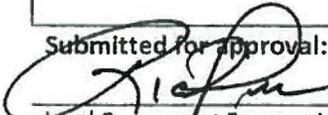
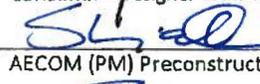


**DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA
TIA PROJECT CONCEPT REPORT**

| | |
|---|-----------------------------|
| Project Type: <u>Interchange</u> | P.I. Number: <u>0011437</u> |
| GDOT District: <u>3</u> | County: <u>Muscogee</u> |
| Federal Route Number: <u>US 27/US 280</u> | MPO TIP Number: _____ |
| State Route Number: <u>SR 1/SR 520</u> | |

A new interchange is to be constructed adjacent to Custer Road and US 27/US 280/SR 1/SR 520/Victory Drive to allow public access to Fort Benning Technology Park.

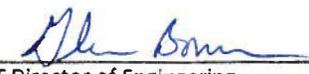
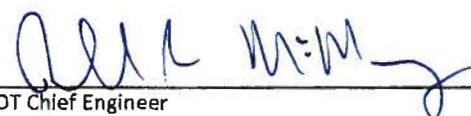
Submitted for approval:

| | | |
|---|-------------------------------------|----------------|
|  | _____ | <u>1/13/14</u> |
| Local Government Representative | | DATE |
|  | <u>Wolverton * Associates, Inc.</u> | <u>1/13/14</u> |
| Consultant Designer & Firm | | DATE |
|  | _____ | <u>1/15/14</u> |
| AECOM (PM) Preconstruction Manager | | DATE |
|  | _____ | <u>1/15/14</u> |
| AECOM Program Manager | | DATE |
|  | _____ | <u>1/17/14</u> |
| GDOT TIA Regional Coordinator | | DATE |
|  | _____ | <u>1/17/14</u> |
| State TIA Administrator | | DATE |

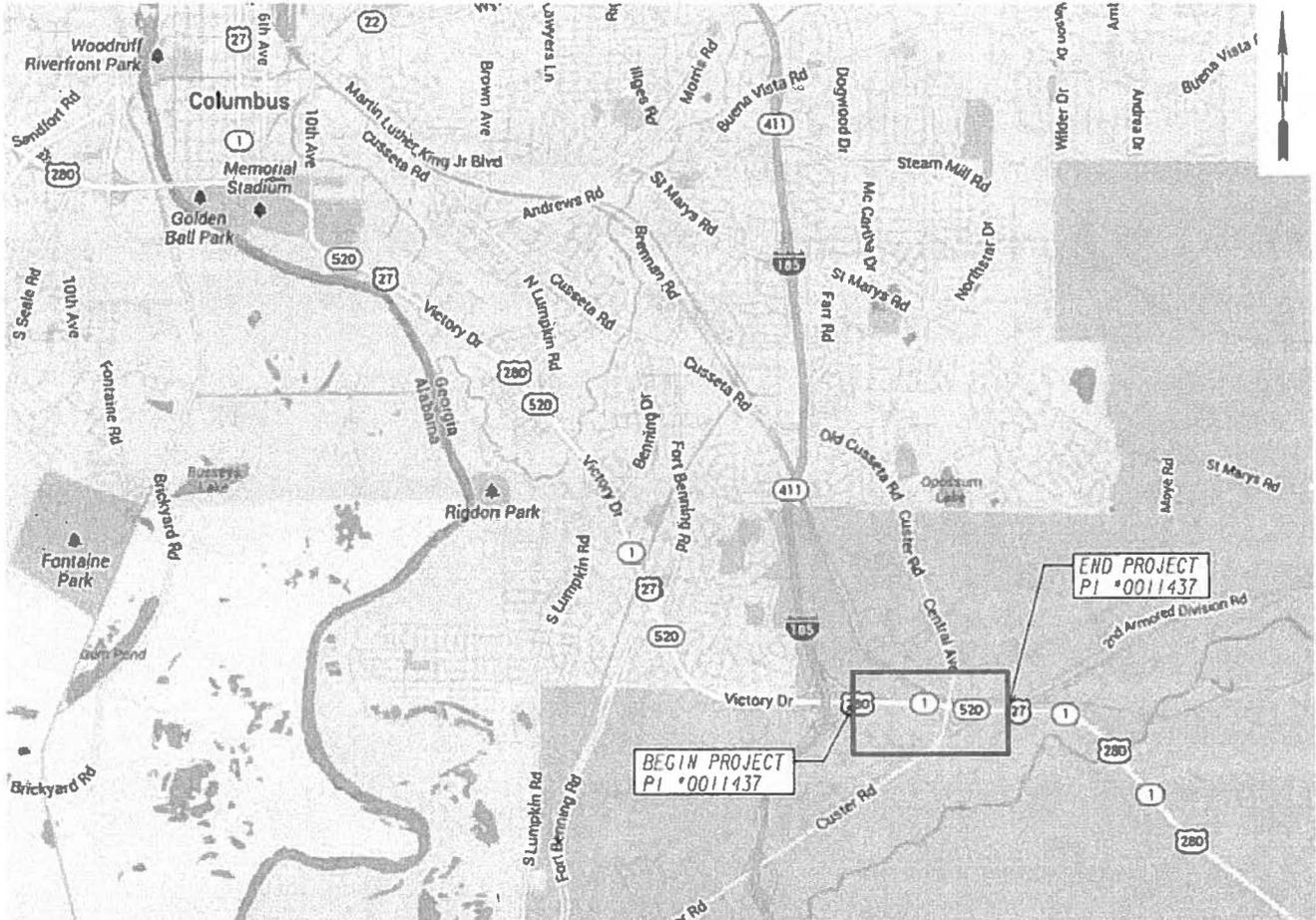
Recommendation for approval:

The concept as presented herein and submitted for approval is consistent with that which is included in the Regional Transportation Plan (RTP) and/or the State Transportation Improvement Program (STIP).

Approval:

| | | |
|--|-------|----------------|
| Concur:  | _____ | <u>1/23/14</u> |
| GDOT Director of Engineering | | DATE |
| Approve:  | _____ | <u>2/3/14</u> |
| GDOT Chief Engineer | | DATE |

PROJECT LOCATION



County: Muscogee

PLANNING & BACKGROUND DATA**Project Justification Statement:**

The City of Columbus has identified the US 27 at Custer Road Interchange Improvements Project as a top priority project for the area. The proposed project has been identified in the local government's Transportation Investment Act (TIA) program as a means to provide civilians with access to a proposed commercial development (Benning Technology Park) without having to pass through the Fort Benning Base security checkpoint interchange. Benning Technology Park is anticipated to bring economic growth to the area. The proposed project also would accommodate future growth of Fort Benning associated with planning actions by the Defense Base Closure and Realignment Commission (BRAC).

Description of the proposed project:

The interchange at US 27/US 280/SR 1/SR 520/Victory Drive and Custer Road is proposed to be modified to allow public access to a parcel located between I-185, Cusseta Road, and US 27. The project would reconstruct the existing interchange and would improve the existing Fort Benning security checkpoint interchange system to allow for non-checkpoint access to Custer Road from US 27. The project also would relieve congestion on the local Base roads by adding gated ramps to the existing interchange that would be open to Base traffic during major events such as graduation. The proposed project would begin at a point approximately 0.69 mile west of the Victory Drive at Custer Road interchange and extend to a point approximately 0.54 mile east of the interchange. The total project length is approximately 1.23 miles. The geographic midpoint of the project is located at 32.404894N and 84.912113W.

Federal Oversight: Full Oversight Exempt State Funded Other - TIA

MPO: Columbus - Phenix City MPO

MPO Project ID N/A

Regional Commission: River Valley RC

RC Project ID 08-000062

Congressional District(s): 2

Functional Classification:

US 27 – Urban Principal Arterial

Custer Road – Urban Minor Arterial Street

Is this a 3R (Resurfacing, Restoration, & Rehabilitation) Project? No Yes

Is this project on a designated Bike Route, Pedestrian Plan, or Transit Network?

None Bike Route Pedestrian Plan Transit Network

County: Muscogee

CONTEXT SENSITIVE SOLUTIONS

Issues of Concern:

Impacts to Fort Benning Housing

Impacts to Fort Benning Security

Context Sensitive Solutions:

There were five meetings held with Fort Benning which helped identify a preferred alternative that minimized impacts to residential housing and base security while providing improved access from Custer Road.

DESIGN AND STRUCTURAL DATA

Mainline Design Features: CD System

| Feature | Existing | Standard* | Proposed |
|---|----------|-----------|----------|
| Typical Section | | | |
| - Number of Lanes | N/A | 2 | 2 |
| - Lane Width(s) | N/A | 11'-12' | 12' |
| - Median Width & Type | N/A | N/A | N/A |
| - Outside Shoulder or Border Area Width | N/A | 12' | 12' |
| - Outside Shoulder Slope | N/A | 4% | 4% |
| - Inside Shoulder Width | N/A | 10' | 10' |
| - Sidewalks | N/A | N/A | N/A |
| - Auxiliary Lanes | N/A | N/A | N/A |
| - Bike Lanes | N/A | N/A | N/A |
| Posted Speed | N/A | | 45 MPH |
| Design Speed | N/A | 45 MPH | 45 MPH |
| Min Horizontal Curve Radius | N/A | 733' | 916' |
| Superelevation Rate | N/A | 6% | 6% |
| Grade | N/A | 5% | 5% |
| Access Control | N/A | N/A | N/A |
| Right-of-Way Width | N/A | N/A | N/A |
| Maximum Grade – Crossroad | N/A | N/A | N/A |
| Design Vehicle | N/A | WB-67 | WB-67 |

*According to current GDOT design policy if applicable

Mainline Design Features: Ramps

| Feature | Existing | Standard* | Proposed |
|---|----------|-----------|----------|
| Typical Section | | | |
| - Number of Lanes | N/A | 1 | 1 |
| - Lane Width(s) | N/A | 16' | 16' |
| - Median Width & Type | N/A | N/A | N/A |
| - Outside Shoulder or Border Area Width | N/A | 12' | 12' |

County: Muscogee

| | | | |
|-----------------------------|-----|--------------|--------------|
| - Outside Shoulder Slope | N/A | 4% | 4% |
| - Inside Shoulder Width | N/A | 8' | 8' |
| - Sidewalks | N/A | N/A | N/A |
| - Auxiliary Lanes | N/A | N/A | N/A |
| - Bike Lanes | N/A | N/A | N/A |
| Posted Speed | N/A | N/A | 25 TO 45 MPH |
| Design Speed | N/A | N/A | 25 TO 45 MPH |
| Min Horizontal Curve Radius | N/A | 144' OR 231' | 174' OR 250' |
| Superelevation Rate | N/A | 6% | 6% |
| Grade | N/A | 7% | 7% |
| Access Control | N/A | N/A | N/A |
| Right-of-Way Width | N/A | N/A | N/A |
| Maximum Grade – Crossroad | N/A | N/A | N/A |
| Design Vehicle | N/A | WB-67 | WB-67 |

*According to current GDOT design policy if applicable

Mainline Design Features: Urban Local Roads

| Feature | Existing | Standard* | Proposed |
|---|----------|-----------|----------|
| Typical Section | | | |
| - Number of Lanes | N/A | 1 | 1 |
| - Lane Width(s) | N/A | 11-12' | 12' |
| - Median Width & Type | N/A | N/A | N/A |
| - Outside Shoulder or Border Area Width | N/A | 8' | 8' |
| - Outside Shoulder Slope | N/A | 6% | 6% |
| - Inside Shoulder Width | N/A | 8' | 8' |
| - Sidewalks | N/A | N/A | N/A |
| - Auxiliary Lanes | N/A | N/A | N/A |
| - Bike Lanes | N/A | N/A | N/A |
| Posted Speed | N/A | N/A | 25 MPH |
| Design Speed | N/A | N/A | 25 MPH |
| Min Horizontal Curve Radius | N/A | 144' | 282' |
| Superelevation Rate | N/A | 6% | 6% |
| Grade | N/A | 10% | 8% |
| Access Control | N/A | N/A | N/A |
| Right-of-Way Width | N/A | N/A | N/A |
| Maximum Grade – Crossroad | N/A | N/A | N/A |
| Design Vehicle | N/A | WB-67 | WB-67 |

*According to current GDOT design policy if applicable

Major Structures:

| Structure | Existing | Proposed |
|--|----------|--|
| Bridge #1 (Ramp over US 27/US 280/ SR 1/ SR | None | Length = 240' Width = 40' Two 12' lanes with 8' outside |

County: Muscogee

| | | |
|---|--|--|
| <p>520/Victory Drive)</p> <p>Bridge #2 (Ramp over Custer Road)</p> <p>Bridge #3 (Structure ID: 215-0163-0, Custer Road Bridge over US 27/US 280/ SR 1/ SR 520/Victory Drive)</p> <p>Bridge #4 (Structure ID: 215-0162-0, Ramps to and from Custer Road Bridge over US 27/US 280/ SR 1/ SR 520/Victory Drive)</p> <p>Existing Culvert #1 (Structure ID: 215-0001-0, tunnel under US 27/US 280/ SR 1/ SR 520/Victory Drive)</p> <p>Proposed Culvert #2 New 9'x8' box culvert under ramp WB4 and EB2A</p> | <p>None</p> <p>Length = 716' Width = 102.4' Number of lanes varies 2-5 with 6' outside shoulders. Current sufficiency rating = 97.25</p> <p>Length = 789' Width = 43.3' Two 12' lanes with 8' outside shoulders. Current sufficiency rating = 95.96</p> <p>Length = 52' Width = 188.80' Four lanes with median on US 27, tunnel under US 27 carries 2 lanes Current sufficiency rating = 87.76</p> <p>None</p> | <p>shoulders</p> <p>Length = 85' Width = 30' One 16' lane with a 10' outside shoulder and a 4' inside shoulder</p> <p>No impact</p> <p>No impact</p> <p>Extend 80' North of US 27/US 280/SR 1/SR 520/Victory Drive</p> <p>Construct 164' long 9'x8' box culvert under ramps.</p> |
| <p>Wall #1</p> <p>Wall #2</p> <p>Wall #3</p> <p>Wall #4</p> <p>Wall #5</p> <p>Wall #6</p> <p>Wall #7</p> <p>Wall #8</p> <p>Wall #9</p> | <p>None</p> <p>None</p> <p>None</p> <p>None</p> <p>None</p> <p>None</p> <p>None</p> <p>None</p> <p>None</p> | <p>Length = 560' Maximum Ht =35' Average Height = 25'</p> <p>Length = 1013' Maximum Ht =32' Average Height = 20'</p> <p>Length = 246' Maximum Ht =50' Average Height = 40'</p> <p>Length = 232' Maximum Ht =20' Average Height = 15'</p> <p>Length = 205' Maximum Ht =25' Average Height = 23'</p> <p>Length = 405' Maximum Ht =22' Average Height = 15'</p> <p>Length = 120' Maximum Ht =24' Average Height = 18'</p> <p>Length = 120' Maximum Ht =25' Average Height = 20'</p> <p>Length = 120' Maximum Ht =25' Average Height = 20'</p> |

County: Muscogee

Major Interchanges/Intersections:

US 27/US 280/SR 1/SR 520/Victory Drive and I-185 – grade separated interchange located west of the project limits

US 27/US 280/SR 1/SR 520/Victory Drive and Custer Road – grade separated interchange located within project limits

Utility Involvements:

Liberty Utilities of Georgia- Gas

Flint EMC- Electric

Georgia Power Company- Electric

Fort Benning- Electric, Telephone, Gas, Water & Sewer

Columbus Water Works- Water & Sewer

Wide Open West Cable TV- CATV

Charter Communications- CATV

AT&T- Telephone

Public Interest Determination Policy and Procedure recommended (Utilities)? No Yes

SUE Required: No Yes

Railroad Involvement:

No railroads are anticipated to be impacted by this project. Two railroads are located within project limits:

- Norfolk Southern has a railroad that runs along the north side of Cusseta Road.
- GDOT owns a railroad that is no longer in service that runs along the north side of Cusseta Road between Norfolk Southern Railroad and Cusseta Road.

Complete Streets - Bicycle, Pedestrian, and/or Transit Warrants:

Warrants met: None Bicycle Pedestrian Transit

Right-of-Way:

Required Right-of-Way anticipated: No Yes Undetermined

Easements anticipated: None Temporary Permanent Utility Other

| | |
|---|---|
| Anticipated number of impacted parcels: | 2 |
| Displacements anticipated: | 0 |
| Total: | 2 |
| Businesses: | 1 |
| Residences: | 0 |
| Other: | 1 |

Location and Design approval: Not Required Required

Off-site Detours Anticipated: No Undetermined Yes

Transportation Management Plan [TMP] Required: No Yes
 If Yes: Project classified as: Non-Significant Significant
 TMP Components Anticipated: TTC TO PI

Design Exceptions to FHWA/AASHTO controlling criteria anticipated:

| FHWA/AASHTO Controlling Criteria | No | Undeter- -mined | Yes | Appvl Date (if applicable) |
|-----------------------------------|-------------------------------------|--------------------------|--------------------------|-------------------------------|
| 1. Design Speed | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| 2. Lane Width | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| 3. Shoulder Width | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| 4. Bridge Width | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| 5. Horizontal Alignment | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| 6. Superelevation | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| 7. Vertical Alignment | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| 8. Grade | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| 9. Stopping Sight Distance | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| 10. Cross Slope | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| 11. Vertical Clearance | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| 12. Lateral Offset to Obstruction | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| 13. Bridge Structural Capacity | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |

Design Variances to GDOT Standard Criteria anticipated:

| GDOT Standard Criteria | Reviewing Office | No | Undeter- -mined | Yes | Appvl Date (if applicable) |
|---|---------------------|-------------------------------------|--------------------------|--------------------------|-------------------------------|
| 1. Access Control - Median Opening Spacing | DP&S | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| 2. Median Usage & Width | DP&S | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| 3. Intersection Skew Angle | DP&S | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| 4. Lateral Offset to Obstruction | DP&S | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| 5. Intersection Sight Distance | DP&S | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| 6. Bike, Pedestrian & Transit Accommodations | DP&S | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| 7. GDOT Drainage Manual | DP&S | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| 8. Georgia Standard Drawings | DP&S | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| 9. GDOT Bridge & Structural Manual | Bridge Design | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| 10. Roundabout Illumination | DP&S | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| 11. Rumble Strips | DP&S | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| 12. Safety Edge | DP&S | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |

County: Muscogee

VE Study anticipated: No Yes Completed – Date:

ENVIRONMENTAL DATA

Anticipated Environmental Document:

GEPA: NEPA: CE EA/FONSI EIS

Project Air Quality:

Is the project located in a PM 2.5 Non-attainment area? No Yes
 Is the project located in an Ozone Non-attainment area? No Yes
 Is a Carbon Monoxide hotspot analysis required? No Yes

MS4 Compliance – Is the project located in an MS4 area? No Yes

Environmental Permits/Variations/Commitments/Coordination anticipated:

| Permit/ Variance/ Commitment/ Coordination Anticipated | No | Yes | Remarks |
|---|-------------------------------------|-------------------------------------|--------------|
| 1. U.S. Coast Guard Permit | <input checked="" type="checkbox"/> | <input type="checkbox"/> | |
| 2. Forest Service/Corps Land | <input checked="" type="checkbox"/> | <input type="checkbox"/> | |
| 3. CWA Section 404 Permit | <input type="checkbox"/> | <input checked="" type="checkbox"/> | |
| 4. Tennessee Valley Authority Permit | <input checked="" type="checkbox"/> | <input type="checkbox"/> | |
| 5. Buffer Variance | <input type="checkbox"/> | <input checked="" type="checkbox"/> | |
| 6. Coastal Zone Management Coordination | <input checked="" type="checkbox"/> | <input type="checkbox"/> | |
| 7. NPDES | <input type="checkbox"/> | <input checked="" type="checkbox"/> | |
| 8. FEMA | <input checked="" type="checkbox"/> | <input type="checkbox"/> | |
| 9. Cemetery Permit | <input checked="" type="checkbox"/> | <input type="checkbox"/> | |
| 10. Other Permits | <input type="checkbox"/> | <input checked="" type="checkbox"/> | Fort Benning |
| 11. Other Commitments | <input checked="" type="checkbox"/> | <input type="checkbox"/> | |
| 12. Other Coordination | <input type="checkbox"/> | <input checked="" type="checkbox"/> | Fort Benning |

Is a PAR required? No Yes Completed – Date:

NEPA/GEPA: The proposed project is being documented under GEPA because it is locally funded through the state’s TIA program. In addition, because Fort Benning is a federal entity, any work conducted on base property must comply with NEPA; therefore, supplemental information to aid Fort Benning in satisfying the NEPA requirements is also being provided as part of the environmental evaluation and documentation.

Ecology: An Ecology Resources Survey and Assessment of Effects Report has been completed for the proposed project. An aquatic survey for protected fish and mussel species was also conducted, and the results of that survey have been incorporated into the Ecology Report. The findings reflect that there are no adverse impacts anticipated to protected species.

County: Muscogee

History: A Phase I Cultural Resources Survey Report has been completed for the proposed project. The State Historic Preservation Office (SHPO) concurred that the proposed project would have no effect on the Former Columbus Southern Railway and the Former Buena Vista & Ellaville Railroad.

Archaeology: A Phase I Archaeological Survey was completed for the proposed project. The SHPO concurred with the findings that there are no National Register of Historic Places (NRHP)-eligible archaeological sites within the proposed project area.

Air & Noise: The proposed project is located in an area that is in attainment for both ozone and PM 2.5, and an air quality impact assessment has been completed for the project. The assessment determined no significant impacts to air and noise are anticipated.

A highway noise evaluation is being provided for the proposed project in order to assist Fort Benning in satisfying its NEPA documentation requirements. TNM 2.5 computer modeling will be performed to determine the existing sound levels at representative noise-sensitive receptors in accordance with GDOT’s *Highway Noise Abatement Policy for Federal-Aid Projects*. Noise abatement measures will be evaluated for any receptors that are predicted to be impacted by the Preferred Alternative, including determinations of feasibility and reasonableness.

Public Involvement: Public involvement is not required as part of the GEPA assessment; however, Fort Benning may conduct public involvement activities.

Major stakeholders:

- Columbus Consolidated Government
- Fort Benning
- Benning Technology Park

CONSTRUCTION

Issues potentially affecting constructability/construction schedule:

Fort Benning security and permit/easement to complete construction

Early Completion Incentives recommended for consideration: No Yes

PROJECT RESPONSIBILITIES

Project Activities:

| Project Activity | Party Responsible for Performing Task(s) |
|--------------------------|---|
| Concept Development | Wolverton & Associates |
| Design | Wolverton & Associates |
| Right-of-Way Acquisition | City of Columbus |
| Utility Relocation | Contractor |
| Letting to Contract | GDOT TIA |
| Construction Supervision | GDOT TIA |
| Providing Material Pits | Contractor |

County: Muscogee

| | |
|---|---------------|
| Providing Detours | N/A |
| Environmental Studies, Documents, and Permits | Michael Baker |
| Environmental Mitigation | Michael Baker |
| Construction Inspection & Materials Testing | Contractor |

Lighting required: No Yes

Initial Concept Meeting: N/A

Concept Meeting: N/A

Other projects in the area:

PI#001434 Cusseta Road and Old Cusseta Road Improvements: The proposed project consists of improvements on Cusseta Road/Old Cusseta Road/CR 62 from Fort Benning Road to Staunton Drive.

Other coordination to date:

- 4-24-13 – Meeting with Fort Benning to discuss project
- 5-22-13 – Meeting with Fort Benning to determine alternatives
- 6-12-13 – Meeting with Fort Benning to discuss alternatives
- 8-7-13 – Meeting with Fort Benning to finalize alternatives
- 9-18-13 – Meeting with Fort Benning for approval of alternative

Project Cost Estimate and Funding Responsibilities:

| | Breakdown of PE | ROW | Reimbursable Utility | CST* | Environmental Mitigation | Total Cost |
|------------------|-----------------|------------|----------------------|--------------|--------------------------|--------------|
| By Whom | GDOT TIA | GDOT TIA | GDOT TIA | GDOT TIA | GDOT TIA | |
| \$ Amount | \$2,150,000 | \$5,000 | \$187,000 | \$14,333,321 | \$122,519 | \$16,797,840 |
| Date of Estimate | 10/17/2013 | 10/17/2013 | 11/17/2013 | 11/17/2013 | 10/11/2013 | |

*CST Cost includes: Construction, Engineering and Inspection, and Liquid AC Cost Adjustment.

ALTERNATIVES DISCUSSION

Alternative selection:

| | | | |
|--|----------------|------------------------------|---------------------|
| Preferred Alternative: CD System/Loop Ramp | | | |
| Estimated Property Impacts: | 2 | Estimated Total Cost: | \$16,797,840 |
| Estimated ROW Cost: | \$5,000 | Estimated CST Time: | 24 months |
| Rationale: | | | |
| <ul style="list-style-type: none"> • Minimal interference with secure base traffic, maintains controlled access to base property. • Allows full access to Fort Benning Technology Park. • Corrects substandard spacing between Custer Road and I-185 Interchange. | | | |

County: Muscogee

| | | | |
|---|------------|------------------------------|------------|
| No-Build Alternative: | | | |
| Estimated Property Impacts: | 0 | Estimated Total Cost: | \$0 |
| Estimated ROW Cost: | \$0 | Estimated CST Time: | 0 |
| Rationale: | | | |
| <ul style="list-style-type: none"> Does not allow public to access future development of Fort Benning Technology Park. | | | |

| | | | |
|---|----------------|------------------------------|---------------------|
| Alternative 1: CD System/Widen Existing Loop Ramp | | | |
| Estimated Property Impacts: | 2 | Estimated Total Cost: | \$16,789,112 |
| Estimated ROW Cost: | \$5,000 | Estimated CST Time: | 24 months |
| Rationale: | | | |
| <ul style="list-style-type: none"> Minimal interference with secure base traffic, maintains controlled access to base property. Allows full access to Fort Benning Technology Park. Corrects substandard spacing between Custer Road and I-185 Interchange. This alternative requires a wider bridge over Custer Road and does not allow eastbound movement to US 27/US 280/SR 1/SR 520/Victory Drive to be removed from project if costs are too high. | | | |

Comments: Additional alternatives were evaluated but not pursued as per Fort Benning's request.

Attachments:

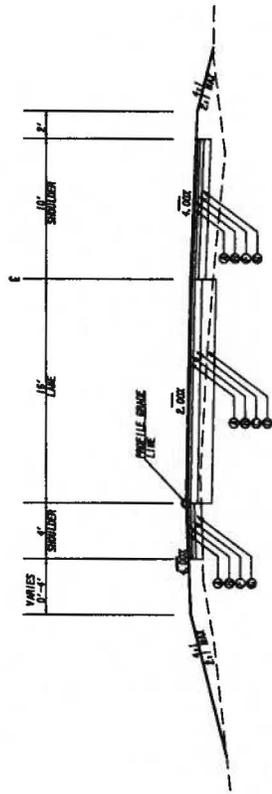
1. Concept Layout
2. Typical sections
3. Detailed Cost Estimates:
 - a. Construction including Engineering and Inspection
 - b. Completed Fuel & Asphalt Price Adjustment forms
 - c. Utilities
 - d. Environmental Mitigation (EPD, etc)
4. Bridge inventory
5. MS4 Summary
6. Pavement analysis
7. Meeting minutes
8. Design Memo

Attachment 1

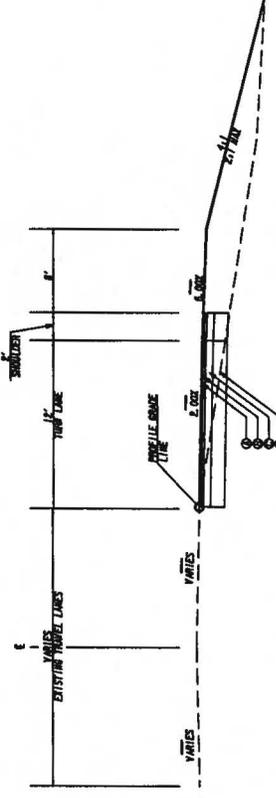
Concept Layout

Attachment 2

Typical Sections



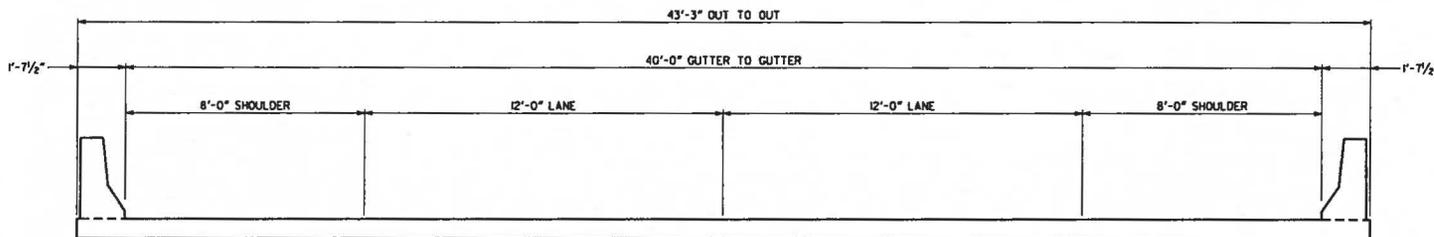
TYPICAL SECTION #1
 FINISH GRADE
 2'-0" TO STA. 100+00
 2'-0" TO STA. 100+00
 4'-0" TO STA. 100+00



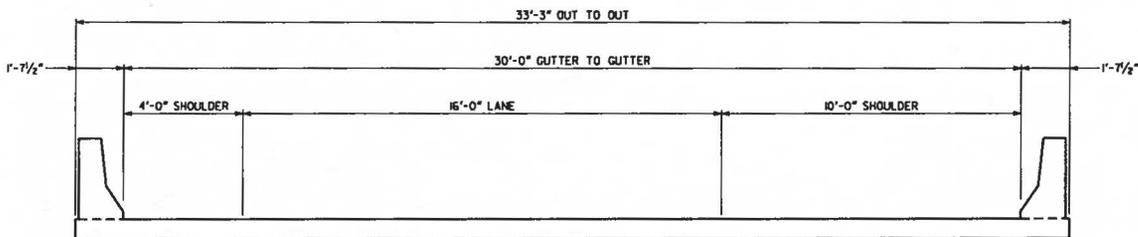
TYPICAL SECTION #2
 FINISH GRADE
 2'-0" TO STA. 100+00
 2'-0" TO STA. 100+00

| | | | | | | |
|--|---------------------|---|---|--|--|--|
| | NOT TO SCALE |  Wolverton & Associates <small>INCORPORATED</small> <small>1000 W. 10th Street, Suite 100</small> <small>Lawrence, KS 66044</small> | REVISIONS <table border="1" style="width: 100%; height: 40px;"> <tr><td> </td><td> </td></tr> </table> | | | STATE OF KANSAS DEPARTMENT OF TRANSPORTATION OFFICE OF THE DIRECTOR US 27/US 280/SR /SR 580/ AT CLUSTER RD  |
| | | | | | | |

| | | | |
|-------|----------------|-----------|--------------|
| STATE | PROJECT NUMBER | SHEET NO. | TOTAL SHEETS |
| GA. | | 1 | 1 |



TYPICAL SECTION - BRIDGE NO. 1
TOTAL BRIDGE LENGTH = 240'-0"



TYPICAL SECTION - BRIDGE NO. 2
TOTAL BRIDGE LENGTH = 90'-0"

| BRIDGE COST ESTIMATE | | | | | |
|----------------------|--------------------------|------------------------------|----------------------------|-----------------------------|-----------------------------|
| BRIDGE NO. | TOTAL BRIDGE LENGTH (FT) | BRIDGE WIDTH OUT TO OUT (FT) | TOTAL BRIDGE AREA (SQ. FT) | BRIDGE COST PER SQUARE FOOT | TOTAL BRIDGE COST (DOLLARS) |
| 1 | 240'-0" | 43'-3" | 10380 | 95 | 986100 |
| 2 | 90'-0" | 33'-3" | 2993 | 95 | 284335 |

| WALL COST ESTIMATE | | | | | | |
|--------------------|-----------|------------------------|--------------------------|--------------------------|-------------------------------------|---------------------------|
| WALL NO. | WALL TYPE | TOTAL WALL LENGTH (FT) | AVERAGE WALL HEIGHT (FT) | TOTAL WALL AREA (SQ. FT) | SQUARE FOOT COST (DOLLARS / SQ. FT) | TOTAL WALL COST (DOLLARS) |
| 1 | MSE | 560'-0" | 25'-0" | 14000 | 50 | 700000 |
| 2 | MSE | 1013'-0" | 20'-0" | 20260 | 50 | 1013000 |
| 3 | MSE | 292'-0" | 35'-0" | 10220 | 50 | 511000 |
| 4 | MSE | 100'-0" | 15'-0" | 1500 | 50 | 75000 |
| 5 | MSE | 265'-0" | 24'-0" | 6360 | 50 | 318000 |
| 6 | MSE | 405'-0" | 15'-0" | 6075 | 50 | 303750 |
| 7 | MSE | 120'-0" | 18'-0" | 2160 | 50 | 108000 |
| 8 | MSE | 180'-0" | 20'-0" | 3600 | 50 | 180000 |
| 9 | MSE | 160'-0" | 18'-0" | 2880 | 50 | 144000 |

Baker

MICHAEL BAKER CORPORATION
3395 ENGINEERING DRIVE
WILDCROSS, GEORGIA 30092
17701 883-9118

GEORGIA
DEPARTMENT OF TRANSPORTATION
ENGINEERING DIVISION-OFFICE OF BRIDGES AND STRUCTURES

BRIDGE TYPICAL SECTIONS &
STRUCTURES COST ESTIMATE
US27/SRI (VICTORY DR) & CUSTER RD
MUSCOGEE COUNTY P.I.: 0011437

SCALE: NO SCALE SEPTEMBER 2013

| | | | | | | | | |
|---------------------------|-----------|------|-----------|------|-----------|------|-----------|------|
| STRUCTURE SHEET 1 OF 1 | REVISIONS | DATE | REVISIONS | DATE | REVISIONS | DATE | REVISIONS | DATE |
| | | | | | | | | |

| | | |
|---------------|-------------------|---------------|
| DESIGNED: JCR | CHECKED: AKZ | REVIEWED: WEL |
| DRAWN: JCR | DESIGN GROUP: AWB | APPROVED: BFR |

Attachment 3

Detailed Cost Estimates

| GDOT - TIA PI#0011437 | | | | | |
|--------------------------------|-----------------|-----------|------------|-------------------|---------------------|
| US 27 @ Custer Road | | | | | |
| Cost Estimate | | | | | |
| 10/17/2013 | | | | | |
| Alternative | CES | E&I | Liquid A/C | CONTINGENCY (10%) | Total |
| Hybrid CD System/Loop | \$10,664,235.11 | \$533,212 | \$267,851 | \$1,146,530 | \$12,611,828 |
| Addition of Eastbound Movement | \$1,450,971.21 | \$72,549 | \$41,474 | \$156,499 | \$1,721,493 |
| Grand Total: | | | | | \$14,333,321 |

Untitled
STATE HIGHWAY AGENCY

DATE : 10/17/2013
PAGE : 1

JOB ESTIMATE REPORT

JOB NUMBER : 0011437_COPY SPEC YEAR: 01
DESCRIPTION: CUSTER ROAD AND US 27/US 280/SR 1/SR 520/VICTORY DR

ITEMS FOR JOB 0011437_COPY

| LINE | ITEM | ALT | UNITS | DESCRIPTION | QUANTITY | PRICE | AMOUNT |
|------|----------|-----|-------|--|-----------|------------|------------|
| 0005 | 150-1000 | | LS | TRAFFIC CONTROL - PI 0011437 | 1.000 | 1400000.00 | 1400000.00 |
| 0015 | 153-1300 | | EA | FIELD ENGINEERS OFFICE TP 3 | 1.000 | 75408.77 | 75408.78 |
| 0020 | 201-1500 | | LS | CLEARING & GRUBBING - PI 0011437 | 1.000 | 190000.00 | 190000.00 |
| 0025 | 205-0001 | | CY | UNCLASS EXCAV | 36000.000 | 2.74 | 98640.00 |
| 0030 | 206-0002 | | CY | BORROW EXCAV, INCL MATL | 87000.000 | 6.50 | 565500.00 |
| 0040 | 310-1101 | | TN | GR AGGR BASE CRS, INCL MATL | 20000.000 | 15.38 | 307600.00 |
| 0055 | 402-3121 | | TN | RECYL AC 25MM SP,GP1/2,BM&HL | 8100.000 | 67.37 | 545712.55 |
| 0060 | 402-3130 | | TN | RECYL AC 12.5MM SP,GP2,BM&HL | 3100.000 | 75.63 | 234474.20 |
| 0065 | 402-3190 | | TN | RECYL AC 19 MM SP,GP 1 OR 2 ,INC BM&HL | 4000.000 | 80.61 | 322447.48 |
| 0070 | 413-1000 | | GL | BITUM TACK COAT | 6600.000 | 2.49 | 16434.00 |
| 0104 | 433-1200 | | SY | REF CONC APPR SL/I SLOPED EDGE | 300.000 | 158.54 | 47562.00 |
| 0105 | 439-0018 | | SY | PLN PC CONC PVMT CL3 8" THK | 9600.000 | 51.10 | 490560.00 |
| 0110 | 441-3999 | | LF | CONCRETE V GUTTER | 1800.000 | 18.55 | 33390.00 |
| 0115 | 500-3101 | | CY | CLASS A CONCRETE | 610.000 | 365.00 | 222651.27 |
| 0120 | 511-1000 | | LB | BAR REINF STEEL | 71000.000 | 0.79 | 56090.00 |
| 0125 | 550-1180 | | LF | STM DR PIPE 18",H 1-10 | 1000.000 | 32.01 | 32011.30 |
| 0130 | 550-1240 | | LF | STM DR PIPE 24",H 1-10 | 800.000 | 36.70 | 29366.16 |
| 0135 | 550-1480 | | LF | STM DR PIPE 48",H 1-10 | 140.000 | 92.09 | 12892.60 |
| 0140 | 550-4224 | | EA | FLARED END SECT 24 IN, ST DR | 1.000 | 584.31 | 584.32 |
| 0144 | 550-4242 | | EA | FLARED END SECT 42 IN, ST DR | 2.000 | 1687.56 | 3375.12 |
| 0154 | 603-2182 | | SY | STN DUMPED RIP RAP, TP 3, 24" | 1000.000 | 31.54 | 31540.00 |
| 0155 | 603-7000 | | SY | PLASTIC FILTER FABRIC | 1000.000 | 3.24 | 3244.68 |
| 0160 | 610-9099 | | LS | REM WINGWALLS/PARAPETS, STA - PI 0011437 | 1.000 | 2985.65 | 2985.65 |
| 0165 | 620-0100 | | LF | TEMP BARRIER, METHOD NO. 1 | 1000.000 | 23.25 | 23250.00 |
| 0168 | 621-3020 | | LF | CONCRETE BARRIER, TYPE 20 | 3100.000 | 61.57 | 190867.00 |
| 0169 | 621-4070 | | LF | CONCRETE SIDE BARRIER, TY 7C | 240.000 | 137.17 | 32920.80 |
| 0170 | 641-1100 | | LF | GUARDRAIL, TP T | 180.000 | 63.85 | 11493.46 |
| 0175 | 641-1200 | | LF | GUARDRAIL, TP W | 5300.000 | 15.77 | 83581.00 |
| 0180 | 641-5001 | | EA | GUARDRAIL ANCHORAGE, TP 1 | 4.000 | 645.95 | 2583.81 |
| 0185 | 641-5012 | | EA | GUARDRAIL ANCHORAGE, TP 12 | 4.000 | 1865.37 | 7461.49 |
| 0189 | 648-1350 | | EA | IMPACT ATT UNIT, TP-P- PI 0011437 | 3.000 | 16926.00 | 50778.00 |
| 0190 | 668-2100 | | EA | DROP INLET, GP 1 | 10.000 | 1588.78 | 15887.85 |
| 0195 | 668-2110 | | LF | DROP INLET, GP 1, ADDL DEPTH | 60.000 | 182.35 | 10941.59 |
| 0200 | 210-0100 | | LS | GRADING COMPLETE - WALLS | 1.000 | 3100000.00 | 3100000.00 |
| 0205 | 210-0100 | | LS | GRADING COMPLETE - FORT BENNING GATES | 1.000 | 12000.00 | 12000.00 |
| 0210 | 210-0100 | | LS | GRADING COMPLETE - EROSION CONTROL (INCLUDING MS4) | 1.000 | 700000.00 | 700000.00 |
| 0215 | 210-0100 | | LS | GRADING COMPLETE - SIGNING AND MARKING | 1.000 | 600000.00 | 600000.00 |
| 0220 | 210-0100 | | LS | GRADING COMPLETE - LARGE OVERHEAD SIGN | 1.000 | 100000.00 | 100000.00 |
| 0230 | 210-0100 | | LS | GRADING COMPLETE - BRIDGE OVER US 27 | 1.000 | 1000000.00 | 1000000.00 |

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STATE HIGHWAY AGENCY

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JOB ESTIMATE REPORT

| | |
|---------------------|-------------|
| ITEM TOTAL | 10664235.10 |
| INFLATED ITEM TOTAL | 10664235.11 |

TOTALS FOR JOB 0011437_COPY

| | |
|------------------------------|-------------|
| ESTIMATED COST: | 10664235.11 |
| CONTINGENCY PERCENT (0.0): | 0.00 |
| ESTIMATED TOTAL: | 10664235.11 |

PROJ. NO.

CALL NO.

P.I. NO.

DATE

INDEX (TYPE)

REG. UNLEADED
DIESEL
LIQUID AC

| DATE | INDEX |
|--------|-----------|
| Oct-13 | \$ 3.260 |
| | \$ 3.600 |
| | \$ 568.00 |

Link to Fuel and AC Index:

<http://www.dot.ga.gov/doingbusiness/Materials/Pages/asphaltcementindex.aspx>

LIQUID AC ADJUSTMENTS

PA=[((APM-APL)/APL)]xTMTxAPL

Asphalt

| | | | | | | |
|--|----------|-----|----|--------|----|------------|
| Price Adjustment (PA) | | | | 298200 | \$ | 298,200.00 |
| Monthly Asphalt Cement Price month placed (APM) | Max. Cap | 60% | \$ | 908.80 | | |
| Monthly Asphalt Cement Price month project let (APL) | | | \$ | 568.00 | | |
| Total Monthly Tonnage of asphalt cement (TMT) | | | | 875 | | |

| ASPHALT | Tons | %AC | AC ton |
|-----------|--------------|------|------------|
| Leveling | | 5.0% | 0 |
| 12.5 OGFC | | 5.0% | 0 |
| 12.5 mm | 3600 | 5.0% | 180 |
| 9.5 mm SP | | 5.0% | 0 |
| 25 mm SP | 9200 | 5.0% | 460 |
| 19 mm SP | 4700 | 5.0% | 235 |
| | 17500 | | 875 |

BITUMINOUS TACK COAT

| | | | | | | |
|--|----------|-----|----|--------------|----|-----------|
| Price Adjustment (PA) | | | | \$ 11,124.65 | \$ | 11,124.65 |
| Monthly Asphalt Cement Price month placed (APM) | Max. Cap | 60% | \$ | 908.80 | | |
| Monthly Asphalt Cement Price month project let (APL) | | | \$ | 568.00 | | |
| Total Monthly Tonnage of asphalt cement (TMT) | | | | 32.64276701 | | |

Bitum Tack

| Gals | gals/ton | tons |
|------|----------|-----------|
| 7600 | 232.8234 | 32.642767 |

BITUMINOUS TACK COAT (surface treatment)

| | | | | | | |
|--|----------|-----|----|--------|----|---|
| Price Adjustment (PA) | | | | 0 | \$ | - |
| Monthly Asphalt Cement Price month placed (APM) | Max. Cap | 60% | \$ | 908.80 | | |
| Monthly Asphalt Cement Price month project let (APL) | | | \$ | 568.00 | | |
| Total Monthly Tonnage of asphalt cement (TMT) | | | | 0 | | |

Bitum Tack

| | SY | Gals/SY | Gals | gals/ton | tons |
|--------------------|----|---------|------|----------|------|
| Single Surf. Trmt. | | 0.20 | 0 | 232.8234 | 0 |
| Double Surf.Trmt. | | 0.44 | 0 | 232.8234 | 0 |
| Triple Surf. Trmt | | 0.71 | 0 | 232.8234 | 0 |

TOTAL LIQUID AC ADJUSTMENT **\$ 309,324.65**

Utility Cost Summary

| | QUANTITY | UNIT | COST/UNIT | TOTAL COST |
|----------------------|----------|------|-----------------|--------------|
| SANITARY SEWER (12") | 2000 | LF | \$65.00 | \$130,000.00 |
| BURIED POWER LINE | 1000 | LF | \$20.00 | \$20,000.00 |
| POWER POLE | 1 | EA | \$20,000.00 | \$20,000.00 |
| | | | 10% Contingency | \$17,000.00 |
| | | | Total | \$187,000.00 |

Detailed Cost Estimates for Compensatory Mitigation

1. Environmental Mitigation for Clean Water Act Section 404 Impacts:

- (a) Please refer to the attached USACE *Adverse Impact Factors for Riverine Systems Worksheet*.
- (b) Total compensatory mitigation for CWA Section 404 impacts
= **1,270.4 stream credits**.
- (c) Stream credits would be purchased from a USACE-approved mitigation bank. Upatoi Creek Mitigation Bank and the project site are located within Hydrologic Unit Code (HUC) 03130003 of the Chattahoochee River basin.

2. Compensatory Mitigation for Impacts to Buffered State Waters:

- (a) To offset the 1,480.3 square feet of buffer impact that is not associated with CWA Section 404 stream impacts, stream credits would be purchased from a USACE-approved mitigation bank. Upatoi Creek Mitigation Bank and the project site are located within Hydrologic Unit Code (HUC) 03130003 of the Chattahoochee River basin. The required number of stream credits calculation follows the formula in Appendix B of the Georgia Department of Natural Resources – Environmental Protection Division *Stream Buffer Mitigation Guidance*, as follows:
- (b) Multiply 1,480.3 square feet of impact x 0.046 per square feet x 2.5 factor for off-site [i.e., 0.046 factor for maximum credits generated per square foot of stream restoration; 2.5 factor for purchase of credits from a mitigation bank]
= **170.23 stream credits**
(EPD procedure requires purchase of next-higher whole number of credits; i.e., **171 stream credits**)

3. At an estimated price of \$85.00 per stream credit, the total cost for compensatory mitigation would be $1,270.4 + 171 = 1,441.4$ stream credits @ \$85.00 / credit = **\$122,519**.

WORKSHEET 1: ADVERSE IMPACT FACTORS FOR RIVERINE SYSTEMS WORKSHEET

| | | | | | | | | | |
|---|------------------------|-------------------------|------------------------|--|--|-------------------------------------|--|-------------------|-------------|
| Stream Type Impacted | Intermittent 0.1 | | | Perennial Stream > 15' in width 0.4 | | | Perennial Stream ≤ 15' in width 0.8 | | |
| Priority Area | Tertiary 0.5 | | | Secondary 0.8 | | | Primary 1.5 | | |
| Existing Condition | Fully Impaired 0.25 | | | Somewhat Impaired 0.5 | | | Fully Functional 1.0 | | |
| Duration | Temporary 0.05 | | | Recurrent 0.1 | | | Permanent 0.2 | | |
| Dominant Impact | Shade/Clear 0.05 | Utility X-ing 0.4 | Bank Armor 0.7 | Detention 1.5 | Stream Crossing (≤ 100') 1.7 | Impound 2.7 | Morphologic Change 2.7 | Pipe >100' 3.0 | Fill 3.0 |
| Scaling Factor (Based on # linear feet impacted) | < 100' impact 0 | 100-200' impact 0.05 | 201-500' impact 0.1 | 501-1000' impact 0.2 | > 1000' impact 0.4 for each 1000' feet of impact (round impacts to the nearest 1000') (example: 2,200' of impact – scaling factor = 0.8; 2,800' of impact – scaling factor = 1.2) | | | | |
| Reaches to Be Impacted | | | | P/S 1 | | P/S 8 | | | |
| Complete the Following for Each Reach to Be Impacted | | | | | | | | | |
| Simon Channel Evolution Stage | | | | II | | II | | | |
| Rosgen Stream Type/D50 | | | | C | | C | | | |
| Criteria for Selecting Existing Condition for Each Reach | | | | Sandy substrate | | Sandy substrate | | | |
| Bankfull Width and Depth | | | | Width: 10 – 12 ft. Depth: 2-6 in. | | Width: 8 – 10 ft. Depth: 3-5 in. | | | |
| Bankfull Indicators (attach photograph showing bankfull for each reach) | | | | Wrested vegetation | | Wrested vegetation | | | |
| Factors | | | | P/S 1 | | P/S 8 | | | |
| Stream Type Impacted | | | | 0.8 | | 0.8 | | | |
| Priority Area | | | | 0.5 | | 0.5 | | | |
| Existing Condition | | | | 0.5 | | 0.5 | | | |
| Duration | | | | 0.2 | | 0.2 | | | |
| Dominant Impact | | | | 3.0 | | 1.7 | | | |
| Scaling Factor | | | | 0.1 | | 0.0 | | | |
| Sum of Factors M = | | | | 5.1 | | 3.7 | | | |
| Feet Stream in Reach Impacted LF = | | | | 215.0 | | 47 | | | |
| M X LF = | | | | 1,096.5 | | 173.9 | | | |

Total Mitigation Credits Required = (M X LF) = 1,270.4

Attachment 4

Bridge Inventory

Bridge Inventory Data Listing



Parameters: Bridge Serial Num

Structure ID:215-0001-0

Muscogee

SUFF. RATING: 87.76

Location & Geography

Structure ID: 215-0001-0
200 Bridge Information: 06
***6A Feature Int:** M-8000 CUSTER ROAD
***6B Critical Bridge:** 0
***7A Route No Carried:** SR00520
***7B Facility Carried:** SR 520 (US 27)
9 Location: SE COLUMBUS CTY LIMITS
2 Dot District: 3

207 Year Photo: 2012
***91 Inspection Frequency:** 24 Date: 09/04/2012
92A Fract Crit Insp Freq: 0 Date: 02/01/1901
92B Underwater Insp Freq: 0 Date: 02/01/1901
92C Other Spc. Insp Freq: 0 Date: 02/01/1901
*** 4 Place Code:** 19000
***5 Inventory Route(O/U):** 1
Type: 2
Designation: 1
Number: 00027
Direction: 0
***16 Latitude:** 32 24.2630 HMMS Prefix:SR
***17 Longitude:** 84 -54.3750 HMMS Suffix:00 MP:6.78
98 Border Bridge: 000%Shared:00
99 ID Number: 0000000000000000
***100 STRAHNET:** 3
12 Base Highway Network: 1
13A LRS Inventory Route: 2151052000
13B Sub Inventory Route: 3
101 parallel Structure: N
***102 Direction of Traffic:** 2
***264 Road Inventory Mile Post:** 006.78
***208 Inspection Area:** 3 Initials: EFP
Engineer's Initials: bcn
*** Location ID No:** 215-00520D-006.78E

***104 Highway System:** 1
***26 Functional Classification:** 14
***204 Federal Route Type:** F No: 00261
105 Federal Lands Highway: 0
***110 Truck Route:** 0
2006 School Bus Route: 0
217 Benchmark Elevation: 0000.00
218 Datum: 0
***19 Bypass Length:** 05
***20 Toll:** 3
***21 Maintenance:** 01
***22 Owner:** 01
***31 Design Load:** 2
37 Historical Significance: 5
205 Congressional District: 02
27 Year Constructed: 1944
106 Year Reconstructed: 0000
33 Bridge Medium: 1
34 Skew: 55
35 Structure Flared: 0
38 Navigation Control: N
213 Special Steel Design: 0
267 Type of Paint: 0
***42 Type of Service On:** 1
Type of Service Under: 1
214 Movable Bridge: 0
203 Type Bridge: A
259 Pile Encasement: 3
***43 Structure Type Main:** 1 07
45 No.Spans Main: 002
44 Structure Type Appr: 0 00
46 No Spans Appr: 0000
226 Bridge Curve Horz: 0 Vert: 0
111 pier Protection: 0
107 Deck Structure Type: 1
108 Wearing Structure Type: 6
Membrane Type: 0
Deck Protection: 8

Signs & Attachments

225 Expansion Joint Type: 00
242 Deck Drains: 0
243 Parapet Location: 0
Height: 0
Width: 0
238 Curb Height: 0
Curb Material: 0
239 Handrail: 00
***240 Medium Barrier Rail:** 0
241 Bridge Median Height: 0
*** Bridge Median Width:** 0
230 Guardrail Loc. Dir. Rear: 6
Fwd: 6
Oppo. Dir. Rear: 6
Oppo. Fwd: 6
244 Approach Slab: 0
224 Retaining Wall: 1
233Posted Speed Limit: 55
236 Warning Sign: 0.00
234 Delineator: 0.00
235 Hazzard Boards: 0
237 Utilities Gas: 00
Water: 00
Electric: 00
Telephone: 00
Sewer: 00
247 Lighting Street: 0
Navigation: 0
Aerial: 0
***248 County Continuity No.:** 08

Bridge Inventory Data Listing



Parameters: Bridge Serial Num

Structure ID:215-0001-0

Programming Data

201 Project No: DAWR-1-C-1
 202 Plans Available: 0
 249 Prop Proj No: 000000000000000000000000
 250 Approval Status: 0000
 251 PI Number: 0000000
 252 Contract Date: 02/01/1901
 260 Seismic No: 00000
 75 Type Work: 00 0
 94 Bridge Imp. Cost: \$314
 95 Roadway Imp. Cost: 31
 96 Total Imp Cost: 471
 76 Imp Length: 000000
 97 Imp Year: 2013
 114 Future ADT: 023775 Year:2031

Hydraulic Data

215 Waterway Data:
 High Water Elev: 0000.0 Year:1900
 Flood Elev: 0000.0 Freq:00
 Avg Streambed Elev: 0000.0
 Drainage Area: 00000
 Area of Opening: 000420
 113 Scour Critical: N
 216 Water Depth: 00.0 Br.Height:00.0
 222 Slope Protection: 0
 221 Slope Protection: 0 Fwd:0
 219 Fender System: 0
 220 Dolphin: 0
 223 Current Cover: 000
 Type: 0
 No. Barrels: 0
 * Width: 0.00 Height:0.00
 * Length: 0 Apron:0
 265 U/W Insp. Area: 0 Diver:ZZZ
 Location ID No: 215-00520D-006.78E

Measurements:

*29 ADT: 015850 Year:2011
 109% Trucks: 0
 * 28 Lanes On: 04 Under:02
 210 No. Tracks On: 00 Under:00
 * 48 Max. Span Length: 0026
 * 49 Structure Length: 52
 51 Br. Rwdy. Width: 58.80
 52 Deck Width: 188.80
 * 47 Tot. Horiz. Cl: 30
 50 Curb / Sidewalk Width: 0.00 / 0.00
 32 Approach Rwdy. Width: 060
 *229 Shoulder Width:
 Rear Lt: 1.90 Type:2 Rt:4.00
 Fwd. Lt: 1.90 Type:2 Rt:4.00
 Permanent Width:
 Rear: 24.00 Type:2
 24.00 Type:2
 Interaction Rear: 0 Fwd: 0
 36 Safety Features Br. Rail: 1
 Transition: 1
 App. G. Rail: 1
 App. Rail End: 1
 53 Minimum Cl. Over: 99' 99"
 Under:
 *228 Minimum Vertical Cl
 Act. Odm Dir.: 99' 99"
 Oppo. Dir: 99' 99"
 Posted Odm. Dir: 00' 00"
 Oppo. Dir: 00' 00"
 55 Lateral Undercl. Rt: H 0 0
 56 Lateral Undercl. Lt: 0.00
 *10 Max Min Vert Cl: 99' 99" Dir:0
 39 Nav Vert Cl: 000 Horiz:0000
 116 Nav Vert Cl Closed: 000
 245 Deck Thickness Main: 12.00
 Deck Thick Approach: 0.00
 246 Overlay Thickness: 6.00
 212 Year Last Painted: Sup:0000 Sub:0000

65 Inventory Rating Method: 5
 63 Operating Rating Method: 5
 66 Inventory Type: 2 Rating: 36
 64 Operating Type: 2 Rating: 36
 231 Calculated Loads:
 H-Modified: 00 0
 HS-Modified: 00 0
 Type 3: 00 0
 Type 3s2: 00 0
 Timber: 00 0
 Piggyback: 40 0
 261 H Inventory Rating: 20
 262 H Operating Rating: 34
 67 Structural Evaluation: 6
 58 Deck Condition: 6
 59 Superstructure Condition: 6
 * 227 Collision Damage: 0
 60A Substructure Condition: 6
 60B Scour Condition: N
 60C Underwater Condition: N
 71 Waterway Adequacy: N
 61 Channel Protection Cond.: N
 68 Deck Geometry: 6
 69 UnderClr. Horz/Vert: 2
 72 Appr. Alignment: 8
 62 Culvert: N
Posting Data
 70 Bridge Posting Required: 5
 41 Struct Open, Posted, CL: A
 * 103 Temporary Structure: 0
 232 Posted Loads
 H-Modified: 00
 HS-Modified: 00
 Type 3: 00
 Type 3s2: 00
 Timber: 00
 Piggyback: 00
 253 Notification Date: 02/01/1901
 258 Fed Notify Date: 2/1/1901 12:00:00AM

Bridge Inventory Data Listing



Parameters: Bridge Serial Num

| Structure ID:215-0162-0 | | Muscogee | | SUFF. RATING: 95.96 | |
|--------------------------------|------------------------------------|--------------------------------|-------------|-------------------------------|------|
| Location & Geography | | | | Signs & Attachments | |
| Structure ID: | 215-0162-0 | *104 Highway System: | 1 | 225 Expansion Joint Type: | 02 |
| 200 Bridge Information: | 06 | *26 Functional Classification: | 19 | 242 Deck Drains: | 0 |
| *6A Feature Int: | EMERGENCY TURNAROUND | *204 Federal Route Type: | F No: 00261 | 243 Parapet Location: | 0 |
| *6B Critical Bridge: | 0 | 105 Federal Lands Highway: | 0 | Height: | 0 |
| *7A Route No Carried: | SR00001 | *110 Truck Route: | 0 | Width: | 0 |
| *7B Facility Carried: | SR 1 RAMP | 2006 School Bus Route: | 0 | 238 Curb Height: | 0 |
| 9 Location: | SOUTH EAST COLUMBUS | 217 Benchmark Elevation: | 0000.00 | Curb Material: | 0 |
| 2 Dot District: | 3 | 218 Datum: | 0 | 239 Handrail: | 99 |
| 207 Year Photo: | 2012 | *19 Bypass Length: | 02 | *240 Medium Barrier Rail: | 0 |
| *91 Inspection Frequency: | 24 Date: 09/04/2012 | *20 Toll: | 3 | 241 Bridge Median Height: | 0 |
| 92A Fract Crit Insp Freq: | 0 Date: 02/01/1901 | *21 Maintenance: | 01 | * Bridge Median Width: | 0 |
| 92B Underwater Insp Freq: | 0 Date: 02/01/1901 | *22 Owner: | 01 | 230 Guardrail Loc. Dir. Rear: | 6 |
| 92C Other Spc. Insp Freq: | 0 Date: 02/01/1901 | *31 Design Load: | 6 | Fwr: | 6 |
| * 4 Place Code: | 19000 | 37 Historical Significance: | 5 | Oppo. Dir. Rear: | 0 |
| *5 Inventory Route(O/U): | 1 | 205 Congressional District: | 02 | Oppo. Fwr: | 0 |
| Type: | 3 | 27 Year Constructed: | 1989 | 244 Approach Slab: | 3 |
| Designation: | 7 | 106 Year Reconstructed: | 0000 | 224 Retaining Wall: | 0 |
| Number: | 00001 | 33 Bridge Medium: | 0 | 233 Posted Speed Limit: | 30 |
| Direction: | 0 | 34 Skew: | 00 | 236 Warning Sign: | 0.00 |
| *16 Latitude: | 32 24.2770 HMMS Prefix:SR | 35 Structure Flared: | 0 | 234 Delineator: | 0.00 |
| *17 Longitude: | 84 -54.5200 HMMS Suffix:00 MP:6.64 | 38 Navigation Control: | N | 235 Hazzard Boards: | 0 |
| 98 Border Bridge: | 000%Shared:00 | 213 Special Steel Design: | 0 | 237 Utilities Gas: | 00 |
| 99 ID Number: | 0000000000000000 | 267 Type of Paint: | 0 | Water: | 00 |
| *100 STRAHNET: | 3 | *42 Type of Service On: | 1 | Electric: | 24 |
| 12 Base Highway Network: | 1 | Type of Service Under: | 3 | Telephone: | 00 |
| 13A LRS Inventory Route: | 2156052010 | 214 Movable Bridge: | 0 | Sewer: | 00 |
| 13B Sub Inventory Route: | 3 | 203 Type Bridge: | 0 | 247 Lighting Street: | 1 |
| 101 parallel Structure: | N | 259 Pile Encasement: | 3 | Navigation: | 0 |
| *102 Direction of Traffic: | 1 | *43 Structure Type Main: | 5 02 | Aerial: | 0 |
| *264 Road Inventory Mile Post: | 001.08 | 45 No.Spans Main: | 012 | *248 County Continuity No.: | 00 |
| *208 Inspection Area: | 3 Initials: EFP | 44 Structure Type Appr: | 0 00 | | |
| Engineer's Initials: | bcn | 46 No Spans Appr: | 0000 | | |
| * Location ID No: | 215-00001R-001.08N | 226 Bridge Curve Horz: | 1 Vert: 1 | | |
| | | 111 pier Protection: | 0 | | |
| | | 107 Deck Structure Type: | 1 | | |
| | | 108 Wearing Structure Type: | 1 | | |
| | | Membrane Type: | 0 | | |
| | | Deck Protection: | 8 | | |

Bridge Inventory Data Listing



Parameters: Bridge Serial Num

Structure ID:215-0162-0

Programming Data

201 Project No: BUILT BY CORP OF ENG.
 202 Plans Available: 0
 249 Prop Proj No: 000000000000000000000000
 250 Approval Status: 0000
 251 PI Number: 0000000
 252 Contract Date: 02/01/1901
 260 Seismic No: 00000
 75 Type Work: 00 0
 94 Bridge Imp. Cost: \$3,083
 95 Roadway Imp. Cost: 308
 96 Total Imp Cost: 4624
 76 Imp Length: 000000
 97 Imp Year: 2013
 114Future ADT: 000420 Year:2031

Hydraulic Data

215Waterway Data:
 High Water Elev: 0000.0 Year:1900
 Flood Elev: 0000.0 Freq:00
 Avg Streambed Elev: 0000.0
 Drainage Area: 00000
 Area of Opening: 000000
 113 Scour Critical N
 216Water Depth: 00.0 Br.Height:00.0
 222Slope Protection: 0
 221Slope Protection 0 Fwd:0
 219Fender System 0
 220Dolphin: 0
 223Current Cover: 000
 Type: 0
 No. Barrels: 0
 * Width: 0.00 Height:0.00
 * Length: 0 Apron:0
 265 U/W Insp. Area 0 Diver:ZZZ
 Location ID No: 215-00001R-001.08N

Measurements:

*29ADT 000280 Year:2011
 109%Trucks: 13
 * 28 Lanes On: 02 Under:00
 210 No. Tracks On: 00 Under:00
 * 48 Max. Span Length 0074
 * 49 Structure Length: 789
 51 Br. Rwdy. Width 40.00
 52 Deck Width: 43.30
 * 47 Tot. Horiz. Cl: 40
 50 Curb / Sidewalk Width 0.00 / 0.00
 32 Approach Rdwy. Width 034
 *229 Shoulder Width:
 Rear Lt: 4.00 Type:2 Rt:8.00
 Fwd. Lt: 4.00 Type:2 Rt:8.00
 Permanent Width:
 Rear: 22.00 Type:2
 22.00 Type:2
 Intersaction Rear: 0 Fwd: 0
 36Safety Features Br. Rail: 1
 Transition: 2
 App. G. Rail: 2
 App. Rail End: 2
 53 Minimum Cl. Over: 99' 99"
 Under:
 *228 Minimum Vertical Cl
 Act. Odm Dir.: 99' 99"
 Oppo. Dir: 99' 99"
 Posted Odm. Dir: 00' 00"
 Oppo. Dir: 00' 00"
 55 Lateral Undercl. Rt: N 0 0
 56 Lateral Undercl. Lt: 0.00
 *10 Max Min Vert Cl: 99' 99" Dir:0
 39 Nav Vert Cl: 000 Horiz:0000
 116 Nav Vert Cl Closed: 000
 245 Deck Thickness Main 8.00
 Deck Thick Approach: 0.00
 246 Overlay Thickness: 0.00
 212 Year Last Painted: Sup:0000Sub:0000

65 Inventory Rating Method: 5
 63 Operating Rating Method: 5
 66 Inventory Type: 2 Rating: 36
 64 Operating Type: 2 Rating: 36
 231Calculated Loads:
 H-Modified: 21 0
 HS-Modified: 30 0
 Type 3: 33 0
 Type 3s2: 40 0
 Timber: 37 0
 Piggyback: 40 0
 261 H Inventory Rating: 27
 262 H Operating Rating 49
 67 Structural Evaluation: 7
 58 Deck Condition: 7
 59 Superstructure Condition: 7
 * 227 Collision Damage: 0
 60A Substructure Condition: 7
 60B Scour Condition: N
 60C Underwater Condition N
 71 Waterway Adequacy: N
 61 Channel Protection Cond.: N
 68 Deck Geometry: 9
 69 UnderClr. Horz/Vert: N
 72 Appr. Alignment: 8
 62 Culvert: N

Posting Data

70 Bridge Posting Required 5
 41 Struct Open, Posted, CL: A
 * 103 Temporary Structure: 0
 232 Posted Loads
 H-Modified: 00
 HS-Modified: 00
 Type 3: 00
 Type 3s2: 00
 Timber: 00
 Piggyback 00
 253 Notification Date: 02/01/1901
 258 Fed Notify Date: 2/1/1901 12:00:00AA

Bridge Inventory Data Listing



Parameters: Bridge Serial Num

Structure ID:215-0163-0

Muscogee

SUFF. RATING: 97.25

Location & Geography

Structure ID: 215-0163-0
 200 Bridge Information: 06
 *6A Feature Int: SR 520- NS RAILROAD
 *6B Critical Bridge: 0
 *7A Route No Carried: PR00115
 *7B Facility Carried: CUSTER ROAD
 9 Location: SOUTHEAST COLUMBUS
 2 Dot District: 3

 207 Year Photo: 2012
 *91 Inspection Frequency: 24 Date: 09/04/2012
 92A Fract Crit Insp Freq: 0 Date: 02/01/1901
 92B Underwater Insp Freq: 0 Date: 02/01/1901
 92C Other Spc. Insp Freq: 0 Date: 02/01/1901
 * 4 Place Code: 19000
 *5 Inventory Route(O/U): 1
 Type: 5
 Designation: 1
 Number: 08000
 Direction: 0
 *16 Latitude: 32 24.2540 HMMS Prefix:
 *17 Longitude: 84 -54.6640 HMMS Suffix: MP:0.00
 98 Border Bridge: 000%Shared:00
 99 ID Number: 0000000000000000
 *100 STRAHNET: 0
 12 Base Highway Network: 1
 13A LRS Inventory Route: 2158011500
 13B Sub Inventory Route: 0
 101 parallel Structure: N
 *102 Direction of Traffic: 2
 *264 Road Inventory Mile Post: 003.10
 *208 Inspection Area: 3 Initials: EFP
 Engineer's Initials: bcn
 * Location ID No: 215-08000M-001.31N

*104 Highway System: 0
 *26 Functional Classification: 16
 *204 Federal Route Type: M No: 08000
 105 Federal Lands Highway: 0
 *110 Truck Route: 0
 2006 School Bus Route: 1
 217 Benchmark Elevation: 0000.00
 218 Datum: 0
 *19 Bypass Length: 03
 *20 Toll: 3
 *21 Maintenance: 01
 *22 Owner: 01
 *31 Design Load: 6
 37 Historical Significance: 5
 205 Congressional District: 02
 27 Year Constructed: 1989
 106 Year Reconstructed: 0000
 33 Bridge Medium: 0
 34 Skew: 00
 35 Structure Flared: 0
 38 Navigation Control: N
 213 Special Steel Design: 0
 267 Type of Paint: 0
 *42 Type of Service On: 5
 Type of Service Under: 4
 214 Movable Bridge: 0
 203 Type Bridge: 0
 259 Pile Encasement 3
 *43 Structure Type Main: 5 02
 45 No. Spans Main: 008
 44 Structure Type Appr: 0 00
 46 No Spans Appr: 0000
 226 Bridge Curve Horz 0 Vert: 1
 111 pier Protection 0
 107 Deck Structure Type: 1
 108 Wearing Structure Type: 1
 Membrane Type: 0
 Deck Protection: 8

Signs & Attachments

225 Expansion Joint Type: 02
 242 Deck Drains: 2
 243 Parapet Location: 1
 Height: 2
 Width: 1
 238 Curb Height: 1
 Curb Material: 1
 239 Handrail 99
 *240 Medium Barrier Rail: 0
 241 Bridge Median Height: 0
 * Bridge Median Width: 0
 230 Guardrail Loc. Dir. Rear: 6
 Fwrd: 6
 Oppo. Dir. Rear: 0
 Oppo. Fwrd: 0
 244 Approach Slab 3
 224 Retaining Wall: 0
 233 Posted Speed Limit: 35
 236 Warning Sign: 0.00
 234 Delineator: 0.00
 235 Hazzard Boards: 0
 237 Utilities Gas: 00
 Water: 00
 Electric: 24
 Telephone: 00
 Sewer: 00
 247 Lighting Street 1
 Navigation: 0
 Aerial: 0
 *248 County Continuity No.: 00

Bridge Inventory Data Listing



Parameters: Bridge Serial Num

Structure ID:215-0163-0

Programming Data

201 Project No: BUILT BY CORP OF ENG.
 202 Plans Available: 0
 249 Prop Proj No: 000000000000000000000000
 250 Approval Status: 0000
 251 PI Number: 0000000
 252 Contract Date: 02/01/1901
 260 Seismic No: 00000
 75 Type Work: 00 0
 94 Bridge Imp: Cost: \$5,086
 95 Roadway Imp. Cost: 509
 96 Total Imp Cost: 7630
 76 Imp Length: 000000
 97 Imp Year: 2013
 114 Future ADT: 005025 Year:2031

Hydraulic Data

215 Waterway Data:
 High Water Elev: 0000.0 Year:1900
 Flood Elev: 0000.0 Freq:00
 Avg Streambed Elev: 0000.0
 Drainage Area: 00000
 Area of Opening: 000000
 113 Scour Critical: N
 216 Water Depth: 00.0 Br.Height:00.0
 222 Slope Protection: 0
 221 Slope Protection: 0 Fwd:0
 219 Fender System: 0
 220 Dolphin: 0
 223 Current Cover: 000
 Type: 0
 No. Barrels: 0
 * Width: 0.00 Height:0.00
 * Length: 0 Apron:0
 265 U/W Insp. Area: 0 Diver:ZZZ
 Location ID No: 215-08000M-001.31N

Measurements:

*29 ADT: 003350 Year:2011
 109% Trucks: 0
 * 28 Lanes On: 05 Under:09
 210 No. Tracks On: 00 Under:02
 * 48 Max. Span Length: 0095
 * 49 Structure Length: 716
 51 Br. Rwdy. Width: 92.00
 52 Deck Width: 102.40
 * 47 Tot. Horiz. Cl: 92
 50 Curb / Sidewalk Width: 0.00 / 6.00
 32 Approach Rdwy. Width: 024
 *229 Shoulder Width:
 Rear Lt: 6.00 Type:8 Rt:6.00
 Fwd. Lt: 6.00 Type:8 Rt:6.00
 Permanent Width:
 Rear: 48.00 Type:8
 24.00 Type:2
 Intersection Rear: 1 Fwd: 1
 36 Safety Features Br. Rail: 1
 Transition: 2
 App. G. Rail: 2
 App. Rail End: 2
 53 Minimum Cl. Over: 99' 99"
 Under:
 *228 Minimum Vertical Cl
 Act. Odm Dir.: 99' 99"
 Oppo. Dir: 99' 99"
 Posted Odm. Dir: 00' 00"
 Oppo. Dir: 00' 00"
 55 Lateral Undercl. Rt: H 33 33
 56 Lateral Undercl. Lt: 8.60
 *10 Max Min Vert Cl: 99' 99" Dir:0
 39 Nav Vert Cl: 000 Horiz:0000
 116 Nav Vert Cl Closed: 000
 245 Deck Thickness Main: 8.00
 Deck Thick Approach: 0.00
 246 Overlay Thickness: 0.00
 212 Year Last Painted: Sup:0000Sub:0000

65 Inventory Rating Method: 1
 63 Operating Rating Method: 1
 66 Inventory Type: 2 Rating: 36
 64 Operating Type: 2 Rating: 36
 231 Calculated Loads:
 H-Modified: 21 0
 HS-Modified: 30 0
 Type 3: 33 0
 Type 3s2: 40 0
 Timber: 37 0
 Piggyback: 00 0
 261 H Inventory Rating: 24
 262 H Operating Rating: 50
 67 Structural Evaluation: 6
 58 Deck Condition: 7
 59 Superstructure Condition: 7
 * 227 Collision Damage: 0
 60A Substructure Condition: 6
 60B Scour Condition: N
 60C Underwater Condition: N
 71 Waterway Adequacy: N
 61 Channel Protection Cond.: N
 68 Deck Geometry: 9
 69 UnderClr. Horz/Vert: 9
 72 Appr. Alignment: 8
 62 Culvert: N

Posting Data

70 Bridge Posting Required: 5
 41 Struct Open, Posted, CL: A
 * 103 Temporary Structure: 0
 232 Posted Loads
 H-Modified: 00
 HS-Modified: 00
 Type 3: 00
 Type 3s2: 00
 Timber: 00
 Piggyback: 00
 253 Notification Date: 02/01/1901
 258 Fed Notify Date: 2/1/1901 12:00:00AA

Attachment 5

MS4 Summary

MS4 Summary:

The project has been evaluated for MS4 requirements on a conceptual level. There are approximately fifteen (15) storm water outfalls. Ten (10) of those outfalls are in locations that appear to be feasible for a detention pond, which will be adequate for water quality, channel protection and control of the 100-year storm event. Feasibility was determined at these locations as detention ponds do not appear to require adverse impacts to environmentally sensitive areas or excessive right-of-way costs. Based on conceptual level studies, outfalls that were identified to be infeasible for detention ponds would require BMP construction costs greater than 10% of the roadway construction or would result in impacts to railroad right-of-way which is a historically eligible resource. The project outfalls will be further evaluated for MS4 compliance during the design phase of this project and appropriate BMPs for water quality and detention will be provided.

**Custer Road MS4
Calculations**

| Basin | Pre-Development | | Post-Development | | | | Water Quality Vol. Req'd (cf) | Channel Protection Vol. Req'd (cf) | Flow Difference Pre and Post 100-YR (cf) | Storage Required (cf) |
|-------|-----------------|--------------|------------------|----------------|-----------------|--------------|-------------------------------|------------------------------------|--|-----------------------|
| | Total Area (ac) | Curve Number | Total Area (ac) | Imp. Area (ac) | Perv. Area (ac) | Curve Number | | | | |
| 1A | 0.48 | 55 | 0.48 | 0.23 | 0.25 | 79 | 1,008 | 2,865 | 4,978 | 5,482 |
| 1B | 2.19 | 55 | 2.19 | 1.25 | 0.94 | 82 | 5,371 | 14,830 | 25,558 | 28,244 |
| 1C | 0.50 | 55 | 0.50 | 0.19 | 0.31 | 75 | 854 | 2,492 | 4,320 | 4,747 |
| 1D | 0.49 | 55 | 0.49 | 0.02 | 0.47 | 63 | 184 | 1,261 | 1,684 | 1,776 |
| 1E | 0.70 | 55 | 0.70 | 0.49 | 0.21 | 87 | 2,073 | 5,774 | 9,680 | 10,717 |
| 1F | 2.69 | 55 | 2.69 | 0.85 | 1.84 | 73 | 3,961 | 12,180 | 20,903 | 22,884 |
| 2 | 1.24 | 55 | 1.24 | 0.43 | 0.81 | 74 | 1,972 | 5,894 | 10,174 | 11,160 |
| 3 | 2.00 | 55 | 2.00 | 0.97 | 1.03 | 79 | 4,278 | 11,936 | 20,744 | 22,883 |
| 4 | 1.06 | 55 | 1.06 | 0.49 | 0.57 | 78 | 2,142 | 6,056 | 10,535 | 11,606 |
| 8 | 1.08 | 55 | 1.08 | 0.34 | 0.74 | 73 | 1,548 | 4,890 | 8,392 | 9,166 |

Attachment 6

Pavement Analysis

Flexible Pavement Design Analysis

| | | | |
|---------------------|---|-------------|----------|
| PI Number | 0011437 | County(s) | Muscogee |
| Project Number | TIA #RC08-000062 | Design Name | CD |
| Project Description | US 27/CUSTER ROAD INTERCHANGE RECONSTRUCTION/MODIFICATION AT FORT BENNING | | |

| Traffic Data (AADTs are one-way) | | | | | Miscellaneous Data | | |
|----------------------------------|------|-------------------|--------|-----------------|--------------------|------------------------|-----|
| Initial Design Year | 2018 | Initial AADT, VPD | 11,295 | 24 Hour Truck % | 7.40 | Lanes in one direction | 2 |
| Final Design Year | 2038 | Final AADT, VPD | 18,115 | SU Truck % | 1.60 | Curb & Gutter/Barrier | Yes |
| | | Mean AADT, VPD | 14,705 | MU Truck % | 5.80 | | |

| Design Data | | | | | |
|-------------------------------|--------|--------------------------|------|------------------------|------|
| Lane Distribution Factor (%) | 100.00 | Soil Support Value | 2.50 | Single Unit ESAL | 0.40 |
| Terminal Serviceability Index | 2.50 | Regional Factor | 1.80 | Multiple Unit ESAL | 1.50 |
| | | User Defined 18-KIP ESAL | 0.00 | Calculated 18-KIP ESAL | 1.26 |
| Non-Standard Value Comment | | | | | |

| Design Loading (Calculated 18-KIP ESAL) | | | | | |
|---|---------|-------------------|------------|-------------|-------------------|
| Mean AADT, VPD | LDF (%) | Vehicle Type | Volume (%) | ESAL Factor | Daily ESAL |
| 14,705 | 100.00 | Single Unit Truck | 1.60 | 0.40 | 95 |
| | | Multi Unit Truck | 5.80 | 1.50 | 1,280 |
| Total Daily ESALs | | | | | 1,375 |
| Total Design Period ESALs | | | | | 10,037,500 |

| Proposed Flexible Full Depth Pavement Structure | | | | | |
|---|-----------------------|---|------------------------|------------------|------|
| Course | Material | Thickness (inches) | Structural Coefficient | Structural Value | |
| Course 1 | 12.5 mm Superpave | 1.50 | 0.4400 | 0.66 | |
| Course 2 | 19 mm Superpave | 2.00 | 0.4400 | 0.88 | |
| Course 3 | 25 mm Superpave | 1.00 | 0.4400 | 0.44 | |
| | | 5.00 | 0.3000 | 1.50 | |
| Course 4 | Graded Aggregate Base | 12.00 | 0.1600 | 1.92 | |
| Required SN | 6.34 | Proposed pavement is 14.85% Underdesigned | | Proposed SN | 5.40 |

| | |
|----------------|----------------------------------|
| Design Remarks | ALTERNATIVE 2, PAVEMENT DESIGN A |
|----------------|----------------------------------|

| | | |
|----------------|-------------------------|--------------------|
| Prepared By | Chris Haggard, P.E. | 7/16/2013 11:29 AM |
| | _____ | Date |
| Recommended By | Office Head | Date |
| | _____ | Date |
| Approved By | State Pavement Engineer | Date |
| | _____ | Date |

Flexible Pavement Design Analysis

| | | | |
|---------------------|---|-------------|-------------------------|
| PI Number | 0011437 | County(s) | Muscogee |
| Project Number | TIA #RC08-000062 | Design Name | Ramp W&A |
| Project Description | US 27/CUSTER ROAD INTERCHANGE RECONSTRUCTION/MODIFICATION AT FORT BENNING | | |

| Traffic Data (AADTs are one-way) | | | | | Miscellaneous Data | | |
|----------------------------------|------|-------------------|-------|-----------------|--------------------|------------------------|-----|
| Initial Design Year | 2018 | Initial AADT, VPD | 3,475 | 24 Hour Truck % | 7.40 | Lanes in one direction | 1 |
| Final Design Year | 2038 | Final AADT, VPD | 4,515 | SU Truck % | 1.60 | Curb & Gutter/Barrier | Yes |
| | | Mean AADT, VPD | 3,995 | MU Truck % | 5.80 | | |

| Design Data | | | | | | |
|-------------------------------|--------|--------------------|--------------------------|--------------------|------------------------|------|
| Lane Distribution Factor (%) | 100.00 | Soil Support Value | 2.50 | Single Unit ESAL | 0.40 | |
| Terminal Serviceability Index | 2.50 | Regional Factor | 1.80 | Multiple Unit ESAL | 1.50 | |
| | | | User Defined 18-KIP ESAL | 0.00 | Calculated 18-KIP ESAL | 1.26 |
| Non-Standard Value Comment | | | | | | |

| Design Loading (Calculated 18-KIP ESAL) | | | | | |
|---|---------|-------------------|------------|-------------|------------|
| Mean AADT, VPD | LDF (%) | Vehicle Type | Volume (%) | ESAL Factor | Daily ESAL |
| 3,995 | 100.00 | Single Unit Truck | 1.60 | 0.40 | 26 |
| | | Multi Unit Truck | 5.80 | 1.50 | 348 |
| Total Daily ESALs | | | | | 374 |
| Total Design Period ESALs | | | | | 2,730,200 |

| Proposed Flexible-Full Depth Pavement Structure | | | | | |
|---|-----------------------|--|------------------------|------------------|------|
| Course | Material | Thickness (inches) | Structural Coefficient | Structural Value | |
| Course 1 | 12.5 mm Superpave | 1.50 | 0.4400 | 0.66 | |
| Course 2 | 19 mm Superpave | 2.00 | 0.4400 | 0.88 | |
| Course 3 | 25 mm Superpave | 1.00 | 0.4400 | 0.44 | |
| | | 3.00 | 0.3000 | 0.90 | |
| Course 4 | Graded Aggregate Base | 12.00 | 0.1600 | 1.92 | |
| Required SN | 5.33 | Proposed pavement is 9.88% Underdesigned | | Proposed SN | 4.80 |

| | |
|----------------|--|
| Design Remarks | |
|----------------|--|

| | | |
|----------------|-------------------------|--------------------|
| Prepared By | Chris Haggard, P.E. | 7/17/2013 10:52 AM |
| | Date | |
| Recommended By | Office Head | Date |
| Approved By | State Pavement Engineer | Date |

Attachment 7

Meeting Minutes



MEETING MINUTES

LOCATION: Fort Benning (Building 4)
MEETING DATE: Wednesday, April 24, 2013, 10:00 AM
RE: CUSTER ROAD INTERCHANGE COORDINATION MEETING
ATTENDEES: Joe Macrina - Wolverton and Associates, Inc.
Chris Haggard - Wolverton & Associates, Inc.
Mike Dover – GDOT TIA
Kelvin Mullins – GDOT TIA
Craig Taylor - DPW Director, Ft. Benning
Brandon Cockrell - GC Office, Ft. Benning
Dominick J. DeCarlo - DPW-Real Estate, Ft. Benning
Linda Veenstra - OSJA, Ft. Benning
Jim Adcock – DPW, Ft. Benning
Tracy Ferring - DPW-EMD, Ft. Benning
Dave Bennefield – DPW, Ft. Benning
John E. Brown - DPW-EMD, Ft. Benning
Kevin Clarke - US Army
Felton G. Grant - City Planning, Columbus
Rick Jones - City Planning, Columbus
Lynda Temples - City Planning, Columbus
Mary Best - Michael Baker
Harold Linnenkohl - Michael Baker
Paul Condit - Michael Baker
Jake Flournoy - The Flournoy Companies
Michael Douglass - Clark Realty

The meeting started with Introductions

- Jake Flournoy started the meeting with a brief history of the project and discussed some of the coordination that had been completed in the past. Jake then asked Wolverton & Associates, Inc.(W&A) to discuss the project further.
- Joe Macrina then shared more information about the project and indicated that this meeting was being held to ensure that all the stakeholders needs are being met with the project, including Fort Benning.
- Mike Dover then discussed the TIA and how this project is scheduled. He said the project is a band 1 project. This means that construction is scheduled to begin by the end of 2015.
- Dominick DeCarlo then began a discussion of some of the constraints of the project that the base had. He said any land required for construction would require an easement from the fort. He also indicated that if over \$750,000 in improvements were proposed on federal land, then the project would need to be approved by additional offices and then the Army Corps of Engineers would need to approve the acquisition of easement.
- Dominick then discussed the housing land lease on the south side of US 27 and that this project could not impact the property within that land lease. Dominick said he would send the map with this land lease line to W&A to ensure it is not impacted.
- Kevin Clarke then discussed some of the security concerns of the base. He informed the project team that all traffic exiting at Custer Road must drive through the checkpoint at this point in time. His concern was to ensure this traffic remains secure while providing access to the public property. Chris Haggard assured him that this project would provide separate access to the public property and the existing secure traffic would not be impacted.



MEETING MINUTES

LOCATION: Fort Benning (Building 4)
MEETING DATE: Wednesday, May 22, 2013, 10:00 AM
RE: CUSTER ROAD INTERCHANGE ALTERNATIVES REVIEW

ATTENDEES: Joe Macrina - Wolverton and Associates, Inc.
Chris Haggard - Wolverton & Associates, Inc.
Brad Robinson – Wolverton & Associates, Inc.
Mike Dover – GDOT TIA (phone)
Kelvin Mullins – GDOT TIA (phone)
Garrick Edwards – AECOM (phone)
Randy Lemoine – DPW ENG, Ft. Benning
Debra Gutierrez – Safety, Ft. Benning
Keith Lovejoy – DPW, Ft. Benning Housing
Linda Veenstra - OSJA, Ft. Benning
John E. Brown - DPW-EMD, Ft. Benning
Dave Bennfield – DPW, Ft. Benning
Felton G. Grant - City Planning, Columbus
Rick Jones - City Planning, Columbus
Lynda Temples - City Planning, Columbus
Jake Flournoy - The Flournoy Companies
George Steuber – GC Office, Ft. Benning
Dominick J. DeCarlo - DPW-Real Estate, Ft. Benning
Brandon Cockrell - GC Office, Ft. Benning
Craig Taylor - DPW Director, Ft. Benning
Tracy Ferring - DPW-EMD, Ft. Benning
Sussanne S. Perry – DPW-EMD-CRM, Ft. Benning
Michael Douglass - Clark Realty
Jim Adcock – DPW, Ft. Benning
Mary Best - Michael Baker

- Rick Jones opened the meeting by discussing the progress made on the concept alternatives and asked Chris Haggard to review. Chris then provided an overview of the following 5 alternatives:
1. Alternative 1 – CD System – provides parallel collector distributor roads along US-27
 - Allows for reduced speed design and spacing of entrance/exits ramps
 - Would require impacts to the I-185 ramps, requiring coordination with FHWA, which could add schedule delays
 - Jake Flournoy stated that this alternative seems to have the least impacts to the military housing from an air and noise perspective.
 - There may be grading challenges on the EB ramps at I-185 to avoid impacts to the housing in the southwest quadrant. Air and noise at his location was also a concern.
 - Mike Dover mentioned that the “tunnel under Custer Road” would likely result in a Custer Rd bridge over the new roadway. The construction of such bridge would impact traffic and lane configurations along Custer Rd. George Steuber said the base would require a minimum of one lane in each direction to be maintained for traffic.
 2. Alternative 2 – Loop Ramps – provides a 2nd loop ramp from US-27 for development access

- The WB entrance onto US-27 from the development is a loop ramp under Custer Rd and existing WB off ramp. This loop only meets turning movements for a WB-40 truck and emergency vehicles. Through group discussion, it was determined that this design does not meet the needs of the development as currently drawn.
3. Alternative 3 - Diamond Interchange – provides a new diamond interchange east of Custer Road
 - The new interchange is an excessive distance from the development.
 - This alternative would also require additional easement along Cusseta Road in order for it to be used for public access.
 - Additional security measures would be required at the 3rd Street intersection to prevent public access to the base. George stated that tiger teeth could not be used unless under constant observation.
 4. Alternative 4 – Limited Access Flyover – modifies existing interchange for public use by providing a secured parallel roadway connecting the north and south portions of the base
 - This alternative would eliminate the U-turn difficulty for the base for vehicles clearing the checkpoint and maneuvering to get to the base south of US-27.
 - The alternative encroaches on the housing in the northwest quadrant
 - After discussion, it was determined that a better location may be along the parallel road just east of Custer Road in the northwest quadrant and tying into the road running along Wetherby Field in the southeast quadrant. The base has plans to remove the warehousing just east of Custer Rd.
 - Rick stated that the city would need to research the ownership of the existing interchange, should it become public.
 - This alternative would require coordination with Norfolk Southern Railroad, which could add schedule delays.
 5. Alternative 5 – Bridge over Railroad
 - Also encroaches on housing in the northwest quadrant
 - Would require that the base maintain the barrier along the right turn lane back onto the US-27 WB ramp.
 - Would also require railroad coordination, with potential schedule delays.
- After review, the decision was made to move forward with two alternates.
 1. Alternate 1 would remain the CD System
 2. Alternate 2 would propose the CD System on the north side of US-27 and the EB loop ramp from the original Alternate 2 above.
 - It was also determined that the majority of traffic would be approaching the interchange from the north on I-185 and west on US-27. A large cost savings could be made by eliminating the eastbound return access onto US-27. Therefore, it was decided to separate this movement on future concepts, so the improvements could be easily removed and quantified. Any eastbound movements would then need to go west either through the cloverleaf of I-185 or to the next traffic signal on US-27 before returning eastbound.
 - Ft. Benning environmentalist stated that a cemetery exists in the southwest corner of US-27 and Custer Rd. All alternatives seem to avoid the cemetery, but detailed locations will be provided to Wolverton for incorporation into future layouts.
 - Meeting Ended 11:15 AM

Action Items:

- 1) W&A to prepare two (2) alternates with costs by May 31st and email to attendees.
- 2) Fort Benning to evaluate the two alternates and provide feedback with preferred alternate at June 12th meeting.
- 3) GDOT to schedule meeting with FHWA for input and process regarding Interchange Modification Report.



MEETING MINUTES

LOCATION: Fort Benning (Building 4)
MEETING DATE: Wednesday, June 12, 2013, 10:00 AM
RE: CUSTER ROAD INTERCHANGE ALTERNATIVES REVIEW
ATTENDEES: Joe Macrina - Wolverton and Associates, Inc.
Chris Haggard - Wolverton & Associates, Inc.
Mike Dover – GDOT TIA
Kelvin Mullins – GDOT TIA
Randy Lemoine – DPW ENG, Ft. Benning
Debra Gutierrez – Safety, Ft. Benning
Keith Lovejoy – DPW, Ft. Benning Housing
Felton G. Grant - City Planning, Columbus
Rick Jones - City Planning, Columbus
Lynda Temples - City Planning, Columbus
Jake Flournoy - The Flournoy Companies
Brandon Cockrell - GC Office, Ft. Benning
Craig Taylor - DPW Director, Ft. Benning
Michael Douglass - Clark Realty
Mary Best - Michael Baker
Britt Horton – DPW-EMD, Ft. Benning
Dean Miller – DPW Master Planning, Ft. Benning
Kevin Clarke – Police – Ft. Benning

- Brandon Cockrell opened the meeting and asked for a status of the concept alternatives. Chris Haggard then provided an overview of the following three (3) alternatives:
 1. Alternative 1 – CD System – provides parallel collector distributor roads along US-27
 2. Alternative 2 – Hybrid Loop Ramps – provides a 2nd loop ramp from US-27 for development access
 3. Alternative 3 – Fort Benning Hybrid Loop Ramps – provides widening of existing loop which crosses Custer Road and US 27 to access site.
- Mike Dover mentioned that he met with FHWA and they are not requiring that any federal action be taken with them to perform any of the three (3) alternatives described. This eliminates the need for an Interchange Modification Report (IMR) and a FHWA NEPA document. Therefore the environmental document can be streamlined to meet Fort Benning and GEPA requirements.
- The project team discussed the environmental document with the Fort Benning NEPA personnel. They stated that we would require a REC document or EA document. The REC document would take less than a month to prepare/approve while an EA would take up to a year. The team asked what the thresholds were for these document types and it was not presently known. A conference call will be held within 2 weeks to determine these answers.
- There were then discussions about the noise study and how it should be handled. Mike indicated that without FHWA involvement, the noise study would not be required by GDOT. Brandon indicated that the noise study would be required by Fort Benning in order to gain approval from the leadership of the base. Mike agreed that we would include the noise study in the next phase of the project and would start as soon as possible.
- Michael Douglass spoke up and reiterated that he objects to any alternative that appears to negatively impact the existing Army family housing. The noise study should help to prove there will be no negative impact to housing.

- Kevin Clarke then said that a lot of traffic that exits at the Custer Road interchange is unintentional and thought they had taken the I-185 north exit. He indicated that the project might want to take this into account and evaluate a movement to allow them to re-enter US 27 prior to entering the development.
- Kevin also indicated that the residents of the base would likely prefer direct access to the site development. It was agreed that Wolverton & Associates would evaluate this and attempt to provide a slip ramp from the Custer Road entrance ramp into the site development.
- Brandon also indicated that the base would prefer that a gate be added at the location where a road closed barricade is currently shown on Cusseta Road. This would allow the base to use this for an exit during special events. Mike indicated that GDOT would be open to this and it will be revised in the concept.
- Mike asked how long it would take Fort Benning to come to a decision on their preferred alternative. Brandon indicated it would take approximately 3 months once the data was received.
- Another idea was brought up to provide access off of the CD system on the north directly into the site. This was evaluated after the meeting and it was determined that the spacing required along a CD system would not allow an exit given the design parameters of the project. 1600 LF is required from an entrance to an exist along a CD system and for this project there is currently 1600 LF from the Custer Road entrance to the I-85 north exit. Adding an additional exit prior to I-185 violates these design constraints.
- Brandon suggested to Jake Flournoy that he provide a brief on the site development and the benefits it will bring to the base. Jake agreed to prepare the documentation for the base.
- It was determined that the Army Corps of Engineers would prepare the RW/ESMT lease documentation once the design team prepared the survey and documentation to relay the land to the City of Columbus.
- Mike also reiterated that the eastbound movement from the site development may be eliminated based on the traffic information provided and in order to stay within the budget constraints of the project.
- Meeting Ended 11:45 AM

Action Items:

- 1) W&A to setup conference call between environmental team and Fort Benning NEPA personnel to determine approach to environmental documentation.
- 2) W&A to scope a noise study with City of Columbus to provide Fort Benning with additional information in support of the preferred alternative.
- 3) W&A to evaluate movements from Fort Benning onto Cusseta Road from Custer Road.
- 4) Jake Flournoy to provide benefit document to Fort Benning discussing the site development.
- 5) Follow-up coordination meeting to be held August 7th at 10 AM at Fort Benning.



MEETING MINUTES

LOCATION: Fort Benning (Building 4)
MEETING DATE: Wednesday, August 7, 2013, 10:00 AM
RE: CUSTER ROAD INTERCHANGE
ATTENDEES: Chris Haggard - Wolverton & Associates, Inc.
Kathryn Trube - Wolverton and Associates, Inc.
Kelvin Mullins – GDOT TIA
Randy Lemoine – DPW ENG, Ft. Benning
John Brown – DPW, Ft. Benning
Rick Jones - City Planning, Columbus
Jake Flournoy - The Flournoy Companies
Brandon Cockrell - GC Office, Ft. Benning
Dominick J. DeCarlo - DPW-Real Estate, Ft. Benning
Michael Douglass - Clark Realty
Sussanne S. Perry – DPW-EMD-CRM, Ft. Benning
Mary Best - Michael Baker
Bruce Hart – AECOM
Patrick Smith - URS

- Brandon Cockrell opened the meeting and asked for a status of the concept alternatives. Chris Haggard then provided an overview of what was evaluated since last time including
 - Access to development from Custer Road
 - Return access to US 27/I-185 for mistaken exits
- Randy brought up the proposed roundabout that he suggested for the return access and the pros and cons were discussed. It would add cost and potential impacts to the project, but would allow Fort Benning to egress traffic during special events onto US 27.
- Brandon asked if the development would get police/fire/garbage service from the base and Jake Flournoy stated that the City would provide these services.
- Access to the site from Fort Benning was discussed further and it was decided that the roundabout should be further evaluated and added as an alternative. Chris made it clear that this additional cost may require removal of the eastbound movement onto US 27 and everyone understood and agreed to pursue this potential alternative.
- Brandon asked that the current alternative and the one with the added roundabout be provided to him so he could elevate the conversation to his superior. Chris said he could provide the alternative drawings by next week. The noise study has not been completed, but should be by late September. Brandon said he would try to use that as validation of the preferred alternative rather than a requirement to make a decision to expedite approval.
- Mike Douglass expressed concerns about the noise study and asked what provisions were assumed for sound walls. Chris indicated that no provisions were expected due to the large buffer and advantageous terrain. The noise study will be completed to validate these assumptions.
- Brandon and Dom Decarlo inquired about the overall project schedule and what the base needed to do to ensure the schedule is met. Chris is going to prepare an overall schedule with Dom's help showing the required items associated with the base prior to beginning construction as well as the steps required to meet the TIA program from a design standpoint.
- The easement to be obtained from Fort Benning was discussed next and Dom asked who would be receiving the easement. The City of Columbus was determined to be the agency to acquire the easement. In this discussion Jake mentioned that he had met with the City to discuss improving Cusseta Road all the way to the north of the

development. It was decided that the easement obtained for this project would include the remainder of Cusseta Road in order to allow future improvements by the City and developer.

- Dom also mentioned that he needed to know how much of the \$18 million would be improvements to federal property which includes US 27 right of way. Wolverton will prepare a breakdown of costs to show how much is attributed to federal property. It will be greater than the \$750 thousand which requires additional reviews for the project.
- One concern Chris brought up was access to the site for survey and geotechnical studies. Dom said he could issue a permit for work for 30 non consecutive days which we could use for the survey effort, but after discussing the required impact for geotechnical studies it was determined a license from the Army Corps would be required. This license would take approximately 90 days to obtain, so Dom was going to setup a meeting with the Corps as soon as possible to get the coordination started.
- Dom also agreed to provide the railroad right of way he has to assist in locating the property lines. He said the easement we obtain will need to include Cusseta Road and any land on the Fort side needed for construction.
- Meeting Ended 11:55 AM

Action Items:

- 1) Dom to setup meeting with Army Corps to discuss project and license
- 2) W&A to provide revised alternatives to Brandon by 8/16/13
- 3) Columbus to execute contract to begin Noise Study
- 4) W&A to prepare overall schedule for project with assistance from Dom



MEETING MINUTES

LOCATION: Fort Benning (Building 4)
MEETING DATE: Wednesday, September 18, 2013, 10:00 AM
RE: CUSTER ROAD INTERCHANGE
ATTENDEES: Chris Haggard - Wolverton & Associates, Inc.
Joe Macrina - Wolverton and Associates, Inc.
Kelvin Mullins – GDOT TIA
Jim Adcock – Ft. Benning
Dean Miller – Ft. Benning
Rick Jones - City Planning, Columbus
Felton Grant – City RW, Columbus
Jake Flournoy - The Flournoy Companies
Brandon Cockrell - GC Office, Ft. Benning
Dominick J. DeCarlo - DPW-Real Estate, Ft. Benning
Mary Best - Michael Baker
Patrick Smith - URS

- Brandon Cockrell opened the meeting and asked for a status of the concept alternatives. Chris Haggard then provided an overview of the two alternatives evaluated since last time including
 - Roundabout on Cussetta Road for return access to US 27/I-185
 - Gated slip ramp for return access to US 27/I-185
- It was decided that the Gated slip ramp was the preferred alternative for Fort Benning and they agreed that the gates would be manned during special events to allow traffic to enter US 27/I-185 for return access to Columbus.
- Dominick DeCarlo then discussed the meeting held with the Army Corps of Engineers in Savannah. It was decided that a 2 year access license would be acquired for all survey and engineering work to be done prior to an established easement. This paperwork is being handled by Dominick and should be completed in approximately 60 days.
- Dominick then discussed the easement that would be acquired for this project. It was decided that a permanent easement with a 25 year term would be acquired along with a construction easement which would last for 2.5 years.
- Chris asked if the existing loop ramp would be included in the easement, so a pond could be constructed if necessary. Dominick said the base would prefer not to include it so as not to impact additional trees. Chris will proceed with design trying not to impact this loop ramp.
- The discussion then turned to maintenance of the infrastructure to be constructed. Rick Jones indicated the City would accept responsibility to maintain the roadways and wanted to understand if the bridge would be the city's responsibility. It was decided that the bridge would be the city's responsibility and a document would be drafted between Fort Benning, Columbus and possibly GDOT to assign responsibilities.
- Brandon then asked about fencing for Forestry. Chris indicated that guardrail was proposed to separate the roadway from the base and this could suffice. Brandon will coordinate with Forestry to determine if this is adequate.
- Dominick indicated that Forestry would also require a tree survey to determine the size and number of trees being removed with the project. Joe Macrina asked what size tree needed to be surveyed and Dominick said anything over 6" needed to be included.

- The project schedule was then discussed and Brandon asked when a noise study would be received. Mary Best said the noise study would be complete by mid-October and submitted to the Fort. Preliminary findings indicate no noise impacts to Fort Benning structures.
- Brandon asked what kind of gate would be constructed and Chris said it would match Fort Benning requirements. Brandon will submit gate details to Chris for inclusion in the plans.

Action Items:

- 1) Dom to coordinate license for access to Fort Benning
- 2) Brandon to provide gate details to W&A
- 3) Columbus to execute contract to begin Noise Study

Attachment 8

Design Memo

W
Wolverton & Associates

DATE January 10, 2014

FILE Muscogee County, PI No. 0011437
Custer Road Interchange

FROM Brad Robinson, P.E.
Project Manager
Wolverton & Associates, Inc.

TO Shrujal Amin
TIA Preconstruction Manager
Georgia Department of Transportation

SUBJECT Design Criteria

A Design Memo is being submitted for PI No. 0011437 in Muscogee County which proposed to construct a new interchange adjacent to Custer Road and US 27/US 280/SR 1/SR 520/Victory Drive to allow public access to Fort Benning Technology Park.

The interchange at US 27/US 280/SR 1/SR 520/Victory Drive and Custer Road is proposed to be modified to allow public access to a parcel located between I-185, Cusseta Road, and US 27. This project is designated for funding under the Transportation Investment Act (TIA) of 2010 and must be designed and constructed within budget. Per the TIA Manual, "the Engineer of Record shall take a practical design approach so to provide the most cost efficient design possible that satisfies the project scope."

Design criteria has been established using a combination of the *AASHTO's 2011 Policy on Geometric Design of Highways and Streets* and *GDOT Design Policy Manual*. This design memo is for the roadway classification and design speed for each roadway segment. The following rationale presents what Wolverton & Associates, Inc. believes to be the most practical design approach to meet the project scope.

Roadway Classification

According to the GDOT Roadway Classification Map for Muscogee County, US 27, Custer Road, and the existing interchange ramps for Custer Road are classified as an Urban Principal Arterial Road, Urban Minor Arterial Road, and Urban Local Roads respectively. The *GDOT Design Policy Manual* defines a ramp as, "a length of roadway providing an exclusive connection between two highway facilities." EB2, EB3, and EB4 can access the roadway connecting to the base parade grounds prior to entering US27 Eastbound. WB4 is only exclusive prior to tying into existing Cusseta Road. Cusseta Road does not currently have direct access to US 27. Therefore EB2, EB3, EB4, and Cusseta Road (WB4) can be classified as local roads. The classification of EB2, EB3, EB4, and Cusseta (WB4) as local roads rather than ramps reduces construction cost by allowing for reduced typical sections and higher vertical grades which reduces earthwork and wall costs.

Design Speed

AASHTO's 2011 Policy on Geometric Design of Highways and Streets (page 10-89) states that

Ramp design speed based on an approximation of the low-volume running speed on intersecting highways is not always practical, and therefore lower design speeds may be selected. However, the design speed should not be less than the low range presented in Table 10-1 (page 10-89).

According to Table 10-1, for a highway design speed of 55 mph, the lower range speed design for a ramp is 28 mph. Therefore, ramps EB1, WB4, WB5 can have a design speed of 30 mph. WB2 is ramp on to the CD roadway (design speed of 45 mph) with a yield condition. The lower range design speed for a ramp entering a highway with a 45 mph is 23 mph per Table 10-1 and WB2 is set at 25 mph in order to avoid additional impacts to streams and the Fort Benning Technology Park.

Summary

Roadway classifications have been selected based on GDOT's Roadway Classification Map or the exclusivity of access to US 27.

The design speed of all ramps exceed the lower range provided by *AASHTO* Table 10-1 (page 10-89).

This project requires the construction of two bridges, large quantities of earthwork and tall retaining walls to reduce/eliminate impacts to streams and the historically eligible railroads. Using this practical approach to design will result in reduced construction cost while meeting the scope of the project.

Please refer to the attached roadway classifications and design criteria.



