VALUE ENGINEERING REPORT

I-95 Welcome Centers Northbound and Southbound
Project Nos.: IM-0000-00(689) and IM-0000-00(690)
PI Nos.: 0000689 and 0000690
Camden and Chatham Counties

July 22, 2009

OWNER:

Georgia Department of Transportation
600 West Peachtree Street
Atlanta, GA 30308
(404.631.1770)

VALUE ENGINEERING CONSULTANT:

MACTEC Engineering and Consulting, Inc.
3200 Town Point Drive NW, Suite 100
Kennesaw, GA 30144
(770.421.3346)

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Camden and Chatham Counties

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EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

VALUE ENGINEERING REPORT

I-95 Welcome Centers Northbound and Southbound
Project Nos.: IM-0000-00(689) and IM-0000-00(690)
PI Nos.: 0000689 and 0000690
Camden and Chatham Counties

July 22, 2009

Introduction

This report presents the results of a value engineering (VE) study conducted on July 7-10, 2009 at GDOT offices in Atlanta, GA, by a three person VE Team. The design team included personnel from Arcadis. and GDOT project management. The study included two projects both designed by the same consultant and both were at the 90+/-% stage of completion.

The Northbound (Camden) Center is located just north of the Florida/Georgia border on I-95. The existing welcome center is too small to handle the existing and projected growth in traffic and visitors. Currently, the 5,520 square foot building is located on 32 acres and handles approximately 1.6 million visitors per year with 143 parking spaces (including 14 for trucks/trailers). Entering the facility from I-95 is confusing with poor sight distance and the entry/exit configuration creates a dangerous weaving movement. The facility currently handles an average of 1,400 vehicles per day (determined from counts during the hours of 7:00am to 11:00pm) with staffing and restrooms available 24 hours/day. Projected vehicle traffic into the welcome center for 2009 is 1,664 vpd (ADT) and is projected to increase to 2,031 vpd in 2029 with 35% trucks. All pavement is proposed to be concrete.

The Southbound (Chatham) Center is located just south of the South Carolina/Georgia border on I-95 near the SR 21 interchange. The existing welcome center is too small to handle the existing and projected growth in traffic and visitors. Currently, the 5,520 square foot building is located on 30 acres and handles approximately 2.2 million visitors per year with 140 parking spaces (including 70 for trucks/trailers). The facility currently handles an average of 5,000 visitors per day (determined from counts during the hours of 7:00am to 11:00pm) with staffing and restrooms available 24 hours/day. This represents approximately 1,670 vehicles per day based on 3 occupants per vehicle average. Projected vehicle traffic into the welcome center for 2010 is

Existing Chatham Facility

4,104 vpd (ADT) and is projected to increase to 5,007 vpd in 2030. All pavement is proposed to be asphalt.

The total estimated project cost, without the cost of the welcome center buildings themselves, includes $15.737 million in bare construction costs in addition to $0 in additional ROW. The building costs were not included as part of the VE scope of work and therefore were not studied as part of this VE effort. No off site utility costs were included in these numbers. The totals do include a markup to allow for E&I and Construction Contingencies as well as fuel and liquid AC adjustments. These markups amounted to 15.33% for Camden and 13.34% for Chatham for a total estimated construction cost of $18.046 million. These markups will appear on the cost sheets of the VE items that are developed into recommendations

This report presents the Team's recommendations and all back-up information, for consideration by the decision-makers. This **Executive Summary** includes a brief description of each recommendation. The **Study Identification** section contains information about the project and the team. The **Recommendations** section presents a more detailed description and support information about each recommendation. The **Appendix** includes a complete record of the Team's activities and findings as well as the meeting attendees sign in sheet. The reader is encouraged to review all sections of the report in order to obtain a complete understanding of the VE process.

Considerations

During the presentation by the design team on the project overview, the VE Team was alerted to the stakeholder's constraints on this project which include:

- The Camden facility will be completely rebuilt and relocated to the northeast of the existing building. The existing building will remain in service until construction is complete with no loss of service.
- The Camden project will include a separate exit from I-95 for the Welcome Center only, not combined with the St. Mary's exit as currently exists.
- Camden will have separate truck and car parking areas.
- For the Chatham project, the existing facility will be closed and reconstructed. Temporary restroom facilities will be provided.
- For Chatham, the car and truck traffic will be separated.

Results Obtained

The VE Team generated over 30 ideas in the creative session and presented 15 of these as recommendations for consideration by GDOT. The major recommendations for Camden

involve: Revising the pavement design to use asphalt not concrete; reusing the existing pavement by relocating the building; using obliterated concrete for GAB; reducing the scope of landscaping; and using asphalt sidewalks in lieu of concrete. For the Chatham site: Reducing the scope of landscaping; revising the pavement design; using asphalt sidewalks

Neglecting the overlapping nature of the recommendations as much as possible, the net total of all the recommendations have the potential to reduce project costs by as much as $5,330,000 capital cost savings in programmed dollars while continuing to provide the required functionality. This is shown in the last column of the Summary Tables that follows the recommendation highlights below.

A brief presentation of these recommendations was conducted on July 10th with the following in attendance: Lisa Myers and Matt Sanders from GDOT Engineering Services; Clay Bastian PM from GDOT Road Design, Carlos Figueros from FHWA and the VE Team: Dave Wohlscheid, George Obaranec and Dan Cogan.

Recommendation Highlights

Camden County Location-Northbound

Idea A-1 – Revise traffic circulation patterns

This concept revises the circulation around the welcome center building in an attempt to simplify the traffic patterns. No cost savings was assumed for this option but redesign would be significant.

Potential programmed savings if accepted is $-0-.

Idea A-4 – Revise pavement design to use asphalt pavement for the cars only areas

Using asphalt in lieu of the concrete pavement included in the original design will have a significant savings on this project. If concrete is desired, the original design is 100% overdesigned and could be reduced in thickness.

Potential programmed savings could be $1,134,000

Idea B-1 – Reuse existing pavement and reduce the grading complete item

This proposal includes reorienting the building slightly to allow reuse of a significant amount of existing pavement. This recommendation assumes the pavement is in good condition.

Potential programmed savings if accepted is $3,759,000

Idea C-1 – Use obliterated concrete pavement in place sidewalks

This proposal includes crushing the pavement to be removed to obtain material that can be used as GAB under the new pavement. This is economical as the cost of quarry material in south

Georgia is $11 more per ton due to the expense suppliers have to ship this material from north Georgia.

If implemented, potential programmed savings is $1,138,900

Idea D-3 – Use narrower drive and parking aisles

The existing design uses 20 foot aisles with 20 foot parking at 45 degree for a total width of 60 feet. Use AASHTO standards and go to 12 foot aisles and 17 foot parking for a width of 46 feet. The reduced width will save paving as well as reduce stormwater runoff and will also serve as a traffic calming method.

Potential savings is $169,000.

Idea E-1 – Reduce scope of landscaping / site plan

This idea proposes cut backs to the existing design in certain areas such as along ramps, and a general reduction in other amenities such as grills which are not in extensive use at most rest areas.

Potential savings if accepted is $287,600

Idea I-1 – Use asphalt sidewalks in lieu of concrete

This appears to be an ideal area to use asphalt sidewalks on a prepared sub-base. The initial cost is substantially lower than concrete and the lifespan of both in this application should be similar.

Potential savings if implemented is $154,000

<u>Chatham County Location – Southbound</u>

Ideas A-1.1 and A-1.2 – Revise traffic circulation patterns option 1 and option 2

These concepts revise the circulation around the welcome center building in an attempt to simplify the traffic patterns. No cost savings was assumed for this option but redesign would be significant.

Savings potential if accepted is $-0-.

Idea D-1 – Reduce the extent of landscaping

This idea proposes cut backs to the existing design in certain areas such as along ramps, and a general reduction in other amenities such as grills which are not in extensive use at most rest areas.

If implemented, savings would be $208,100.

Idea F-1 – Eliminate 30 inch RCP drain pipe and use ditch for drainage

The ditch and pipe are in the same area and it appears the pipe could be eliminated and the ditch could be used for drainage.

Potential savings is $51,000

Idea G-1 – Revise the pavement design

From the pavement design analysis sheets, the existing AC pavement is 155% over designed. Reducing this to a section that is 51% over designed provides a more than adequate pavement section with a significant cost savings.

Potential savings is $111,500.

Idea G-2 – Use narrower drive and parking aisles

The existing design uses 20 foot aisles with 22 foot parking at 60 degree for a total width of 64 feet. Use AASHTO standards and go to 15 foot aisles and 19 foot parking for a width of 53 feet. The reduced width will save paving as well as reduce stormwater runoff and will also serve as a traffic calming method.

Savings potential is $47,000.

Idea H-1 – Use asphalt sidewalks in lieu of concrete

This appears to be an ideal area to use asphalt sidewalks with an appropriate GAB base. The initial cost is substantially lower than concrete and the lifespan of both in this application should be similar.

Savings potential is $82,000.

Idea I-1 – Reduce the amount of curbing

The proposal indicates potential reduction of curbing along the entrance ramp. Replace with an urban non-curbed section in this open alignment area.

Savings potential is $38,000.

I-95 Welcome Centers Northbound and Southbound
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Camden and Chatham Counties

SUMMARY OF POTENTIAL COST SAVINGS---NORTHBOUND, Camden County

ITEM No.	CREATIVE IDEA DESCRIPTION	ORIGINAL INITIAL COST	PROPOSED INITIAL COST	INITIAL COST SAVINGS	FUTURE SAVINGS	TOTAL PRESENT WORTH SAVINGS	Maximum Savings in Combination with other VE proposals
A	**Concrete Pavement**						
A-1	Revise traffic circulation patterns	-0-	-0-	-0-		-0-	-0-
A-4	Revise pavement design to use asphalt for the car only areas	1,360,000	226,000	1,134,000	-0-	1,134,000	(0% if B-1 Accepted) -0-
B	**Grading Complete**						
B-1	Reuse existing pavement and reduce grading complete item	9,323,000	5,564,000	3,759,000	-0-	3,759,000	3,759,000
C	**Graded Aggregate Base**						
C-1	Use obliterated concrete pavement in place of GAB	1,801,000	662,100	1,138,900	-0-	1,138,900	(40% with B-1) 455,000

I-95 Welcome Centers Northbound and Southbound
Project Nos.: IM-0000-00(689) and IM-0000-00(690)
PI Nos.: 0000689 and 0000690
Camden and Chatham Counties

SUMMARY OF POTENTIAL COST SAVINGS---NORTHBOUND, Camden County

ITEM No.	CREATIVE IDEA DESCRIPTION	ORIGINAL INITIAL COST	PROPOSED INITIAL COST	INITIAL COST SAVINGS	FUTURE SAVINGS	TOTAL PRESENT WORTH SAVINGS	Maximum Savings in Combination with other VE proposals
D	**AC Pavement**						
D-3	Use narrower drive and parking aisles	169,000	-0-	169,000	-0-	169,000	169,000
E	**Landscaping**						
E-1	Reduce scope of landscaping / site plan	287,600	-0-	287,600	-0-	287,600	287,600
I	**Sidewalks**						
I-1	Use asphalt sidewalks	270,000	116,000	154,000	-0-	154,000	154,000
	TOTAL POTENTIAL SAVINGS						**$4,824,600**

I-95 Welcome Centers Northbound and Southbound
Project Nos.: IM-0000-00(689) and IM-0000-00(690)
PI Nos.: 0000689 and 0000690
Camden and Chatham Counties

SUMMARY OF POTENTIAL COST SAVINGS---SOUTHBOUND, Chatham County

ITEM No.	CREATIVE IDEA DESCRIPTION	ORIGINAL INITIAL COST	PROPOSED INITIAL COST	INITIAL COST SAVINGS	FUTURE SAVINGS	TOTAL PRESENT WORTH SAVINGS	Maximum Savings in Combination with other VE proposals
A	**Grading Complete**						
A-1.1	Revise traffic circulation patterns, Option 1	-0-	-0-	-0-	-0-	-0-	-0-
A-1.2	Revise traffic circulation patterns, Option 2	-0-	-0-	-0-	-0-	-0-	-0-
D	**Landscape**						
D-1	Reduce scope of landscape/site plan	208,100	-0-	208,100	-0-	208,100	208,100
F	**Drainage**						
F-1	Eliminate 30 inch RCP	51,000	-0-	51,000	-0-	51,000	51,000
G	**Asphalt Cement Pavement**						
G-1	Revise the pavement design	111,500	-0-	111,500	-0-	111,500	111,500

I-95 Welcome Centers Northbound and Southbound
Project Nos.: IM-0000-00(689) and IM-0000-00(690)
PI Nos.: 0000689 and 0000690
Camden and Chatham Counties

SUMMARY OF POTENTIAL COST SAVINGS---SOUTHBOUND, Chatham County

ITEM No.	CREATIVE IDEA DESCRIPTION	ORIGINAL INITIAL COST	PROPOSED INITIAL COST	INITIAL COST SAVINGS	FUTURE SAVINGS	TOTAL PRESENT WORTH SAVINGS	Maximum Savings in Combination with other VE proposals
G-2	Use narrower drive and parking aisles	47,000	-0-	47,000	-0-	47,000	(Calculated w/ G-1) 15,000
H	**Concrete Sidewalks and Driveways**						
H-1	Use asphalt sidewalks	145,000	67,000	82,000	-0-	82,000	82,000
I	**Other**						
I-1	Reduce the amount of curbing	38,000	-0-	38,000	-0-	38,000	38,000
TOTAL POTENTIAL SAVINGS							**$505,600**

STUDY IDENTIFICATION

STUDY IDENTIFICATION

I-95 Welcome Centers – Northbound (Camden County) and Southbound (Chatham County)	Dates: July 7-10, 2009
Location: GDOT HQ - Atlanta	

VE Team Members

Name:	Discipline:	Organization:	Telephone:
David Wohlscheid	VE Team Leader	MACTEC	703-471-8383
George Obaranec	Highway Design	MACTEC	770-421-3481
Dan Cogan	Highway Construction	KEA Group	404-290-6424

Project Description

The Northbound (Camden) Center is located just north of the Florida/Georgia border on I-95. The existing welcome center is too small to handle the existing and projected growth in traffic and visitors. Currently, the 5,520 square foot building is located on 32 acres and handles approximately 1.6 million visitors per year with 143 parking spaces (including 14 for trucks/trailers). Entering the facility from I-95 is confusing with poor sight distance, and the entry/exit configuration creates a dangerous weaving movement. The facility currently handles an average of 1,400 vehicles per day (determined from counts during the hours of 7:00am to 11:00pm) with staffing and restrooms available 24 hours/day. Projected vehicle traffic into the welcome center for 2009 is 1,664 vpd (ADT) and project to increase to 2,031 vpd in 2029 with 35% trucks. All pavement is proposed to be concrete.

The proposed Northbound Center includes a complete reconstruction of the welcome center site and facilities. The proposed exit ramp from I-95 will be relocated 1,600 feet south to separate it from the Saint Mary's Road exit. The existing building will be demolished and reconstructed 200 foot to the south. The proposed building site will be raised 3 feet to improve flooding and sewer drainage issues. Approximately 100 car and 50 truck parking spaces will be provided. The merge length between the cars and the trucks will be increased by approximately 500 feet.

The Southbound (Chatham) Center is located just south of the South Carolina/Georgia border on I-95 near the SR 21 interchange. The existing welcome center is too small to handle the existing and projected growth in traffic and visitors. Currently, the 5,520 square foot building is located on 30 acres and handles approximately 2.2 million visitors per year with 140 parking spaces (including 70 for trucks/trailers). The facility currently handles an average of 5,000 visitors per day (determined from counts during the hours of 7:00am to 11:00pm) with staffing and restrooms available 24 hours/day. This represents approximately 1,670 vehicles per day based on 3 occupants per vehicle average. Projected vehicle traffic into the welcome center for 2010 is 4,104 vpd (ADT) and projected to increase to 5,007 vpd in 2030. All pavement is proposed to be asphalt.

The proposed Southbound Center includes a renovation of the existing welcome center building and the addition of 60 parking spaces to the southwest side of the site. A new building addition will be located to the northeast side of the building. This will require modification to the existing parking lot. Much of the existing site remains as is. All existing picnic shelters, picnic tables, seats and work tables will be cleaned and painted.

Kick off Meeting/Design Presentation

In addition to the VE Team, the following personnel attended this meeting which was held at the outset of the VE study:

Lisa Myers	GDOT Engineering Services
Matt Sanders	GDOT Engineering Services
Ron Wishon	GDOT Engineering Service
James Magnus	GDOT Construction
Clay Bastian	GDOT Design
Carlos Figueros	FHWA Project Manager
Laura Rish	GDOT OEL
Nabil Raad	GDOT Traffic Operations

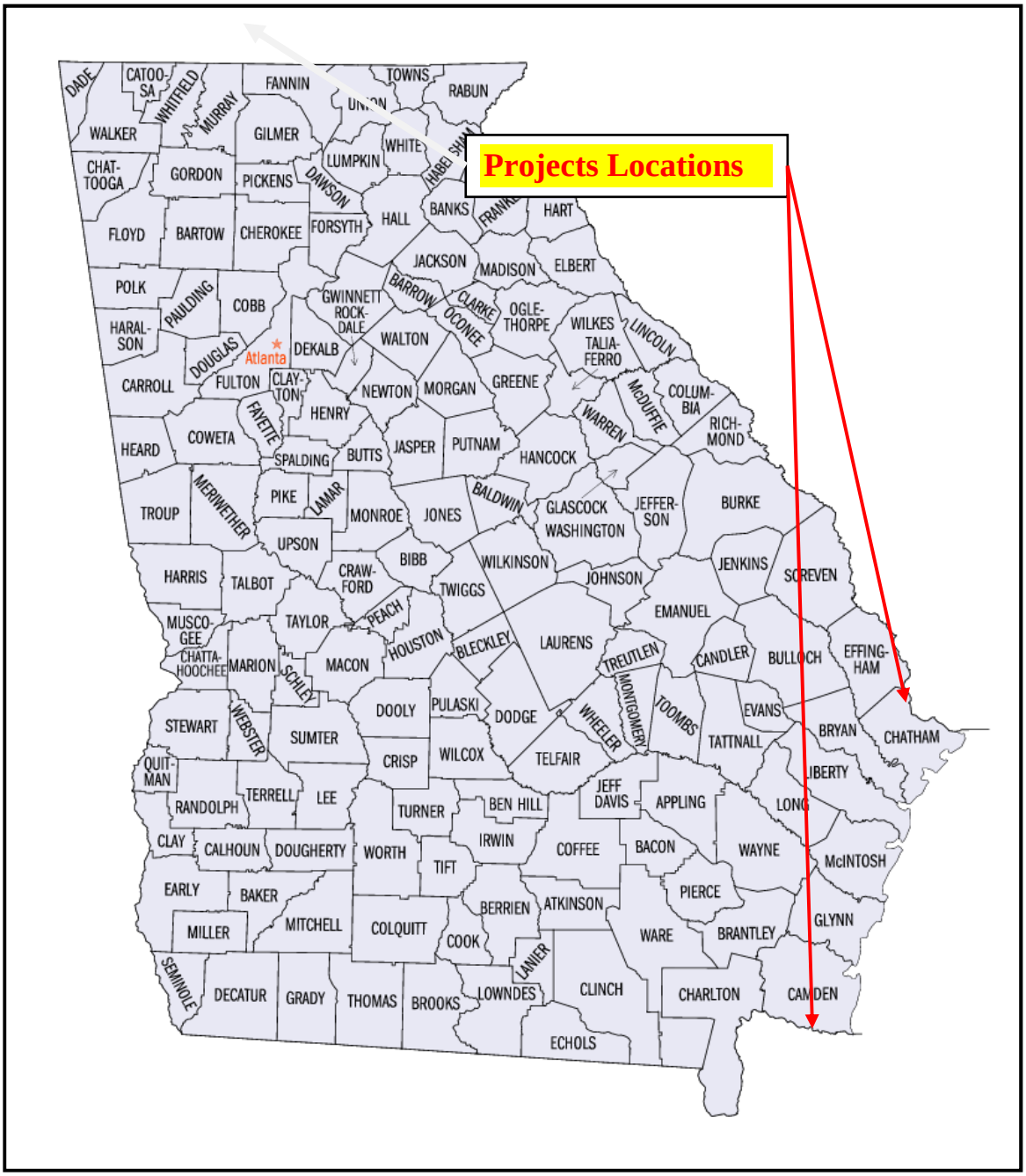
The VE Team appreciated the project overview given by Clay Bastian. Highlights included:

- The Camden facility will be completely rebuilt and relocated to the northeast of the existing building. The existing building will remain in service until construction is complete with no loss of service.
- The Camden facility has a completed Categorical Exclusion (a re-evaluation is required) and is currently scheduled to be let in February 2010.

- The Camden project will include a separate exit from I-95 for the Welcome Center only, not combined with the St. Mary's exit as currently exists.
- For Camden the Field Plan and comments have been completed.
- For the Chatham project, the existing facility will be closed and reconstructed. Temporary restroom facilities will be provided.
- For Chatham, the car and truck traffic will be separated.
- For Chatham, the wastewater treatment system will be refurbished.

The following presents the project vicinity and location maps, site plans and project cost information used in this VE effort to present a more complete project description.

Figure 1
Project Vicinity Map



County Map of Georgia

Figure 2
Project Location Map

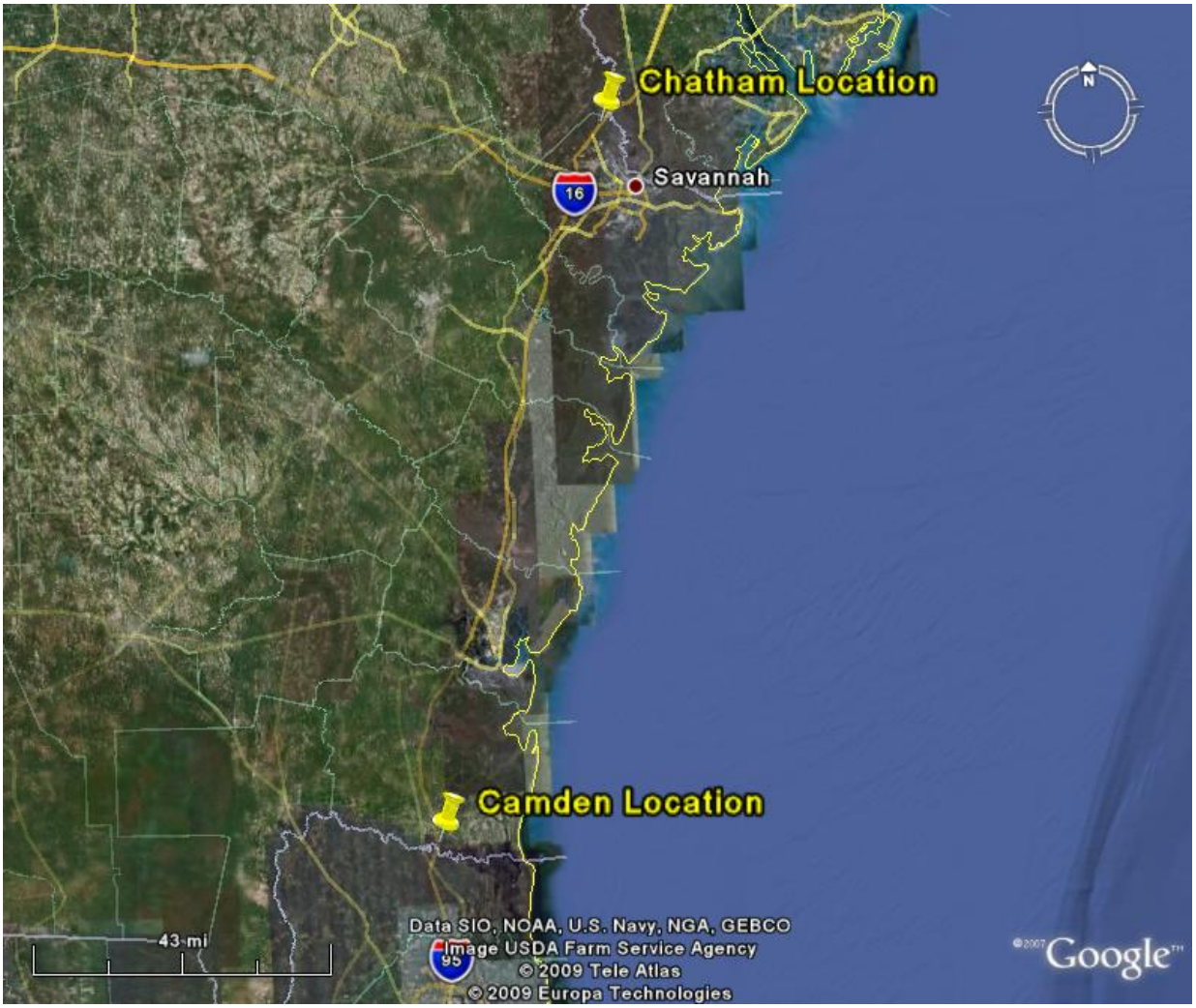


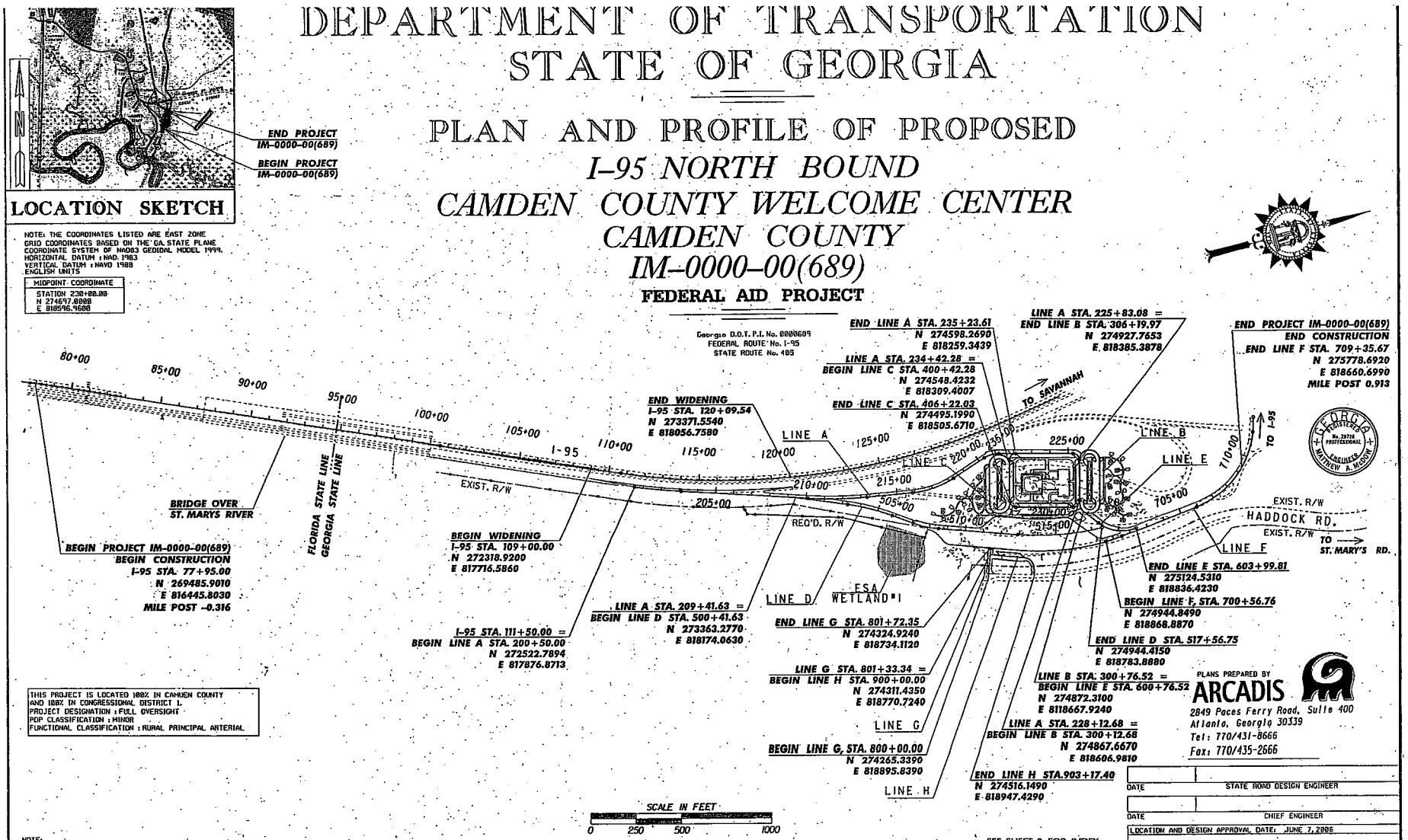
Figure 3
Existing Camden Site

Figure 4
Existing Chatham Site

Figure 5
Proposed Camden Plan

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

PLAN AND PROFILE OF PROPOSED
I–95 NORTH BOUND
CAMDEN COUNTY WELCOME CENTER
CAMDEN COUNTY
IM–0000–00(689)
FEDERAL AID PROJECT



MACTEC

Figure 6
Proposed Camden Hardscape Plan

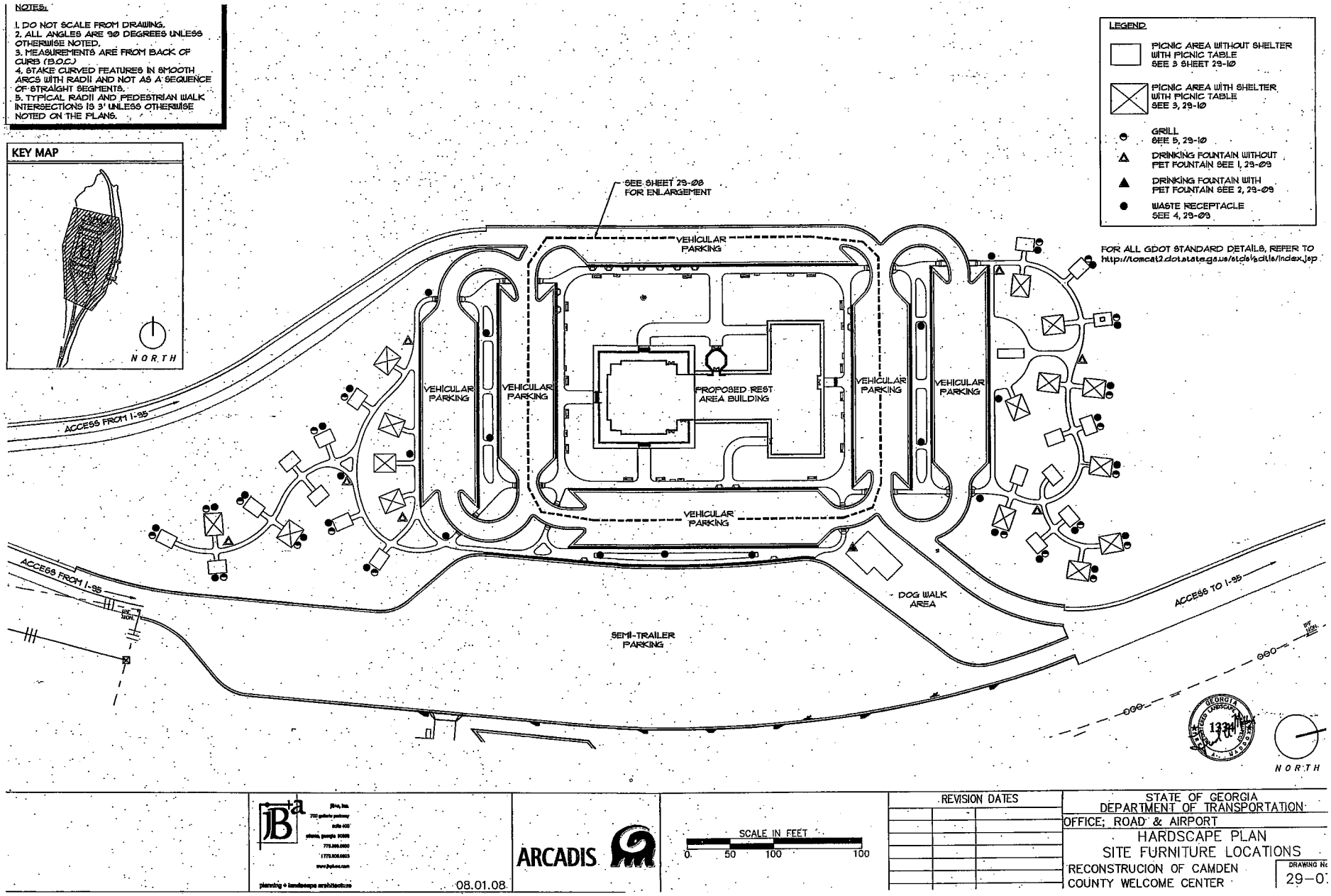


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Figure 7
Proposed Chatham Plan

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

PLAN AND PROFILE OF PROPOSED
I–95 CHATHAM COUNTY
WELCOME CENTER IMPROVEMENTS
IM–0000–00(690)

Any and all references to project IM-0000-00(690), Chatham County shall hereby mean and be deemed to mean. Project IM000-0000-00(690), Chatham County.

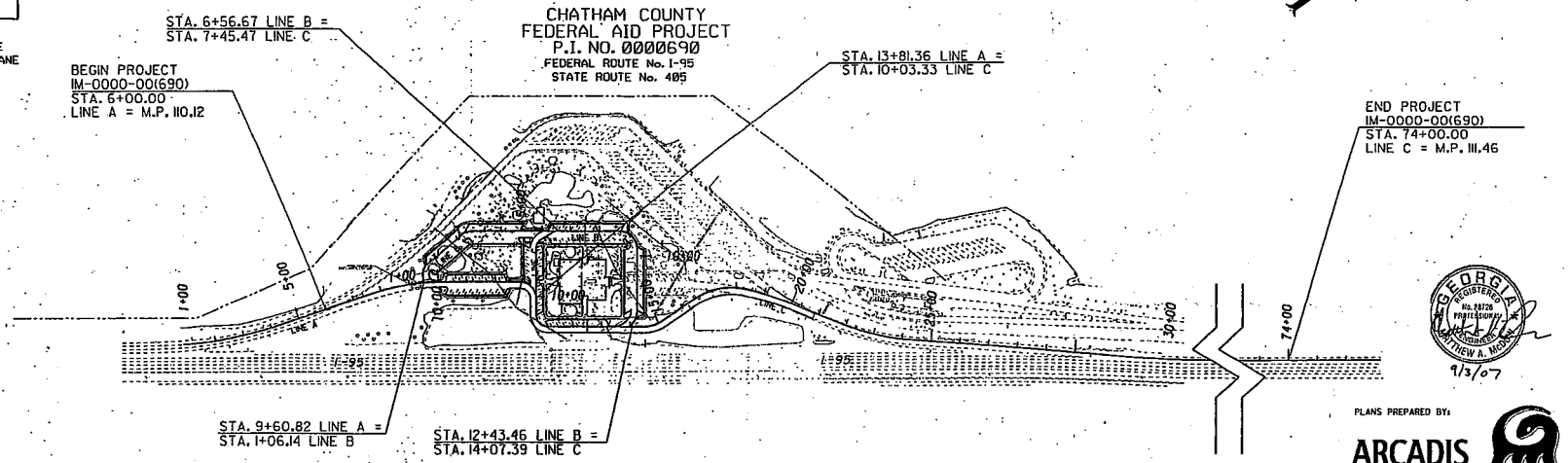
LOCATION SKETCH

NOTE: THE CO-ORDINATES LISTED ARE WEST ZONE GRID CO-ORDINATES BASED ON THE GA. STATE PLANE CO-ORDINATE SYSTEM OF 1985.
HORIZONTAL DATUM : NAD 83
VERTICAL DATUM : NAVD 88

MIDPOINT COORDINATE
STATION 7+10.30 LINE B
N 807810.2080
E 962824.2880

PROJECT DESIGNATION:	FULL OVERSIGHT
PDP CLASSIFICATION:	MINOR -
FUNCTIONAL CLASS:	RURAL PRINCIPAL ARTERIAL
	WELCOME CENTER
TRAFFIC A.D.T.:	4,104 (2010)
TRAFFIC A.D.T.:	5,007 (2030)
TRAFFIC D.H.V.:	NA
TRAFFIC D.H.V.:	NA
SPEED DESIGN:	VARIABLE
% TRUCKS	0%
% 24 HR TRUCKS	0%
DIRECTIONAL DIST.:	100%

SEE SHEET 2 FOR INDEX



9/3/07

PLANS PREPARED BY:
ARCADIS
2849 Paces Ferry Road, Suite 400
Atlanta, Georgia 30339
Tel: 770/431-8666
Fax: 770/435-2666

NOTE:
ALL REFERENCES IN THIS DOCUMENT, WHICH INCLUDES ALL PAPERS, WRITINGS, DOCUMENTS DRAWINGS, OF PHOTOGRAPHS USED, OR TO BE USED IN CONNECTION WITH THIS DOCUMENT, TO "STATE HIGHWAY DEPARTMENT OF GEORGIA", "STATE HIGHWAY DEPARTMENT", "GEORGIA STATE HIGHWAY DEPARTMENT", "HIGHWAY DEPARTMENT", OR "DEPARTMENT" WHEN THE CONTEXT THEREOF MEANS THE STATE HIGHWAY DEPARTMENT OF GEORGIA MEAN, AND SHALL BE DEEMED TO MEAN THE DEPARTMENT OF TRANSPORTATION.

THE DATA, TOGETHER WITH ALL OTHER INFORMATION SHOWN ON THESE PLANS, OR IN ANY WAY INDICATED THEREBY, WHETHER BY DRAWINGS OR NOTES, OR IN ANY OTHER MANNER, ARE BASED UPON FIELD INVESTIGATIONS AND ARE BELIEVED TO BE INDICATIVE OF ACTUAL CONDITIONS. HOWEVER, THE SAME ARE SHOWN AS INFORMATION ONLY, ARE NOT GUARANTEED; AND DO NOT BIND THE DEPARTMENT OF TRANSPORTATION IN ANY WAY. THE ATTENTION OF THE BIDDER IS SPECIFICALLY DIRECTED TO ARTICLES 102.04, 102.05, AND 104.03 OF THE SPECIFICATIONS.

PROJECT NUMBER: IM-0000-00(690)
COUNTY: CHATHAM
GA. P.I. NO. 0000690

LENGTH OF PROJECT	COUNTY NO. 051
	MILES
NET LENGTH OF ROADWAY	0.553
NET LENGTH OF BRIDGES	0.000
NET LENGTH OF PROJECT	1.340
NET LENGTH OF EXCEPTIONS	0.000
GROSS LENGTH OF PROJECT	1.340

SCALE IN FEET
0 200 400 800

9-6-07 DATE	P.E. STATE ROAD AND AIRPORT DESIGN ENGINE
9-6-07 DATE	Gerald M. Ross, P.E. CHIEF ENGINEER
LOCATION AND DESIGN APPROVAL DATE 6/7/06	
PLANS COMPLETED DATE 9/3/07	

REVISION DATES:
5/20/07
4/22/08

IM-0000-00(690) CHATHAM COUNTY

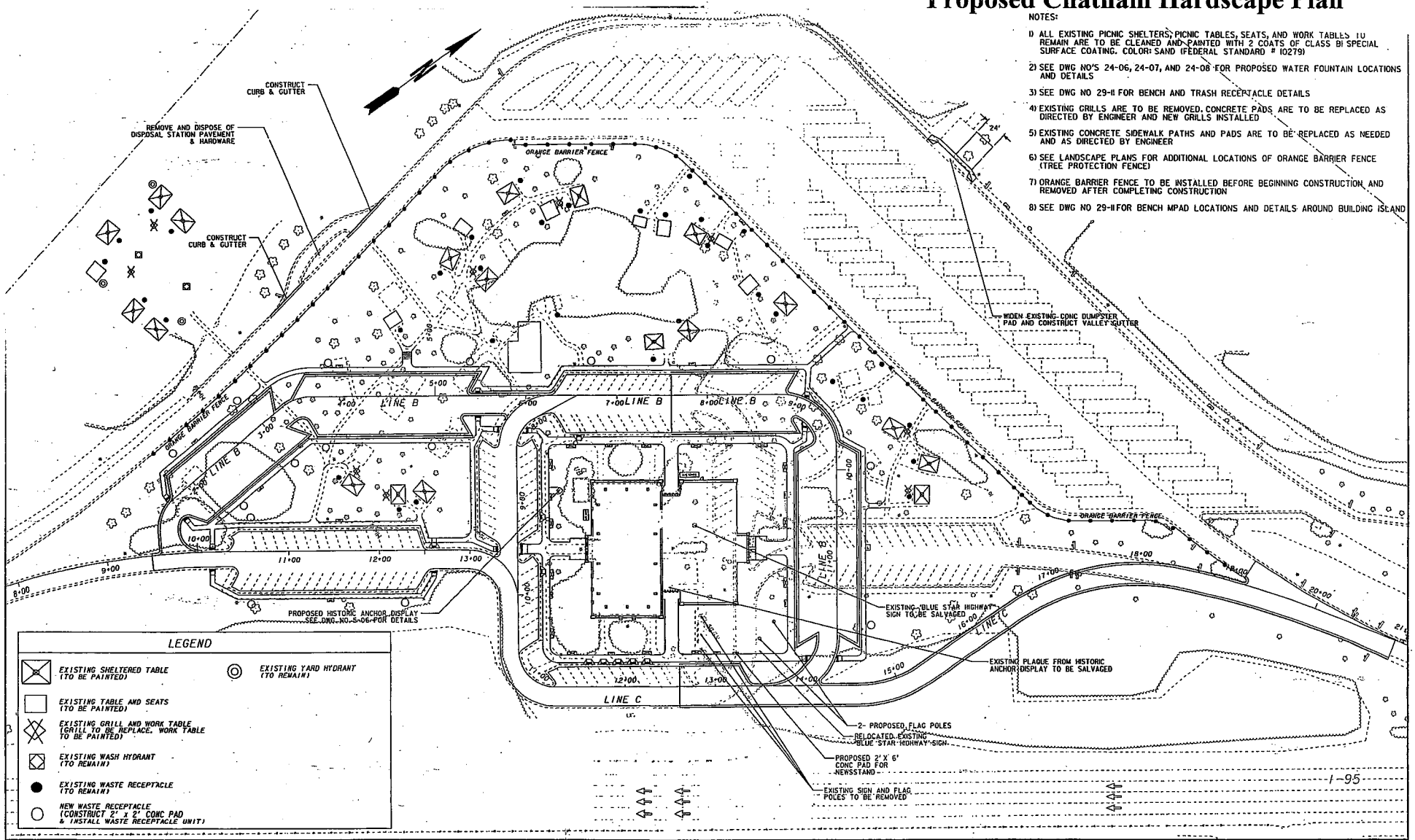
THIS PROJECT IS LOCATED 100% IN CHATHAM COUNTY AND CONGRESSIONAL DISTRICT 12

MACTEC

Figure 8
Proposed Chatham Hardscape Plan

NOTES:

1) ALL EXISTING PICNIC SHELTERS, PICNIC TABLES, SEATS, AND WORK TABLES TO REMAIN ARE TO BE CLEANED AND PAINTED WITH 2 COATS OF CLASS BI SPECIAL SURFACE COATING. COLOR: SAND (FEDERAL STANDARD # 10279)
2) SEE DWG NO'S 24-06, 24-07, AND 24-08 FOR PROPOSED WATER FOUNTAIN LOCATIONS AND DETAILS
3) SEE DWG NO 29-11 FOR BENCH AND TRASH RECEPTACLE DETAILS
4) EXISTING GRILLS ARE TO BE REMOVED. CONCRETE PADS ARE TO BE REPLACED AS DIRECTED BY ENGINEER AND NEW GRILLS INSTALLED
5) EXISTING CONCRETE SIDEWALK PATHS AND PADS ARE TO BE REPLACED AS NEEDED AND AS DIRECTED BY ENGINEER
6) SEE LANDSCAPE PLANS FOR ADDITIONAL LOCATIONS OF ORANGE BARRIER FENCE (TREE PROTECTION FENCE)
7) ORANGE BARRIER FENCE TO BE INSTALLED BEFORE BEGINNING CONSTRUCTION AND REMOVED AFTER COMPLETING CONSTRUCTION
8) SEE DWG NO 29-11 FOR BENCH MPAD LOCATIONS AND DETAILS AROUND BUILDING ISLAND



MACTEC

Estimate Report for file "Camden" P.I. 0000689

Section ROADWAY

Item Number	Quantity	Units	Unit Price	Item Description	Cost
150-1000	Lump	LS	310000.00	TRAFFIC CONTROL - IM-0000-00(689)	310000.00 80,850
153-1300	1	EA	67354.21	FIELD ENGINEERS OFFICE TP 3	67354.21 42,000
210-0100	Lump	LS	1234000.00	GRADING COMPLETE - IM-0000-00(689)	1234000.00 24,23,60
310-1101	33300	TN 40 90	18.67	GR AGGR BASE CRS, INCL MATL	621711.00 1,561,77
318-3000	1000	TN	22.73	AGGR SURF CRS	22730.00
402-1812	1200	TN	25 105 70.59	RECYCLED ASPH CONC LEVELING, INCL BITUM MATL & H LIME	84708.00 125,100
402-3121	840	TN 95	55 61.76	RECYCLED ASPH CONC 25 MM SUPERPAVE, GP 1 OR 2, INCL BITUM MATL & H LIME	51878.40 80,262
402-3130	700	TN	100 66.09	RECYCLED ASPH CONC 12.5 MM SUPERPAVE, GP 2 ONLY, INCL BITUM MATL & H LIME	46263.00 70,000
402-3190	7000	TN	70 96 65.79	RECYCLED ASPH CONC 19 MM SUPERPAVE, GP 1 OR 2,INCL BITUM MATL & H LIME	460530.00 676,90
413-1000	800	GL 3.50	2.17	BITUM TACK COAT	1736.00 2,800
439-0018	15000	SY	68.00	PLAIN PC CONC PVMT, CL 3 CONC, 8 INCH THK	1020000.00
439-0026	21600	SY	71.66	PLAIN PC CONC PVMT, CL 3 CONC, 12 INCH THK	1547856.00
441-0018	94	SY	45.11	DRIVEWAY CONCRETE, 8 IN TK	4240.34
441-0050	40	SY	50.92	CONC SLOPE DRAIN	2036.80
441-0104	6900	SY	33.87	CONC SIDEWALK, 4 IN	233703.00
441-0303	3	EA	2101.55	CONC SPILLWAY, TP 3	6304.65
441-3999	180	LF	21.88	CONCRETE V GUTTER	3938.40
441-4030	38	SY	44.65	CONC VALLEY GUTTER, 8 IN	1696.70
441-6222	9200	LF	15.43	CONC CURB & GUTTER, 8 IN X 30 IN, TP 2	141956.00
446-1100	1500	LF	5.08	PVMT REINF FABRIC STRIPS, TP 2, 18 INCH WIDTH	7620.00
500-3900	2	CY	763.82	CLASS B CONCRETE, INCL REINF STEEL	1527.64
500-9999	17	CY	196.18	CLASS B CONC, BASE OR PVMT WIDENING	3335.06
515-2020	10	LF	37.70	GALV STEEL PIPE HANDRAIL, 2 IN, ROUND	377.00
550-1180	3100	LF	35.41	STORM DRAIN PIPE, 18 IN, H 1-10	109771.00
550-1240	480	LF	43.51	STORM DRAIN PIPE, 24 IN, H 1-10	20884.80
550-1300	340	LF	64.02	STORM DRAIN PIPE, 30 IN, H 1-10	21766.80
550-1301	530	LF	63.99	STORM DRAIN PIPE, 30 IN, H 10-15	33914.70
550-1360	430	LF	72.32	STORM DRAIN PIPE, 36 IN, H 1-10	31097.60
550-1420	140	LF	91.66	STORM DRAIN PIPE, 42 IN, H 1-10	12832.40
550-4218	7	EA	631.77	FLARED END SECTION 18 IN, STORM DRAIN	4422.39
550-4224	1	EA	772.90	FLARED END SECTION 24 IN, STORM DRAIN	772.90
550-4230	5	EA	879.58	FLARED END SECTION 30 IN, STORM DRAIN	4397.90
550-4236	2	EA	1218.63	FLARED END SECTION 36 IN, STORM DRAIN	2437.26
550-4242	1	EA	1376.94	FLARED END SECTION 42 IN, STORM DRAIN	1376.94
603-2182	330	SY 67	40 53.66	STN DUMPED RIP RAP, TP 3, 24 IN	17707.80 22,242
603-7000	330	SY	5.36	PLASTIC FILTER FABRIC	1768.80
634-1200	4	EA	104.77	RIGHT OF WAY MARKERS	419.08
641-1200	1225	LF	16.69	GUARDRAIL, TP W	20445.25
641-5001	4	EA	644.45	GUARDRAIL ANCHORAGE, TP 1	2577.80
641-5012	4	EA	1812.79	GUARDRAIL ANCHORAGE, TP 12	7251.16
643-2162	2400	LF	27.42	CH LK FENCE W/EXT ARMS & BARBED WIRE, ZC COAT, 8 FT, 9 GA	65808.00
668-1100	41	EA	2634.38	CATCH BASIN, GP 1	108009.58
668-1110	28	LF	289.78	CATCH BASIN, GP 1, ADDL DEPTH	8113.84
668-1200	1	EA	3917.08	CATCH BASIN, GP 2	3917.08
668-1210	6	LF	315.15	CATCH BASIN, GP 2, ADDL DEPTH	1890.90
668-2100	7	EA	2403.81	DROP INLET, GP 1	16826.67
668-4300	2	EA	2303.22	STORM SEWER MANHOLE, TP 1	4606.44
				Section Sub Total:	**$6,378,519.29**

$8,568,154

Section EROSION CONTROL

Item Number	Quantity	Units	Unit Price	Item Description	Cost
163-0232	10	AC	477.88	TEMPORARY GRASSING	4778.80
163-0240	389	TN	187.98	MULCH	73124.22
163-0300	2	EA	1521.75	CONSTRUCTION EXIT	3043.50
163-0503	6	EA	542.90	CONSTRUCT AND REMOVE SILT CONTROL	3257.40

				GATE, TP 3	
163-0520	160	LF	15.57	CONSTRUCT AND REMOVE TEMPORARY PIPE SLOPE DRAIN	2491.20
163-0530	8500	LF	3.63	CONSTRUCT AND REMOVE BALED STRAW EROSION CHECK	30855.00
163-0531	1	EA	9135.86	CONSTRUCT AND REMOVE SEDIMENT BASIN, TP 1, STA NO - 516+00	9135.86
163-0540	1	EA	3885.93	CONSTRUCT AND REMOVE RETROFIT, STA NO - 515+97	3885.93
163-0540	1	EA	3885.93	CONSTRUCT AND REMOVE RETROFIT, STA NO - 516+07	3885.93
163-0540	1	EA	3885.93	CONSTRUCT AND REMOVE RETROFIT, STA NO - 516+02	3885.93
163-0541	31	EA	260.00	CONSTRUCT AND REMOVE ROCK FILTER DAMS	8060.00
163-0550	48	EA	219.94	CONSTRUCT AND REMOVE INLET SEDIMENT TRAP	10557.12
165-0030	230	LF	1.03	MAINTENANCE OF TEMPORARY SILT FENCE, TP C	236.90
165-0060	1	EA	1616.10	MAINTENANCE OF TEMPORARY SEDIMENT BASIN, STA NO - 516+00	1616.10
165-0070	4000	LF	1.78	MAINTENANCE OF BALED STRAW EROSION CHECK	7120.00
165-0087	6	EA	131.36	MAINTENANCE OF SILT CONTROL GATE, TP 3	788.16
165-0095	1	EA	1500.00	MAINTENANCE OF RETROFIT, STA NO - 515+97	1500.00
165-0095	1	EA	1500.00	MAINTENANCE OF RETROFIT, STA NO 516+02	1500.00
165-0095	1	EA	1500.00	MAINTENANCE OF RETROFIT, STA NO 515+07	1500.00
165-0101	2	EA	510.76	MAINTENANCE OF CONSTRUCTION EXIT	1021.52
165-0105	48	EA	96.35	MAINTENANCE OF INLET SEDIMENT TRAP	4624.80
165-0110	31	EA	120.00	MAINTENANCE OF ROCK FILTER DAM	3720.00
167-1000	2	EA	783.30	WATER QUALITY MONITORING AND SAMPLING	1566.60
167-1500	12	MO	905.40	WATER QUALITY INSPECTIONS	10864.80
171-0030	460	LF	3.92	TEMPORARY SILT FENCE, TYPE C	1803.20
700-6910	19	AC	899.19	PERMANENT GRASSING	17084.61
700-7000	38	TN	66.81	AGRICULTURAL LIME	2538.78
700-7010	48	GL	20.41	LIQUID LIME	979.68
700-8000	19	TN	382.77	FERTILIZER MIXED GRADE	7272.63
700-8100	944	LB	2.45	FERTILIZER NITROGEN CONTENT	2312.80
716-2000	3900	SY	0.89	EROSION CONTROL MATS, SLOPES	3471.00
				Section Sub Total:	**$228,482.47**

Section LIGHTING

Item Number	Quantity	Units	Unit Price	Item Description	Cost
441-0004	19	SY	46.94	CONC SLOPE PAV, 4 IN	891.86
500-3101	19	CY	279.62	CLASS A CONCRETE	5312.78
511-1000	3156	LB	0.87	BAR REINF STEEL	2745.72
681-4120	36	EA	3616.13	LIGHTING STD, 12 FT MH, POST TOP	130180.68
681-4215	40	EA	2200.00	LIGHTING STD, 12 FT MH, POST TOP	88000.00
681-6366	40	EA	1515.00	LUMINAIRE, TP 3, 400 W, HP SODIUM	60600.00
681-6520	36	EA	761.48	LUMINAIRE, TP 5, 150 W, HP SODIUM	27413.28
682-1405	7100	LF	2.01	CABLE, TP XHHW, AWG NO 8	14271.00
682-1406	16000	LF	1.83	CABLE, TP XHHW, AWG NO 6	29280.00
682-1408	29500	LF	2.84	CABLE, TP XHHW, AWG NO 2	83780.00
682-1409	200	LF	3.10	CABLE, TP XHHW, AWG NO. 1	620.00
682-6110	360	LF	14.25	CONDUIT, RIGID, 1 IN	5130.00
682-6115	840	LF	14.75	CONDUIT, RIGID, 1 1/2 IN	12390.00
682-6120	710	LF	13.34	CONDUIT, RIGID, 2 IN	9471.40
682-6219	3400	LF	4.53	CONDUIT, NONMETL, TP 2, 1 IN	15402.00
682-6221	5700	LF	5.85	CONDUIT, NONMETL, TP 2, 1 1/2 IN	33345.00
682-6222	750	LF	6.06	CONDUIT, NONMETL, TP 2, 2 IN	4545.00
682-9000	1	LS	13076.13	MAIN SERVICE PICK UP POINT	13076.13
682-9020	17	EA	591.50	ELECTRICAL JUNCTION BOX	10055.50
683-1101	2	EA	15801.28	LIGHTING TOWER, STEEL, 100 FT MH, INCL LOWERING EQUIP	31602.56
683-6586	8	EA	695.00	HIGH LEVEL LUMINAIRE, TP 5, 1000 W, HP SODIUM	5560.00
				Section Sub Total:	**$583,672.91**

Section SIGNING AND MARKING					
Item Number	Quantity	Units	Unit Price	Item Description	Cost
500-3101	57	CY	279.62	CLASS A CONCRETE	15938.34
610-6510	3	EA	400.00	REM HWY SIGN, OVHD	1200.00
610-6515	1	EA	33.88	REM HIGHWAY SIGN, STD	33.88
610-6520	4	EA	700.00	REM HIGHWAY SIGN, SPCL ROADSIDE	2800.00
610-9401	1	Lump Sum	5000.00	REM STR SUPPORT, TYPE 1, INCL ILLUM SIGN SYSTEM, STA	5000.00
633-3500	3	EA	500.00	REMOUNT UNMODIFIED HWY SIGN, SPCL ROADSIDE	1500.00
635-1000	50	LF	90.23	BARRICADES	4511.50
636-1020	246	SF	15.52	HIGHWAY SIGNS, TP 1 MATL, REFL SHEETING, TP 3	3817.92
636-1029	78	SF	15.25	HIGHWAY SIGNS, TP 2 MATL, REFL SHEETING, TP 3	1189.50
636-1033	164	SF	19.62	HIGHWAY SIGNS, TP 1 MATL, REFL SHEETING, TP 9	3217.68
636-1041	30	SF	42.82	HIGHWAY SIGNS, TP 2 MATL, REFL SHEETING, TP 9	1284.60
636-1072	1131	SF	38.78	HIGHWAY SIGNS, ALUM EXTRUDED PANELS, REFL SHEETING, TP 3	43860.18
636-2070	736	LF	8.74	GALV STEEL POSTS, TP 7	6432.64
636-2080	105	LF	8.95	GALV STEEL POSTS, TP 8	939.75
636-3000	400	LB	3.05	GALV STEEL STR SHAPE POST	1220.00
636-3010	7	EA	401.49	GROUND-MOUNTED BREAKAWAY SIGN SUPPORT	2810.43
636-9094	13	LF	66.35	PILING IN PLACE, SIGNS, STEEL H, HP 12 X 53	862.55
638-1001	Lump	Lump Sum	87252.00	STR SUPPORT FOR OVERHEAD SIGN, TP 1, STA 116+15	87252.00
638-1001	Lump	LS	87252.00	STR SUPPORT FOR OVERHEAD SIGN, TP I , STA - 82+60	87252.00
652-0095	6	EA	52.41	PAVEMENT MARKING, HANDICAP SYMBOL	314.46
652-0110	18	EA	38.69	PAVEMENT MARKING, ARROW, TP 1	696.42
652-5451	11880	LF	0.18	SOLID TRAFFIC STRIPE, 5 IN, WHITE	2138.40
652-5701	28	LF	2.26	SOLID TRAF STRIPE, 24 IN, WHITE	63.28
652-5801	1166	LF	1.36	SOLID TRAF STRIPE, 8 IN, WHITE	1585.76
652-9001	105	SY	2.22	TRAFFIC STRIPE, WHITE	233.10
653-1501	1628	LF	0.46	THERMOPLASTIC SOLID TRAF STRIPE, 5 IN, WHITE	748.88
653-1502	550	LF	0.46	THERMOPLASTIC SOLID TRAF STRIPE, 5 IN, YELLOW	253.00
653-1810	611	LF	0.82	THERMOPLASTIC SOLID TRAF STRIPE, 10 IN, WHITE	501.02
653-3501	1023	GLF	0.38	THERMOPLASTIC SKIP TRAF STRIPE, 5 IN, WHITE	388.74
657-1054	2011	LF	4.14	PREFORMED PLASTIC SOLID PVMT MKG, 5 IN, WHITE, TP PB	8325.54
657-1084	1759	LF	5.60	PREFORMED PLASTIC SOLID PVMT MKG, 8 IN, WHITE, TP PB	9850.40
657-1104	77	LF	6.11	PREFORMED PLASTIC SOLID PVMT MKG, 10 IN, WHITE, TP PB	470.47
				Section Sub Total:	$296,692.44

Section UTILITY					
Item Number	Quantity	Units	Unit Price	Item Description	Cost
660-0004	124	LF	12.15	SAN SEWER PIPE, 4 IN, PVC	1506.60
660-0006	125	LF	13.68	SAN SEWER PIPE, 6 IN, PVC	1710.00
660-0008	33	LF	43.81	SAN SEWER PIPE, 8 IN, PVC	1445.73
660-0808	555	LF	80.23	SAN SEWER PIPE, 8 IN, DUCTILE IRON	44527.65
668-3300	3	EA	2640.00	SAN SEWER MANHOLE, TP 1	7920.00
668-3311	5	LF	200.04	SAN SEWER MANHOLE, TP 1, ADDL DEPTH, CL 1	1000.20
670-4000	2	EA	2377.40	FIRE HYDRANT	4754.80
670-5010	1105	LF	18.04	WATER SERVICE LINE, 1 IN	19934.20
670-5020	1095	LF	22.70	WATER SERVICE LINE, 2 IN	24856.50
670-5040	600	LF	30.00	WATER SERVICE LINE, 4 IN	18000.00

670-5080	925	LF	62.50	WATER SERVICE LINE, 8 IN	57812.50
670-5100	165	LF	85.00	WATER SERVICE LINE, 10 IN	14025.00
670-5640	1420	LF	20.50	WATER SERVICE LINE, 1.5 IN	29110.00
670-9732	1	EA	339.29	INSTALL BACKFLOW PREVENTION ASSEMBLY, WITH VAULT	339.29
				Section Sub Total:	**$226,942.47**

Section LANDSCAPING

Item Number	Quantity	Units	Unit Price	Item Description	Cost
676-1000	15	EA	1000.00	DRINKING FOUNTAIN	15000.00
700-9300	24000	SY	5.10	SOD	122400.00
702-0006	140	EA	500.00	ABELIA X GRANDIFLORA -	70000.00
702-0030	127	EA	91.55	ACER RUBRUM -	11626.85
702-0045	60	EA	25.80	AGAPANTHUS	1548.00
702-0104	2	EA	420.00	BUTIA CAPITATA	840.00
702-0140	32	EA	210.84	CERCIS CANADENSIS - FOREST PANSY	6746.88
702-0141	1	EA	688.00	CERCIDPHYLUM JAPONICUM - PENDULA	688.00
702-0159	16	EA	215.00	CHIONANTHUS VIRGINICUS	3440.00
702-0160	6900	SF	3.50	CHASMANTHIUM LATIFOLIUM	24150.00
702-0221	21	EA	33.50	CRINUM SPP	703.50
702-0234	80	EA	17.60	DIETIES BICOLOR	1408.00
702-0330	140	EA	6.72	HEMEROCALLIS SPECIES - STELLA DE ORO	940.80
702-0358	767	EA	16.93	ILEX CORNUTA - CARISSA	12985.31
702-0469	521	EA	8.33	ILEX VOMITORIA SCHILLINGS	4339.93
702-0470	100	EA	325.00	ILEX VOMITORA - NANA	32500.00
702-0489	3	EA	106.10	JUNIPERUS CHINENSIS - TORULOSA	318.30
702-0542	99	EA	12.11	LAGERSTROEMIA INDICA - NATCHEZ	1198.89
702-0542	16	EA	85.60	LAGERSTROEMIA INDICA - MUSKOGEE	1369.60
702-0542	4	EA	92.80	LAGERSTROEMIA INDICA - SIOUX	371.20
702-0544	270	EA	50.00	LANTANA CAMARA	13500.00
702-0547	2	EA	770.00	LIGUSTRUM JAPONICUM	1540.00
702-0555	127	EA	2.27	LIQUIDAMBAR STYRACIFLUA	288.29
702-0559	300	EA	7.50	LIROPE MUSCARI - AZTEC	2250.00
702-0559	4035	EA	4.60	LIRIOPE MUSCARI - BIG BLUE	18561.00
702-0575	127	EA	2.63	LIRIODENDRON TULIPIFERA	334.01
702-0610	280	EA	2.10	LOROPETALUM CHINENSE - BLUSH	588.00
702-0674	3	EA	281.00	MICHELIA FIGO	843.00
702-0675	2	EA	2.00	MYRICA CERIFERA	4.00
702-0678	400	EA	5.90	MULLENBERGIA CAPILLARIS	2360.00
702-0719	13700	EA	2.60	PANICUM VIRGATUM	35620.00
702-0724	200	EA	38.50	PENNISETUM ALOPECUROIDES - HAMELN	7700.00
702-0785	127	EA	86.25	PINUS TAEDA	10953.75
702-0793	4	EA	123.00	PISTACIA CHINENSIS	492.00
702-0795	82	EA	30.10	PITTOSPORUM TOBIRA - WHEELERS DWARF	2468.20
702-0805	4	EA	468.00	PODOCARPUS MACROPHYLLUS	1872.00
702-0897	33	EA	245.00	QUERCUS NUTTALLI	8085.00
702-0905	53	EA	2.00	QUERCUS PHELLOS	106.00
702-0910	77	EA	16.50	QUERCUS VIRGINIANA	1270.50
702-0910	4	EA	550.00	QUERCUS VIRGINIANA - QVITA	2200.00
702-0977	519	EA	20.00	RHAPHIOLEPIS INDICA	10380.00
702-0981	231	EA	18.40	ROSA SP. - RADRAZZ	4250.40
702-1020	20	EA	625.00	SABAL PALMETTO	12500.00
702-1058	46	EA	92.00	SPARTINA BAKERI	4232.00
702-1082	7	EA	135.00	ULMUS PARVIFOLIA - BSNUPF	945.00
702-1094	216	EA	2.56	VIBURNUM SUSPENSUM	552.96
702-1095	138	EA	3.10	VIBURNUM OBOVATUM - DENSA	427.80
754-0800	15	EA	2500.00	PICNIC SHELTER	37500.00
754-1050	33	EA	1053.60	PICNIC TABLE	34768.80
754-3010	20	EA	500.00	GRILL	10000.00
754-4000	49	EA	153.44	WASTE RECEPTACLE UNIT	7518.56
754-5000	15	EA	1216.93	BENCH	18253.95
760-1100	Lump	Lump Sum	9221885.00	WELCOME CENTER BUILDING - IM-0000-00 (689)	9221885.00
765-1000	1	EA	1000.00	FLAGPOLE	1000.00
766-7020	Lump	Lump Sum	65000.00	IRRIGATION SYSTEM - IM-0000-00(689)	65000.00
				Section Sub Total:	**$9,852,825.48**

Total Estimated Cost: $17,567,135.06

+ 2,189,635.59

$19,756,770.65

Subtotal Construction Cost		$17,567,135.06
ENGINEERING + INSPECTION	5%	878,356.75
CONST. CONT	3%	527,014.05
Total Construction Cost		$ 18,972,505.86

PROJ: IM000-0000-00(689) Camden
P.I. NO. 0000689
DATE: 12/15/08

Subtotal Construction Cost		$	19,756,770.65
E&I	5%	$	987,838.53
Construction Contingency	6%	$	1,185,406.24
Subtotal Construction		**$**	**21,930,015.42**
Fuel Adjustment (Roadway)(125% cap)		$	148,724.77
Fuel Adjustment (Bridge) (125% cap)		$	-
Liquid AC Adjustment (125% cap)		$	307,209.16
Total Construction		**$**	**22,385,949.35**

W/O WELCOME CENTER BUILDING:

SUBTOTAL =	$10,534,885.65
5%	526,744.28
6%	632,093.14
SUB	$11,693,723.07
FUEL ADJ	148,724.77
LIQUID AC	307,209.16
TOTAL CONST.	$12,149,657.00

MARKUP USED ON VE RECOMMEN. COST SHEETS =

$$\frac{\$12,149,657}{10,543,886} = 1.1533$$

OR 15.33%

0000690 : Chatham Co.
Let date: 5/7/09

Estimate Report for file "Chatham"

Section Roadway Items

Item Number	Quantity	Units	Unit Price	Item Description	Cost
150-1000	1	LS	354098.22	TRAFFIC CONTROL -	354098.22
207-0203	180	CY	56.68	FOUND BKFILL MATL, TP II	10202.40
210-0100	1	LS	2831251.58	GRADING COMPLETE -	2831251.58
310-5080	7400	SY	14.83	GR AGGR BASE CRS, 8 INCH, INCL MATL	109742.00
402-1812	150	TN	65.05	RECYCLED ASPH CONC LEVELING, INCL BITUM MATL & H LIME	9757.50
402-3121	1300	TN	63.99	RECYCLED ASPH CONC 25 MM SUPERPAVE, GP 1 OR 2, INCL BITUM MATL & H LIME	83187.00
402-3130	1200	TN	65.79	RECYCLED ASPH CONC 12.5 MM SUPERPAVE, GP 2 ONLY, INCL BITUM MATL & H LIME	78948.00
402-3190	690	TN	63.21	RECYCLED ASPH CONC 19 MM SUPERPAVE, GP 1 OR 2,INCL BITUM MATL & H LIME	43614.90
413-1000	1300	GL	2.00	BITUM TACK COAT	2600.00
432-0206	5700	SY	1.85	MILL ASPH CONC PVMT, 1 1/2 IN DEPTH	10545.00
432-5010	200	SY	2.07	MILL ASPH CONC PVMT, VARIABLE DEPTH	414.00
441-0018	96	SY	52.55	DRIVEWAY CONCRETE, 8 IN TK	5044.80
441-0104	3800	SY	33.67	CONC SIDEWALK, 4 IN	127946.00
441-0301	2	EA	2172.56	CONC SPILLWAY, TP 1	4345.12
441-4030	89	SY	53.05	CONC VALLEY GUTTER, 8 IN	4721.45
441-6222	3200	LF	19.04	CONC CURB & GUTTER, 8 IN X 30 IN, TP 2	60928.00
446-1100	340	LF	3.20	PVMT REINF FABRIC STRIPS, TP 2, 18 INCH WIDTH	1088.00
500-3101	5	CY	600.77	CLASS A CONCRETE	3003.85
500-3200	2	CY	394.64	CLASS B CONCRETE	789.28
500-3900	45	CY	803.44	CLASS B CONCRETE, INCL REINF STEEL	36154.80
515-2020	20	LF	34.44	GALV STEEL PIPE HANDRAIL, 2 IN, ROUND	688.80
550-1080	330	LF	30.00	STORM DRAIN PIPE, 8 IN., H 1-10	9900.00
550-1180	1200	LF	45.96	STORM DRAIN PIPE, 18 IN, H 1-10	55152.00
550-1300	590	LF	70.50	STORM DRAIN PIPE, 30 IN, H 1-10	41595.00
550-1360	79	LF	86.79	STORM DRAIN PIPE, 36 IN, H 1-10	6856.41
550-1480	150	LF	127.33	STORM DRAIN PIPE, 48 IN, H 1-10	19099.50
550-2180	28	LF	32.87	SIDE DRAIN PIPE, 18 IN, H 1-10	920.36
550-4118	2	EA	275.65	FLARED END SECTION 18 IN, SIDE DRAIN	551.30
550-4218	1	EA	672.20	FLARED END SECTION 18 IN, STORM DRAIN	672.20
576-1018	120	LF	33.79	SLOPE DRAIN PIPE, 18 IN	4054.80
632-0003	1	EA	16286.19	CHANGEABLE MESSAGE SIGN, PORTABLE, TYPE 3	16286.19
668-1100	12	EA	2784.43	CATCH BASIN, GP 1	33413.16
668-1110	12	LF	285.46	CATCH BASIN, GP 1, ADDL DEPTH	3425.52
668-1200	1	EA	4010.77	CATCH BASIN, GP 2	4010.77
668-1210	10	LF	346.09	CATCH BASIN, GP 2, ADDL DEPTH	3460.90
668-2100	5	EA	3987.53	DROP INLET, GP 1	19937.65
668-2110	9	LF	353.03	DROP INLET, GP 1, ADDL DEPTH	3177.27
668-2200	1	EA	4918.88	DROP INLET, GP 2	4918.88
668-2210	3	LF	360.51	DROP INLET, GP 2, ADDL DEPTH	1081.53
668-4300	2	EA	2550.50	STORM SEWER MANHOLE, TP 1	5101.00
668-4400	1	EA	4161.80	STORM SEWER MANHOLE, TP 2	4161.80
668-4412	9	LF	251.56	STORM SEWER MANHOLE, TP 2, ADDL DEPTH, CL 2	2264.04
				Section Sub Total:	**$4,019,110.98**

Section Erosion Control

Item Number	Quantity	Units	Unit Price	Item Description	Cost
163-0232	4	AC	679.69	TEMPORARY GRASSING	2718.76
163-0240	101	TN	161.07	MULCH	16268.07
163-0300	2	EA	1655.76	CONSTRUCTION EXIT	3311.52
163-0503	1	EA	529.93	CONSTRUCT AND REMOVE SILT CONTROL GATE, TP 3	529.93
163-0522	15	EA	86.88	CONSTRUCT AND REMOVE TEMPORARY DITCH CHECKS - TYPE A SILT FENCE	1303.20
163-0530	1000	LF	4.20	CONSTRUCT AND REMOVE BALED STRAW EROSION CHECK	4200.00
163-0550	23	EA	282.90	CONSTRUCT AND REMOVE INLET SEDIMENT TRAP	6506.70
165-0030	1600	LF	1.64	MAINTENANCE OF TEMPORARY SILT FENCE, TP C	2624.00
165-0040	15	EA	66.20	MAINTENANCE OF EROSION CONTROL CHECKDAMS/DITCH CHECKS	993.00
165-0070	500	LF	1.86	MAINTENANCE OF BALED STRAW EROSION CHECK	930.00
165-0087	1	EA	169.84	MAINTENANCE OF SILT CONTROL GATE, TP 3	169.84
165-0101	4	EA	607.78	MAINTENANCE OF CONSTRUCTION EXIT	2431.12
165-0105	23	EA	96.97	MAINTENANCE OF INLET SEDIMENT TRAP	2230.31
167-1000	2	EA	1278.47	WATER QUALITY MONITORING AND SAMPLING	2556.94
167-1500	18	MO	944.75	WATER QUALITY INSPECTIONS	17005.50

171-0030	3200	LF	3.83	TEMPORARY SILT FENCE, TYPE C	12256.00
700-6910	4	AC	1023.43	PERMANENT GRASSING	4093.72
700-7000	7	TN	59.64	AGRICULTURAL LIME	417.48
700-7010	8	GL	22.32	LIQUID LIME	178.56
700-8000	4	TN	292.83	FERTILIZER MIXED GRADE	1171.32
700-8100	159	LB	2.31	FERTILIZER NITROGEN CONTENT	367.29
716-1000	490	SY	4.14	EROSION CONTROL MATS, WATERWAYS	2028.60
				Section Sub Total:	**$84,291.86**

Section Lighting Items

Item Number	Quantity	Units	Unit Price	Item Description	Cost
610-6060	3	EA	500.00	REMOVE ELECTRICAL JUNCTION BOX	1500.00
610-6605	17	EA	1614.58	REM LIGHTING STANDARD	27447.86
610-6610	16	EA	100.00	REM LUMINAIRE	1600.00
610-6611	1	EA	500.00	REMOVE LUMINAIRE ARM	500.00
615-1200	100	LF	11.62	DIRECTIONAL BORE -	1162.00
681-4160	10	EA	2000.00	LIGHTING STD, 16 FT MH, POST TOP	20000.00
681-4354	14	EA	3200.00	LIGHTING STD, 35 FT MH, 12 FT ARM	44800.00
681-6220	4	EA	350.00	LUMINAIRE, TP 2, 150 W, HP SODIUM	1400.00
681-6346	21	EA	311.00	LUMINAIRE, TP 3, 250 W, HP SODIUM	6531.00
681-6514	15	EA	450.00	LUMINAIRE, TP 5, 100 W, HP SODIUM	6750.00
682-1407	7300	LF	1.80	CABLE, TP XHHW, AWG NO 4	13140.00
682-1408	21300	LF	2.84	CABLE, TP XHHW, AWG NO 2	60492.00
682-6120	200	LF	15.26	CONDUIT, RIGID, 2 IN	3052.00
682-6222	3500	LF	10.14	CONDUIT, NONMETL, TP 2, 2 IN	35490.00
682-6324	260	LF	60.00	CONDUIT, ENCASED, TP 1, 2 IN 4-WAY	15600.00
682-9000	1	LS	12012.53	MAIN SERVICE PICK UP POINT	12012.53
682-9021	10	EA	1879.05	ELECTRICAL JUNCTION BOX, CONC GROUND MOUNTED	18790.50
				Section Sub Total:	**$270,267.89**

Section Signing and Marking Items

Item Number	Quantity	Units	Unit Price	Item Description	Cost
636-1020	230	SF	15.19	HIGHWAY SIGNS, TP 1 MATL, REFL SHEETING, TP 3	3493.70
636-1029	23	SF	15.83	HIGHWAY SIGNS, TP 2 MATL, REFL SHEETING, TP 3	364.09
636-1033	40	SF	19.64	HIGHWAY SIGNS, TP 1 MATL, REFL SHEETING, TP 9	785.60
636-1041	120	SF	36.76	HIGHWAY SIGNS, TP 2 MATL, REFL SHEETING, TP 9	4411.20
636-2070	730	LF	8.27	GALV STEEL POSTS, TP 7	6037.10
652-0095	7	EA	33.28	PAVEMENT MARKING, HANDICAP SYMBOL	232.96
652-5451	6100	LF	0.24	SOLID TRAFFIC STRIPE, 5 IN, WHITE	1464.00
652-5803	350	LF	0.81	SOLID WHITE STRIPE, 10 IN, WHITE	283.50
652-9001	160	SY	2.23	TRAFFIC STRIPE, WHITE	356.80
653-0110	18	EA	71.26	THERMOPLASTIC PVMT MARKING, ARROW, TP 1	1282.68
653-1501	750	LF	0.68	THERMOPLASTIC SOLID TRAF STRIPE, 5 IN, WHITE	510.00
653-1502	750	LF	0.62	THERMOPLASTIC SOLID TRAF STRIPE, 5 IN, YELLOW	465.00
653-1704	75	LF	4.53	THERMOPLASTIC SOLID TRAF STRIPE, 24 IN, WHITE	339.75
653-1804	850	LF	2.08	THERMOPLASTIC SOLID TRAF STRIPE, 8 IN, WHITE	1768.00
				Section Sub Total:	**$21,794.38**

Section UTILITY ITEMS

Item Number	Quantity	Units	Unit Price	Item Description	Cost
660-0002	1000	LF	50.00	SAN SEWER PIPE, 2 IN, PVC	50000.00
660-0604	270	LF	300.00	SAN SEWER PIPE, 4 IN, CAST IRON	81000.00
660-0608	160	LF	400.00	SAN SEWER PIPE, 8 IN, CAST IRON	64000.00
670-2010	22	EA	300.00	GATE VALVE, 1 IN	6600.00
670-2020	6	EA	536.25	GATE VALVE, 2 IN	3217.50
670-2030	3	EA	600.00	GATE VALVE, 3 IN	1800.00
670-5010	1500	LF	34.05	WATER SERVICE LINE, 1 IN	51075.00
670-5020	2400	LF	61.23	WATER SERVICE LINE, 2 IN	146952.00
670-5030	720	LF	75.00	WATER SERVICE LINE, 3 IN	54000.00
682-6344	150	LF	59.54	CONDUIT, ENCASED, TP 1, 4 IN 4-WAY	8931.00
				Section Sub Total:	**$467,575.50**

Section LANDSCAPE ITEMS

Item Number	Quantity	Units	Unit Price	Item Description	Cost
009-3500	1	Lump Sum	5000.00	MISCELLANEOUS LANDSCAPE ITEMS	5000.00
535-3000	40	EA	100.00	PAINT EXISTING CONCRETE STRUCTURE	4000.00

611-5380	1	EA	500.00	RESET HISTORIC MARKER, CAST IRON	500.00
643-8200	4100	LF	2.98	BARRIER FENCE (ORANGE), 4 FT	12218.00
676-1000	21	EA	2500.00	DRINKING FOUNTAIN	52500.00
700-9300	2500	SY	5.47	SOD	13675.00
702-0159	16	EA	215.00	CHIONANTHUS VIRGINICUS -	3440.00
702-0330	390	EA	6.72	HEMEROCALLIS SPECIES -	2620.80
702-0358	142	EA	16.93	ILEX CORNUTA -	2404.06
702-0395	129	EA	58.82	ILEX CRENATA -	7587.78
702-0470	335	EA	27.20	ILEX VOMITORIA -	9112.00
702-0529	40	EA	225.00	LAGERSTROEMIA FAURI	9000.00
702-0544	55	EA	50.00	LANTANA CAMARA	2750.00
702-0559	925	EA	3.62	LIRIOPE MUSCARI -	3348.50
702-0630	35	EA	339.23	MAGNOLIA GRANDIFLORA -	11873.05
702-0675	57	EA	29.00	MYRICA CERIFERA -	1653.00
702-0905	23	EA	399.00	QUERCUS PHELLOS -	9177.00
702-0908	13	EA	500.00	QUERCUS SHUMARDII	6500.00
702-0910	52	EA	550.00	QUERCUS VIRGINIANA	28600.00
702-0977	101	EA	19.77	RHAPHIOLEPIS INDICA -	1996.77
702-1020	43	EA	625.00	SABAL PALMETTO	26875.00
702-1044	150	EA	4.00	SEASONAL COLOR	600.00
754-3010	9	EA	500.00	GRILL	4500.00
754-4000	29	EA	1577.44	WASTE RECEPTACLE UNIT	45745.76
754-5000	14	EA	2320.66	BENCH	32489.24
760-110	1	Lump Sum	7500000.00	WELCOME CENTER BUILDING	7500000.00
765-1000	2	EA	1000.00	FLAGPOLE	2000.00
766-7020	1	LS	38750.00	IRRIGATION SYSTEM	38750.00
				Section Sub Total:	**$7,838,915.96**

Total Estimated Cost: $12,701,956.57

	12,701,956.57
E+I 5%	635,097.83
CST CNT 6%	762,117.39
	14,099,171.79
FUEL ADJ / LIQ AC ADJ	121,888.10
	$14,221,059.89

W/O BUILDING:

5,201,957
260,098
312,117
5,774,172
121,888
$5,896,060

MARKUP USED FOR VE RECOMMENDATION COST SHEETS:

$$\frac{\$5,896,060}{5,201,957} = 1.1334$$

OR 13.34%

VE RECOMMENDATIONS

DEVELOPMENT AND RECOMMENDATION PHASE

I-95 Welcome Centers - Camden

IDEA No.:	PAGE No.:	CREATIVE IDEA:
A-1	1 of 3	Revise traffic circulation patterns

Comp By: GAO Date: 7-8-09 Checked By: DW Date: 7-8-09

Original Concept:

The current traffic circulation provides a one way pattern, circulating around the building pad. Vehicles in some of the remote parking areas will have to drive through the one-way alignment back in front of the existing building to exit the site. This unnecessarily provides additional opportunities for accidents and congestion.

Proposed Change:

Revise the traffic patterns to minimize traffic circulation around the building.

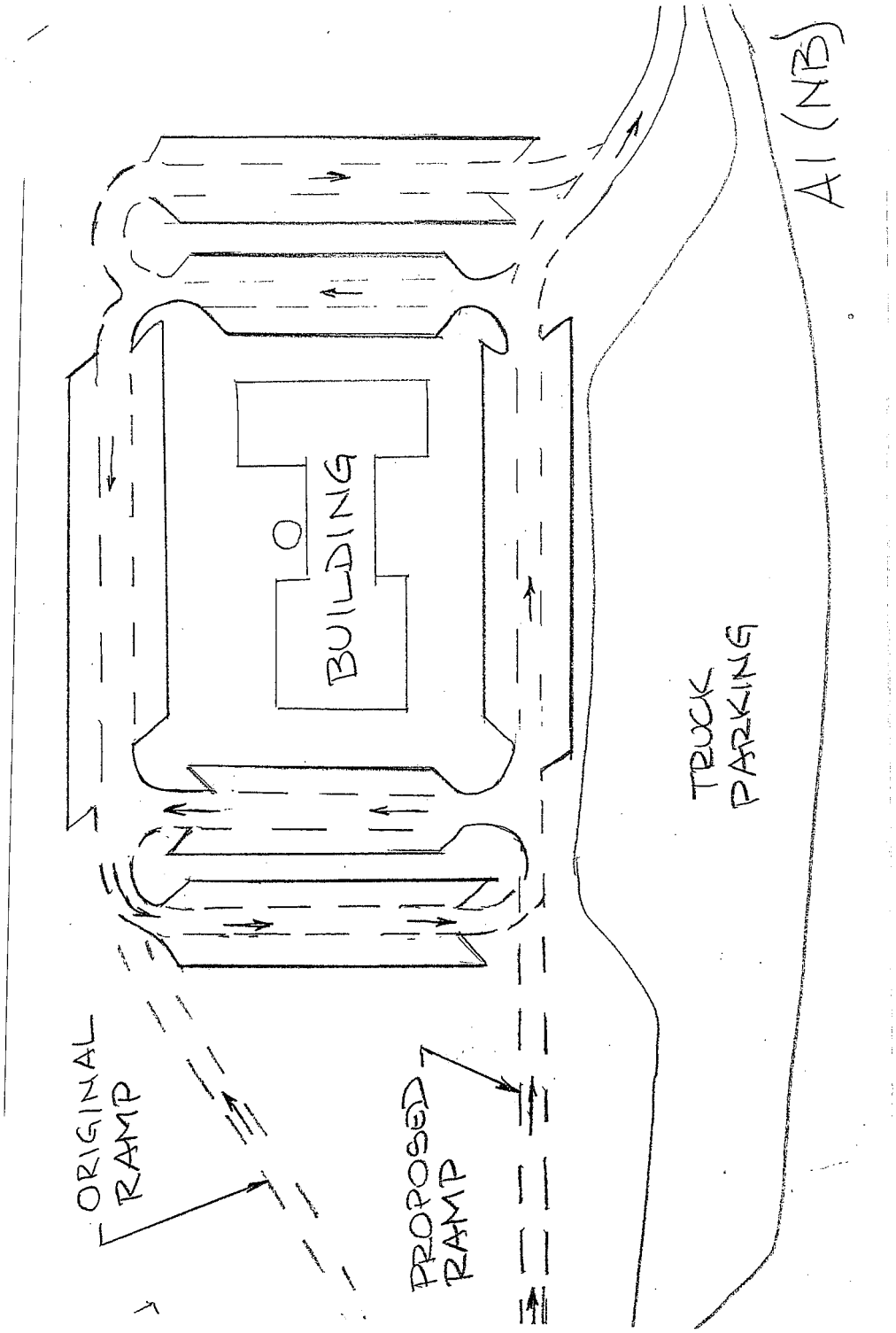
Justification:

Revising traffic circulation will minimize traffic having to double back around the buildings. This will reduce traffic congestion at the front of the buildings thereby lessening the opportunities for accidents. The parking areas will be constructed in the same general area, only oriented differently to optimize traffic flow. The overall construction costs should have no appreciable differences. Total parking spaces should be similar.

LIFE CYCLE COST SUMMARY	CAPITAL COST	FUTURE COST	PRESENT WORTH
INITIAL COST - Original			
- Proposed			
- Savings			
FUTURE COST - Savings			
TOTAL PRESENT WORTH SAVINGS			-0-

SKETCH

I-95 Welcome Centers - Camden	ITEM N^{O} : A-1 CLIENT: GDOT Sheet 2 of 3



CALCULATIONS	
I-95 Welcome Centers	ITEM N^{O} :A-1 CLIENT: GDOT Sheet 3 of 3

The traffic and parking alignments will be in the same locations, only re-oriented. There will be a minor amount of additional work required for the grading of the relocated entry ramp however it will be slightly shorter, about 125 feet so the costs should offset.

DEVELOPMENT AND RECOMMENDATION PHASE

I-95 Welcome Centers - Camden

IDEA No.:	**PAGE No.:**	**CREATIVE IDEA:**
A-4	1 of 5	Revise the pavement design. Use asphalt pavement for the car only areas

Comp By: GAO Date: 7-8-09 Checked By: DW Date: 7-8-09

Original Concept:

Use the original full-depth concrete pavement design. The existing area is concrete pavement although there is no re-use of existing proposed.

8” - PCC

3” – 19mm

12” - GAB

Proposed Change:

Use a revised asphalt pavement design for the car parking and ramp areas.

1 ¼ “ – 12.5mm
2” – 25 mm
4” - GAB

Justification:

The original pavement design is 100% overdesigned. A reduced thickness pavement can be developed providing significant cost savings. There are also benefits with constructing asphalt instead of concrete pavement.

LIFE CYCLE COST SUMMARY	**CAPITAL COST**	**FUTURE COST**	**PRESENT WORTH**
INITIAL COST - Original	1,360,000		
- Proposed	226,000		
- Savings	1,134,000		1,134,000
FUTURE COST - Savings			-0-
TOTAL PRESENT WORTH SAVINGS			**1,134,000**

 A-4 NB ORIGINAL

Rigid Pavement Design Analysis

Based on AASHTO Interim Guide for Design of Pavement Structures

P.I. No.	0000689	Project No.	IM-0000-00(689)	County	Camden
Description	Car Parking	Location	Welcome Center	Type Section	PCC
Begin Project	I-95	End Project	I-95	Project Length	0.40

Traffic Data			
Begin Design Year	2008	Begin one way AADT, VPD	1070
End Design Year	2018	Ending one way AADT, VPD	1320
		Mean one way AADT, VPD	1195

Design Loading								
Mean one way AADT		LDF		24 hr Trucks, %		ESAL Factor		
1195	*	100	*	98	*	0.004	=	5
1195	*	100	*	1	*	0.500	=	6
1195	*	100	*	1	*	2.680	=	32
				Total Daily ESAL's				43
Total Design Period ESALs			=	43*365*20= 311,603				

Design Data					
Terminal Serviceability, (Pt)	**2.5**	**Working Stress**	**450 psi**	**Soil Support Value**	**4.5**
Subgrade Modulus, k	**200**	**Subbase Modulus, k_1**	**290 on 12 inches GAB**	**Subbase Modulus, k_2**	**360 on 3 inches AC**
Trial Depth of PCC Pavement, in		**8**	**Calculated Stress from Equation**		**225.6**
Percent Understressed	**49.9**	**Percent Overdesigned**	**99.4**	**Balanced Thickness**	**4.56**

Recommended Rigid Pavement Structure

- 8 inches Plain Portland Cement Concrete with $1^1/_4$ inch diameter dowels
- 3 inches of 19 mm Superpave Asphaltic Concrete Interlayer
- 12 inches Graded Aggregate Base

Prepared By Erik Rohde, Assistant Design Group Manager — Date July 11, 2007

Recommended By [signature], Office Head — Date 7-11-07

Approved By [signature], State Pavement Engineer — Date 7-11-07

0000805RPD Car Parking 8 in Slab

FLEXIBLE PAVEMENT DESIGN ANALYSIS A-4 NB

PAGE 3 OF 5

Project: IM-0000-00(689) **County:** Camden
P.I. no.: 0000689
Description: NB Welcome Center

PROPOSED

Traffic Data (NOTE: AADTs are one-way)
24-hour Truck Percentage: 0.00%
AADT initial year of design period: 1,648 vpd (2008)
AADT final year of design period: 2,011 vpd (2028)
Mean AADT (one-way): 1,830 vpd

Design Loading

Mean AADT		LDF		Trucks		18-K ESAL		Total Daily Loads
1,830	*	1.00	*	0.000	*	1.00	=	1

Total predicted design period loading = 1 * 20 * 365 = 7,300

Design Data
Terminal Serviceability Index: 2.50
Soil Support: 4.50
Regional Factor: 1.70

PROPOSED FLEXIBLE PAVEMENT STRUCTURE

Material	Thickness Inches	Thickness (mm)	Structural Coefficient	Structural Value
12.5 mm OGFC	90 lb/sy	(50 kg/sm)	0.00	0.00
12.5 mm Superpave	1.25	(32)	0.44	0.55
25 mm Superpave	2.50	(64)	0.44	1.10
Graded Aggregate Base	4.00	(102)	0.16	0.64

Required SN = 1.52 Proposed SN = 2.29

>>> Proposed pavement is 51.1% Overdesign <<<

Remarks:

Prepared by george obaranec July 8, 2009
Date

Recommended _____
State Materials & Research Engineer **Date**

Approved _____
State Consultant Design Engineer **Date**

							COST WORKSHEET
PROJECT:	**I-95 Welcome Center Northbound Camden County**				ITEM No: A-4 CLIENT: GDOT Sheet 4 of 5		
CONSTRUCTION ELEMENT		**ORIGINAL ESTIMATE**			**NEW ESTIMATE**		
ITEM	Units	No. Units	Cost/ Unit	Total Cost	No. Units	Cost/ Unit	Total Cost
PCC Pavement, 8"	sy	13,625	68	926,500			
Asphalt, 3 " intermediate layer	ton	2,300	65.00	149,500			
GAB	ton	5,520	18.67	103,058			
Asphalt, 3.75 "	ton				2490	65	161,850
GAB	ton				1840	18.67	34,353
SUBTOTAL				1,179,058			196,203
Markup 15.33%				180,750			30,078
TOTAL				1,359,808			226,281
TOTAL ROUNDED				1,360,000			226,000

I-95 Welcome Centers -Camden	ITEM N^{O} : A-4 CLIENT: GDOT Sheet 5 of 5

New pavement areas:

(900 x 20) + (350 x 42) + [(210 + 200+ 210+220+290) 64] + 4(150 x 20) + (280 x 20) =

18,000 + 14,700 + 72,320 + 12,000 + 5,600 = 122,620 sf = 13,625 sy

GAB; 12” to 4”

(122,620 sf x 8/12 ft) 135 #/cf (1/2000 tons/#) = 5,520 tons

Asphalt; 3.25 “

(122,620 sf x 3.25/12 ft) 150 #/cf (1/2000 tons/#) = 2,490 tons

DEVELOPMENT AND RECOMMENDATION PHASE

I-95 Welcome Centers - Camden

IDEA No.:	PAGE No.:	CREATIVE IDEA:
B-1	1 of 3	Reuse existing pavement and reduce grading complete item

Comp By: DC Date: 7/9/09 Checked By: DCW Date: 7/9/09

Original Concept:

Remove 100% of existing pavement throughout the entire Welcome Center Facility and build 100% new pavement infrastructure.

Proposed Change:

Adjust new Welcome Center Facility site location in order to save and reuse a portion of the existing pavement infrastructure.

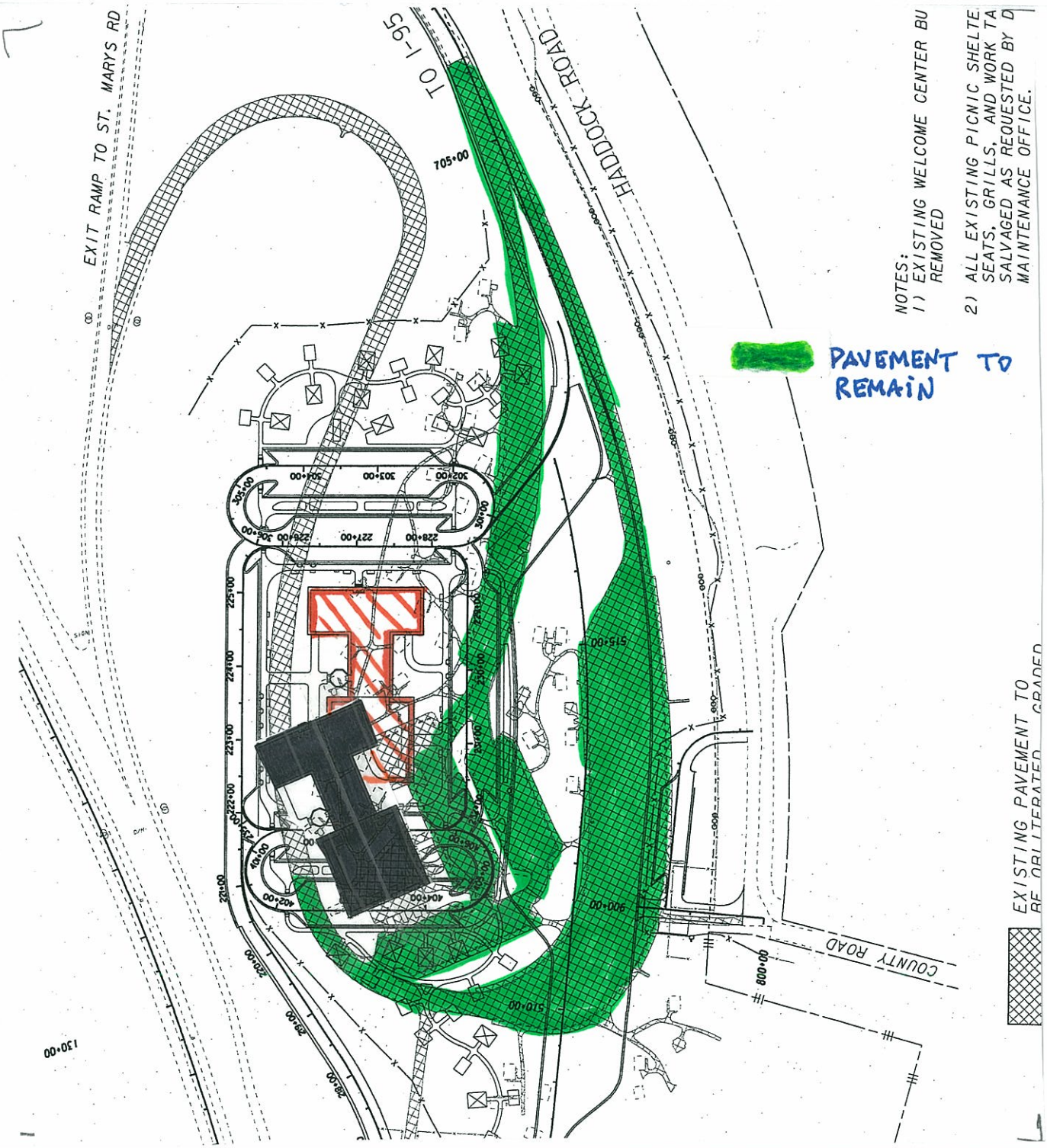
Justification:

Grading Complete is the second highest element on the Cost Model / Distribution matrix contributing to 23% of the overall cost at $2.79 million. The Pavement Removal Plan (sheet 13-05) clearly shows that the current location of the new facility controls the surrounding parking, staging, and traffic flow movements on the site. In order to work around this building location 100% of the surrounding pavement must be eliminated. By adjusting the Welcome Center Facility footprint we can retain approximately 60% of the existing pavement infrastructure and add the needed capacity relatively easy.

LIFE CYCLE COST SUMMARY	CAPITAL COST	FUTURE COST	PRESENT WORTH
INITIAL COST - Original	9,323,000		
- Proposed	5,564,000		
- Savings	3,759,000		3,759,000
FUTURE COST - Savings			-0-
TOTAL PRESENT WORTH SAVINGS			**3,759,000**

SKETCH

I-95 Welcome Centers - Camden	ITEM N^{O} : B-1 CLIENT: GDOT Sheet 2 of 3



							COST WORKSHEET
PROJECT:	**I-95 Welcome Center Northbound Camden County**				ITEM No: B-1 CLIENT: GDOT		
					Sheet 3 of 3		
CONSTRUCTION ELEMENT		**ORIGINAL ESTIMATE**			**NEW ESTIMATE**		
ITEM	Units	No. Units	Cost/ Unit	Total Cost	No. Units	Cost/ Unit	Total Cost
Grading Complete	LS	1	2,795,000	2,795,000	0.6	2,795,000	1,677,000
Storm Drain System	LS	1	490,000	490,000	0.4	490,000	196,000
Concrete Pavement Items	LS	1	2,972,000	2,972,000	0.6	2,972,000	1,783,200
G.A.B.	LS	1	1,827,000	1827000	0.6	1,827,000	1,096,200
Portable Bathroom Facilities -4	MO				18	4000	72,000
SUBTOTAL				8,084,000			4,824,400
Markup 15.33%				1,239,277			739,581
TOTAL				9,323,277			5,563,981
TOTAL ROUNDED				9,323,000			5,564,000

MACTEC

DEVELOPMENT AND RECOMMENDATION PHASE

I-95 Welcome Centers - Camden

IDEA No.:	PAGE No.:	CREATIVE IDEA:
C-1	1 of 3	Use obliterated concrete pavement in place of GAB.

Comp By: DC Date: 7/9/09 Checked By: DCW Date: 7/9/09

Original Concept:

Remove and haul away 100% of existing pavement and base section throughout the entire Welcome Center Facility and construct 100% new pavement section by hauling in 100% new material.

Proposed Change:

Reuse 100% of the existing pavement section by method of on-site reclamation techniques. Use mobile rock crushing units to reduce existing concrete pavement rubble to GAB size material and then place per plan location.

Justification:

The cost of quarry material in south Georgia runs approximately $11.00 per ton more due to the expense of suppliers having to ship this material from north Georgia. By utilizing local material or recycling existing on site material, the Department can save a substantial cost and reduce project time as well.

LIFE CYCLE COST SUMMARY	CAPITAL COST	FUTURE COST	PRESENT WORTH
INITIAL COST - Original	1,801,000		
- Proposed	662,100		
- Savings	1,138,900		1,138,900
FUTURE COST - Savings			-0-
TOTAL PRESENT WORTH SAVINGS			**1,138,900**

COST WORKSHEET							
PROJECT:	**I-95 Welcome Center Northbound Camden County**				ITEM No: C-1 CLIENT: GDOT		
					Sheet 2 of 3		
CONSTRUCTION ELEMENT		**ORIGINAL ESTIMATE**			**NEW ESTIMATE**		
ITEM	Units	No. Units	Cost/ Unit	Total Cost	No. Units	Cost/ Unit	Total Cost
G.A.B. including material - off site	TN	33,300	$46.90	1,561,770			
G.A.B. including material - on site	TN				33,300	$17.24	574,092
SUBTOTAL				1,561,770			574,092
Markup 15.33%				239,419			88,008
TOTAL				1,801,189			662,100
TOTAL ROUNDED				1,801,000			662,100

I-95 Welcome Centers	ITEM N$^{\underline{O}}$: C-1 CLIENT: GDOT Sheet 3 of 3

Utilized RS Means to breakdown bare costs between labor, material, and equipment in order to apply the cost savings to the appropriate component.

<u>GAB Bare Costs per ton at 12" thick placed by traditional method:</u>
Material (including haul costs) @ $38.00 ton; labor @ $1.42 ton, equipment @ $1.36 ton and OH & P per ton @ $6.12 totaling $46.90 per ton placed.

<u>GAB Bare Costs per ton at 12" thick placed by on-site unconventional methods:</u>
Reducing material and hauling costs from supplier to 0, increasing labor and equipment cost by a factor of 4, and holding OH & P at $6.12 per ton equates to the following revised unit cost.
Material (including haul costs) @ $0.00 ton; labor @ $5.68 ton, equipment @ $5.44 ton and OH & P per ton @ $6.12 totaling $17.24 per ton placed.

DEVELOPMENT AND RECOMMENDATION PHASE

I-95 Welcome Centers - Camden

IDEA No.:	PAGE No.:	CREATIVE IDEA:
D-3	1 of 4	Use narrower drive and parking aisles

Comp By: GAO Date: 7-9-09 Checked By: DW Date: 7-9-09

Original Concept:

Use parking and drive aisles as shown; 20 foot drive with 20 ft parking, 45 deg; total width - 60 ft

Proposed Change:

Use AASHTO minimum, for 45 deg, allows for a 12 ft drive aisle and 17 ft parking; total width- 46 ft.

Justification:

The total width for the drive and parking areas is excessive, based on AASHTO minimum criteria. The reduced widths will decrease pavement costs, impervious areas and serve as a traffic calming measure.

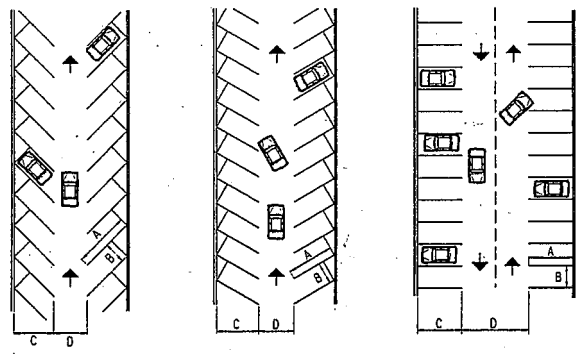
LIFE CYCLE COST SUMMARY	CAPITAL COST	FUTURE COST	PRESENT WORTH
INITIAL COST - Original	169,000		
- Proposed	-0-		
- Savings	169,000		169,000
FUTURE COST - Savings			-0-
TOTAL PRESENT WORTH SAVINGS			**169,000**

SKETCH

I-95 Welcome Centers - Camden	ITEM N$^{\underline{O}}$: D-3 CLIENT: GDOT Sheet 2 of 4

Guide for Development of Rest Areas on Major Arterials and Freeways

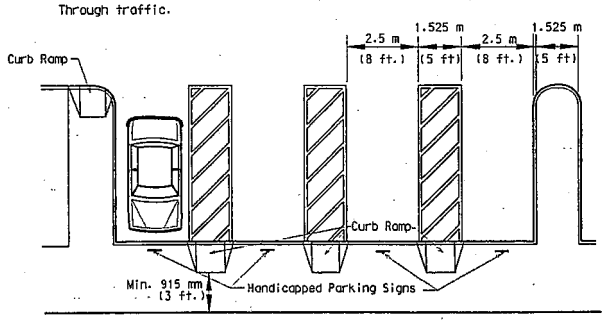
FIGURE 25. Parking-area design dimensions.



	45° Parking	60° Parking	90° Parking
A	7.6 m (25 ft.)	6.7 m (22 ft.)	5.6 m (18 ft.)
B	2.7 m (9 ft.)	2.7 m (9 ft.)	2.7 m (9 ft.)
C	5.3 m (17 ft.)	5.8 m (19 ft.)	5.6 m (18 ft.)
D	3.7 m (12 ft.)	4.6 m (15 ft.)	7.3 m (24 ft.)

NOTES:

All dimensions shown are minimums.
Greater aisle widths may be desirable to accommodate:
Winter weather conditions.
High number of turning movements associated with short term parking.
Through traffic.



Handicap Parking Stalls

45° 17' 12' 17' = 46'

							COST WORKSHEET
PROJECT:	**I-95 Welcome Center Northbound**				ITEM No: D-3		
	Camden County				CLIENT: GDOT		
					Sheet 3 of 4		
CONSTRUCTION ELEMENT		**ORIGINAL ESTIMATE**			**NEW ESTIMATE**		
ITEM	Units	No. Units	Cost/ Unit	Total Cost	No. Units	Cost/ Unit	Total Cost
full depth PCC pavement	sy	2150	68	146,200			
SUBTOTAL				146,200			0
Markup 15.33%				22,412			0
TOTAL				168,612			0
TOTAL ROUNDED				169,000			0

CALCULATIONS	
I-95 Welcome Centers-Camden	ITEM N^{O} : D-3 CLIENT: GDOT Sheet 4 of 4

Total width reduction 60 ft to 46 ft = 14 ft

Total length - (200 + 210 + 290 + 210 + 220) = 1,130 ft

(1,130 x 14) + (320 x 11) = 19,340 sf = 2,149 sy

Full depth 8 inch PCC pavement cost
$68/sy

DEVELOPMENT AND RECOMMENDATION PHASE

I-95 Welcome Center – Camden NB

IDEA No.:	PAGE No.:	CREATIVE IDEA:
E-1	1 of 4	Reduce scope of landscaping/site plan

Comp By: DC Date: 7/8/09 Checked By: DW Date: 7/8/09

Original Concept:

Landscape and irrigate building plan site, parking, picnic, and access ramps areas with variety of trees, shrubs, groundcovers, flowers and picnic amenities.

Proposed Change:

Reduce scope of the landscape, irrigation, and site amenity plans in the parking, picnic, and access ramp locations. Leave landscape/irrigation scope unaltered directly surrounding Welcome Center Facility.

Justification:

Evaluate plant types and species to confirm survival with reduced or eliminated mechanical watering efforts. Reduce or eliminate the number of plantings and irrigation system in specific areas, such as along access ramps, not conducive to pedestrian benefits. Reduce the scope of site amenities such as picnic shelters, picnic tables, benches, grills, and water fountains based on their historical use and intended function of Welcome Center facility, which is to provide an area of temporary relief to the traveling public.

Scope reduction or elimination would provide a substantial savings to project cost.

LIFE CYCLE COST SUMMARY	CAPITAL COST	FUTURE COST	PRESENT WORTH
INITIAL COST - Original	287,600		
- Proposed			
- Savings	287,600		287,600
FUTURE COST - Savings			-0-
TOTAL PRESENT WORTH SAVINGS			**287,600**

COST WORKSHEET							
PROJECT:	**I-95 Welcome Center Northbound Camden County**				ITEM No: E-1 CLIENT: GDOT Sheet 2 of 4		
CONSTRUCTION ELEMENT		**ORIGINAL ESTIMATE**			**NEW ESTIMATE**		
ITEM	Units	No. Units	Cost/ Unit	Total Cost	No. Units	Cost/ Unit	Total Cost
Irrigation System	LS	0.5	65,000	32,500			
Natchez Crape Myrtle - ramps	EA	72	150.00	10,800			
Live Oak - ramps	EA	42	550.00	23,100			
Willow Oak - ramps	EA	40	399.00	15,960			
Cabbage Palm - ramps	EA	10	625.00	6,250			
Live Oak - parking	EA	15	550.00	8,250			
Natchez Crape Myrtle - parking	EA	13	150.00	1,950			
Willow Oak - parking	EA	4	399.00	1,596			
Nuttle Oak - picnic	EA	14	245.00	3,430			
Willow Oak - picnic	EA	3	399.00	1,197			
Elm - picnic	EA	6	135.00	810			
Chionanthus trees - picnic	EA	14	215.00	3,010			
Live Oak - picnic	EA	5	550.00	2,750			
Cabbage Palm - picnic	EA	6	625.00	3,750			
Natchez Crape Myrtle - picnic	EA	8	150.00	1,200			
Drinking Fountains - keep 6	EA	9	1000.00	9,000			
Water service line, 1.5 inch	LF	350	20.50	7,175			
Picnic Shelters - keep 4	EA	11	2500.00	27,500			
Picnic Tables - keep 4	EA	29	1053.60	30,554			
Grill - keep 4	EA	16	500.00	8,000			
Waste Receptacle Unit - keep 25	EA	24	153.44	3,683			
Bench - keep 4	EA	11	1216.93	13,386			
Concrete pad	CY	120	279.62	33,554			
SUBTOTAL				249,406			0
Markup 15.33%				38,234			0
TOTAL				287,639			0
TOTAL ROUNDED				287,600			0

I-95 Welcome Centers	ITEM N^{O} : E-1 CLIENT: GDOT Sheet 3 of 4

Exit / Entrance Ramp and Truck Parking locations:
Eliminate all plantings along both sides of ramp shoulders as well as east side of truck parking lot. Physical take off on plan sheets category series 29 by 100%.

Parking and Picnic locations:
Physical take off on plan sheets category series 29 by 50%.

Landscape Irrigation System:
Since plant count was reduced by 50% reduce irrigation by 50%.

Welcome Center Facility landscaping:
No reduction in this area.

Drinking Fountains:
Leave 1 fountain at each of the four facility entrances and 1 each at the two picnic areas located on each end of welcome center. A total of 15 in detailed estimate. Reduce by 9 and keep 6.

Picnic Shelters:
There are 15 proposed covered picnic shelters in detailed estimate. Leave 2 on each side of Welcome Center at each picnic location. Reduce by 7 and keep 4.

Picnic Tables:
Only place picnic tables under covered shelter locations. Geographical location in southern GA makes covered eating a plus. Eliminate remaining uncovered picnic table areas. Reduce estimate by 29 and keep 4.

Grills:
Only place grills near under covered shelter locations. Geographical location in southern GA makes covered eating a plus. Eliminate remaining uncovered picnic table areas with grills. Reduce estimate by 16 and keep 4.

Waste Receptacles:
Recycle existing receptacles in use. Reduce 49 estimated receptacles by 50% replacing only unsalvageable receptacles. Reduce by 24 and keep 25.
Benches:
There is an average 3.75 benches' proposed for each entrance / exit point of the Welcome Center. Recommend placement of 1 bench per each of the 4 entrance points. Reduce by 11 and keep 4.

CALCULATION	
I-95 Welcome Centers	ITEM N$^{\underline{O}}$: E-1 CLIENT: GDOT Sheet 4 of 4

Concrete slab for picnic tables, picnic shelters and bench/trash receptacles locations. Need to eliminate pads and slabs for all locations reduced. Item includes grading site, placing reinforcing/anchor bolts if required, post excavation, saw cutting joints, etc.

Pad for Bench / Receptacle locations:
4.5’ x 10’ x .5’ (.83 CY) each
Total reduced = 7 x .83 CY = 6 CY

Pad for Drinking Fountain locations:
7’ x 3’x .5’ (.4 CY) each
Total reduced = 9 x .4 CY = 4 CY

Pad for picnic table locations:
15’ x 20’x .5’ (5.6 CY) each
Total reduced = 17 x 5.6 CY = 96 CY

Pad for covered picnic shelter locations:
20’ x 25’x .5’ (9.3 CY) each
Total reduced = 11 x 9.3 CY= 103 CY

Pad for each grill location:
18” x 18”x .5’ (.04 CY) each
Total reduced= 16 x .04 = 1 CY

Total concrete slab quantity eliminated = 120 CY

DEVELOPMENT AND RECOMMENDATION PHASE

I-95 Welcome Centers - Camden

IDEA No.:	PAGE No.:	CREATIVE IDEA:
I-1	1 of 3	Use asphalt sidewalks

Comp By: GAO Date: 7-9-09 Checked By: DCW Date: 7-9-09

Original Concept:

Concrete sidewalks are used throughout the welcome center area.

Proposed Change:

Use asphalt sidewalks, 4 in thick on prepared sub-base to replace the concrete walks.

Justification:

This is an ideal application for using asphalt sidewalks. The welcome centers promote a less harsh, park-like setting where an asphalt sidewalk can be suitable. Also, all the landscaping is new and controlled so root damage should be minimal. Asphalt sidewalks will save costs and should not be more to maintain.

LIFE CYCLE COST SUMMARY	CAPITAL COST	FUTURE COST	PRESENT WORTH
INITIAL COST - Original	270,000		
- Proposed	116,000		
- Savings	154,000		154,000
FUTURE COST - Savings			-0-
TOTAL PRESENT WORTH SAVINGS			**154,000**

							COST WORKSHEET
PROJECT:	**I-95 Welcome Center Northbound Camden County**				ITEM No: I-1 CLIENT: GDOT		
					Sheet 2 of 3		
CONSTRUCTION ELEMENT		**ORIGINAL ESTIMATE**			**NEW ESTIMATE**		
ITEM	Units	No. Units	Cost/ Unit	Total Cost	No. Units	Cost/ Unit	Total Cost
concrete sidewalk	sy	6,900	33.87	233,703			
asphalt sidewalk, 4 in thick	tons				1553	65	100,945
SUBTOTAL				233,703			100,945
Markup 15.33%				35,827			15,475
TOTAL				269,530			116,420
TOTAL ROUNDED				270,000			116,000

I-95 Welcome Centers - Camden	ITEM N^{O} : I-1 CLIENT: GDOT Sheet 3 of 3

Concrete sidewalk - 6,900 sy

1 sy = 9 sf (4/12)ft (150#/cf) (1ton / 2000#) = 0.225 tons/sy

6,900 sy x 0.225 tons / sy = 1,553 tons

DEVELOPMENT AND RECOMMENDATION PHASE

I-95 Welcome Centers - Chatham

IDEA No.:	PAGE No.:	CREATIVE IDEA:
A-1.1	1 of 3	Revise traffic circulation patterns – Option 1

Comp By: GAO Date: 7-8-09 Checked By: DW Date: 7-8-09

Original Concept:

The current traffic circulation provides a one way pattern, circulating around the building pad. Vehicles in some of the remote parking areas will have to drive through the one-way alignment back in front of the existing building to exit the site. This unnecessarily provides addition opportunities for accidents and congestion.

Proposed Change:

Revise the traffic patterns to minimize traffic circulation around the building.

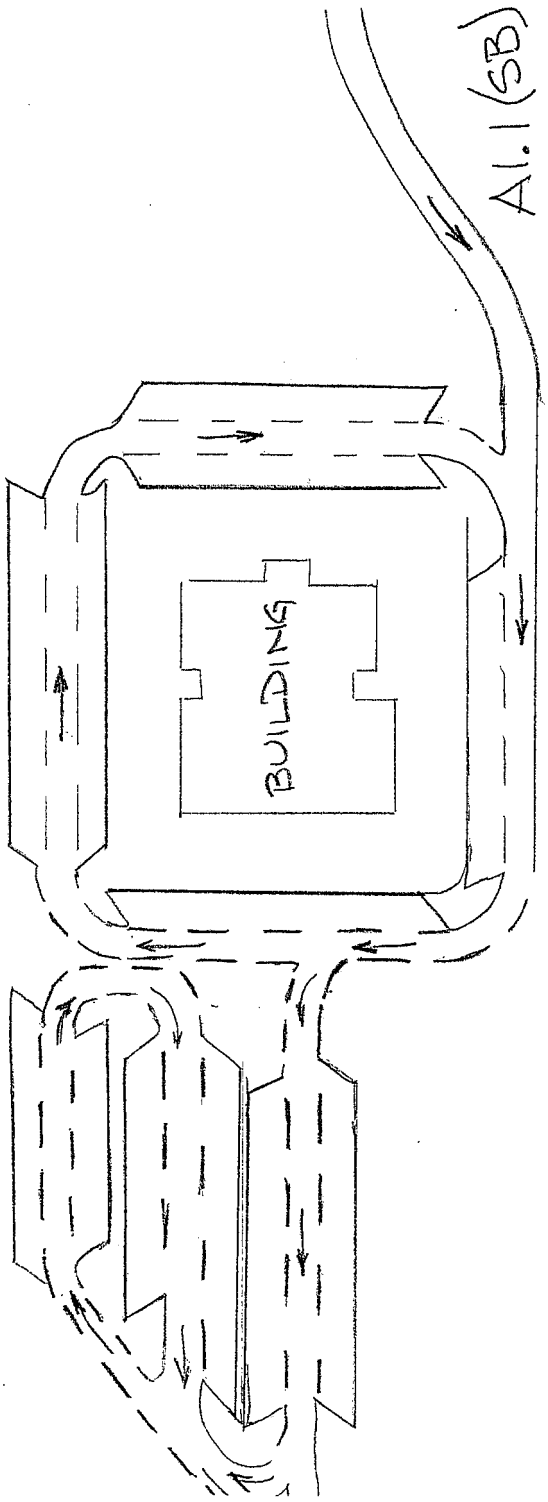
Justification:

Revising traffic circulation will minimize traffic having to double back around the buildings. This will reduce traffic congestion at the front of the buildings thereby lessening the opportunities for accidents. The parking areas will be constructed in the same general area, only oriented differently to optimize traffic flow. The overall construction costs should have no appreciable differences. Total parking spaces should be similar.

LIFE CYCLE COST SUMMARY	CAPITAL COST	FUTURE COST	PRESENT WORTH
INITIAL COST - Original			
- Proposed			
- Savings			
FUTURE COST - Savings			
TOTAL PRESENT WORTH SAVINGS			-0-

SKETCH

I-95 Welcome Centers - Chatham	ITEM N$^{\underline{O}}$: A-1.1 CLIENT: GDOT Sheet 2 of 3



I-95 Welcome Centers - Chatham	ITEM N^{O} : A-1.1 (SB) CLIENT: GDOT Sheet 3 of 3

The traffic and parking alignments will generally be in the same locations only re-oriented. The area between the two lots currently being proposed for picnic tables will be lost however there are ample areas throughout the remainder of the site. No appreciable cost difference.

DEVELOPMENT AND RECOMMENDATION PHASE

I-95 Welcome Centers - Chatham

IDEA No.:	PAGE No.:	CREATIVE IDEA:
A-1.2	1 of 4	Revise traffic circulation patterns – Option 2.

Comp By: GAO Date: 7/8/09 Checked By: DW Date: 7/8/09

Original Concept:

The current traffic circulation provides a one way pattern, circulating around the building pad. Vehicles in some of the remote parking areas will have to drive through the one-way alignment back in front of the existing building to exit the site. This unnecessarily provides addition opportunities for accidents and congestion.

Proposed Change:

Revise the traffic patterns to minimize traffic circulation around the building. This recommendation proposes to relocate the main ramp beyond the building further east and will provide additional area for parking.

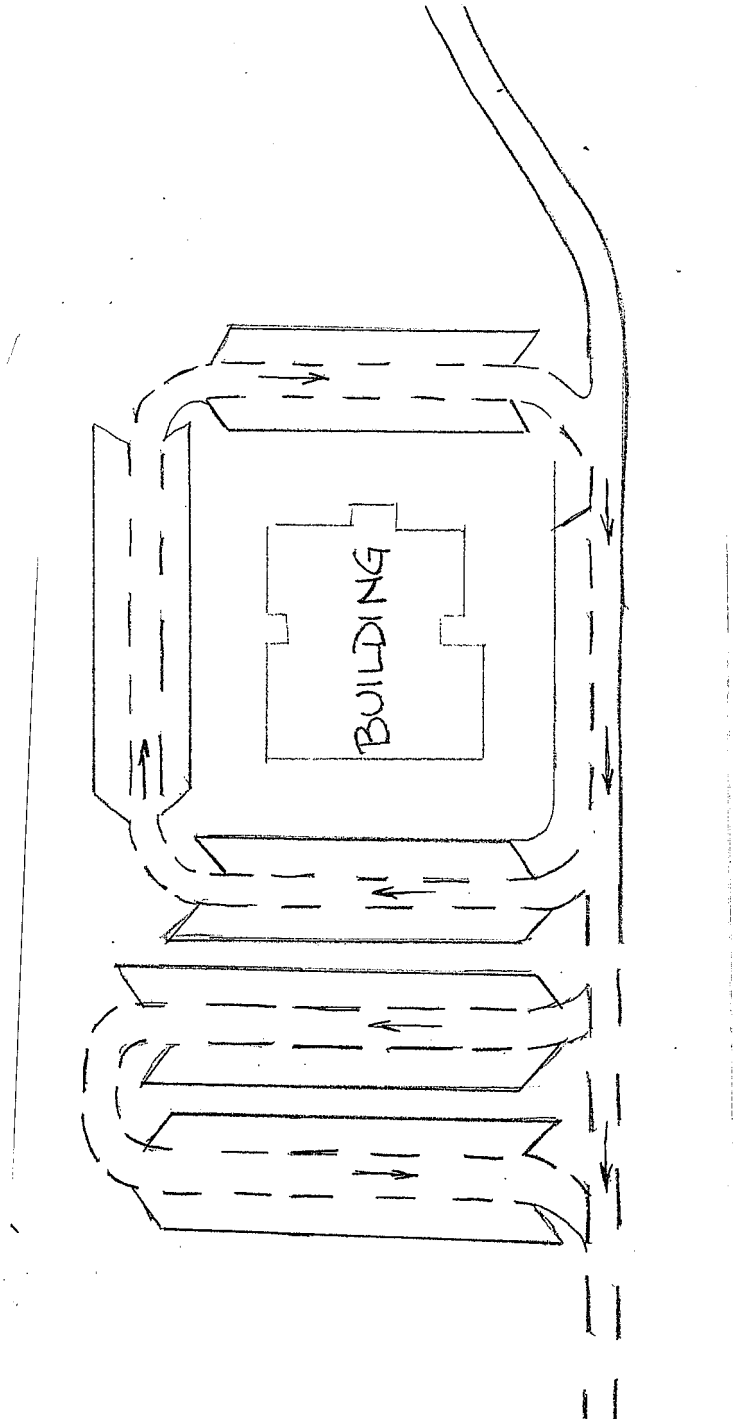
Justification:

Revising traffic circulation will minimize traffic having to double back around the buildings. This will reduce traffic congestion at the front of the buildings thereby lessening the opportunities for accidents. With this scheme, the main entry ramp is relocated and the parking on the south side of the building pad is reoriented for additional parking and improved circulation. There will be some additional costs for reconstruction of the ramp, however the traffic circulation will be improved. Also, with the re-oriented area there is space for up to 50 additional parking spaces. Their cost is not included in the cost analysis shown below.

LIFE CYCLE COST SUMMARY	CAPITAL COST	FUTURE COST	PRESENT WORTH
INITIAL COST - Original	-0-		
- Proposed	23,000		
- Savings	(23,000)		(23,000)
FUTURE COST - Savings			-0-
TOTAL PRESENT WORTH SAVINGS			**(23,000)**

SKETCH

I-95 Welcome Centers - Chatham	ITEM N$^{\underline{O}}$: A-1.2 CLIENT: GDOT Sheet 2 of 4



COST WORKSHEET

PROJECT:	I-95 Welcome Center Southbound Chatham County	ITEM No: A1.2 CLIENT: GDOT Sheet 3 of 4

CONSTRUCTION ELEMENT		ORIGINAL ESTIMATE			NEW ESTIMATE		
ITEM	Units	No. Units	Cost/ Unit	Total Cost	No. Units	Cost/ Unit	Total Cost
earthwork	cy			0	4000	5	20,000
SUBTOTAL				0			20,000
Markup 13.34%				0			2,668
TOTAL				0			22,668
TOTAL ROUNDED				0			23,000

I-95 Welcome Centers - Chatham	ITEM N^{O} : A-1.2 CLIENT: GDOT Sheet 4 of 4

The main ramp will be reconstructed further east and require additional grading and earthwork.

Additional earthwork:

700 ft long x 30ft wide x 5 ft avg ht = 105,000 cf = 3,889 cy

Additional parking analysis:

Area south of building: 118 current spaces
Re-oriented area: 172 potential spaces

Cost for additional spaces not included in cost analysis.

DEVELOPMENT AND RECOMMENDATION PHASE

I-95 Welcome Center – Chatham

IDEA No.:	PAGE No.:	CREATIVE IDEA:
D-1	1 of 4	Reduce scope of landscaping/site plan

Comp By: DC Date: 7/8/09 Checked By: DW Date: 7/8/09

Original Concept:

Landscape and irrigate the building plan site, parking, picnic, and access ramps areas with a variety of trees, shrubs, groundcovers, flowers and picnic amenities.

Proposed Change:

Reduce the scope of the landscape, irrigation, and site amenity plans in the parking, picnic, and access ramp locations. Leave landscape/irrigation scope unaltered directly surrounding Welcome Center Facility.

Justification:

Evaluate the plant types and species to confirm survival with reduced or eliminated mechanical watering efforts. Reduce or eliminate the number of plantings and irrigation system in specific areas, such as along access ramps, not conducive to pedestrian benefits. Reduce the scope of site amenities such as benches, grills, and water fountains based on their historical use and intended function of the Welcome Center facility, which is to provide an area of temporary relief to the traveling public.

Scope reduction or elimination would provide a substantial savings to project cost.

LIFE CYCLE COST SUMMARY	CAPITAL COST	FUTURE COST	PRESENT WORTH
INITIAL COST - Original	208,100		
- Proposed	-0-		
- Savings	208,100		208,100
FUTURE COST - Savings			-0-
TOTAL PRESENT WORTH SAVINGS			**208,100**

COST WORKSHEET							
PROJECT:	**I-95 Welcome Center Southbound Chatham County**				ITEM No: D-1 CLIENT: GDOT Sheet 2 of 4		
CONSTRUCTION ELEMENT		**ORIGINAL ESTIMATE**			**NEW ESTIMATE**		
ITEM	Units	No. Units	Cost/ Unit	Total Cost	No. Units	Cost/ Unit	Total Cost
Irrigation System	LS	0.5	38,750.00	19,375			
Fringetree - ramps	EA	16	215.00	3,440			
Live Oak - ramps	EA	27	550.00	14,850			
Magnolia trees - ramps	EA	35	339.23	11,873			
Cabbage Palm - ramps	EA	24	625.00	15,000			
Live Oak - parking	EA	17	550.00	9,350			
Shumard Oak - parking	EA	7	500.00	3,500			
Willow Oak - parking	EA	10	399.00	3,990			
Drinking Fountains - keep 6	EA	15	2,500.00	37,500			
Water service line, 1.0 inch	LF	400	34.05	13,620			
Grill - keep 4	EA	5	500.00	2,500			
Waste Receptacle Unit - keep 19	EA	10	1,577.44	15,774			
Bench - keep 4	EA	10	2,320.56	23,206			
Concrete pad	CY	16	600.77	9,612			
SUBTOTAL				183,590			0
Markup 13.34%				24,491			0
TOTAL				208,081			0
TOTAL ROUNDED				208,100			0

MACTEC

I-95 Welcome Centers - Chatham	ITEM N^{O} : D-1 CLIENT: GDOT Sheet 3 of 4

Exit / Entrance Ramp and Truck Parking locations:
Eliminate all plantings along both sides of ramp shoulders as well as east side of truck parking lot. Physical take off on plan sheets by 100%.

Parking and Picnic locations:
Physical take off on plan sheets by 50%.

Landscape Irrigation System:
Since plant count was reduced by 50% reduce irrigation by 50%.

Welcome Center Facility landscaping:
No reduction in this area.

Drinking Fountains:
Leave 1 fountain at each of the four facility entrances and 1 each at the two picnic areas located on each end of welcome center. A total of 21 in detailed estimate. Reduce by 15 and keep 6.

Grills:
Only place grills near / under covered shelter locations. Geographical location in southern GA makes covered eating a plus. Eliminate remaining uncovered picnic table areas with grills. Reduce estimate by 5 and keep 4.

Waste Receptacles:
Recycle existing receptacles in use. Reduce 29 estimated receptacles by 50% replacing only unsalvageable receptacles. Reduce by 10 and keep 19.

Benches:
There is an average 3.5 benches' proposed for each entrance / exit point of the Welcome Center. Recommend placement of 1 bench per each of the 4 entrance points. Reduce by 10 and keep 4.

CALCULATIONS	
I-95 Welcome Centers - Chatham	ITEM N$^{\underline{O}}$: D-1 CLIENT: GDOT Sheet 4 of 4

Concrete slab for picnic tables, picnic shelters and bench/trash receptacles locations. Need to eliminate pads and slabs for all locations reduced. Item includes grading site, placing reinforcing/anchor bolts if required, post excavation, saw cutting joints, etc.

Concrete Pad for bench / trash receptacles: = 4.5’ x 10’ x .5’ = (.83 CY)each
Concrete pad for Bench / Receptacle locations = 10 x .83 CY = 9 CY

Concrete pad for Drinking Fountains =
7’ x 3’x .5’ = (.40 CY)each
Pad for Drinking Fountain locations = 15 x .4 CY = 6 CY

Concrete pad for grills:
18” x 18”x .5’ (.04 CY)each
Pad for each grill location = 5 x .04 = .25 CY

Total concrete slab quantity eliminated = 16 CY

DEVELOPMENT AND RECOMMENDATION PHASE

I-95 Welcome Centers - Chatham

IDEA No.:	PAGE No.:	CREATIVE IDEA:
F-1	1 of 5	Eliminate 30″ RCP and use ditch for drainage

Comp By: GAO Date: 7/9/09 Checked By: DCW Date: 7/9/09

Original Concept:

Use a 30 in RCP to convey storm-water run-off from the southern parking area to a drainage structure at the front of the building

Proposed Change:

Use an open ditch in lieu of piping

Justification:

The current plans show a 30 inch RCP to carry the storm-water run-off from the southern parking areas to the discharge point and a drainage structure at the front of the building along the interstate. There is also a roadside ditch to be graded to convey the surface run-off. This is a duplication of drainage, and the roadside ditch can be used for both run-offs. If needed, it can be somewhat increased. 520 feet of piping and three drainage structures can be eliminated.

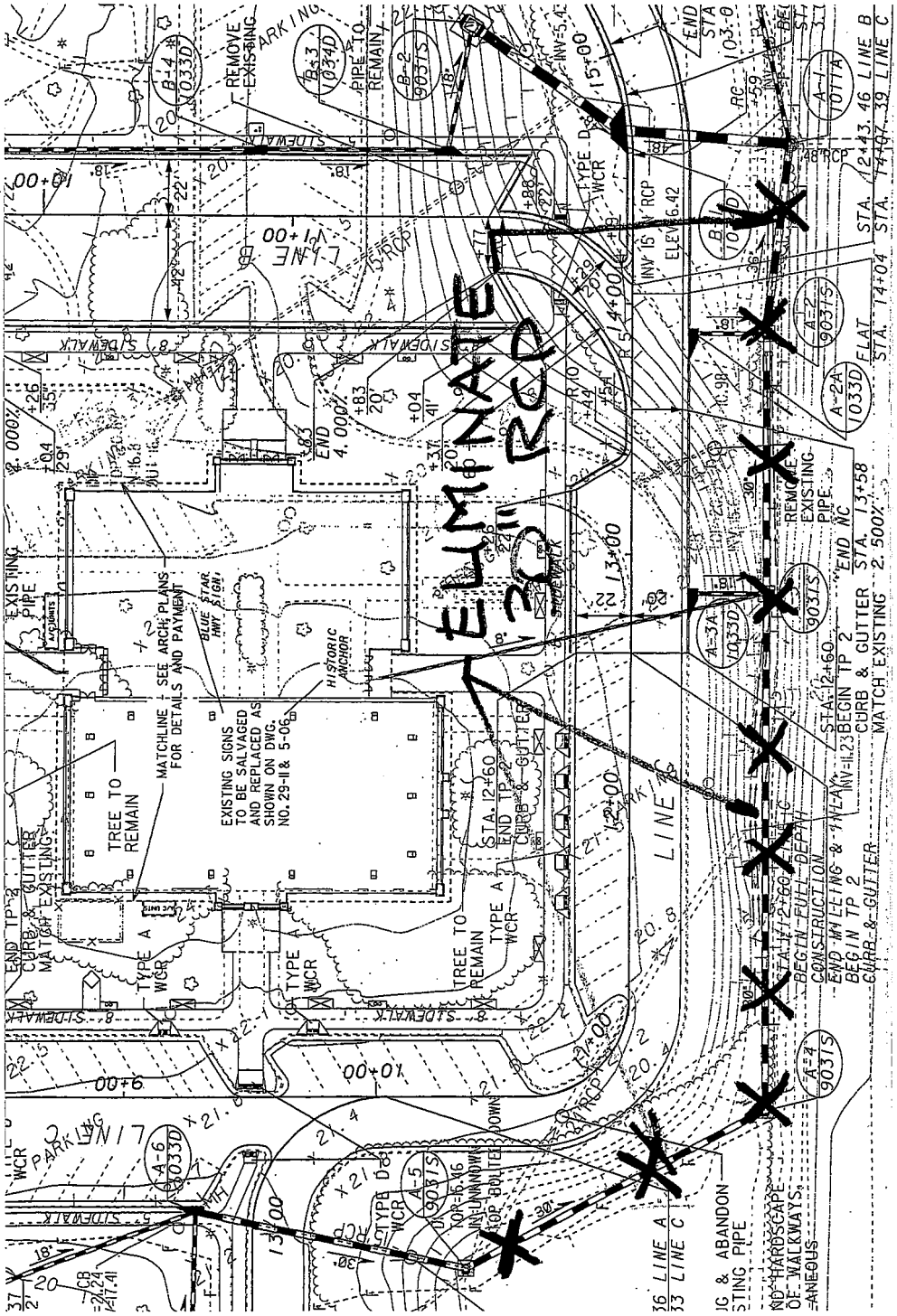
Also, another advantage of not installing the 30 inch line would be the elimination of potential conflict with the I-95 shoulder that may result from the 30 inch trench excavation.

LIFE CYCLE COST SUMMARY	CAPITAL COST	FUTURE COST	PRESENT WORTH
INITIAL COST - Original	51,000		
- Proposed	-0-		
- Savings	51,000		51,000
FUTURE COST - Savings			-0-
TOTAL PRESENT WORTH SAVINGS			**51,000**

SKETCH

I-95 Welcome Centers Chatham

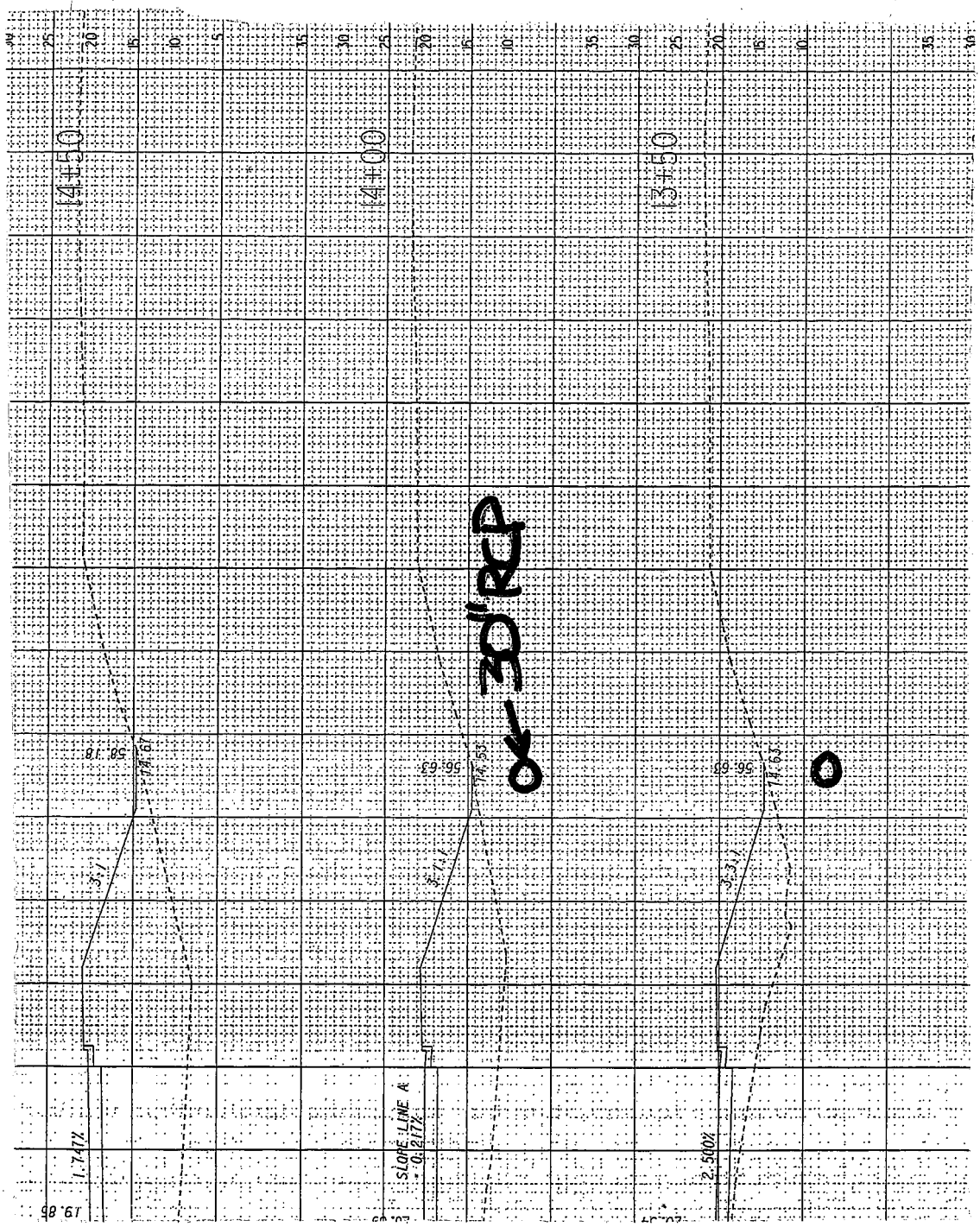
ITEM N$^{\underline{O}}$: F-1
CLIENT: GDOT
Sheet 2 of 5



SKETCH

I-95 Welcome Centers - Chatham

ITEM N$^{\underline{O}}$: F-1
CLIENT: GDOT
Sheet 3 of 5



							COST WORKSHEET
PROJECT:	**I-95 Welcome Center Southbound Chatham County**				ITEM No: F-1 CLIENT: GDOT		
					Sheet 4 of 5		
CONSTRUCTION ELEMENT		**ORIGINAL ESTIMATE**			**NEW ESTIMATE**		
ITEM	Units	No. Units	Cost/ Unit	Total Cost	No. Units	Cost/ Unit	Total Cost
30 " RCP	lf	520	71	36,660	0		
drainage structure	unit	3	2784.43	8,353	0		
SUBTOTAL				45,013			0
Markup 13.34%				6,005			0
TOTAL				51,018			0
TOTAL ROUNDED				51,000			0

I-95 Welcome Centers	ITEM N$^{\underline{O}}$: F-1 CLIENT: GDOT Sheet 5 of 5

Length of pipe – 520 ft
Drainage structures eliminated - 3

DEVELOPMENT AND RECOMMENDATION PHASE

I-95 Welcome Centers - Chatham

IDEA No.:	PAGE No.:	CREATIVE IDEA:
G-1	1 of 5	Revise the pavement design in car parking and ramp areas

Comp By: GAO Date: 7-8-09 Checked By: DW Date: 7-8-09

Original Concept:

Use the original full-depth pavement design;
1 ½ " – 12.5mm
2" – 19mm
3" – 25 mm
8" - GAB

Proposed Change:

Use a revised pavement design for the car parking and ramp areas
1 ¼ " – 12.5mm
3" – 25 mm
4" - GAB

Justification:

The original pavement design is 155% overdesigned. A reduced thickness pavement can be developed providing significant cost savings.

LIFE CYCLE COST SUMMARY	CAPITAL COST	FUTURE COST	PRESENT WORTH
INITIAL COST - Original	111,500		
- Proposed	0		
- Savings	111,500		111,500
FUTURE COST - Savings			-0-
TOTAL PRESENT WORTH SAVINGS			**111,500**

FLEXIBLE PAVEMENT DESIGN ANALYSIS

G-1 SB

Pg 2 of 5

Project: IM-0000-00(690) **County:** Chatham
P.I. no.: 0000690
Description: Welcome Center Improvements - Car Access and Parking

ORIGINAL DESIGN

Traffic Data (NOTE: AADTs are one-way)
24-hour Truck Percentage: 0.00%
AADT initial year of design period: 3,983 vpd (2007)
AADT final year of design period: 4,860 vpd (2027)
Mean AADT (one-way): 4,422 vpd

Design Loading

Mean AADT		LDF		Trucks		18-K ESAL		Total Daily Loads
4,422	*	1.00	*	0.000	*	1.50	=	1

Total predicted design period loading = 1 * 20 * 365 = 7,300

Design Data
Terminal Serviceability Index: 2.50
Soil Support: 4.50
Regional Factor: 1.70

PROPOSED FLEXIBLE PAVEMENT STRUCTURE

Material	Thickness Inches	Thickness (mm)	Structural Coefficient	Structural Value
12.5 mm Superpave	1.50	(38)	0.44	0.66
19 mm Superpave	2.00	(51)	0.44	0.88
25 mm Superpave	1.00	(25)	0.44	0.44
	2.00	(51)	0.30	0.60
Graded Aggregate Base	8.00	(203)	0.16	1.28

Required SN = 1.52 Proposed SN = 3.86

>>> Proposed pavement is 154.7% Overdesign <<<

Remarks: Full Depth Access Road and Parking Area - Trucks Prohibited

Prepared by Erik Rohde ADGM December 27, 2006
Date

Recommended Brent A. Story
State Road Design Engineer
January 24, 2007
Date

Approved
State Pavement Engineer
1/25/2007
Date

FLEXIBLE PAVEMENT DESIGN ANALYSIS

G-1 SB

Pg 3 of 5

Project: IM-0000-00(690) **County:** Chatham
P.I. no.: 0000690
Description: SB Welcome Center

PROPOSED

Traffic Data (NOTE: AADTs are one-way)
24-hour Truck Percentage: 0.00%
AADT initial year of design period: 3,983 vpd (2007)
AADT final year of design period: 4,860 vpd (2027)
Mean AADT (one-way): 4,422 vpd

Design Loading

Mean AADT		LDF		Trucks		18-K ESAL		Total Daily Loads
4,422	*	0.01	*	0.000	*	1.00	=	1

Total predicted design period loading = 1 * 20 * 365 = 7,300

Design Data
Terminal Serviceability Index: 2.50
Soil Support: 4.50
Regional Factor: 1.70

PROPOSED FLEXIBLE PAVEMENT STRUCTURE

Material	Thickness Inches	Thickness (mm)	Structural Coefficient	Structural Value
12.5 mm OGFC	90 lb/sy	(50 kg/sm)	0.00	0.00
12.5 mm Superpave	1.25	(32)	0.44	0.55
25 mm Superpave	2.50	(64)	0.44	1.10
Graded Aggregate Base	4.00	(102)	0.16	0.64

Required SN = 1.52 Proposed SN = 2.29

>>> Proposed pavement is 51.1% Overdesign <<<

Remarks:

Prepared by george obaranec July 8, 2009
Date

Recommended _____
State Materials & Research Engineer **Date**

Approved _____
State Consultant Design Engineer **Date**

							COST WORKSHEET
PROJECT:	**I-95 Welcome Center Southbound Chatham County**				ITEM No: G-1 CLIENT: GDOT		
					Sheet 4 of 5		
CONSTRUCTION ELEMENT		**ORIGINAL ESTIMATE**			**NEW ESTIMATE**		
ITEM	Units	No. Units	Cost/ Unit	Total Cost	No. Units	Cost/ Unit	Total Cost
GAB	tons	1370	22**	30,140	0	0	
Asphalt	tons	1,050	65.00	68,250	0	0	
** from Item Means Summary							
SUBTOTAL				98,390			0
Markup 13.34%				13,125			0
TOTAL				111,515			0
TOTAL ROUNDED				111,500			0

MACTEC

I-95 Welcome Centers - Chatham	ITEM N^{O} : G-1 CLIENT: GDOT Sheet 5 of 5

New pavement areas:

(1,000 x 20) + (220 x 64) + [(200 + 150) 64] + (220 x 20) =

20,000 + 14,080 + 22,400 + 4,400 = 60,880 sf = 6765 sy

GAB; 8” to 4”

(60,880 sf x 4/12 ft) 135 #/cf (1/2000 tons/#) = 1370 tons

Asphalt; 6.5 “ to 3.75 “

(60,880 sf x 2.75/12 ft) 150 #/cf (1/2000 tons/#) = 1050 tons

DEVELOPMENT AND RECOMMENDATION PHASE

I-95 Welcome Centers - Chatham

IDEA No.:	PAGE No.:	CREATIVE IDEA:
G-2	1 of 4	Use narrower drive and parking aisles

Comp By: GAO Date: 7-9-09 Checked By: DW Date: 7-9-09

Original Concept:

Use parking and drive aisles as shown; 20 foot drive with 22 ft parking, 60 deg; total width - 64 ft

Proposed Change:

AASHTO minimum, for 60 deg, allows for a 15 ft drive aisle and 19 ft parking; total width- 53 ft.

Justification:

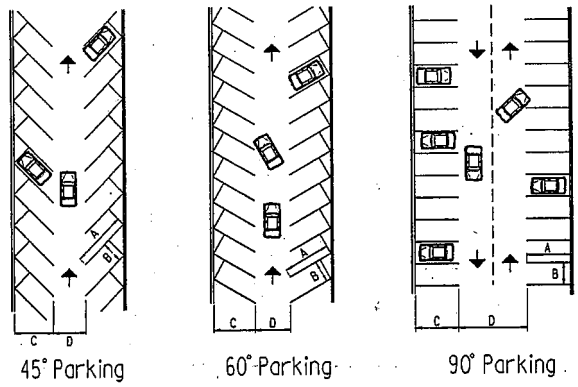
The total width for the drive and parking areas is excessive, based on AASHTO minimum criteria. The reduced widths will decrease pavement costs, impervious areas and serve as a traffic calming measure.

LIFE CYCLE COST SUMMARY	CAPITAL COST	FUTURE COST	PRESENT WORTH
INITIAL COST - Original	47,000		
- Proposed	0		
- Savings	47,000		47,000
FUTURE COST - Savings			-0-
TOTAL PRESENT WORTH SAVINGS			**47,000**

SKETCH

I-95 Welcome Centers - Chatham	ITEM N$^{\underline{O}}$: G-2 CLIENT: GDOT Sheet 2 of 4

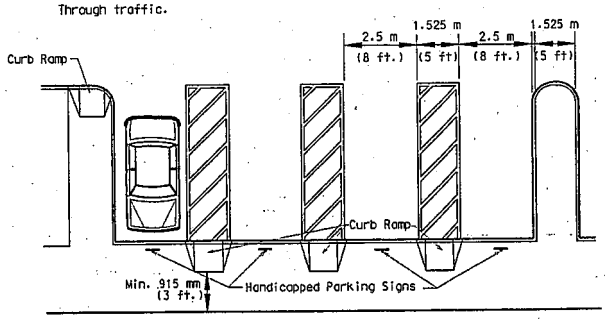
FIGURE 25. **Parking-area design dimensions.**



	45° Parking	60° Parking	90° Parking
A	7.6 m (25 ft.)	6.7 m (22 ft.)	5.6 m (18 ft.)
B	2.7 m (9 ft.)	2.7 m (9 ft.)	2.7 m (9 ft.)
C	5.3 m (17 ft.)	5.8 m (19 ft.)	5.6 m (18 ft.)
D	3.7 m (12 ft.)	4.6 m (15 ft.)	7.3 m (24 ft.)

NOTES:

All dimensions shown are minimums.
Greater aisle widths may be desirable to accommodate:
Winter weather conditions.
High number of turning movements associated with short term parking.
Through traffic.



Handicap Parking Stalls

60° 19' * 15' * 19' = 53'

MACTEC

							COST WORKSHEET
PROJECT:	**I-95 Welcome Center Southbound** **Chatham County**				ITEM No: G-2 CLIENT: GDOT Sheet 3 of 4		
CONSTRUCTION ELEMENT		**ORIGINAL ESTIMATE**			**NEW ESTIMATE**		
ITEM	Units	No. Units	Cost/ Unit	Total Cost	No. Units	Cost/ Unit	Total Cost
full depth asphalt pavement	sy	917	45.00	41,265			
SUBTOTAL				41,265			0
Markup 13.34%				5,505			0
TOTAL				46,770			0
TOTAL ROUNDED				47,000			0

I-95 Welcome Centers - Chatham	ITEM N^{O} : G-2 CLIENT: GDOT Sheet 4 of 4

Total width reduction 64 ft to 53 ft = 11 ft

Total length - (150 + 200 + 110 + 210 + 80) = 750 ft

(750 x 11) = 8,250 sf = 917 sy

Full depth asphalt pavement cost
Assume $45 /sy

DEVELOPMENT AND RECOMMENDATION PHASE

I-95 Welcome Centers - Chatham

IDEA No.:	PAGE No.:	CREATIVE IDEA:
H-1	1 of 3	Use asphalt sidewalks in lieu of concrete

Comp By: GAO Date: 7/9/09 Checked By: DCW Date: 7/9/09

Original Concept:

Use concrete sidewalks throughout the welcome center area on a prepared sub-base.

Proposed Change:

Use asphalt sidewalks, 4 in thick on prepared sub-base.

Justification:

This is an ideal application for using asphalt sidewalk. The welcome centers promote a less harsh, park-like setting where an asphalt sidewalk can be suitable. Also, all the landscaping is new and controlled so root damage should be minimal. Asphalt sidewalks will save costs and should not be more to maintain. The GAB prepared base is assumed to be the same for both alternatives.

LIFE CYCLE COST SUMMARY	CAPITAL COST	FUTURE COST	PRESENT WORTH
INITIAL COST - Original	145,000		
- Proposed	63,000		
- Savings	82,000		82,000
FUTURE COST - Savings			-0-
TOTAL PRESENT WORTH SAVINGS			**82,000**

							COST WORKSHEET
PROJECT:	**I-95 Welcome Center Southbound** **Chatham County**				ITEM No: H-1 CLIENT: GDOT		
					Sheet 2 of 3		
CONSTRUCTION ELEMENT		**ORIGINAL ESTIMATE**			**NEW ESTIMATE**		
ITEM	Units	No. Units	Cost/ Unit	Total Cost	No. Units	Cost/ Unit	Total Cost
concrete sidewalk	sy	3,800	33.67	127,946			
asphalt sidewalk, 4 in thick	ton				855	65	55,575
GAB basecourse the same for both							
SUBTOTAL				127,946			55,575
Markup 13.34%				17,068			7,414
TOTAL				145,014			62,989
TOTAL ROUNDED				145,000			63,000

CALCULATIONS	
I-95 Welcome Centers - Chatham	ITEM N$^{\underline{O}}$: H-1 CLIENT: GDOT Sheet 3 of 3

Concrete sidewalk - 3,800 sy

1 sy = 9 sf (4/12)ft (150#/cf) (1ton / 2000#) = 0.225 tons/sy

3,800 sy x 0.225 tons / sy = 855 ton

DEVELOPMENT AND RECOMMENDATION PHASE

I-95 Welcome Centers - Chatham

IDEA No.:	PAGE No.:	CREATIVE IDEA:
I-1	1 of 4	Reduce the amount of curbing

Comp By: GAO Date: 7/9/09 Checked By: DCW Date: 7/9/09

Original Concept:

Use curb and gutter along the ramp approaching the building pad island.

Proposed Change:

Eliminate the curb and gutter and use an open section.

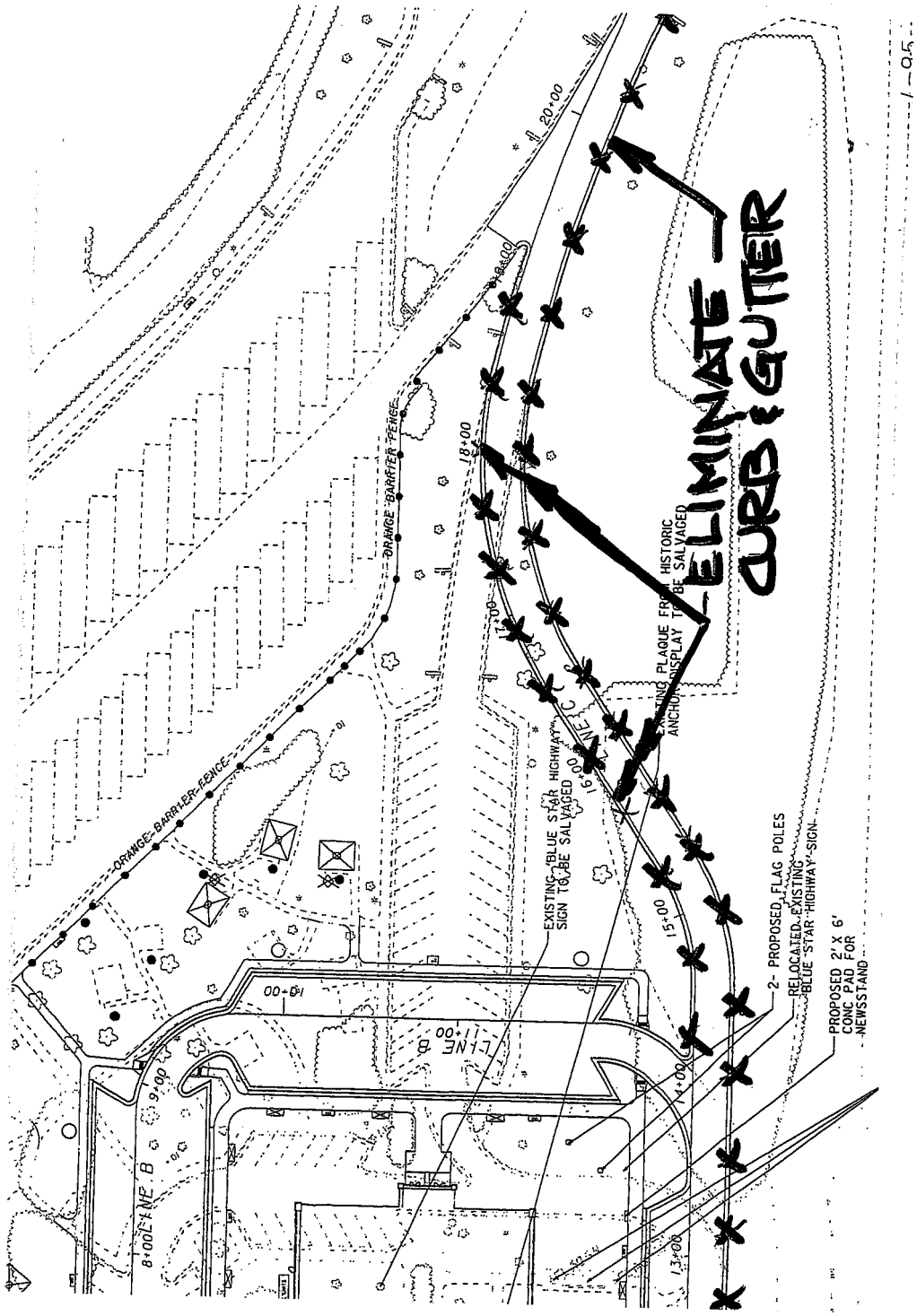
Justification:

The current plans show curb and gutter along the ramp approaching the building. This is in an area of open alignment where an urban, non-curbed section can be appropriate. This will save curbing and drainage costs and provide a more open section coming from the interstate.

LIFE CYCLE COST SUMMARY	CAPITAL COST	FUTURE COST	PRESENT WORTH
INITIAL COST - Original	38,000		
- Proposed	-0-		
- Savings	38,000		38,000
FUTURE COST - Savings			-0-
TOTAL PRESENT WORTH SAVINGS			**38,000**

SKETCH

I-95 Welcome Centers	ITEM N^{O} : I-1 CLIENT: GDOT Sheet 2 of 4



COST WORKSHEET

PROJECT:	I-95 Welcome Center Southbound Chatham County	ITEM No: I -1 CLIENT: GDOT Sheet 3 of 4

CONSTRUCTION ELEMENT		ORIGINAL ESTIMATE			NEW ESTIMATE		
ITEM	Units	No. Units	Cost/ Unit	Total Cost	No. Units	Cost/ Unit	Total Cost
18 " CMP - slope pipe	lf	106	34	3,582	0		
drainage spillway - flume	unit	2	2172.56	4,345	0		
concrete curb & gutter	lf	1,350	19.04	25,704	0		
SUBTOTAL				33,631			0
Markup 13.34%				4,486			0
TOTAL				38,117			0
TOTAL ROUNDED				38,000			0

I-95 Welcome Centers	ITEM N$^{\underline{O}}$: I-1 CLIENT: GDOT Sheet 4 of 4

Length of curb and gutter eliminated – 1,350 ft
Drainage spillways eliminated - 2

APPENDIX

COST MODEL #1

VALUE ENGINEERING

COST MODEL / DISTRIBUTION

By

Decreasing Item Number Without Building

Project No. IM-0000-00(689)

I-95 Welcome Center - Northbound

PI No. 0000689

Camden County

July 2009

Element ID.	Item Description	Cost x $1,000	%
A	Concrete Pavement	2,972	25
B	Grading Complete	2,795	23
C	Graded Aggregate Base	1,827	15
D	Asphalt Concrete Pavement	1,110	9
E	Landscape	728	6
F	Site Lighting	673	6
84% Cost Line			
G	Storm Drainage	490	4
H	Signing and Marking	342	3
I	Sidewalks	270	2
J	Erosion Control	264	2
K	Utilities	262	2
L	Curb and Gutter	164	1
M	Traffic Control / Field Office	142	1
N	Chain Link Fence	76	1
O	Guard Rail	35	<1
	TOTAL	**$12,150**	**100%**

COST MODEL #2

VALUE ENGINEERING

COST MODEL / DISTRIBUTION

By

Decreasing Item Number Without Building

Project No. IM-0000-00(690)

I-95 Welcome Center - Southbound

PI No. 0000690

Chatham County

July 2009

Element ID.	Item Description	Cost x $1,000	%
A	Grading Complete	3,221	55
B	Utilities	530	9
C	Traffic Control	401	7
D	Landscape	384	7
E	Site Lighting	307	5
88% Cost Line			
F	Storm Drainage	282	5
G	Asphalt Concrete Pavement	261	4
H	Concrete Sidewalk and Driveways	152	3
I	Graded Aggregate Base	124	2
J	Erosion Control	95	2
K	Curb and Gutter	69	1
L	Concrete A,B and C	45	<1
M	Signing and Marking	25	<1
			-
	TOTAL	**$5,896**	**100%**

INFORMATION PHASE ------- FUNCTION ANALYSIS

I-95 Welcome Centers – Camden Location

System: **Update Facilities**
Function: **Expand / Promote Tourism**

ITEM		FUNCTION			INITIAL DOLLARS (x 1,000)		
No.	DESCRIPTION	Verb	Noun	Kind*	Cost	% of Total	Worth
A	Concrete pavement	Support	Load	S	2,972	25	2,000
		Drain	Area				
		Store	Vehicles				
B	Grading Complete	Demolish	Existing Items	B	2,795	23	2,600
		Prepare	Site				
		Raise	Grade				
C	Graded Aggregate Base	Support	Site	S	1,827	15	1,827
		Support	Pavement				
D	AC Pavement	Support	Load	B	1,110	9	1,000
		Drain	Area				
		Store	Vehicle				
E	Landscape	Enhance	Appearance	S	728	6	650
F	Site Lighting	Illuminate	Area	S	673	6	600
TOTALS					**10,105**	**84**	**8,677**

* B = Basic, S = Secondary

INFORMATION PHASE ------- FUNCTION ANALYSIS

I-95 Welcome Centers – Chatham Location

System: **Update Facilities**
Function: **Expand / Promote Tourism**

ITEM		FUNCTION			INITIAL DOLLARS (x 1,000)		
No.	DESCRIPTION	Verb	Noun	Kind*	Cost	% of Total	Worth
A	Grading Complete	Demolish	Material	S	3,221	55	3,000
		Prepare	Site				
B	Utilities	Distribute	Water	B	530	9	500
		Drain	Sewage				
		Distribute	Power				
C	Traffic Control	Protect	Workers	B	401	7	375
		Allow	Construction				
D	Landscape	Beautify	Area	S	384	7	300
		Enhance	Appearance				
E	Site Lighting	Illuminate	Area	S	307	5	250
TOTALS					**4,843**	**83**	**4,425**

* B = Basic, S = Secondary

CREATIVE PHASE Creative Idea Listing		JUDGMENT PHASE Idea Evaluation	
I-95 Welcome Center – Camden Location			
NO.	**CREATIVE IDEA**	**COMMENTS**	**IDEA RATING ****
A	**Concrete Pavement**		
A-1	Revise traffic circulation		√
A-2	Reduce thickness of concrete		See A-4
A-3	Reduce use of concrete		√
A-4	Revise pavement design		√
A-5	Use asphalt sidewalks		√
A-6	Use asphalt for car parking area		√
B	**Grading Complete**		
B-1	Reuse existing pavement		√
B-2	Use sewage pump station, reduce grade	Life cycle not cost effective	**X**
B-3	Buildup building in lieu of earthwork – use ramps	Not cost effective –earthwork less costly	**X**
B-4	Reduce fill	Minimal savings	**X**
C	**Graded Aggregate Base (GAB)**		
C-1	Use demolished concrete for GAB		√

** √ = Idea will be evaluated; X= idea will be dropped; DC = Design Consideration – presented for consideration by the design team

NO.	CREATIVE IDEA	COMMENTS	IDEA RATING **
C-2	Reduce thickness		See A-4
D	**Asphaltic Concrete**		
D-1	Use porous concrete		√
D-2	Eliminate layer of asphaltic cement in pavement section	Needed for bonding	**X**
E	**Landscape**		
E-1	Reduce extent of landscaping		√
F	**Site Lighting**		
F-1	Reduce extent of lighting		**DC**
G	**Storm Drainage**		
G-1	Optimize drainage		√
H	**Other**		
H-1	Eliminate select curbing		√
H-2	Use asphalt curb	Not ideal with number of trucks	**X**
H-3	Evaluate construction phasing	Looks Ok as designed	√

** √ = Idea will be evaluated; X= idea will be dropped; DC= Design Consideration – presented for consideration by the design team

CREATIVE PHASE Creative Idea Listing		JUDGMENT PHASE Idea Evaluation	
I-95 Welcome Center – Chatham Location			
NO.	**CREATIVE IDEA**	**COMMENTS**	**IDEA RATING ****
A	**Grading Complete**		
A-1	Revise traffic circulation		√
A-2	Use asphalt sidewalks		√
B	**Utilities**		
B-1	Reduce number of water fountains		√
C	**Traffic Control**		
	No ideas generated		
D	**Landscaping**		
D-1	Review plan for energy / resource reduction		√
D-2	Reduce the number of grill replacements		√
D-3	Replace the number of waste receptacles		√
E	**Site Lighting**		
E-1	Reduce the extent of site lighting		**DC**

** √ = Idea will be evaluated; X= idea will be dropped; DC = Design Consideration – presented for consideration by the design team

Page 2 of 2

NO.	CREATIVE IDEA	COMMENTS	IDEA RATING **
F	**Storm Drainage**		
F-1	Optimize storm drainage		√
G	**Other**		
G-1	Use asphalt curb	Not feasible with number of trucks	**X**
G-2	Reduce curbing where feasible		√

** √ = Idea will be evaluated; X= idea will be dropped; DC= Design Consideration – presented for consideration by the design team

VE STUDY SIGN-IN SHEET

Project No.: IM000-0000-00(689)(690) County: Camden & Chatham PI No.: 0000689 & 0000690 Date: July 7-10, 2009

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	~~Ken Kwerho~~	~~00258268~~	~~Traffic Operations~~	404-635-8144	kwerho@dot.ga.gov
	Ron Wishon	00208180	Engineering Services	404-631-1753	rwishon@dot.ga.gov
✓	Matt Sanders	00284154	Engineering Services	404-631-1752	msanders@dot.ga.gov
✓	DAVE WOHLSCHEID		MACTEC	(C) 571-217-0808	dcwohlscheid@MACTEC.com
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	Nabil Kamal	00729514	TRAFFIC OPERATION	404-635-3026	nkamal@dot.ga.gov
	11 ATTENDED TUESDAY				
	7 ATTENDED FRIDAY				