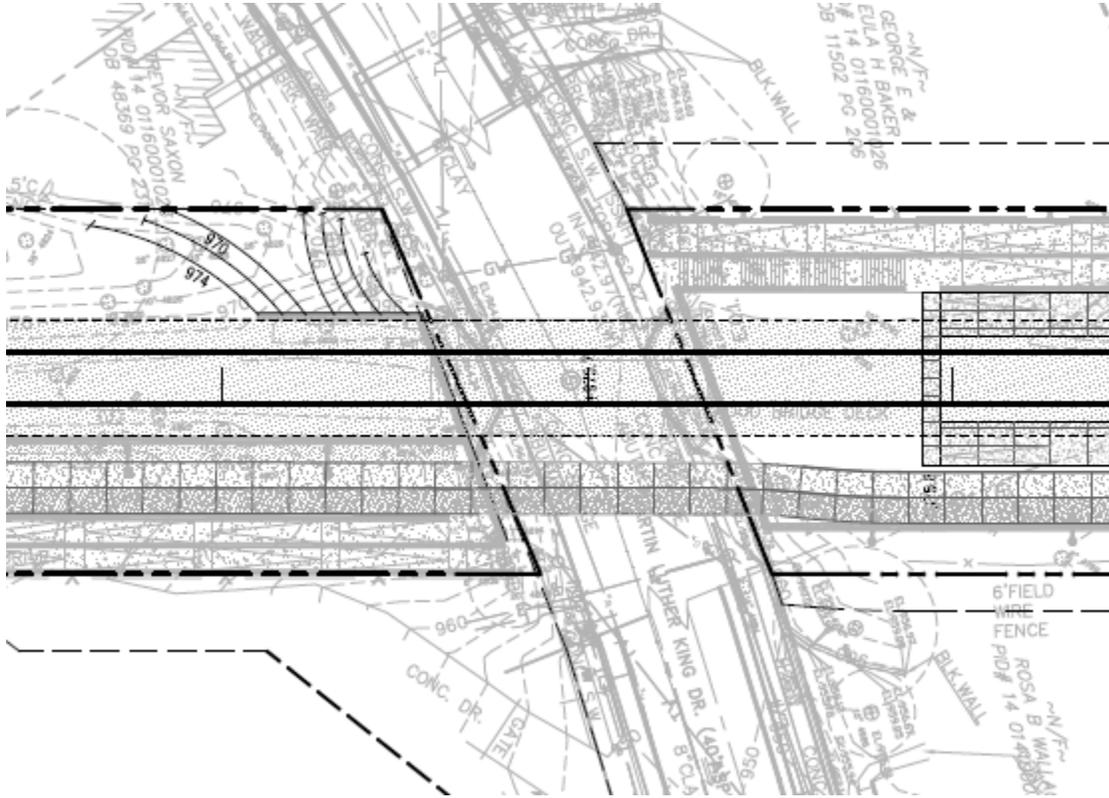
- | | |
|---|--|
| <ul style="list-style-type: none"> 1. Project Cost Estimate 2. USC Estimate Database 3. GDOT Item Mean Summary 4. Means Estimating Manual | <ul style="list-style-type: none"> 5. Richardson's Estimating Manual 6. Vendor (Specify) 7. Other (GDOT Guidance) |
|---|--|

ORIGINAL DESIGN SKETCH/DETAIL

PROPOSAL NUMBER: B6-2

PAGE NUMBER: 3 of 7

PROJECT #/PI #: CSSTP-0009-00(396) / 0009396



Current Design: single span Bridge at MLK

PROPOSED CHANGE SKETCH/DETAIL

PROPOSAL NUMBER: B6-2

PAGE NUMBER: 4 of 7

PROJECT #/PI #: CSSTP-0009-00(396) / 0009396

- Use 3 AASHTO Type II beams (3 feet tall) to replace the plate girders.
- Height of prestressed beams is approximately the same as the plate girders.
- Spacing would be the same as the steel beam design.

CALCULATIONS

PROPOSAL NUMBER: B6-2

PAGE NUMBER: 5 of 7

PROJECT #/PI #: CSSTP-0009-00(396) / 0009396

Original Design

From the design presentation, it was understood that the existing RR bridge over MLK will be replaced with a new bridge to accommodate the multi-use trail. The substructure for the guideway bridge would be installed; however, the superstructure for the guideway bridge would not be constructed as part of this project.

The reason for the replacement is the low vertical clearance of the RR bridge over MLK (12'-9") and the lack of sidewalk accommodation on MLK beneath the bridge.



Figure 1 – looking East along MLK at Railroad Bridge (Source: Google Maps)

The abutment walls beneath MLK are assumed to be full height. Because the minimum GDOT vertical clearance is expected to be maintained beneath the bridges, the height of the abutment is expected to be approximately:

16'-6" min vertical clear

+3 feet embedment into ground. (2 ft min + 1 ft accommodation for the sidewalk)

====

Say 20 ft tall

CALCULATIONS

PROPOSAL NUMBER: B6-2

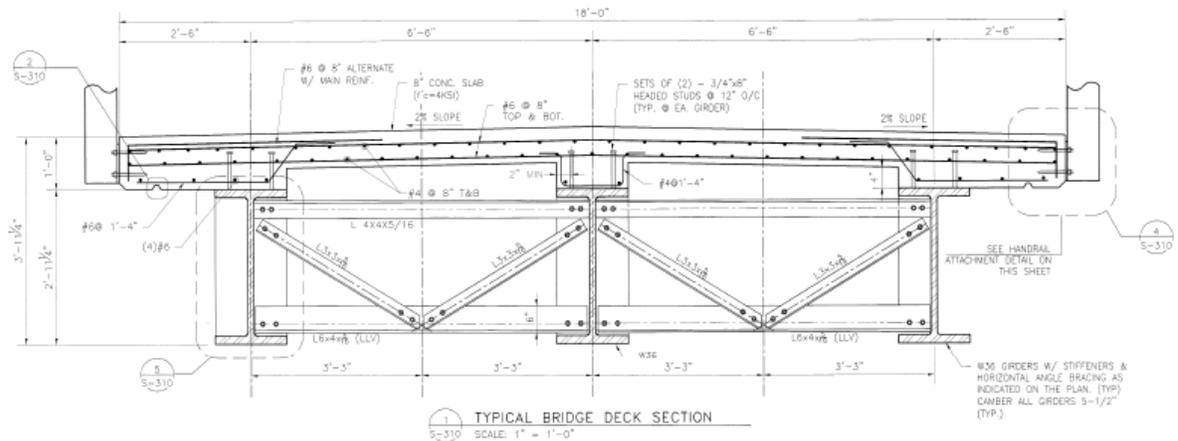
PAGE NUMBER: 6 of 7

PROJECT #/PI #: CSSTP-0009-00(396) / 0009396

Original Design (Continued)

From the Concept Report, the new bridge is described as 55 feet long in the narrative and 18 feet wide in the cost estimate. It is assumed that this width is comprised of the 14 ft. wide trail plus a 2 foot allowance for clear distance on each side of the trail. The parapet consists of a stainless steel fence that bolts to the side of the bridge and is not included in the width. The span length would appear to accommodate 4x10 ft lanes, + 2 x 2 ft shy distance (gutter) + 2 x 5'-6" sidewalk = 55 feet. This would be face of abutment to face of abutment and the actual length of bridge would be 55 ft + 2 x 6 feet from face of abutment to Back Face of Paving Rest (BFPR) = 67 feet.

No proposed bridge plans are available but the example bridge provided to the team was the Ralph McGill Bridge. The Ralph McGill Bridge has a superstructure comprised of 3 x 3 ft. deep steel beams with a cast in place (CIP) concrete deck. Based on span to depth ratio's for steel beams, a similar arrangement should be sufficient for this bridge



Proposed Design

The proposed design would replace the bridge with a single span prestressed concrete beam bridge.

CALCULATIONS

PROPOSAL NUMBER: B6-2

PAGE NUMBER: 7 of 7

PROJECT #/PI #: CSSTP-0009-00(396) / 0009396

From GDOT the price of AASHTO Beam bridges is approximately \$95/SF

From Expanded Component Estimate the price of the MLK bridge is \$250,000
Bridge is 18 x 67 for unit price for the Original Design = $\$250,000 / (18 \times 67) = \207

Back out the 26% markup = $\$207 / 1.26 = \164

Bridge square footage = $18 \times 67 = 1206$ SF

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER: B6-3.1	PAGE NUMBER: 1 of 8
--------------------------------	----------------------------

PROJECT #/PI #:	CSSTP-0009-00(396) / 0009396
PROJECT TITLE:	Atlanta Beltline Corridor from Allene Avenue to Lena Street Fulton County

PROPOSAL DESCRIPTION: USE GEO-GRID SLOPES FOR WALLS UP TO 6 FEET HIGH IN LIEU OF GRANITE CLAD RETAINING WALLS.

ORIGINAL DESIGN: The current design uses cantilever retaining walls for breaks in grade. The retaining walls are clad with granite and have fencing fastened to them.

PROPOSED CHANGE: It is proposed to eliminate concrete walls in areas where there is sufficient right of way to use a geo-grid slope at 1:1. The geo-grid walls are only proposed to be used in fill conditions on walls that are under 6 feet in height.

JUSTIFICATION: The geo-grid slopes look more natural and are less expensive to maintain. The cost is also significantly reduced over a traditional wall and the granite cladding is not necessary.

ADVANTAGES:

- Reduces Construction Cost
- Reduces maintenance
- More natural appearance

DISADVANTAGES:

- None apparent, when used in fill condition

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:	\$ 980,703		\$ 980,703
PROPOSED CHANGE:	\$ 146,389		\$ 146,389
SAVINGS:	\$ 834,314		\$ 834,314

COST ESTIMATING WORKSHEET

PROPOSAL NUMBER:	B6-3.1	PAGE NUMBER:	2 of 8
-------------------------	--------	---------------------	--------

PROJECT #/PI #:	CSSTP-0009-00(396) / 0009396
------------------------	------------------------------

ORIGINAL DESIGN

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Granite clad walls (See Calcs)	7				778,336
SUBTOTAL – COST TO PRIME					778,336
				MARKUP	26%
TOTAL CONTRACT COST					980,703

PROPOSED CHANGE

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Geo-grid Slopes (See Calcs)	7				116,182
SUBTOTAL – COST TO PRIME					116,182
				MARKUP	26.0%
TOTAL CONTRACT COST					146,389

Difference [Original-Proposed] **\$834,314**

SOURCES

- | | |
|---|---|
| <ol style="list-style-type: none"> 1. Project Cost Estimate 2. USC Estimate Database 3. GDOT Item Mean Summary 4. Means Estimating Manual | <ol style="list-style-type: none"> 5. Richardson's Estimating Manual 6. Vendor (Specify) 7. Other (See Calculations Sheet) |
|---|---|

ORIGINAL DESIGN SKETCH/DETAIL

PROPOSAL NUMBER: B6-3.1

PAGE NUMBER: 3 of 8

PROJECT #/PI #: CSSTP-0009-00(396) / 0009396



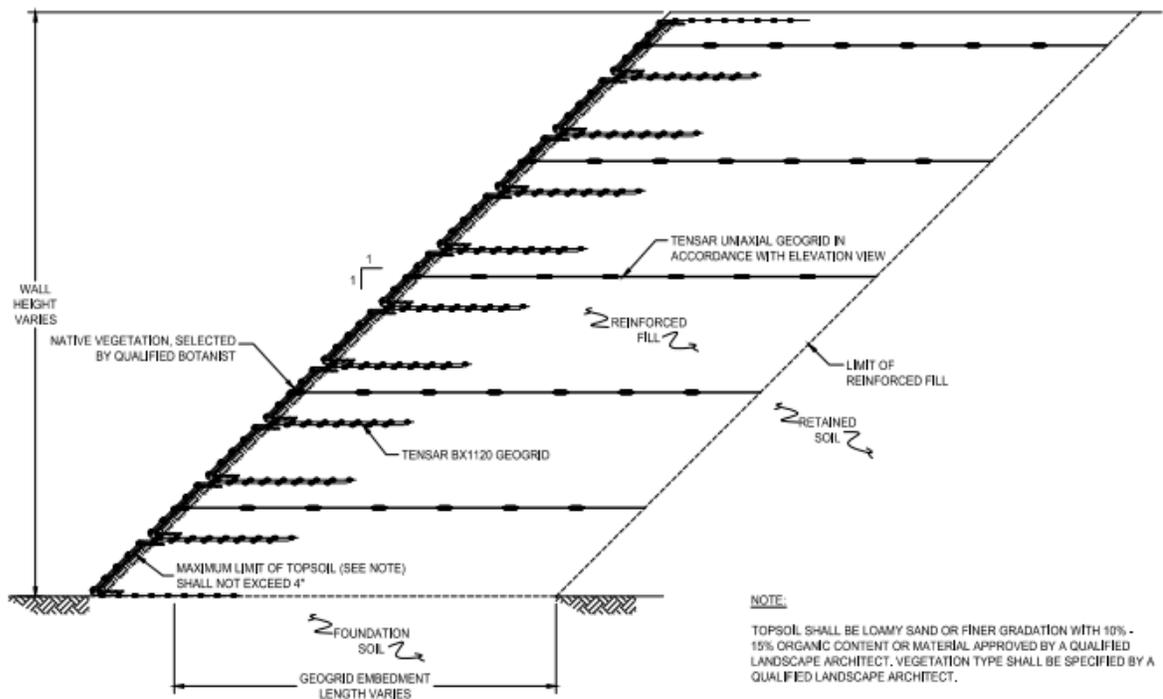
Granite Clad Retaining Wall
Source: Perkins + Will

PROPOSED CHANGE SKETCH/DETAIL

PROPOSAL NUMBER: B6-3.1

PAGE NUMBER: 4 of 8

PROJECT #/PI #: CSSTP-0009-00(396) / 0009396



WRAPPED FACE SIERRA SLOPE TYPICAL CROSS-SECTION

Example of a geogrid reinforced slope

Source <http://www.tensarcorp.com/Systems-and-Products/Sierra-Slope-Retention-System/~media/Files/uploadedCADFiles/Sierra-Slope/MKE-SI-WF-CS-001-Model.pdf>

CALCULATIONS

PROPOSAL NUMBER: B6-3.1

PAGE NUMBER: 5 of 8

PROJECT #/PI #: CSSTP-0009-00(396) / 0009396

Note: Assumptions are based on the Atlanta Beltline - Eastside Trail–North Section plans loaned to the VE Team for the study:

Assumptions:

- The 16” Battered retaining wall appears to be adequate for retained fills up to 10 feet.
- Using the 1:1 slope would make the wall “drift” its height in front of the wall if the ground is level.
- Based on the offsets to right of way to provide room in front of the walls to construct Cantilever walls, the “drift” of the geogrid walls should not be an issue for walls less than 10 feet high.
- Assume that 54” fence will be required in lieu of 42” wall mounted fence
- Applied proposed change to fill walls up to 6 feet in height for calculations

CALCULATIONS

PROPOSAL NUMBER: B6-3.1

PAGE NUMBER: 6 of 8

PROJECT #/PI #: CSSTP-0009-00(396) / 0009396

Wall Take-off Data By the VE Team

Wall	Begin STA	End STA	Length	Cut/Fill	Top Elev	Bottom Elev	Height	SF
1	646+74	649+10	236	Fill	956.00	952.00	4.00	944.00
2	649+30	656+47	717	Fill	979.50	971.50	8.00	5736.00
Ramp	655+05	656+85	578	NA	975.67	958.00	17.67	10211.33
3	657+26	661+30	474	Fill	973.17	960.00	13.17	6241.00
4	658+85	666+50	765	Fill	976.90	968.20	8.70	6655.50
5	688+10	705+80	1770	Fill	1010.86	1002.11	8.74	15477.67
Ramp	701+75	705+80	405	NA	1016.20	1009.25	6.95	2814.75
6	706+25	710+40	415	Fill	1006.67	1000.00	6.67	2766.67
7	712+93	714+36	143	Fill	1011.00	1001.00	5.00	715.00
8	714+47	717+80	333	Cut	1018.00	1008.00	10.00	3330.00
Ramp	719+05	723+60	1037	NA	1018.17	1012.83	5.33	5530.67
9	723+60	724+93	133	Fill	1010.00	1004.00	6.00	798.00
10	727+00	734+35	735	Fill	1001.50	998.25	3.25	2388.75
11	730+68	748+23	1755	Fill	1008.87	997.08	11.78	20679.75
12	734+80	738+05	325	Fill	996.50	995.25	1.25	406.25
13	738+50	745+85	735	Fill	997.67	993.33	4.33	3185.00
14	748+03	755+93	790	Cut	1021.67	1010.67	11.00	8690.00
15	753+75	757+70	425	Fill	1017.00	1012.00	5.00	2125.00
Ramp	756+00		245	NA	1027.00	1021.00	6.00	1470.00
Stair	756+00		153	NA	1039.00	1026.50	12.50	1912.50
16	775+05	780+35	530	Cut	1018.00	1011.00	7.00	3710.00
Ramp	780+50	782+72	666	NA	1028.88	1016.59	12.29	8181.81
Ramp	784+70	787+52	705	NA	1029.75	1021.25	8.50	5992.50
17	787+52	790+30	278	Cut	1021.00	1015.50	5.50	1529.00
Totals			14348					121491

CALCULATIONS

PROPOSAL NUMBER: B6-3.1

PAGE NUMBER: 7 of 8

PROJECT #/PI #: CSSTP-0009-00(396) / 0009396

Cost of Original Design Walls

Granite Clad CIP Retaining Wall Costs									
	Battered Concrete Retaining Walls			Veneer	Wall Cap	Coating	Footing	Total Cost	Cost
	16"	28"	39"	Granite	Granite	Anti-Graffiti	1.5 ft thick x .5H wide		
	10 ft H max	16 ft H max	16+ ft H max						
	\$ 28.00	\$ 40.00	\$ 50.00	\$ 26.00	\$ 35.00	\$ 3.00	\$ 275.00		
Wall	SF	SF	SF	SF	LF	SF	CY		\$/SF
1	\$ 26,432			\$ 24,544	\$ 8,260	\$ 2,832	\$ 7,211	\$ 69,279	\$ 73.39
2	\$ 160,608			\$ 149,136	\$ 25,095	\$ 17,208	\$ 43,817	\$ 395,864	\$ 69.01
Ramp			\$ 510,567	\$ 265,495	\$ 20,230	\$ 30,634	\$ 78,003	\$ 904,929	\$ 88.62
3		\$ 249,640		\$ 162,266	\$ 16,590	\$ 18,723	\$ 47,674	\$ 494,893	\$ 79.30
4	\$ 186,354			\$ 173,043	\$ 26,775	\$ 19,966	\$ 50,841	\$ 456,979	\$ 68.66
5	\$ 433,375			\$ 402,419	\$ 61,950	\$ 46,433	\$ 118,232	\$ 1,062,409	\$ 68.64
Ramp	\$ 78,813			\$ 73,184	\$ 14,175	\$ 8,444	\$ 21,502	\$ 196,117	\$ 69.67
6	\$ 77,467			\$ 71,933	\$ 14,525	\$ 8,300	\$ 21,134	\$ 193,359	\$ 69.89
7	\$ 20,020			\$ 18,590	\$ 5,005	\$ 2,145	\$ 5,462	\$ 51,222	\$ 71.64
8	\$ 93,240			\$ 86,580	\$ 11,655	\$ 9,990	\$ 25,438	\$ 226,903	\$ 68.14
Ramp	\$ 154,859			\$ 143,797	\$ 36,295	\$ 16,592	\$ 42,248	\$ 393,791	\$ 71.20
9	\$ 22,344			\$ 20,748	\$ 4,655	\$ 2,394	\$ 6,096	\$ 56,237	\$ 70.47
10	\$ 66,885			\$ 62,108	\$ 25,725	\$ 7,166	\$ 18,247	\$ 180,131	\$ 75.41
11		\$ 827,190		\$ 537,673	\$ 61,425	\$ 62,039	\$ 157,970	\$ 1,646,298	\$ 79.61
12	\$ 11,375			\$ 10,563	\$ 11,375	\$ 1,219	\$ 3,103	\$ 37,635	\$ 92.64
13	\$ 89,180			\$ 82,810	\$ 25,725	\$ 9,555	\$ 24,330	\$ 231,600	\$ 72.72
14		\$ 347,600		\$ 225,940	\$ 27,650	\$ 26,070	\$ 66,382	\$ 693,642	\$ 79.82
15	\$ 59,500			\$ 55,250	\$ 14,875	\$ 6,375	\$ 16,233	\$ 152,233	\$ 71.64
Ramp	\$ 41,160			\$ 38,220	\$ 8,575	\$ 4,410	\$ 11,229	\$ 103,594	\$ 70.47
Stair		\$ 76,500		\$ 49,725	\$ 5,355	\$ 5,738	\$ 14,609	\$ 151,927	\$ 79.44
16	\$ 103,880			\$ 96,460	\$ 18,550	\$ 11,130	\$ 28,340	\$ 258,360	\$ 69.64
Ramp		\$ 327,272		\$ 212,727	\$ 23,310	\$ 24,545	\$ 62,500	\$ 650,355	\$ 79.49
Ramp	\$ 167,790			\$ 155,805	\$ 24,675	\$ 17,978	\$ 45,776	\$ 412,024	\$ 68.76
17	\$ 42,812			\$ 39,754	\$ 9,730	\$ 4,587	\$ 11,680	\$ 108,563	\$ 71.00
Totals				\$ 3,158,770		\$ 364,473	\$ 928,057	\$ 9,128,343	

CALCULATIONS

PROPOSAL NUMBER: B6-3.1	PAGE NUMBER: 8 of 8
--------------------------------	----------------------------

PROJECT #/PI #: CSSTP-0009-00(396) / 0009396

Geogrid Wall with 1:1				
	Replace wall with a wire basket Geogrid Slope if a Fill wall and Height <= 6 ft	Cost of Geogrid	Cost of CIP wall with Granite	Difference (+ = Saving)
Wall		\$11.00 SF		
1	Yes	\$ 10,384	\$ 69,279	\$ 58,895
2	No	\$ -	\$ -	\$ -
Ramp	No	\$ -	\$ -	\$ -
3	No	\$ -	\$ -	\$ -
4	No	\$ -	\$ -	\$ -
5	No	\$ -	\$ -	\$ -
Ramp	No	\$ -	\$ -	\$ -
6	No	\$ -	\$ -	\$ -
7	Yes	\$ 7,865	\$ 51,222	\$ 43,357
8	No	\$ -	\$ -	\$ -
Ramp	No	\$ -	\$ -	\$ -
9	Yes	\$ 8,778	\$ 56,237	\$ 47,459
10	Yes	\$ 26,276	\$ 180,131	\$ 153,855
11	No	\$ -	\$ -	\$ -
12	Yes	\$ 4,469	\$ 37,635	\$ 33,166
13	Yes	\$ 35,035	\$ 231,600	\$ 196,565
14	No	\$ -	\$ -	\$ -
15	Yes	\$ 23,375	\$ 152,233	\$ 128,858
Ramp	No	\$ -	\$ -	\$ -
Stair	No	\$ -	\$ -	\$ -
16	No	\$ -	\$ -	\$ -
Ramp	No	\$ -	\$ -	\$ -
Ramp	No	\$ -	\$ -	\$ -
17	No	\$ -	\$ -	\$ -
Totals		\$ 116,182	\$ 778,336	\$ 662,154

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER: B6-3.2	PAGE NUMBER: 1 of 10
--------------------------------	-----------------------------

PROJECT #/PI #:	CSSTP-0009-00(396) / 0009396
PROJECT TITLE:	Atlanta Beltline Corridor from Allene Avenue to Lena Street Fulton County

PROPOSAL DESCRIPTION:	USE WIRE-BASKET WALLS FOR WALLS UP TO 6 FEET HIGH IN LIEU OF GRANITE CLAD RETAINING WALLS.
------------------------------	---

ORIGINAL DESIGN: The current design uses cantilever retaining walls for breaks in grade. The retaining walls are clad with granite and have fencing fastened to it.

PROPOSED CHANGE: It is proposed to eliminate concrete walls in areas where there is sufficient right of way to use wire basket walls with plant-able facing and 70 degree slopes. Only use them in fill walls with heights under 6 feet.

JUSTIFICATION: The vegetative wire basket retaining walls look more natural and are less expensive to maintain. The cost is also significantly reduced over a traditional wall and the granite cladding is not necessary.

ADVANTAGES:

- Saves Cost
- Reduces maintenance
- Natural vegetative appearance

DISADVANTAGES:

- None apparent

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:	\$ 980,703		\$ 980,703
PROPOSED CHANGE:	\$ 173,006		\$ 173,006
SAVINGS:	\$ 807,698		\$ 807,698

COST ESTIMATING WORKSHEET

PROPOSAL NUMBER:	B6-3.2	PAGE NUMBER:	2 of 10
-------------------------	--------	---------------------	---------

PROJECT #/PI #:	CSSTP-0009-00(396) / 0009396
------------------------	------------------------------

ORIGINAL DESIGN

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Granite Clad Walls (See Calcs)	7				778,336
SUBTOTAL – COST TO PRIME					778,336
				MARKUP	26%
					202,367
TOTAL CONTRACT COST					980,703

PROPOSED CHANGE

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Wire Basket Walls (See Calcs)	7				137,306
SUBTOTAL – COST TO PRIME					137,306
				MARKUP	26%
					35,700
TOTAL CONTRACT COST					173,006

Difference [Original-Proposed] **\$807,698**

SOURCES

- | | |
|---|---|
| <ol style="list-style-type: none"> 1. Project Cost Estimate 2. USC Estimate Database 3. GDOT Item Mean Summary 4. Means Estimating Manual | <ol style="list-style-type: none"> 5. Richardson's Estimating Manual 6. Vendor (Specify) 7. Other (See Calculations Sheet) |
|---|---|

ORIGINAL DESIGN SKETCH/DETAIL

PROPOSAL NUMBER: B6-3.2

PAGE NUMBER: 3 of 10

PROJECT #/PI #: CSSTP-0009-00(396) / 0009396



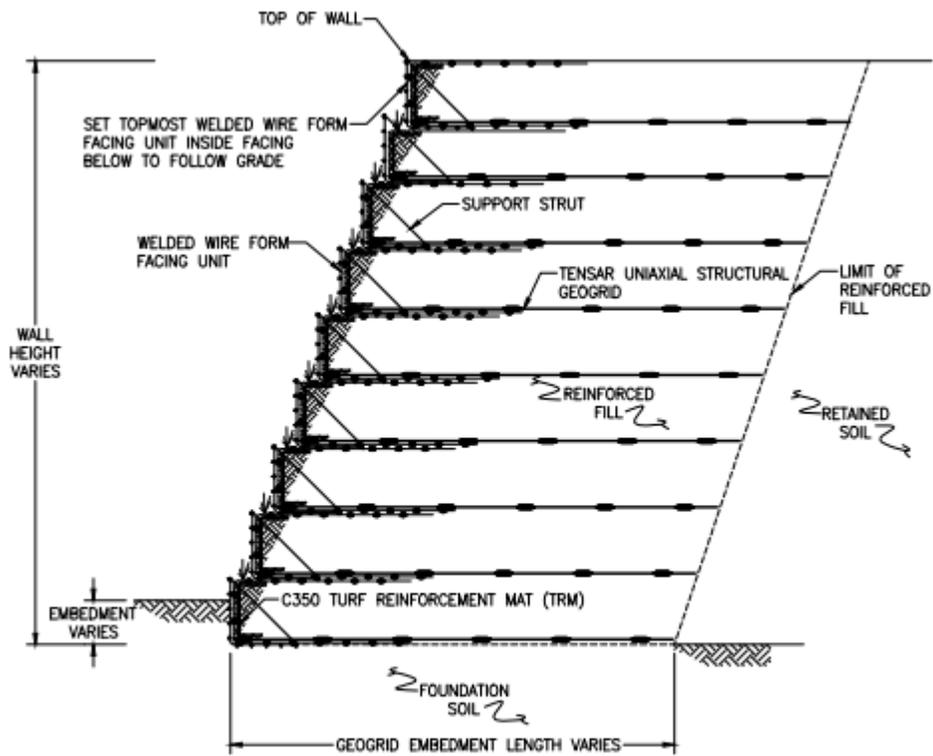
Granite Clad Retaining Wall
Source: Perkins + Will

PROPOSED CHANGE SKETCH/DETAIL

PROPOSAL NUMBER: B6-3.2

PAGE NUMBER: 4 of 10

PROJECT #/PI #: CSSTP-0009-00(396) / 0009396



SIERRA SLOPE TYPICAL CROSS-SECTION

Source: <http://www.tensarcorp.com>

PROPOSED CHANGE SKETCH/DETAIL

PROPOSAL NUMBER: B6-3.2

PAGE NUMBER: 5 of 10

PROJECT #/PI #: CSSTP-0009-00(396) / 0009396

Vegetated Reinforced Soil Slopes



Vegetated wall facing

Source: <http://www.tensarcorp.com/Systems-and-Products/Triton-Systems/Vegetated-Reinforced-Soil-Slopes>

PROPOSED CHANGE SKETCH/DETAIL

PROPOSAL NUMBER: B6-3.2

PAGE NUMBER: 6 of 10

PROJECT #/PI #: CSSTP-0009-00(396) / 0009396

Sierra® Slope Retention System



The Sierra® Slope Retention System provides an economic and aesthetic alternative to conventional concrete retaining walls, replacing them with natural, landscaped, sloping structures nearly indistinguishable from native terrain. These graded and steepened reinforced soil slopes (RSS) typically range from 26° to 70°, depending upon site development conditions. Unlike flatter slopes, Sierra Slopes claim a smaller footprint as they maximize developable land, create usable land in undeveloped areas and enhance property values.

Another picture of a Vegetated Wall face

Source: <http://www.tensarcorp.com>

CALCULATIONS

PROPOSAL NUMBER: B6-3.2

PAGE NUMBER: 7 of 10

PROJECT #/PI #: CSSTP-0009-00(396) / 0009396

Note: Assumptions are based on the Atlanta Beltline - Eastside Trail–North Section plans loaned to the VE Team for the study:

Assumptions:

- The 16” Battered retaining wall appears to be adequate for retained fills up to 6 feet.
- Proposed Change applied to walls with 6 feet in height or less
- Using the steep Vegetated retaining wall face (approximately 70 degrees) the toe of the wall would “drift” forward approximately $6 \text{ ft} / \tan(70) = 2.2$ feet.
- Based on the offsets to right of way to provide room in front of the walls to construct Cantilever walls, the “drift” of the wire-basket walls should not be an issue.
- Assume that fence on top of the wall or slope is approximately the same
- From Janice Reid, Strata Systems, 770-712-1729, \$13/SF of Height for wire basket Geogrid walls.

CALCULATIONS

PROPOSAL NUMBER: B6-3.2

PAGE NUMBER: 8 of 10

PROJECT #/PI #: CSSTP-0009-00(396) / 0009396

Wall Take-off Data By the VE Team

Wall	Begin STA	End STA	Length	Cut/Fill	Top Elev	Bottom Elev	Height	SF
1	646+74	649+10	236	Fill	956.00	952.00	4.00	944.00
2	649+30	656+47	717	Fill	979.50	971.50	8.00	5736.00
Ramp	655+05	656+85	578	NA	975.67	958.00	17.67	10211.33
3	657+26	661+30	474	Fill	973.17	960.00	13.17	6241.00
4	658+85	666+50	765	Fill	976.90	968.20	8.70	6655.50
5	688+10	705+80	1770	Fill	1010.86	1002.11	8.74	15477.67
Ramp	701+75	705+80	405	NA	1016.20	1009.25	6.95	2814.75
6	706+25	710+40	415	Fill	1006.67	1000.00	6.67	2766.67
7	712+93	714+36	143	Fill	1011.00	1001.00	5.00	715.00
8	714+47	717+80	333	Cut	1018.00	1008.00	10.00	3330.00
Ramp	719+05	723+60	1037	NA	1018.17	1012.83	5.33	5530.67
9	723+60	724+93	133	Fill	1010.00	1004.00	6.00	798.00
10	727+00	734+35	735	Fill	1001.50	998.25	3.25	2388.75
11	730+68	748+23	1755	Fill	1008.87	997.08	11.78	20679.75
12	734+80	738+05	325	Fill	996.50	995.25	1.25	406.25
13	738+50	745+85	735	Fill	997.67	993.33	4.33	3185.00
14	748+03	755+93	790	Cut	1021.67	1010.67	11.00	8690.00
15	753+75	757+70	425	Fill	1017.00	1012.00	5.00	2125.00
Ramp	756+00		245	NA	1027.00	1021.00	6.00	1470.00
Stair	756+00		153	NA	1039.00	1026.50	12.50	1912.50
16	775+05	780+35	530	Cut	1018.00	1011.00	7.00	3710.00
Ramp	780+50	782+72	666	NA	1028.88	1016.59	12.29	8181.81
Ramp	784+70	787+52	705	NA	1029.75	1021.25	8.50	5992.50
17	787+52	790+30	278	Cut	1021.00	1015.50	5.50	1529.00
Totals			14348					121491.14

CALCULATIONS

PROPOSAL NUMBER: B6-3.2

PAGE NUMBER: 9 of 10

PROJECT #/PI #: CSSTP-0009-00(396) / 0009396

Original Design

Granite Clad CIP Retaining Wall Costs									
	Battered Concrete Retaining Walls			Veneer	Wall Cap	Coating	Footing	Total Cost	Cost
	16"	28"	39"	Granite	Granite	Anti-Graffiti	1.5 ft thick x .5H wide		
	10 ft H max	16 ft H max	16+ ft H max						
	\$ 28.00	\$ 40.00	\$ 50.00				\$ 26.00		
Wall	SF	SF	SF	SF	LF	SF	CY	\$/SF	
1	\$ 26,432			\$ 24,544	\$ 8,260	\$ 2,832	\$ 7,211	\$ 69,279	\$ 73.39
2	\$ 160,608			\$ 149,136	\$ 25,095	\$ 17,208	\$ 43,817	\$ 395,864	\$ 69.01
Ramp			\$ 510,567	\$ 265,495	\$ 20,230	\$ 30,634	\$ 78,003	\$ 904,929	\$ 88.62
3		\$ 249,640		\$ 162,266	\$ 16,590	\$ 18,723	\$ 47,674	\$ 494,893	\$ 79.30
4	\$ 186,354			\$ 173,043	\$ 26,775	\$ 19,966	\$ 50,841	\$ 456,979	\$ 68.66
5	\$ 433,375			\$ 402,419	\$ 61,950	\$ 46,433	\$ 118,232	\$ 1,062,409	\$ 68.64
Ramp	\$ 78,813			\$ 73,184	\$ 14,175	\$ 8,444	\$ 21,502	\$ 196,117	\$ 69.67
6	\$ 77,467			\$ 71,933	\$ 14,525	\$ 8,300	\$ 21,134	\$ 193,359	\$ 69.89
7	\$ 20,020			\$ 18,590	\$ 5,005	\$ 2,145	\$ 5,462	\$ 51,222	\$ 71.64
8	\$ 93,240			\$ 86,580	\$ 11,655	\$ 9,990	\$ 25,438	\$ 226,903	\$ 68.14
Ramp	\$ 154,859			\$ 143,797	\$ 36,295	\$ 16,592	\$ 42,248	\$ 393,791	\$ 71.20
9	\$ 22,344			\$ 20,748	\$ 4,655	\$ 2,394	\$ 6,096	\$ 56,237	\$ 70.47
10	\$ 66,885			\$ 62,108	\$ 25,725	\$ 7,166	\$ 18,247	\$ 180,131	\$ 75.41
11		\$ 827,190		\$ 537,673	\$ 61,425	\$ 62,039	\$ 157,970	\$ 1,646,298	\$ 79.61
12	\$ 11,375			\$ 10,563	\$ 11,375	\$ 1,219	\$ 3,103	\$ 37,635	\$ 92.64
13	\$ 89,180			\$ 82,810	\$ 25,725	\$ 9,555	\$ 24,330	\$ 231,600	\$ 72.72
14		\$ 347,600		\$ 225,940	\$ 27,650	\$ 26,070	\$ 66,382	\$ 693,642	\$ 79.82
15	\$ 59,500			\$ 55,250	\$ 14,875	\$ 6,375	\$ 16,233	\$ 152,233	\$ 71.64
Ramp	\$ 41,160			\$ 38,220	\$ 8,575	\$ 4,410	\$ 11,229	\$ 103,594	\$ 70.47
Stair		\$ 76,500		\$ 49,725	\$ 5,355	\$ 5,738	\$ 14,609	\$ 151,927	\$ 79.44
16	\$ 103,880			\$ 96,460	\$ 18,550	\$ 11,130	\$ 28,340	\$ 258,360	\$ 69.64
Ramp		\$ 327,272		\$ 212,727	\$ 23,310	\$ 24,545	\$ 62,500	\$ 650,355	\$ 79.49
Ramp	\$ 167,790			\$ 155,805	\$ 24,675	\$ 17,978	\$ 45,776	\$ 412,024	\$ 68.76
17	\$ 42,812			\$ 39,754	\$ 9,730	\$ 4,587	\$ 11,680	\$ 108,563	\$ 71.00
Totals				\$ 3,158,770		\$ 364,473	\$ 928,057	\$ 9,128,343	

CALCULATIONS

PROPOSAL NUMBER: B6-3.2

PAGE NUMBER: 10 of 10

PROJECT #/PI #: CSSTP-0009-00(396) / 0009396

Geogrid Wall with Wire Basket Cost				
	Replace wall with a wire basket Geogrid Slope if a Fill wall and Height <= 6 ft	Cost of Geogrid	Cost of CIP wall with Granite	Difference (+ = Saving)
Wall		\$13.00 SF		
1	Yes	\$ 12,272	\$ 69,279	\$ 57,007
2	No	\$ -	\$ -	\$ -
Ramp	No	\$ -	\$ -	\$ -
3	No	\$ -	\$ -	\$ -
4	No	\$ -	\$ -	\$ -
5	No	\$ -	\$ -	\$ -
Ramp	No	\$ -	\$ -	\$ -
6	No	\$ -	\$ -	\$ -
7	Yes	\$ 9,295	\$ 51,222	\$ 41,927
8	No	\$ -	\$ -	\$ -
Ramp	No	\$ -	\$ -	\$ -
9	Yes	\$ 10,374	\$ 56,237	\$ 45,863
10	Yes	\$ 31,054	\$ 180,131	\$ 149,077
11	No	\$ -	\$ -	\$ -
12	Yes	\$ 5,281	\$ 37,635	\$ 32,353
13	Yes	\$ 41,405	\$ 231,600	\$ 190,195
14	No	\$ -	\$ -	\$ -
15	Yes	\$ 27,625	\$ 152,233	\$ 124,608
Ramp	No	\$ -	\$ -	\$ -
Stair	No	\$ -	\$ -	\$ -
16	No	\$ -	\$ -	\$ -
Ramp	No	\$ -	\$ -	\$ -
Ramp	No	\$ -	\$ -	\$ -
17	No	\$ -	\$ -	\$ -
Totals		\$ 137,306	\$ 778,336	\$ 641,030

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER: B6-3.3	PAGE NUMBER: 1 of 10
--------------------------------	-----------------------------

PROJECT #/PI #:	CSSTP-0009-00(396) / 0009396
PROJECT TITLE:	Atlanta Beltline Corridor from Allene Avenue to Lena Street Fulton County

PROPOSAL DESCRIPTION: USE MSE RETAINING WALLS THAT ARE ABLE TO BE VEGETATED FOR WALLS UP TO 6 FEET HIGH IN LIEU OF GRANITE CLAD CANTILEVER RETAINING WALLS.

ORIGINAL DESIGN: The current design uses cantilever retaining walls for breaks in grade. The retaining walls are clad with granite and have fencing fastened to it.

PROPOSED CHANGE: It is proposed to eliminate concrete walls in areas where there is sufficient right of way to use an MSE wall that is able to be vegetated. These are proposed for walls under 6 feet in height.

JUSTIFICATION: The vegetative MSE walls reduce construction costs, look more natural and are less expensive to maintain than granite clad concrete retaining walls.

ADVANTAGES:

- Reduces cost
- Reduces maintenance
- More natural appearance

DISADVANTAGES:

- None apparent

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:	\$ 980,703		\$ 980,703
PROPOSED CHANGE:	\$ 532,325		\$ 532,325
SAVINGS:	\$ 448,378		\$ 448,378

COST ESTIMATING WORKSHEET

PROPOSAL NUMBER: B6-3.3	PAGE NUMBER: 2 of 10
--------------------------------	-----------------------------

PROJECT #/PI #: CSSTP-0009-00(396) / 0009396

ORIGINAL DESIGN

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Granite Clad Walls (See Calcs)	7				778,336
SUBTOTAL – COST TO PRIME					778,336
MARKUP				26%	202,367
TOTAL CONTRACT COST					980,703

PROPOSED CHANGE

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Vegetated MSE Walls (See Calcs)	7				422,480
SUBTOTAL – COST TO PRIME					422,480
MARKUP				26%	109,845
TOTAL CONTRACT COST					532,325

Difference [Original-Proposed] **\$448,378**

SOURCES

- | | |
|---|---|
| <ol style="list-style-type: none"> 1. Project Cost Estimate 2. USC Estimate Database 3. GDOT Item Mean Summary 4. Means Estimating Manual | <ol style="list-style-type: none"> 5. Richardson's Estimating Manual 6. Vendor (Specify) 7. Other (See Calculations Sheet) |
|---|---|

ORIGINAL DESIGN SKETCH/DETAIL

PROPOSAL NUMBER: B6-3.3

PAGE NUMBER: 3 of 10

PROJECT #/PI #: CSSTP-0009-00(396) / 0009396



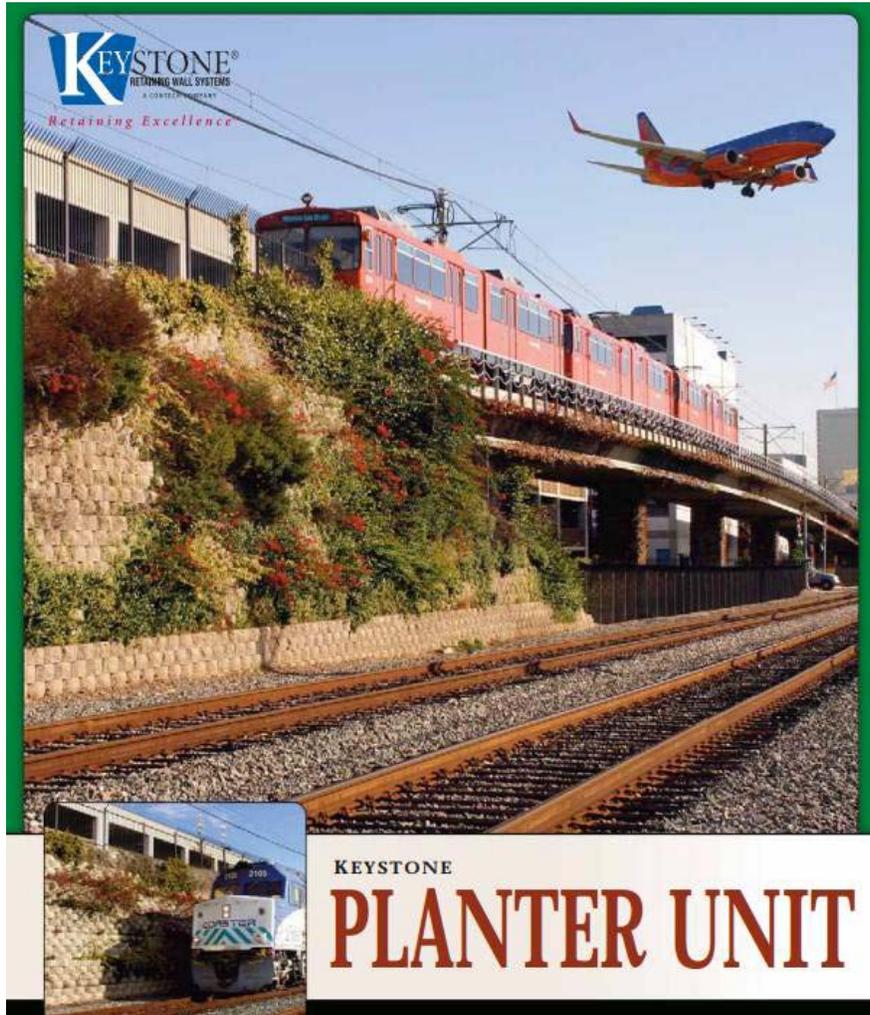
Granite Clad Retaining Wall
Source: Perkins + Will

PROPOSED CHANGE SKETCH/DETAIL

PROPOSAL NUMBER: B6-3.3

PAGE NUMBER: 4 of 10

PROJECT #/PI #: CSSTP-0009-00(396) / 0009396



Example of a vegetated segmental retaining wall near a transit facility
Source www.geogridwalls.com

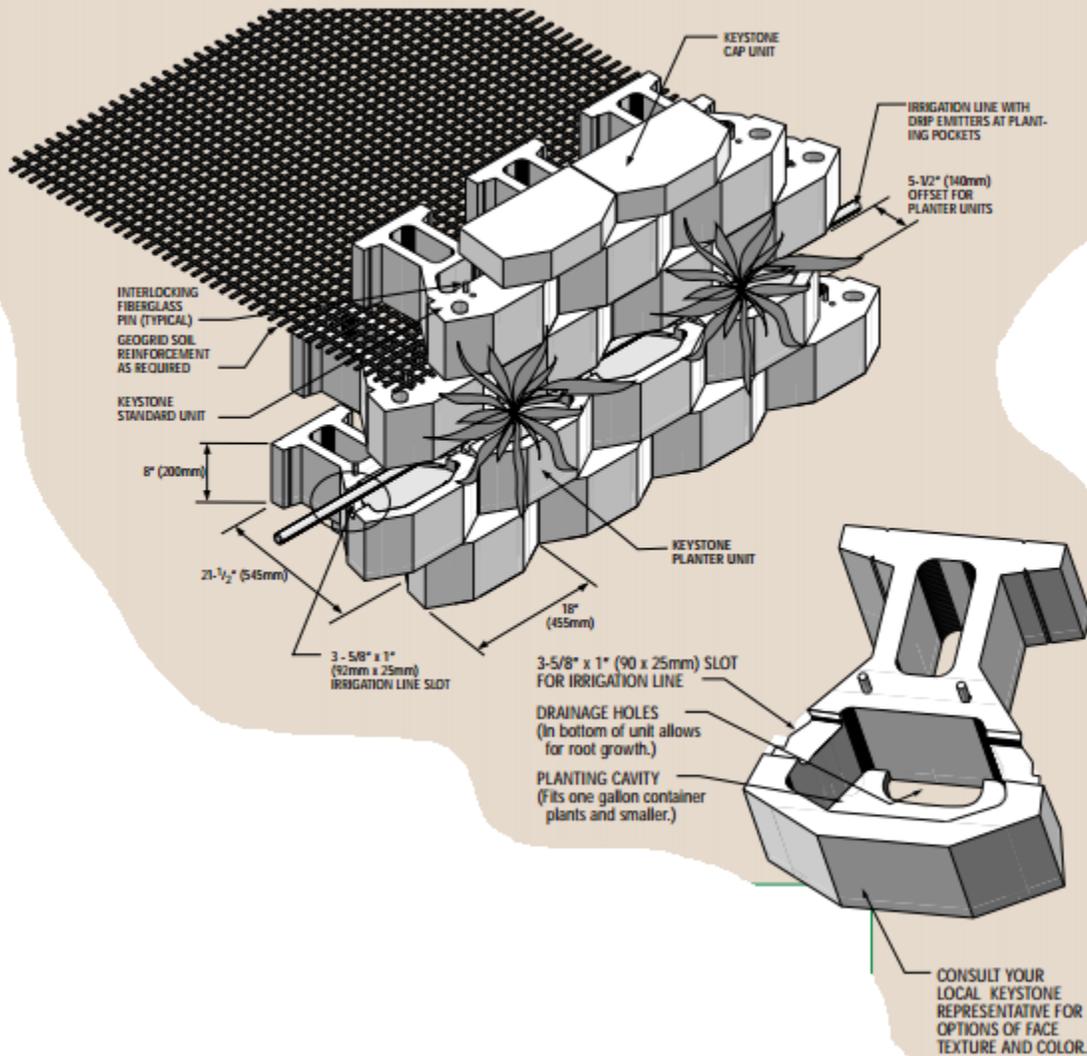
PROPOSED CHANGE SKETCH/DETAIL

PROPOSAL NUMBER: B6-3.3

PAGE NUMBER: 5 of 10

PROJECT #/PI #: CSSTP-0009-00(396) / 0009396

ASSEMBLY OF SYSTEM COMPONENTS



Wall System Details

Source www.geogridwalls.com

PROPOSED CHANGE SKETCH/DETAIL

PROPOSAL NUMBER: B6-3.3

PAGE NUMBER: 6 of 10

PROJECT #/PI #: CSSTP-0009-00(396) / 0009396



Similar MSE wall system that is able to be vegetated (near install and after vegetation is established)

Source: http://www.herculesmfg.com/casestudyimages/rss_doc.pdf

CALCULATIONS

PROPOSAL NUMBER: B6-3.3

PAGE NUMBER: 7 of 10

PROJECT #/PI #: CSSTP-0009-00(396) / 0009396

Note: Assumptions are based on the Atlanta Beltline - Eastside Trail–North Section plans loaned to the VE Team for the study:

Assumptions:

- The 16” Battered retaining wall appears to be adequate for retained fills up to 6 feet.
- Proposed change applied to walls 6 feet in height or less
- Using the steep Vegetated retaining wall face (approximately 70 degrees) the toe of the wall would “drift” forward approximately $6 \text{ ft} / \tan(70) = 2.2$ feet.
- Based on the offsets to right of way to provide room in front of the walls to construct Cantilever walls, the “drift” of the MSE walls should not be an issue.
- Assume that 54” fence will be required in lieu of 42” wall mounted fence

CALCULATIONS

PROPOSAL NUMBER: B6-3.3

PAGE NUMBER: 8 of 10

PROJECT #/PI #: CSSTP-0009-00(396) / 0009396

Wall Take-off Data By the VE Team

Wall	Begin STA	End STA	Length	Cut/Fill	Top Elev	Bottom Elev	Height	SF
1	646+74	649+10	236	Fill	956.00	952.00	4.00	944.00
2	649+30	656+47	717	Fill	979.50	971.50	8.00	5736.00
Ramp	655+05	656+85	578	NA	975.67	958.00	17.67	10211.33
3	657+26	661+30	474	Fill	973.17	960.00	13.17	6241.00
4	658+85	666+50	765	Fill	976.90	968.20	8.70	6655.50
5	688+10	705+80	1770	Fill	1010.86	1002.11	8.74	15477.67
Ramp	701+75	705+80	405	NA	1016.20	1009.25	6.95	2814.75
6	706+25	710+40	415	Fill	1006.67	1000.00	6.67	2766.67
7	712+93	714+36	143	Fill	1011.00	1001.00	5.00	715.00
8	714+47	717+80	333	Cut	1018.00	1008.00	10.00	3330.00
Ramp	719+05	723+60	1037	NA	1018.17	1012.83	5.33	5530.67
9	723+60	724+93	133	Fill	1010.00	1004.00	6.00	798.00
10	727+00	734+35	735	Fill	1001.50	998.25	3.25	2388.75
11	730+68	748+23	1755	Fill	1008.87	997.08	11.78	20679.75
12	734+80	738+05	325	Fill	996.50	995.25	1.25	406.25
13	738+50	745+85	735	Fill	997.67	993.33	4.33	3185.00
14	748+03	755+93	790	Cut	1021.67	1010.67	11.00	8690.00
15	753+75	757+70	425	Fill	1017.00	1012.00	5.00	2125.00
Ramp	756+00		245	NA	1027.00	1021.00	6.00	1470.00
Stair	756+00		153	NA	1039.00	1026.50	12.50	1912.50
16	775+05	780+35	530	Cut	1018.00	1011.00	7.00	3710.00
Ramp	780+50	782+72	666	NA	1028.88	1016.59	12.29	8181.81
Ramp	784+70	787+52	705	NA	1029.75	1021.25	8.50	5992.50
17	787+52	790+30	278	Cut	1021.00	1015.50	5.50	1529.00
Totals			14348					121491

CALCULATIONS

PROPOSAL NUMBER: B6-3.3	PAGE NUMBER: 9 of 10
--------------------------------	-----------------------------

PROJECT #/PI #: CSSTP-0009-00(396) / 0009396

Original Design

Granite Clad CIP Retaining Wall Costs									
Wall	Battered Concrete Retaining Walls			Veneer	Wall Cap	Coating	Footing	Total Cost	Cost
	16"	28"	39"	Granite	Granite	Anti-Graffiti	1.5 ft thick x .5H wide		
	10 ft H max	16 ft H max	16+ ft H max						
	\$ 28.00	\$ 40.00	\$ 50.00						
SF	SF	SF	SF	LF	SF	CY	\$	\$/SF	
1	\$ 26,432			\$ 24,544	\$ 8,260	\$ 2,832	\$ 7,211	\$ 69,279	\$ 73.39
2	\$ 160,608			\$ 149,136	\$ 25,095	\$ 17,208	\$ 43,817	\$ 395,864	\$ 69.01
Ramp			\$ 510,567	\$ 265,495	\$ 20,230	\$ 30,634	\$ 78,003	\$ 904,929	\$ 88.62
3		\$ 249,640		\$ 162,266	\$ 16,590	\$ 18,723	\$ 47,674	\$ 494,893	\$ 79.30
4	\$ 186,354			\$ 173,043	\$ 26,775	\$ 19,966	\$ 50,841	\$ 456,979	\$ 68.66
5	\$ 433,375			\$ 402,419	\$ 61,950	\$ 46,433	\$ 118,232	\$ 1,062,409	\$ 68.64
Ramp	\$ 78,813			\$ 73,184	\$ 14,175	\$ 8,444	\$ 21,502	\$ 196,117	\$ 69.67
6	\$ 77,467			\$ 71,933	\$ 14,525	\$ 8,300	\$ 21,134	\$ 193,359	\$ 69.89
7	\$ 20,020			\$ 18,590	\$ 5,005	\$ 2,145	\$ 5,462	\$ 51,222	\$ 71.64
8	\$ 93,240			\$ 86,580	\$ 11,655	\$ 9,990	\$ 25,438	\$ 226,903	\$ 68.14
Ramp	\$ 154,859			\$ 143,797	\$ 36,295	\$ 16,592	\$ 42,248	\$ 393,791	\$ 71.20
9	\$ 22,344			\$ 20,748	\$ 4,655	\$ 2,394	\$ 6,096	\$ 56,237	\$ 70.47
10	\$ 66,885			\$ 62,108	\$ 25,725	\$ 7,166	\$ 18,247	\$ 180,131	\$ 75.41
11		\$ 827,190		\$ 537,673	\$ 61,425	\$ 62,039	\$ 157,970	\$ 1,646,298	\$ 79.61
12	\$ 11,375			\$ 10,563	\$ 11,375	\$ 1,219	\$ 3,103	\$ 37,635	\$ 92.64
13	\$ 89,180			\$ 82,810	\$ 25,725	\$ 9,555	\$ 24,330	\$ 231,600	\$ 72.72
14		\$ 347,600		\$ 225,940	\$ 27,650	\$ 26,070	\$ 66,382	\$ 693,642	\$ 79.82
15	\$ 59,500			\$ 55,250	\$ 14,875	\$ 6,375	\$ 16,233	\$ 152,233	\$ 71.64
Ramp	\$ 41,160			\$ 38,220	\$ 8,575	\$ 4,410	\$ 11,229	\$ 103,594	\$ 70.47
Stair		\$ 76,500		\$ 49,725	\$ 5,355	\$ 5,738	\$ 14,609	\$ 151,927	\$ 79.44
16	\$ 103,880			\$ 96,460	\$ 18,550	\$ 11,130	\$ 28,340	\$ 258,360	\$ 69.64
Ramp		\$ 327,272		\$ 212,727	\$ 23,310	\$ 24,545	\$ 62,500	\$ 650,355	\$ 79.49
Ramp	\$ 167,790			\$ 155,805	\$ 24,675	\$ 17,978	\$ 45,776	\$ 412,024	\$ 68.76
17	\$ 42,812			\$ 39,754	\$ 9,730	\$ 4,587	\$ 11,680	\$ 108,563	\$ 71.00
Totals				\$ 3,158,770		\$ 364,473	\$ 928,057	\$ 9,128,343	

CALCULATIONS

PROPOSAL NUMBER: B6-3.3

PAGE NUMBER: 10 of 10

PROJECT #/PI #: CSSTP-0009-00(396) / 0009396

Proposed Design

MSE Wall with Vegetated Face Cost

	Replace wall with a Vegetated MSE Wall if a Fill wall and Height <= 6 ft	Cost of Wall	Cost of CIP wall with Granite	Difference (+ = Saving)
Wall	Height <= 6 ft	\$40.00 SF		
1	Yes	\$ 37,760	\$ 69,279	\$ 31,519
2	No	\$ -	\$ -	\$ -
Ramp	No	\$ -	\$ -	\$ -
3	No	\$ -	\$ -	\$ -
4	No	\$ -	\$ -	\$ -
5	No	\$ -	\$ -	\$ -
Ramp	No	\$ -	\$ -	\$ -
6	No	\$ -	\$ -	\$ -
7	Yes	\$ 28,600	\$ 51,222	\$ 22,622
8	No	\$ -	\$ -	\$ -
Ramp	No	\$ -	\$ -	\$ -
9	Yes	\$ 31,920	\$ 56,237	\$ 24,317
10	Yes	\$ 95,550	\$ 180,131	\$ 84,581
11	No	\$ -	\$ -	\$ -
12	Yes	\$ 16,250	\$ 37,635	\$ 21,385
13	Yes	\$ 127,400	\$ 231,600	\$ 104,200
14	No	\$ -	\$ -	\$ -
15	Yes	\$ 85,000	\$ 152,233	\$ 67,233
Ramp	No	\$ -	\$ -	\$ -
Stair	No	\$ -	\$ -	\$ -
16	No	\$ -	\$ -	\$ -
Ramp	No	\$ -	\$ -	\$ -
Ramp	No	\$ -	\$ -	\$ -
17	No	\$ -	\$ -	\$ -
Totals		\$ 422,480	\$ 778,336	\$ 355,856
	markup	\$ 109,845	\$ 202,367	\$ 92,523
	Total	\$ 532,325	\$ 980,703	\$ 448,378

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER: B6-4	PAGE NUMBER: 1 of 7
------------------------------	----------------------------

PROJECT #/PI #:	CSSTP-0009-00(396) / 0009396
PROJECT TITLE:	Atlanta Beltline Corridor from Allene Avenue to Lena Street Fulton County

PROPOSAL DESCRIPTION: UTILIZE 2:1 SLOPES AND ELIMINATE RETAINING WALLS AT SPECIFIC LOCATIONS.

ORIGINAL DESIGN: The current design utilizes over 14,000 linear feet of Granite Clad Cast-in-Place Concrete Retaining Wall located between the trail and transit alignment, as well as to the outside of the trail alignment.

PROPOSED CHANGE: It is proposed to utilize a 5-foot graded shoulder with 2:1 slopes in lieu of retaining walls in locations where wall removal and use of slope will not adversely affect right-of-way or easement limits or adjoining properties. As shown in the calculations sheets within this proposal it is believed that 7 of the 17 retaining walls in the current design can be eliminated or reduced.

JUSTIFICATION: Utilizing a wider shoulder would allow a 2:1 slope to be used in lieu of retaining walls and handrail/fencing.

ADVANTAGES:

- Reduces cost
- Reduces wall maintenance
- Reduces opportunity for graffiti

DISADVANTAGES:

- More slope maintenance

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:	\$ 2,985,675		\$ 2,985,675
PROPOSED CHANGE:	\$ 0		\$ 0
SAVINGS:	\$ 2,985,675		\$ 2,985,675

COST ESTIMATING WORKSHEET

PROPOSAL NUMBER: B6-4	PAGE NUMBER: 2 of 7
------------------------------	----------------------------

PROJECT #/PI #: CSSTP-0009-00(396) / 0009396

ORIGINAL DESIGN

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Granite Clad CIP Wall (reduction)	1,7	SF	27640.67	See Calcs	1,736,833
42" Stainless Steel Barrier Fence (reduction)	1,7	LF	1770	350	619,500
42" Chainlink Fence (reduction)	1,7	LF	530	25	13,250
SUBTOTAL – COST TO PRIME					2,369,583
MARKUP				26%	616,092
TOTAL CONTRACT COST					2,985,675

PROPOSED CHANGE

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
SUBTOTAL – COST TO PRIME					0
MARKUP					
TOTAL CONTRACT COST					0

Difference [Original-Proposed] **\$2,985,675**

SOURCES

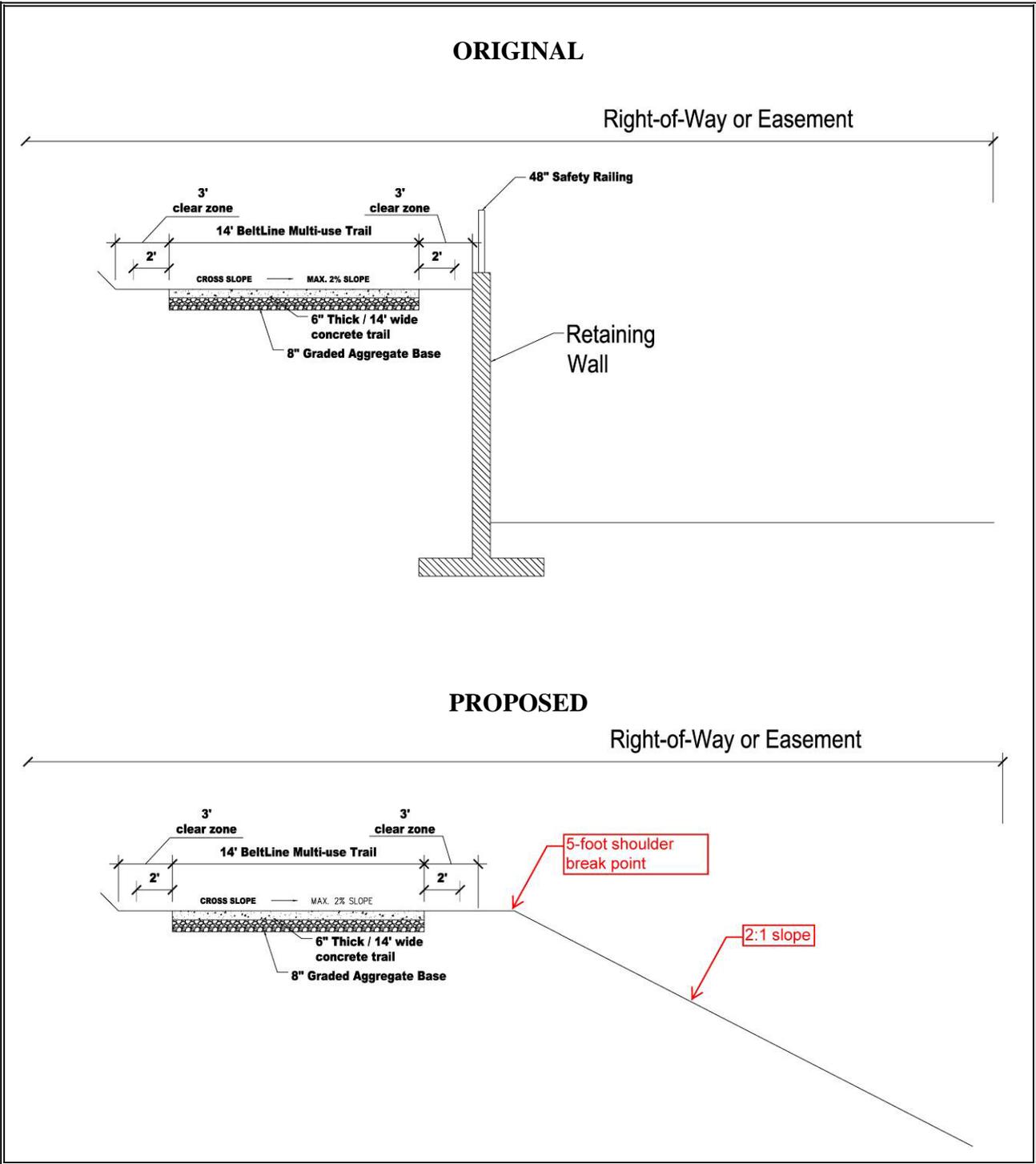
- | | |
|---|---|
| <ol style="list-style-type: none"> 1. Project Cost Estimate 2. USC Estimate Database 3. GDOT Item Mean Summary 4. Means Estimating Manual | <ol style="list-style-type: none"> 5. Richardson's Estimating Manual 6. Vendor (Specify) 7. Other (See Calculations) |
|---|---|

ORIGINAL & PROPOSED DESIGN SKETCH/DETAIL

PROPOSAL NUMBER: B6-4

PAGE NUMBER: 3 of 7

PROJECT #/PI #: CSSTP-0009-00(396) / 0009396



CALCULATIONS

PROPOSAL NUMBER: B6-4

PAGE NUMBER: 4 of 7

PROJECT #/PI #: CSSTP-0009-00(396) / 0009396

A total of 17 walls were identified on the 25% Plans as provided. Each wall was identified by length and height per the plan design and a square foot total area per wall calculated. Using these wall heights, costs for each wall, including a cost per square foot was calculated for each wall.

The tables on the following pages present these square foot and cost calculations. In addition, the third table presents the following analysis:

To evaluate if 2:1 fill slopes could be used in lieu of retaining walls, it was assumed that the 3-foot graded shoulder would need to be widened to 5-foot minimum to provide adequate recovery distance before the shoulder break to the 2:1 slope. To evaluate if use of 2:1 slope in lieu of a retaining wall was possible, the plan view (25% Plans) was reviewed to determine if adequate space was available to accommodate a 5-foot graded shoulder and a fill slope two times the wall height. If the plan review indicated that adequate right-of-way or proposed easement (as noted in the 25% Plans) was available and that adjoining properties would not be adversely impacted, then the “change” or use of 2:1 slopes in lieu of a retaining wall would be proposed. If adequate width was not available or if additional conditions or constraints were present that would be impacted by the “change”, then the “change” or use of 2:1 slopes in lieu of a retaining wall would not be proposed. Seven of the 17 walls could be changed per this analysis.

CALCULATIONS

PROPOSAL NUMBER: B6-4

PAGE NUMBER: 5 of 7

PROJECT #/PI #: CSSTP-0009-00(396) / 0009396

Wall	Begin STA	End STA	Length	Cut/Fill	Top Elev	Bottom Elev	Height	SF
1	646+74	649+10	236	Fill	956.00	952.00	4.00	944.00
2	649+30	656+47	717	Fill	979.50	971.50	8.00	5736.00
3	657+26	661+30	404	Fill	972.00	964.00	8.00	3232.00
4	658+85	666+50	765	Fill	976.90	968.20	8.70	6655.50
5	688+10	705+80	1770	Fill	1010.86	1002.11	8.74	15477.67
6	706+25	710+40	415	Fill	1006.67	1000.00	6.67	2766.67
7	712+93	714+36	143	Fill	1011.00	1001.00	5.00	715.00
8	714+47	717+80	333	Cut	1018.00	1008.00	10.00	3330.00
9	723+60	724+93	133	Fill	1010.00	1004.00	6.00	798.00
10	727+00	734+35	735	Fill	1001.50	998.25	3.25	2388.75
11	730+68	748+23	1755	Fill	1008.87	997.08	11.78	20679.75
12	734+80	738+05	325	Fill	996.50	995.25	1.25	406.25
13	738+50	745+85	735	Fill	997.67	993.33	4.33	3185.00
14	748+03	755+93	790	Cut	1021.67	1010.67	11.00	8690.00
15	753+75	757+70	425	Fill	1017.00	1012.00	5.00	2125.00
16	775+05	780+35	530	Cut	1018.00	1011.00	7.00	3710.00
17	787+52	790+30	278	Cut	1021.00	1015.50	5.50	1529.00

total LF 10489

total SF 82368.58

CALCULATIONS

PROPOSAL NUMBER: B6-4

PAGE NUMBER: 6 of 7

PROJECT #/PI #: CSSTP-0009-00(396) / 0009396

	Battered Concrete Retaining Walls			Veneer	Wall Cap	Coating	Total Cost	Cost	
	16"	28"	39"	Granite	Granite	Anti-Graffiti			
	10 ft H max	16 ft H max	16+ ft H max						
	\$ 28.00	\$ 40.00	\$ 50.00						
Wall	SF	SF	SF	SF	LF	SF		\$/SF	
1	\$ 26,432.00			\$ 24,544	\$ 8,260	\$ 2,832	\$ 62,068	\$ 65.75	
2	\$ 160,608.00			\$ 149,136	\$ 25,095	\$ 17,208	\$ 352,047	\$ 61.38	
3		\$ 249,640.00		\$ 162,266	\$ 16,590	\$ 18,723	\$ 447,219	\$ 71.66	
4	\$ 186,354.00			\$ 173,043	\$ 26,775	\$ 19,966	\$ 406,138	\$ 61.02	
5	\$ 433,374.67			\$ 402,419	\$ 61,950	\$ 46,433	\$ 944,177	\$ 61.00	
6	\$ 77,466.67			\$ 71,933	\$ 14,525	\$ 8,300	\$ 172,225	\$ 62.25	
7	\$ 20,020.00			\$ 18,590	\$ 5,005	\$ 2,145	\$ 45,760	\$ 64.00	
8	\$ 93,240.00			\$ 86,580	\$ 11,655	\$ 9,990	\$ 201,465	\$ 60.50	
9	\$ 22,344.00			\$ 20,748	\$ 4,655	\$ 2,394	\$ 50,141	\$ 62.83	
10	\$ 66,885.00			\$ 62,108	\$ 25,725	\$ 7,166	\$ 161,884	\$ 67.77	
11		\$ 827,190.00		\$ 537,673	\$ 61,425	\$ 62,039	\$ 1,488,328	\$ 71.97	
12	\$ 11,375.00			\$ 10,563	\$ 11,375	\$ 1,219	\$ 34,531	\$ 85.00	
13	\$ 89,180.00			\$ 82,810	\$ 25,725	\$ 9,555	\$ 207,270	\$ 65.08	
14		\$ 347,600.00		\$ 225,940	\$ 27,650	\$ 26,070	\$ 627,260	\$ 72.18	
15	\$ 59,500.00			\$ 55,250	\$ 14,875	\$ 6,375	\$ 136,000	\$ 64.00	
16	\$ 103,880.00			\$ 96,460	\$ 18,550	\$ 11,130	\$ 230,020	\$ 62.00	
17	\$ 42,812.00			\$ 39,754	\$ 9,730	\$ 4,587	\$ 96,883	\$ 63.36	
Totals				\$ 2,219,817		\$ 256,133	\$ 5,663,416		

CALCULATIONS

PROPOSAL NUMBER: B6-4	PAGE NUMBER: 7 of 7
------------------------------	----------------------------

PROJECT #/PI #: CSSTP-0009-00(396) / 0009396

Wall	width w 5' shldr w 2:1 slope	Change? If no, why?	SF	Cost/ SF*	Wall removal	Fence removal	Notes
1	13.00	Yes	944.00	65.75	\$ 62,068.00		
2	21.00	No; Shifts trail outside RW		61.38	\$ -		
3	21.00	No; Shifts trail too close to RW		71.66	\$ -		
4	22.40	No; Shifts trail outside RW		61.02	\$ -		
5	22.49	Yes	15477.67	61.00	\$ 944,177.00	\$ 619,500.00	<i>Remove 1770 linear feet of 42" Fence at \$350/LF</i>
6	18.33	No; Trail under Lucille, wall & 2:1 goes to RW		62.25	\$ -		
7	15.00	No; Small ADA ramp change NA.		64.00	\$ -		
8	25.00	No; Slope would cut 25 feet into adjoining property		60.50	\$ -		
9	17.00	No; Attaches to ADA ramp.		62.83	\$ -		
10	11.50	Yes	2388.75	67.77	\$ 161,883.75		
11	28.57	No; Shifts trail outside RW		71.97	\$ -		
12	7.50	Yes	406.25	85.00	\$ 34,531.25		
13	13.67	Yes	3185.00	65.08	\$ 207,270.00		
14	27.00	No; Shifts trail outside RW		72.18	\$ -		
15	15.00	No; Proximity of trail to transit; alignment under Lawton		64.00	\$ -		
16	19.00	Yes	3710.00	62.00	\$ 230,020.00	\$ 13,250.00	<i>Remove 530 linear feet of chain link fence at \$25/LF</i>
17	16.00	Yes	1529.00	63.36	\$ 96,883.00		
			27640.67		\$ 1,736,833.00	\$ 632,750.00	
					subtotal	\$ 2,369,583.00	
					26% markups	\$ 616,091.58	
					total	\$ 2,985,674.58	

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER: T6-1	PAGE NUMBER: 1 of 5
------------------------------	----------------------------

PROJECT #/PI #:	CSSTP-0009-00(396) / 0009396
PROJECT TITLE:	Atlanta Beltline Corridor from Allene Avenue to Lena Street Fulton County

PROPOSAL DESCRIPTION: AT RETAINING WALLS, SET PERMANENT EASEMENT AT APPROPRIATE DISTANCE BASED ON WALL HEIGHT WITH TEMPORARY EASEMENT BEYOND.

ORIGINAL DESIGN: The current design utilizes permanent easement to accommodate most of the limit of work area that is beyond the right-of-way boundary, with some small areas of temporary easements as well.

PROPOSED CHANGE: In areas where retaining walls are to be implemented, it is proposed to utilize a permanent easement beyond the face of the walls at a width of 10-feet for fill walls and a width of 1.5 times the height of cut walls. Utilize temporary easements to accommodate the remainder of the limit of work area beyond these permanent easements. As identified in the calculations sheets within this proposal, there are 4 locations where this proposed alternative could be implemented.

JUSTIFICATION: Utilizing the 10-foot width beyond the front face of fill walls and 1.5 times the wall height behind the face of cut walls will maintain control of the zone of influence of the wall, while minimizing the amount of permanent easement to be acquired.

ADVANTAGES:

- Reduces cost
- Reduces maintenance
- Reduces permanent impact to adjacent properties

DISADVANTAGES:

- Requires multiple easements (permanent and temporary) from each affected property

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:	\$ 278,525		\$ 278,525
PROPOSED CHANGE:	\$ 37,137		\$ 37,137
SAVINGS:	\$ 241,388		\$ 241,388

COST ESTIMATING WORKSHEET

PROPOSAL NUMBER: T6-1	PAGE NUMBER: 2 of 5
------------------------------	----------------------------

PROJECT #/PI #: CSSTP-0009-00(396) / 0009396

ORIGINAL DESIGN

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Permanent Easement (Commercial)	1,7	AC	0.495	562,500	278,525
Temporary Easement (Commercial)	1,7	AC	0	75,000	0
SUBTOTAL – COST TO PRIME					278,525
MARKUP					Incl.
TOTAL CONTRACT COST					278,525

PROPOSED CHANGE

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Permanent Easement (Commercial)	1,7	AC	0	562,500	0
Temporary Easement (Commercial)	1,7	AC	0.495	75,000	37,137
SUBTOTAL – COST TO PRIME					37,137
MARKUP					Incl.
TOTAL CONTRACT COST					37,137

Difference [Original-Proposed] **\$241,388**

SOURCES

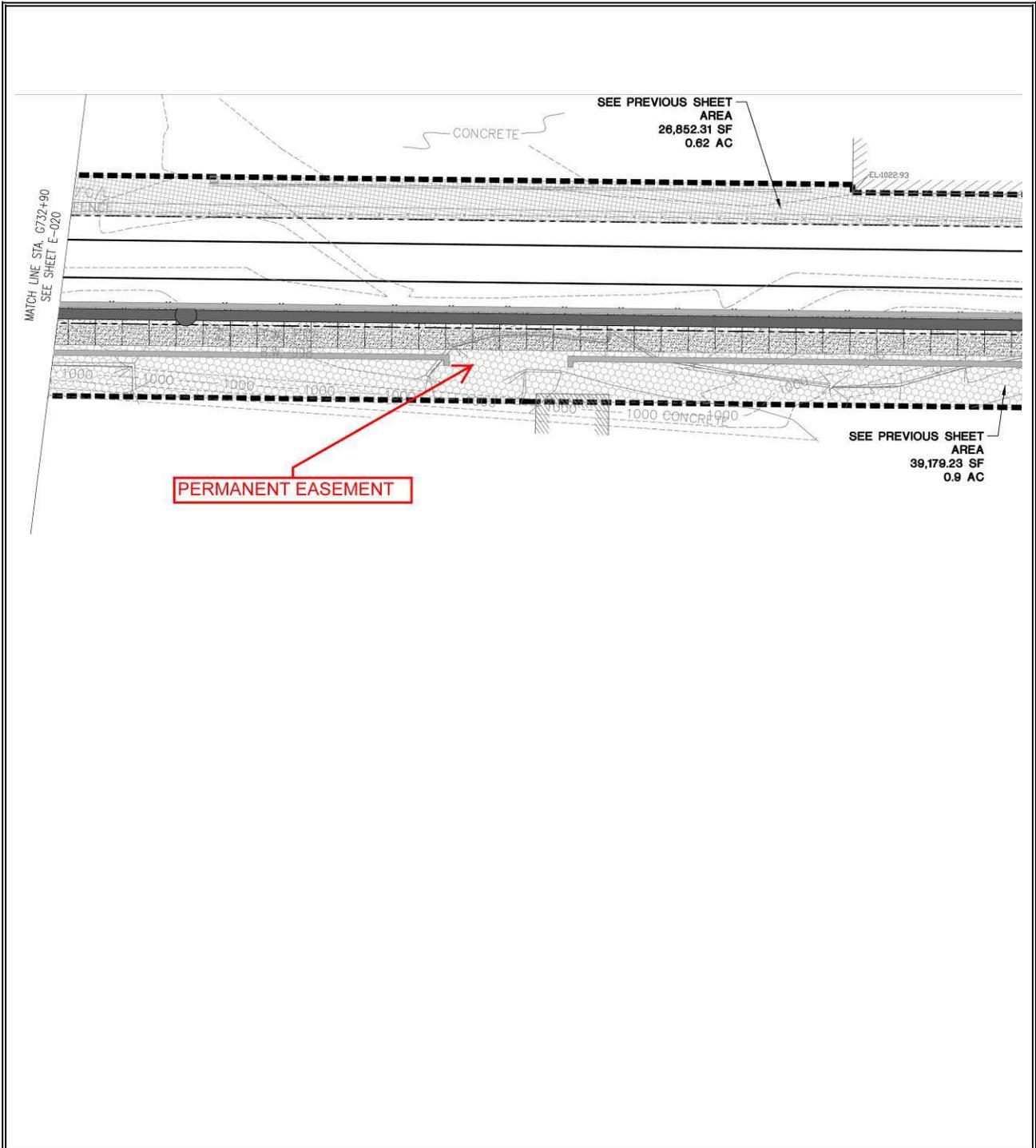
- | | |
|---|---|
| <ol style="list-style-type: none"> 1. Project Cost Estimate 2. USC Estimate Database 3. GDOT Item Mean Summary 4. Means Estimating Manual | <ol style="list-style-type: none"> 5. Richardson's Estimating Manual 6. Vendor (Specify) 7. Other (Calculations) |
|---|---|

ORIGINAL DESIGN SKETCH/DETAIL

PROPOSAL NUMBER: T6-1

PAGE NUMBER: 3 of 5

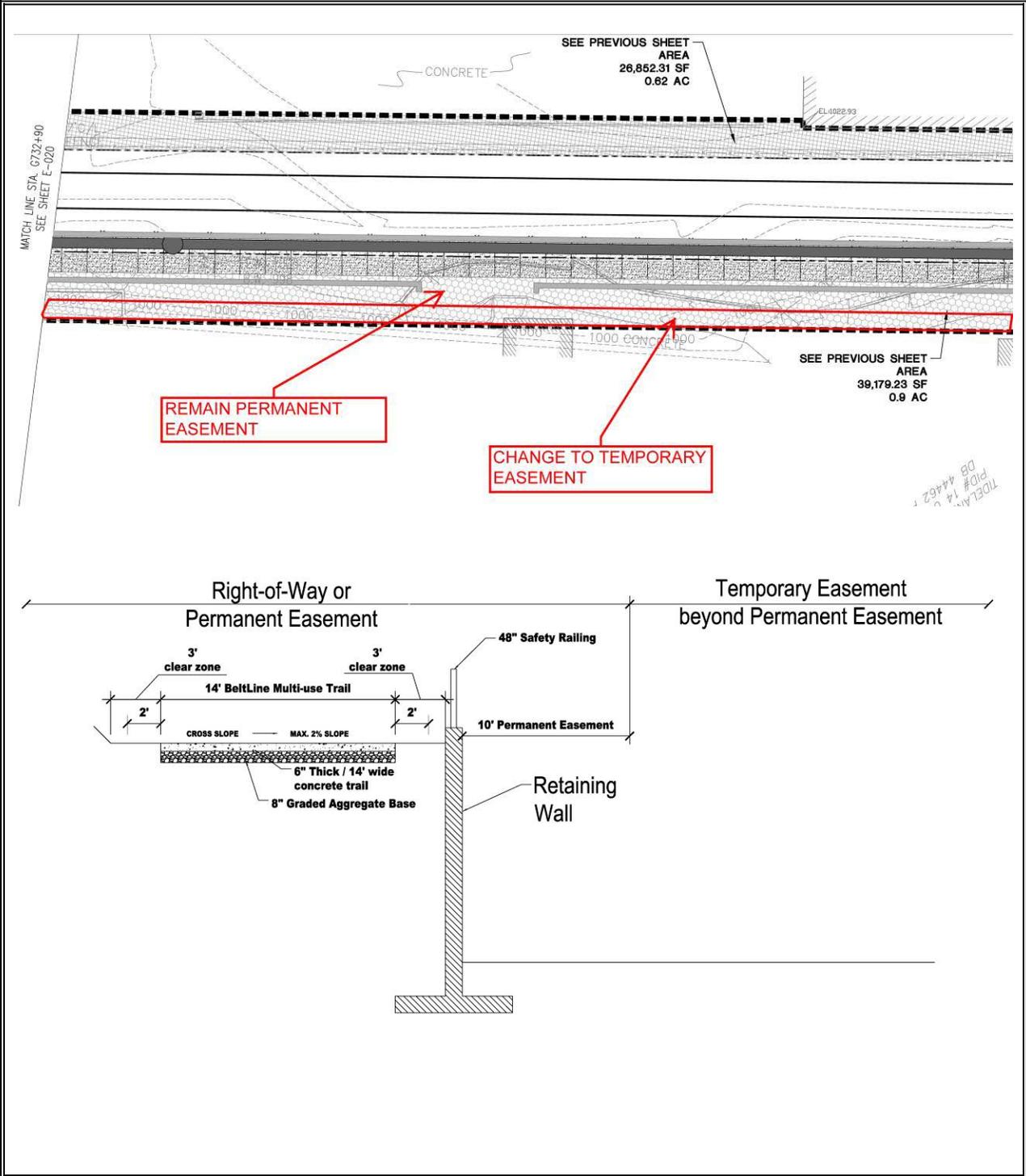
PROJECT #/PI #: CSSTP-0009-00(396) / 0009396



PROPOSED CHANGE SKETCH/DETAIL

PROPOSAL NUMBER: T6-1 **PAGE NUMBER:** 4 of 5

PROJECT #/PI #: CSSTP-0009-00(396) / 0009396



CALCULATIONS

PROPOSAL NUMBER: T6-1

PAGE NUMBER: 5 of 5

PROJECT #/PI #: CSSTP-0009-00(396) / 0009396

Areas with retaining walls where permanent easements are proposed in original design:

1. STA G719+10 (at Ralph David Abernathy Blvd.) to STA G725+30 [Sheet E-018 to E-019]
2. STA G727+00 to STA G728+00 [Sheet E-020]
3. STA G728+80 to STA G745+80 [Sheet E-020 to E-023]
4. STA G747+90 to STA G755+30 [Sheet E-023 to E-025]

Per aerial review of the areas included in the proposed change are commercial (COM). Square foot areas (SF) were measured in CADD files as provided by the designers in the VE package and represent areas of permanent easement outside of the recommended permanent easement limits that would be converted to temporary easement under the proposed change.

Area	RES/ COM	SF	AC	Permanent Easement			Temporary Easement		
				\$/AC	+50%	TOTAL	\$/AC	+50%	TOTAL
1	COM	5952	0.137	\$ 375,000.00	\$ 562,500.00	\$ 76,859.50	\$ 50,000.00	\$ 75,000.00	\$ 10,247.93
2	COM	688	0.016	\$ 375,000.00	\$ 562,500.00	\$ 8,884.30	\$ 50,000.00	\$ 75,000.00	\$ 1,184.57
3	COM	8454	0.194	\$ 375,000.00	\$ 562,500.00	\$ 109,168.39	\$ 50,000.00	\$ 75,000.00	\$ 14,555.79
4	COM	6475	0.149	\$ 375,000.00	\$ 562,500.00	\$ 83,613.12	\$ 50,000.00	\$ 75,000.00	\$ 11,148.42
			0.495	\$ 278,525.31			\$ 37,136.71		

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER: T6-2	PAGE NUMBER: 1 of 5
------------------------------	----------------------------

PROJECT #/PI #:	CSSTP-0009-00(396) / 0009396
PROJECT TITLE:	Atlanta Beltline Corridor from Allene Avenue to Lena Street Fulton County

PROPOSAL DESCRIPTION: WHERE THERE ARE NO RETAINING WALLS, SET PERMANENT EASEMENT AT CLEAR ZONE WITH TEMPORARY EASEMENT BEYOND.

ORIGINAL DESIGN: The current design utilizes permanent easement to accommodate most of the limit of work area that is beyond the right-of-way boundary, with some small areas of temporary easements as well.

PROPOSED CHANGE: In areas where cut or fill slopes are to be implemented, it is proposed to utilize a permanent easement to the clear zone (3-foot from trail edge). Utilize temporary easements to accommodate the remainder of the limit of work area beyond these permanent easements.

JUSTIFICATION: Utilizing the clear zone for permanent easements will maintain control of the trail corridor, while minimizing the amount of permanent easement to be acquired.

ADVANTAGES:

- Reduces cost
- Reduces maintenance
- Reduces permanent impact to adjacent properties

DISADVANTAGES:

- Requires multiple easements (permanent and temporary) from each affected property

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:	\$ 99,117		\$ 99,117
PROPOSED CHANGE:	\$ 13,216		\$ 13,216
SAVINGS:	\$ 85,901		\$ 85,901

COST ESTIMATING WORKSHEET

PROPOSAL NUMBER: T6-2	PAGE NUMBER: 2 of 5
------------------------------	----------------------------

PROJECT #/PI #: CSSTP-0009-00(396) / 0009396

ORIGINAL DESIGN

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Permanent Easement (Residential)	1,7	AC	0.297	112,500	33,453
Temporary Easement (Residential)	1,7	AC	0	15,000	0
Permanent Easement (Commercial)	1,7	AC	0.117	562,500	65,664
Temporary Easement (Commercial)	1,7	AC	0	75,000	
SUBTOTAL – COST TO PRIME					99,117
				MARKUP	Incl.
TOTAL CONTRACT COST					99,117

PROPOSED CHANGE

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Permanent Easement (Residential)	1,7	AC	0	112,500	0
Temporary Easement (Residential)	1,7	AC	0.297	15,000	4,461
Permanent Easement (Commercial)	1,7	AC	0	562,500	0
Temporary Easement (Commercial)	1,7	AC	0.117	75,000	8,755
SUBTOTAL – COST TO PRIME					13,216
				MARKUP	Incl.
TOTAL CONTRACT COST					13,216

Difference [Original-Proposed] **\$85,901**

SOURCES

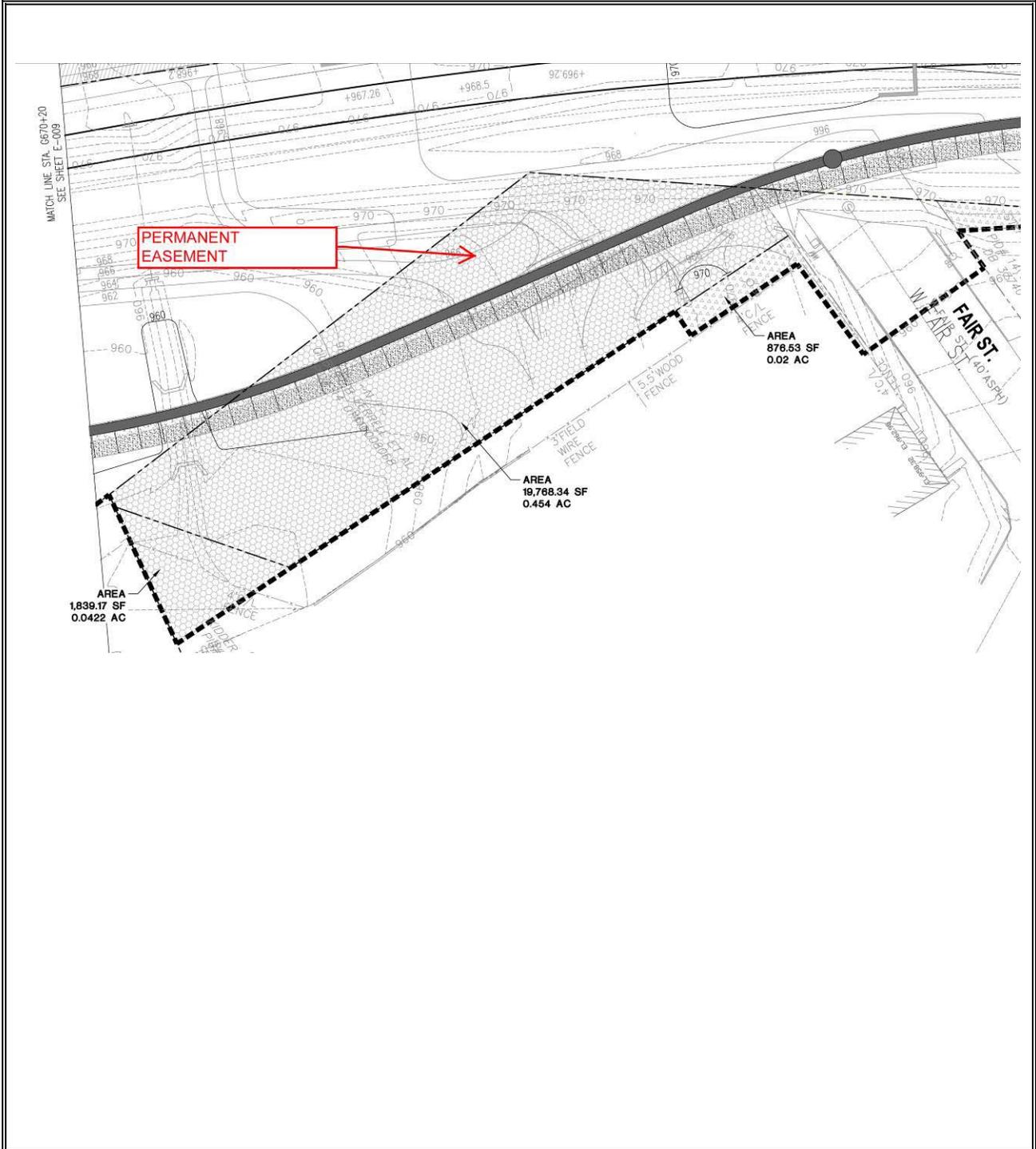
- | | |
|---|---|
| <ol style="list-style-type: none"> 1. Project Cost Estimate 2. USC Estimate Database 3. GDOT Item Mean Summary 4. Means Estimating Manual | <ol style="list-style-type: none"> 5. Richardson's Estimating Manual 6. Vendor (Specify) 7. Other (Calculations) |
|---|---|

ORIGINAL DESIGN SKETCH/DETAIL

PROPOSAL NUMBER: T6-2

PAGE NUMBER: 3 of 5

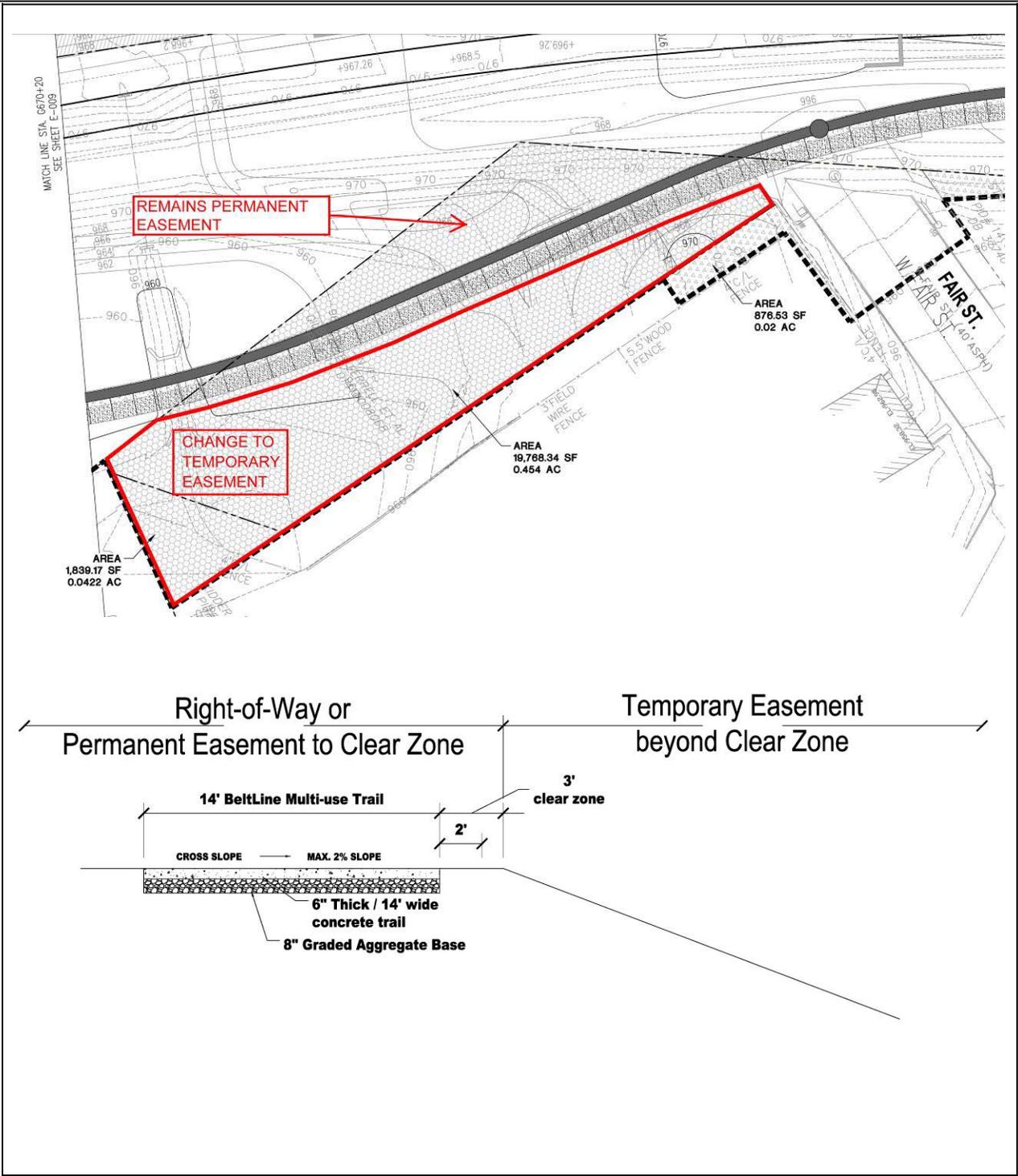
PROJECT #/PI #: CSSTP-0009-00(396) / 0009396



PROPOSED CHANGE SKETCH/DETAIL

PROPOSAL NUMBER: T6-2 **PAGE NUMBER:** 4 of 5

PROJECT #/PI #: CSSTP-0009-00(396) / 0009396



CALCULATIONS

PROPOSAL NUMBER: T6-2

PAGE NUMBER: 5 of 5

PROJECT #/PI #: CSSTP-0009-00(396) / 0009396

Areas without retaining walls where permanent easements are proposed in original design:

1. STA G670+20 to STA G673+50 at Fair Street [Sheet E-010]
2. STA G725+30 to STA G727+00 [Sheet E-019]
3. STA G745+80 to STA G747+90 [Sheet E-023]

Per aerial review of the areas included in the proposed change, one area is residential (RES) while the other two areas are commercial (COM). Square foot areas (SF) were measured in cad files as provided by the designers in the VE package and represent areas of permanent easement outside of the recommended permanent easement limits that would be converted to temporary easement under the proposed change.

Area	RES/ COM	SF	AC	Permanent Easement			Temporary Easement		
				\$/AC	+50%	TOTAL	\$/AC	+50%	TOTAL
1	RES	12953	0.297	\$ 75,000.00	\$ 112,500.00	\$ 33,453.00	\$ 10,000.00	\$ 15,000.00	\$ 4,460.40
2	COM	2803	0.064	\$ 375,000.00	\$ 562,500.00	\$ 36,195.76	\$ 50,000.00	\$ 75,000.00	\$ 4,826.10
3	COM	2282	0.052	\$ 375,000.00	\$ 562,500.00	\$ 29,467.98	\$ 50,000.00	\$ 75,000.00	\$ 3,929.06
						\$ 99,116.74	\$ 13,215.56		

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER: T6-3	PAGE NUMBER: 1 of 5
------------------------------	----------------------------

PROJECT #/PI #:	CSSTP-0009-00(396) / 0009396
PROJECT TITLE:	Atlanta Beltline Corridor from Allene Avenue to Lena Street Fulton County

PROPOSAL DESCRIPTION:	REDUCE LIMIT OF WORK BOUNDARY AT SPECIFIC LOCATIONS.
------------------------------	---

ORIGINAL DESIGN: The Current Design shows a limit of work required to construct the trail plus additional easement to be acquired.

PROPOSED CHANGE: It is proposed to reduce the limit of work to the area of grading and reduce unnecessary easements to be acquired outside of right of way. As identified in the calculations sheets within this proposal, there are 4 locations where this proposed alternative can be implemented.

JUSTIFICATION: In one area North of W. Fair Street, easement was obtained to provide additional landscaping which can be removed since it is not required to construct the trail. In the other areas, with an example being West of Lee Street, the limits extend outside of right of way behind walls where it can be reduced to a point approximately 20' behind the wall.

ADVANTAGES:

- Reduces costs
- Reduces maintenance

DISADVANTAGES:

- None apparent

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:	\$ 43,724		\$ 43,724
PROPOSED CHANGE:	\$ 0		\$ 0
SAVINGS:	\$ 43,724		\$ 43,724

COST ESTIMATING WORKSHEET

PROPOSAL NUMBER: T6-3	PAGE NUMBER: 2 of 5
------------------------------	----------------------------

PROJECT #/PI #: CSSTP-0009-00(396) / 0009396

ORIGINAL DESIGN

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Permanent Easement (Residential)	1,7	AC	0.075	112,500	8,394
Temporary Easement (Commercial)	1,7	AC	0.471	75,000	35,330
SUBTOTAL – COST TO PRIME					43,724
MARKUP					Incl.
TOTAL CONTRACT COST					43,724

PROPOSED CHANGE

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
SUBTOTAL – COST TO PRIME					
MARKUP					
TOTAL CONTRACT COST					

Difference [Original-Proposed] **\$43,724**

SOURCES

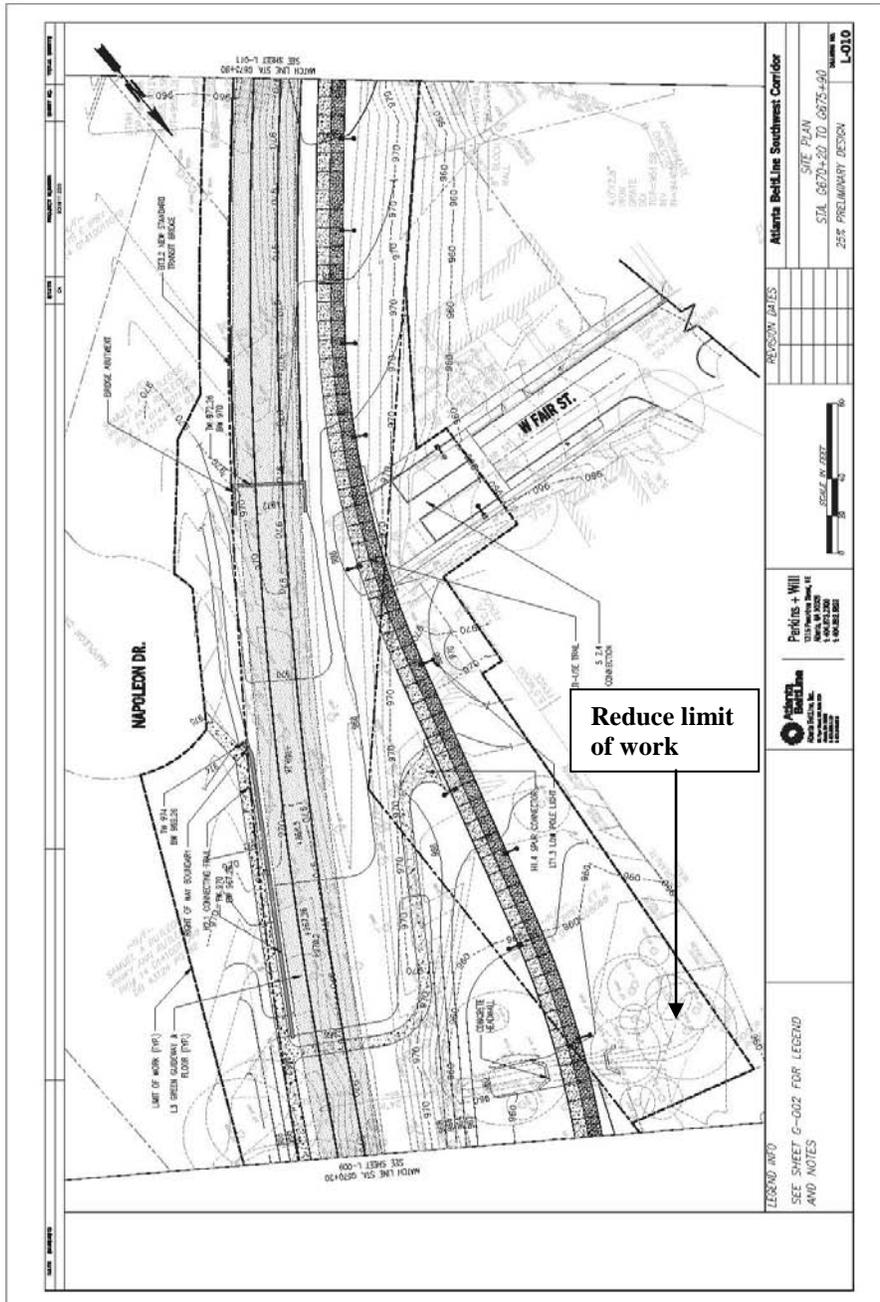
- | | |
|---|---|
| <ol style="list-style-type: none"> 1. Project Cost Estimate 2. USC Estimate Database 3. GDOT Item Mean Summary 4. Means Estimating Manual | <ol style="list-style-type: none"> 5. Richardson's Estimating Manual 6. Vendor (Specify) 7. Other (Calculations) |
|---|---|

PROPOSED CHANGE SKETCH/DETAIL

PROPOSAL NUMBER: T6-3

PAGE NUMBER: 3 of 5

PROJECT #/PI #: CSSTP-0009-00(396) / 0009396



LEGEND AND
SEE SHEET G-002 FOR LEGEND
AND NOTES

Atlanta Belt Line
Projects + Will
Atlanta Belt Line
1-10-2010

Atlanta Belt Line Southwest Corridor
SITE PLAN
STA. 6875+00 TO 6975+00
25% PRELIMINARY DESIGN
SCALE: 1" = 40'

REVISION DATES

NO.	DATE	DESCRIPTION

SCALE BY: 1" = 40'

DATE: 1-10-2010

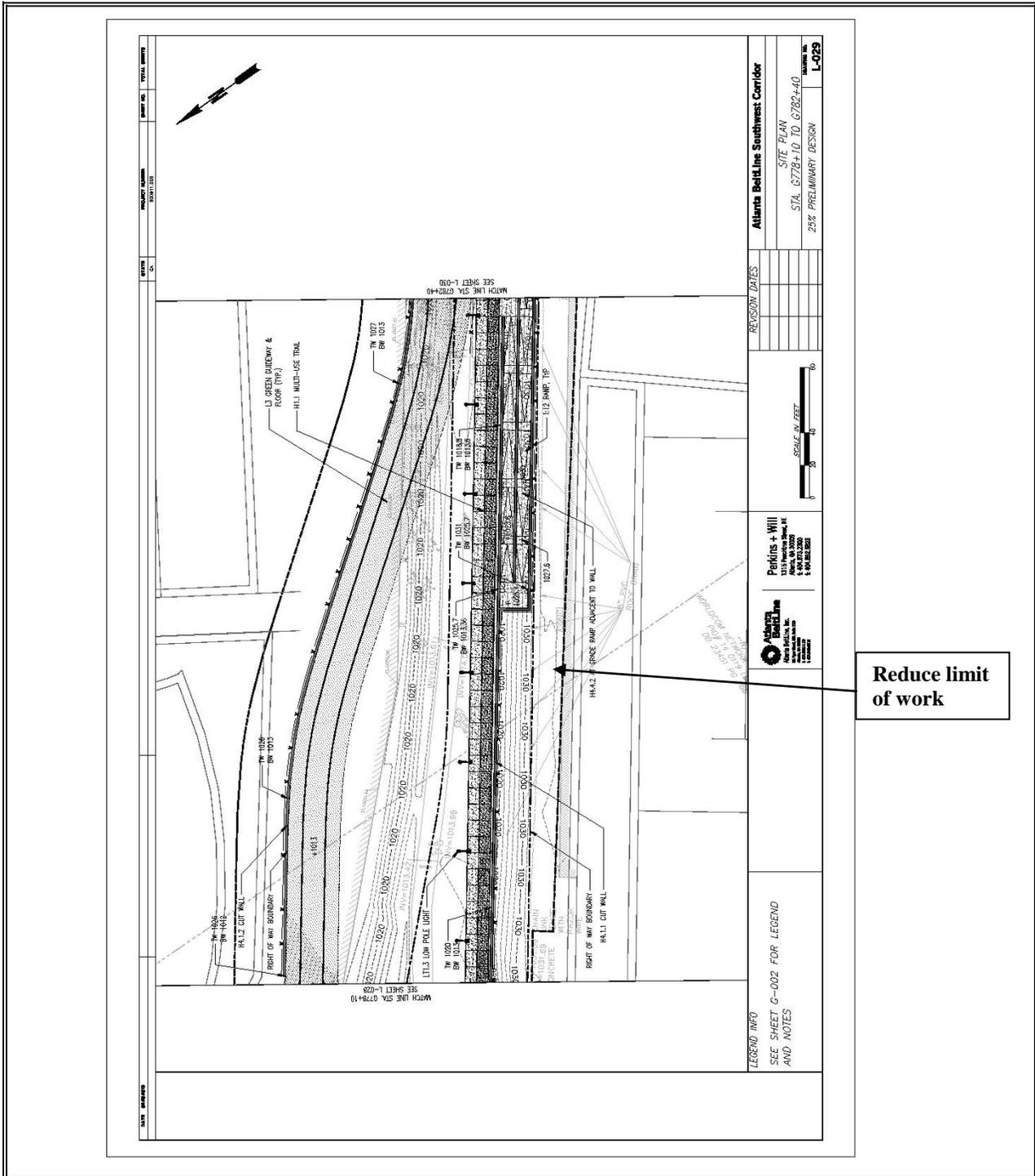
PROJECT NO: L-010

PROPOSED CHANGE SKETCH/DETAIL

PROPOSAL NUMBER: T6-3

PAGE NUMBER: 4 of 5

PROJECT #/PI #: CSSTP-0009-00(396) / 0009396



CALCULATIONS

PROPOSAL NUMBER: T6-3

PAGE NUMBER: 5 of 5

PROJECT #/PI #: CSSTP-0009-00(396) / 0009396

Areas to reduce limit of work:

1. STA G670+20 to STA G671+40
2. STA G778+40 to STA G780+10
3. STA G785+00 to STA G788+45
4. STA G790+55 to STA G797+30

Per aerial review of the areas included in the proposed change, one area is residential (RES) while the other three areas are commercial (COM). Square foot areas (SF) were calculated from the 25% plans as provided by the designers in the VE package and represent areas of permanent or temporary easement.

Area	RES/ COM	SF	AC	Permanent Easement			Temporary Easement		
				\$/AC	+50%	TOTAL	\$/AC	+50%	TOTAL
1	RES	3250	0.075	\$ 75,000.00	\$ 112,500.00	\$ 8,393.60			
2	COM	2550	0.059				\$ 50,000.00	\$ 75,000.00	\$ 4,390.50
3	COM	10350	0.238				\$ 50,000.00	\$ 75,000.00	\$ 17,820.25
4	COM	7620	0.175				\$ 50,000.00	\$ 75,000.00	\$ 13,119.83
						\$ 8,393.60	\$ 35,330.58		

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER: T6-4	PAGE NUMBER: 1 of 6
------------------------------	----------------------------

PROJECT #/PI #:	CSSTP-0009-00(396) / 0009396
PROJECT TITLE:	Atlanta Beltline Corridor from Allene Avenue to Lena Street Fulton County

PROPOSAL DESCRIPTION: ELIMINATE STAIRS WHERE RAMP IS NEARBY.

ORIGINAL DESIGN: The current design includes constructing stairs to access the trail at various locations where ramps are also being provided.

PROPOSED CHANGE: It is proposed to eliminate stair access and allow all users to enter trail via ramps.

JUSTIFICATION: The purpose of the stairs and ramps is to provide access to the trail. One access point for each location where access is needed will be adequate to serve the trail. Therefore, removing the stairs is possible since the ramp is required to meet ADA standards.

ADVANTAGES:

- Reduces quantities/cost
- Improves constructability
- Reduces impacts

DISADVANTAGES:

- Does not provide multiple access options.

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:	\$ 363,535		\$ 363,535
PROPOSED CHANGE:	\$ 0		\$ 0
SAVINGS:	\$ 363,535		\$ 363,535

COST ESTIMATING WORKSHEET

PROPOSAL NUMBER: T6-4	PAGE NUMBER: 2 of 6
------------------------------	----------------------------

PROJECT #/PI #: CSSTP-0009-00(396) / 0009396

ORIGINAL DESIGN

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Battered Concrete Retaining Walls, 16"	1	SF	3840	\$28	107,520
Granite Veneer @ Retaining Walls	1	SF	3840	\$26	99,840
4" Granite Retaining Wall Cap	1	LF	480	\$35	16,800
Footings @ Retaining Walls	1	CY	120	\$275	33,000
Anti-Graffiti Coatings	1	SF	3840	\$3	11,520
Exterior Steps	1	LF	992	\$20	19,840
SUBTOTAL – COST TO PRIME					288,520
				MARKUP	26.0%
TOTAL CONTRACT COST					363,535

PROPOSED CHANGE

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
SUBTOTAL – COST TO PRIME					0
				MARKUP	
TOTAL CONTRACT COST					0

Difference [Original-Proposed] **\$363,535**

SOURCES

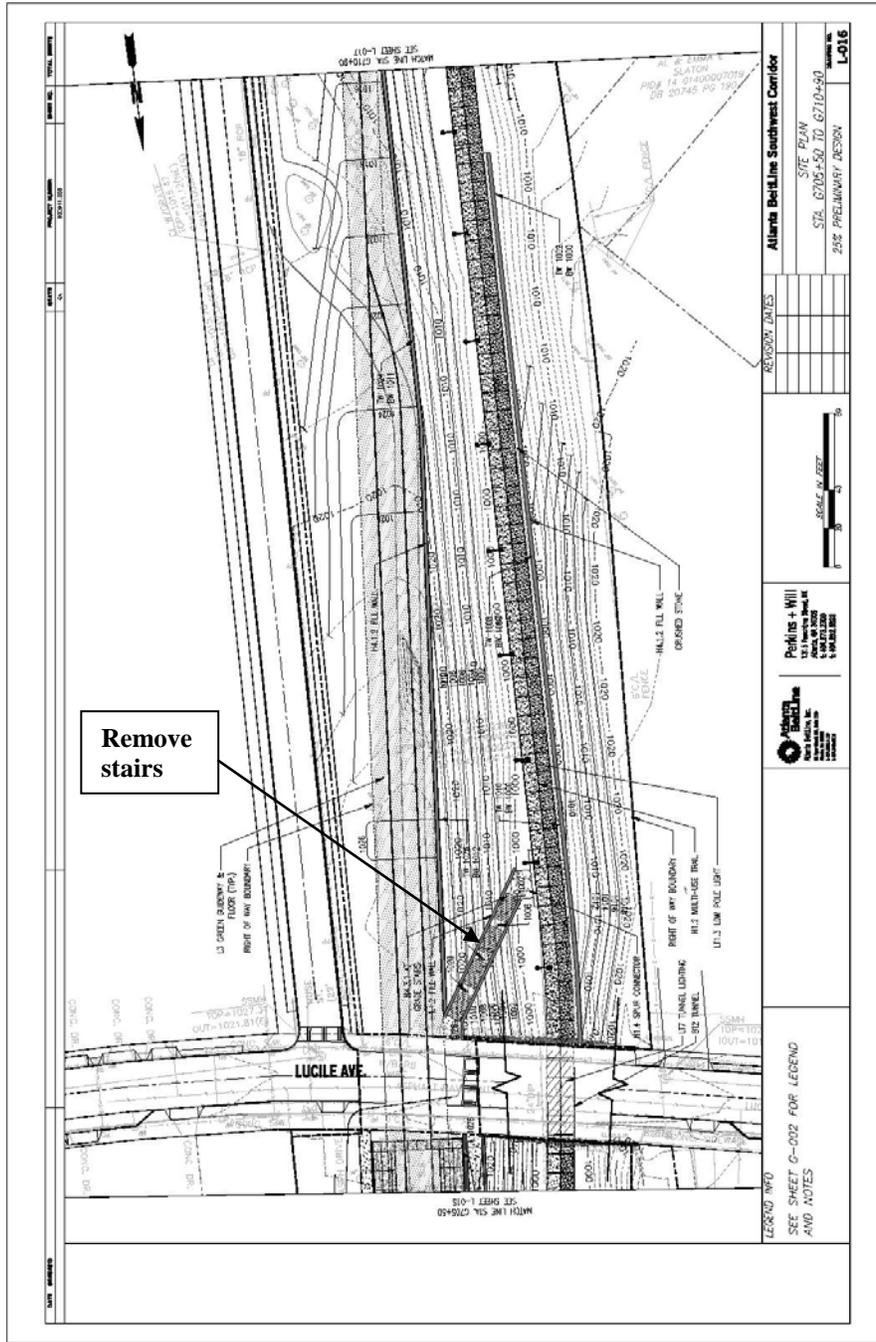
- | | |
|---|--|
| <ul style="list-style-type: none"> 1. Project Cost Estimate 2. USC Estimate Database 3. GDOT Item Mean Summary 4. Means Estimating Manual | <ul style="list-style-type: none"> 5. Richardson's Estimating Manual 6. Vendor (Specify) 7. Other (Specify) |
|---|--|

PROPOSED CHANGE SKETCH/DETAIL

PROPOSAL NUMBER: T6-4

PAGE NUMBER: 3 of 6

PROJECT #/PI #: CSSTP-0009-00(396) / 0009396

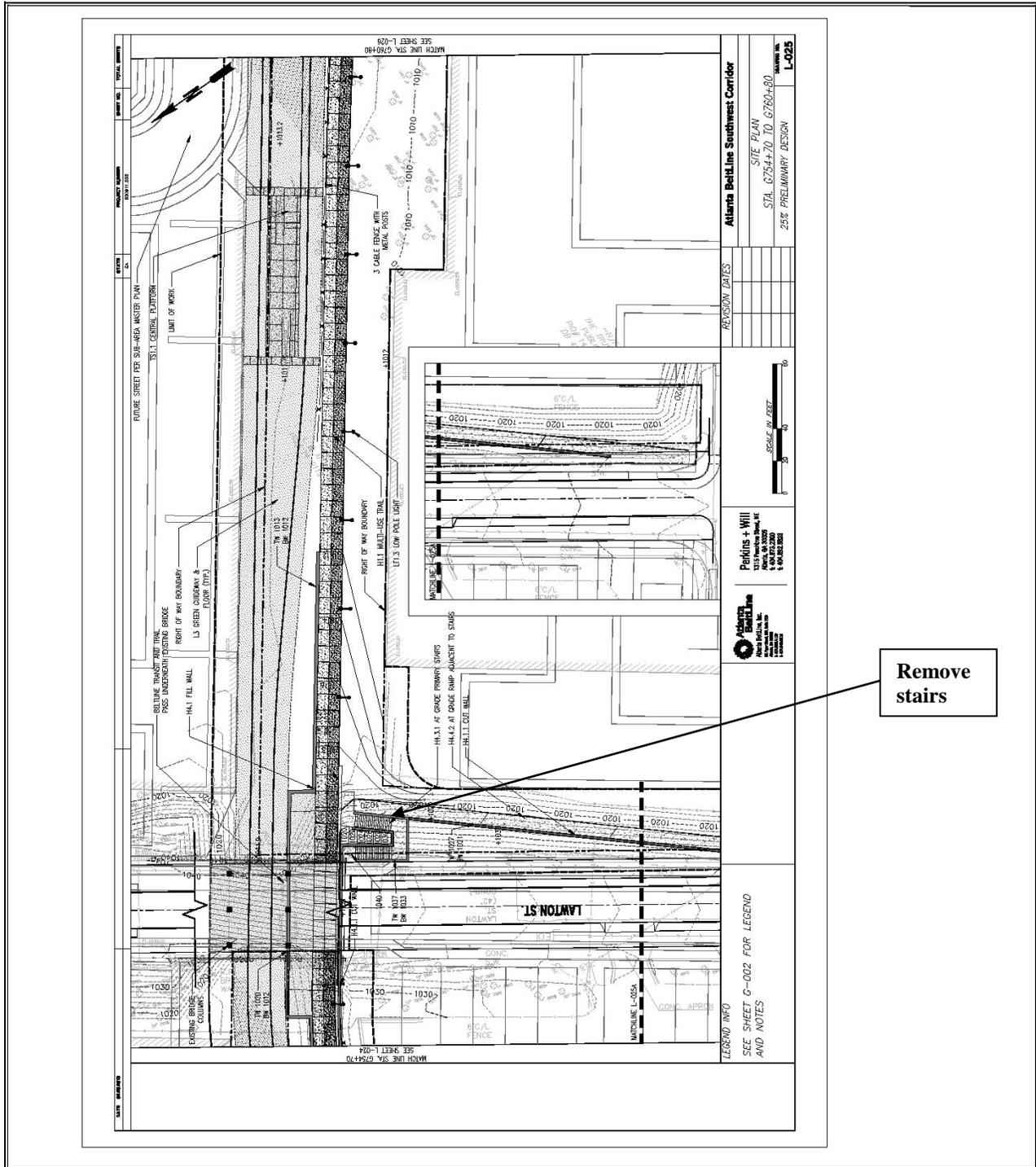


PROPOSED CHANGE SKETCH/DETAIL

PROPOSAL NUMBER: T6-4

PAGE NUMBER: 5 of 6

PROJECT #/PI #: CSSTP-0009-00(396) / 0009396



CALCULATIONS

PROPOSAL NUMBER: T6-4

PAGE NUMBER: 6 of 6

PROJECT #/PI #: CSSTP-0009-00(396) / 0009396

Stair Costs:

Battered Concrete Retaining Wall, 16" = \$28/SF

Granite Veneer = \$26/SF

Anti-Graffiti Coatings = \$3/SF

4" Granite Retaining Wall Cap = \$35/LF

Footings @ Retaining Wall = \$275/CY

Exterior Steps = \$20/LF

Stair Locations:

Lucille Avenue:

80 LF of stairs

2 walls * 9 foot average height * 80 LF = 1440 SF

Wall/Veneer/Coating = 1440 SF * \$57/SF = \$82,080

Cap = 160 LF * \$35/LF = \$5,600

Footing = 1.33 LF * 5 LF * 160 LF = 1064 SF = 40 CY * \$275/CY = \$11,000

Steps = 48 steps * 8 LF * \$20/LF = \$7,680

Total = \$106,360

Ralph David Abernathy:

80 LF of stairs

2 walls * 9 foot average height * 80 LF = 1440 SF

Wall/Veneer/Coating = 1440 SF * \$57/SF = \$82,080

Cap = 160 LF * \$35/LF = \$5,600

Footing = 1.33 LF * 5 LF * 160 LF = 1064 SF = 40 CY * \$275/CY = \$11,000

Steps = 38 steps * 8 LF * \$20/LF = \$6,080

Total = \$104,760

Lawton Street:

80 LF of stairs

2 walls * 6 foot average height * 80 LF = 960 SF

Wall/Veneer/Coating = 960 SF * \$57/SF = \$54,720

Cap = 160 LF * \$35/LF = \$5,600

Footing = 1.33 LF * 5 LF * 160 LF = 1064 SF = 40 CY * \$275/CY = \$11,000

Steps = 38 steps * 8 LF * \$20/LF = \$6,080

Total = \$77,400

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER: T6-5	PAGE NUMBER: 1 of 6
------------------------------	----------------------------

PROJECT #/PI #:	CSSTP-0009-00(396) / 0009396
PROJECT TITLE:	Atlanta Beltline Corridor from Allene Avenue to Lena Street Fulton County

PROPOSAL DESCRIPTION:	CONNECT TO EXISTING WEST END TRAIL AT I-20 AND DEFER NEW TRAIL FROM I-20 UP TO LAWTON STREET UNTIL TRANSIT CONSTRUCTION.
------------------------------	---

ORIGINAL DESIGN: There is an existing West End Trail that runs to the South in the vicinity of the new corridor from I-20 and extends beyond Lawton Street. The current project design proposes to construct a new trail and all required improvements from I-20 to Ralph David Abernathy (RDA) and then accesses the existing trail from RDA to Lawton Street, with a new trail constructed along this portion at the time the future transit corridor is constructed.

PROPOSED CHANGE: It is proposed to utilize the existing West End trail beginning at I-20 and extending to Lawton Street and defer construction of the new trail and all required improvements until the transit line is constructed. Extending the use of the existing West End Trail beginning at I-20 defers construction of 3,460 LF of trail until the transit is constructed.

JUSTIFICATION: This proposal makes greater use of the existing West End Trail and defers expenditures for new trail construction until a later date.

ADVANTAGES:

- Reduces quantities/cost
- Reduces right-of-way impacts
- Makes greater use of existing infrastructure

DISADVANTAGES:

- Additional construction in future project

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:	\$ 4,096,778		\$ 4,096,778
PROPOSED CHANGE:	\$ 0		\$ 0
SAVINGS:	\$ 4,096,778		\$ 4,096,778

COST ESTIMATING WORKSHEET

PROPOSAL NUMBER: T6-5	PAGE NUMBER: 2 of 6
------------------------------	----------------------------

PROJECT #/PI #: CSSTP-0009-00(396) / 0009396

ORIGINAL DESIGN

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Reduction in Items (See Calcs)	7	LS	1	3,251,411	3,251,411
SUBTOTAL – COST TO PRIME					3,251,411
				MARKUP	26.0%
TOTAL CONTRACT COST					4,096,778

PROPOSED CHANGE

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Deferred new work along this section					
SUBTOTAL – COST TO PRIME					
				MARKUP	
TOTAL CONTRACT COST					0

Difference [Original-Proposed] **\$4,096,778**

SOURCES

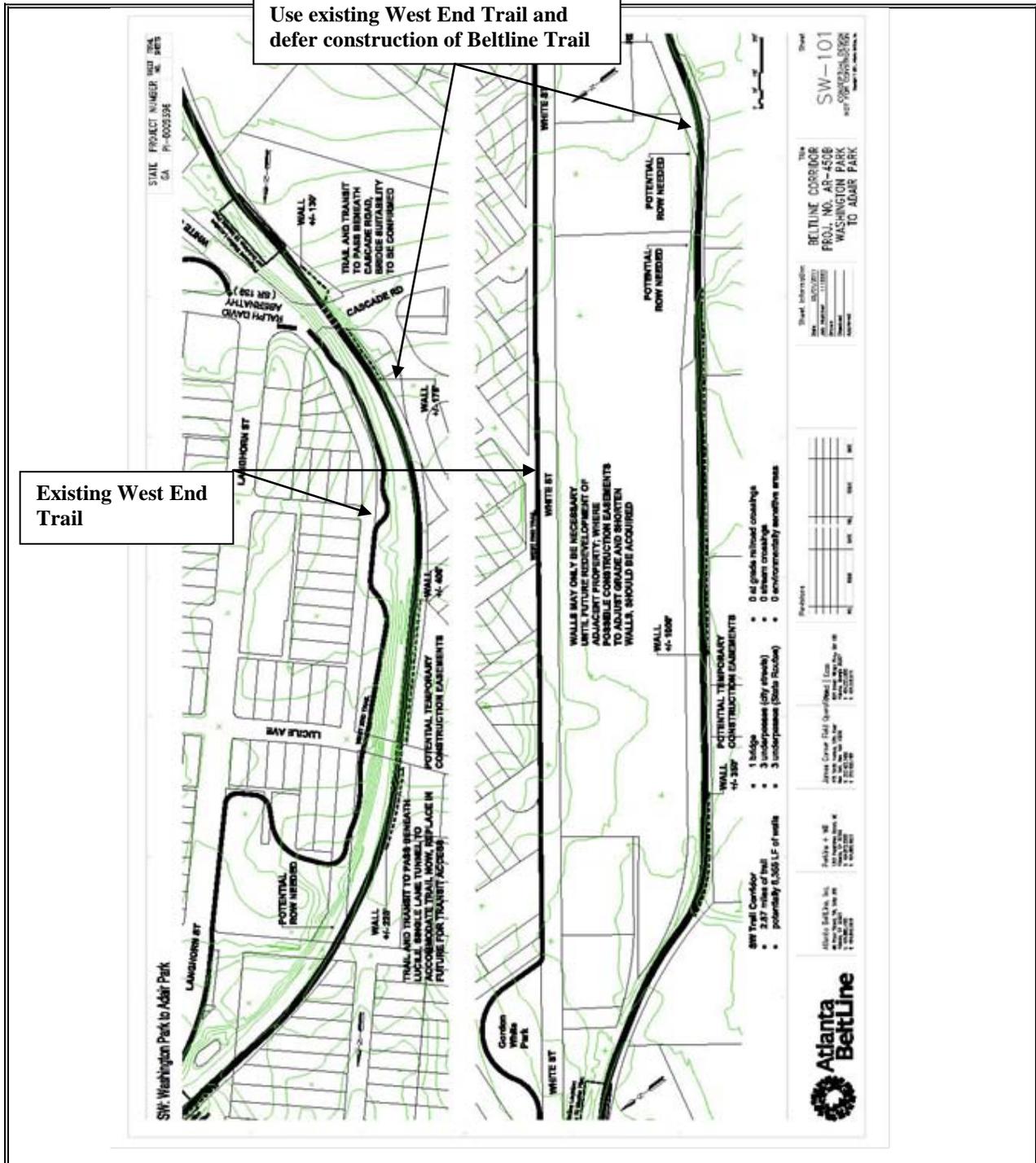
- | | |
|---|--|
| <ol style="list-style-type: none"> 1. Project Cost Estimate 2. USC Estimate Database 3. GDOT Item Mean Summary 4. Means Estimating Manual | <ol style="list-style-type: none"> 5. Richardson's Estimating Manual 6. Vendor (Specify) 7. Other (See Calcs) |
|---|--|

PROPOSED CHANGE SKETCH/DETAIL

PROPOSAL NUMBER: T6-5

PAGE NUMBER: 5 of 6

PROJECT #/PI #: CSSTP-0009-00(396) / 0009396



CALCULATIONS

PROPOSAL NUMBER: T6-5

PAGE NUMBER: 6 of 6

PROJECT #/PI #: CSSTP-0009-00(396) / 0009396

Multi-use Trail Section 2 (Lena to Ralph David Abernathy):

Lena to I-20 = 3,790 LF (52%)

I-20 to Ralph David Abernathy = 3,460 LF (48%)

Most items assumed to be split 50/50 for Transit/Trail project. Therefore Trail will be 24% of original costs for associated items.

Reductions Based on Proposed Change (as per cost estimate provided):

LENA TO RDA	QUANTITY	UNIT	UNIT PRICE	TOTAL	Reduction	Savings
Clearing & Grubbing	332,789	SF	\$0.25	\$83,197	24%	\$19,967
Rough Grading Allowance	147,000	CY	\$15	\$2,205,000	24%	\$529,200
Fine Grading	500,000	SF	\$0.10	\$50,000	24%	\$12,000
Retaining Walls						
Retaining Walls, 16"	30,777	SF	\$28	\$861,756	24%	\$206,821
Retaining Walls, 28"	36,102	SF	\$40	\$1,444,080	24%	\$346,579
Retaining Walls, 39"	3,312	SF	\$50	\$165,600	24%	\$39,744
Granite Veneer @ Retaining Walls	70,191	SF	\$26	\$1,824,966	24%	\$437,992
4" Granite Retaining Wall Cap	8,119	LF	\$35	\$284,165	24%	\$68,200
Footings @ Retaining Walls	7,747	CY	\$275	\$2,130,425	24%	\$511,302
Railings/Fencing						
Railing, 54" Stainless Steel	1,518	LF	\$350	\$531,300	24%	\$127,512
Wall Railings	1,615	LF	\$150	\$242,250	24%	\$58,140
42" Chainlink Fence	2,374	LF	\$25	\$59,350	24%	\$14,244
3' Cable Fence	404	LF	\$20	\$8,080	24%	\$1,939
Pavings						
Multi-use Trail - Pedestrian	104,580	SF	\$10	\$1,045,800	48%	\$501,984
Sealer on Multi-use Trail	104,580	SF	\$0.30	\$31,374	48%	\$15,060
Crushed Stone Surfacing	10,008	SF	\$3.00	\$30,024	48%	\$14,412
Handicap Ramp	10,087	SF	\$5.50	\$55,479	48%	\$26,630
Exterior Steps @ Grade	1,305	LF	\$20	\$26,100	48%	\$12,528
Signs - Freestanding Small	14	EA	\$2,000	\$28,000	24%	\$6,720
Trees, 3-1/2" Caliper	457	EA	\$750	\$342,750	24%	\$82,260
Storm Sewer Piping	4,721	LF	\$75	\$354,075	24%	\$84,978
Low Pole Lights	111	EA	\$5,000	\$555,000	24%	\$133,200
Total				\$12,358,771		\$3,251,411

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER: T6-6.3	PAGE NUMBER: 1 of 2
--------------------------------	----------------------------

PROJECT #/PI #:	CSSTP-0009-00(396) / 0009396
PROJECT TITLE:	Atlanta Beltline Corridor from Allene Avenue to Lena Street Fulton County

PROPOSAL DESCRIPTION: ALLOCATE PORTION OF DUCTBANK COSTS FOR RELOCATION OF TELECOM TO THIS TRAIL PROJECT AND OBTAIN FUNDING FOR EXCESS DUCTBANK CAPACITY FROM OTHER SOURCES.

ORIGINAL DESIGN: The current design includes a ductbank with eight (8) conduits to be constructed along the trail for relocation of existing fiber optic telecom lines with excess capacity for location of future utilities within this ductbank.

PROPOSED CHANGE: It is proposed to allocate the portion of the ductbank used to house the relocated telecom lines to the trail funds, with the remaining cost of the ductbank paid for by other funds due to the excess capacity being a revenue stream from the utility when the ductbank is utilized. It is assumed that only one-half, or 4 of the 8 conduits, are required for relocating the existing fiber optic lines into this ductbank; thus, half of the ductbank costs would be allocated to the trail project.

JUSTIFICATION: The excess ductbank capacity will be a revenue stream from utilities wishing to use the ductbank in the future; thus, other funds should be allocated to pay for the excess capacity built into the ductbank.

ADVANTAGES:

- Reduces portion of project paid for with trail funds
- Properly allocates costs among parties

DISADVANTAGES:

- None apparent

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:	\$ 2,290,680		\$ 2,290,680
PROPOSED CHANGE:	\$ 1,145,340		\$ 1,145,340
SAVINGS:	\$ 1,145,340		\$ 1,145,340

COST ESTIMATING WORKSHEET

PROPOSAL NUMBER: T6-6.3	PAGE NUMBER: 2 of 2
--------------------------------	----------------------------

PROJECT #/PI #: CSSTP-0009-00(396) / 0009396

ORIGINAL DESIGN

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Exc/fill/Compact – full ductbank	2	LF	15,150	8.00	121,200
Flowable fill – full ductbank	2	LF	15,150	22.00	333,300
8 conduits w/ spacers	2	LF	15,150	90.00	1,363,500
SUBTOTAL – COST TO PRIME					1,818,000
MARKUP				26.0%	472,680
TOTAL CONTRACT COST					2,290,680

PROPOSED CHANGE

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Exc/fill/Compact – 1/2 ductbank	2	LF	15,150	4.00	60,600
Flowable fill – 1/2 ductbank	2	LF	15,150	11.00	166,650
4 conduits w/ spacers	2	LF	15,150	45.00	681,750
SUBTOTAL – COST TO PRIME					909,000
MARKUP				26.0%	236,340
TOTAL CONTRACT COST					1,145,340

Difference [Original-Proposed] **1,145,340**

SOURCES

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

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER: T6-8	PAGE NUMBER: 1 of 4
------------------------------	----------------------------

PROJECT #/PI #:	CSSTP-0009-00(396) / 0009396
PROJECT TITLE:	Atlanta Beltline Corridor from Allene Avenue to Lena Street Fulton County

PROPOSAL DESCRIPTION:	OBTAIN FUNDING FOR UPGRADED TRAIL CONSTRUCTION FEATURES FROM OTHER FUNDING SOURCES.
------------------------------	--

ORIGINAL DESIGN: The current design of the multi-use trail includes several features which can be considered as upgrades to a typical multi-use trail project. These components or features are as follows:

- Stainless steel fencing and rails
- Granite facing on retaining walls
- Colored concrete and sandblasting one-half of trail concrete surface

PROPOSED CHANGE: It is proposed to allocate trail funds for only those basic features required to develop a functioning multi-use trail and to obtain funding of the portions of the trail project attributed to these upgraded features from other funding sources.

JUSTIFICATION: A functioning multi-use trail could be constructed with basic concrete sections, basic fencing and rails, and retaining walls without finished surfacing. While the VE Team takes no exception to including these elements in the project, it is simply suggested that these upgrades be funded from other sources.

ADVANTAGES:

- Reduces portion of project paid for with trail funds
- Properly allocates costs for requested upgrades among parties

DISADVANTAGES:

- None apparent

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:	\$ 8,690,787		\$ 8,690,787
PROPOSED CHANGE:	\$ 1,319,580		\$ 1,319,580
SAVINGS:	\$ 7,371,207		\$ 7,371,207

COST ESTIMATING WORKSHEET

PROPOSAL NUMBER: T6-8	PAGE NUMBER: 2 of 4
------------------------------	----------------------------

PROJECT #/PI #: CSSTP-0009-00(396) / 0009396

ORIGINAL DESIGN

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
54" SS rail with SS mesh	1	LF	6,692	350.00	2,342,200
42" SS barrier fence w/ 3 cables	1	LF	575	300.00	172,500
SS Wall Railing	1	LF	2,918	150.00	437,700
Granite wall facing	1	SF	119,725	26.00	3,112,850
Granite wall cap	1	LF	14,348	35.00	502,180
Concrete coloring	2	CY	3,929	30.00	117,870
Sandblasting of concrete sidewalk surface	2	SF	106,075	2.00	212,150
SUBTOTAL – COST TO PRIME					6,897,450
				MARKUP	26.0 %
TOTAL CONTRACT COST					8,690,787

PROPOSED CHANGE

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
54" galv steel railing with vinyl fabric	4	LF	6,692	115.00	769,580
42" barrier fence w/ 3 steel cables	4	LF	575	90.00	51,750
Painted Steel Wall Railing	4	LF	2,918	32.00	93,376
Granite wall facing	1	SF	0	26.00	0
16" thick concrete wall	1	SF	4,735	28.00	132,580
Concrete coloring	2	CY	0	30.00	0
Sandblasting of concrete	2	SF	0	2.00	0
SUBTOTAL – COST TO PRIME					1,047,286
				MARKUP	26.0%
TOTAL CONTRACT COST					1,319,580

Difference [Original-Proposed] **\$7,371,207**

SOURCES

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

CALCULATIONS

PROPOSAL NUMBER: T6-8

PAGE NUMBER: 3 of 4

PROJECT #/PI #: CSSTP-0009-00(396) / 0009396

Quantities:

54" SS Railing with SS Mesh - from 25% Preliminary Design "Expanded Component Estimate":

From Lena to Ralph David Abernathy (RDA) – 1,518 LF

From RDA to Lawton – 2,442 LF

Lawton to Lee/Murphy – 825 LF

Lee/Murphy to University – 355 LF, take ½ for 9396, or 178 LF

Total: 8,923 LF; use 75% for trail project or 6,692 LF

42" SS Barrier Fence with 3 cables - from 25% Preliminary Design "Expanded Component Estimate":

From Lena to Ralph David Abernathy (RDA) – 0 LF

From RDA to Lawton – 244 LF

Lawton to Lee/Murphy – 522 LF

Lee/Murphy to University – 0 LF

Total: 766 LF; use 75% for trail project or 575 LF

SS Wall Railings – from 25% Preliminary Design "Expanded Component Estimate":

From Lena to Ralph David Abernathy (RDA) – 1,615 LF

From RDA to Lawton – 798 LF

Lawton to Lee/Murphy – 1,358 LF

Lee/Murphy to University – 240 LF, take ½ for 9396 or 120 LF

Total: 3,891 LF; use 75% for trail project or 2,918 LF

Granite Retaining Wall Facing – from 25% Preliminary Design Drawings:

See table on following page for calculation of 119,725 SF in trail project

Granite Retaining Wall Cap – from 25% Preliminary Design Drawings:

See table on following page for calculation of 14,348 LF in trail project

For proposed, add 4" height of 16" thk wall: $14,348 \times 0.33 = 4,735$ SF 16" thk wall

Colored concrete trail:

2.87 miles x 5,280 LF/mile x 14' wide = 212,150 SF

Total: 212,150 SF x 0.5' thick / 27 = 3,929 CY

Sandblasting of concrete trail:

½ of area calculated above, or 106,075 SF

CALCULATIONS

PROPOSAL NUMBER: T6-8

PAGE NUMBER: 4 of 4

PROJECT #/PI #: CSSTP-0009-00(396) / 0009396

Retaining Wall Quantities – from 25% Preliminary Design dated 2/28/13

Wall	Begin STA	End STA	Length	Cut/Fill	Top Elev	Bottom Elev	Height	SF
1	646+74	649+10	236	Fill	956.00	952.00	4.00	944.00
2	649+30	656+47	717	Fill	979.50	971.50	8.00	5736.00
Ramp	655+05	656+85	578	Cut	975.67	958.00	17.67	10211.33
3	657+26	661+30	404	Fill	972.00	964.00	8.00	3232.00
3a	657+26		70	Fill	974.75	957.00	17.75	1242.50
4	658+85	666+50	765	Fill	976.90	968.20	8.70	6655.50
5	688+10	705+80	1770	Fill	1010.86	1002.11	8.74	15477.67
Ramp	701+75	705+80	405	Fill	1016.20	1009.25	6.95	2814.75
6	706+25	710+40	415	Fill	1006.67	1000.00	6.67	2766.67
7	712+93	714+36	143	Fill	1011.00	1001.00	5.00	715.00
8	714+47	717+80	333	Cut	1018.00	1008.00	10.00	3330.00
Ramp	719+05	723+60	1037	Fill	1018.17	1012.83	5.33	5530.67
9	723+60	724+93	133	Fill	1010.00	1004.00	6.00	798.00
10	727+00	734+35	735	Fill	1001.50	998.25	3.25	2388.75
11	730+68	748+23	1755	Fill	1008.87	997.08	11.78	20679.75
12	734+80	738+05	325	Fill	996.50	995.25	1.25	406.25
13	738+50	745+85	735	Fill	997.67	993.33	4.33	3185.00
14	748+03	755+93	790	Cut	1021.67	1010.67	11.00	8690.00
15	753+75	757+70	425	Fill	1017.00	1012.00	5.00	2125.00
Ramp	756+00		245	Cut	1027.00	1021.00	6.00	1470.00
Stair	756+00		153	NA	1039.00	1026.50	12.50	1912.50
16	775+05	780+35	530	Cut	1018.00	1011.00	7.00	3710.00
Ramp	780+50	782+72	666	Cut	1028.88	1016.59	12.29	8181.81
Ramp	784+70	787+52	705	Cut	1029.75	1021.25	8.50	5992.50
17	787+52	790+30	278	Cut	1021.00	1015.50	5.50	1529.00
Totals			14348					119725

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER: T6-10	PAGE NUMBER: 1 of 6
-------------------------------	----------------------------

PROJECT #/PI #:	CSSTP-0009-00(396) / 0009396
PROJECT TITLE:	Atlanta Beltline Corridor from Allene Avenue to Lena Street Fulton County

PROPOSAL DESCRIPTION: ADJUST TRAIL PROFILES TO ELIMINATE INTERIOR WALLS.

ORIGINAL DESIGN: In the current design, the trail is being constructed at a different elevation than the transit and therefore requires walls between the trail and transit.

PROPOSED CHANGE: It is proposed to revise the trail profile in areas to eliminate the wall between the transit and trail. As identified in the Calculations sheets within this proposal, there are 3 locations where this proposed alternative could be implemented and result in elimination of 550 LF of walls.

JUSTIFICATION: Revising the trail profile and grading to create similar vertical elevations for the trail and the transit allows for lowering or eliminating some of these walls.

ADVANTAGES:

- Reduces quantities/cost
- Maintains typical section
- Simplifies construction by reducing or eliminating wall construction

DISADVANTAGES:

- Revised grading could impact trees

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:	\$ 326,403		\$ 326,403
PROPOSED CHANGE:	\$ 0		\$ 0
SAVINGS:	\$ 326,403		\$ 326,403

COST ESTIMATING WORKSHEET

PROPOSAL NUMBER: T6-10	PAGE NUMBER: 2 of 6
-------------------------------	----------------------------

PROJECT #/PI #: CSSTP-0009-00(396) / 0009396

ORIGINAL DESIGN

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Battered Concrete Retaining Walls, 16"	1	SF	2625	\$28	73,500
Granite Veneer @ Retaining Walls	1	SF	2625	\$26	68,250
4" Granite Retaining Wall Cap	1	LF	550	\$35	19,250
Footings @ Retaining Walls	1	CY	137	\$275	37,675
Anti-Graffiti Coatings	1	SF	2625	\$3	7,875
Railing, 54" Stainless Steel W/Stainless Steel Mesh	1	LF	150	\$350	52,500
SUBTOTAL – COST TO PRIME					259,050
				MARKUP	26.0%
TOTAL CONTRACT COST					326,403

PROPOSED CHANGE

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
SUBTOTAL – COST TO PRIME					
				MARKUP	
TOTAL CONTRACT COST					

Difference [Original-Proposed] **\$326,403**

SOURCES

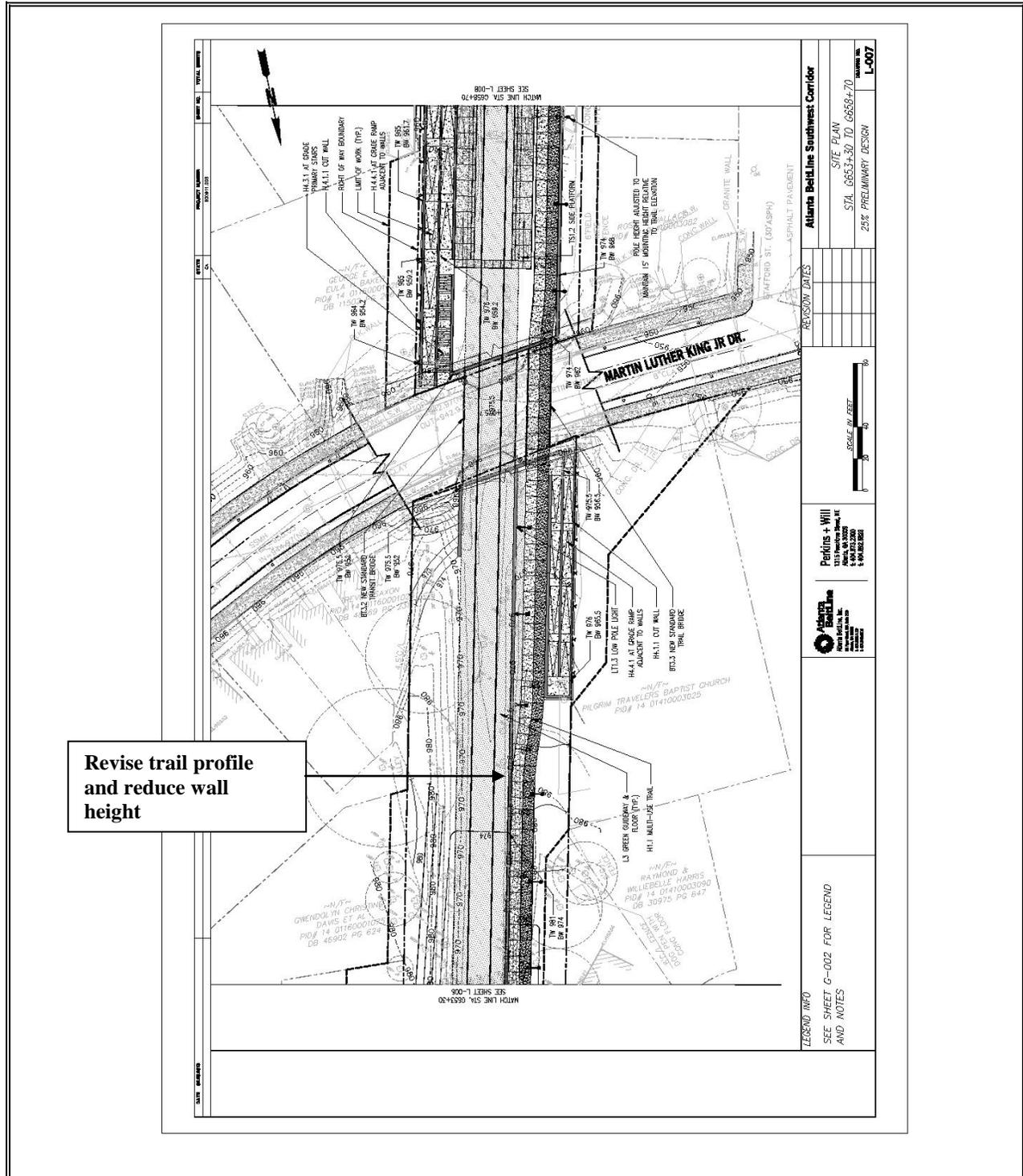
- | | |
|---|--|
| <ul style="list-style-type: none"> 1. Project Cost Estimate 2. USC Estimate Database 3. GDOT Item Mean Summary 4. Means Estimating Manual | <ul style="list-style-type: none"> 5. Richardson's Estimating Manual 6. Vendor (Specify) 7. Other (Specify) |
|---|--|

PROPOSED CHANGE SKETCH/DETAIL

PROPOSAL NUMBER: T6-10

PAGE NUMBER: 3 of 6

PROJECT #/PI #: CSSTP-0009-00(396) / 0009396



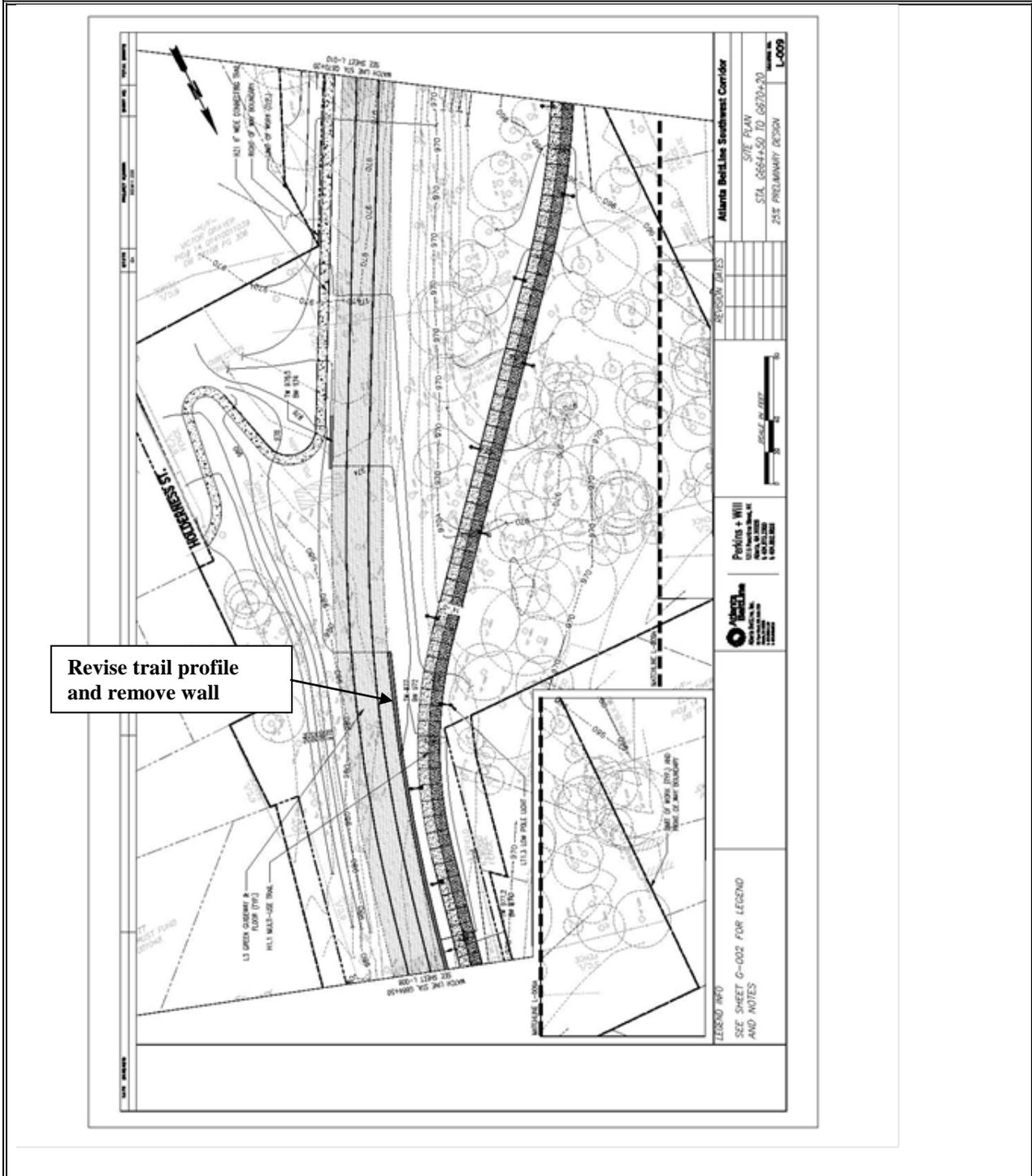
**Revise trail profile
and reduce wall
height**

PROPOSED CHANGE SKETCH/DETAIL

PROPOSAL NUMBER: T6-10

PAGE NUMBER: 4 of 6

PROJECT #/PI #: CSSTP-0009-00(396) / 0009396



CALCULATIONS

PROPOSAL NUMBER: T6-10

PAGE NUMBER: 6 of 6

PROJECT #/PI #: CSSTP-0009-00(396) / 0009396

Wall Costs:

Battered Concrete Retaining Wall, 16" = \$28/SF

Granite Veneer = \$26/SF

Anti-Graffiti Coatings = \$3/SF

4" Granite Retaining Wall Cap = \$35/LF

Footings @ Retaining Wall = \$275/CY

Wall Locations:

Station 652+00 to 654+00:

200 LF of wall * 8 foot average height = 1600 SF

Wall/Veneer/Coating = 1600 SF * \$57/SF = \$91,200

Cap = 200 LF * \$35/LF = \$7,000

Footing = 1.33 LF * 5 LF * 200 LF = 1330 SF = 50 CY * \$275/CY = \$13,750

Total = \$111,950

Station 664+50 to 666+50:

200 LF of wall * 4 foot average height = 800 SF

Wall/Veneer/Coating = 800 SF * \$57/SF = \$45,600

Cap = 200 LF * \$35/LF = \$7,000

Footing = 1.33 LF * 5 LF * 200 LF = 1330 SF = 50 CY * \$275/CY = \$13,750

Total = \$66,350

Station 688+00 to 689+50

150 LF of wall * 1.5 foot average height = 225 SF

Wall/Veneer/Coating = 225 SF * \$57/SF = \$12,825

Cap = 150 LF * \$35/LF = \$5,250

Footing = 1.33 LF * 5 LF * 150 LF = 998 SF = 37 CY * \$275/CY = \$10,175

Railing, 54" Stainless Steel W/Stainless Steel Mesh = 150 LF * \$350 = \$52,500

Total = \$80,750

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER: T6-11	PAGE NUMBER: 1 of 5
-------------------------------	----------------------------

PROJECT #/PI #:	CSSTP-0009-00(396) / 0009396
PROJECT TITLE:	Atlanta Beltline Corridor from Allene Avenue to Lena Street Fulton County

PROPOSAL DESCRIPTION:	MAINTAIN 5' SEPARATION BETWEEN TRAIL AND TRANSIT IN ORDER TO ELIMINATE FENCING.
------------------------------	--

ORIGINAL DESIGN: In the current design, the trail is being constructed within 5' of transit with fencing around Stations 750+00 and 760+00.

PROPOSED CHANGE: It is proposed to separate the trail from the transit by the 5' minimum distance in order to eliminate fencing between the trail and transit. As shown in the Calculations sheets within this proposal, there are 2 locations where this proposed alternative can be implemented and results in an elimination of 700 LF of separation fence.

JUSTIFICATION: The current design narrows the separation from trail to transit. By maintaining a 5' separation, the fencing will not be required and the trail can be constructed within the existing right of way footprint.

ADVANTAGES:

- Reduces quantities/cost
- Maintains typical section

DISADVANTAGES:

- None apparent

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:	\$ 289,800		\$ 289,800
PROPOSED CHANGE:	\$ 0		\$ 0
SAVINGS:	\$ 289,800		\$ 289,800

COST ESTIMATING WORKSHEET

PROPOSAL NUMBER: T6-11	PAGE NUMBER: 2 of 5
-------------------------------	----------------------------

PROJECT #/PI #: CSSTP-0009-00(396) / 0009396

ORIGINAL DESIGN

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Railing, 54" Stainless Steel W/Stainless Steel Mesh	1	LF	400	350	140,000
42" Stainless Steel Barrier Fence W/3 cables	1	LF	300	300	90,000
SUBTOTAL – COST TO PRIME					230,000
MARKUP				26.0%	59,800
TOTAL CONTRACT COST					289,800

PROPOSED CHANGE

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
SUBTOTAL – COST TO PRIME					0
MARKUP					
TOTAL CONTRACT COST					0

Difference [Original-Proposed] **\$289,800**

SOURCES

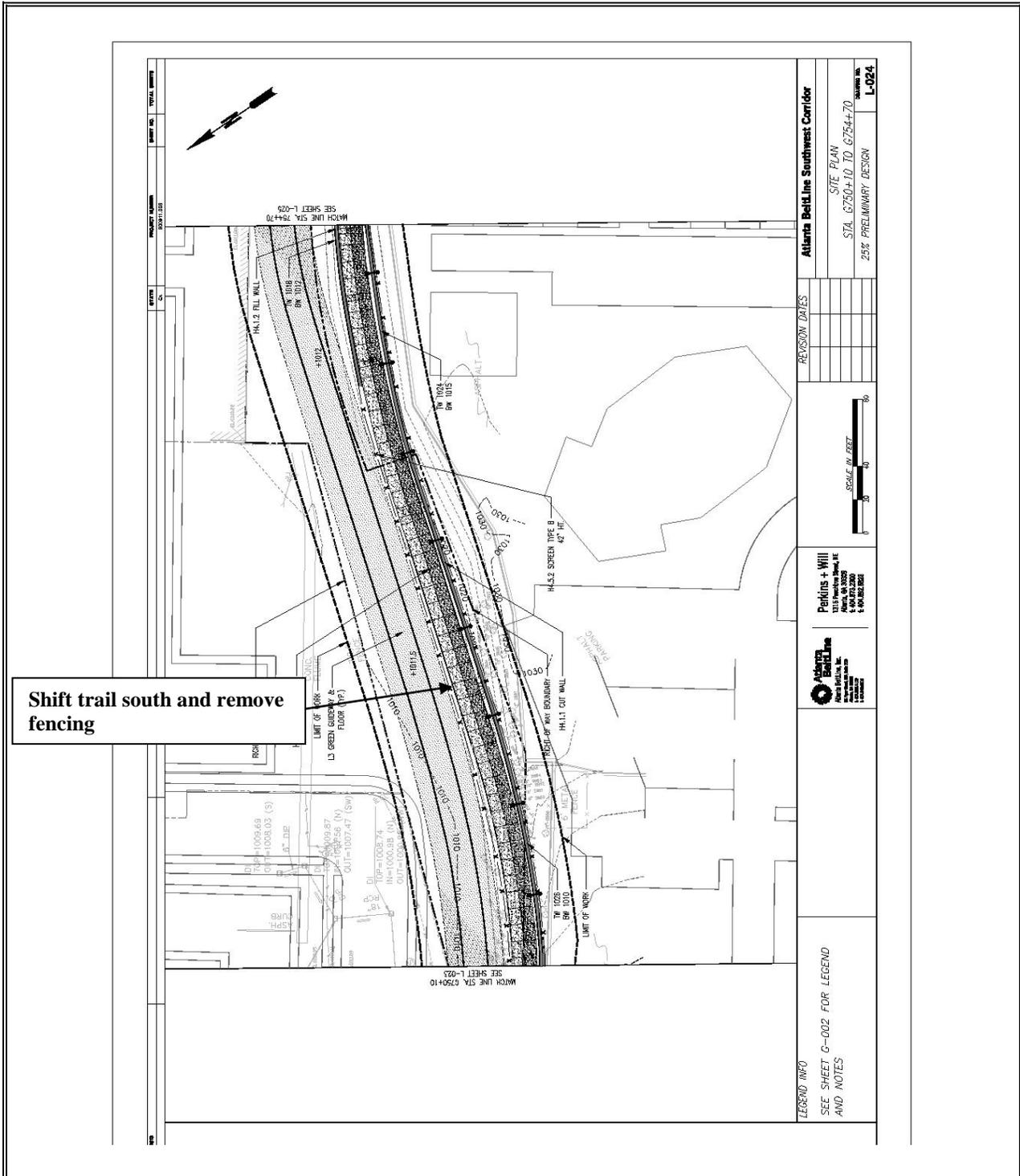
- | | |
|---|--|
| <ol style="list-style-type: none"> 1. Project Cost Estimate 2. USC Estimate Database 3. GDOT Item Mean Summary 4. Means Estimating Manual | <ol style="list-style-type: none"> 5. Richardson's Estimating Manual 6. Vendor (Specify) 7. Other (Specify) |
|---|--|

PROPOSED CHANGE SKETCH/DETAIL

PROPOSAL NUMBER: T6-11

PAGE NUMBER: 3 of 5

PROJECT #/PI #: CSSTP-0009-00(396) / 0009396



Shift trail south and remove fencing

LEGEND INFO	REVISION DATES	Atlanta BeltLine Southwest Corridor
SEE SHEET G-002 FOR LEGEND AND NOTES		SITE PLAN
		STA. 6750+10 TO 6754+70
		25% PRELIMINARY DESIGN
		NUMBER L-024

Perkins + Will 1333 Avenue of the Americas, 48th Floor New York, NY 10020 Tel: 212.512.2000 Fax: 212.512.2001	 SCALE: 1/4" = 1'-0"
--	--------------------------------

CALCULATIONS

PROPOSAL NUMBER: T6-11

PAGE NUMBER: 5 of 5

PROJECT #/PI #: CSSTP-0009-00(396) / 0009396

Multi-use Trail:

Railing, 54" Stainless Steel W/Stainless Steel Mesh
At Station 750+00 = 400 LF at \$350/LF = \$140,000

42" Stainless Steel Barrier Fence W/3 cables
At Station 760+00 = 300 LF at \$300/LF = \$90,000

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER: B7-8	PAGE NUMBER: 1 of 5
------------------------------	----------------------------

PROJECT #/PI #:	CSSTP-0009-00(397) / 0009397
PROJECT TITLE:	Atlanta Beltline Corridor from Glenwood Park to Allene Ave. Fulton County

PROPOSAL DESCRIPTION: USE LEAD ENCAPSULATING PAINT IN LIEU OF JACKING EXISTING BRIDGES AND SANDBLASTING AND REPAINTING THE SUPERSTRUCTURE.

ORIGINAL DESIGN: As mentioned in the project briefing, the current design will jack the existing bridges to provide adequate clearance to allow for the installation of a protective barrier while allowing vehicular traffic beneath the bridge. Once the rehabilitation and painting is complete, the bridges will be lowered back into their original position.

The VE team understands that for the RR bridges crossing Pryor Street and Metropolitan that the bridges were inspected by MACTEC as part of the design team and given sufficiency ratings of 66 and 64 respectively. The major recommendation was to remove surface rust and repaint. Repainting using GDOT practice involves sandblasting to base metal and applying a series of paint coats to achieve the desired base paint system.

PROPOSED CHANGE: It is proposed to use a lead encapsulating paint and omit jacking the bridges to maintain them or require them to be lowered back into position.

JUSTIFICATION: This approach can be performed faster at a reduced cost and eliminates jacking of the bridges.

ADVANTAGES:

- Reduces costs
- Eliminates bridge jacking

DISADVANTAGES:

- Not a currently approved paint system

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:	\$ 233,289		\$ 233,289
PROPOSED CHANGE:	\$ 30,331		\$ 30,331
SAVINGS:	\$ 202,958		\$ 202,958

COST ESTIMATING WORKSHEET

PROPOSAL NUMBER:	B7-8	PAGE NUMBER:	2 of 5
-------------------------	------	---------------------	--------

PROJECT #/PI #:	CSSTP-0009-00(397) / 0009397
------------------------	------------------------------

ORIGINAL DESIGN

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Pryor Road - Jack and lower single span steel plate girder bridge	7	LF	80	1,000	80,000
Pryor Road - Sand blasting and painting superstructure over traffic	7	SF	6,451	6.25	40,319
Metropolitan Pkwy - Jack and lower single span steel plate girder bridge	7	LF	55	1,000	55,000
Metropolitan Pkwy - Sand blasting and painting superstructure over traffic	7	SF	1,573	6.25	9,831
SUBTOTAL – COST TO PRIME					185,150
				MARKUP	26%
TOTAL CONTRACT COST					233,289

PROPOSED CHANGE

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Pryor Road - Pressure wash and paint structural steel in place over traffic with lead encapsulating paint	7	SF	6,451	3.00	19,353
Metropolitan Pkwy - Pressure wash and paint structural steel in place over traffic with lead encapsulating paint	7	SF	1,573	3.00	4,719
SUBTOTAL – COST TO PRIME					24,072
				MARKUP	26.0%
TOTAL CONTRACT COST					30,331

Difference [Original-Proposed] **\$202,958**

SOURCES

- | | |
|---|---|
| <ol style="list-style-type: none"> 1. Project Cost Estimate 2. USC Estimate Database 3. GDOT Item Mean Summary 4. Means Estimating Manual | <ol style="list-style-type: none"> 5. Richardson's Estimating Manual 6. Vendor (Specify) 7. Other (Sources noted in write up) |
|---|---|

ORIGINAL DESIGN SKETCH/DETAIL

PROPOSAL NUMBER: B7-8

PAGE NUMBER: 3 of 5

PROJECT #/PI #: CSSTP-0009-00(397) / 0009397



Pryor Street looking North at RR Bridge
(Source: Google Maps)



Metropolitan Parkway looking North at RR Bridge
(Source: Google Maps)

PROPOSED CHANGE SKETCH/DETAIL

PROPOSAL NUMBER: B7-8

PAGE NUMBER: 4 of 5

PROJECT #/PI #: CSSTP-0009-00(397) / 0009397

Technical Data Sheet (SPECS)

DESCRIPTION

RUST GRIP® is a tough, one-part moisture-cure polyurethane coating that absorbs atmospheric moisture to cure. RUST GRIP® is loaded with a metallic pigment for strength and is also resistant to chemical solvents and acid splash. Upon curing, RUST GRIP® provides a protective coating film of superior adhesion and flexibility, and is resistant to abrasion and impact. RUST GRIP® can be used as a primer or as a one-coat system. It is patented to encapsulate lead-based paints and other toxic materials, including asbestos. RUST GRIP® can be applied over pressure-washed, dry flash rust and firmly bonded commercial paints. In most cases, a white or near-white blasting is not required. A light to medium surface rust is preferred as the profile.

TYPICAL USES

- Good acid and very good alkali resistance.
- As a coating to encapsulate rust, lead-based paints and other hazardous materials.
- As a protective coating on metal, concrete, wood, etc. to add strength and prevent deterioration.
- As a one-coat system on new or existing bridges, oil platforms, roofs, and other commercial/industrial surfaces with minimal surface preparation.
- As a moisture protective membrane to stop moisture penetration, contaminants, and mold and mildew.

APPLICATION METHODS

RUST GRIP® can be applied to concrete or masonry substrates. The coating can be applied by spray, brush or roller. For specific instructions on surface preparation, mixing and application, please refer to the SPI's application instructions for RUST GRIP® (millage may vary due to surface profile).

NOTE: This product must not be applied on or within 2 inches of chlorinated rubber.

NOTE: Never use mineral spirits to prep surfaces or to thin this product.

NOTE: For temperatures 95F/35C and above with less than 20% humidity: Rust Grip will dry to touch but will not be completely finished gassing off. If you can move the coating with your fingers, it is not set hard enough to overcoat; if overcoated too soon, bubbles will be caught in the top coat.

NOTE: Zinc rich primers must be removed by sandblast, hand or power tool prior to application of RUST GRIP®. Also, surface should be allowed to develop surface rust as the profile before applying RUST GRIP®.

MINIMUM SPREAD RATE (mil thickness)

Apply RUST GRIP® at a minimum thickness 8 mils wet / 4 mils dry over the highest peaks of the surface profile. Allow for absorption into the substrate and filling profile when figuring spread rate.

TEST AND CERTIFICATIONS

1. Tensile Strength (6,780 psi after 3 weeks)
2. USDA approved
3. Factory Mutual approval
4. E-108-00: Spread of flame on pitched roofs (Class "A" non-combustible)
5. GBS: Prohesion over rusted metal
6. Marine approvals for salt water/maritime user:
 - DNV (Det Norske Veritas)
 - ABS (American Bureau of Shipping)
 - IMO (International Maritime Organization)

6. • US Coast Guard
7. Mildew Resistance – excellent (ASTM D3273, 3274)
8. Chemical Resistance (24 hours/12 reagents)
9. Flexibility (Mandrel Bend: ASTM D522) – 1/8"
10. Direct Impact Resistance (ASTM D2794)
11. Adhesion (ASTM D3359, D4541)
12. Water Vapor Transmission (ASTM D1653)
13. Surface Burning Characteristics (EB4)
14. Weathering (2000 hours) – China
15. Scrub Resistance (ASTM D2486)
16. ASTM B117 - 15000 hours, one coat 6 mils (150Microns) Prefect score

PHYSICAL DATA

- Solids: By weight 62.2% / By volume 51.4%
- 30-60 MINUTES TO TACK FREE AT 70°F (21°C)
- Overcoat window is three hours or less at 70°F (21°C)
- Lead and chromate free
- Hygroscopic: Cures by absorbing moisture in the air
- Net Weight: 9.4 lbs. per gallon
- Moisture-cure Polyurethane
- Shelf Life: Up to 3 years (unopened) under appropriate storage condition (see MSDS)
- One component coating; No curing agent needed
- VOC Level: 414 grams/liter
- Silver-gray in color; not available in colors
- Resistant to most solvents, chemicals and some acids
- Maximum Surface Temperature when applying: 150°F (65°C)
- Minimum Surface Temperature when applying: 50°F (10°C)
- Maximum Surface Temperature after curing: 325°F (163°C)
- Failure will occur at a constant temperature equal to or greater than 302°F (150°C); consult SPI for intermittent temperatures greater than 302°F (150°C)

SAFETY PRECAUTIONS

Do not use this product without first taking all appropriate safety measures to prevent property damage and injuries. These measures may include, without limitation: proper ventilation, use of proper lamps, wearing of protective clothing and masks, tenting, and proper separation of application areas. This coating is flammable. Keep away from fire, or other sources of ignition. For more specific safety procedures, please refer to the RUST GRIP Material Safety Data Sheet. **KEEP OUT OF REACH OF CHILDREN.**

LIMITATION OF LIABILITY: The information contained in this data sheet is based upon tests that we believe to be accurate and is intended for guidance only. All recommendations or suggestions relating to the use of the products made by SPI, whether in technical documentation, or in response to a specific enquiry, or otherwise, are based on data which to the best of our knowledge is reliable. The products and information are designed for users having the requisite knowledge and industrial skills, and the end-user has the responsibility to determine the suitability of the product for its intended use. SPI has no control over either the quality of condition of the substrate, or the many factors affecting the use and application of the product. Therefore, SPI does not accept any liability arising from loss, injury, or damage resulting from such use or the contents of this data sheet (unless there are written agreements stating otherwise).

The information contained in this data sheet is subject to modification as a result of practical experience and continuous product development. This data sheet replaces and annuls all previous issues and the user has the responsibility to ensure that this sheet is current prior to using the product.

Eagle Specialized Coatings And Protected Environments
18523 Fraser Hwy, Surrey, BC, CANADA V3S 8E7

Tel: (604) 576 - 2212
Fax: (604) 576 - 7773

CALCULATIONS

PROPOSAL NUMBER: B7-8

PAGE NUMBER: 5 of 5

PROJECT #/PI #: CSSTP-0009-00(397) / 0009397

Jacking the existing bridges to allow for sandblasting would be cost prohibitive.

It would involve the following costs:

- Jack single span steel plate girder bridge
- sand blasting superstructure over traffic
- painting superstructure over traffic
- lower bridge onto existing bearings

There are no costs in the cost estimate for this approach.

The concept report cost estimate indicates a new bridge for these locations and the “Expanded Component Estimate” does not cover this project.

Here are ballpark estimates for these activities:

- Jack and lower single span steel plate girder bridge ----- \$ 1K/ft
- Sand blasting and painting superstructure over traffic ----- \$ 6.25/sf (from Clayton Bennett, GDOT Bridge Maintenance)
- Pressure wash and paint structural steel in place over traffic with lead encapsulating paint --- \$ 3.00/ SF (from Gene Boullain, Sunbelt Structures, Inc.)

Estimate SF of Structural steel: 4 beams

Pryor Street:

80 ft long x 8.4 ft deep x 4 beams x 2 sides x 1.2 (factor for secondary members and flanges) = 6,451 SF

Metropolitan Parkway: Through Girder (2 beams)

55 ft long x 5.5 ft deep (estimate) x 2 beams x 2 sides x 1.3 (factor for secondary members & flanges) = 1,573 SF

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER: T7-1	PAGE NUMBER: 1 of 4
------------------------------	----------------------------

PROJECT #/PI #:	CSSTP-0009-00(397) / 0009397
PROJECT TITLE:	Atlanta Beltline Corridor from Glenwood Park to Allene Ave. Fulton County

PROPOSAL DESCRIPTION: AT RETAINING WALLS, SET PERMANENT EASEMENT AT APPROPRIATE DISTANCE BASED ON WALL HEIGHT WITH TEMPORARY EASEMENT BEYOND.

ORIGINAL DESIGN: The current design utilizes permanent easement to accommodate most of the limit of work area that is beyond the right-of-way boundary, with some small areas of temporary easements as well.

PROPOSED CHANGE: In areas where retaining walls are to be implemented, utilize a permanent easement beyond the face of the walls at a width of 10-feet for fill walls and a width of 1.5 times the height behind the face of cut walls. Utilize temporary easements to accommodate the remainder of the limit of work area beyond these permanent easements.

JUSTIFICATION: Utilizing the 10-foot width beyond the front face of fill walls and 1.5 times the wall height behind the face of cut walls will maintain control of the zone of influence of the wall, while minimizing the amount of permanent easement to be acquired.

ADVANTAGES:

- Reduces cost
- Reduces maintenance
- Reduces permanent impact to adjacent properties

DISADVANTAGES:

- Requires multiple easements (permanent and temporary) from each affected property

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:	\$ 412,743		\$ 412,743
PROPOSED CHANGE:	\$ 55,033		\$ 55,033
SAVINGS:	\$ 357,710		\$ 357,710

COST ESTIMATING WORKSHEET

PROPOSAL NUMBER: T7-1	PAGE NUMBER: 2 of 4
------------------------------	----------------------------

PROJECT #/PI #: CSSTP-0009-00(397) / 0009397

ORIGINAL DESIGN

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Permanent Easement (Residential)	1,7	AC	0.940	196,875.00	185,127
Temporary Easement (Residential)	1,7	AC	0	26,250.00	0
Permanent Easement (Commercial)	1,7	AC	0.231	984,375.00	227,616
Temporary Easement (Commercial)	1,7	AC	0	131,250.00	0
SUBTOTAL – COST TO PRIME					412,743
MARKUP					Incl.
TOTAL CONTRACT COST					412,743

PROPOSED CHANGE

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Permanent Easement (Residential)	1,7	AC	0	196,875.00	0
Temporary Easement (Residential)	1,7	AC	0.940	26,250.00	24,684
Permanent Easement (Commercial)	1,7	AC	0	984,375.00	0
Temporary Easement (Commercial)	1,7	AC	0.231	131,250.00	30,349
SUBTOTAL – COST TO PRIME					55,033
MARKUP					Incl.
TOTAL CONTRACT COST					55,033

Difference [Original-Proposed] **\$357,710**

SOURCES

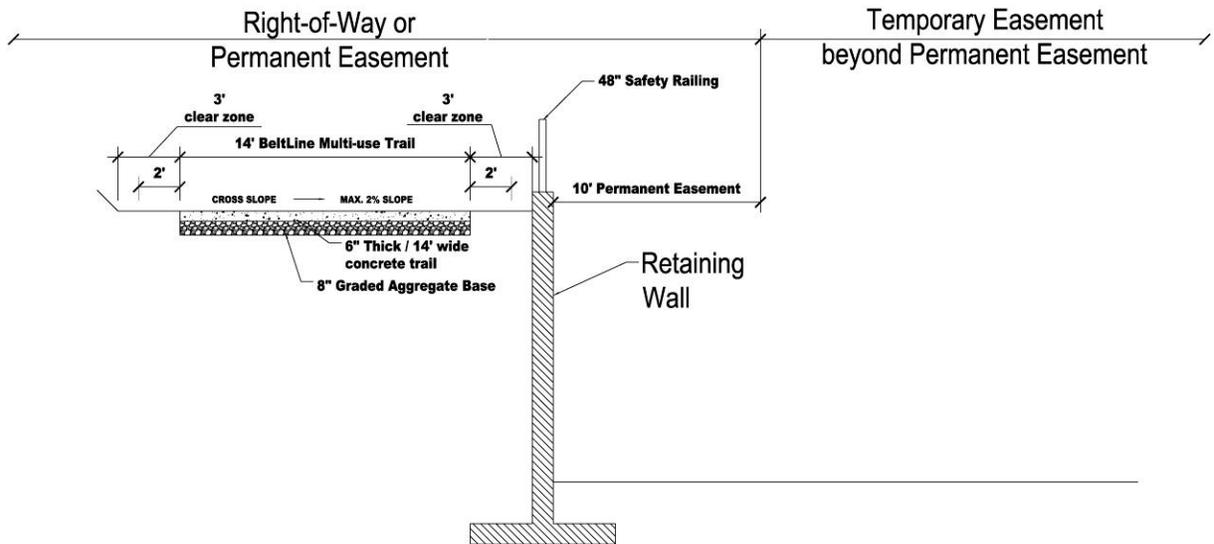
- | | |
|---|--|
| <ol style="list-style-type: none"> 1. Project Cost Estimate 2. USC Estimate Database 3. GDOT Item Mean Summary 4. Means Estimating Manual | <ol style="list-style-type: none"> 5. Richardson's Estimating Manual 6. Vendor (Specify) 7. Other (Specify) |
|---|--|

PROPOSED CHANGE SKETCH/DETAIL

PROPOSAL NUMBER: T7-1

PAGE NUMBER: 3 of 4

PROJECT #/PI #: CSSTP-0009-00(397) / 0009397



CALCULATIONS

PROPOSAL NUMBER: T7-1

PAGE NUMBER: 4 of 4

PROJECT #/PI #: CSSTP-0009-00(397) / 0009397

Using the calculations prepared for VE Idea T6-1 for Project CSSTP-0009-00(396) / 0009396 - Atlanta Beltline Corridor from Allene Avenue to Lena Street, Fulton County, it was determined that permanent easement for retaining wall locations occurred on approximately 23 percent of the permanent easements. Assuming this same ratio applies to this project the following table was prepared indicating that 22.92 percent of permanent easement would be changed to temporary easements. This was applied to both residential (RES) and commercial (COM) properties equally utilizing the right of way cost estimate provided in the Concept Report. Since no plans were available, this is an estimate intended to give an order of magnitude.

Type	Perm Ease AC	% Area to Change	Temp Ease AC	Permanent Easement			Temporary Easement		
				\$/AC	+50%	TOTAL	\$/AC	+50%	TOTAL
RES	1.220	22.92%	0.940	\$ 131,250.00	\$ 196,875.00	\$ 185,127.17	\$ 17,500.00	\$ 26,250.00	\$ 24,683.62
COM	0.300	22.92%	0.231	\$ 656,250.00	\$ 984,375.00	\$ 227,615.38	\$ 87,500.00	\$ 131,250.00	\$ 30,348.72
	1.520		1.172			\$ 412,742.55			\$ 55,032.34

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER: T7-2	PAGE NUMBER: 1 of 4
------------------------------	----------------------------

PROJECT #/PI #:	CSSTP-0009-00(397) / 0009397
PROJECT TITLE:	Atlanta Beltline Corridor from Glenwood Park to Allene Ave. Fulton County

PROPOSAL DESCRIPTION: WHERE THERE ARE NO RETAINING WALLS, SET PERMANENT EASEMENT AT CLEAR ZONE WITH TEMPORARY EASEMENT BEYOND.

ORIGINAL DESIGN: The current design utilizes permanent easement to accommodate most of the limit of work area that is beyond the right-of-way boundary, with some small areas of temporary easements as well.

PROPOSED CHANGE: In areas where cut or fill slopes are to be implemented, utilize a permanent easement to the clear zone (3-foot from trail edge). Utilize temporary easements to accommodate the remainder of the limit of work area beyond these permanent easements.

JUSTIFICATION: Utilizing the clear zone for permanent easements will maintain control of the trail corridor, while minimizing the amount of permanent easement to be acquired.

ADVANTAGES:

- Reduces cost
- Reduces maintenance
- Reduces permanent impact to adjacent properties

DISADVANTAGES:

- Requires multiple easements (permanent and temporary) from each affected property

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:	\$ 432,839		\$ 432,839
PROPOSED CHANGE:	\$ 57,712		\$ 57,712
SAVINGS:	\$ 375,127		\$ 375,127

COST ESTIMATING WORKSHEET

PROPOSAL NUMBER: T7-2	PAGE NUMBER: 2 of 4
------------------------------	----------------------------

PROJECT #/PI #: CSSTP-0009-00(397) / 0009397

ORIGINAL DESIGN

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Permanent Easement (Residential)	1,7	AC	0.986	196,875	194,141
Temporary Easement (Residential)	1,7	AC	0	26,250	0
Permanent Easement (Commercial)	1,7	AC	0.242	984,375	238,698
Temporary Easement (Commercial)	1,7	AC	0	131,250	0
SUBTOTAL – COST TO PRIME					432,839
MARKUP					Incl.
TOTAL CONTRACT COST					432,839

PROPOSED CHANGE

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Permanent Easement (Residential)	1,7	AC	0	196,875	0
Temporary Easement (Residential)	1,7	AC	0.986	26,250	25,886
Permanent Easement (Commercial)	1,7	AC	0	984,375	0
Temporary Easement (Commercial)	1,7	AC	0.242	131,250	31,826
SUBTOTAL – COST TO PRIME					57,712
MARKUP					Incl.
TOTAL CONTRACT COST					57,712

Difference [Original-Proposed] **\$375,127**

SOURCES

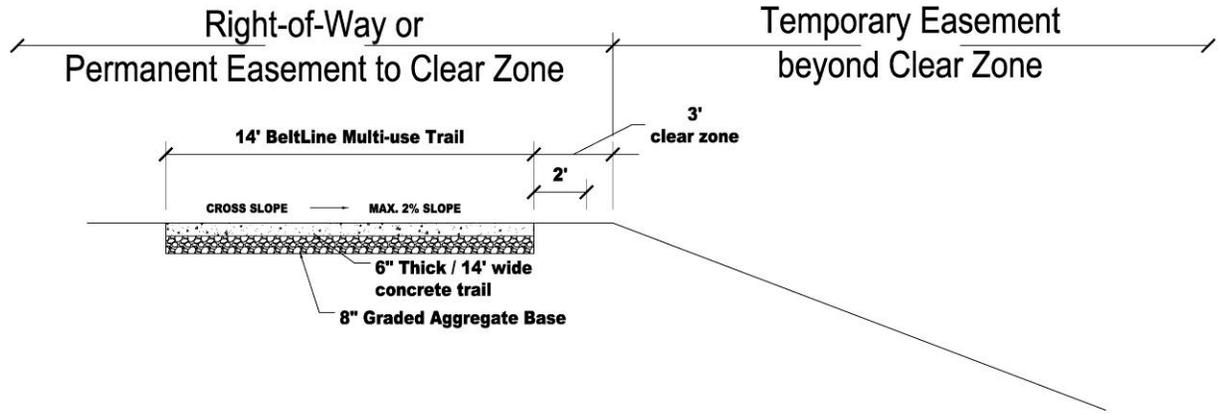
- | | |
|---|---|
| <ol style="list-style-type: none"> 1. Project Cost Estimate 2. USC Estimate Database 3. GDOT Item Mean Summary 4. Means Estimating Manual | <ol style="list-style-type: none"> 5. Richardson's Estimating Manual 6. Vendor (Specify) 7. Other (Calculations) |
|---|---|

PROPOSED CHANGE SKETCH/DETAIL

PROPOSAL NUMBER: T7-2

PAGE NUMBER: 3 of 4

PROJECT #/PI #: CSSTP-0009-00(397) / 0009397



CALCULATIONS

PROPOSAL NUMBER: T7-2

PAGE NUMBER: 4 of 4

PROJECT #/PI #: CSSTP-0009-00(397) / 0009397

Using the calculations prepared for VE Idea T6-2 for Project CSSTP-0009-00(396) / 0009396 - Atlanta Beltline Corridor from Allene Avenue to Lena Street, Fulton County, it was determined that permanent easement for locations where there is no retaining wall occurred on approximately 19 percent of the permanent easements. Assuming this same ratio applies to this project the following table was prepared indicating that 19.17 percent of permanent easement would be changed to temporary easements. This was applied to both residential (RES) and commercial (COM) properties equally utilizing the right of way cost estimate provided in the Concept Report. Since no plans were available, this is an estimate intended to give an order of magnitude.

Type	Perm Ease AC	% Area to Change	Temp Ease AC	Permanent Easement			Temporary Easement		
				\$/AC	+50%	TOTAL	\$/AC	+50%	TOTAL
RES	1.220	19.17%	0.986	\$ 131,250.00	\$ 196,875.00	\$ 194,140.94	\$ 17,500.00	\$ 26,250.00	\$ 25,885.46
COM	0.300	19.17%	0.242	\$ 656,250.00	\$ 984,375.00	\$ 238,697.88	\$ 87,500.00	\$ 131,250.00	\$ 31,826.38
	1.520		1.229			\$ 432,838.82			\$ 57,711.84

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER: T7-6.3

PAGE NUMBER: 1 of 2

PROJECT #/PI #: CSSTP-0009-00(397) / 0009397

PROJECT TITLE: Atlanta Beltline Corridor from Glenwood Park to Allene Ave. Fulton County

PROPOSAL DESCRIPTION: ALLOCATE PORTION OF DUCTBANK COSTS FOR RELOCATION OF TELECOM TO THIS PROJECT AND OBTAIN FUNDING FOR EXCESS DUCTBANK CAPACITY FROM OTHER SOURCES.

ORIGINAL DESIGN: The current design includes a ductbank with eight (8) conduits to be constructed along the trail for relocation of existing fiber optic telecom lines with excess capacity for location of future utilities within this ductbank.

PROPOSED CHANGE: It is proposed to allocate the portion of the ductbank used to house the relocated telecom lines to the trail funds, with the remaining cost of the ductbank paid for by other funds due to the excess capacity being a revenue stream from the utility when the ductbank is utilized. It is assumed that only one-half, or 4 of the 8 conduits, are required for relocating the existing fiber optic lines into this ductbank; thus, half of the ductbank costs would be allocated to the trail project.

JUSTIFICATION: The excess ductbank capacity will be a revenue stream from utilities wishing to use the ductbank in the future; thus, other funds should be allocated to pay for the excess capacity built into the ductbank.

ADVANTAGES:

- Reduces portion of project paid for with trail funds
- Properly allocates costs among parties

DISADVANTAGES:

- None apparent

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:	\$ 3,250,800		\$ 3,250,800
PROPOSED CHANGE:	\$ 1,625,400		\$ 1,625,400
SAVINGS:	\$ 1,625,400		\$ 1,625,400

COST ESTIMATING WORKSHEET

PROPOSAL NUMBER: T7-6.3	PAGE NUMBER: 2 of 2
--------------------------------	----------------------------

PROJECT #/PI #: CSSTP-0009-00(397) / 0009397

ORIGINAL DESIGN

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Exc/fill/Compact – full ductbank	2	LF	21,500	8.00	172,000
Flowable fill – full ductbank	2	LF	21,500	22.00	473,000
8 conduits w/ spacers	2	LF	21,500	90.00	1,935,000
SUBTOTAL – COST TO PRIME					2,580,000
MARKUP				26.0%	670,800
TOTAL CONTRACT COST					3,250,800

PROPOSED CHANGE

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Exc/fill/Compact – 1/2 ductbank	2	LF	21,500	4.00	86,000
Flowable fill – 1/2 ductbank	2	LF	21,500	11.00	236,500
4 conduits w/ spacers	2	LF	21,500	45.00	967,500
SUBTOTAL – COST TO PRIME					1,290,000
MARKUP				26.0%	335,400
TOTAL CONTRACT COST					1,625,400

Difference [Original-Proposed] **\$1,625,400**

SOURCES

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

VE STUDY SIGN-IN SHEET

Project No.: CSSTP000900396
CSSTP000900397

County: Fulton PI No.: 0009396 & 0009397 Date: June 17-20, 2013
(Southwest and Southeast portions of the Atlanta Beltline)

Days

FIRST	LAST	NAME	GDOT OFFICE OR COMPANY NAME	PHONE NUMBER	EMAIL ADDRESS
X	X	Robert Reid Jr.	Engineering Services	404-631-1754	rreid@dot.ga.gov
X	X	Matt Sanders	Engineering Services	404-631-1752	msanders@dot.ga.gov
X	X	Tom Orr	US Cost	770-481-1638	torr@uscost.com
X	X	Lenor Bromberg	KEA Group	404-805-8244	lbromberg@keagroup.cpm
X	X	Chris Haggard	Wolverton & Associates	770-447-8999	chris.haggard@wolverton-assoc.com
X	X	Greg Grant	RS&H	678-429-7501	greg.grant@rsandh.com
X	X	Kevin Burke	ABI	404-477-3637	kburke@atlbeltline.org
X	X	Valdis Zusmanis	Perkins + Will	404-443-7490	valdis.zusmanis@perkinswill.com
X	O	Chandria Brown	Program Delivery	404-631-1580	chbrown@dot.ga.gov
X	O	Charles A. Robinson	Program Delivery	404-631-1439	chrobinson@dot.ga.gov
X	X	Davida White	Program Delivery	404-631-1717	dwhite@dot.ga.gov
X	O	Brent Pierce	Perkins + Will	404-443-7651	brent.pierce@perkinswill.com
X	O	Catherine Owens	ABI	404-477-3643	cownes@atlbeltline.org
X	O	Micah Lipscomb	Perkins + Will	404-433-7530	micah.lipscomb@perkinswill.com
O	X	Xavier James	Program Delivery	404-631-1583	xjames@dot.ga.gov
O	X	Tamaya Huff	Program Delivery	404-631-1546	thuff@dot.ga.gov
O	X	Merishia Robinson	Program Delivery	404-631-1157	mrobinson@dot.ga.gov

X = Check all that attend

O = Did Not Attend

14 Attended Project Overview (Day 1)

12 Attended Project Presentation (Day 4)

Page 1

VALUE ENGINEERING STUDY

FUNCTION ANALYSIS

The following functions for the Atlanta Beltline Southwest and Southeast Corridor projects were identified during discussions with the V.E. participants on the first day of the study. These two-word functions consist of an active verb, and a quantifiable (measurable) noun. The functions represent the proposed capital improvement expenditures of the project, and assist the V.E. team in becoming familiar with the needs and long-term goals for the project. The Basic Function of the project is to “Enhance Transportation (Options)”. The following are considered by the V.E. team to be Secondary and Supporting Functions.

Verb	Noun		Verb	Noun
Spur	Development		Attract	Business
Reduce	Congestion		Enhance	Property (Marketability)
Increase	Mobility		Improve	Access
Connect	Neighborhoods		Reduce	Pollution
Promote	Fitness		Facilitate	Cyclists
Reduce	Commute		Facilitate	Pedestrians
Promote	Multi-modal		Improve	Drainage
Increase	Visibility		Encourage	Change
Increase	(Transit) Use		Facilitate	(Mixed-use) Development
Improve	Aesthetics		Connect	Communities
Enhance	Image		Promote	Recreation
Attract	Tourists		Preserve	Communities
Grow	Economy		Support	Commerce

VALUE ENGINEERING STUDY

COST MODEL/DISTRIBUTION

**Atlanta Beltline Southwest Corridor from Allene Ave. to Lena St. (PI #0009396)
Fulton County, Georgia**

ITEM	COST \$	% OF TOTAL
RIGHT-OF-WAY	3,307,000	29.82%
CONCRETE TRAIL AND WARNING PAVING	2,466,152	22.24%
GRADING COMPLETE	1,748,974	15.77%
RETAINING WALLS	1,580,242	14.25%
TELECOM DUCTBANK	635,586	5.73%
DRAINAGE SYSTEM	443,000	3.99%
BRIDGES/STRUCTURES	361,800	3.26%
AGGREGATE BASE COURSE	226,899	2.05%
GRASSING/EROSION CONTROL	189,310	1.71%
TRAFFIC CONTROL	75,270	0.68%
BOLLARDS/GUARDRAILS	55,890	0.50%
*TOTAL - PROJECT	11,090,123	100.00%
*Does not include Engrg & Inspection, Fuel Adjustment or Liquid AC Adjustment		

VALUE ENGINEERING STUDY

COST MODEL/DISTRIBUTION

**Atlanta Beltline Southeast Corridor from Glenwood Park to Allene Ave. (PI #0009397)
Fulton County, Georgia**

ITEM	COST \$	% OF TOTAL
RIGHT-OF-WAY	40,636,000	77.47%
CONCRETE TRAIL AND WARNING PAVING	3,545,276	6.76%
BRIDGES/STRUCTURES	2,587,421	4.93%
GRADING COMPLETE	2,540,331	4.84%
TELECOM DUCTBANK	909,300	1.73%
RETAINING WALLS	833,640	1.59%
DRAINAGE SYSTEM	638,000	1.22%
AGGREGATE BASE COURSE	313,574	0.60%
GRASSING/EROSION CONTROL	261,015	0.50%
TRAFFIC CONTROL	106,740	0.20%
BOLLARDS/GUARDRAILS	80,730	0.15%
*TOTAL - PROJECT	52,452,027	100.00%
*Does not include Engrg & Inspection, Fuel Adjustment or Liquid AC Adjustment		

VALUE ENGINEERING STUDY

BRAINSTORMING OR SPECULATION IDEAS

PROJECT TITLE: Atlanta Beltline Southwest Corridor from Allene Ave. to Lena St.
PROJECT #/PI # CSSTP-0009-00(396) / 0009396
PROJECT LOCATION: FULTON COUNTY, GEORGIA

NO.	IDEA	RANK
	TRAIL (T)	
T6-1	At Retaining Walls, Set Permanent Easement at Appropriate Distance Based on Wall Height with Temporary Easement Beyond	5
T6-2	Where No Retaining Walls, Set Permanent Easement at Clear Zone with Temporary Easement Beyond	5
T6-3	Reduce Limit of Work Boundary at Specific Locations	4
T6-4	Eliminate Stairs Where Ramp is Nearby	4
T6-5	Connect to Existing West End Trail at I-20 and Defer New Trail from I-20 up to Lawton Street until Transit Construction	4
T6-6.1	Wherever possible, locate ductbank outside of paved trail	Cmmt
T6-6.2	Construct ductbank vertically in lieu of horizontally	2
T6-6.3	Allocate Portion of Ductbank Costs Associated with Relocation of Telecom to this Trail Project and Obtain Funding for Excess Ductbank Capacity from Other Sources	4
T6-7	Eliminate colored concrete and sandblasting of concrete trail	2
T6-8	Obtain Funding for Upgraded Trail Construction Features from Other Funding Sources	4
T6-9	Make following corrections to GDOT CES Estimate: Add lighting Add landscaping associated with trail Add signage for trail Update right-of-way Delete crushed stone quantity for shoulders Add S.S. rails and fencing	Cmmts
T6-10	Adjust Trail Profiles to Eliminate Interior Walls	5
T6-11	Maintain 5' Separation Between Trail and Transit and Eliminate Separation Fence	4
T6-12	Use asphalt trail in lieu of concrete	1

VALUE ENGINEERING STUDY

BRAINSTORMING OR SPECULATION IDEAS

PROJECT TITLE: Atlanta Beltline Southwest Corridor from Allene Ave. to Lena St.

PROJECT #/PI # CSSTP-0009-00(396) / 0009396

PROJECT LOCATION: FULTON COUNTY, GEORGIA

NO.	IDEA	RANK
	BRIDGE (B)	
B6-1	At MLK Overpass, use 2:1 slopes in lieu of vertical abutments	Drop
B6-2	At MLK Overpass Bridge, use Prestressed Beams in lieu of Steel Beams	4
B6-3.1	Use Geogrid Slopes for walls up to 6 feet high in lieu of Granite Clad Concrete Retaining Walls	4
B6-3.2	Use Wire Basket Walls for walls up to 6 feet high in lieu of Granite Clad Concrete Retaining Walls	4
B6-3.3	Use MSE Retaining Walls with Vegetative Plantings for walls up to 6 feet high in lieu of Granite Clad Concrete Retaining Walls	4
B6-3.4	Use MSE walls in lieu of CIP retaining walls	1
B6-3.5	Eliminate granite facing on CIP retaining walls	1
B6-4	Use 2:1 Slopes and Eliminate Retaining Walls at Specific Locations	4
B6-5	Use painted steel handrails in lieu of stainless steel	1
B6-6	Use vinyl-coated steel safety fence in lieu of stainless steel fence	1
B6-7	Extend top of retaining walls to 54" above grade and eliminate safety railing/fence	2

The rankings indicated as "Drop" were ideas that were investigated by the VE Team during the workshop but did not prove to be feasible for consideration.

VALUE ENGINEERING STUDY

BRAINSTORMING OR SPECULATION IDEAS

PROJECT TITLE: Atlanta Beltline Southeast Corridor from Glenwood Park to Allene Avenue

PROJECT #/PI # CSSTP-0009-00(397) / 0009397

PROJECT LOCATION: FULTON COUNTY, GEORGIA

NO.	IDEA	RANK
TRAIL (T)		
T7-1	At Retaining Walls, Set Permanent Easement at Appropriate Distance Based on Wall Height with Temporary Easement Beyond	5
T7-2	Where No Retaining Walls, Set Permanent Easement at Clear Zone with Temporary Easement Beyond	5
T7-3	Reduce Limit of Work Boundary at Specific Locations	*
T7-4	Eliminate Stairs Where Ramp is Nearby	--
T7-6.1	Wherever possible, locate ductbank outside of paved trail	Cmmt
T7-6.2	Construct ductbank vertically in lieu of horizontally	2
T7-6.3	Allocate Portion of Ductbank Costs Associated with Relocation of Telecom to this Trail Project and Obtain Funding for Excess Ductbank Capacity from Other Sources	4
T7-7	Eliminate colored concrete and sandblasting of concrete trail	2
T7-8	Obtain Funding for Upgraded Trail Construction Features from Other Funding Sources	4
T7-9	Make following corrections to GDOT CES Estimate: Add lighting Add landscaping associated with trail Add signage for trail Update right-of-way Delete crushed stone quantity for shoulders Add S.S. rails and fencing	Cmmts
T7-10	Adjust Trail Profiles to Eliminate Interior Walls	*
T7-11	Maintain 5' Separation Between Trail and Transit and Eliminate Separation Fence	*
T7-12	Use asphalt trail in lieu of concrete	1

*For this project at an early stage of design, alternative cannot be assessed

VALUE ENGINEERING STUDY

BRAINSTORMING OR SPECULATION IDEAS

PROJECT TITLE: Atlanta Beltline Southeast Corridor from Glenwood Park to Allene Avenue

PROJECT #/PI # CSSTP-0009-00(397) / 0009397

PROJECT LOCATION: FULTON COUNTY, GEORGIA

NO.	IDEA	RANK
BRIDGE (B)		
B7-3.1	Use Geogrid Slopes for walls up to 6 feet high in lieu of Granite Clad Concrete Retaining Walls	*
B7-3.2	Use Wire Basket Walls for walls up to 6 feet high in lieu of Granite Clad Concrete Retaining Walls	*
B7-3.3	Use MSE Retaining Walls with Vegetative Plantings for walls up to 6 feet high in lieu of Granite Clad Concrete Retaining Walls	*
B7-3.4	Use MSE walls in lieu of CIP retaining walls	1
B7-3.5	Eliminate granite facing on CIP retaining walls	1
B7-4	Use 2:1 Slopes and Eliminate Retaining Walls at Specific Locations	*
B7-5	Use painted steel handrails in lieu of stainless steel	1
B7-6	Use vinyl-coated steel safety fence in lieu of stainless steel fence	1
B7-7	Extend top of retaining walls to 54" above grade and eliminate safety railing/fence	2
B7-8	Encapsulate lead paint in lieu of removal on bridges	4

The rankings indicated as "Drop" were ideas that were investigated by the VE Team during the workshop but did not prove to be feasible for consideration.

*For this project at an early stage of design, alternative cannot be assessed

VALUE ENGINEERING WORKSHOP AGENDA
For
GEORGIA DEPARTMENT OF TRANSPORTATION

Project #'s: CSSTP-0009-00(396) & (397) - PI#: 0009396 & 0009397
Atlanta Beltline Southwest and Southeast Corridors

28 HOUR - V.E. STUDY
17-20 June 2013

The value engineering workshop for the subject project will be conducted for 3-1/2 days from 17-20 June 2013. **The first day will take place at the offices of Perkins & Will at 1315 Peachtree Street NE, Atlanta, GA 30309. Sessions for the remainder of the week will take place in the Engineering Services Conference Room (5CR1L2) on the 5th floor of the GDOT General Office Facility located at 600 W. Peachtree Street NW, Atlanta GA 30308; POC – Matt Sanders @ (404)631-1752 voice**

Pre-workshop Activities

The V.E. Team Leader coordinates logistics with GDOT, and confirms project objectives and any unique requests, and develops a cost model for the project. The V.E. Team receives and reviews all project documents.

MONDAY

0800 - 0900

V.E. Team Introduction Phase

Tom Orr, P.E., CVS
Team Leader, U.S. Cost, Inc.
(V.E. Team Only)

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

The team members will discuss their initial impression and understanding of the project with other team members based on their pre-study review of the project plans, cost estimates, and available calculations. The V.E. Team Leader will provide cost models, and cost bar graphs to help the team identify the high-cost features of the project.

0900 - 1100

Project Design Briefing

V.E. Team; Atlanta Beltline,
A/E, GDOT

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

MONDAY (CONTINUED)

1100 - 1200 **Function Analysis Phase** V.E. Team

The V.E. team will discuss the required functions of the project. The project cost model will be analyzed to identify functions provided by all project features.

1200 - 1300 **Lunch**

1300 - 1600 **Creative Phase** V.E. Team

The V.E. team will creatively review, Brainstorm, and tabulate possible design alternatives for the project. While the designer's solution will serve as the "baseline", the team will identify alternatives not in the recommended solution, but deserving of further investigation. Each project feature will be carefully analyzed with the basic questions in mind:

What is the system/item?

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

What must it do?

What does it cost?

What is the item worth?

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

What does that alternative cost?

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

1600 - 1700 **Analysis Phase** V.E. Team

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

TUESDAY

0800 - 1700 **Development Phase** V.E. Team

During the development phase, each team member will gather information and prepare written proposals for those ideas assigned to him/her. These may require additional discussions with the designer, Atlanta Beltline representatives, outside contractors and suppliers, and other specialists to fully define the alternative. The team members will prepare sketches, perform calculations and develop other data to support each proposal. In addition, each team member will prepare estimates of costs for each alternative as originally designed, and as proposed by the V.E. team.

WEDNESDAY

0800 - 1200 **Development Phase** V.E. Team

1200 - 1300 Lunch

1300 - 1700 **Development Phase & Quality Review** V.E. Team

THURSDAY

0800 – 0900 **Prepare for Presentation** V.E. Team

0900 – 1000 **V.E. Presentation** V.E. Team Members, Atlanta
Beltline, Designers & GDOT

The Value Engineering Team will present the proposals developed in the course of the study to the design team representatives and any participating stakeholders. The intent of the presentation is to give a clear understanding of the basis of the proposals rather than to reach a conclusion as to their acceptability. A summary table of results will be distributed at the presentation. The formal V.E. Reports will be issued within 8 business days of the workshop conclusion.

1000 – 1200 **V.E. Team Wrap-up & Final QC/QA** V.E. Team Members only

The Value Engineering Team will have a wrap-up session consisting of a final review of proposals to ensure consistency and clarity of content.