TIA

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA
TIA PROJECT CONCEPT REPORT

Project Type: Resurfacing & Maintenance

P.I. Number: 0011386

GDOT District: 2

County: Richmond

Federal Route Number: None

MPO ID Number:

State Route Number: S.R. 28

Project Description (provide a very brief description of the project)
The proposed project will include pavement replacement, resurfacing and rehabilitation to improve the structural integrity, ride quality, and aesthetics of this gateway corridor into the City of Augusta. Additional project elements include drainage improvements, lighting replacement, bridge deck repair, guardrail replacement, landscaping, signage, and fencing improvements.

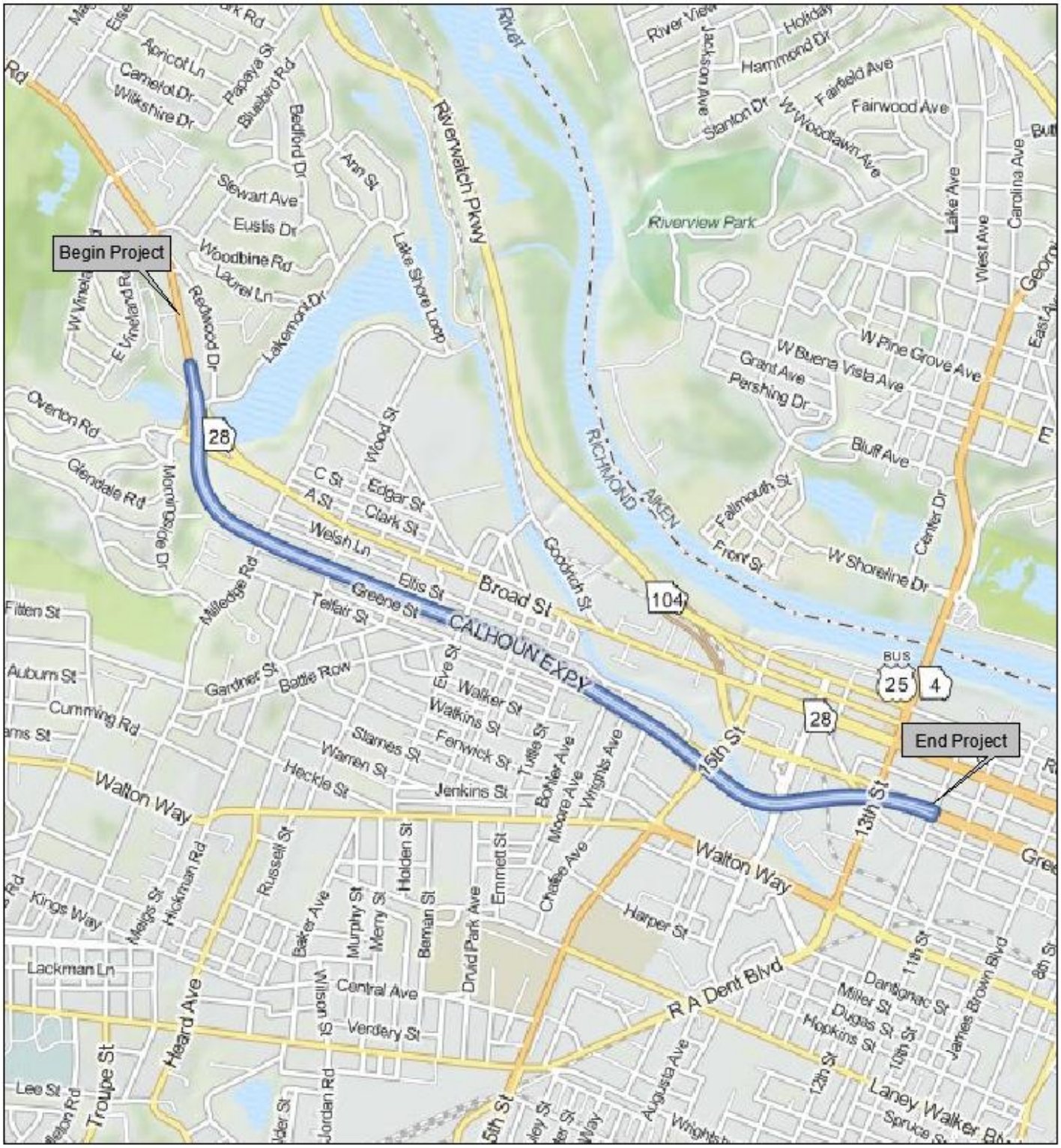
Submitted for approval:

Local Government Representative	9/23/14 DATE
District Engineer/Consultant & Firm — W. R. Toole Engineers Inc.	9/23/14 DATE
TIA Project Manager	9/25/14 DATE
GDOT TIA Regional Coordinator	9/26/2014 DATE
TIA Program Manager	26 Sep 2014 DATE
GDOT State TIA Administrator	9/30/2014 DATE

Approval:

Concur: GDOT Director of Engineering	10/2/14 DATE
Approve: GDOT Chief Engineer	10/6/14 DATE

PROJECT LOCATION



PLANNING & BACKGROUND DATA

Project Intended Benefit: The proposed project will include pavement replacement, resurfacing, rehabilitation, and bridge deck repair to improve the structural integrity and ride quality of the corridor. Drainage improvements, lighting replacement, and guardrail replacement will address safety concerns. Fencing improvements along the R/W and median barrier will deter pedestrians from crossing at uncontrolled locations and new landscaping and signage will improve the aesthetics of this gateway corridor into the City of Augusta.

Description of the proposed project:

Federal Oversight: ☐ Exempt ☐ State Funded ☒ TIA ☐ Other

MPO: Augusta Regional Transportation Study (ARTS)
MPO Project ID

Regional Commission: Central Savannah River RC RC Project ID RC07-000113

Congressional District(s): 12

Projected Traffic: *(if necessary) ADT or AADT*
Current Year (2014): 25,170 Open Year (2016): N/A Design Year (20YY): N/A
Traffic Projections Performed by: N/A

Functional Classification (Mainline): Urban Freeway and Expressway

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

Will Context Sensitive Solutions procedures be utilized? ☒ No ☐ Yes

DESIGN AND STRUCTURAL DATA - *Delete table if not applicable to project* **Mainline Design Features:** *Roadway name/ID - delete any rows in table that are not applicable.*

Feature	Existing	Standard*	Proposed
Typical Section			
- **Number of Lanes**	**4**	**--**	**4**
- **Lane Width(s)**	**12'**	**12'**	**12'**
- **Median Width & Type**	**2'-6" barrier**	**--**	**2'-6" barrier**
- **Outside Shoulder or Border Area Width**	**12' (8'/4')**	**12'**	**12'**
- **Outside Shoulder Slope**	**4%**	**6%**	**4%**
- **Inside Shoulder Width**	**8'-9"**	**8'**	**8'-9"**
Posted Speed	**50**		**50**
Rumble Strips	**Skip Pattern**	**Skip Pattern**	**Skip Pattern**

*According to current GDOT design policy if applicable

Major Structures: *(If no major structures on project, N/A and delete table below)*

Structure ID	Existing	Proposed
NBI 24500950	CR 2398 – Lake Olmstead	N/A
NBI 24500970	CR 2417 (Eve St.) bridge	N/A
NBI 24500980	CR 2429 (Crawford Ave.) bridge	N/A
NBI 24501070	SR 4–CR2469–CR1499–Canal Bridge	N/A

Major Interchanges/Intersections:
Calhoun Expressway at Broad Street
Calhoun Expressway at Eve Street / Crawford Avenue
Calhoun Expressway at 15th Street
Calhoun Expressway at 12th Street

Utility Involvements:
Augusta Utilities Department
Georgia Power Distribution/Georgia Power Transmission
Atlanta Gas Light
Comcast / AT&T / Level 3 / WOW

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

SUE Required: ☒ No ☐ Yes

Railroad Involvement: None

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:	0
Displacements Anticipated:	0
Businesses:	0
Residences:	0
Other:	0

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:
None

Design Variances to GDOT Standard Criteria anticipated:
None

ENVIRONMENTAL DATA

Anticipated Environmental Document:

GEPA: ☐ Type A Letter ☒ Type B Letter
NEPA: ☐ CE ☐ EA/FONSI

Project Air Quality: *(On-system projects only)*

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
Project is located in Augusta, GA MS4 service area

Environmental Permits/Variances/Commitments/Coordination anticipated (*Include description of potential for 404 Permit, Stream Buffer Variance, and Section 4(f)***):**

N/A

NEPA/GEPA Comments & Information: *(Describe anticipated effects to ecology, history, archeology, air & noise, public involvement, etc. & the effect on the environmental document)*

GT Hill will provide ecology study, history survey, archaeology, cultural resources, and air screening. The corridor improvements are expected to have no environmental impact.

PROJECT RESPONSIBILITIES

Project Activities:

Project Activity	Party Responsible for Performing Task(s)
Concept Development	Consultant
Design	Consultant
Right-of-Way Acquisition	None
Utility Relocation	Augusta Engineering Department
Letting to Contract	Augusta Engineering Department
Construction Supervision	Augusta Engineering Department
Providing Material Pits	Augusta Engineering Department
Providing Detours	Augusta Engineering Department
Environmental Studies, Documents, and Permits	Consultant
Environmental Mitigation	N/A
Construction Inspection & Materials Testing	Augusta Engineering Department

Lighting required: ☐ No ☒ Yes

Other projects in the area:
Broad Street Bridges over Augusta Canal
Archibald W. Butt Memorial Bridge Rehabilitation
15th Street Pedestrian Improvements Project

Other coordination to date:
Initial Concept Meeting (Pavement Alternatives) – 7/8/2014
Concept Team Meeting – 7/21/2014

Project Cost Estimate and Funding Responsibilities:

	Breakdown of PE	Breakdown of ROW	Breakdown of Reimbursable Utilities	Breakdown of CST	GDOT Project Management	Total Cost
By Whom	Augusta	Augusta	Augusta	Augusta		
Date of Estimate	9/11/2014		9/11/2014	9/11/2014		
TIA Current Programmed Budget $	$650,000.00	$0.00	S0.00	$$7,770,415.30	$85,054.70	$8,505,470.00
Estimated $ Amount	$718,136.00	$0.00	$0.00	$7,498,347.00	N/A	
Budget Contingency $	$7,182.00	$0.00	$0.00	$194,958.00	N/A	
Total Estimated Cost	$725,318.00	$0.00	$0.00	$7,693,305.00	$85,054.70	$8,503,677.70

Note: 1. Construction phase contains CEI & CMT in addition to other contingencies.
3. All phases contain Augusta, GA, Project Management Cost.

ALTERNATIVES

Preferred Alternative: Concrete Pavement Grinding and Asphalt Shoulder Replacement			
Estimated Property Impacts:	**None**	**Estimated Total Cost:**	**$7,498,346.57**
Estimated ROW Cost:	**$0**	**Estimated CST Time:**	**12 months**
Rationale: Grinding the concrete pavement and full depth asphalt shoulder reconstruction was selected based on cost constraints.			

Alternative 1: Asphalt Overlay			
Estimated Property Impacts:	**None**	**Estimated Total Cost:**	**$9,459,998.48**
Estimated ROW Cost:	**$0**	**Estimated CST Time:**	**12 months**
Rationale: The asphalt overlay alternative was rejected following the initial concept team meeting based on construction cost (a minimum 4" thickness required), additional maintenance concerns, and potential drainage reconstruction costs.			

No Build Alternative:			
Estimated Property Impacts:	**None**	**Estimated Total Cost:**	**$0**
Estimated ROW Cost:	**$0**	**Estimated CST Time:**	**N/A**
Rationale: This alternative was rejected based on the evaluation of the concrete pavement, asphalt shoulders, and bridge decks. Inspections found deficiencies that require improvements to assure continued safety and viability of the roadway.			

Comments/additional information:

Attachments:

1. Concept Layout
2. Typical sections
3. Cost Estimates
4. Pavement assessment report including profilograph.
5. Bridge deck assessment and photos

Calhoun Expressway
Improvements Project
200 0 200
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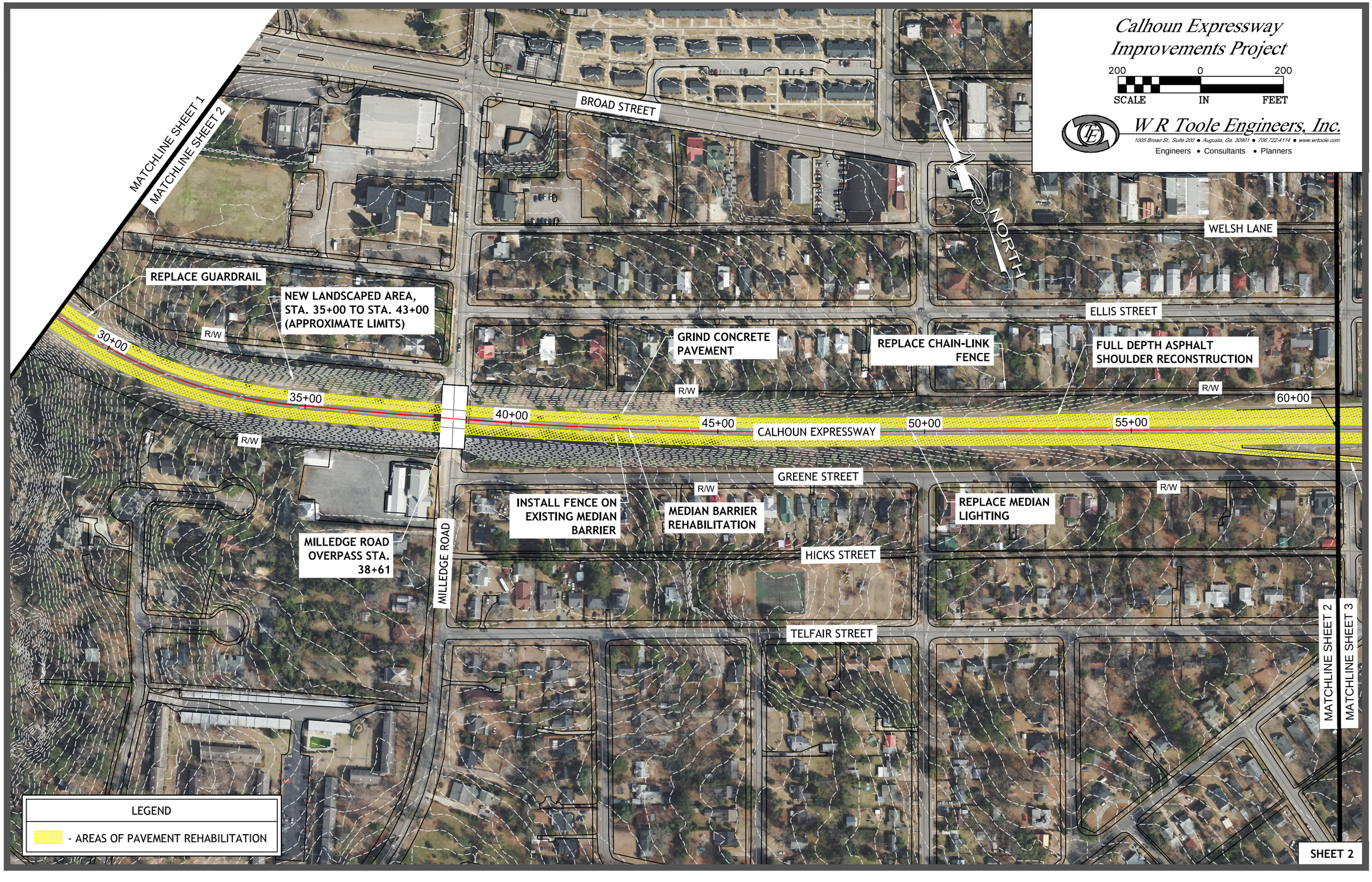
NORTH
LAKE OLMSTEAD
GLENBURN ROAD
LAKEMONT DRIVE
AZALEA ROAD
REDWOOD DRIVE
BROAD STREET
BROAD STREET
MATCHLINE SHEET 1
MATCHLINE SHEET 2
BEGIN MEDIAN BARRIER REHABILITATION STA.14+75
BEGIN BROAD ST. BRIDGE STA.15+37
END BROAD ST. BRIDGE STA. 20+88
CLEAN AND RE-SEAL JOINTS ON BRIDGE DECK
REPLACE GUARDRAIL BEGIN STA. 21+17 (LT)
REPLACE CHAIN-LINK FENCE
FULL DEPTH ASPHALT SHOULDER RECONSTRUCTION BEGIN STA: 21+21
R/W
R/W
R/W
R/W
R/W
15+00
10+00
5+00
0+00
CALHOUN EXPRESSWAY
20+00
25+00
WASHINGTON ROAD / SR 28
PAINT EXISTING PARAPET WALL RAIL
BEGIN LIGHTING REPLACEMENT STA. 7+89
BEGIN PROJECT STA. 0+00
MEDIAN BARRIER AND PARAPET WALLS REHABILITATION ON BRIDGE
REPLACE GUARDRAIL BEGIN STA. 20+71 (RT)
GRIND CONCRETE PAVEMENT BEGIN STA: 20+71 (RT)
REPLACE CHAIN-LINK FENCE
INSTALL FENCE ON EXISTING MEDIAN BARRIER
LAKEWOOD DRIVE
MORNINGSIDE DRIVE
LEGEND
- AREAS OF PAVEMENT REHABILITATION
SHEET 1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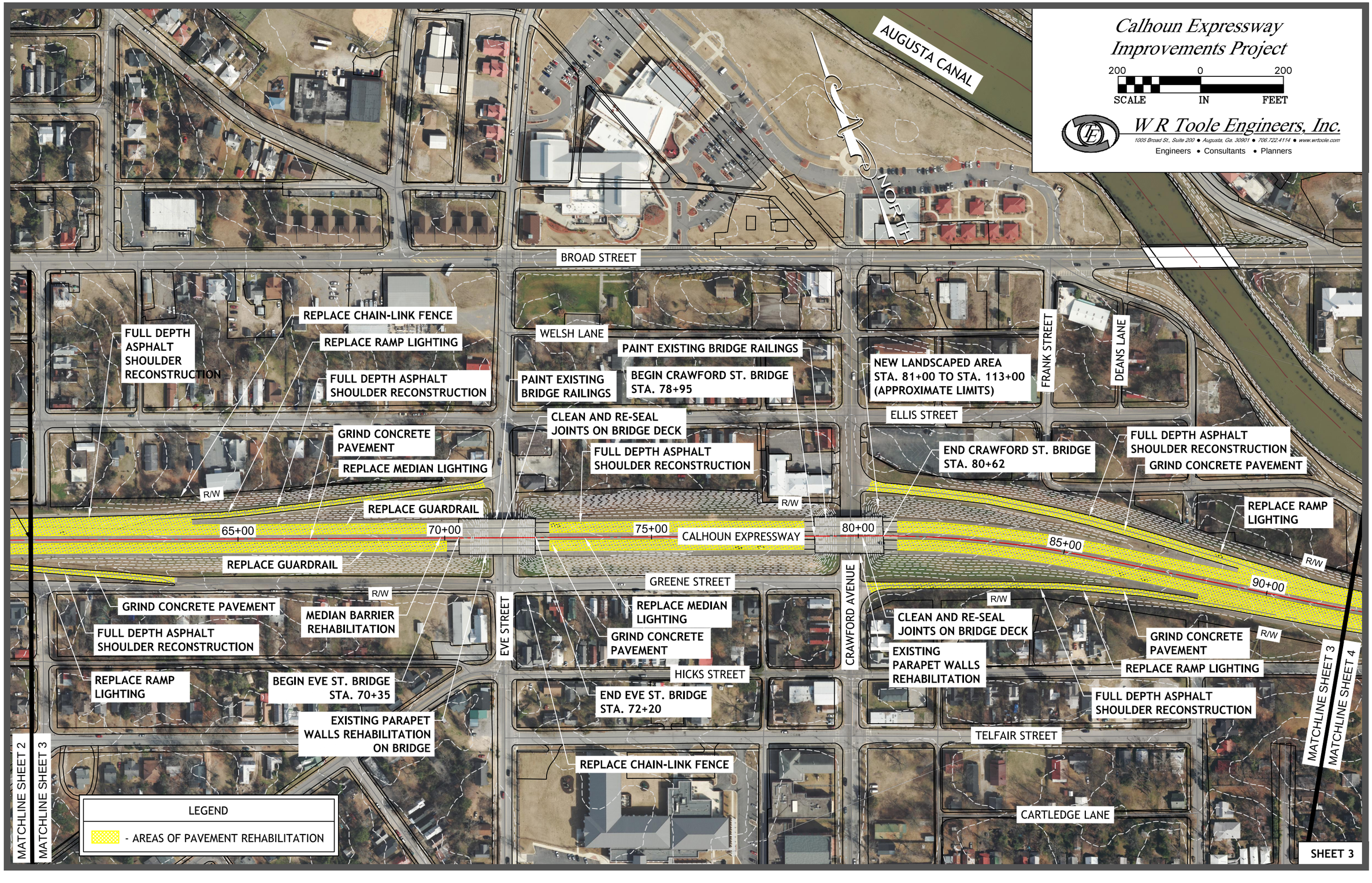
MATCHLINE SHEET 1
MATCHLINE SHEET 2
BROAD STREET
NORTH
WELSH LANE
ELLIS STREET
REPLACE GUARDRAIL
NEW LANDSCAPED AREA, STA. 35+00 TO STA. 43+00 (APPROXIMATE LIMITS)
GRIND CONCRETE PAVEMENT
REPLACE CHAIN-LINK FENCE
FULL DEPTH ASPHALT SHOULDER RECONSTRUCTION
R/W
30+00
35+00
40+00
45+00
50+00
55+00
60+00
CALHOUN EXPRESSWAY
GREENE STREET
INSTALL FENCE ON EXISTING MEDIAN BARRIER
MEDIAN BARRIER REHABILITATION
REPLACE MEDIAN LIGHTING
MILLEDGE ROAD OVERPASS STA. 38+61
MILLEDGE ROAD
HICKS STREET
TELFAIR STREET
MATCHLINE SHEET 2
MATCHLINE SHEET 3
LEGEND
- AREAS OF PAVEMENT REHABILITATION
SHEET 2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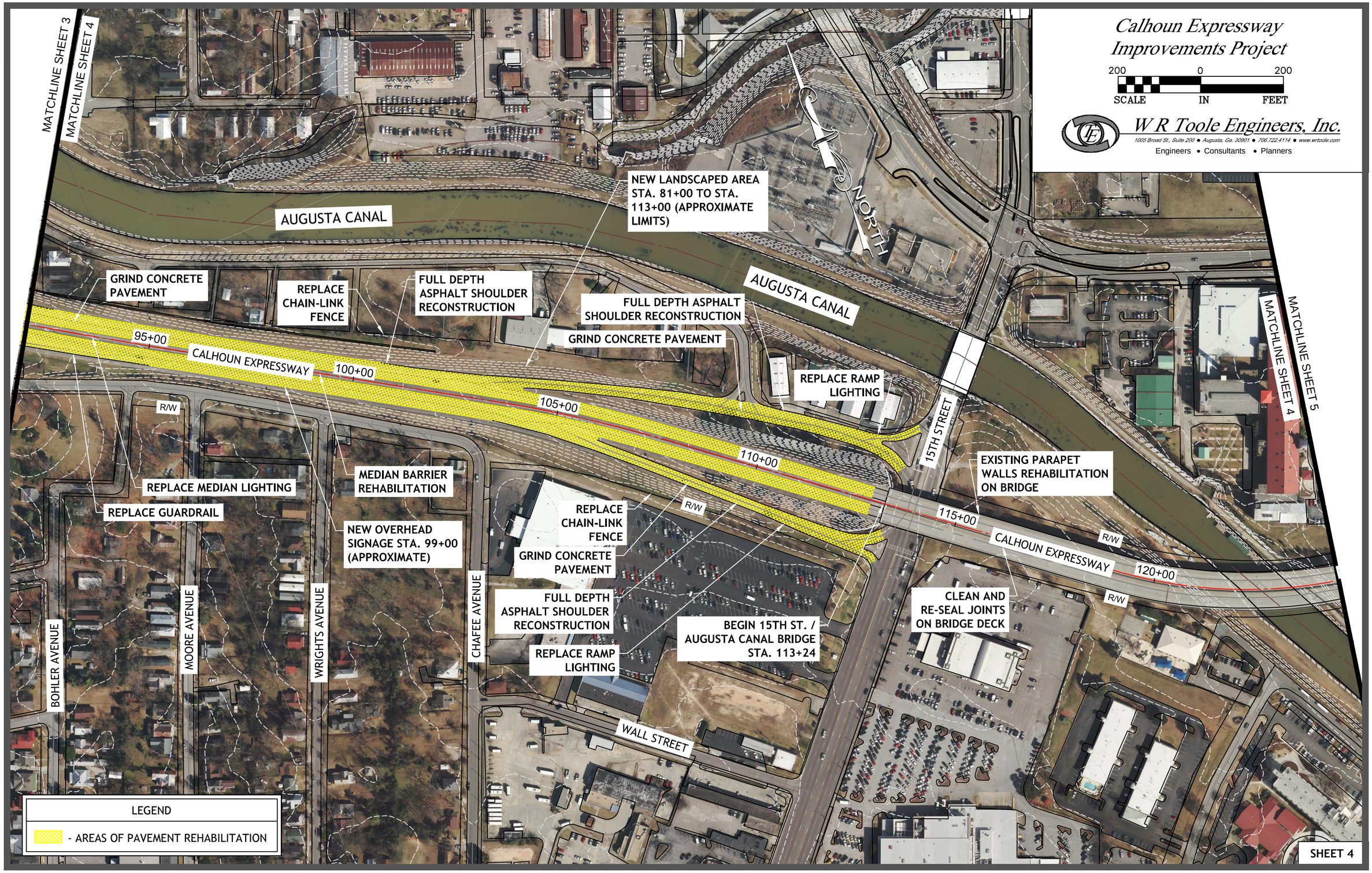
AUGUSTA CANAL
NORTH
BROAD STREET
WELSH LANE
GREENE STREET
HICKS STREET
ELLIS STREET
TELFAIR STREET
CARTLEDGE LANE
EVE STREET
CRAWFORD AVENUE
FRANK STREET
DEANS LANE
CALHOUN EXPRESSWAY
65+00
70+00
75+00
80+00
85+00
90+00
R/W
FULL DEPTH ASPHALT SHOULDER RECONSTRUCTION
REPLACE CHAIN-LINK FENCE
REPLACE RAMP LIGHTING
FULL DEPTH ASPHALT SHOULDER RECONSTRUCTION
PAINT EXISTING BRIDGE RAILINGS
PAINT EXISTING BRIDGE RAILINGS
BEGIN CRAWFORD ST. BRIDGE STA. 78+95
NEW LANDSCAPED AREA STA. 81+00 TO STA. 113+00 (APPROXIMATE LIMITS)
CLEAN AND RE-SEAL JOINTS ON BRIDGE DECK
GRIND CONCRETE PAVEMENT
FULL DEPTH ASPHALT SHOULDER RECONSTRUCTION
END CRAWFORD ST. BRIDGE STA. 80+62
FULL DEPTH ASPHALT SHOULDER RECONSTRUCTION
GRIND CONCRETE PAVEMENT
REPLACE MEDIAN LIGHTING
REPLACE GUARDRAIL
REPLACE RAMP LIGHTING
REPLACE GUARDRAIL
GRIND CONCRETE PAVEMENT
MEDIAN BARRIER REHABILITATION
FULL DEPTH ASPHALT SHOULDER RECONSTRUCTION
REPLACE MEDIAN LIGHTING
GRIND CONCRETE PAVEMENT
CLEAN AND RE-SEAL JOINTS ON BRIDGE DECK
GRIND CONCRETE PAVEMENT
EXISTING PARAPET WALLS REHABILITATION
REPLACE RAMP LIGHTING
REPLACE RAMP LIGHTING
BEGIN EVE ST. BRIDGE STA. 70+35
END EVE ST. BRIDGE STA. 72+20
FULL DEPTH ASPHALT SHOULDER RECONSTRUCTION
EXISTING PARAPET WALLS REHABILITATION ON BRIDGE
REPLACE CHAIN-LINK FENCE
MATCHLINE SHEET 2
MATCHLINE SHEET 3
MATCHLINE SHEET 3
MATCHLINE SHEET 4
LEGEND
- AREAS OF PAVEMENT REHABILITATION
SHEET 3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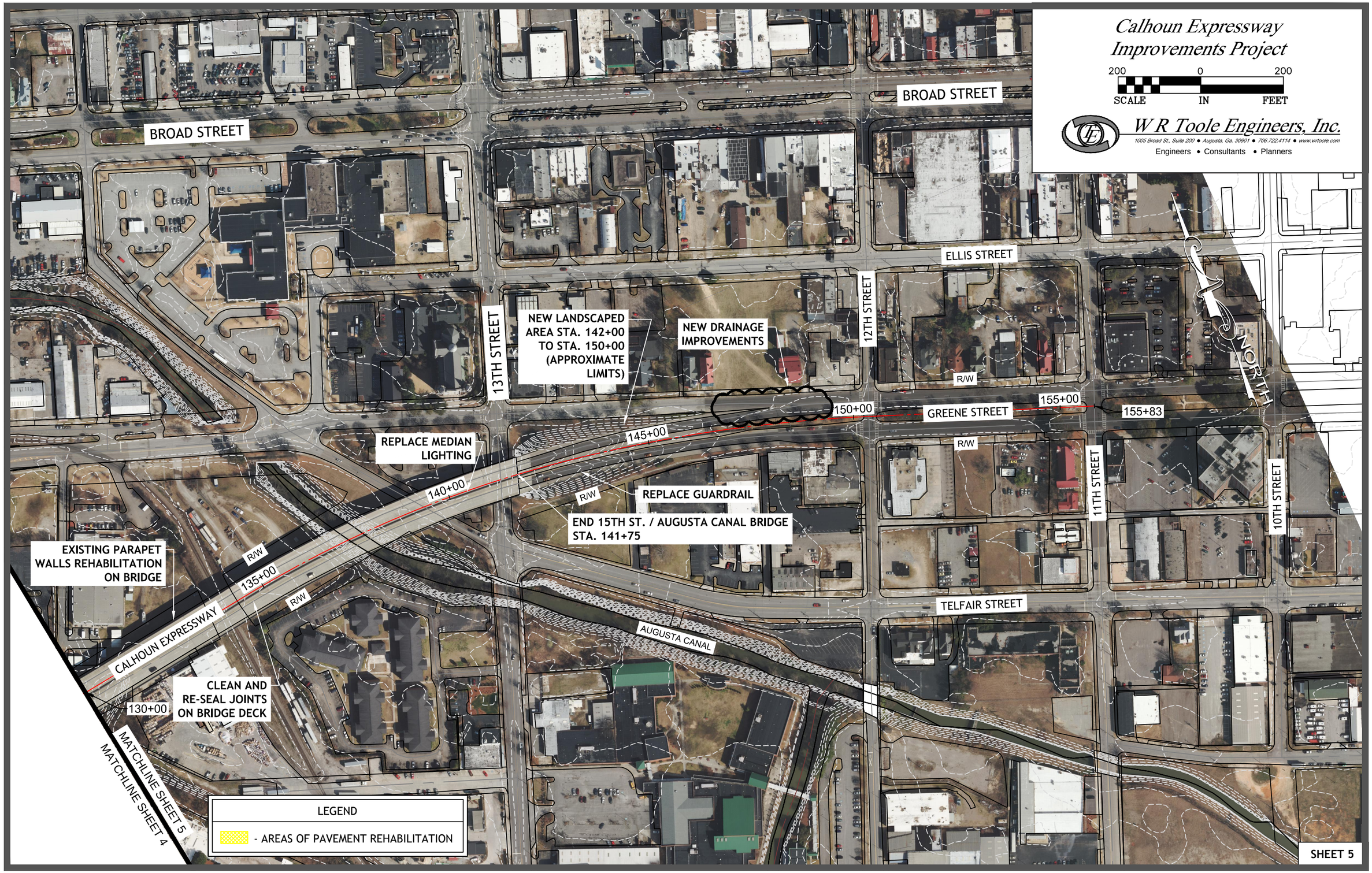
MATCHLINE SHEET 3
MATCHLINE SHEET 4
MATCHLINE SHEET 5
NORTH
AUGUSTA CANAL
NEW LANDSCAPED AREA STA. 81+00 TO STA. 113+00 (APPROXIMATE LIMITS)
GRIND CONCRETE PAVEMENT
REPLACE CHAIN-LINK FENCE
FULL DEPTH ASPHALT SHOULDER RECONSTRUCTION
FULL DEPTH ASPHALT SHOULDER RECONSTRUCTION
GRIND CONCRETE PAVEMENT
AUGUSTA CANAL
95+00
CALHOUN EXPRESSWAY
100+00
105+00
110+00
115+00
120+00
R/W
REPLACE RAMP LIGHTING
15TH STREET
EXISTING PARAPET WALLS REHABILITATION ON BRIDGE
REPLACE MEDIAN LIGHTING
REPLACE GUARDRAIL
MEDIAN BARRIER REHABILITATION
NEW OVERHEAD SIGNAGE STA. 99+00 (APPROXIMATE)
REPLACE CHAIN-LINK FENCE
GRIND CONCRETE PAVEMENT
FULL DEPTH ASPHALT SHOULDER RECONSTRUCTION
REPLACE RAMP LIGHTING
BEGIN 15TH ST. / AUGUSTA CANAL BRIDGE STA. 113+24
CLEAN AND RE-SEAL JOINTS ON BRIDGE DECK
BOHLER AVENUE
MOORE AVENUE
WRIGHTS AVENUE
CHAFEE AVENUE
WALL STREET
LEGEND
- AREAS OF PAVEMENT REHABILITATION
SHEET 4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Improvements Project
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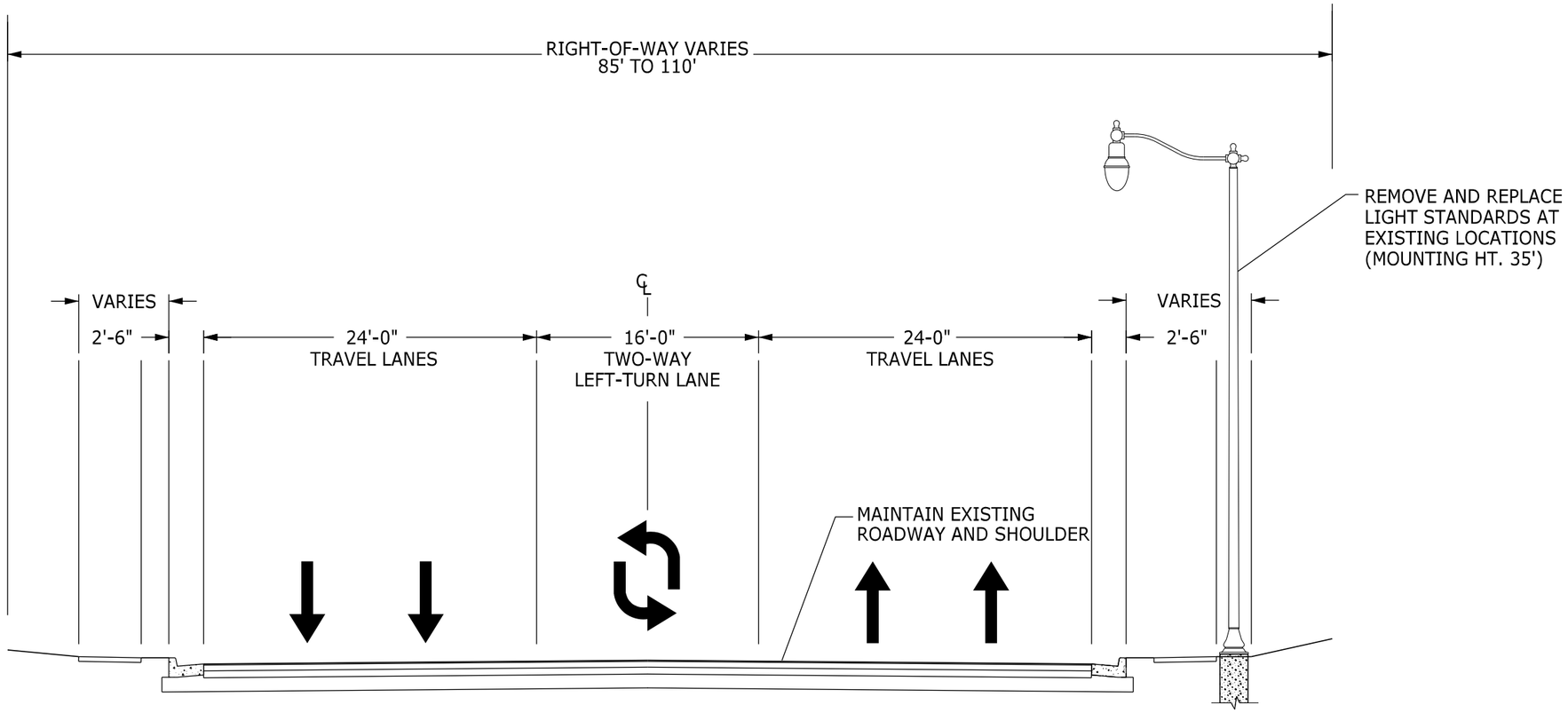
BROAD STREET
BROAD STREET
ELLIS STREET
13TH STREET
12TH STREET
NEW LANDSCAPED AREA STA. 142+00 TO STA. 150+00 (APPROXIMATE LIMITS)
NEW DRAINAGE IMPROVEMENTS
R/W
150+00
GREENE STREET
155+00
155+83
NORTH
REPLACE MEDIAN LIGHTING
145+00
R/W
11TH STREET
10TH STREET
140+00
R/W
REPLACE GUARDRAIL
END 15TH ST. / AUGUSTA CANAL BRIDGE STA. 141+75
EXISTING PARAPET WALLS REHABILITATION ON BRIDGE
R/W
135+00
R/W
TELFAIR STREET
AUGUSTA CANAL
CALHOUN EXPRESSWAY
CLEAN AND RE-SEAL JOINTS ON BRIDGE DECK
130+00
MATCHLINE SHEET 5
MATCHLINE SHEET 4
LEGEND
- AREAS OF PAVEMENT REHABILITATION
SHEET 5



SCALE IN FEET

10 0 10

TYPICAL SECTION #1

WASHINGTON ROAD

SCALE: 1"=10'

JOHN C. CALHOUN EXPRESSWAY (S.R. 28)
REPAIR AND REHABILITATION

SHEET 1 OF 4

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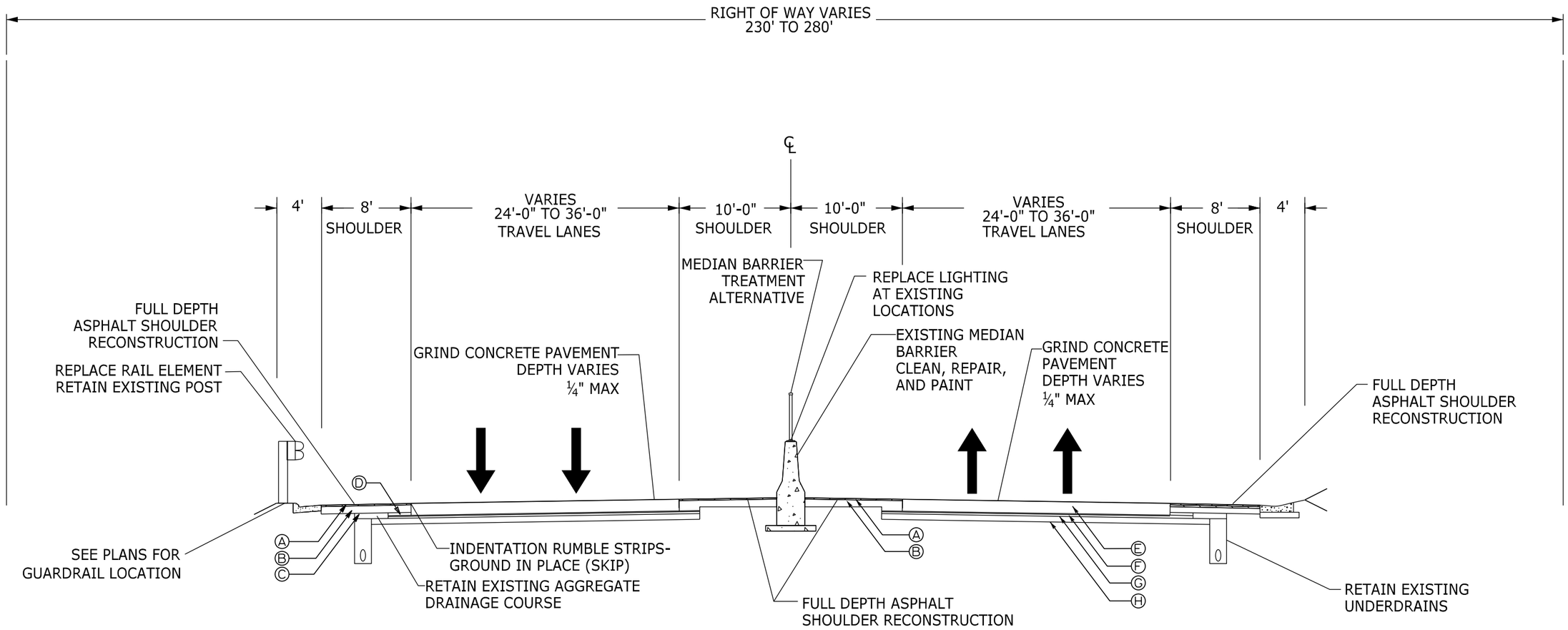

EXISTING PAVEMENT MATERIAL SCHEDULE
A: 1" ASPHALTIC CONC. "G OR H" B: 6" GRADED AGGR. CEMENT STAB. SHOULDER COURSE C: EXISTING AGGREGATE DRAINAGE COURSE, TYPE 1 D: 3" ASPHALTIC CONC. "C" E: 10" PLAIN PORTLAND CEMENT CONC. PAVEMENT F: 1" ASPHALTIC CONC. "H" G: 6" GRADED AGGR. CEMENT STAB. SUBBASE COURSE H: SUBGRADE STABILIZER AGGR. TYPE 2 (RATE OF 200 LBS/SY IN TOP 6")

SCALE IN FEET

10 0 10

TYPICAL SECTION #2

CALHOUN EXPRESSWAY

SCALE: 1"=10'

JOHN C. CALHOUN EXPRESSWAY (S.R. 28)
REPAIR AND REHABILITATION

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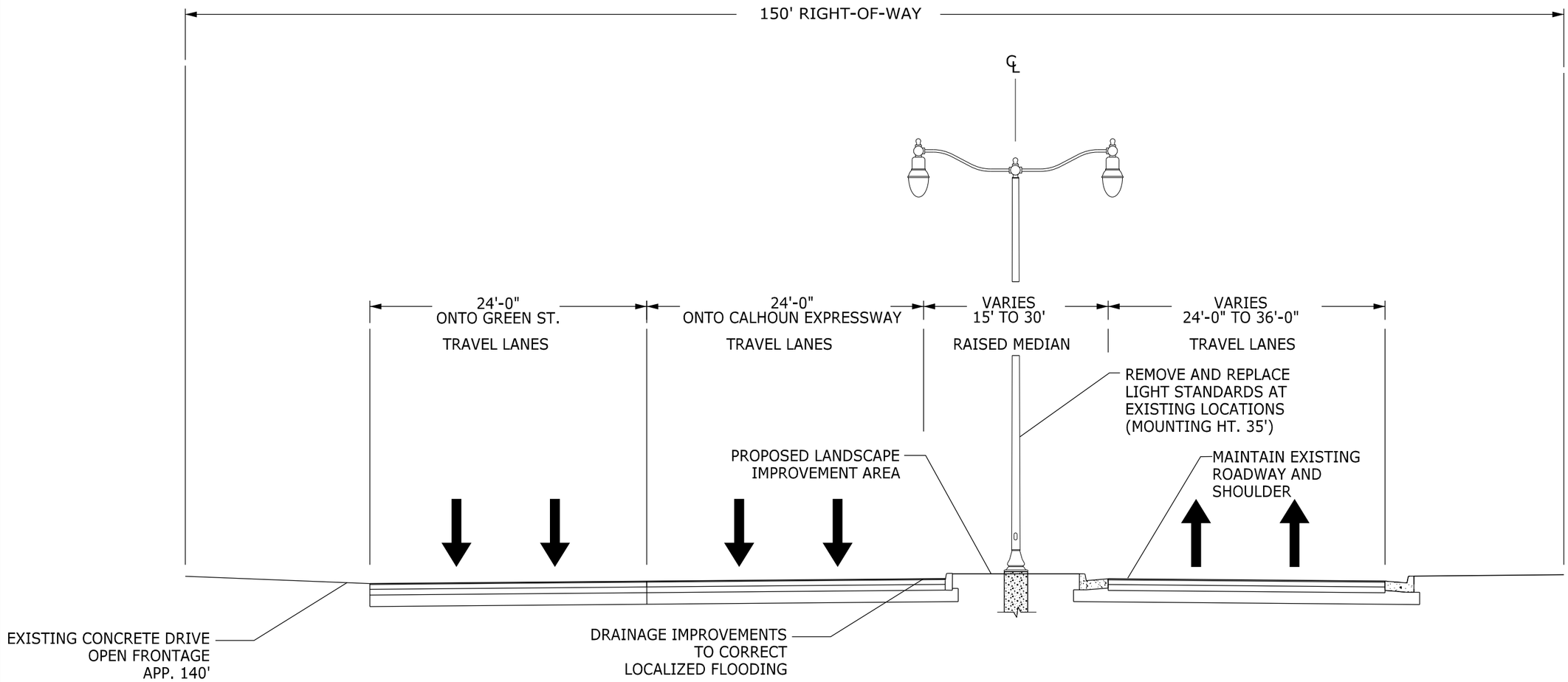

SCALE IN FEET

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TYPICAL SECTION #3

GREEN STREET

SCALE: 1"=10'

JOHN C. CALHOUN EXPRESSWAY (S.R. 28)
REPAIR AND REHABILITATION

SHEET 3 OF 4

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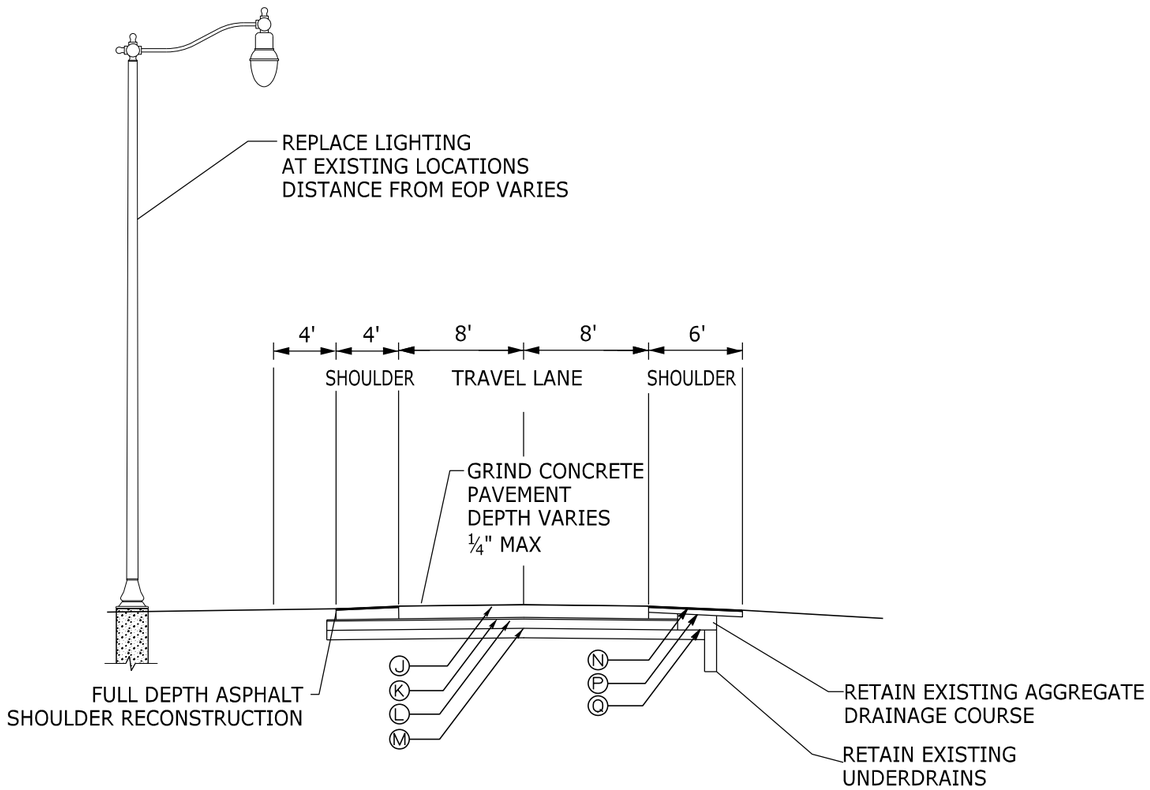

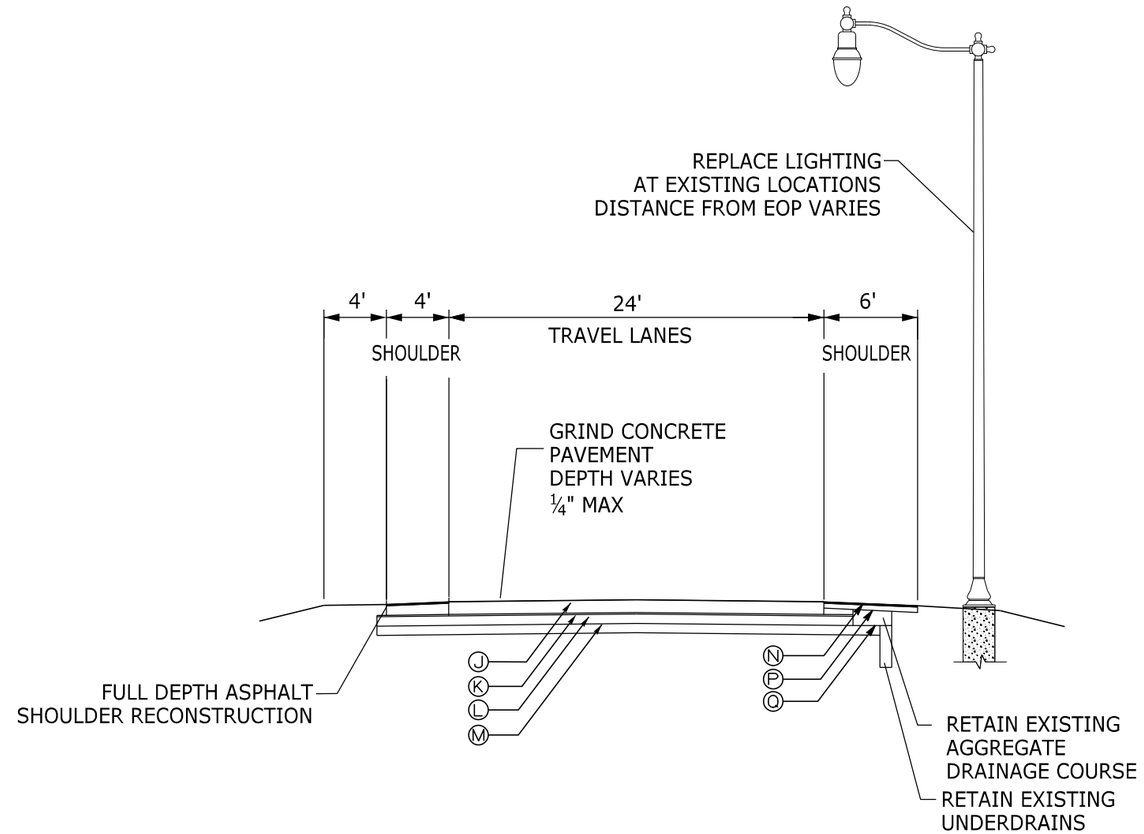

EXISTING PAVEMENT MATERIAL SCHEDULE
J: PLAIN PORTLAND CEMENT CONC. PAVEMENT - DEPTH VARIES 8" TO 10" K: 1" ASPHALTIC CONC. "H" L: 6" GRADED AGGR. CEMENT STAB. SUBBASE COURSE M: SUBGRADE STABILIZED AGGR., TYPE II (RATE OF 200 LBS/SY IN TOP 6") N: 1" ASPHALTIC CONC. "G OR H" P: 4" GRADED AGGR. CEMENT STAB. SHOULDER COURSE Q: EXISTING AGGREGATE DRAINAGE COURSE, TYPE 1

SCALE IN FEET

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TYPICAL SECTION #4

CALHOUN EXPRESSWAY RAMPS

SCALE: 1"=10'

SHEET 4 OF 4

JOHN C. CALHOUN EXPRESSWAY (S.R. 28)
REPAIR AND REHABILITATION

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John C. Calhoun Expressway - Repair and Restoration

Cost Estimate

Roadway Items

Pay item	Quantity	Unit Cost	Basis	Description	Cost
150-1000	1	$ 150,000.00	LS	TRAFFIC CONTROL	$ 150,000.00
153-1300	1	$ 65,000.00	EA	FIELD ENGINEERS OFFICE TP 3	$ 65,000.00
230-1000	1	$ 100,000.00	LS	LUMP SUM CONSTRUCTION	$ 100,000.00
				Lump Sum Items Subtotal	***$ 315,000.00***
Roadway Surfaces and Shoulder					
402-3121	8800	$ 85.00	TN	RECYCLED ASPH CONC 25 MM SUPERPAVE, GP 1 OR 2, INCL BITUM MATL & H LIME	$ 748,000.00
402-3190	4400	$ 85.00	TN	RECYCLED ASPH CONC 19 MM SUPERPAVE, GP 1 OR 2, INCL BITUM MATL & H LIME	$ 374,000.00
310-5060	14000	$ 10.00	TN	GR AGGR BASE CRS, 6 INCH, INCL MATL	$ 140,000.00
431-1000	7100	$ 4.50	SY	GRIND CONC PVMT (ramps)	$ 31,950.00
431-1000	55025	$ 4.50	SY	GRIND CONC PVMT (mainline)	$ 247,612.50
452-1000	480.00	$ 660.00	CY	FULL DEPTH SLAB REPLACEMENT	$ 316,800.00
408-9010	10000.00	$ 2.00	LF	JOINT AND CRACK CLEANING AND SEALING IN PCC PAVEMENT	$ 20,000.00
456-2015	6.8	$ 1,500.00	GLM	INDENTATION RUMBLE STRIPS - GROUND IN PLACE (SKIP)	$ 10,200.00
441-6221	500	$ 15.00	LF	CONCRETE CURB & GUTTER, 8" x 30", TP 1	$ 7,500.00
610-1055	7532	$ 1.14	LF	REM GUARDRAIL	$ 8,586.48
610-1066	7	$ 112.50	EA	REM GUARDRAIL ANCH, TP 1	$ 787.50
610-1075	7	$ 112.50	EA	REM GUARDRAIL ANCH, ALL TYPES	$ 787.50
641-1105	120	$ 37.50	LF	CORROSION RESISTANT WEATHERED GUARDRAIL, TYPE T	$ 4,500.00
641-1205	7532	$ 15.00	LF	CORROSION RESISTANT WEATHERED GUARDRAIL, TYPE W	$ 112,980.00
641-5001	7	$ 750.00	EA	GUARDRAIL ANCHORAGE, TP 1	$ 5,250.00
641-5012	7	$ 1,500.00	EA	GUARDRAIL ANCHORAGE, TP 12	$ 10,500.00
653-0120	2	$ 85.36	EA	THERMOPLASTIC PVMT MARKING, ARROW, TP 2	$ 170.72
653-0140	4	$ 175.00		THERMOPLASTIC PVMT MARKING, ARROW, TP 4	$ 700.00
653-1501	31000	$ 0.46	LF	THERMOPLASTIC SOLID TRAF STRIPE, 5 IN, WHITE	$ 14,260.00
653-1502	28000	$ 0.40	LF	THERMOPLASTIC SOLID TRAF STRIPE, 5 IN, YELLOW	$ 11,200.00
653-1810	1800	$ 2.54	LF	THERMOPLASTIC SOLID TRAF STRIPE, 10 IN, WHITE	$ 4,572.00
653-3501	30000	$ 0.24	GLF	THERMOPLASTIC SKIP TRAF STRIP, 5 IN, WHITE	$ 7,200.00
653-6004	200	$ 4.48	SY	THERMOPLASTIC TRAF STRIPING, WHITE	$ 896.00
653-6006	875	$ 3.95	SY	THERMOPLASTIC TRAF STRIPING, YELLOW	$ 3,456.25
654-1003	550	$ 4.26	EA	RAISED PVMT MARKERS TP 3	$ 2,343.00
611-3010	25	$ 2,000.00	EA	RECONSTR DROP INLET, GROUP 1	$ 50,000.00
610-2587	40000	$ 3.50	SY	REM ASPH SHLDR INCL BASE	$ 140,000.00
				Roadway Surfaces and Shoulder Subtotal	***$ 2,274,251.95***

Right-of-Way Fencing						
610-0213	7500	$	7.00	LF	REM CHAIN LINK FENCE, 6 FT	$ 52,500.00
643-1171	7500	$	37.50	LF	CH LK FENCE, ZC COAT, 8 FT, 9 GA	$ 281,250.00
					Right-of-Way Fencing Subtotal	***$ 333,750.00***
Overhead Signage						
636-1072	550	$	95.00	SF	HIGHWAY SIGNS, ALUM EXTRUDED PANELS, REFL SHEETING, TP 3	$ 52,250.00
638-1005	4	$	45,000.00	LS	STR SUPPORT FOR OVERHEAD SIGN, TP V, STA -	$ 180,000.00
500-3101	20	$	510.00	CY	CLASS A CONCRETE	$ 10,200.00
					Overhead Signage Subtotal	***$ 242,450.00***
Median Treatment						
685-2000	80000	$	1.75	SF	BLAST CLEANING PC CONC STRUCTURES	$ 140,000.00
836-XXXX	80000	$	4.25	SF	SPECIAL SURFACE COATING FOR CONCRETE	$ 340,000.00
643-8300	10380	$	65.00	LF	ORNAMENTAL FENCE (TO CANAL BRIDGE)	$ 674,700.00
643-8300	2861	$	65.00	LF	ORNAMENTAL FENCE (ON CANAL BRIDGE)	$ 185,965.00
					Median Treatment Subtotal	***$ 1,340,665.00***
Drainage Improvements approaching 12th Street						
611-3000	2	$	3,500.00	EA	RECONSTR CATCH BASIN, GROUP 1	$ 7,000.00
402-3113	45.00	$	69.26	TN	RECYCLED ASPH CONC 12.5 MM SUPERPAVE, GP 1 OR 2, INCL BITUM MATL & H LIME	$ 3,116.70
402-3190	80.00	$	105.31	TN	RECYCLED ASPH CONC 19 MM SUPERPAVE, GP 1 OR 2, INCL BITUM MATL & H LIME	$ 8,424.80
310-5120	375.00	$	20.25	SY	GR AGGR BASE CRS, 12 INCH, INCL MATL	$ 7,593.75
441-6221	300	$	15.00	LF	CONCRETE CURB & GUTTER, 8" x 30", TP 1	$ 4,500.00
550-1240	300	$	40.00	LF	STORM DRAIN PIPE, 24, IN, H 1-10	$ 12,000.00
432-5010	375	$	3.75	SY	MILL ASPH CONC PVMT, VARIABLE DEPTH	$ 1,406.25
207-0203	200	$	44.40	CY	SELECT BACKFILL	$ 8,880.00
611-4001	2	$	5,000.00	EA	RECONSTR MINOR DRAINAGE STR	$ 10,000.00
					Drainage Improvements Subtotal	***$ 62,921.50***

Erosion Control						
163-0232	3	$	1,500.00	AC	TEMPORARY GRASSING	$ 4,500.00
163-0240	75	$	220.00	TN	MULCH	$ 16,500.00
165-0030	8700	$	1.00	LF	MAINTENANCE OF TEMPORARY SILT FENCE, TP C	$ 8,700.00
163-0550	50	$	150.00	EA	CONSTRUCT AND REMOVE INLET SEDIMENT TRAP	$ 7,500.00
165-0105	50.00	$	50.00	EA	MAINTENANCE OF INLET SEDIMENT TRAP	$ 2,500.00
167-1000	12.00	$	500.00	EA	WATER QUALITY MONITORING AND SAMPLING	$ 6,000.00
167-1500	12.00	$	560.00	MO	WATER QUALITY INSPECTIONS	$ 6,720.00
171-0300	10000.00	$	3.00	LF	TEMPORARY SILT FENCE, TYPE C	$ 30,000.00
700-6910	3.00	$	1,000.00	AC	PERMANENT GRASSING	$ 3,000.00
700-7000	3.00	$	100.00	TN	AGRICULTURAL LIME	$ 300.00
700-8000	0.50	$	500.00	TN	FERTILIZER MIXED GRADE	$ 250.00
700-8100	100.00	$	3.00	LB	FERTILIZER NITROGEN CONTENT	$ 300.00
					Erosion Control Subtotal	***$ 86,270.00***

Lighting and Electrical Items

Pay item	Quantity	Unit Cost		Basis	Description	Cost
500-3101	16	$	510.00	EA	CLASS A CONCRETE	$ 8,160.00
610-6605	126	$	500.00	EA	REMOVE LIGHTING STANDARD	$ 63,000.00
610-6610	126	$	440.00	EA	REMOVE LUMINAIRE	$ 55,440.00
610-6611	194	$	180.00	EA	REMOVE LUMINAIRE ARM	$ 34,920.00
681-4210	126	$	3,407.00	EA	LIGHTING STANDARD, 30 FT MH, POST TOP	$ 429,282.00
681-5260	194	$	606.00	EA	LUMINAIRE BRACKET ARM, 8 FT ARM	$ 117,564.00
681-6318	194	$	1,070.00	EA	LUMINAIRE, TP 3, 150 W, LED	$ 207,580.00
682-1504	6300	$	0.97	LF	CABLE TP RHH/RHW, 10 AWG	$ 6,111.00
682-1506	12600	$	1.83	LF	CABLE TP RHH/RHW, 6 AWG	$ 23,058.00
					Lighting Total	**$ 945,115.00**

Landscaping

XXX-XXXX	1	$ 230,000.00	LS	Milledge Road overpass	$	230,000.00
XXX-XXXX	1	$ 280,000.00	LS	Crawford Ave. to 15th St.	$	280,000.00
XXX-XXXX	1	$ 250,000.00	LS	13th St.transition to Green St.	$	250,000.00
				Landscaping Total	**$**	**760,000.00**

Bridge Items

Pay item	Quantity	Unit Cost	Basis	Description	Cost	
461-2000	2100	$ 28.00	LF	RESEALING BRIDGE JOINTS	$	58,800.00
611-3010	12	$ 2,023.25	EA	RECONSTR DROP INLET, GROUP 1	$	24,279.00
685-2000	52000	$ 1.75	SF	BLAST CLEANING PC CONC STRUCTURES	$	91,000.00
836-XXXX	52000	$ 4.25	SF	SPECIAL SURFACE COATING FOR CONCRETE	$	221,000.00
XXX-XXXX	1	$ 200,000.00	LS	REPAIRING VERTICAL JOINTS IN PARAPET WALLS	$	200,000.00
XXX-XXXX	1789	$ 20.00	LF	PAINTING EXISTING BRIDGE RAILINGS	$	35,780.00
XXX-XXXX	1	$ 150,000.00	EA	PAINTING MILLEDGE ROAD BRIDGE	$	150,000.00
				Bridge Total	**$**	**780,859.00**

Project Total	***$***	***7,141,282.45***
Contingency (5%)	***$***	***357,064.12***
Total Estimated Cost	***$***	***7,498,346.57***

CONCRETE PAVEMENT EVALUATION
JOHN C. CALHOUN EXPRESSWAY REPAIR AND RESTORATION PROJECT
TIA PROJECT NO. 371-041110-5212115/ T13049113-5212115
AUGUSTA, GEORGIA
S&ME PROJECT NO. 3319-14-053

Prepared for**:**

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1005 Broad Street, Suite 201
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Prepared by:

1732 Wylds Road
Augusta, Georgia 30909

September 5, 2014

CONCRETE PAVEMENT EVALUATION SUMMARY
John C. Calhoun Expressway Repair and Restoration Project
TIA Project Number: 371-041110-5212115 / T13049113-5212115
Augusta, Richmond County

1. Location / Description

This project is for the repair and restoration of the John C. Calhoun Expressway in Richmond County, Georgia. The project begins at Lakewood Drive at Station 0+00, extends to the east for approximately 2.85 miles, and ends at the intersection with 12th Street at Station 150+38.

At the beginning of the project, between Stations 0+00 to 14+95, John C. Calhoun Expressway consists of a 4-lane asphalt road. At Station 14+95, John C. Calhoun Expressway transitions to a Joint Reinforced Concrete Pavement (JRCP) at the west approach slab associated with the bridge spanning Raes Creek. John C. Calhoun Expressway crosses over Eve Street at Station 70+35. At Station 78+95, John C. Calhoun Expressway crosses over Crawford Avenue. John C. Calhoun Expressway crosses over 15th Street at Station 113+24. The project ends at Station 150+38.

Current plans do not call for rehabilitation or reconstruction of the asphalt portions within the project limits. Therefore, evaluation of the existing asphalt pavement was excluded from this study.

2. PACES Study

A PACES study was not completed for the asphalt portions of the John C. Calhoun Expressway present between Stations 0+00 and 14+95 and from Station 141+75 and 150+38. The primary focus of this study was the JRCP based on current plans to focus on the concrete.

3. Measurements

The faulting of every 8th joint was not measured as part of this CPACES study.

4. Broken Pavement Slabs

Severity Level 2 broken slabs were identified at two locations in the eastbound outer lane and three locations in the westbound outer lane. Broken slabs represent approximately 0.4 percent of the slabs associated with the eastbound outer lane. Broken slabs represent approximately 0.6 percent of the slabs associated with the westbound outer lane. The approximate locations of the broken slabs are:

Eastbound Outer Broken Slabs

- Station 21+18 – Severity Level 2
  - The broken slab was not previously sealed.
- Station 87+97 – Severity Level 2
  - The broken slab was previously sealed and shows signs of continued movement. Sealant had pulled from the distress.

Westbound Outer Broken Slabs

- Station 63+03 – Severity Level 2
  - The broken slab was previously sealed and shows signs of continued movement. Sealant had pulled from the distress.
- Station 97+40 – Severity Level 2
  - The broken slab was previously sealed and shows signs of continued movement. Sealant had pulled from the distress.
- Station 99+62 – Severity Level 2
  - The broken slab was previously sealed and shows signs of continued movement. Sealant had pulled from the distress.

5. Slabs with Longitudinal Cracks

Severity Level 1 longitudinal cracks were identified at two locations associated with the eastbound outer lane and eight locations associated with the westbound outer lane. Slabs with longitudinal cracks represent approximately 0.4 percent of the slabs associated with the eastbound outer lane. Slabs with longitudinal cracks represent approximately 1.6 percent of the slabs associated with the westbound outer lane. The approximate locations of the longitudinal cracks are:

Eastbound Outer Longitudinal Cracks

- Eastbound Outer at Station 94+78 – Severity Level 1.
- Eastbound Outer at Station 141+62 – Severity Level 1.

Westbound Outer Longitudinal Cracks

- Westbound Outer at Station 16+04 – Severity Level 1.
- Westbound Outer at Station 22+05 – Severity Level 1.
- Westbound Outer at Station 71+05 – Severity Level 1.
- Westbound Outer at Station 73+01 – Severity Level 1.
- Westbound Outer at Station 73+22 – Severity Level 1.
- Westbound Outer at Station 81+03 – Severity Level 1.

- Westbound Outer at Station 112+24 – Severity Level 1.
- Westbound Outer at Station 142+28 – Severity Level 1.

6. Replaced Slabs

Eight slabs were identified in the eastbound outer lane as replaced slabs. No slabs were identified as replaced slabs in the westbound outer lane. Replaced slabs represent approximately 1.7 percent of the eastbound outer lane. The approximate locations of the replaced slabs are:

- Eastbound Outer at Station 70+18.
- Eastbound Outer at Station 82+16.
- Eastbound Outer at Station 82+38.
- Eastbound Outer at Station 102+97.
- Eastbound Outer at Station 103+18.
- Eastbound Outer at Station 103+39.
- Eastbound Outer at Station 103+55.
- Eastbound Outer at Station 103+76.

7. Failed Replaced Slabs

No failed replaced slabs were observed.

8. Joint Defects

Joint defects including spalls, patched spalls, and failed patched spalls were observed in slabs for both the eastbound and westbound outer lanes. Joint sealant was minimal or absent in the majority of slabs. Relatively incompressible material (sand and gravel) was present in the majority of the joints. The approximate percent of joint defect occurrence associated with the eastbound and westbound outer lanes are as follows:

Eastbound Outer Lane:

- Joint with Spall 37.7%
- Joint with Patched Spall 25.3%
- Joint with Failed Patched Spall 14.4%

Westbound Outer Lane:

- Joint with Spall 23.6%
- Joint with Patched Spall 25.2%
- Joint with Failed Patched Spall 6.5%

9. Shoulder Joint Distress

Severity Level 1 shoulder joint distress was observed in approximately 25.7 percent of the slabs associated with the eastbound outer lane. Level 1 and Level 2 shoulder joint distress was observed in approximately 24.4 percent of the slabs associated with the westbound outer lane. Shoulder joint distress is primarily located as follows:

Eastbound Outer Lane

- Station 22+98 to 27+57 – Severity Level 1.
- Station 31+37 to 39+55 – Severity Level 1.
- Station 55+18 to 56+19 – Severity Level 1.
- Station 74+19 to 76+57 – Severity Level 1.
- Station 85+17 to 87+18 – Severity Level 1.
- Station 105+98 to 112+00 – Severity Level 1.

Westbound Outer Lane

- Station 24+65 to 36+63 – Severity Level 1.
- Station 83+04 to 85+84 – Severity Level 1.
- Station 88+21 to 91+64 – Severity Level 1.
- Station 106+43 to 112+61 – Severity Level 1and 2.

10. Punch-out

No punch-out was observed.

11. Scaling

No scaling was observed.

12. D Cracking

No D cracking was observed.

13. Map Cracking

No map cracking was observed.

14. Blowups

One blowup was observed at Station 38+76 in the eastbound outer lane. The blowup is located on the northeast corner of the slab.

15. Water Pumping and Bleeding

No water pumping was observed. No bleeding was observed.

16. Popouts

Popouts were identified in the eastbound outer and westbound outer lanes. Slabs with popouts, including bridge decks, represent approximately 92 percent of the slabs associated with the eastbound outer lane. Slabs with popouts, including bridge decks, represent approximately 85.7 percent of the slabs associated with the westbound outer lane. Depths of popouts were not measured.

17. Alkali-Silica Reactivity (ASR)

No ASR tests were performed.

18. Transverse Cracking

Transverse cracking was observed five locations associated with the eastbound outer lane and seven location associated with the westbound outer lane. Six of the westbound outer lane slabs with transverse cracking are associated with the approach slabs and bridge decks at Eve Street. Slabs with transverse cracking represent approximately 1 percent of the eastbound outer lane. Slabs with transverse cracking represent approximately 1.4 percent of the westbound outer lane.

19. Road Profilagraph

Road profile elevation measurements on all four lanes of the John C. Calhoun Expressway was performed using a Dynatest Mark III inertial profiler by Dynatest Consulting, Inc. (Dynatest). Profile elevations were recorded at 6 inch intervals. The profile elevation data was processed by Dynatest processed the data and provided a summary report of procedures, International Roughness Index (IRI), data exclusions, exceptions, and conclusions.

Georgia Department of Transportation (GDOT) does not provide an IRI category limits for existing PCC pavements. Federal Highway Association (FHWA) categorizes ride quality based on IRI. FHWA categories based on IRI are:

Good Ride Quality: IRI < 95
Acceptable Ride Quality: 95≤ IRI ≤ 170
Unacceptable Ride Quality: 170 < IRI

Table 1 presents the average IRI values for left and right wheel path associated with the JRCP for the eastbound inner lane. Table 2 presents the average IRI values for left and right wheel path associated with the JRCP for the eastbound outer lane.

Table 1: Eastbound Inner IRI Values

Station Begin	Station End	Left Wheel Path IRI	Right Wheel Path IRI
13+20	20+06	149.1	145.1
23+23	36+43	123.9	110.1
36+43	49+10	149.9	147.5
51+74	53+86	146.6	202.3
57+02	70+22	121.9	150.6
70+22	83+42	161.8	150.9
83+42	96+62	125.8	150.2
96+62	109+82	138.7	153.6
123+02	136+22	102.5	94.6
136+22	149+42	100.1	89.5

Table 2: Eastbound Outer IRI Values

Station Begin	Station End	Left Wheel Path IRI	Right Wheel Path IRI
13+20	21+12	139.9	137.4
25+34	38+54	102.7	100.6
38+54	51+74	159.4	117.3
51+74	64+94	158.7	118.7
64+94	78+14	153.1	129.4
78+14	91+34	161.1	144.2
91+34	104+54	151.4	121.5
104+54	117+74	128.2	123.2
117+74	130+94	94.2	86.9
130+94	144+14	114.8	110.5

The average IRI value for the eastbound inner and outer lane when weighted based on segment length is 127.2.

Table 3 presents the average IRI values for left and right wheel path associated with the JRCP for the westbound inner lane. Table 4 presents the average IRI values for left and right wheel path associated with the JRCP for the westbound outer lane.

Table 3: Westbound Inner IRI Values

Station Begin	Station End	Left Wheel Path IRI	Right Wheel Path IRI
9+01	22+21	110.3	88.3
22+21	24+85	178.3	149.2
24+85	38+05	117	119.2
38+05	51+25	120.3	163.3
51+25	64+45	134.7	163.8
64+45	77+65	153.1	153
77+65	90+85	140.6	144.4
90+85	104+05	127.1	139.4
104+05	117+25	94.1	93.6
117+25	130+45	102.1	94.4
130+45	143+65	109.1	99.7

Table 4: Westbound Outer IRI Values

Station Begin	Station End	Left Wheel Path IRI	Right Wheel Path IRI
13+59	26+79	94.6	125.8
26+79	34+19	121.5	125.9
34+19	47+39	141.5	116.2
47+39	60+59	168.1	107.9
60+59	73+79	156.5	123.3
86+99	100+19	124.7	98.3
100+19	101+77	130.2	126.3
101+77	114+97	120	102.2
114+97	128+17	105.5	102.4
128+17	141+37	100.9	98.9

The average IRI value for the westbound inner and outer lane when weighted based on segment length is 124.1.

20. Cores

No cores were obtained as part of the initial phase of investigation. Select coring of specific slabs and asphalt shoulders will occur during the second phase of the pavement evaluation.

21. Pavement Condition Summary

Reconstruction of all JRCP broken slabs present in eastbound and westbound lanes and asphalt shoulder reconstruction is recommended.

Repair of all joint spalls and joints with failed patches is recommended.

Existing ride quality is considered acceptable based on FHWA category levels. Ride quality can be improved by grinding. Excluded sections and sections with higher acceptable IRI values and sections with IRI values that categorize as unacceptable by FHWA may be ground to improve ride quality. Ride quality for the JRCP project limits may be ground to improve overall ride quality if required.

Grinding should not occur on bridge decks. Grinding depth should taper prior to and following all bridge decks to prevent negative impact on ride quality. Grinding of JRCP should be done in accordance with GDOT Section 431. Post grinding IRI values shall be determined for conformance with GDOT requirements of an upper limit of IRI of 57 inches per pile over a 0.25 mile segment of roadway.

Cleaning and resealing of all joints is recommended following grinding. Sealing JRCP slabs should be done in accordance with GDOT Section 461.

Full depth replacement of all asphalt shoulders is recommended.

22. Overlay Sections

It is recommended that overlay sections not be used for restoration at this time.

23. Other

Slab sections in eastbound inner and westbound outer lanes that contain joint defects, shoulder distress, missing joint sealer, broken slabs, and missing pavement structure should be repaired. Full depth replacement of broken slabs should be constructed flush with existing slab sections.

Grinding of pavement should occur following all slab replacement. All joints should be cleans and repaired following grinding operations.

Remove all markers prior to grinding.

Post grinding ride IRI criteria should be consistent with GDOT requirements. Pavement structures should be profiled using similar equipment and data processing for conformance to final project specifications.

Prepared by:

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Reviewed by:

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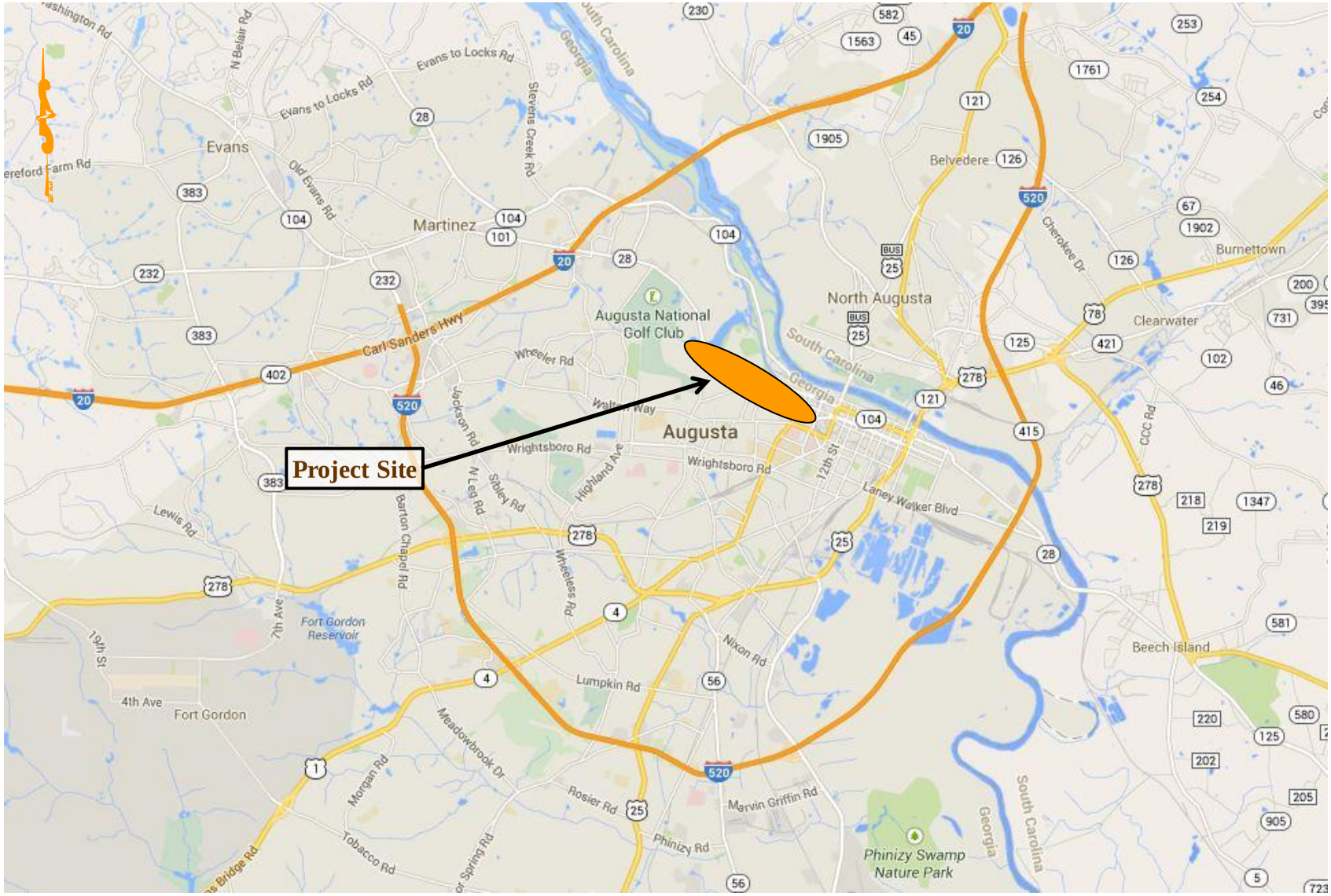
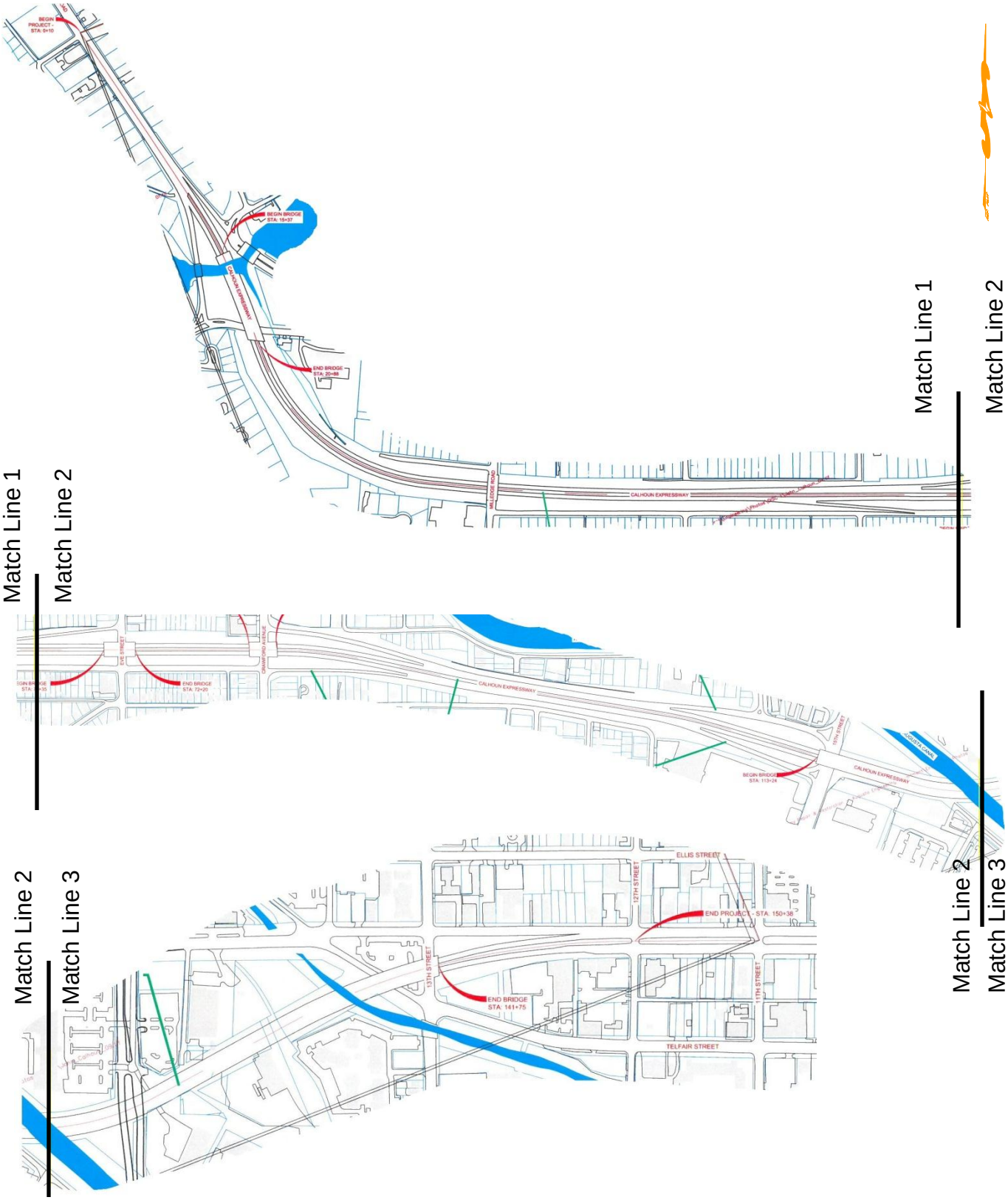
APPENDIX I

Figure 1 –General Project Location Plan

Figure 2 – Project Limits Location Plan



S&ME	General Project Location Plan John C. Calhoun Expressway TIA Project No. 371-041110-5212115/ T13049113-5212115 Augusta, Richmond County, Georgia	JOB NO.:3319-14-053	FIGURE NO.: 1
		SOURCE: Google	DRAWN BY: RAW
		DATE: 9/03/2014	CHECKED BY: TPS



NOT TO SCALE

S&ME	Project Limits Location Plan John C. Calhoun Expressway TIA Project No. 371-041110-5212115/T13049113-5212115 Augusta, Georgia	JOB NO.:3319-14-053	FIGURE NO.: 2
		SOURCE: WR Toole	DRAWN BY: RAW
		DATE: 9/3/2014	CHECKED BY: TPS

APPENDIX II

Eastbound Outer Lane Pavement Survey Data

Westbound Outer Lane Pavement Survey Data

TIA Project No.: 371-041110-5212115/T13049113-5212115
John C. Calhoun Expressway - Augusta, Georgia
Eastbound Outer CPACE Observations

From STA	To STA	Broken Slabs	Longitudinal Cracks	Replaced Slabs	Joint w/Spall	Joint w/Patched Spall	Joint w/Failed Patched Spall	Shoulder Joint Distress	Punch Out	D-Cracking	Scaling	Map Cracking	Blowups	Water Pumping and Bleeding	Transverse Cracking	Popouts	Notes
14+95	15+37				1											1	East approach slab for bridge at Rays Creek
15+37	15+95				1											1	Start of bridge over Rays Creek
15+95	16+59														1	1	
16+59	17+38															1	
17+38	17+96															1	
17+96	18+38															1	
18+38	18+96				1										1	1	
18+96	19+39				1											1	
19+39	20+18				1											1	
20+18	20+55				1											1	End of bridge over Rays Creek
20+55	20+97				1											1	West approach slab for bridge at Rays Creek
20+97	21+18				1											1	
21+18	21+39	1			1			1								1	
21+39	21+55					1										1	
21+55	21+76				1											1	
21+76	21+97															1	
21+97	22+18				1	1										1	
22+18	22+39				1											1	
22+39	22+55				1	1										1	
22+55	22+76				1											1	Level 2 Spall at Joint
22+76	22+98				1											1	
22+98	23+19				1			1								1	
23+19	23+35				1	1		1								1	
23+35	23+56				1	1		1								1	
23+56	23+77				1	1		1								1	
23+77	23+98				1			1								1	
23+98	24+19				1			1								1	
24+19	24+35				1	1		1								1	
24+35	24+56				1	1		1								1	

TIA Project No.: 371-041110-5212115/T13049113-5212115
John C. Calhoun Expressway - Augusta, Georgia
Eastbound Outer CPACE Observations

From STA	To STA	Broken Slabs	Longitudinal Cracks	Replaced Slabs	Joint w/Spall	Joint w/Patched Spall	Joint w/Failed Patched Spall	Shoulder Joint Distress	Punch Out	D-Cracking	Scaling	Map Cracking	Blowups	Water Pumping and Bleeding	Transverse Cracking	Popouts	Notes
24+56	24+77				1			1								1	
24+77	24+98				1			1								1	
24+98	25+19				1	1	1	1								1	
25+19	25+35				1	1	1	1								1	
25+35	25+56				1	1										1	
25+56	25+77				1											1	
25+77	25+99															1	
25+99	26+20															1	
26+20	26+35							1								1	
26+35	26+57							1								1	
26+57	26+78				1	1	1	1								1	
26+78	26+99				1											1	
26+99	27+15				1			1								1	
27+15	27+36				1		1									1	
27+36	27+57				1		1	1								1	
27+57	27+78				1		1									1	
27+78	27+99				1		1									1	
27+99	28+15				1	1										1	
28+15	28+36															1	
28+36	28+57															1	
28+57	28+78				1	1	1									1	
28+78	28+99															1	
28+99	29+15															1	
29+15	29+36				1	1										1	
29+36	29+58				1	1										1	
29+58	29+79				1	1	1									1	
29+79	29+95				1	1										1	
29+95	30+16				1											1	
30+16	30+37				1	1										1	

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From STA	To STA	Broken Slabs	Longitudinal Cracks	Replaced Slabs	Joint w/Spall	Joint w/Patched Spall	Joint w/Failed Patched Spall	Shoulder Joint Distress	Punch Out	D-Cracking	Scaling	Map Cracking	Blowups	Water Pumping and Bleeding	Transverse Cracking	Popouts	Notes
30+37	30+58				1	1		1								1	
30+58	30+79				1											1	
30+79	30+95				1	1	1									1	
30+95	31+16				1		1									1	
31+16	31+37				1											1	
31+37	31+58				1	1	1	1								1	
31+58	31+79					1		1								1	
31+79	31+95				1	1										1	
31+95	32+16				1	1		1								1	
32+16	32+37				1	1		1								1	
32+37	32+59				1	1		1								1	
32+59	32+80				1			1								1	
32+80	32+95				1	1		1								1	
32+95	33+17				1	1		1								1	
33+17	33+38				1	1		1								1	
33+38	33+59				1	1	1	1								1	
33+59	33+75					1		1								1	
33+75	33+96							1								1	
33+96	34+17				1	1	1	1								1	
34+17	34+38				1	1		1								1	
34+38	34+59				1			1								1	
34+59	34+75							1								1	
34+75	34+96				1			1								1	
34+96	35+17				1	1	1	1								1	
35+17	35+38				1			1								1	
35+38	35+59				1			1								1	
35+59	35+75				1			1								1	
35+75	35+96				1	1	1	1								1	
35+96	36+18					1	1	1								1	

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From STA	To STA	Broken Slabs	Longitudinal Cracks	Replaced Slabs	Joint w/Spall	Joint w/Patched Spall	Joint w/Failed Patched Spall	Shoulder Joint Distress	Punch Out	D-Cracking	Scaling	Map Cracking	Blowups	Water Pumping and Bleeding	Transverse Cracking	Popouts	Notes
36+18	36+39							1								1	
36+39	36+55				1			1								1	
36+55	36+76				1		1	1								1	
36+76	36+97				1	1	1	1								1	
36+97	37+18							1								1	
37+18	37+39				1	1		1								1	
37+39	37+55				1	1		1								1	
37+55	37+76				1	1		1								1	
37+76	37+97				1		1	1								1	Milledgeville Road overpass
37+97	38+18							1								1	
38+18	38+39				1	1		1								1	
38+39	38+55							1								1	
38+55	38+76							1								1	
38+76	38+97							1					1			1	
38+97	39+19							1								1	
39+19	39+40				1	1		1								1	
39+40	39+55				1	1		1								1	
39+55	39+77				1											1	
39+77	39+98				1	1	1									1	
39+98	40+19				1	1										1	
40+19	40+35				1											1	
40+35	40+56				1											1	
40+56	40+77				1	1	1									1	
40+77	40+98				1	1										1	
40+98	41+19															1	
41+19	41+35				1	1	1									1	
41+35	41+56				1	1										1	
41+56	41+77				1	1										1	
41+77	42+19				1	1										1	

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From STA	To STA	Broken Slabs	Longitudinal Cracks	Replaced Slabs	Joint w/Spall	Joint w/Patched Spall	Joint w/Failed Patched Spall	Shoulder Joint Distress	Punch Out	D-Cracking	Scaling	Map Cracking	Blowups	Water Pumping and Bleeding	Transverse Cracking	Popouts	Notes
42+19	42+56				1	1										1	
42+56	42+99				1	1										1	
42+99	43+36				1	1										1	
43+36	43+78				1	1	1									1	
43+78	43+99				1	1	1									1	
43+99	44+15				1	1	1									1	
44+15	44+36				1	1	1									1	
44+36	44+57				1	1										1	
44+57	44+78				1	1										1	
44+78	44+99				1	1										1	
44+99	45+15															1	
45+15	45+36															1	
45+36	45+57															1	
45+57	45+79				1											1	
45+79	46+00															1	
46+00	46+15															1	
46+15	46+37				1											1	
46+37	46+58															1	
46+58	46+79						1									1	
46+79	46+95				1		1									1	
46+95	47+16				1											1	
47+16	47+37				1		1									1	
47+37	47+58					1										1	
47+58	47+79					1										1	
47+79	47+95					1										1	
47+95	48+16				1											1	
48+16	48+37				1											1	
48+37	48+58															1	
48+58	48+79															1	

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From STA	To STA	Broken Slabs	Longitudinal Cracks	Replaced Slabs	Joint w/Spall	Joint w/Patched Spall	Joint w/Failed Patched Spall	Shoulder Joint Distress	Punch Out	D-Cracking	Scaling	Map Cracking	Blowups	Water Pumping and Bleeding	Transverse Cracking	Popouts	Notes
48+79	48+95															1	
48+95	49+16				1											1	
49+16	49+38				1	1										1	
49+38	49+59					1										1	
49+59	49+75				1	1										1	
49+75	49+96				1											1	
49+96	50+17															1	
50+17	50+38					1										1	
50+38	50+59															1	
50+59	50+75				1											1	
50+75	50+96					1										1	
50+96	51+17															1	2 inch diameter popout
51+17	51+59				1											1	
51+59	51+96				1	1	1	1								1	
51+96	52+17					1										1	
52+17	52+39															1	
52+39	52+60															1	
52+60	52+75															1	
52+75	52+97					1										1	
52+97	53+18					1										1	
53+18	53+39					1										1	
53+39	53+55					1										1	
53+55	53+76					1		1								1	
53+76	53+97				1											1	
53+97	54+18					1		1								1	
54+18	54+39															1	
54+39	54+55				1											1	
54+55	54+76				1											1	
54+76	54+97															1	

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From STA	To STA	Broken Slabs	Longitudinal Cracks	Replaced Slabs	Joint w/Spall	Joint w/Patched Spall	Joint w/Failed Patched Spall	Shoulder Joint Distress	Punch Out	D-Cracking	Scaling	Map Cracking	Blowups	Water Pumping and Bleeding	Transverse Cracking	Popouts	Notes
54+97	55+18															1	
55+18	55+39				1			1								1	
55+39	55+55							1								1	
55+55	55+76							1								1	
55+76	55+98							1								1	
55+98	56+19					1		1								1	
56+19	56+35				1	1										1	
56+35	56+56															1	
56+56	56+77															1	
56+77	56+98															1	
56+98	57+19															1	
57+19	57+35															1	
57+35	57+56					1										1	
57+56	57+77															1	
57+77	57+98				1											1	
57+98	58+19															1	
58+19	58+35				1											1	
58+35	58+56															1	
58+56	58+77															1	
58+77	58+99															1	
58+99	59+20															1	
59+20	59+35															1	
59+35	59+57															1	
59+57	59+78				1											1	
59+78	59+99															1	
59+99	60+15															1	
60+15	60+36															1	
60+36	60+57															1	
60+57	60+78															1	

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From STA	To STA	Broken Slabs	Longitudinal Cracks	Replaced Slabs	Joint w/Spall	Joint w/Patched Spall	Joint w/Failed Patched Spall	Shoulder Joint Distress	Punch Out	D-Cracking	Scaling	Map Cracking	Blowups	Water Pumping and Bleeding	Transverse Cracking	Popouts	Notes
60+78	60+99															1	
60+99	61+15															1	
61+15	61+36															1	
61+36	61+57															1	
61+57	61+78				1											1	
61+78	61+99															1	
61+99	62+15															1	
62+15	62+36				1											1	
62+36	62+58					1										1	
62+58	62+79				1											1	
62+79	62+95				1	1										1	
62+95	63+16				1											1	
63+16	63+37															1	
63+37	63+58				1	1										1	
63+58	63+79				1	1										1	
63+79	63+95				1	1										1	
63+95	64+16															1	
64+16	64+37				1	1										1	
64+37	64+58				1											1	
64+58	64+79				1											1	
64+79	64+95				1											1	
64+95	65+16															1	
65+16	65+37					1										1	
65+37	65+59				1											1	
65+59	65+80				1											1	
65+80	65+95				1											1	
65+95	66+17				1											1	
66+17	66+59															1	
66+59	66+96				1	1										1	

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From STA	To STA	Broken Slabs	Longitudinal Cracks	Replaced Slabs	Joint w/Spall	Joint w/Patched Spall	Joint w/Failed Patched Spall	Shoulder Joint Distress	Punch Out	D-Cracking	Scaling	Map Cracking	Blowups	Water Pumping and Bleeding	Transverse Cracking	Popouts	Notes
66+96	67+38					1										1	
67+38	67+75															1	
67+75	68+17						1									1	
68+17	68+38				1											1	
68+38	68+59					1										1	
68+59	68+75															1	
68+75	69+18				1											1	
69+18	69+55						1									1	
69+55	69+76															1	
69+76	69+97				1											1	
69+97	70+18															1	
70+18	70+55			1												1	
70+55	70+97														1	1	
70+97	71+55															1	
71+55	72+19														1	1	
72+19	72+40					1										1	
72+40	72+55															1	
72+55	72+77					1										1	
72+77	72+98				1											1	
72+98	73+19				1											1	
73+19	73+35															1	
73+35	73+56					1										1	
73+56	73+77				1											1	
73+77	73+98					1										1	
73+98	74+19															1	
74+19	74+35						1	1								1	
74+35	74+56							1								1	
74+56	74+77							1								1	
74+77	74+98				1		1	1								1	

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From STA	To STA	Broken Slabs	Longitudinal Cracks	Replaced Slabs	Joint w/Spall	Joint w/Patched Spall	Joint w/Failed Patched Spall	Shoulder Joint Distress	Punch Out	D-Cracking	Scaling	Map Cracking	Blowups	Water Pumping and Bleeding	Transverse Cracking	Popouts	Notes
74+98	75+19							1								1	
75+19	75+35							1								1	
75+35	75+56				1		1	1								1	
75+56	75+78							1								1	
75+78	75+99							1								1	
75+99	76+15				1			1								1	
76+15	76+36					1		1								1	
76+36	76+57					1		1								1	
76+57	76+78															1	
76+78	76+99															1	
76+99	77+15															1	
77+15	77+36															1	
77+36	77+57				1											1	
77+57	77+78				1											1	
77+78	77+99															1	
77+99	78+15															1	
78+15	78+36															1	
78+36	78+57															1	
78+57	78+79															1	
78+79	79+00															1	
79+00	79+15															1	
79+15	79+37															1	
79+37	79+58															1	
79+58	79+79															1	
79+79	79+95															1	
79+95	80+16															1	
80+16	80+37															1	
80+37	80+58															1	
80+58	80+79															1	

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From STA	To STA	Broken Slabs	Longitudinal Cracks	Replaced Slabs	Joint w/Spall	Joint w/Patched Spall	Joint w/Failed Patched Spall	Shoulder Joint Distress	Punch Out	D-Cracking	Scaling	Map Cracking	Blowups	Water Pumping and Bleeding	Transverse Cracking	Popouts	Notes
80+79	80+95															1	
80+95	81+16															1	
81+16	81+37				1											1	
81+37	81+58				1											1	
81+58	81+79				1											1	
81+79	81+95				1		1									1	
81+95	82+16				1											1	
82+16	82+38			1	1		1									1	
82+38	82+59			1	1											1	
82+59	82+75				1		1									1	
82+75	82+96															1	
82+96	83+17				1		1									1	
83+17	83+38															1	
83+38	83+59					1		1								1	
83+59	83+75															1	
83+75	83+96															1	
83+96	84+17							1								1	
84+17	84+38				1											1	
84+38	84+59															1	
84+59	84+75															1	
84+75	85+33						1									1	
85+33	85+17				1											1	
85+17	85+39															1	
85+39	85+60					1	1	1								1	
85+60	85+75					1		1								1	
85+75	85+97							1								1	
85+97	86+18				1			1								1	
86+18	86+39				1		1	1								1	
86+39	86+55				1			1								1	

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From STA	To STA	Broken Slabs	Longitudinal Cracks	Replaced Slabs	Joint w/Spall	Joint w/Patched Spall	Joint w/Failed Patched Spall	Shoulder Joint Distress	Punch Out	D-Cracking	Scaling	Map Cracking	Blowups	Water Pumping and Bleeding	Transverse Cracking	Popouts	Notes
86+55	86+76				1	1										1	
86+76	86+97				1											1	
86+97	87+18					1		1								1	
87+18	87+39															1	
87+39	87+55															1	
87+55	87+76															1	
87+76	87+97															1	
87+97	88+18	1					1	1								1	
88+18	88+39				1											1	
88+39	88+55															1	
88+55	88+76															1	
88+76	88+98					1										1	
88+98	89+19															1	
89+19	89+35															1	
89+35	89+56															1	
89+56	89+77															1	
89+77	89+98				1		1									1	
89+98	90+19															1	
90+19	90+35				1											1	
90+35	90+56							1								1	
90+56	90+77															1	
90+77	90+98							1								1	
90+98	91+19															1	
91+19	91+35															1	
91+35	91+56															1	
91+56	91+77						1	1								1	
91+77	91+99															1	
91+99	92+20						1									1	
92+20	92+35															1	

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92+35	92+57															1	
92+57	92+78															1	
92+78	92+99															1	
92+99	93+15															1	
93+15	93+36															1	
93+36	93+57															1	
93+57	88+50															1	
88+50	93+99															1	
93+99	94+15															1	
94+15	94+36															1	
94+36	94+57				1											1	
94+57	94+78															1	
94+78	94+99		1				1									1	
94+99	95+15						1									1	
95+15	95+36						1									1	
95+36	95+58						1									1	
95+58	95+79						1									1	
95+79	95+95						1									1	
95+95	96+16						1									1	
96+16	96+37						1									1	6" by 6" loss of pavement
96+37	96+58						1									1	
96+58	96+79						1									1	
96+79	96+95						1									1	
96+95	97+16						1									1	
97+16	97+37				1		1									1	
97+37	97+58						1									1	
97+58	97+79						1									1	
97+79	97+95						1									1	
97+95	98+16						1									1	

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98+16	98+37				1		1									1	
98+37	98+59						1									1	
98+59	98+80					1	1									1	
98+80	98+95						1									1	
98+95	99+17						1									1	
99+17	99+38				1		1									1	
99+38	99+59															1	
99+59	99+75															1	
99+75	99+96															1	
99+96	100+17															1	
100+17	100+38															1	
100+38	100+59				1											1	
100+59	100+75															1	
100+75	100+96															1	
100+96	101+17				1											1	
101+17	101+38															1	
101+38	101+59															1	
101+59	101+75															1	
101+75	101+96															1	
101+96	102+18															1	
102+18	102+39															1	
102+39	102+55				1											1	
102+55	102+76															1	
102+76	102+97															1	
102+97	103+18			1												1	15th Street Exit
103+18	103+39			1	1			1								1	
103+39	103+55			1	1			1								1	
103+55	103+76			1												1	
103+76	103+97			1												1	

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From STA	To STA	Broken Slabs	Longitudinal Cracks	Replaced Slabs	Joint w/Spall	Joint w/Patched Spall	Joint w/Failed Patched Spall	Shoulder Joint Distress	Punch Out	D-Cracking	Scaling	Map Cracking	Blowups	Water Pumping and Bleeding	Transverse Cracking	Popouts	Notes
103+97	104+18															1	
104+18	104+39				1											1	
104+39	104+55															1	
104+55	104+76				1			1								1	
104+76	104+97															1	
104+97	105+19															1	
105+19	105+40															1	
105+40	105+55				1											1	
105+55	105+77															1	
105+77	105+98					1										1	
105+98	106+19					1		1								1	
106+19	106+35					1		1								1	
106+35	106+56					1		1								1	
106+56	106+77					1		1								1	
106+77	106+98					1		1								1	
106+98	107+19					1		1								1	
107+19	107+35					1		1								1	
107+35	107+56					1		1								1	
107+56	107+77					1		1								1	
107+77	107+98					1		1								1	
107+98	108+19					1		1								1	
108+19	108+35					1		1								1	
108+35	108+56					1		1								1	
108+56	108+78					1		1								1	
108+78	108+99					1		1								1	
108+99	109+15					1		1								1	
109+15	109+36					1		1								1	
109+36	109+57					1		1								1	
109+57	109+78							1								1	

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From STA	To STA	Broken Slabs	Longitudinal Cracks	Replaced Slabs	Joint w/Spall	Joint w/Patched Spall	Joint w/Failed Patched Spall	Shoulder Joint Distress	Punch Out	D-Cracking	Scaling	Map Cracking	Blowups	Water Pumping and Bleeding	Transverse Cracking	Popouts	Notes
109+78	109+99							1								1	
109+99	110+15							1								1	
110+15	110+36							1								1	
110+36	110+57							1								1	
110+57	110+78							1								1	
110+78	110+99							1								1	
110+99	111+15							1								1	
111+15	111+36							1								1	
111+36	111+57							1								1	
111+57	111+79							1								1	
111+79	112+00				1			1								1	
112+00	112+15															1	
112+15	112+37															1	
112+37	112+58																
112+58	113+26																
113+26	114+43																
114+43	114+85																
114+85	115+22																
115+22	116+43																
116+43	116+85																
116+85	117+22																
117+22	118+23																
118+23	118+65																
118+65	119+02																
119+02	120+23																
120+23	121+45																
121+45	121+82																
121+82	122+24																
122+24	123+45																

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From STA	To STA	Broken Slabs	Longitudinal Cracks	Replaced Slabs	Joint w/Spall	Joint w/Patched Spall	Joint w/Failed Patched Spall	Shoulder Joint Distress	Punch Out	D-Cracking	Scaling	Map Cracking	Blowups	Water Pumping and Bleeding	Transverse Cracking	Popouts	Notes
123+45	123+82																
123+82	124+03																
124+03	125+04																
125+04	125+83				1												expansion joint on flyover
125+83	126+83																
126+83	127+63																
127+63	128+42																
128+42	129+42																
129+42	130+21																
130+21	131+06																
131+06	132+06																
132+06	132+85																
132+85	133+64																
133+64	134+44																
134+44	135+02																
135+02	135+81																
135+81	136+65																
136+65	137+23																
137+23	138+03																
138+03	139+03																
139+03	139+82																
139+82	140+61																
140+61	141+62																
141+62	141+83		1		1										1	1	

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From STA	To STA	Broken Slabs	Longitudinal Cracks	Replaced Slabs	Joint w/Spall	Joint w/Patched Spall	Joint w/Failed Patched Spall	Shoulder Joint Distress	Punch Out	D-Cracking	Scaling	Map Cracking	Blowups	Water Pumping and Bleeding	Transverse Cracking	Popouts	Notes
142+28	141+75		1														Approach Slab Flyover
141+75	140+80																Flyover
140+80	140+38																
140+38	139+59																
139+59	138+58																
138+58	137+79																
137+79	136+79																
136+79	136+36																
136+36	135+78																
135+78	134+99																
134+99	134+20																
134+20	133+57																
133+57	132+77																
132+77	131+77				1												
131+77	130+98																
130+98	130+19																
130+19	129+18																
129+18	128+39															1	
128+39	127+60																
127+60	126+75																
126+75	125+96				1												
125+96	124+96				1												Flyover expansion joint
124+96	123+80																
123+80	123+38																
123+38	122+95																
122+95	121+95																
121+95	121+58																
121+58	121+16																
121+16	120+58				1												Flyover expansion joint

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From STA	To STA	Broken Slabs	Longitudinal Cracks	Replaced Slabs	Joint w/Spall	Joint w/Patched Spall	Joint w/Failed Patched Spall	Shoulder Joint Distress	Punch Out	D-Cracking	Scaling	Map Cracking	Blowups	Water Pumping and Bleeding	Transverse Cracking	Popouts	Notes
120+58	119+36																
119+36	118+99				1												
118+99	118+57																
118+57	117+57																
117+57	117+20																Aerial Marking on shoulder
117+20	116+78																
116+78	115+56																
115+56	115+19																
115+19	114+77																
114+77	113+24																End of bridge
113+24	113+03																Approach Slab
113+03	112+82																
112+82	112+61																
112+61	112+40							1									
112+40	112+24							1									
112+24	112+03		1					1							1		
112+03	111+81							1									
111+81	111+60							1									
111+60	111+44							1									
111+44	111+23				1			1									
111+23	111+02							1									
111+02	110+81							1									
110+81	110+60							1									
110+60	110+44							1									
110+44	110+23							1									
110+23	110+02							1									
110+02	109+81							1									
109+81	109+60							1									
109+60	109+44							1									Aerial Marking on shoulder

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From STA	To STA	Broken Slabs	Longitudinal Cracks	Replaced Slabs	Joint w/Spall	Joint w/Patched Spall	Joint w/Failed Patched Spall	Shoulder Joint Distress	Punch Out	D-Cracking	Scaling	Map Cracking	Blowups	Water Pumping and Bleeding	Transverse Cracking	Popouts	Notes
109+44	109+23							1									
109+23	109+02							1									
109+02	108+80							1									
108+80	108+59							1									
108+59	108+44							1									
108+44	108+22							1									
108+22	108+01				1			1									
108+01	107+80							1									
107+80	107+64							1									
107+64	107+43							1									
107+43	107+22							1									
107+22	107+01							1									
107+01	106+80							1									
106+80	106+64							1									
106+64	106+43				1			1								1	
106+43	106+22															1	
106+22	106+01				1											1	
106+01	105+80				1											1	
105+80	105+64				1	1										1	
105+64	105+43				1											1	
105+43	105+21				1	1										1	
105+21	105+00				1											1	
105+00	104+84															1	
104+84	104+63				1		1									1	
104+63	104+42				1											1	
104+42	104+21															1	
104+21	104+00															1	
104+00	103+84															1	
103+84	103+63															1	

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From STA	To STA	Broken Slabs	Longitudinal Cracks	Replaced Slabs	Joint w/Spall	Joint w/Patched Spall	Joint w/Failed Patched Spall	Shoulder Joint Distress	Punch Out	D-Cracking	Scaling	Map Cracking	Blowups	Water Pumping and Bleeding	Transverse Cracking	Popouts	Notes
103+63	103+42				1											1	
103+42	103+21															1	
103+21	103+00															1	
103+00	102+84															1	
102+84	102+63				1											1	
102+63	102+42				1											1	
102+42	102+20				1											1	
102+20	101+99															1	
101+99	101+84															1	
101+84	101+62				1											1	
101+62	101+41															1	
101+41	101+20				1											1	
101+20	101+04				1											1	
101+04	100+83															1	
100+83	100+62				1											1	
100+62	100+41				1											1	end of solid white merge paint strip
100+41	100+20															1	
100+20	100+04															1	
100+04	99+83															1	
99+83	99+62															1	
99+62	99+41	1														1	
99+41	99+20															1	
99+20	99+04															1	
99+04	98+83															1	
98+83	98+61				1											1	
98+61	98+40						1									1	
98+40	98+24															1	2 inch diameter hole
98+24	98+24					1	1									1	
98+24	98+03															1	

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From STA	To STA	Broken Slabs	Longitudinal Cracks	Replaced Slabs	Joint w/Spall	Joint w/Patched Spall	Joint w/Failed Patched Spall	Shoulder Joint Distress	Punch Out	D-Cracking	Scaling	Map Cracking	Blowups	Water Pumping and Bleeding	Transverse Cracking	Popouts	Notes
98+03	97+82							1								1	
97+82	97+61					1	1									1	
97+61	97+40															1	
97+40	97+24	1														1	
97+24	97+03															1	
97+03	96+82															1	
96+82	96+71															1	
96+71	96+61															1	
96+61	96+40					1										1	
96+40	96+24															1	
96+24	96+03															1	
96+03	95+82															1	
95+82	95+60															1	
95+60	95+39															1	
95+39	95+24															1	
95+24	95+02															1	
95+02	94+81				1											1	
94+81	94+60				1											1	
94+60	94+44															1	
94+44	94+23															1	
94+23	94+02															1	
94+02	93+81															1	
93+81	93+60															1	
93+60	93+44															1	
93+44	93+23															1	
93+23	93+02															1	
93+02	92+81				1											1	
92+81	92+60															1	
92+60	92+44															1	

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From STA	To STA	Broken Slabs	Longitudinal Cracks	Replaced Slabs	Joint w/Spall	Joint w/Patched Spall	Joint w/Failed Patched Spall	Shoulder Joint Distress	Punch Out	D-Cracking	Scaling	Map Cracking	Blowups	Water Pumping and Bleeding	Transverse Cracking	Popouts	Notes
92+44	92+23															1	
92+23	92+01															1	
92+01	91+80															1	
91+80	91+64				1											1	
91+64	91+43							1								1	
91+64	91+43				1											1	
91+43	91+22															1	
91+22	91+01															1	Start of two lanes (exit to Crawford)
91+01	90+85				1											1	
90+85	90+64							1								1	
90+64	90+43							1								1	
90+43	90+22							1								1	
90+22	90+01							1								1	
90+01	89+85							1								1	
89+85	89+64							1								1	End of Concrete at exit shoulder for Crawford
89+64	89+43							1								1	
89+43	89+22							1								1	
89+22	89+00							1								1	
89+00	88+85							1								1	
88+85	88+64							1								1	
88+64	88+42							1								1	
88+42	88+21							1								1	
88+21	88+05															1	
88+05	87+84				1											1	single width asphalt shoulder
87+84	87+63				1		1									1	
87+63	87+42				1		1									1	
87+42	87+21															1	
87+21	87+05						1									1	
87+05	86+84															1	

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From STA	To STA	Broken Slabs	Longitudinal Cracks	Replaced Slabs	Joint w/Spall	Joint w/Patched Spall	Joint w/Failed Patched Spall	Shoulder Joint Distress	Punch Out	D-Cracking	Scaling	Map Cracking	Blowups	Water Pumping and Bleeding	Transverse Cracking	Popouts	Notes
86+84	86+63															1	
86+63	86+42															1	
86+42	86+21															1	
86+21	86+05															1	
86+05	85+84															1	
85+84	85+63				1			1								1	
85+63	85+41							1								1	
85+41	85+26							1								1	
85+26	85+04							1								1	
85+04	84+83					1		1								1	
84+83	84+62				1			1								1	
84+62	84+41							1								1	
84+41	84+25							1								1	
84+25	84+04							1								1	
84+04	83+83							1								1	
83+83	83+62							1								1	
83+62	83+41							1								1	
83+41	83+25							1								1	
83+25	83+04					1		1								1	
83+04	82+83					1	1									1	
82+83	82+62															1	
82+62	82+40					1										1	
82+40	82+25				1	1										1	
82+25	82+04					1										1	
82+04	81+82						1									1	
81+82	81+61															1	
81+61	81+45															1	
81+45	81+24															1	
81+24	81+03															1	

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From STA	To STA	Broken Slabs	Longitudinal Cracks	Replaced Slabs	Joint w/Spall	Joint w/Patched Spall	Joint w/Failed Patched Spall	Shoulder Joint Distress	Punch Out	D-Cracking	Scaling	Map Cracking	Blowups	Water Pumping and Bleeding	Transverse Cracking	Popouts	Notes
81+03	80+56		1													1	Approach Slab for Bridge
80+56	79+82															1	Bridge Deck
79+82	79+34															1	
79+34	79+13															1	
79+13	78+81															1	Bridge Deck
78+81	78+66															1	Approach Slab for Bridge
78+66	78+44															1	
78+44	78+76															1	
78+76	78+02															1	
78+02	77+81															1	
77+81	77+65					1										1	
77+65	77+44				1	1										1	
77+44	77+23					1										1	
77+23	77+02				1	1										1	
77+02	76+81					1										1	
76+81	76+65				1											1	
76+65	76+44															1	
76+44	76+23					1										1	
76+23	76+02					1										1	
76+02	75+80						1									1	
75+80	75+65															1	
75+65	75+44															1	
75+44	75+22															1	
75+22	75+01															1	
75+01	74+85															1	
74+85	74+64															1	
74+64	74+43															1	
74+43	74+22				1											1	
74+22	74+01															1	

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From STA	To STA	Broken Slabs	Longitudinal Cracks	Replaced Slabs	Joint w/Spall	Joint w/Patched Spall	Joint w/Failed Patched Spall	Shoulder Joint Distress	Punch Out	D-Cracking	Scaling	Map Cracking	Blowups	Water Pumping and Bleeding	Transverse Cracking	Popouts	Notes
74+01	73+85															1	
73+85	73+64															1	
73+64	73+43				1											1	loss of pavement structure
73+43	73+22					1	1									1	
73+22	73+01		1												1	1	Approach slab for bridge
73+01	72+64		1												1	1	bridge deck
72+64	72+21														1	1	
72+21	71+63														1	1	bridge deck
71+63	71+05														1	1	End of Bridge
71+05	70+84		1												1	1	approach slab
70+84	70+63					1										1	
70+63	70+42					1										1	
70+42	70+21															1	
70+21	70+05															1	
70+05	69+84					1	1									1	
69+84	69+63															1	
69+63	69+42				1	1										1	
69+42	69+20					1										1	
69+20	69+05				1	1										1	
69+05	68+84					1										1	
68+84	68+62				1	1										1	
68+62	68+41				1	1										1	
68+41	68+25				1	1										1	
68+25	68+04				1											1	
68+04	67+83				1	1										1	
67+83	67+62				1											1	
67+62	67+41				1											1	
67+41	67+25				1	1										1	
67+25	67+04				1											1	

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67+04	66+83					1										1	
66+83	66+62						1									1	
66+62	66+41															1	
66+41	66+25															1	
66+25	66+04					1										1	
66+04	65+83				1	1										1	
65+83	65+61															1	
65+61	65+46					1										1	
65+46	65+24				1	1										1	
65+24	65+03					1										1	
65+03	64+82															1	
64+82	64+61															1	
64+61	64+45				1											1	start of concrete at on-ramp
64+45	64+24															1	
64+24	64+03					1										1	
64+03	63+82															1	
63+82	63+61															1	
63+61	63+45															1	
63+45	63+24															1	
63+24	63+03															1	
63+03	62+82	1														1	
62+82	62+60				1											1	
62+60	62+45															1	
62+45	62+24															1	
62+24	62+02															1	
62+02	61+81															1	
61+81	61+65															1	
61+65	61+44															1	
61+44	61+23															1	

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61+23	61+02															1	
61+02	60+81															1	
60+81	60+65															1	
60+65	60+44															1	
60+44	60+23															1	
60+23	60+02															1	
60+02	59+81															1	
59+81	59+65				1											1	
59+65	59+44															1	
59+44	59+23				1											1	
59+23	59+01															1	
59+01	58+86				1											1	
58+86	58+64															1	
58+64	58+43															1	
58+43	58+22															1	
58+22	58+01				1											1	end of white dash on-ramp striping
58+01	57+85															1	
57+85	57+64															1	
57+64	57+43															1	
57+43	57+22				1											1	
57+22	57+01															1	
57+01	56+85															1	
56+85	56+64															1	
56+64	56+43															1	
56+43	56+22				1	1										1	
56+22	56+00															1	
56+00	55+85				1	1										1	
55+85	55+64															1	
55+64	55+42															1	

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From STA	To STA	Broken Slabs	Longitudinal Cracks	Replaced Slabs	Joint w/Spall	Joint w/Patched Spall	Joint w/Failed Patched Spall	Shoulder Joint Distress	Punch Out	D-Cracking	Scaling	Map Cracking	Blowups	Water Pumping and Bleeding	Transverse Cracking	Popouts	Notes
55+42	55+21															1	
55+21	55+05															1	
55+05	54+84				1											1	
54+84	54+63															1	
54+63	54+42															1	
54+42	54+21															1	
54+21	54+05				1											1	
54+05	53+84															1	
53+84	53+73				1	1										1	
53+73	53+63						1									1	
53+63	53+21					1	1									1	
53+21	53+05					1										1	
53+05	52+84															1	
52+84	52+63						1									1	
52+63	52+41					1										1	end of concrete on-ramp
52+41	52+26					1										1	
52+26	52+04					1										1	
52+04	51+83					1	1									1	
51+83	51+62						1									1	
51+62	51+41						1									1	missing part of pavement structure
51+41	51+25				1	1										1	
51+25	51+04				1											1	
51+04	50+83				1											1	
50+83	50+62					1										1	
50+62	50+41				1	1										1	
50+41	50+25					1										1	
50+25	50+04				1	1										1	
50+04	49+83					1										1	
49+83	49+62															1	

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John C. Calhoun Expressway - Augusta, Georgia
Westbound Outer CPACE Observations

From STA	To STA	Broken Slabs	Longitudinal Cracks	Replaced Slabs	Joint w/Spall	Joint w/Patched Spall	Joint w/Failed Patched Spall	Shoulder Joint Distress	Punch Out	D-Cracking	Scaling	Map Cracking	Blowups	Water Pumping and Bleeding	Transverse Cracking	Popouts	Notes
49+62	49+40															1	
49+40	49+25					1										1	
49+25	49+04															1	
49+04	48+93															1	
48+93	48+61				1											1	
48+61	48+45															1	
48+45	48+24															1	
48+24	48+03				1	1										1	
48+03	47+82					1	1									1	
47+82	47+61				1		1									1	
47+61	47+45					1										1	
47+45	47+24					1										1	
47+24	47+03					1										1	
47+03	46+82				1	1										1	
46+82	46+61					1										1	
46+61	46+45				1	1										1	
46+45	46+24					1										1	
46+24	46+03					1										1	
46+03	45+81					1	1									1	
45+81	45+66				1	1										1	
45+66	45+44				1	1										1	
45+44	45+23					1	1									1	
45+23	45+02				1	1										1	
45+02	44+81					1										1	
44+81	44+65															1	
44+65	44+44					1										1	
44+44	44+23					1										1	
44+23	44+02					1										1	
44+02	43+81					1										1	

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John C. Calhoun Expressway - Augusta, Georgia
Westbound Outer CPACE Observations

From STA	To STA	Broken Slabs	Longitudinal Cracks	Replaced Slabs	Joint w/Spall	Joint w/Patched Spall	Joint w/Failed Patched Spall	Shoulder Joint Distress	Punch Out	D-Cracking	Scaling	Map Cracking	Blowups	Water Pumping and Bleeding	Transverse Cracking	Popouts	Notes
43+81	43+65				1	1										1	
43+65	43+44				1											1	
43+44	43+23					1										1	
43+23	43+02					1										1	
43+02	42+80				1	1										1	
42+80	42+65				1	1										1	
42+65	42+44					1										1	
42+44	42+22				1	1										1	
42+22	42+01					1										1	
42+01	41+85															1	
41+85	41+64					1										1	
41+64	41+54					1										1	
41+54	41+38															1	
41+38	41+12															1	
41+12	41+01															1	
41+01	40+80															1	
40+80	40+53															1	
40+53	40+27															1	
40+27	40+01															1	
40+01	39+85					1										1	At Milledgeville Road Bridge
39+85	39+64				1	1										1	
39+64	39+43					1										1	
39+43	39+21					1	1									1	At Milledgeville Road Bridge
39+21	39+06				1	1										1	
39+06	38+84				1											1	
38+84	38+63				1	1										1	
38+63	38+42															1	
38+42	38+21				1	1	1									1	
38+21	38+05															1	

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John C. Calhoun Expressway - Augusta, Georgia
Westbound Outer CPACE Observations

From STA	To STA	Broken Slabs	Longitudinal Cracks	Replaced Slabs	Joint w/Spall	Joint w/Patched Spall	Joint w/Failed Patched Spall	Shoulder Joint Distress	Punch Out	D-Cracking	Scaling	Map Cracking	Blowups	Water Pumping and Bleeding	Transverse Cracking	Popouts	Notes
38+05	37+84				1	1	1									1	
37+84	37+63															1	
37+63	37+42															1	
37+42	37+21															1	
37+21	37+05					1										1	
37+05	36+84					1										1	
36+84	36+63						1	1								1	
36+63	36+42					1		1								1	
36+42	36+20					1		1								1	
36+20	36+05				1	1		1								1	
36+05	35+84				1	1	1	1								1	
35+84	35+62					1		1								1	
35+62	35+41							1								1	
35+41	35+25							1								1	
35+25	35+04						1	1								1	
35+04	34+83							1								1	
34+83	34+62							1								1	
34+62	34+41					1		1								1	
34+41	34+25				1	1		1								1	
34+25	34+04						1	1								1	
34+04	33+83				1			1								1	
33+83	33+62							1								1	
33+62	33+41							1								1	
33+41	33+25							1								1	
33+25	33+04					1		1								1	
33+04	32+83					1		1								1	
32+83	32+61					1		1								1	
32+61	32+46					1		1								1	
32+46	32+24							1								1	

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Westbound Outer CPACE Observations

From STA	To STA	Broken Slabs	Longitudinal Cracks	Replaced Slabs	Joint w/Spall	Joint w/Patched Spall	Joint w/Failed Patched Spall	Shoulder Joint Distress	Punch Out	D-Cracking	Scaling	Map Cracking	Blowups	Water Pumping and Bleeding	Transverse Cracking	Popouts	Notes
32+24	32+03					1		1								1	
32+03	31+82					1		1								1	
31+82	31+61				1	1		1								1	
31+61	31+45					1		1								1	
31+45	31+24				1			1								1	
31+24	31+03				1	1		1								1	
31+03	30+82					1		1								1	
30+82	30+61					1		1								1	
30+61	30+45				1	1	1	1								1	
30+45	30+24					1		1								1	
30+24	30+03							1								1	
30+03	29+82					1		1								1	
29+82	29+60				1			1								1	
29+60	29+45							1								1	
29+45	29+24				1			1								1	
29+24	29+02				1			1								1	
29+02	28+81				1	1		1								1	
28+81	28+65				1			1								1	
28+65	28+44				1			1								1	
28+44	28+23				1	1		1								1	
28+23	28+02					1		1								1	
28+02	27+81							1								1	
27+81	27+65							1								1	
27+65	27+44							1								1	
27+44	27+23					1		1								1	
27+23	27+02							1								1	
27+02	26+81							1								1	
26+81	26+65							1								1	
26+65	26+44				1			1								1	

TIA Project No.: 371-041110-5212115/T13049113-5212115
John C. Calhoun Expressway - Augusta, Georgia
Westbound Outer CPACE Observations

From STA	To STA	Broken Slabs	Longitudinal Cracks	Replaced Slabs	Joint w/Spall	Joint w/Patched Spall	Joint w/Failed Patched Spall	Shoulder Joint Distress	Punch Out	D-Cracking	Scaling	Map Cracking	Blowups	Water Pumping and Bleeding	Transverse Cracking	Popouts	Notes
26+44	26+23							1								1	
26+23	26+01							1								1	
26+01	25+86					1		1								1	
25+86	25+64					1		1								1	
25+64	25+43				1			1								1	
25+43	25+22				1	1		1								1	
25+22	25+01				1			1								1	missing section of corner on slab
25+01	24+85				1		1	1								1	
24+85	24+64				1	1		1								1	
24+64	24+43					1										1	
24+43	24+22				1											1	
24+22	24+01					1										1	
24+01	23+85															1	
23+85	23+64				1											1	
23+64	23+43															1	
23+43	23+22				1											1	
23+22	23+00															1	
23+00	22+85															1	
22+85	22+64															1	
22+64	22+42															1	
22+42	22+05				1											1	
22+05	21+63		1													1	Approach Slab at Rays Creek
21+63	21+05															1	Rays Creek Bridge
21+05	20+42															1	
20+42	19+84															1	
19+84	19+26															1	
19+26	18+41															1	
18+41	17+83															1	
17+83	17+04															1	

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John C. Calhoun Expressway - Augusta, Georgia
Westbound Outer CPACE Observations

From STA	To STA	Broken Slabs	Longitudinal Cracks	Replaced Slabs	Joint w/Spall	Joint w/Patched Spall	Joint w/Failed Patched Spall	Shoulder Joint Distress	Punch Out	D-Cracking	Scaling	Map Cracking	Blowups	Water Pumping and Bleeding	Transverse Cracking	Popouts	Notes
17+04	16+40															1	
16+40	16+04															1	Rays Creek Bridge
16+04	15+37		1													1	Approach Slab

APPENDIX III

Pavement Smoothness Measurements Report

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Pavement Engineering Specialists and Equipment

Pavement Smoothness Measurements on the John C Calhoun Expressway

August 5, 2014

Submitted by:

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Conclusions and Recommendations 6
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Executive Summary

On June 23, 2014, Dynatest Consulting collected pavement smoothness data on the John C Calhoun Expressway in Augusta Georgia. The measurements were taken on all four lanes of the expressway from Lakewood Drive on the northwest end of the expressway to 11th Street at the southeast end. Total length per measurement was about 2.95 miles. IRI (International Roughness Index) values were derived from the profile elevation data and compared to Georgia DOT smoothness requirements for newly ground Portland cement concrete pavement. It was found that the existing IRI values over the entire project significantly exceed GDOT grinding requirements, which was expected since this pavement has been in service for many years. However from the FHWA perspective, the ride quality on the facility falls into the acceptable category. No corrective action for improving ride quality is recommended at this time.

Introduction

On June 23, 2014, Dynatest conducted profile elevation measurements on all four lanes of the J C Calhoun Parkway from Lakewood drive (northeast limit) to 11th Street (southeast limits). A Dynatest Mark III inertial profiler (http://www.dynatest.com/equipment/functional/profiling.aspx) was used to collect the elevation data. Mr. Nolan Mast of Dynatest operated the profiler. The profiler measurements in each direction were initiated and terminated manually. Profile elevations were recorded at 6-inch intervals. In addition the fault measurement system on the RSP was activated to detect slab elevation differences across expansion joints. For archival purposes, the data collection setup screen from the RSP control software is shown in Figure 1. Data items recorded consist of those in the left most columns that are checked. Station “0.00” for the eastbound runs is the centerline of Lakewood Drive. Station “0.00” for the westbound runs was the centerline of 11th street.

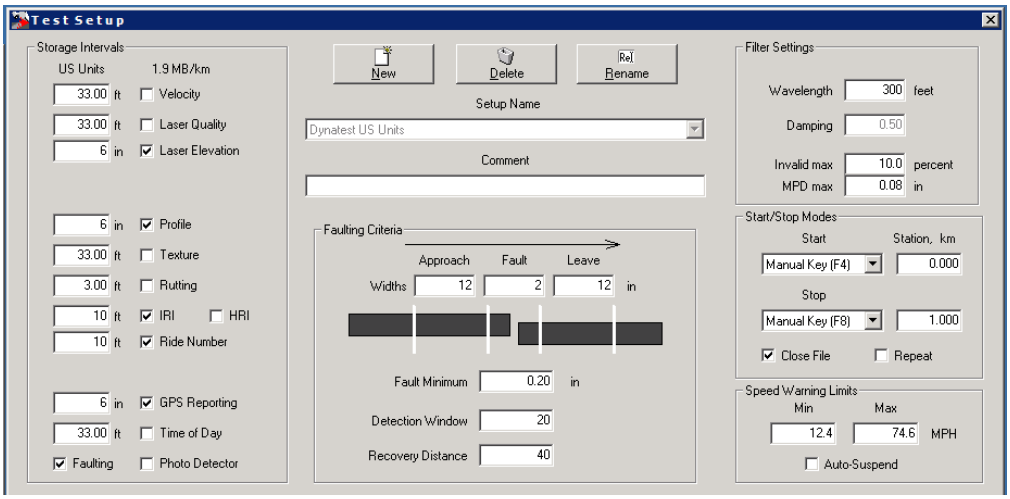


Figure 1 - RSP Data Collection Setup

Data collection was conducted in accordance with GDT 126, "*Test Method for Determining the Ride Quality and Smoothness of a Pavement Surface Using a Road Profiler*" which is published by the Georgia Department of Transportation.

Measurement Results

The profile elevation data was processed with the "Proval" software which was developed by the Transtec Group under contract with the Federal Highway Administration (see www.roadprofile.com). The Proval program has extensive capabilities, including the ability to calculate IRI from profile elevations and to simulate the effects of grinding on pavement smoothness.

During the analytical review of the data, several instances were observed where very high and/or unreasonable profile elevations were recorded. These instances were typically 300 feet or so in length. The source of these excessive elevation changes were not known, and it is not possible to determine if they were caused by pavement irregularities or equipment malfunction. As such, these segments were designated as "leave outs", were removed from the database and listed in Table 1.

Table 1 - "Leave-out" locations

Leave-out locations			
Direction/Lane	Start Distance (mile)	Stop Distance (mile)	Length (ft)
Eastbound, Inner	0.38	0.44	312.50
	0.93	0.98	267.00
	1.02	1.08	290.00
Eastbound, Outer	0.40	0.48	422.99
Westbound, Inner	2.55	2.63	422.00
	2.93	2.99	313.50
Westbound, Outer	0.00	0.07	365.49
	1.10	1.16	305.99
	2.55	2.62	371.49

These "leave-out" sections should be inspected visually to determine if major profile elevation deviations are present at these locations (i.e. "objectionable ride quality").

Target IRI Values

Ride quality is somewhat of a subjective parameter and some criteria is needed to categorize the measurements obtained on Calhoun Expressway. Two criteria are considered here – GDOT specifications for grinding pcc pavements, and the FHWA ride quality categorizations.

Georgia DOT specifications, particularly Section 431, "Grind Concrete Pavement", places an upper limit on IRI when grinding concrete pavements, above which, corrective action by the grinding contractor is required. This value is 900 mm/km or 57 inches per mile over a 0.25 mile segment of roadway. As will be seen from the IRI data, all of the segments profiled on the expressway exceed this amount by a large margin. This is not surprising since the 57 inch per mile criteria applies to freshly ground pcc pavement whereas the Calhoun Expressway has been in service for many years. The 57 inch per mile might be regarded as the "best case" or "target" ride quality value if grinding is selected as a rehabilitation option.

The FHWA considers a road surface with an IRI below 95 as having good ride quality, a road with an IRI from 95 to 170 provides an acceptable ride quality and

that a road with an IRI above 170 provides an unacceptable ride quality ("*2002 Status of the Nation's Highways, Bridges, and Transit: Conditions and Performance, U.S. Department of Transportation*". P. 3-6). All of the 0.25 mile segments fell below (better than) the FHWA limit of 170 inches per mile.

Table 2 in Appendix 1 shows that the overall average of IRI on a lane by lane basis exceeds the FHWA criteria by a large margin, all of which fall into the "acceptable" category while being somewhat close to the "good" category. Moreover, when you view the data at the 0.25 segment length level (Tables 3 and 4), only two segments fall inside the FHWA "unacceptable" category.

Faulting

As can be seen in Figure 1, the RSP was configured to detect and record faults if present. Very few if any faults were detected, usually one or two in either direction and/or lane. As such, a detailed discussion or presentation of faulting results was not considered to be warranted.

Conclusions and Recommendations

- The overall average IRI on each lane was well below the FHWA criteria for "acceptable" ride quality.
- When calculating IRI at 0.25 mile intervals, all but two segments met FWHA criteria for "acceptable" ride quality.
- Few instances of faulting were found on any particular lane and therefore is not considered an issue for this facility.
- Nine pavement sections, of about 300 ft each were removed from the analysis due to excessive or unreasonable pavement profile elevations. It is not clear whether this was caused by abrupt pavement elevation changes or a transient problem with our profiler.
- The "leave-out" sections mentioned above should be visually inspected to determine if any pavement distresses are evident in these sections.
- Based on the IRI and faulting results obtained during this study, we would not recommend the application of any corrective measures to this facility at this time, except as needed to correct localized areas of roughness or distress.

Appendix 1 – IRI Tables

Table 2 - Average IRI Results by Lane

Overall Averages		
File	Profile	IRI (in/mi)
EB_INNER	Left Wheel Path	121.5
EB_INNER	Right Wheel Path	119.6
EB_OUTER	Left Wheel Path	125.2
EB_OUTER	Right Wheel Path	113.2
WB_INNER	Left Wheel Path	122.3
WB_INNER	Right Wheel Path	124.8
WB_OUTER	Left Wheel Path	125.4
WB_OUTER	Right Wheel Path	114.0

Table 3 - IRI, Eastbound Lanes, by 0.25 miles segments

Eastbound Inner Lane				
Start Distance (mile)	Stop Distance (mile)	Length (ft)	Left Wheel Path - IRI (in/mi)	Right Wheel Path - IRI (in/mi)
0.00	0.25	1320.0	74.5	68.1
0.25	0.38	704.0	149.1	145.1
0.44	0.69	1320.0	123.9	110.1
0.69	0.93	1276.0	149.9	147.5
0.98	1.02	194.5	146.6	202.3
1.08	1.33	1320.0	121.9	150.6
1.33	1.58	1320.0	161.8	150.9
1.58	1.83	1320.0	125.8	150.2
1.83	2.08	1320.0	138.7	153.6
2.08	2.33	1320.0	105.1	79.8
2.33	2.58	1320.0	102.5	94.6
2.58	2.83	1320.0	100.1	89.5
2.83	2.95	663.5	107.7	74.6

Eastbound Outer Lane				
Start Distance (mile)	Stop Distance (mile)	Length (ft)	Left Wheel Path - IRI (in/mi)	Right Wheel Path - IRI (in/mi)
0.00	0.25	1320.0	61.3	85.0
0.25	0.40	767.0	139.9	137.4
0.48	0.73	1320.0	102.7	100.6
0.73	0.98	1320.0	159.4	117.3
0.98	1.23	1320.0	158.7	118.7
1.23	1.48	1320.0	153.1	129.4
1.48	1.73	1320.0	161.1	144.2
1.73	1.98	1320.0	151.4	121.5
1.98	2.23	1320.0	128.2	123.2
2.23	2.48	1320.0	94.2	86.9
2.48	2.73	1320.0	114.8	110.5
2.73	2.97	1282.0	82.8	93.3

Table 4 - IRI, Westbound Lanes, by 0.25 miles segments

Westbound Inner Lane				
Start Distance (mile)	Stop Distance (mile)	Length (ft)	Left Wheel Path - IRI (in/mi)	Right Wheel Path - IRI (in/mi)
0.00	0.25	1320.0	133.4	115.5
0.25	0.50	1320.0	109.1	99.7
0.50	0.75	1320.0	102.1	94.4
0.75	1.00	1320.0	94.1	93.6
1.00	1.25	1320.0	127.1	139.4
1.25	1.50	1320.0	140.6	144.4
1.50	1.75	1320.0	153.1	153.0
1.75	2.00	1320.0	134.7	163.8
2.00	2.25	1320.0	120.3	163.3
2.25	2.50	1320.0	117.0	119.2
2.50	2.55	241.0	178.3	149.2
2.63	2.88	1320.0	110.3	88.3
2.88	2.93	266.5	86.0	98.6

Westbound Outer Lane				
Start Distance (mile)	Stop Distance (mile)	Length (ft)	Left Wheel Path - IRI (in/mi)	Right Wheel Path - IRI (in/mi)
0.07	0.32	1320.0	89.1	104.7
0.32	0.57	1320.0	100.9	98.9
0.57	0.82	1320.0	105.5	102.4
0.82	1.07	1320.0	120.0	102.2
1.07	1.10	165.0	130.2	126.3
1.16	1.41	1320.0	124.7	98.3
1.41	1.66	1320.0	183.9	162.8
1.66	1.91	1320.0	156.5	123.3
1.91	2.16	1320.0	168.1	107.9
2.16	2.41	1320.0	141.5	116.2
2.41	2.55	736.5	121.5	125.9
2.62	2.87	1320.0	94.6	125.8
2.87	2.97	539.0	55.2	88.7

John C. Calhoun Expressway Repair & Restoration

TIA
TRANSPORTATION INVESTMENT ACT

Structural Concept Report

prepared for:

W.R. Toole Engineers, Inc.

prepared by:

Cranston Engineering Group, P.C.
ENGINEERS - PLANNERS - SURVEYORS

September 15, 2014

STRUCTURAL CONCEPT REPORT

John C. Calhoun Expressway
Repair & Restoration Project

Augusta, Georgia

INTRODUCTION

On June 5, 2014, Cranston Engineering Group, P.C. was commissioned by W.R. Toole Engineers to perform various tasks pertaining to the four (4) bridge structures along the John C. Calhoun Expressway (State Route No. 28) in Augusta, Georgia. This work was performed in support of the preparation of the project concept report for the John C. Calhoun Expressway Repair & Restoration Project which was awarded to W.R. Toole Engineers by Augusta, Georgia. The John C. Calhoun Expressway Repair & Restoration Project includes pavement replacement, resurfacing, bridge deck repair, drainage improvements, safety improvements, and signage and lighting improvements. While addressing the restoration and safety needs of the project, landscaping and new fencing will be addressed to improve the aesthetics of the gateway corridor into the City of Augusta. The project is being funded by the Georgia Transportation Investment Act of 2010 (TIA) with project oversight by the Georgia Department of Transportation.

SCOPE OF WORK

The scope of work addressed in this report includes a limited structural topside surface assessment of the four (4) bridge structures along John C. Calhoun Expressway, the preparation of a pedestrian overpass bridge between Crawford Avenue and Eve Street, and an evaluation of various aesthetic improvement alternatives for the Milledge Road overpass bridge. The limited structural surface assessment addressed various structural and drainage deficiencies for the four bridge structures including the 12th Street to 15th Street overpass, the Crawford Avenue overpass, the Eve Street overpass, and the Rae's Creek/Broad Street overpass. The surface assessment included a field evaluation of the bridge deck surfaces as well as the barriers and drainage inlets.

A pedestrian crossing alternative was also evaluated between Crawford Avenue and Eve Street. The aerial crossing was evaluated to address the safety of pedestrians who currently cross John C. Calhoun Expressway illegally by jumping the corridor fence on both sides of the roadway.

The scope of work also evaluated a decorative railing along the tops of the concrete barriers and along the Milledge Road overpass bridge. The Milledge Road overpass was evaluated with various improvements including the adding exterior beam facades, ornamental railing, and painting of the exterior bridge girders.

DISCUSSION

A limited topside surface structural assessment was conducted for the 12th Street to 15th Street overpass, the Crawford Avenue overpass, the Eve Street overpass, and the Rae's Creek/Broad Street overpass. The assessment was limited to the top of the concrete bridge deck

and concrete barrier surfaces. A detailed summary of the various structural deficiency findings is itemized in the Deficiency Table included with this report as in Appendix A. Detailed findings at each bridge location are described as follows:

Superstructure Surface Assessment

12th Street to 15th Street Overpass Bridge:

The 12th Street to 15th Street Overpass Bridge structure, the longest of the bridge structures along John C. Calhoun Expressway, begins just west of 15th Street and terminates just west of the 12th Street intersection. The crossing includes independent bridge structures for both eastbound and westbound traffic. The structures include 7-1/2 inch thick concrete deck supported on a combination of concrete and steel bridge girders. The decks are grooved. Various deficiencies were observed along the surface of the overpass bridge which included concrete spalls in the deck and barriers, blocked deck drains, longitudinal and transverse cracks in deck, hairline cracks in barriers, and damaged expansion joints in deck and barriers in need of repair. The cracks in the deck varied in width from hairline to approximately 1/8 inch. The cracks observed in the barriers were measured to be hairline in width. Some of the concrete spalls were located along the deck expansion joints. Other spalls were observed where some of the large aggregate had dislodged leaving multiple depressions in the deck due to wear. Other damaged concrete surfaces in the barriers were observed which are believed to have been caused by vehicle impacts. Several of the deck drains were blocked with silt, debris, and vegetation. Storm water was observed to be ponding at some of the blocked drain locations. Several of the horizontal deck expansion joints were observed to be in need of both repair and replacement. Some of the vertical joint material in the barriers was observed to have fallen away from the barrier. All of these deficiencies are shown on Photographs 1 through 31 in Appendix B.

Crawford Avenue Overpass Bridge:

The Crawford Avenue Overpass Bridge structure includes a single bridge for both eastbound and westbound traffic. The structure includes 7-1/2 inch thick concrete deck supported on steel bridge girders. The decks are grooved. Various deficiencies were observed along the surface of the overpass bridge which included minor concrete spalls in the deck and barriers, longitudinal and transverse cracks in deck, hairline cracks in barriers, and damaged expansion joints in deck and barriers in need of repair. The cracks in the deck varied in width from hairline to approximately 1/8 inch. The cracks observed in the barriers were measured to be hairline in width. Some of the concrete spalls were located along the deck expansion joints. Other spalls were observed where some of the large aggregate had dislodged leaving multiple depressions in the deck. Several of the horizontal deck expansion joints were observed to be in need of both repair and replacement. Most of these deficiencies are shown on Photographs 32 through 39 in Appendix B.

Eve Street Overpass Bridge:

The Eve Street Overpass Bridge structure includes a single bridge for both eastbound and westbound traffic. The structure includes 7-1/2 inch thick concrete deck supported on steel bridge girders. The decks are grooved. Various deficiencies were observed along the surface of the overpass bridge which included minor concrete spalls in the deck and barriers, longitudinal and transverse cracks in deck, hairline cracks in barriers, and damaged expansion joints in deck

and barriers in need of repair. The cracks in the deck varied in width from hairline to approximately 1/8 inch. The cracks observed in the barriers were measured to be hairline in width. Some of the concrete spalls were located along the deck expansion joints. Other spalls were observed where some of the large aggregate had dislodged leaving multiple depressions in the deck. Several of the horizontal deck expansion joints were observed to be in need of both repair and replacement. Most of these deficiencies are shown on Photographs 40 through 48 in Appendix B.

Rae's Creek/Broad Street Overpass Bridge:

The Rae's Creek/Broad Street Overpass Bridge structure, begins at the Washington Road/Broad Street ramps and crosses over both Broad Street and Rae's Creek. The crossing includes a single bridge for both eastbound and westbound traffic. The structure includes 7-1/2 inch thick concrete deck supported on steel bridge girders. The decks are grooved. Various deficiencies were observed along the surface of the overpass bridge which included concrete spalls in the deck and barriers, blocked deck drains, longitudinal and transverse cracks in deck, hairline cracks in barriers, and damaged expansion joints in deck and barriers in need of repair. The cracks in the deck varied in width from hairline to approximately 1/8 inch. The cracks observed in the barriers were measured to be hairline in width. Some of the concrete spalls were located along the deck expansion joints. Other spalls were observed where some of the large aggregate had dislodged leaving multiple depressions in the deck. Some of the other damaged concrete surfaces in the barriers were observed and are believed to have been caused by vehicle impacts. Several of the deck drains were blocked with silt, debris, and vegetation. Storm water was observed to be ponding at some of the blocked drain locations. Several of the horizontal deck expansion joints were observed to be in need of both repair and replacement. Some of the vertical joint material in the barriers was observed to have fallen away from the barrier. All of these deficiencies are shown on Photographs 49 through 68 in Appendix B.

Pedestrian Bridge Overpass

Pedestrians have been observed crossing the John C. Calhoun Expressway by jumping the corridor fence or walking through a fence section that has been removed. After entering the corridor, the pedestrian is then required to climb over the center median barrier to complete the crossing. An overpass bridge alternative was evaluated at a known pedestrian traffic location between Crawford Avenue and Eve Street. Several bridge alternatives were evaluated which included single span concrete girders, multi-span concrete and steel girders, and a pre-manufactured arch truss. Since one of the primary project objectives includes improving the aesthetics of the corridor, the single span steel arch structure was further evaluated. This alternative includes a single 150 foot span arched steel truss with a deck width of 10 feet. The bridge would be placed to allow for a minimum vehicle clearance of 18 feet. The bridge is supported by two concrete and steel towers at each end with a metal pan or concrete stairway system. Since no detailed project objectives have been identified for this particular proposed corridor feature, a ramp system was not evaluated at this time. The bridge structure is assumed to include protective fencing which would prevent pedestrians from throwing objects onto the expressway while maintaining the visually pleasing appearance of the bridge structure. Reference the proposed bridge section in Appendix C. The preliminary costs associated with this alternative are included in Appendix D.

Milledge Road Bridge Overpass Improvements

The overpass bridge along Milledge Road was evaluated for various aesthetic improvements which could be viewed eastbound and westbound lanes along the John C. Calhoun Expressway. The alternatives that were evaluated included adding a stone or brick facade to the outer face of the exterior steel girders and barriers. This alternative would include adding a steel lintel plate to the bottom flange of the steel girder to support a stone or brick masonry facade. The facade would be connected to the girder and barrier wall using masonry ties anchored directly to the bridge superstructure. A second alternative was evaluated which included adding ornamental steel railing to the tops of the barriers of the Milledge Road Bridge. The third alternative included painting the exterior bridge girders using a standard Georgia Department of Transportation approved painting method. The preliminary costs associated with the various alternatives described herein are included in this report in Appendix D.

Decorative Railing on Bridge Structures

As part of our structural assessment, we determined that a decorative steel railing could be added to the tops of the concrete barriers on the bridge structures. Various alternatives were evaluated which included horizontal rails and vertical pickets. The preliminary costs associated with this aesthetic improvement alternative are included in this report in Appendix D.

CONCLUSIONS AND RECOMMENDED CORRECTIVE ACTION

This structural concept report has identified various deficiencies on the four (4) bridge structures located along the John C. Calhoun Expressway corridor. In addition, several corridor safety and aesthetic improvement alternatives have been identified and evaluated for structural impacts at a conceptual level. It is not the intent of this report to recommend any or all of the aesthetic improvement alternatives that have been evaluated but to present project options based on ideas presented in the Concept Team Meetings.

Several bridge structure deficiencies have been identified in all of the four bridge structures. We recommend that the following corrective action be completed as soon as possible:

- Repair all cracks in the concrete decks and barrier walls.
- Repair all visible concrete spalls
- Open all deck drains by removing sediment and vegetation causing blockage
- Replace and repair all damaged and deteriorated deck expansion joints
- Replace and repair all damaged and deteriorated barrier expansion joints

Appendix A

Difficiency Table

JOHN C. CALHOUN EXPRESSWAY REPAIR & RESTORATION

DIFFICIENCY TABLE

PHOTO NO.	BRIDGE ID	DIRECTION	COMMENT
1	12th St. to 15th St.	Westbound	Barrier wall at end abutment missing joint material
2	12th St. to 15th St.	Westbound	Drainage holes in barrier wall partially blocked by debris
3	12th St. to 15th St.	Westbound	Concrete spalling at expansion joint in bridge deck
4	12th St. to 15th St.	Westbound	Standing water at barrier wall due to blocked drains
5	12th St. to 15th St.	Westbound	Vegetation growing in expansion joint
6	12th St. to 15th St.	Westbound	Multiple hairline cracks in bridge deck
7	12th St. to 15th St.	Westbound	Concrete spalling along armor joint at bridge deck
8	12th St. to 15th St.	Westbound	Missing and damaged joint material at barrier wall and bridge deck
9	12th St. to 15th St.	Westbound	Multiple hairline cracks in barrier wall
10	12th St. to 15th St.	Westbound	Drain holes in barrier wall have been filled with concrete over St. Sebastian
11	12th St. to 15th St.	Westbound	Damaged expansion joint material at bridge deck and barrier wall
12	12th St. to 15th St.	Westbound	Grate drain in bridge deck is completely blocked with sediment and vegetation
13	12th St. to 15th St.	Westbound	Grate drain in bridge deck is partially blocked with sediment and vegetation
14	12th St. to 15th St.	Westbound	Damaged expansion joint material at bridge deck and barrier wall
15	12th St. to 15th St.	Westbound	Grate drain in bridge deck is completely blocked with sediment and vegetation
16	12th St. to 15th St.	Westbound	Grate drain in bridge deck is completely blocked with sediment and vegetation
17	12th St. to 15th St.	Westbound	Grate drain in bridge deck is completely blocked with sediment
18	12th St. to 15th St.	Westbound	Concrete spalling at barrier wall joint and missing expansion joint material
19	12th St. to 15th St.	Westbound	Grate drain in bridge deck is completely blocked with sediment
20	12th St. to 15th St.	Westbound	Damaged barrier joint material and partially blocked drain due to sediment and vegetation
21	12th St. to 15th St.	Westbound	Multiple cracks in approach slab approximately 1/8" wide
22	12th St. to 15th St.	Eastbound	Multiple hairline cracks in barrier wall at light pole baseplate and no grout below light pole baseplate
23	12th St. to 15th St.	Eastbound	Concrete spall in bridge deck approximately 1" diameter
24	12th St. to 15th St.	Eastbound	Missing and damaged joint material at barrier wall
25	12th St. to 15th St.	Eastbound	Grate drain in bridge deck is partially blocked with sediment and vegetation
26	12th St. to 15th St.	Eastbound	Grate drain in bridge deck is completely blocked with sediment and vegetation
27	12th St. to 15th St.	Eastbound	Damaged expansion joint material and concrete spalling at bridge deck
28	12th St. to 15th St.	Eastbound	Concrete spalling at barrier wall around light pole anchor bolts, light pole appears to have been damaged in car accident
29	12th St. to 15th St.	Eastbound	Missing and damaged joint material at barrier wall and bridge deck
30	12th St. to 15th St.	Eastbound	Concrete spalling along armored joint in bridge deck
31	12th St. to 15th St.	Eastbound	Vegetation growing in expansion joint

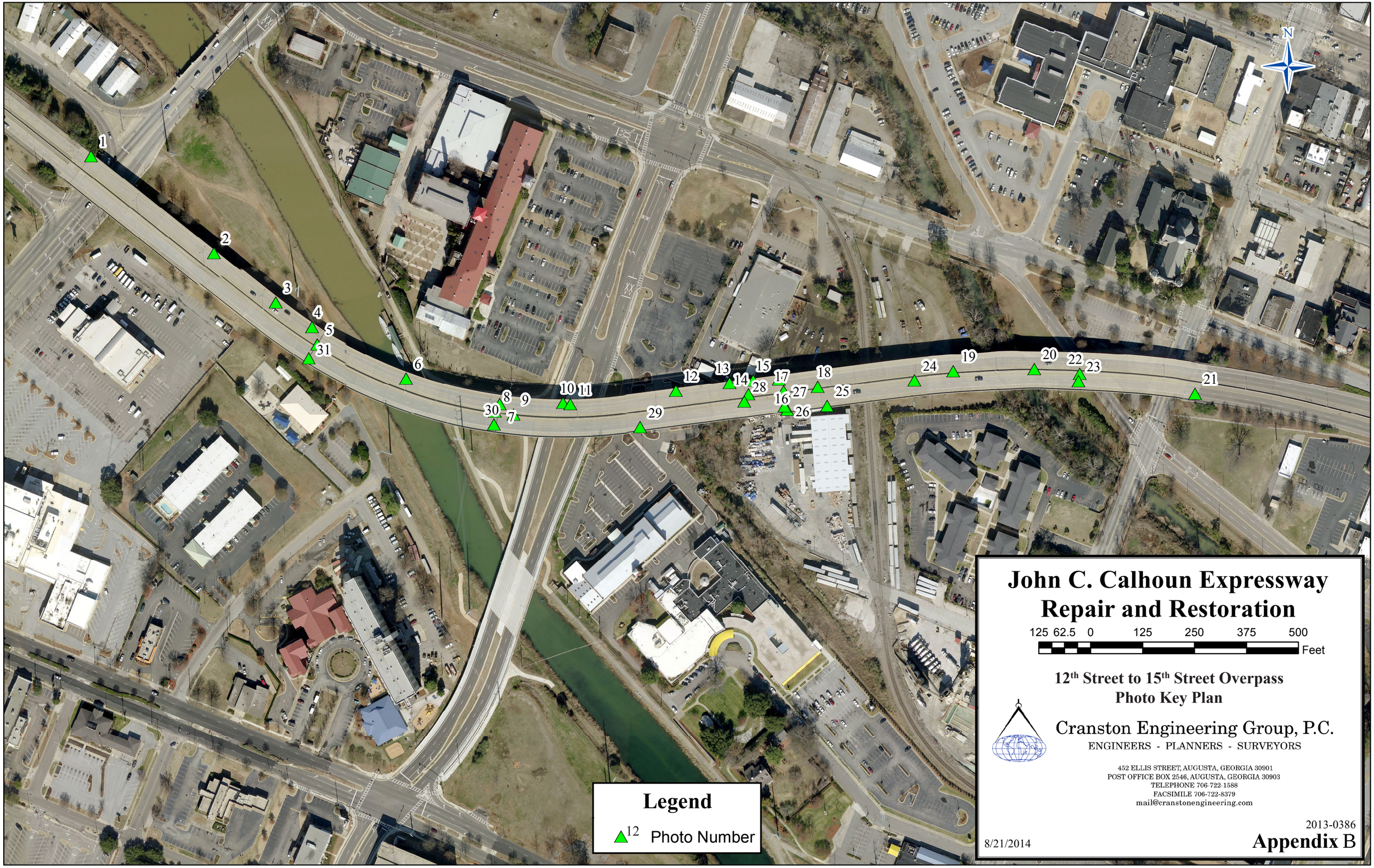
PHOTO NO.	BRIDGE ID	DIRECTION	COMMENT
32	Crawford Ave.	Westbound	Multiple hairline cracks in bridge deck
33	Crawford Ave.	Westbound	Aggregate exposed in bridge deck
34	Crawford Ave.	Westbound	Multiple hairline cracks in bridge deck
35	Crawford Ave.	Westbound	Multiple repaired cracks in bridge deck
36	Crawford Ave.	Westbound	Crack in bridge deck approximately 1/8" wide
37	Crawford Ave.	Eastbound	Aggregate exposed in approach slab
38	Crawford Ave.	Eastbound	Aggregate exposed in bridge deck
39	Crawford Ave.	Eastbound	Missing and damaged joint material at barrier wall

PHOTO NO.	BRIDGE ID	DIRECTION	COMMENT
40	Eve St.	Westbound	Missing and damaged joint material at bridge deck
41	Eve St.	Eastbound	Multiple hairline cracks in bridge deck and concrete spalling
42	Eve St.	Eastbound	Multiple hairline cracks in bridge deck
43	Eve St.	Eastbound	Exposed aggregate
44	Eve St.	Eastbound	Crack in approach slab approximately 1/8" wide
45	Eve St.	Westbound	Multiple repaired cracks in approach slab
46	Eve St.	Westbound	Multiple hairline cracks in bridge deck and exposed aggregate
47	Eve St.	Westbound	Concrete spalling in bridge deck and exposed aggregate
48	Eve St.	Westbound	Repaired crack in bridge deck

PHOTO NO.	BRIDGE ID	DIRECTION	COMMENT
49	Rae's Creek/Broad St.	Southbound	Multiple repaired cracks in approach slab
50	Rae's Creek/Broad St.	Southbound	Exposed aggregate in bridge deck
51	Rae's Creek/Broad St.	Southbound	Damage to bridge deck most likely caused by a wreck
52	Rae's Creek/Broad St.	Southbound	Damaged and missing expansion joint material at bridge deck
53	Rae's Creek/Broad St.	Southbound	Damaged and missing expansion joint material at bridge deck
54	Rae's Creek/Broad St.	Southbound	Grate drain in bridge deck is partially blocked with sediment
55	Rae's Creek/Broad St.	Southbound	Damaged and missing expansion joint material at bridge deck
56	Rae's Creek/Broad St.	Southbound	Concrete spalling at bridge deck due to missing aggregate
57	Rae's Creek/Broad St.	Southbound	Repaired crack in approach slab
58	Rae's Creek/Broad St.	Southbound	Damaged and missing expansion joint material at barrier wall
59	Rae's Creek/Broad St.	Northbound	Multiple repaired cracks in approach slab
60	Rae's Creek/Broad St.	Northbound	Concrete spalling at expansion joint in bridge deck
61	Rae's Creek/Broad St.	Northbound	Concrete spall in bridge deck approximately 1-1/2" diameter
62	Rae's Creek/Broad St.	Northbound	Concrete spalling and damaged joint material at bridge deck
63	Rae's Creek/Broad St.	Northbound	Concrete spalling along expansion joint and exposed aggregate
64	Rae's Creek/Broad St.	Northbound	Damaged and missing joint material at bridge deck
65	Rae's Creek/Broad St.	Northbound	Grate drain in bridge deck is completely blocked with sediment and vegetation
66	Rae's Creek/Broad St.	Northbound	Vegetation growing in expansion joint
67	Rae's Creek/Broad St.	Northbound	Multiple repaired cracks in approach slab
68	Rae's Creek/Broad St.	Northbound	Grate drain in bridge deck is completely blocked with vegetation

Appendix B

Photographs



John C. Calhoun Expressway Repair and Restoration

125 62.5 0 125 250 375 500 Feet

12th Street to 15th Street Overpass Photo Key Plan

Cranston Engineering Group, P.C.
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2013-0386

8/21/2014

Appendix B

PHOTO NO: 1
BRIDGE ID: 12th St. to 15th St.
DIRECTION: Westbound
FILE NAME: PHOTO1_0001.jpg

COMMENT
Barrier wall at end abutment missing joint material

PHOTO NO: 2
BRIDGE ID: 12th St. to 15th St.
DIRECTION: Westbound
FILE NAME: PHOTO1_0002.jpg

COMMENT
Drainage holes in barrier wall partially blocked by debris

PHOTO NO: 3
BRIDGE ID: 12th St. to 15th St.
DIRECTION: Westbound
FILE NAME: PHOTO1_0003.jpg

COMMENT
Concrete spalling at expansion joint in bridge deck

PHOTO NO: 4
BRIDGE ID: 12th St. to 15th St.
DIRECTION: Westbound
FILE NAME: PHOTO1_0004.jpg

COMMENT
Standing water at barrier wall due to blocked drains

PHOTO NO: 5
BRIDGE ID: 12th St. to 15th St.
DIRECTION: Westbound
FILE NAME: PHOTO1_0005.jpg

COMMENT
Vegetation growing in expansion joint

PHOTO NO: 6
BRIDGE ID: 12th St. to 15th St.
DIRECTION: Westbound
FILE NAME: PHOTO1_0006.jpg

COMMENT
Multiple hairline cracks in bridge deck

PHOTO NO: 7
BRIDGE ID: 12th St. to 15th St.
DIRECTION: Westbound
FILE NAME: PHOTO1_0007.jpg

COMMENT
Concrete spalling along armor joint at bridge deck

PHOTO NO: 8
BRIDGE ID: 12th St. to 15th St.
DIRECTION: Westbound
FILE NAME: PHOTO1_0008.jpg

COMMENT
Missing and damaged joint material at barrier wall and bridge deck

PHOTO NO: 9
BRIDGE ID: 12th St. to 15th St.
DIRECTION: Westbound
FILE NAME: PHOTO1_0009.jpg

COMMENT
Multiple hairline cracks in barrier wall

PHOTO NO: 10
BRIDGE ID: 12th St. to 15th St.
DIRECTION: Westbound
FILE NAME: PHOTO1_0010.jpg

COMMENT
Drain holes in barrier wall have been filled with concrete over St. Sebastian

PHOTO NO: 11
BRIDGE ID: 12th St. to 15th St.
DIRECTION: Westbound
FILE NAME: PHOTO1_0011.jpg

COMMENT
Damaged expansion joint material at bridge deck and barrier wall

PHOTO NO: 12
BRIDGE ID: 12th St. to 15th St.
DIRECTION: Westbound
FILE NAME: PHOTO1_0012.jpg

COMMENT
Grate drain in bridge deck is completely blocked with sediment and vegetation

PHOTO NO: 13
BRIDGE ID: 12th St. to 15th St.
DIRECTION: Westbound
FILE NAME: PHOTO1_0013.jpg

COMMENT
Grate drain in bridge deck is partially blocked with sediment and vegetation

PHOTO NO: 14
BRIDGE ID: 12th St. to 15th St.
DIRECTION: Westbound
FILE NAME: PHOTO1_0014.jpg

COMMENT
Damaged expansion joint material at bridge deck and barrier wall

PHOTO NO: 15
BRIDGE ID: 12th St. to 15th St.
DIRECTION: Westbound
FILE NAME: PHOTO1_0015.jpg

COMMENT
Grate drain in bridge deck is completely blocked with sediment and vegetation

PHOTO NO: 16
BRIDGE ID: 12th St. to 15th St.
DIRECTION: Westbound
FILE NAME: PHOTO1_0016.jpg

COMMENT
Grate drain in bridge deck is completely blocked with sediment and vegetation

PHOTO NO: 17
BRIDGE ID: 12th St. to 15th St.
DIRECTION: Westbound
FILE NAME: PHOTO1_0017.jpg

COMMENT
Grate drain in bridge deck is completely blocked with sediment

PHOTO NO: 18
BRIDGE ID: 12th St. to 15th St.
DIRECTION: Westbound
FILE NAME: PHOTO1_0018.jpg

COMMENT
Concrete spalling at barrier wall joint and missing expansion joint material

PHOTO NO: 19
BRIDGE ID: 12th St. to 15th St.
DIRECTION: Westbound
FILE NAME: PHOTO1_0019.jpg

COMMENT
Grate drain in bridge deck is completely blocked with sediment

PHOTO NO: 20
BRIDGE ID: 12th St. to 15th St.
DIRECTION: Westbound
FILE NAME: PHOTO1_0020.jpg

COMMENT
Damaged barrier joint material and partially blocked drain due to sediment and vegetation

PHOTO NO: 21
BRIDGE ID: 12th St. to 15th St.
DIRECTION: Westbound
FILE NAME: PHOTO1_0022.jpg

COMMENT
Multiple cracks in approach slab approximately 1/8” wide

PHOTO NO: 22
BRIDGE ID: 12th St. to 15th St.
DIRECTION: Eastbound
FILE NAME: PHOTO1_0023.jpg

COMMENT
Multiple hairline cracks in barrier wall at light pole baseplate and no grout below light pole baseplate

PHOTO NO: 23
BRIDGE ID: 12th St. to 15th St.
DIRECTION: Eastbound
FILE NAME: PHOTO1_0024.jpg

COMMENT
Concrete spall in bridge deck approximately 1” diameter

PHOTO NO: 24
BRIDGE ID: 12th St. to 15th St.
DIRECTION: Eastbound
FILE NAME: PHOTO1_0025.jpg

COMMENT
Missing and damaged joint material at barrier wall

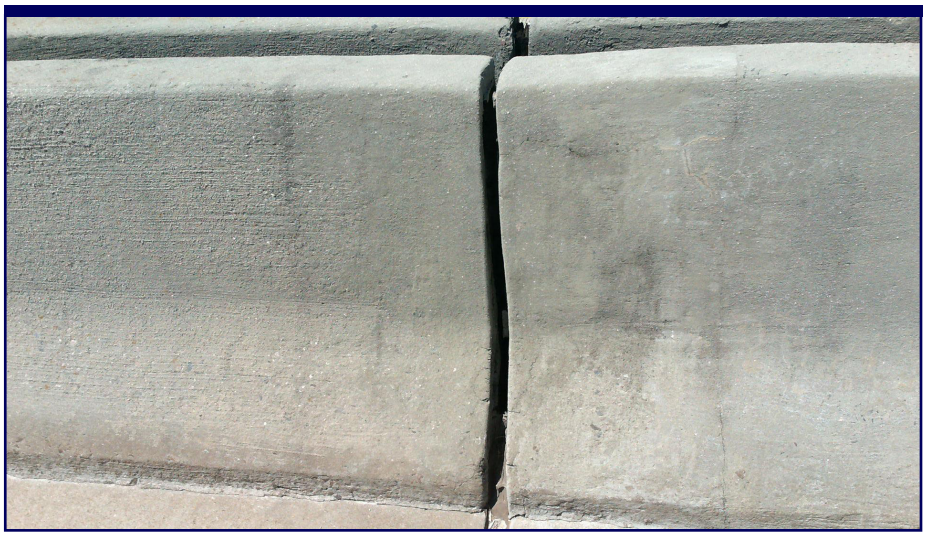


PHOTO NO: 25
BRIDGE ID: 12th St. to 15th St.
DIRECTION: Eastbound
FILE NAME: PHOTO1_0026.jpg

COMMENT
Grate drain in bridge deck is partially blocked with sediment and vegetation

PHOTO NO: 26
BRIDGE ID: 12th St. to 15th St.
DIRECTION: Eastbound
FILE NAME: PHOTO1_0027.jpg

COMMENT
Grate drain in bridge deck is completely blocked with sediment and vegetation

PHOTO NO: 27
BRIDGE ID: 12th St. to 15th St.
DIRECTION: Eastbound
FILE NAME: PHOTO1_0028.jpg

COMMENT
Damaged expansion joint material and concrete spalling at bridge deck

PHOTO NO: 28
BRIDGE ID: 12th St. to 15th St.
DIRECTION: Eastbound
FILE NAME: PHOTO1_0029.jpg

COMMENT
Concrete spalling at barrier wall around light pole anchor bolts, light pole appears to have been damaged in car accident

PHOTO NO: 29
BRIDGE ID: 12th St. to 15th St.
DIRECTION: Eastbound
FILE NAME: PHOTO1_0030.jpg

COMMENT
Missing and damaged joint material at barrier wall and bridge deck

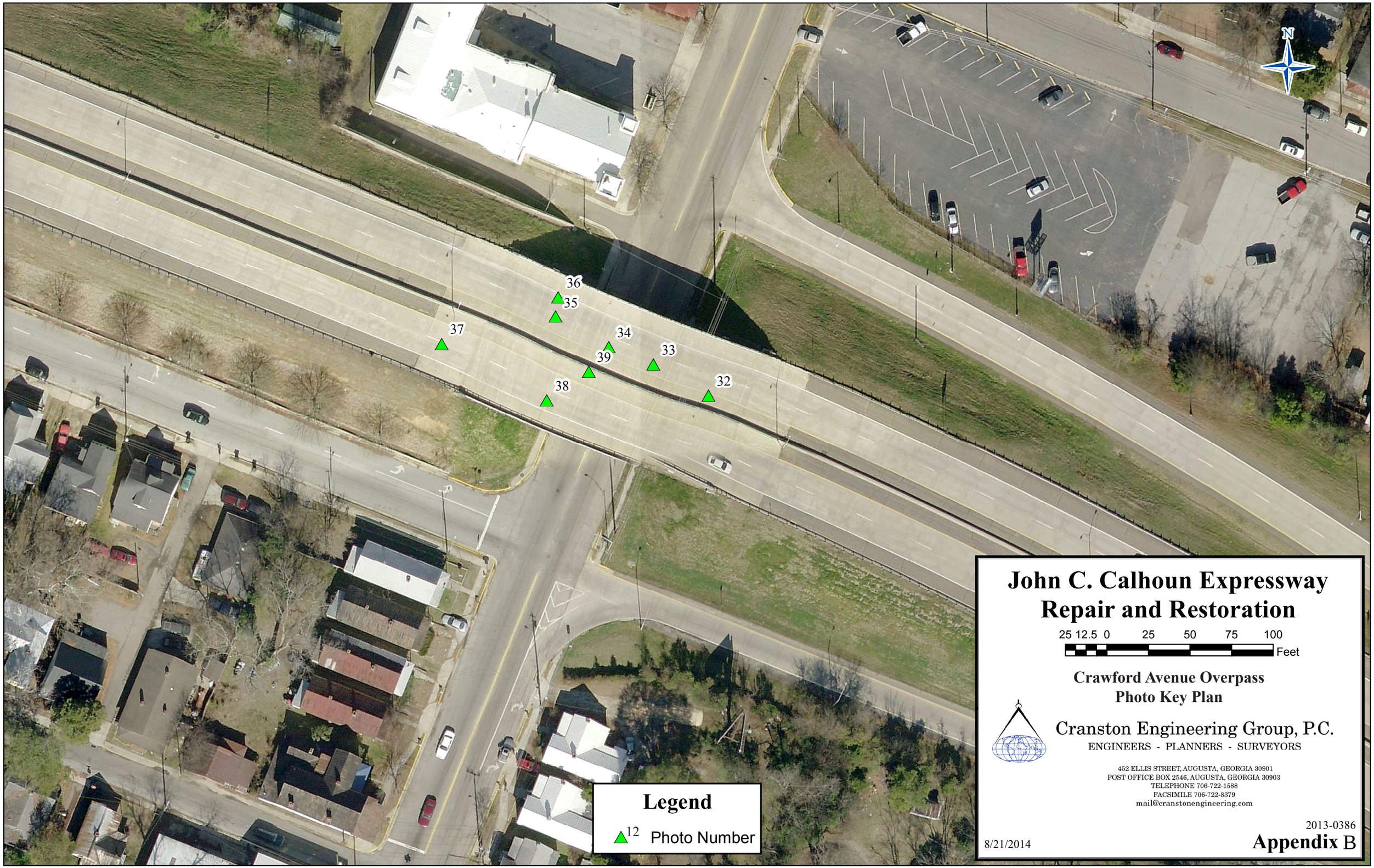
PHOTO NO: 30
BRIDGE ID: 12th St. to 15th St.
DIRECTION: Eastbound
FILE NAME: PHOTO1_0031.jpg

COMMENT
Concrete spalling along armored joint in bridge deck

PHOTO NO:	31
BRIDGE ID:	12th St. to 15th St.
DIRECTION:	Eastbound
FILE NAME:	PHOTO1_0033.jpg

COMMENT

Vegetation growing in expansion joint



John C. Calhoun Expressway Repair and Restoration

25 12.5 0 25 50 75 100 Feet

Crawford Avenue Overpass
Photo Key Plan

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2013-0386

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Appendix B

PHOTO NO: 32
BRIDGE ID: Crawford Ave.
DIRECTION: Westbound
FILE NAME: PHOTO1_0034.jpg

COMMENT
Multiple hairline cracks in bridge deck

PHOTO NO: 33
BRIDGE ID: Crawford Ave.
DIRECTION: Westbound
FILE NAME: PHOTO1_0035.jpg

COMMENT
Aggregate exposed in bridge deck

PHOTO NO: 34
BRIDGE ID: Crawford Ave.
DIRECTION: Westbound
FILE NAME: PHOTO1_0036.jpg

COMMENT
Multiple hairline cracks in bridge deck

PHOTO NO: 35
BRIDGE ID: Crawford Ave.
DIRECTION: Westbound
FILE NAME: PHOTO1_0038.jpg

COMMENT
Multiple repaired cracks in bridge deck

PHOTO NO: 36
BRIDGE ID: Crawford Ave.
DIRECTION: Westbound
FILE NAME: PHOTO1_0039.jpg

COMMENT
Crack in bridge deck approximately 1/8" wide

PHOTO NO: 37
BRIDGE ID: Crawford Ave.
DIRECTION: Eastbound
FILE NAME: PHOTO1_0040.jpg

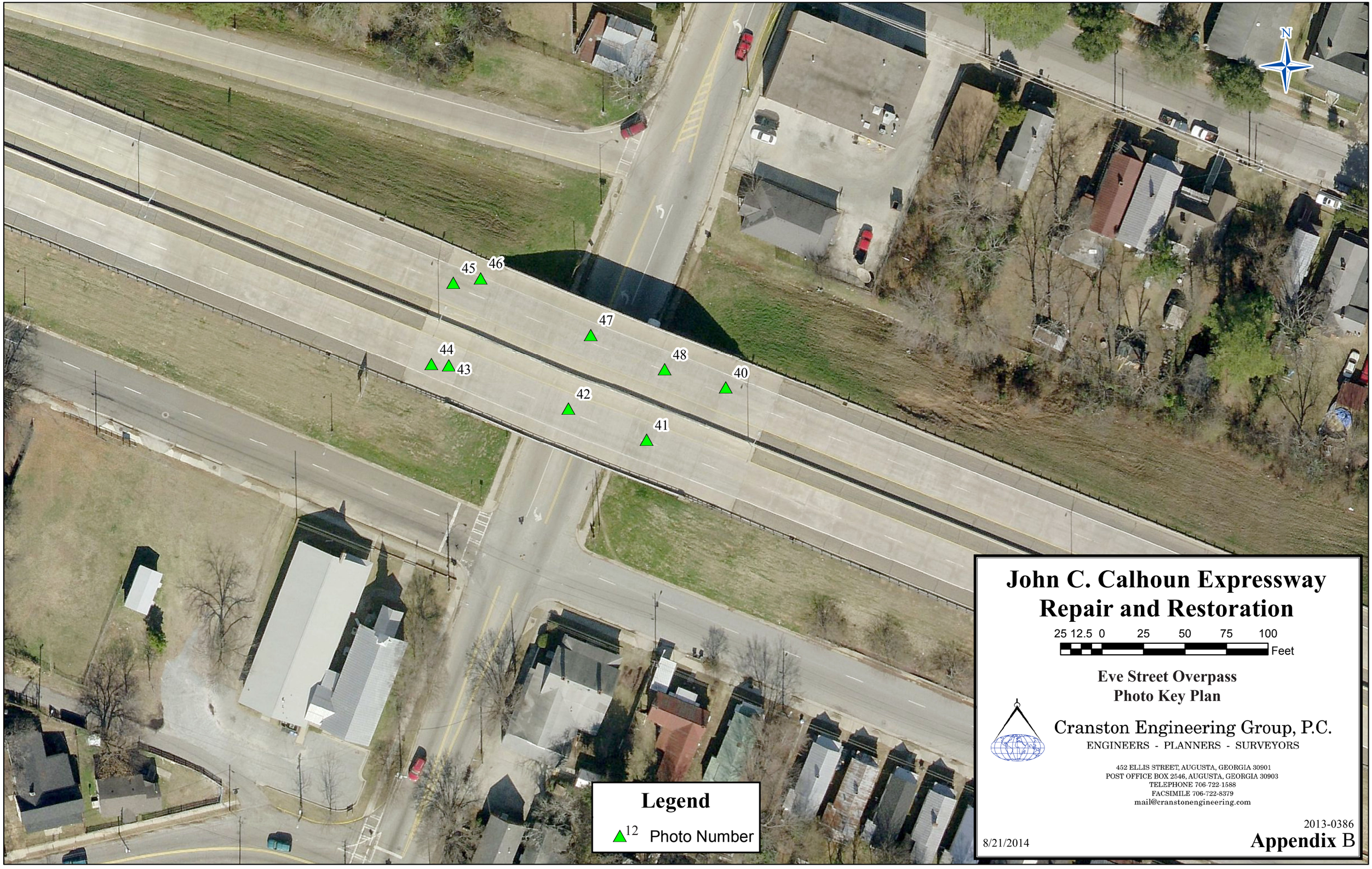
COMMENT
Aggregate exposed in approach slab

PHOTO NO: 38
BRIDGE ID: Crawford Ave.
DIRECTION: Eastbound
FILE NAME: PHOTO1_0041.jpg

COMMENT
Aggregate exposed in bridge deck

PHOTO NO: 39
BRIDGE ID: Crawford Ave.
DIRECTION: Eastbound
FILE NAME: PHOTO1_0042.jpg

COMMENT
Missing and damaged joint material at barrier wall



John C. Calhoun Expressway Repair and Restoration

25 12.5 0 25 50 75 100 Feet

Eve Street Overpass
Photo Key Plan

Cranston Engineering Group, P.C.
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2013-0386

8/21/2014

Appendix B

PHOTO NO: 40
BRIDGE ID: Eve St.
DIRECTION: Westbound
FILE NAME: PHOTO1_0043.jpg

COMMENT
Missing and damaged joint material at bridge deck

PHOTO NO: 41
BRIDGE ID: Eve St.
DIRECTION: Eastbound
FILE NAME: PHOTO1_0044.jpg

COMMENT
Multiple hairline cracks in bridge deck and concrete spalling

PHOTO NO: 42
BRIDGE ID: Eve St.
DIRECTION: Eastbound
FILE NAME: PHOTO1_0045.jpg

COMMENT
Multiple hairline cracks in bridge deck

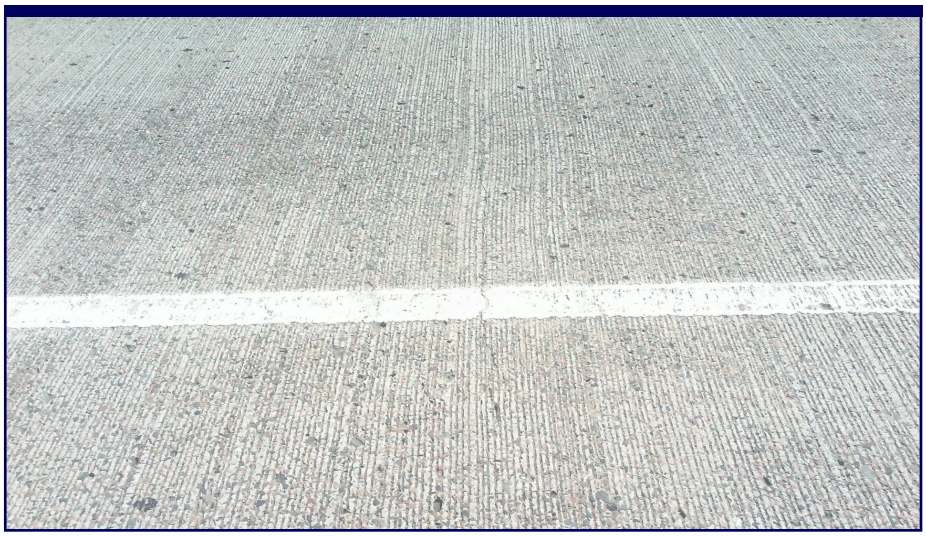


PHOTO NO: 43
BRIDGE ID: Eve St.
DIRECTION: Eastbound
FILE NAME: PHOTO1_0046.jpg

COMMENT
Exposed aggregate

PHOTO NO: 44
BRIDGE ID: Eve St.
DIRECTION: Eastbound
FILE NAME: PHOTO1_0047.jpg

COMMENT
Crack in approach slab approximately 1/8” wide

PHOTO NO: 45
BRIDGE ID: Eve St.
DIRECTION: Westbound
FILE NAME: PHOTO1_0048.jpg

COMMENT
Multiple repaired cracks in approach slab

PHOTO NO: 46
BRIDGE ID: Eve St.
DIRECTION: Westbound
FILE NAME: PHOTO1_0049.jpg

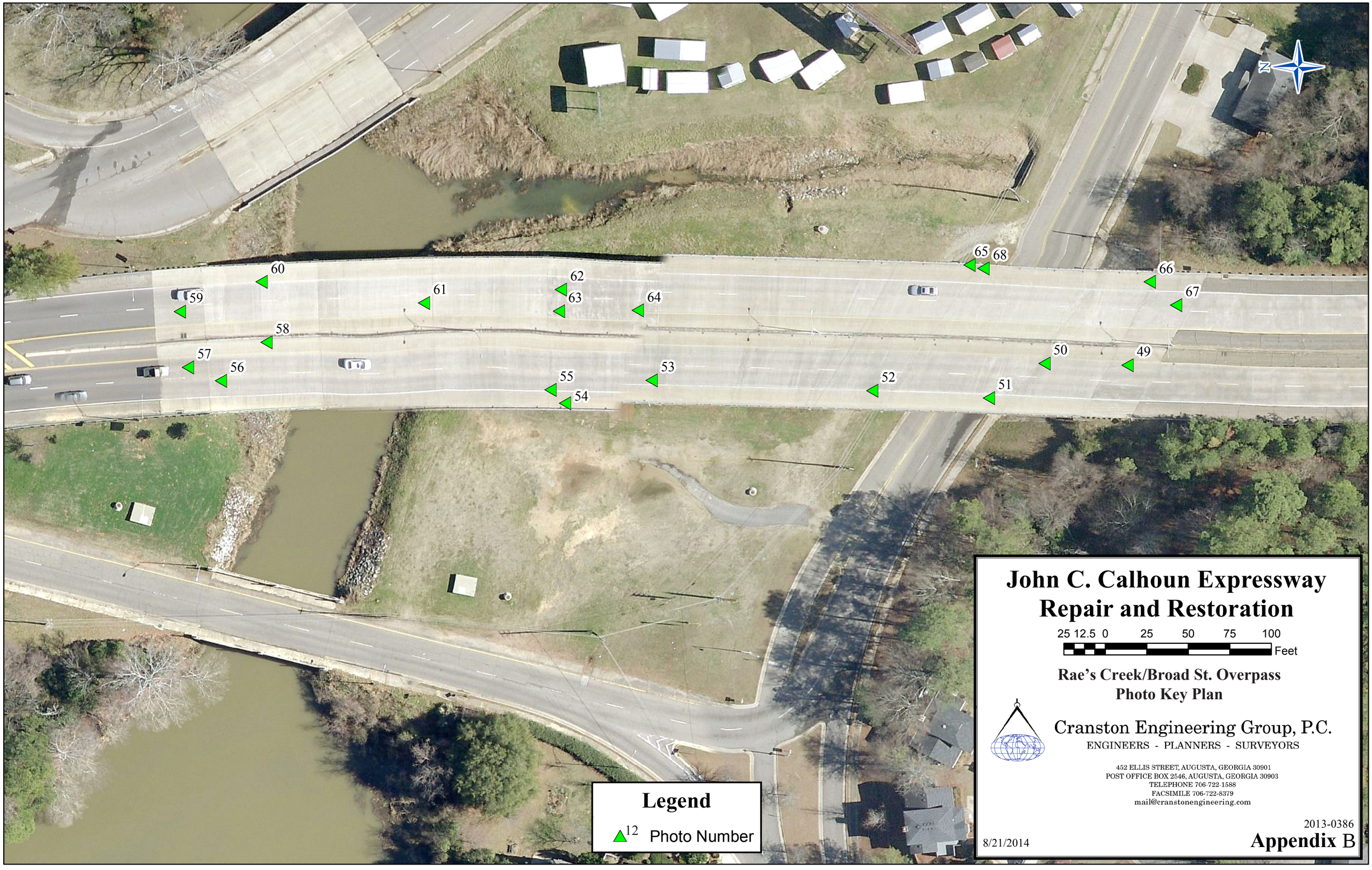
COMMENT
Multiple hairline cracks in bridge deck and exposed aggregate

PHOTO NO: 47
BRIDGE ID: Eve St.
DIRECTION: Westbound
FILE NAME: PHOTO1_0051.jpg

COMMENT
Concrete spalling in bridge deck and exposed aggregate

PHOTO NO: 48
BRIDGE ID: Eve St.
DIRECTION: Westbound
FILE NAME: PHOTO1_0052.jpg

COMMENT
Repaired crack in bridge deck



John C. Calhoun Expressway Repair and Restoration

Rae's Creek/Broad St. Overpass
Photo Key Plan

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2013-0386

8/21/2014

Appendix B

PHOTO NO: 49
BRIDGE ID: Rae's Creek/Broad St.
DIRECTION: Southbound
FILE NAME: PHOTO1_0053.jpg

COMMENT
Multiple repaired cracks in approach slab

PHOTO NO: 50
BRIDGE ID: Rae's Creek/Broad St.
DIRECTION: Southbound
FILE NAME: PHOTO1_0054.jpg

COMMENT
Exposed aggregate in bridge deck

PHOTO NO: 51
BRIDGE ID: Rae's Creek/Broad St.
DIRECTION: Southbound
FILE NAME: PHOTO1_0055.jpg

COMMENT
Damage to bridge deck most likely caused by a wreck

PHOTO NO: 52
BRIDGE ID: Rae's Creek/Broad St.
DIRECTION: Southbound
FILE NAME: PHOTO1_0056.jpg

COMMENT
Damaged and missing expansion joint material at bridge deck

PHOTO NO: 53
BRIDGE ID: Rae's Creek/Broad St.
DIRECTION: Southbound
FILE NAME: PHOTO1_0057.jpg

COMMENT
Damaged and missing expansion joint material at bridge deck

PHOTO NO: 54
BRIDGE ID: Rae's Creek/Broad St.
DIRECTION: Southbound
FILE NAME: PHOTO1_0058.jpg

COMMENT
Grate drain in bridge deck is partially blocked with sediment

PHOTO NO: 55
BRIDGE ID: Rae's Creek/Broad St.
DIRECTION: Southbound
FILE NAME: PHOTO1_0059.jpg

COMMENT
Damaged and missing expansion joint material at bridge deck

PHOTO NO: 56
BRIDGE ID: Rae's Creek/Broad St.
DIRECTION: Southbound
FILE NAME: PHOTO1_0060.jpg

COMMENT
Concrete spalling at bridge deck due to missing aggregate

PHOTO NO: 57
BRIDGE ID: Rae's Creek/Broad St.
DIRECTION: Southbound
FILE NAME: PHOTO1_0061.jpg

COMMENT
Repaired crack in approach slab

PHOTO NO: 58
BRIDGE ID: Rae's Creek/Broad St.
DIRECTION: Southbound
FILE NAME: PHOTO1_0062.jpg

COMMENT
Damaged and missing expansion joint material at barrier wall

PHOTO NO: 59
BRIDGE ID: Rae's Creek/Broad St.
DIRECTION: Northbound
FILE NAME: PHOTO1_0064.jpg

COMMENT
Multiple repaired cracks in approach slab

PHOTO NO: 60
BRIDGE ID: Rae's Creek/Broad St.
DIRECTION: Northbound
FILE NAME: PHOTO1_0065.jpg

COMMENT
Concrete spalling at expansion joint in bridge deck

PHOTO NO: 61
BRIDGE ID: Rae's Creek/Broad St.
DIRECTION: Northbound
FILE NAME: PHOTO1_0066.jpg

COMMENT
Concrete spall in bridge deck approximately 1-1/2" diameter

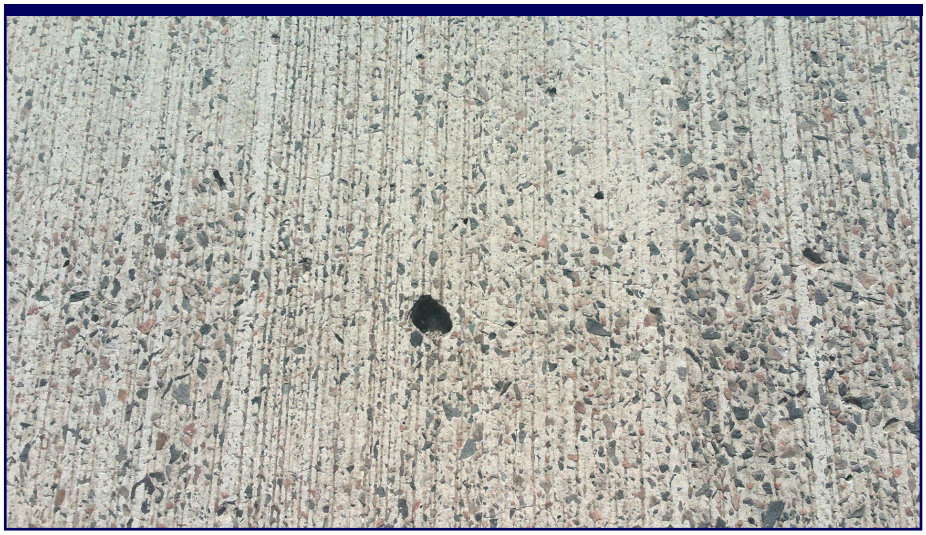


PHOTO NO: 62
BRIDGE ID: Rae's Creek/Broad St.
DIRECTION: Northbound
FILE NAME: PHOTO1_0067.jpg

COMMENT
Concrete spalling and damaged joint material at bridge deck

PHOTO NO: 63
BRIDGE ID: Rae's Creek/Broad St.
DIRECTION: Northbound
FILE NAME: PHOTO1_0068.jpg

COMMENT
Concrete spalling along expansion joint and exposed aggregate

PHOTO NO: 64
BRIDGE ID: Rae's Creek/Broad St.
DIRECTION: Northbound
FILE NAME: PHOTO1_0069.jpg

COMMENT
Damaged and missing joint material at bridge deck

PHOTO NO: 65
BRIDGE ID: Rae's Creek/Broad St.
DIRECTION: Northbound
FILE NAME: PHOTO1_0070.jpg

COMMENT
Grate drain in bridge deck is completely blocked with sediment and vegetation

PHOTO NO: 66
BRIDGE ID: Rae's Creek/Broad St.
DIRECTION: Northbound
FILE NAME: PHOTO1_0071.jpg

COMMENT
Vegetation growing in expansion joint

PHOTO NO: 67
BRIDGE ID: Rae's Creek/Broad St.
DIRECTION: Northbound
FILE NAME: PHOTO1_0072.jpg

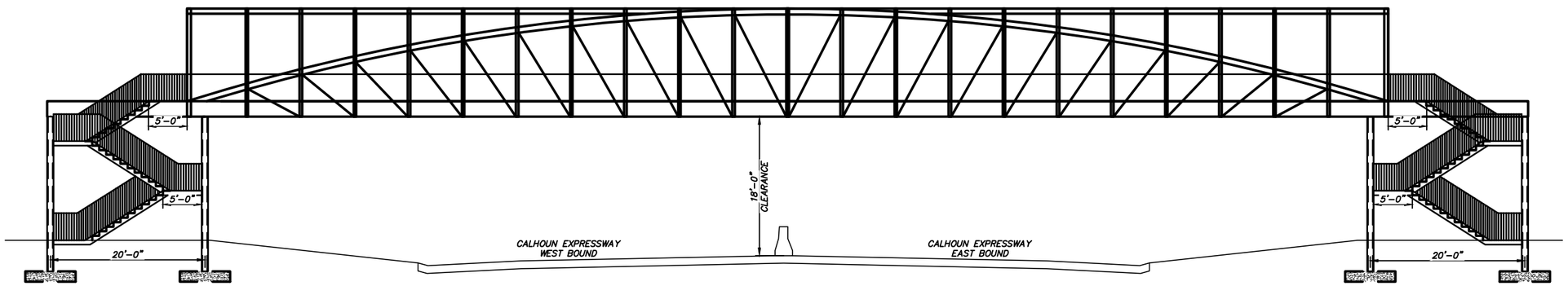
COMMENT
Multiple repaired cracks in approach slab

PHOTO NO: 68
BRIDGE ID: Rae's Creek/Broad St.
DIRECTION: Northbound
FILE NAME: PHOTO1_0075.jpg

COMMENT
Grate drain in bridge deck is completely blocked with vegetation

Appendix C

Pedestrian Bridge Crossing



Pedestrian Bridge Concept over Calhoun Expressway

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Appendix D

Preliminary Cost Estimates

ENGINEER'S OPINION OF PROBABLE COSTS

Calhoun Expressway Repair & Restoration
Includes All Four Bridges
Job No. 2013-0386
September 5, 2014

Item #	Description	Quantity	Unit	Unit Price	Amount
1.	Railing	7,950	LF	$ 75.00/LF	$ 596,250.00
2.	Pressure Washing	1	EA	$ 90,000.00/EA	$ 90,000.00
3.	Crack Repair	400	LF	$ 55.00/LF	$ 22,000.00
4.	Drain Maintenance	12	EA	$ 400.00/EA	$ 4,800.00
5.	Horizontal Joint Repair	36	EA	$ 1,600.00/EA	$ 57,600.00
6.	Vertical Joint Repair/Repl.	1	EA	$ 200,000.00/EA	$ 200,000.00
6.	Traffic Control	1	EA	$ 80,000.00/EA	$ 80,000.00
				Subtotal	$ 1,050,650.00
				Mobilization @ 5%	$ 52,500.00
				Subtotal	$ 1,103,150.00
				Contingency @ 15%	$ 165,475.00
				Estimated Grand Total	**$ 1,268,625.00**

ENGINEER'S OPINION OF PROBABLE COSTS

Pedestrian Bridge over Calhoun Expressway
150 Feet Long With a vertical clearance of 18 feet
Job No. 2013-0386
August 28, 2014

Item #	Description	Quantity	Unit	Unit Price	Amount
1.	Bridge Truss	1	EA	$310,000.00/EA	$ 310,000.00
2.	Truss Erection	1	EA	$ 25,000.00/EA	$ 25,000.00
3.	Concrete Bridge Deck	23	CY	$ 1,000.00/CY	$ 23,000.00
4.	HSS Columns	8,060	LB	$ 2.75/LB	$ 22,165.00
5.	Concrete Stairs	10	CY	$ 1,000.00/CY	$ 10,000.00
6.	Steel Stairway	6,850	LB	$ 2.75/LB	$ 18,840.00
7.	Concrete Foundations	12	CY	$ 1,500.00/CY	$ 18,000.00
8.	Misc. Hardware	1	EA	$ 2,800.00/EA	$ 2,800.00
9.	Traffic Control	1	EA	$ 10,000.00/EA	$ 10,000.00
10.	Metal Decking	360	SF	$ 3.00/SF	$ 1,080.00
11.	Hand Rails	144	LF	$ 55.00/LF	$ 7,920.00
				Mobilization @ 10%	$ 44,880.00
				Subtotal	$ 493,685.00
				Contingency @ 15%	$ 74,100.00
				Estimated Grand Total	**$ 567,785.00**

ENGINEER'S OPINION OF PROBABLE COSTS

Milledge Road Bridge Improvements over Calhoun Expressway
Alternative A
Paint Exterior Bridge Girders
Job No. 2013-0386
September 9, 2014

Item #	Description	Quantity	Unit	Unit Price	Amount
1.	Bridge Painting	1,812	SF	$ 38.00/SF	$ 68,856.00
				Mobilization @ 5%	$ 3,500.00
				Subtotal	$ 72,356.00
				Contingency @ 15%	$ 10,853.40
				Estimated Grand Total	**$ 83,209.40**

ENGINEER'S OPINION OF PROBABLE COSTS

Milledge Road Bridge Improvements over Calhoun Expressway
Alternative B
Girder Facade Improvements
Job No. 2013-0386
September 9, 2014

Item #	Description	Quantity	Unit	Unit Price	Amount
1.	Girder Facade	906	SF	$ 85.00/SF	$ 77,010.00
				Mobilization @ 5%	$ 3,850.00
				Subtotal	$ 80,860.00
				Contingency @ 15%	$ 12,130.00
				Estimated Grand Total	**$ 92,990.00**

ENGINEER'S OPINION OF PROBABLE COSTS

Milledge Road Bridge Improvements over Calhoun Expressway
Alternative C
Ornamental Railing Addition
Job No. 2013-0386
September 9, 2014

Item #	Description	Quantity	Unit	Unit Price	Amount
1.	Ornamental Railing	302	LF	$ 165.00/SF	$ 66,595.00
				Mobilization @ 5%	$ 3,175.00
				Subtotal	$ 69,770.00
				Contingency @ 15%	$ 10,465.00
				Estimated Grand Total	**$ 80,235.00**