GEORGIA DEPARTMENT OF TRANSPORTATION

GDOT Project No: NH000-0575-01(028)

PI No: 713640

JBT Project No. 255717

Bridge No. 42
I-575 REVERSIBLE OVER LITTLE RIVER

November, 2009

CHEROKEE COUNTY

DESIGN CALCULATIONS

Note 1: Georgia Department of Transportation (GDOT) terminated Contract Number TOURDPPI60072 for its convenience prior to the completion of all work under that contract and directed that the work with respect to these calculations be discontinued.

(a) These calculations were not completed at the time of GDOT's direction and the information contained herein is not complete and/or has not been fully verified or checked. These calculations are a work-in-progress and are presented only as such.

(b) Any user is cautioned that the use of these calculations and any related information or calculations, without access to pertinent factors and without proper regard for their purpose, could lead to erroneous conclusions.

(c) If any such calculations or any information contained herein is used in future work efforts or any follow on design work activity, a complete confirmation of the information contained herein should be performed prior to any such use.

(d) GTP has no responsibility for the use of this information not under its direct control.

Prepared for Georgia Transportation Partners
Atlanta, Georgia

J.B. TRIMBLE, INC.
2550 Heritage Ct, SE Suite 250
Atlanta, GA 30339-3062
(770) 952-1022

Purpose of Calculation

Bridge design calculations for Bridge #42 were made for costing purposes.

1. Specifications and References

AASHTO 17th Edition, 2002
GDOT Bridge Design Manual, 2008

2. Computer

Computer Type Used: PC
Operating System: Windows XP, Pentium 4, 2GB RAM (min.)

3. Computer Programs (Standard Computer Program)

Excel, Microsoft Office 2003 – JBT Calculation Spreadsheets
BRLLCA, 2008 – Live Load Case Program, by GDOT
BRPIER, 2008 – Pier Design and Analysis, by GDOT
BRPSBM1, 2008 – PSC Beam Design and Analysis, by GDOT
LEAP Geomath 08.01.00.01 – Bridge and Structure Geometry, by Bentley Systems Inc.
LPile 4.0 – Analysis of Piles and Drilled Shafts under Lateral Loads, by Ensoft Inc.
PCACOL 2.30 – Design of Reinforced Column Sections, by Portland Cement Association

CALCULATION COVER SHEET

PROJECT	JOB NO.	CALC NO.	SHEET
I-75 / I-575 NORTHWEST CORRIDOR	NH000-0575-01(028)	BR#42	1
SUBJECT	DISCIPLINE		
Bridge Geometry Output	STRUCTURAL		

CALCULATION STATUS DESIGNATION	PRELIMINARY	CONFIRMED	SUPSEDED	VOIDED	INCOMPLETE
	☐	☐	☐	☐	X

COMPUTER PROGRAM/TYPE	SCP	MAINFRAME	PC	PROGRAM	VERSION/RELEASE NO.
	X YES ◯ NO	◯	X	LEAP GEOMATH	08.01.00.01

Note 1: Georgia Department of Transportation (GDOT) terminated Contract Number TOURDPPI60072 for its convenience the completion of all work under that contract and directed that the work with respect to these calculations be discontinued.
(a) These calculations were not completed at the time of GDOT's direction and the information contained herein is not and/or has not been fully verified or checked. These calculations are a work-in-progress and are presented only as such.
(b) Any user is cautioned that the use of these calculations and any related information or calculations, without access to factors and without proper regard for their purpose, could lead to erroneous conclusions.
(c) If any such calculations or any information contained herein is used in future work efforts or any follow on design work a complete confirmation of the information contained herein should be performed prior to any such use.
(d) GTP has no responsibility for the use of this information not under its direct control.

NO.	REASON FOR REVISION	TOTAL NO. OF SHEETS	LAST SHEET NO.	BY	CHECKED	APPROVED/ ACCEPTED	DATE
A	As per GDOT's termination for convenience direction	56	56	JCR			11/30/09

RECORD OF REVISIONS

CALCULATION SHEET

PROJECT: I-75 / I-575 NORTHWEST CORRIDOR
JOB NUMBER NH000-0575-01(028)
CALC NO. BR#42

SUBJECT: Bridge Geometry Output
BY: JCR DATE: 11/30/2009

SHEET NO.
SHEET REV.

Sufficient sample calculations representative of the scope and conditions in the design calculation were performed and the results compared to demonstrate the computer program adequacy.

Filename: N:\TRA\255717\Eng\BR42\Geomath\I-575 BR42.gmd

Alignment ID: 575align

Start Station: 1562+35.2081

P.I.	North	East	Trans	Spiral-In	Spiral-Out	Radius
1	1,502,994.7799	2,187,975.9729	None			
2	1,503,894.7322	2,188,026.6120	Arc			2,860.0000
3	1,504,603.0189	2,188,584.1140	None			

***** End of Report *****

Filename: N:\TRA\255717\Eng\BR42\Geomath\I-575 BR42.gmd

Alignment ID: 575align

Element # 1 Shape: Arc Radius 2,860.0000

	Station	North	East	Direction	Radius
Start:	1562+35.2081	1,502,994.7799	2,187,975.9729	N 3 13 14.02 E	2,860.0000
End:	1579+81.5938	1,504,603.0189	2,188,584.1140	N 38 12 24.34 E	2,860.0000
Length:	1,746.3857	Sense: Right		Delta: 34 59 10.32	

Transition Point: CT Station: 1579+81.5938

Element # 2 Shape: Tangent

	Station	North	East	Direction	Radius
Start:	1579+81.5938	1,504,603.0189	2,188,584.1140	N 38 12 24.31 E	INFINITY
End:	1579+81.5938	1,504,603.0189	2,188,584.1140	N 38 12 24.31 E	INFINITY
Length:	0.0000			Delta: 0 00 00.00	

***** End of Report *****

Filename: N:\TRA\255717\Eng\BR42\Geomath\I-575 BR42.gmd

XSection ID: 575xsect

SLOPE BREAK POINTS: 4

STATION	PGL-OFFSET	POINT	DIST-FR-PGL	GRADE	DESCRIPTION
1570+00.0000	0.0000	1	-25.6250		
				-0.070000	EOD-GUT
		2	-24.0000		
				-0.070000	SH
		3	-14.0000		
				-0.070000	HOVexitLN
		4	0.0000		

SLOPE BREAK POINTS: 4

STATION	PGL-OFFSET	POINT	DIST-FR-PGL	GRADE	DESCRIPTION
1577+00.0000	0.0000	1	-25.6250		
				-0.070000	EOD-GUT
		2	-24.0000		
				-0.070000	SH
		3	-14.0000		
				-0.070000	HOVexitLN
		4	0.0000		

***** End of Report *****

Filename: N:\TRA\255717\Eng\BR42\Geomath\I-575 BR42.gmd

Profile ID: 575vert

VPI	Station	Elevation	Trans	Parabola-1	Parabola-2
1	1567+59.5000	904.3712	None		
2	1573+59.5000	886.8800	Parabola	1,200.0000	
3	1579+59.5000	904.8800	None		

***** End of Report *****

Filename: N:\TRA\255717\Eng\BR42\Geomath\I-575 BR42.gmd

Profile ID: 575vert

Elem		Start	End	Apex		Transition
1	Sta	1567+59.5000	1567+59.5000	None	Length	0.0000
	Elev	904.3712	904.3712	None	Type	Tangent
	Grade	-0.0292	-0.0292			
2	Sta	1567+59.5000	1579+59.5000	1573+50.8984	Length	1,200.0000
	Elev	904.3712	904.8800	895.7510	Type	Parabola
	Grade	-0.0292	0.0300			
3	Sta	1579+59.5000	1579+59.5000	None	Length	0.0000
	Elev	904.8800	904.8800	None	Type	Tangent
	Grade	0.0300	0.0300			

***** End of Report *****

Filename: N:\TRA\255717\Eng\BR42\Geomath\I-575 BR42.gmd

COORDINATE REPORT

Station Ref: 575

ID	STATION	OFFSET (ft)	NORTH (ft)	EAST (ft)	575 ELEV (ft)
B1&PGL	1570+62.5000	0.0000	1,503,802.6192	2,188,140.4373	897.8009
B2&PGL	1571+50.5000	0.0000	1,503,884.9483	2,188,171.5068	896.7408
B3&PGL	1572+38.5000	0.0000	1,503,966.2826	2,188,205.0944	896.0623
B4&PGL	1573+26.5000	0.0000	1,504,046.5451	2,188,241.1682	895.7656
B5&PGL	1574+14.5000	0.0000	1,504,125.6598	2,188,279.6942	895.8507
B6&PGL	1575+02.5000	0.0000	1,504,203.5518	2,188,320.6359	896.3174
B7&PGL	1575+90.5000	0.0000	1,504,280.1474	2,188,363.9546	897.1659

***** End of Report *****

Filename: N:\TRA\255717\Eng\BR42\Geomath\I-575 BR42.gmd

SPAN AND GIRDER REPORT

SPAN ID: B1-B2 ROADWAY: 575 ALIGNMENT: 575align NUMBER OF GIRDERS: 3
STARTING PIER: B1 STATION: 1570+62.5000 AZM: N 109.794104 SKEW: -0.000000
ENDING PIER: B2 STATION: 1571+50.5000 AZM: N 111.557051 SKEW: 0.000000

GIRDER	END POINT DISTANCES ALONG PIER CL			LENGTH		
	START	END	AZIMUTH	CL - CL	SEAT-SEAT	RADIUS
S1-G1	2.9973	2.9973	N 20.675577	88.7043	86.2040	INFINITY
S1-G2	9.4980	9.4980	N 20.675577	88.5043	86.0040	INFINITY
S1-G3	15.9988	15.9988	N 20.675577	88.3042	85.8039	INFINITY

***** End of Report *****

Filename: N:\TRA\255717\Eng\BR42\Geomath\I-575 BR42.gmd

SPAN AND GIRDER REPORT

SPAN ID: B2-B3 ROADWAY: 575 ALIGNMENT: 575align NUMBER OF GIRDERS: 3
STARTING PIER: B2 STATION: 1571+50.5000 AZM: N 111.557051 SKEW: 0.000000
ENDING PIER: B3 STATION: 1572+38.5000 AZM: N 113.319998 SKEW: -0.000000

GIRDER	END POINT DISTANCES ALONG PIER CL			LENGTH		
	START	END	AZIMUTH	CL - CL	SEAT-SEAT	RADIUS
S2-G1	2.9973	2.9973	N 22.438524	88.7043	86.7040	INFINITY
S2-G2	9.4980	9.4980	N 22.438524	88.5043	86.5040	INFINITY
S2-G3	15.9988	15.9988	N 22.438524	88.3042	86.3040	INFINITY

***** End of Report *****

Filename: N:\TRA\255717\Eng\BR42\Geomath\I-575 BR42.gmd

SPAN AND GIRDER REPORT

SPAN ID: B3-B4 ROADWAY: 575 ALIGNMENT: 575align NUMBER OF GIRDERS: 3
STARTING PIER: B3 STATION: 1572+38.5000 AZM: N 113.319998 SKEW: -0.000000
ENDING PIER: B4 STATION: 1573+26.5000 AZM: N 115.082945 SKEW: 0.000000

GIRDER	END POINT DISTANCES ALONG PIER CL			LENGTH		
	START	END	AZIMUTH	CL - CL	SEAT-SEAT	RADIUS
S3-G1	2.9973	1.4973	N 24.201471	88.7043	86.7040	INFINITY
S3-G2	9.4980	7.9980	N 24.201471	88.5043	86.5040	INFINITY
S3-G3	15.9988	14.4988	N 24.201471	88.3042	86.3040	INFINITY

***** End of Report *****

Filename: N:\TRA\255717\Eng\BR42\Geomath\I-575 BR42.gmd

SPAN AND GIRDER REPORT

SPAN ID: B4-B5 ROADWAY: 575 ALIGNMENT: 575align NUMBER OF GIRDERS: 3
STARTING PIER: B4 STATION: 1573+26.5000 AZM: N 115.082945 SKEW: 0.000000
ENDING PIER: B5 STATION: 1574+14.5000 AZM: N 116.845892 SKEW: 0.000000

GIRDER	END POINT DISTANCES ALONG PIER CL			LENGTH		
	START	END	AZIMUTH	CL - CL	SEAT-SEAT	RADIUS
S4-G1	1.4973	2.9973	N 25.964419	88.7043	86.7040	INFINITY
S4-G2	7.9980	9.4980	N 25.964419	88.5043	86.5040	INFINITY
S4-G3	14.4988	15.9988	N 25.964419	88.3042	86.3040	INFINITY

***** End of Report *****

Filename: N:\TRA\255717\Eng\BR42\Geomath\I-575 BR42.gmd

SPAN AND GIRDER REPORT

SPAN ID: B5-B6 ROADWAY: 575 ALIGNMENT: 575align NUMBER OF GIRDERS: 3
STARTING PIER: B5 STATION: 1574+14.5000 AZM: N 116.845892 SKEW: 0.000000
ENDING PIER: B6 STATION: 1575+02.5000 AZM: N 118.608839 SKEW: 0.000000

GIRDER	END POINT DISTANCES ALONG PIER CL			LENGTH		
	START	END	AZIMUTH	CL - CL	SEAT-SEAT	RADIUS
S5-G1	2.9973	2.9973	N 27.727366	88.7043	86.7040	INFINITY
S5-G2	9.4980	9.4980	N 27.727366	88.5043	86.5040	INFINITY
S5-G3	15.9988	15.9988	N 27.727366	88.3042	86.3040	INFINITY

***** End of Report *****

Filename: N:\TRA\255717\Eng\BR42\Geomath\I-575 BR42.gmd

SPAN AND GIRDER REPORT

SPAN ID: B6-B7 ROADWAY: 575 ALIGNMENT: 575align NUMBER OF GIRDERS: 3
STARTING PIER: B6 STATION: 1575+02.5000 AZM: N 118.608839 SKEW: 0.000000
ENDING PIER: B7 STATION: 1575+90.5000 AZM: N 120.371786 SKEW: -0.000000

GIRDER	END POINT DISTANCES ALONG PIER CL			LENGTH		
	START	END	AZIMUTH	CL - CL	SEAT-SEAT	RADIUS
S6-G1	2.9973	2.9973	N 29.490313	88.7043	86.2040	INFINITY
S6-G2	9.4980	9.4980	N 29.490313	88.5043	86.0040	INFINITY
S6-G3	15.9988	15.9988	N 29.490313	88.3042	85.8039	INFINITY

***** End of Report *****

Filename: N:\TRA\255717\Eng\BR42\Geomath\I-575 BR42.gmd

DECK ELEVATIONS ALONG OFFSETS (EQUAL SPACINGS)

SPAN ID: B1-B2 ROADWAY: 575 BETWEEN PIERS : B1 - B2 SPACES = 2

OFFSET	DISTANCE	STATION	OFFSET	ELEVATION
1	88.7885			
		1570+62.5000	-25.6250	899.5947
		1571+06.5000	-25.6250	899.0169
		1571+50.5000	-25.6250	898.5345
2	88.7385			
		1570+62.5000	-24.0000	899.4809
		1571+06.5000	-24.0000	898.9031
		1571+50.5000	-24.0000	898.4208
3	88.4308			
		1570+62.5000	-14.0000	898.7809
		1571+06.5000	-14.0000	898.2031
		1571+50.5000	-14.0000	897.7208
4	88.0000			
		1570+62.5000	0.0000	897.8009
		1571+06.5000	0.0000	897.2231
		1571+50.5000	0.0000	896.7408

***** End of Report *****

Filename: N:\TRA\255717\Eng\BR42\Geomath\I-575 BR42.gmd

DECK ELEVATIONS ALONG OFFSETS (EQUAL SPACINGS)

SPAN ID: B2-B3 ROADWAY: 575 BETWEEN PIERS : B2 - B3 SPACES = 2

OFFSET	DISTANCE	STATION	OFFSET	ELEVATION
1	88.7885			
		1571+50.5000	-25.6250	898.5345
		1571+94.5000	-25.6250	898.1476
		1572+38.5000	-25.6250	897.8561
2	88.7385			
		1571+50.5000	-24.0000	898.4208
		1571+94.5000	-24.0000	898.0338
		1572+38.5000	-24.0000	897.7423
3	88.4308			
		1571+50.5000	-14.0000	897.7208
		1571+94.5000	-14.0000	897.3338
		1572+38.5000	-14.0000	897.0423
4	88.0000			
		1571+50.5000	0.0000	896.7408
		1571+94.5000	0.0000	896.3538
		1572+38.5000	0.0000	896.0623

***** End of Report *****

Filename: N:\TRA\255717\Eng\BR42\Geomath\I-575 BR42.gmd

DECK ELEVATIONS ALONG OFFSETS (EQUAL SPACINGS)

SPAN ID: B3-B4 ROADWAY: 575 BETWEEN PIERS : B3 - B4 SPACES = 2

OFFSET	DISTANCE	STATION	OFFSET	ELEVATION
1	88.7885			
		1572+38.5000	-25.6250	897.8561
		1572+82.5000	-25.6250	897.6600
		1573+26.5000	-25.6250	897.5594
2	88.7385			
		1572+38.5000	-24.0000	897.7423
		1572+82.5000	-24.0000	897.5463
		1573+26.5000	-24.0000	897.4456
3	88.4308			
		1572+38.5000	-14.0000	897.0423
		1572+82.5000	-14.0000	896.8463
		1573+26.5000	-14.0000	896.7456
4	88.0000			
		1572+38.5000	0.0000	896.0623
		1572+82.5000	0.0000	895.8663
		1573+26.5000	0.0000	895.7656

***** End of Report *****

Filename: N:\TRA\255717\Eng\BR42\Geomath\I-575 BR42.gmd

DECK ELEVATIONS ALONG OFFSETS (EQUAL SPACINGS)

SPAN ID: B4-B5 ROADWAY: 575 BETWEEN PIERS : B4 - B5 SPACES = 2

OFFSET	DISTANCE	STATION	OFFSET	ELEVATION
1	88.7885			
		1573+26.5000	-25.6250	897.5594
		1573+70.5000	-25.6250	897.5542
		1574+14.5000	-25.6250	897.6444
2	88.7385			
		1573+26.5000	-24.0000	897.4456
		1573+70.5000	-24.0000	897.4404
		1574+14.5000	-24.0000	897.5307
3	88.4308			
		1573+26.5000	-14.0000	896.7456
		1573+70.5000	-14.0000	896.7404
		1574+14.5000	-14.0000	896.8307
4	88.0000			
		1573+26.5000	0.0000	895.7656
		1573+70.5000	0.0000	895.7604
		1574+14.5000	0.0000	895.8507

***** End of Report *****

Filename: N:\TRA\255717\Eng\BR42\Geomath\I-575 BR42.gmd

DECK ELEVATIONS ALONG OFFSETS (EQUAL SPACINGS)

SPAN ID: B5-B6 ROADWAY: 575 BETWEEN PIERS : B5 - B6 SPACES = 2

OFFSET	DISTANCE	STATION	OFFSET	ELEVATION
1	88.7885			
		1574+14.5000	-25.6250	897.6444
		1574+58.5000	-25.6250	897.8301
		1575+02.5000	-25.6250	898.1112
2	88.7385			
		1574+14.5000	-24.0000	897.5307
		1574+58.5000	-24.0000	897.7163
		1575+02.5000	-24.0000	897.9974
3	88.4308			
		1574+14.5000	-14.0000	896.8307
		1574+58.5000	-14.0000	897.0163
		1575+02.5000	-14.0000	897.2974
4	88.0000			
		1574+14.5000	0.0000	895.8507
		1574+58.5000	0.0000	896.0363
		1575+02.5000	0.0000	896.3174

***** End of Report *****

Filename: N:\TRA\255717\Eng\BR42\Geomath\I-575 BR42.gmd

DECK ELEVATIONS ALONG OFFSETS (EQUAL SPACINGS)

SPAN ID: B6-B7 ROADWAY: 575 BETWEEN PIERS : B6 - B7 SPACES = 2

OFFSET	DISTANCE	STATION	OFFSET	ELEVATION
1	88.7885			
		1575+02.5000	-25.6250	898.1112
		1575+46.5000	-25.6250	898.4877
		1575+90.5000	-25.6250	898.9597
2	88.7385			
		1575+02.5000	-24.0000	897.9974
		1575+46.5000	-24.0000	898.3740
		1575+90.5000	-24.0000	898.8459
3	88.4308			
		1575+02.5000	-14.0000	897.2974
		1575+46.5000	-14.0000	897.6740
		1575+90.5000	-14.0000	898.1459
4	88.0000			
		1575+02.5000	0.0000	896.3174
		1575+46.5000	0.0000	896.6940
		1575+90.5000	0.0000	897.1659

***** End of Report *****

Filename: N:\TRA\255717\Eng\BR42\Geomath\I-575 BR42.gmd

GIRDER VERTICAL PLACEMENT

SPAN : B1-B2 ROADWAY: 575 GIRDERS COMPLETED: 3
MIN BUILD UP, in : 1.5000
DECK THICKNESS, in : 7.3752
NUMBER OF CHECK PTS: 3

GIRDER DATA

GIRDER	LENGTH (ft)	GIRDER TYPE	CAMBER (in)	TOTAL DEFL (in)	DAP START (in)	DAP END (in)
S1-G3	85.8039	BT-54	2.0856	1.0788	0.0000	0.0000
S1-G2	86.0040	BT-54	2.0856	1.0788	0.0000	0.0000
S1-G1	86.2040	BT-54	2.0856	1.0788	0.0000	0.0000

GIRDER	BRG TOP ELEVATION START (ft)	BRG TOP ELEVATION END (ft)	BUILD-UP THICKNESS MIN (in)	MIN LOCATION (ft)	BUILD-UP THICKNESS MAX (in)	MAX LOCATION (ft)
S1-G1	893.8748	892.8461	1.5000	42.8520 R	6.3845	-1.5271 L
S1-G2	893.4198	892.3911	1.5000	42.7520 R	6.3841	-1.5271 L
S1-G3	892.9647	891.9362	1.5000	42.6519 R	6.3836	-1.5271 L

***** End of Report *****

Filename: N:\TRA\255717\Eng\BR42\Geomath\I-575 BR42.gmd

GIRDER VERTICAL PLACEMENT

SPAN : B2-B3 ROADWAY: 575 GIRDERS COMPLETED: 3
MIN BUILD UP, in : 1.5000
DECK THICKNESS, in : 7.3752
NUMBER OF CHECK PTS: 3

GIRDER DATA

GIRDER	LENGTH (ft)	GIRDER TYPE	CAMBER (in)	TOTAL DEFL (in)	DAP START (in)	DAP END (in)
S2-G3	86.3040	BT-54	2.0856	1.0788	0.0000	0.0000
S2-G2	86.5040	BT-54	2.0856	1.0788	0.0000	0.0000
S2-G1	86.7040	BT-54	2.0856	1.0788	0.0000	0.0000

GIRDER	BRG TOP ELEVATION START (ft)	BRG TOP ELEVATION END (ft)	BUILD-UP THICKNESS MIN (in)	MIN LOCATION (ft)	BUILD-UP THICKNESS MAX (in)	MAX LOCATION (ft)
S2-G1	892.8257	892.1626	1.5000	43.3520 R	6.3569	87.7311 L
S2-G2	892.3707	891.7076	1.5000	43.2520 R	6.3564	87.5311 L
S2-G3	891.9157	891.2526	1.5000	43.1520 R	6.3559	87.3311 L

***** End of Report *****

Filename: N:\TRA\255717\Eng\BR42\Geomath\I-575 BR42.gmd

GIRDER VERTICAL PLACEMENT

SPAN : B3-B4 ROADWAY: 575 GIRDERS COMPLETED: 3
MIN BUILD UP, in : 1.5000
DECK THICKNESS, in : 7.3752
NUMBER OF CHECK PTS: 3

		GIRDER DATA			
GIRDER	LENGTH (ft)	GIRDER TYPE	CAMBER (in)	TOTAL DEFL (in)	DAP START (in)	DAP END (in)
S3-G3	86.3040	BT-54	2.0856	1.0788	0.0000	0.0000
S3-G2	86.5040	BT-54	2.0856	1.0788	0.0000	0.0000
S3-G1	86.7040	BT-54	2.0856	1.0788	0.0000	0.0000

	BRG TOP ELEVATION		BUILD-UP THICKNESS			
	START	END	MIN	LOCATION	MAX	LOCATION
GIRDER	(ft)	(ft)	(in)	(ft)	(in)	(ft)
S3-G1	892.1516	891.8616	1.5000	43.3520 R	6.3555	87.7311 L
S3-G2	891.6966	891.4066	1.5000	43.2520 R	6.3550	87.5311 L
S3-G3	891.2416	890.9516	1.5000	43.1520 R	6.3544	87.3311 L

***** End of Report *****

Filename: N:\TRA\255717\Eng\BR42\Geomath\I-575 BR42.gmd

GIRDER VERTICAL PLACEMENT

SPAN : B4-B5 ROADWAY: 575 GIRDERS COMPLETED: 3
MIN BUILD UP, in : 1.5000
DECK THICKNESS, in : 7.3752
NUMBER OF CHECK PTS: 3

GIRDER DATA

GIRDER	LENGTH (ft)	GIRDER TYPE	CAMBER (in)	TOTAL DEFL (in)	DAP START (in)	DAP END (in)
S4-G3	86.3040	BT-54	2.0856	1.0788	0.0000	0.0000
S4-G2	86.5040	BT-54	2.0856	1.0788	0.0000	0.0000
S4-G1	86.7040	BT-54	2.0856	1.0788	0.0000	0.0000

GIRDER	BRG TOP ELEVATION START (ft)	BRG TOP ELEVATION END (ft)	BUILD-UP THICKNESS MIN (in)	MIN LOCATION (ft)	BUILD-UP THICKNESS MAX (in)	MAX LOCATION (ft)
S4-G1	891.8592	891.9423	1.5000	43.3520 R	6.3547	-1.0270 L
S4-G2	891.4042	891.4873	1.5000	43.2520 R	6.3542	-1.0270 L
S4-G3	890.9492	891.0323	1.5000	43.1520 R	6.3537	-1.0270 L

***** End of Report *****

Filename: N:\TRA\255717\Eng\BR42\Geomath\I-575 BR42.gmd

GIRDER VERTICAL PLACEMENT

SPAN : B5-B6 ROADWAY: 575 GIRDERS COMPLETED: 3
MIN BUILD UP, in : 1.5000
DECK THICKNESS, in : 7.3752
NUMBER OF CHECK PTS: 3

GIRDER DATA

GIRDER	LENGTH (ft)	GIRDER TYPE	CAMBER (in)	TOTAL DEFL (in)	DAP START (in)	DAP END (in)
S5-G3	86.3040	BT-54	2.0856	1.0788	0.0000	0.0000
S5-G2	86.5040	BT-54	2.0856	1.0788	0.0000	0.0000
S5-G1	86.7040	BT-54	2.0856	1.0788	0.0000	0.0000

GIRDER	BRG TOP ELEVATION START (ft)	BRG TOP ELEVATION END (ft)	BUILD-UP THICKNESS MIN (in)	MIN LOCATION (ft)	BUILD-UP THICKNESS MAX (in)	MAX LOCATION (ft)
S5-G1	891.9485	892.4048	1.5000	43.3520 R	6.3561	-1.0270 L
S5-G2	891.4935	891.9498	1.5000	43.2520 R	6.3556	-1.0270 L
S5-G3	891.0386	891.4947	1.5000	43.1520 R	6.3551	-1.0270 L

***** End of Report *****

Filename: N:\TRA\255717\Eng\BR42\Geomath\I-575 BR42.gmd

GIRDER VERTICAL PLACEMENT

SPAN : B6-B7 ROADWAY: 575 GIRDERS COMPLETED: 3
MIN BUILD UP, in : 1.5000
DECK THICKNESS, in : 7.3752
NUMBER OF CHECK PTS: 3

GIRDER DATA

GIRDER	LENGTH (ft)	GIRDER TYPE	CAMBER (in)	TOTAL DEFL (in)	DAP START (in)	DAP END (in)
S6-G3	85.8039	BT-54	2.0856	1.0788	0.0000	0.0000
S6-G2	86.0040	BT-54	2.0856	1.0788	0.0000	0.0000
S6-G1	86.2040	BT-54	2.0856	1.0788	0.0000	0.0000

GIRDER	BRG TOP ELEVATION START (ft)	BRG TOP ELEVATION END (ft)	BUILD-UP THICKNESS MIN (in)	MIN LOCATION (ft)	BUILD-UP THICKNESS MAX (in)	MAX LOCATION (ft)
S6-G1	892.4204	893.2434	1.5000	43.3520 R	6.3853	87.7311 L
S6-G2	891.9654	892.7883	1.5000	43.2520 R	6.3848	87.5311 L
S6-G3	891.5104	892.3333	1.5000	43.1520 R	6.3844	87.3311 L

***** End of Report *****

Filename: N:\TRA\255717\Eng\BR42\Geomath\I-575 BR42.gmd

GIRDER VERTICAL GEOMETRY

SPAN ID: B1-B2 ROADWAY: 575
MIN BUILD-UP,in: 1.5000 DECK THICK,in: 7.3752

		BRG CO-ORDS		ELEVATION	DAP HEIGHT
GIRDER ID: S1-G1		North	East	(ft)	(ft)
AZIMUTH, deg: N 20.675577					
WPT-WPT LEN,ft: 86.2040	Start:	1,503,811.8125	2,188,119.3234	893.8748	0.0000
PR-PR LEN,ft: 88.7043	End:	1,503,892.4644	2,188,149.7599	892.8461	0.0000

GIRDER TYPE:BT-54 CAMBER,in : 2.0856 TOTAL DEFL,in: 1.0788
TOP WIDTH,in: 42.0000 BOT WIDTH,in: 26.0000 HEIGHT,in: 54.0000

DECK SLOPE ,ft/ft Start: -0.069784 End: -0.070140 Avg: -0.069962
GIRDER PITCH,ft/ft: -0.011933 ROLL,deg: 0.000000

CHECK POINT	DIST ALONG CENTERLINE WPT-WPT (ft)	FINAL DECK ELEVATION (ft)	SCREED ELEVATION (ft)	GIRDER TOP ELEVATION (ERECTED) (ft)	SCREED HT. ABOVE GIRDER (ft)
1	0.0000	899.3884	899.3884	898.3748	1.0136
2	43.1020	898.8065	898.8964	898.0343	0.8621
3	86.2040	898.3597	898.3597	897.3461	1.0136

BUILD-UP	THICKNESS,in	LOCATION,ft	SIDE
MINIMUM:	1.500	42.8520	R
MAXIMUM:	6.385	-1.5271	L

		BUILD-UP		
CHECK POINT	DIST ALONG CENTERLINE END-END (ft)	LEFT (in)	CL (in)	RIGHT (in)
1	0.0000	6.3845	4.9169	3.4493
2	44.3521	4.4400	2.9700	1.5000
3	88.7043	6.3489	4.8736	3.3982

***** End of Report *****

Filename: N:\TRA\255717\Eng\BR42\Geomath\I-575 BR42.gmd

GIRDER VERTICAL GEOMETRY

SPAN ID: B1-B2 ROADWAY: 575
MIN BUILD-UP,in: 1.5000 DECK THICK,in: 7.3752

		BRG CO-ORDS		ELEVATION	DAP HEIGHT
GIRDER ID: S1-G2					
AZIMUTH, deg: N 20.675577		North	East	(ft)	(ft)
WPT-WPT LEN,ft: 86.0040	Start:	1,503,809.6110	2,188,125.4401	893.4198	0.0000
PR-PR LEN,ft: 88.5043	End:	1,503,890.0759	2,188,155.8060	892.3911	0.0000

GIRDER TYPE:BT-54 CAMBER,in : 2.0856 TOTAL DEFL,in: 1.0788
TOP WIDTH,in: 42.0000 BOT WIDTH,in: 26.0000 HEIGHT,in: 54.0000

DECK SLOPE ,ft/ft Start: -0.069783 End: -0.070141 Avg: -0.069962
GIRDER PITCH,ft/ft: -0.011960 ROLL,deg: 0.000000

CHECK POINT	DIST ALONG CENTERLINE WPT-WPT (ft)	FINAL DECK ELEVATION (ft)	SCREED ELEVATION (ft)	GIRDER TOP ELEVATION (ERECTED) (ft)	SCREED HT. ABOVE GIRDER (ft)
1	0.0000	898.9333	898.9333	897.9198	1.0136
2	43.0020	898.3515	898.4414	897.5793	0.8621
3	86.0040	897.9047	897.9047	896.8911	1.0136

BUILD-UP	THICKNESS,in	LOCATION,ft	SIDE
MINIMUM:	1.500	42.7520	R
MAXIMUM:	6.384	-1.5271	L

		BUILD-UP		
CHECK POINT	DIST ALONG CENTERLINE END-END (ft)	LEFT (in)	CL (in)	RIGHT (in)
1	0.0000	6.3841	4.9164	3.4488
2	44.2521	4.4400	2.9700	1.5000
3	88.5043	6.3483	4.8730	3.3977

***** End of Report *****

Filename: N:\TRA\255717\Eng\BR42\Geomath\I-575 BR42.gmd

GIRDER VERTICAL GEOMETRY

SPAN ID: B1-B2 ROADWAY: 575
MIN BUILD-UP,in: 1.5000 DECK THICK,in: 7.3752

		BRG CO-ORDS		ELEVATION	DAP HEIGHT
GIRDER ID: S1-G3		North	East	(ft)	(ft)
AZIMUTH, deg: N 20.675577					
WPT-WPT LEN,ft: 85.8039	Start:	1,503,807.4096	2,188,131.5567	892.9647	0.0000
PR-PR LEN,ft: 88.3042	End:	1,503,887.6873	2,188,161.8521	891.9362	0.0000

GIRDER TYPE:BT-54 CAMBER,in : 2.0856 TOTAL DEFL,in: 1.0788
TOP WIDTH,in: 42.0000 BOT WIDTH,in: 26.0000 HEIGHT,in: 54.0000

DECK SLOPE ,ft/ft Start: -0.069783 End: -0.070141 Avg: -0.069962
GIRDER PITCH,ft/ft: -0.011987 ROLL,deg: 0.000000

CHECK POINT	DIST ALONG CENTERLINE WPT-WPT (ft)	FINAL DECK ELEVATION (ft)	SCREED ELEVATION (ft)	GIRDER TOP ELEVATION (ERECTED) (ft)	SCREED HT. ABOVE GIRDER (ft)
1	0.0000	898.4782	898.4782	897.4647	1.0135
2	42.9020	897.8964	897.9863	897.1243	0.8621
3	85.8039	897.4497	897.4497	896.4362	1.0135

BUILD-UP	THICKNESS,in	LOCATION,ft	SIDE
MINIMUM:	1.500	42.6519	R
MAXIMUM:	6.384	-1.5271	L

		BUILD-UP		
CHECK POINT	DIST ALONG CENTERLINE END-END (ft)	LEFT (in)	CL (in)	RIGHT (in)
1	0.0000	6.3836	4.9160	3.4484
2	44.1521	4.4400	2.9700	1.5000
3	88.3042	6.3478	4.8725	3.3971

***** End of Report *****

Filename: N:\TRA\255717\Eng\BR42\Geomath\I-575 BR42.gmd

GIRDER VERTICAL GEOMETRY

SPAN ID: B2-B3 ROADWAY: 575
MIN BUILD-UP,in: 1.5000 DECK THICK,in: 7.3752

GIRDER ID: S2-G1 BRG CO-ORDS ELEVATION DAP HEIGHT
AZIMUTH, deg: N 22.438524 North East (ft) (ft)
WPT-WPT LEN,ft: 86.7040 Start: 1,503,894.3245 2,188,150.4948 892.8257 0.0000
PR-PR LEN,ft: 88.7043 End: 1,503,974.4642 2,188,183.5890 892.1626 0.0000

GIRDER TYPE:BT-54 CAMBER,in : 2.0856 TOTAL DEFL,in: 1.0788
TOP WIDTH,in: 42.0000 BOT WIDTH,in: 26.0000 HEIGHT,in: 54.0000

DECK SLOPE ,ft/ft Start: -0.069845 End: -0.070075 Avg: -0.069960
GIRDER PITCH,ft/ft: -0.007648 ROLL,deg: 0.000000

CHECK POINT	DIST ALONG CENTERLINE WPT-WPT (ft)	FINAL DECK ELEVATION (ft)	SCREED ELEVATION (ft)	GIRDER TOP ELEVATION (ERECTED) (ft)	SCREED HT. ABOVE GIRDER (ft)
1	0.0000	898.3401	898.3401	897.3257	1.0144
2	43.3520	897.9402	898.0301	897.1680	0.8621
3	86.7040	897.6770	897.6770	896.6626	1.0144

BUILD-UP	THICKNESS,in	LOCATION,ft	SIDE
MINIMUM:	1.500	43.3520	R
MAXIMUM:	6.357	87.7311	L

CHECK POINT	DIST ALONG CENTERLINE END-END (ft)	BUILD-UP LEFT (in)	BUILD-UP CL (in)	BUILD-UP RIGHT (in)
1	0.0000	6.3519	4.8830	3.4140
2	44.3521	4.4400	2.9700	1.5000
3	88.7043	6.3569	4.8830	3.4091

***** End of Report *****

Filename: N:\TRA\255717\Eng\BR42\Geomath\I-575 BR42.gmd

GIRDER VERTICAL GEOMETRY

SPAN ID: B2-B3 ROADWAY: 575
MIN BUILD-UP,in: 1.5000 DECK THICK,in: 7.3752

		BRG CO-ORDS		ELEVATION	DAP HEIGHT
GIRDER ID: S2-G2		North	East	(ft)	(ft)
AZIMUTH, deg: N 22.438524					
WPT-WPT LEN,ft: 86.5040	Start:	1,503,891.9360	2,188,156.5409	892.3707	0.0000
PR-PR LEN,ft: 88.5043	End:	1,503,971.8908	2,188,189.5587	891.7076	0.0000

GIRDER TYPE:BT-54 CAMBER,in : 2.0856 TOTAL DEFL,in: 1.0788
TOP WIDTH,in: 42.0000 BOT WIDTH,in: 26.0000 HEIGHT,in: 54.0000

DECK SLOPE ,ft/ft Start: -0.069845 End: -0.070076 Avg: -0.069960
GIRDER PITCH,ft/ft: -0.007666 ROLL,deg: 0.000000

CHECK POINT	DIST ALONG CENTERLINE WPT-WPT (ft)	FINAL DECK ELEVATION (ft)	SCREED ELEVATION (ft)	GIRDER TOP ELEVATION (ERECTED) (ft)	SCREED HT. ABOVE GIRDER (ft)
1	0.0000	897.8850	897.8850	896.8707	1.0143
2	43.2520	897.4852	897.5751	896.7130	0.8621
3	86.5040	897.2220	897.2220	896.2076	1.0143

BUILD-UP	THICKNESS,in	LOCATION,ft	SIDE
MINIMUM:	1.500	43.2520	R
MAXIMUM:	6.356	87.5311	L

CHECK POINT	DIST ALONG CENTERLINE END-END (ft)	BUILD-UP LEFT (in)	CL (in)	RIGHT (in)
1	0.0000	6.3514	4.8824	3.4134
2	44.2521	4.4400	2.9700	1.5000
3	88.5043	6.3564	4.8824	3.4085

***** End of Report *****

Filename: N:\TRA\255717\Eng\BR42\Geomath\I-575 BR42.gmd

GIRDER VERTICAL GEOMETRY

SPAN ID: B2-B3 ROADWAY: 575
MIN BUILD-UP,in: 1.5000 DECK THICK,in: 7.3752

		BRG CO-ORDS		ELEVATION	DAP HEIGHT
GIRDER ID: S2-G3					
AZIMUTH, deg: N 22.438524		North	East	(ft)	(ft)
WPT-WPT LEN,ft: 86.3040	Start:	1,503,889.5474	2,188,162.5869	891.9157	0.0000
PR-PR LEN,ft: 88.3042	End:	1,503,969.3173	2,188,195.5285	891.2526	0.0000

GIRDER TYPE:BT-54 CAMBER,in : 2.0856 TOTAL DEFL,in: 1.0788
TOP WIDTH,in: 42.0000 BOT WIDTH,in: 26.0000 HEIGHT,in: 54.0000

DECK SLOPE ,ft/ft Start: -0.069845 End: -0.070076 Avg: -0.069960
GIRDER PITCH,ft/ft: -0.007683 ROLL,deg: 0.000000

CHECK POINT	DIST ALONG CENTERLINE WPT-WPT (ft)	FINAL DECK ELEVATION (ft)	SCREED ELEVATION (ft)	GIRDER TOP ELEVATION (ERECTED) (ft)	SCREED HT. ABOVE GIRDER (ft)
1	0.0000	897.4300	897.4300	896.4157	1.0143
2	43.1520	897.0302	897.1201	896.2580	0.8621
3	86.3040	896.7669	896.7669	895.7526	1.0143

BUILD-UP	THICKNESS,in	LOCATION,ft	SIDE
MINIMUM:	1.500	43.1520	R
MAXIMUM:	6.356	87.3311	L

CHECK POINT	DIST ALONG CENTERLINE END-END (ft)	BUILD-UP LEFT (in)	CL (in)	RIGHT (in)
1	0.0000	6.3509	4.8819	3.4129
2	44.1521	4.4400	2.9700	1.5000
3	88.3042	6.3559	4.8819	3.4080

***** End of Report *****

Filename: N:\TRA\255717\Eng\BR42\Geomath\I-575 BR42.gmd

GIRDER VERTICAL GEOMETRY

SPAN ID: B3-B4 ROADWAY: 575
MIN BUILD-UP,in: 1.5000 DECK THICK,in: 7.3752

		BRG CO-ORDS		ELEVATION	DAP HEIGHT
GIRDER ID: S3-G1		North	East	(ft)	(ft)
AZIMUTH, deg: N 24.201471					
WPT-WPT LEN,ft: 86.7040	Start:	1,503,976.3008	2,188,184.3808	892.1516	0.0000
PR-PR LEN,ft: 88.7043	End:	1,504,055.3844	2,188,219.9248	891.8616	0.0000

GIRDER TYPE:BT-54 CAMBER,in : 2.0856 TOTAL DEFL,in: 1.0788
TOP WIDTH,in: 42.0000 BOT WIDTH,in: 26.0000 HEIGHT,in: 54.0000

DECK SLOPE ,ft/ft Start: -0.069910 End: -0.070011 Avg: -0.069960
GIRDER PITCH,ft/ft: -0.003345 ROLL,deg: 0.000000

CHECK POINT	DIST ALONG CENTERLINE WPT-WPT (ft)	FINAL DECK ELEVATION (ft)	SCREED ELEVATION (ft)	GIRDER TOP ELEVATION (ERECTED) (ft)	SCREED HT. ABOVE GIRDER (ft)
1	0.0000	897.6660	897.6660	896.6516	1.0144
2	43.3520	897.4526	897.5425	896.6804	0.8621
3	86.7040	897.3760	897.3760	896.3616	1.0144

BUILD-UP	THICKNESS,in	LOCATION,ft	SIDE
MINIMUM:	1.500	43.3520	R
MAXIMUM:	6.356	87.7311	L

		BUILD-UP		
CHECK POINT	DIST ALONG CENTERLINE END-END (ft)	LEFT (in)	CL (in)	RIGHT (in)
1	0.0000	6.3533	4.8830	3.4126
2	44.3521	4.4400	2.9700	1.5000
3	88.7043	6.3555	4.8830	3.4104

***** End of Report *****

Filename: N:\TRA\255717\Eng\BR42\Geomath\I-575 BR42.gmd

GIRDER VERTICAL GEOMETRY

SPAN ID: B3-B4 ROADWAY: 575
MIN BUILD-UP,in: 1.5000 DECK THICK,in: 7.3752

		BRG CO-ORDS		ELEVATION	DAP HEIGHT
GIRDER ID: S3-G2					
AZIMUTH, deg: N 24.201471		North	East	(ft)	(ft)
WPT-WPT LEN,ft: 86.5040	Start:	1,503,973.7274	2,188,190.3505	891.6966	0.0000
PR-PR LEN,ft: 88.5043	End:	1,504,052.6285	2,188,225.8125	891.4066	0.0000

GIRDER TYPE:BT-54 CAMBER,in : 2.0856 TOTAL DEFL,in: 1.0788
TOP WIDTH,in: 42.0000 BOT WIDTH,in: 26.0000 HEIGHT,in: 54.0000

DECK SLOPE ,ft/ft Start: -0.069910 End: -0.070011 Avg: -0.069960
GIRDER PITCH,ft/ft: -0.003352 ROLL,deg: 0.000000

CHECK POINT	DIST ALONG CENTERLINE WPT-WPT (ft)	FINAL DECK ELEVATION (ft)	SCREED ELEVATION (ft)	GIRDER TOP ELEVATION (ERECTED) (ft)	SCREED HT. ABOVE GIRDER (ft)
1	0.0000	897.2109	897.2109	896.1966	1.0143
2	43.2520	896.9976	897.0875	896.2254	0.8621
3	86.5040	896.9209	896.9209	895.9066	1.0143

BUILD-UP	THICKNESS,in	LOCATION,ft	SIDE
MINIMUM:	1.500	43.2520	R
MAXIMUM:	6.355	87.5311	L

		BUILD-UP		
CHECK POINT	DIST ALONG CENTERLINE END-END (ft)	LEFT (in)	CL (in)	RIGHT (in)
1	0.0000	6.3528	4.8824	3.4121
2	44.2521	4.4400	2.9700	1.5000
3	88.5043	6.3550	4.8824	3.4099

***** End of Report *****

Filename: N:\TRA\255717\Eng\BR42\Geomath\I-575 BR42.gmd

GIRDER VERTICAL GEOMETRY

SPAN ID: B3-B4 ROADWAY: 575
MIN BUILD-UP,in: 1.5000 DECK THICK,in: 7.3752

GIRDER ID: S3-G3 BRG CO-ORDS ELEVATION DAP HEIGHT
AZIMUTH, deg: N 24.201471 North East (ft) (ft)
WPT-WPT LEN,ft: 86.3040 Start: 1,503,971.1539 2,188,196.3202 891.2416 0.0000
PR-PR LEN,ft: 88.3042 End: 1,504,049.8727 2,188,231.7002 890.9516 0.0000

GIRDER TYPE:BT-54 CAMBER,in : 2.0856 TOTAL DEFL,in: 1.0788
TOP WIDTH,in: 42.0000 BOT WIDTH,in: 26.0000 HEIGHT,in: 54.0000

DECK SLOPE ,ft/ft Start: -0.069910 End: -0.070011 Avg: -0.069960
GIRDER PITCH,ft/ft: -0.003360 ROLL,deg: 0.000000

CHECK POINT	DIST ALONG CENTERLINE WPT-WPT (ft)	FINAL DECK ELEVATION (ft)	SCREED ELEVATION (ft)	GIRDER TOP ELEVATION (ERECTED) (ft)	SCREED HT. ABOVE GIRDER (ft)
1	0.0000	896.7559	896.7559	895.7416	1.0143
2	43.1520	896.5426	896.6325	895.7704	0.8621
3	86.3040	896.4659	896.4659	895.4516	1.0143

BUILD-UP	THICKNESS,in	LOCATION,ft	SIDE
MINIMUM:	1.500	43.1520	R
MAXIMUM:	6.354	87.3311	L

CHECK POINT	DIST ALONG CENTERLINE END-END (ft)	BUILD-UP LEFT (in)	CL (in)	RIGHT (in)
1	0.0000	6.3523	4.8819	3.4115
2	44.1521	4.4400	2.9700	1.5000
3	88.3042	6.3544	4.8819	3.4094

***** End of Report *****

Filename: N:\TRA\255717\Eng\BR42\Geomath\I-575 BR42.gmd

GIRDER VERTICAL GEOMETRY

SPAN ID: B4-B5 ROADWAY: 575
MIN BUILD-UP,in: 1.5000 DECK THICK,in: 7.3752

		BRG CO-ORDS		ELEVATION	DAP HEIGHT
GIRDER ID: S4-G1					
AZIMUTH, deg: N 25.964419		North	East	(ft)	(ft)
WPT-WPT LEN,ft: 86.7040	Start:	1,504,057.1958	2,188,220.7726	891.8592	0.0000
PR-PR LEN,ft: 88.7043	End:	1,504,135.1484	2,188,258.7328	891.9423	0.0000

GIRDER TYPE:BT-54 CAMBER,in : 2.0856 TOTAL DEFL,in: 1.0788
TOP WIDTH,in: 42.0000 BOT WIDTH,in: 26.0000 HEIGHT,in: 54.0000

DECK SLOPE ,ft/ft Start: -0.069975 End: -0.069946 Avg: -0.069960
GIRDER PITCH,ft/ft: 0.000959 ROLL,deg: 0.000000

CHECK POINT	DIST ALONG CENTERLINE WPT-WPT (ft)	FINAL DECK ELEVATION (ft)	SCREED ELEVATION (ft)	GIRDER TOP ELEVATION (ERECTED) (ft)	SCREED HT. ABOVE GIRDER (ft)
1	0.0000	897.3736	897.3736	896.3592	1.0144
2	43.3520	897.3468	897.4367	896.5746	0.8621
3	86.7040	897.4567	897.4567	896.4423	1.0144

BUILD-UP	THICKNESS,in	LOCATION,ft	SIDE
MINIMUM:	1.500	43.3520	R
MAXIMUM:	6.355	-1.0270	L

CHECK POINT	DIST ALONG CENTERLINE END-END (ft)	BUILD-UP LEFT (in)	CL (in)	RIGHT (in)
1	0.0000	6.3547	4.8830	3.4112
2	44.3521	4.4400	2.9700	1.5000
3	88.7043	6.3541	4.8830	3.4118

***** End of Report *****

Filename: N:\TRA\255717\Eng\BR42\Geomath\I-575 BR42.gmd

GIRDER VERTICAL GEOMETRY

SPAN ID: B4-B5 ROADWAY: 575
MIN BUILD-UP,in: 1.5000 DECK THICK,in: 7.3752

		BRG CO-ORDS		ELEVATION	DAP HEIGHT
GIRDER ID: S4-G2		North	East	(ft)	(ft)
AZIMUTH, deg: N 25.964419					
WPT-WPT LEN,ft: 86.5040	Start:	1,504,054.4399	2,188,226.6604	891.4042	0.0000
PR-PR LEN,ft: 88.5043	End:	1,504,132.2127	2,188,264.5329	891.4873	0.0000

GIRDER TYPE:BT-54 CAMBER,in : 2.0856 TOTAL DEFL,in: 1.0788
TOP WIDTH,in: 42.0000 BOT WIDTH,in: 26.0000 HEIGHT,in: 54.0000

DECK SLOPE ,ft/ft Start: -0.069975 End: -0.069946 Avg: -0.069960
GIRDER PITCH,ft/ft: 0.000961 ROLL,deg: 0.000000

CHECK POINT	DIST ALONG CENTERLINE WPT-WPT (ft)	FINAL DECK ELEVATION (ft)	SCREED ELEVATION (ft)	GIRDER TOP ELEVATION (ERECTED) (ft)	SCREED HT. ABOVE GIRDER (ft)
1	0.0000	896.9185	896.9185	895.9042	1.0143
2	43.2520	896.8918	896.9817	896.1196	0.8621
3	86.5040	897.0017	897.0017	895.9873	1.0143

BUILD-UP	THICKNESS,in	LOCATION,ft	SIDE
MINIMUM:	1.500	43.2520	R
MAXIMUM:	6.354	-1.0270	L

	DIST ALONG	BUILD-UP		
CHECK POINT	CENTERLINE END-END (ft)	LEFT (in)	CL (in)	RIGHT (in)
1	0.0000	6.3542	4.8824	3.4107
2	44.2521	4.4400	2.9700	1.5000
3	88.5043	6.3536	4.8824	3.4113

***** End of Report *****

Filename: N:\TRA\255717\Eng\BR42\Geomath\I-575 BR42.gmd

GIRDER VERTICAL GEOMETRY

SPAN ID: B4-B5 ROADWAY: 575
MIN BUILD-UP,in: 1.5000 DECK THICK,in: 7.3752

		BRG CO-ORDS		ELEVATION	DAP HEIGHT
GIRDER ID: S4-G3					
AZIMUTH, deg: N 25.964419		North	East	(ft)	(ft)
WPT-WPT LEN,ft: 86.3040	Start:	1,504,051.6840	2,188,232.5481	890.9492	0.0000
PR-PR LEN,ft: 88.3042	End:	1,504,129.2771	2,188,270.3331	891.0323	0.0000

GIRDER TYPE:BT-54 CAMBER,in : 2.0856 TOTAL DEFL,in: 1.0788
TOP WIDTH,in: 42.0000 BOT WIDTH,in: 26.0000 HEIGHT,in: 54.0000

DECK SLOPE ,ft/ft Start: -0.069975 End: -0.069946 Avg: -0.069960
GIRDER PITCH,ft/ft: 0.000963 ROLL,deg: 0.000000

CHECK POINT	DIST ALONG CENTERLINE WPT-WPT (ft)	FINAL DECK ELEVATION (ft)	SCREED ELEVATION (ft)	GIRDER TOP ELEVATION (ERECTED) (ft)	SCREED HT. ABOVE GIRDER (ft)
1	0.0000	896.4635	896.4635	895.4492	1.0143
2	43.1520	896.4368	896.5267	895.6646	0.8621
3	86.3040	896.5466	896.5466	895.5323	1.0143

BUILD-UP	THICKNESS,in	LOCATION,ft	SIDE
MINIMUM:	1.500	43.1520	R
MAXIMUM:	6.354	-1.0270	L

		BUILD-UP		
CHECK POINT	DIST ALONG CENTERLINE END-END (ft)	LEFT (in)	CL (in)	RIGHT (in)
1	0.0000	6.3537	4.8819	3.4101
2	44.1521	4.4400	2.9700	1.5000
3	88.3042	6.3530	4.8819	3.4107

***** End of Report *****

Filename: N:\TRA\255717\Eng\BR42\Geomath\I-575 BR42.gmd

GIRDER VERTICAL GEOMETRY

SPAN ID: B5-B6 ROADWAY: 575
MIN BUILD-UP,in: 1.5000 DECK THICK,in: 7.3752

		BRG CO-ORDS		ELEVATION	DAP HEIGHT
GIRDER ID: S5-G1		North	East	(ft)	(ft)
AZIMUTH, deg: N 27.727366					
WPT-WPT LEN,ft: 86.7040	Start:	1,504,136.9329	2,188,259.6360	891.9485	0.0000
PR-PR LEN,ft: 88.7043	End:	1,504,213.6808	2,188,299.9763	892.4048	0.0000

GIRDER TYPE:BT-54 CAMBER,in : 2.0856 TOTAL DEFL,in: 1.0788
TOP WIDTH,in: 42.0000 BOT WIDTH,in: 26.0000 HEIGHT,in: 54.0000

DECK SLOPE ,ft/ft Start: -0.070040 End: -0.069881 Avg: -0.069960
GIRDER PITCH,ft/ft: 0.005262 ROLL,deg: 0.000000

CHECK POINT	DIST ALONG CENTERLINE WPT-WPT (ft)	FINAL DECK ELEVATION (ft)	SCREED ELEVATION (ft)	GIRDER TOP ELEVATION (ERECTED) (ft)	SCREED HT. ABOVE GIRDER (ft)
1	0.0000	897.4629	897.4629	896.4485	1.0144
2	43.3520	897.6226	897.7125	896.8504	0.8621
3	86.7040	897.9192	897.9192	896.9048	1.0144

BUILD-UP	THICKNESS,in	LOCATION,ft	SIDE
MINIMUM:	1.500	43.3520	R
MAXIMUM:	6.356	-1.0270	L

		BUILD-UP		
CHECK POINT	DIST ALONG CENTERLINE END-END (ft)	LEFT (in)	CL (in)	RIGHT (in)
1	0.0000	6.3561	4.8830	3.4098
2	44.3521	4.4400	2.9700	1.5000
3	88.7043	6.3527	4.8830	3.4132

***** End of Report *****

Filename: N:\TRA\255717\Eng\BR42\Geomath\I-575 BR42.gmd

GIRDER VERTICAL GEOMETRY

SPAN ID: B5-B6 ROADWAY: 575
MIN BUILD-UP,in: 1.5000 DECK THICK,in: 7.3752

GIRDER ID: S5-G2 BRG CO-ORDS ELEVATION DAP HEIGHT
AZIMUTH, deg: N 27.727366 North East (ft) (ft)
WPT-WPT LEN,ft: 86.5040 Start: 1,504,133.9972 2,188,265.4361 891.4935 0.0000
PR-PR LEN,ft: 88.5043 End: 1,504,210.5681 2,188,305.6834 891.9498 0.0000

GIRDER TYPE:BT-54 CAMBER,in : 2.0856 TOTAL DEFL,in: 1.0788
TOP WIDTH,in: 42.0000 BOT WIDTH,in: 26.0000 HEIGHT,in: 54.0000

DECK SLOPE ,ft/ft Start: -0.070040 End: -0.069881 Avg: -0.069960
GIRDER PITCH,ft/ft: 0.005274 ROLL,deg: 0.000000

CHECK POINT	DIST ALONG CENTERLINE WPT-WPT (ft)	FINAL DECK ELEVATION (ft)	SCREED ELEVATION (ft)	GIRDER TOP ELEVATION (ERECTED) (ft)	SCREED HT. ABOVE GIRDER (ft)
1	0.0000	897.0079	897.0079	895.9935	1.0143
2	43.2520	897.1676	897.2575	896.3954	0.8621
3	86.5040	897.4641	897.4641	896.4498	1.0143

BUILD-UP	THICKNESS,in	LOCATION,ft	SIDE
MINIMUM:	1.500	43.2520	R
MAXIMUM:	6.356	-1.0270	L

CHECK POINT	DIST ALONG CENTERLINE END-END (ft)	BUILD-UP LEFT (in)	CL (in)	RIGHT (in)
1	0.0000	6.3556	4.8824	3.4093
2	44.2521	4.4400	2.9700	1.5000
3	88.5043	6.3522	4.8824	3.4127

***** End of Report *****

Filename: N:\TRA\255717\Eng\BR42\Geomath\I-575 BR42.gmd

GIRDER VERTICAL GEOMETRY

SPAN ID: B5-B6 ROADWAY: 575
MIN BUILD-UP,in: 1.5000 DECK THICK,in: 7.3752

GIRDER ID: S5-G3 BRG CO-ORDS ELEVATION DAP HEIGHT
AZIMUTH, deg: N 27.727366 North East (ft) (ft)
WPT-WPT LEN,ft: 86.3040 Start: 1,504,131.0615 2,188,271.2363 891.0386 0.0000
PR-PR LEN,ft: 88.3042 End: 1,504,207.4553 2,188,311.3905 891.4947 0.0000

GIRDER TYPE:BT-54 CAMBER,in : 2.0856 TOTAL DEFL,in: 1.0788
TOP WIDTH,in: 42.0000 BOT WIDTH,in: 26.0000 HEIGHT,in: 54.0000

DECK SLOPE ,ft/ft Start: -0.070040 End: -0.069881 Avg: -0.069960
GIRDER PITCH,ft/ft: 0.005286 ROLL,deg: 0.000000

CHECK POINT	DIST ALONG CENTERLINE WPT-WPT (ft)	FINAL DECK ELEVATION (ft)	SCREED ELEVATION (ft)	GIRDER TOP ELEVATION (ERECTED) (ft)	SCREED HT. ABOVE GIRDER (ft)
1	0.0000	896.5528	896.5528	895.5386	1.0143
2	43.1520	896.7126	896.8025	895.9404	0.8621
3	86.3040	897.0090	897.0090	895.9947	1.0143

BUILD-UP	THICKNESS,in	LOCATION,ft	SIDE
MINIMUM:	1.500	43.1520	R
MAXIMUM:	6.355	-1.0270	L

CHECK POINT	DIST ALONG CENTERLINE END-END (ft)	BUILD-UP LEFT (in)	BUILD-UP CL (in)	BUILD-UP RIGHT (in)
1	0.0000	6.3551	4.8819	3.4087
2	44.1521	4.4400	2.9700	1.5000
3	88.3042	6.3516	4.8819	3.4121

***** End of Report *****

Filename: N:\TRA\255717\Eng\BR42\Geomath\I-575 BR42.gmd

GIRDER VERTICAL GEOMETRY

SPAN ID: B6-B7 ROADWAY: 575
MIN BUILD-UP,in: 1.5000 DECK THICK,in: 7.3752

		BRG CO-ORDS		ELEVATION	DAP HEIGHT
GIRDER ID: S6-G1					
AZIMUTH, deg: N 29.490313		North	East	(ft)	(ft)
WPT-WPT LEN,ft: 86.2040	Start:	1,504,215.4367	2,188,300.9340	892.4204	0.0000
PR-PR LEN,ft: 88.7043	End:	1,504,290.4720	2,188,343.3702	893.2434	0.0000

GIRDER TYPE:BT-54 CAMBER,in : 2.0856 TOTAL DEFL,in: 1.0788
TOP WIDTH,in: 42.0000 BOT WIDTH,in: 26.0000 HEIGHT,in: 54.0000

DECK SLOPE ,ft/ft Start: -0.070104 End: -0.069819 Avg: -0.069962
GIRDER PITCH,ft/ft: 0.009547 ROLL,deg: 0.000000

CHECK POINT	DIST ALONG CENTERLINE WPT-WPT (ft)	FINAL DECK ELEVATION (ft)	SCREED ELEVATION (ft)	GIRDER TOP ELEVATION (ERECTED) (ft)	SCREED HT. ABOVE GIRDER (ft)
1	0.0000	897.9340	897.9340	896.9204	1.0136
2	43.1020	898.2779	898.3678	897.5057	0.8621
3	86.2040	898.7570	898.7570	897.7434	1.0136

BUILD-UP	THICKNESS,in	LOCATION,ft	SIDE
MINIMUM:	1.500	43.3520	R
MAXIMUM:	6.385	87.7311	L

CHECK POINT	DIST ALONG CENTERLINE END-END (ft)	BUILD-UP LEFT (in)	CL (in)	RIGHT (in)
1	0.0000	6.3481	4.8735	3.3990
2	44.3521	4.4400	2.9700	1.5000
3	88.7043	6.3853	4.9169	3.4485

***** End of Report *****

Filename: N:\TRA\255717\Eng\BR42\Geomath\I-575 BR42.gmd

GIRDER VERTICAL GEOMETRY

SPAN ID: B6-B7 ROADWAY: 575
MIN BUILD-UP,in: 1.5000 DECK THICK,in: 7.3752

GIRDER ID: S6-G2 BRG CO-ORDS ELEVATION DAP HEIGHT
AZIMUTH, deg: N 29.490313 North East (ft) (ft)
WPT-WPT LEN,ft: 86.0040 Start: 1,504,212.3239 2,188,306.6411 891.9654 0.0000
PR-PR LEN,ft: 88.5043 End: 1,504,287.1851 2,188,348.9788 892.7883 0.0000

GIRDER TYPE:BT-54 CAMBER,in : 2.0856 TOTAL DEFL,in: 1.0788
TOP WIDTH,in: 42.0000 BOT WIDTH,in: 26.0000 HEIGHT,in: 54.0000

DECK SLOPE ,ft/ft Start: -0.070105 End: -0.069819 Avg: -0.069962
GIRDER PITCH,ft/ft: 0.009569 ROLL,deg: 0.000000

CHECK POINT	DIST ALONG CENTERLINE WPT-WPT (ft)	FINAL DECK ELEVATION (ft)	SCREED ELEVATION (ft)	GIRDER TOP ELEVATION (ERECTED) (ft)	SCREED HT. ABOVE GIRDER (ft)
1	0.0000	897.4790	897.4790	896.4654	1.0136
2	43.0020	897.8229	897.9128	897.0507	0.8621
3	86.0040	898.3019	898.3019	897.2883	1.0136

BUILD-UP	THICKNESS,in	LOCATION,ft	SIDE
MINIMUM:	1.500	43.2520	R
MAXIMUM:	6.385	87.5311	L

CHECK POINT	DIST ALONG CENTERLINE END-END (ft)	BUILD-UP LEFT (in)	BUILD-UP CL (in)	BUILD-UP RIGHT (in)
1	0.0000	6.3476	4.8730	3.3984
2	44.2521	4.4400	2.9700	1.5000
3	88.5043	6.3848	4.9165	3.4481

***** End of Report *****

Filename: N:\TRA\255717\Eng\BR42\Geomath\I-575 BR42.gmd

GIRDER VERTICAL GEOMETRY

SPAN ID: B6-B7 ROADWAY: 575
MIN BUILD-UP,in: 1.5000 DECK THICK,in: 7.3752

		BRG CO-ORDS		ELEVATION	DAP HEIGHT
GIRDER ID: S6-G3					
AZIMUTH, deg: N 29.490313		North	East	(ft)	(ft)
WPT-WPT LEN,ft: 85.8039	Start:	1,504,209.2112	2,188,312.3481	891.5104	0.0000
PR-PR LEN,ft: 88.3042	End:	1,504,283.8983	2,188,354.5874	892.3333	0.0000

GIRDER TYPE:BT-54 CAMBER,in : 2.0856 TOTAL DEFL,in: 1.0788
TOP WIDTH,in: 42.0000 BOT WIDTH,in: 26.0000 HEIGHT,in: 54.0000

DECK SLOPE ,ft/ft Start: -0.070105 End: -0.069818 Avg: -0.069962
GIRDER PITCH,ft/ft: 0.009590 ROLL,deg: 0.000000

CHECK POINT	DIST ALONG CENTERLINE WPT-WPT (ft)	FINAL DECK ELEVATION (ft)	SCREED ELEVATION (ft)	GIRDER TOP ELEVATION (ERECTED) (ft)	SCREED HT. ABOVE GIRDER (ft)
1	0.0000	897.0239	897.0239	896.0104	1.0135
2	42.9020	897.3679	897.4578	896.5957	0.8621
3	85.8039	897.8468	897.8468	896.8333	1.0135

BUILD-UP	THICKNESS,in	LOCATION,ft	SIDE
MINIMUM:	1.500	43.1520	R
MAXIMUM:	6.384	87.3311	L

		BUILD-UP		
CHECK POINT	DIST ALONG CENTERLINE END-END (ft)	LEFT (in)	CL (in)	RIGHT (in)
1	0.0000	6.3470	4.8724	3.3979
2	44.1521	4.4400	2.9700	1.5000
3	88.3042	6.3844	4.9160	3.4476

***** End of Report *****

Filename: N:\TRA\255717\Eng\BR42\Geomath\I-575 BR42.gmd

PIER CAP BEAM SEAT REPORT

PIER: B1 LEFT OF PIER CL

GIRDER	WORK PT DISTANCE (ft)	GIRDER TYPE	PAD THICK (in)		DISTANCE FROM WORK PT ALONG CL (ft)	PERP TO CL (ft)	ELEVATION (ft)
S1-G1	2.9973	BT-54	2.5000				
				a	-0.8999	-1.0975	893.6698
				b	-0.8871	-1.9307	893.6631
				c	0.9460	-1.9025	893.6631
				d	0.9332	-1.0693	893.6698
				BrgCtr	0.0231	-1.5000	893.6665
S1-G2	6.5008	BT-54	2.5000				
				a	-0.8999	-1.0975	893.2148
				b	-0.8871	-1.9307	893.2081
				c	0.9460	-1.9025	893.2081
				d	0.9332	-1.0693	893.2148
				BrgCtr	0.0231	-1.5000	893.2114
S1-G3	6.5008	BT-54	2.5000				
				a	-0.8999	-1.0975	892.7598
				b	-0.8871	-1.9307	892.7530
				c	0.9460	-1.9025	892.7530
				d	0.9332	-1.0693	892.7598
				BrgCtr	0.0231	-1.5000	892.7564
RIGHT	1.5012						

***** End of Report *****

Filename: N:\TRA\255717\Eng\BR42\Geomath\I-575 BR42.gmd

PIER CAP BEAM SEAT REPORT

PIER: B2 RIGHT OF PIER CL

GIRDER	WORK PT DISTANCE (ft)	GIRDER TYPE	PAD THICK (in)		DISTANCE FROM WORK PT ALONG CL (ft)	PERP TO CL (ft)	ELEVATION (ft)
S1-G1	2.9973	BT-54	2.5000				
				a	0.9255	0.5693	892.6312
				b	0.9384	1.4025	892.6444
				c	-0.8948	1.4307	892.6444
				d	-0.9076	0.5975	892.6312
				BrgCtr	0.0154	1.0000	892.6378
S1-G2	6.5008	BT-54	2.5000				
				a	0.9255	0.5693	892.1762
				b	0.9384	1.4025	892.1894
				c	-0.8948	1.4307	892.1894
				d	-0.9076	0.5975	892.1762
				BrgCtr	0.0154	1.0000	892.1828
S1-G3	6.5008	BT-54	2.5000				
				a	0.9255	0.5693	891.7212
				b	0.9384	1.4025	891.7344
				c	-0.8948	1.4307	891.7344
				d	-0.9076	0.5975	891.7212
				BrgCtr	0.0154	1.0000	891.7278
RIGHT	2.0012						

***** End of Report *****

Filename: N:\TRA\255717\Eng\BR42\Geomath\I-575 BR42.gmd

PIER CAP BEAM SEAT REPORT

PIER: B2 LEFT OF PIER CL

GIRDER	WORK PT DISTANCE (ft)	GIRDER TYPE	PAD THICK (in)		DISTANCE FROM WORK PT ALONG CL (ft)	PERP TO CL (ft)	ELEVATION (ft)
S2-G1	2.9973	BT-54	2.5000				
				a	-0.9076	-0.5975	892.6190
				b	-0.8948	-1.4307	892.6158
				c	0.9384	-1.4025	892.6158
				d	0.9255	-0.5693	892.6190
				BrgCtr	0.0154	-1.0000	892.6174
S2-G2	6.5008	BT-54	2.5000				
				a	-0.9076	-0.5975	892.1639
				b	-0.8948	-1.4307	892.1608
				c	0.9384	-1.4025	892.1608
				d	0.9255	-0.5693	892.1639
				BrgCtr	0.0154	-1.0000	892.1624
S2-G3	6.5008	BT-54	2.5000				
				a	-0.9076	-0.5975	891.7089
				b	-0.8948	-1.4307	891.7058
				c	0.9384	-1.4025	891.7058
				d	0.9255	-0.5693	891.7089
				BrgCtr	0.0154	-1.0000	891.7074
RIGHT	2.0012						

***** End of Report *****

Filename: N:\TRA\255717\Eng\BR42\Geomath\I-575 BR42.gmd

PIER CAP BEAM SEAT REPORT

PIER: B3 RIGHT OF PIER CL

GIRDER	WORK PT DISTANCE (ft)	GIRDER TYPE	PAD THICK (in)		DISTANCE FROM WORK PT ALONG CL (ft)	PERP TO CL (ft)	ELEVATION (ft)
S2-G1	2.9973	BT-54	2.5000				
				a	0.9255	0.5693	891.9494
				b	0.9384	1.4025	891.9590
				c	-0.8948	1.4307	891.9590
				d	-0.9076	0.5975	891.9494
				BrgCtr	0.0154	1.0000	891.9543
S2-G2	6.5008	BT-54	2.5000				
				a	0.9255	0.5693	891.4945
				b	0.9384	1.4025	891.5041
				c	-0.8948	1.4307	891.5041
				d	-0.9076	0.5975	891.4945
				BrgCtr	0.0154	1.0000	891.4993
S2-G3	6.5008	BT-54	2.5000				
				a	0.9255	0.5693	891.0395
				b	0.9384	1.4025	891.0491
				c	-0.8948	1.4307	891.0491
				d	-0.9076	0.5975	891.0395
				BrgCtr	0.0154	1.0000	891.0443
RIGHT	2.0012						

***** End of Report *****

Filename: N:\TRA\255717\Eng\BR42\Geomath\I-575 BR42.gmd

PIER CAP BEAM SEAT REPORT

PIER: B3 LEFT OF PIER CL

GIRDER	WORK PT DISTANCE (ft)	GIRDER TYPE	PAD THICK (in)		DISTANCE FROM WORK PT ALONG CL (ft)	PERP TO CL (ft)	ELEVATION (ft)
S3-G1	2.9973	BT-54	2.5000				
				a	-0.9076	-0.5975	891.9430
				b	-0.8948	-1.4307	891.9435
				c	0.9384	-1.4025	891.9435
				d	0.9255	-0.5693	891.9430
				BrgCtr	0.0154	-1.0000	891.9433
S3-G2	6.5008	BT-54	2.5000				
				a	-0.9076	-0.5975	891.4880
				b	-0.8948	-1.4307	891.4885
				c	0.9384	-1.4025	891.4885
				d	0.9255	-0.5693	891.4880
				BrgCtr	0.0154	-1.0000	891.4883
S3-G3	6.5008	BT-54	2.5000				
				a	-0.9076	-0.5975	891.0330
				b	-0.8948	-1.4307	891.0335
				c	0.9384	-1.4025	891.0335
				d	0.9255	-0.5693	891.0330
				BrgCtr	0.0154	-1.0000	891.0332
RIGHT	2.0012						

***** End of Report *****

Filename: N:\TRA\255717\Eng\BR42\Geomath\I-575 BR42.gmd

PIER CAP BEAM SEAT REPORT

PIER: B4 RIGHT OF PIER CL

GIRDER	WORK PT DISTANCE (ft)	GIRDER TYPE	PAD THICK (in)		DISTANCE FROM WORK PT ALONG CL (ft)	PERP TO CL (ft)	ELEVATION (ft)
S3-G1	1.4973	BT-54	2.5000				
				a	0.9255	0.5693	891.6502
				b	0.9384	1.4025	891.6563
				c	-0.8948	1.4307	891.6563
				d	-0.9076	0.5975	891.6502
				BrgCtr	0.0154	1.0000	891.6533
S3-G2	6.5008	BT-54	2.5000				
				a	0.9255	0.5693	891.1952
				b	0.9384	1.4025	891.2013
				c	-0.8948	1.4307	891.2013
				d	-0.9076	0.5975	891.1952
				BrgCtr	0.0154	1.0000	891.1983
S3-G3	6.5008	BT-54	2.5000				
				a	0.9255	0.5693	890.7402
				b	0.9384	1.4025	890.7463
				c	-0.8948	1.4307	890.7463
				d	-0.9076	0.5975	890.7402
				BrgCtr	0.0154	1.0000	890.7433
RIGHT	1.5012						

***** End of Report *****

Filename: N:\TRA\255717\Eng\BR42\Geomath\I-575 BR42.gmd

PIER CAP BEAM SEAT REPORT

PIER: B4 LEFT OF PIER CL

GIRDER	WORK PT DISTANCE (ft)	GIRDER TYPE	PAD THICK (in)		DISTANCE FROM WORK PT ALONG CL (ft)	PERP TO CL (ft)	ELEVATION (ft)
S4-G1	1.4973	BT-54	2.5000				
				a	-0.9076	-0.5975	891.6488
				b	-0.8948	-1.4307	891.6529
				c	0.9384	-1.4025	891.6529
				d	0.9255	-0.5693	891.6488
				BrgCtr	0.0154	-1.0000	891.6509
S4-G2	6.5008	BT-54	2.5000				
				a	-0.9076	-0.5975	891.1938
				b	-0.8948	-1.4307	891.1979
				c	0.9384	-1.4025	891.1979
				d	0.9255	-0.5693	891.1938
				BrgCtr	0.0154	-1.0000	891.1959
S4-G3	6.5008	BT-54	2.5000				
				a	-0.9076	-0.5975	890.7388
				b	-0.8948	-1.4307	890.7429
				c	0.9384	-1.4025	890.7429
				d	0.9255	-0.5693	890.7388
				BrgCtr	0.0154	-1.0000	890.7409
RIGHT	1.5012						

***** End of Report *****

Filename: N:\TRA\255717\Eng\BR42\Geomath\I-575 BR42.gmd

PIER CAP BEAM SEAT REPORT

PIER: B5 RIGHT OF PIER CL

GIRDER	WORK PT DISTANCE (ft)	GIRDER TYPE	PAD THICK (in)		DISTANCE FROM WORK PT ALONG CL (ft)	PERP TO CL (ft)	ELEVATION (ft)
S4-G1	2.9973	BT-54	2.5000				
				a	0.9255	0.5693	891.7328
				b	0.9384	1.4025	891.7352
				c	-0.8948	1.4307	891.7352
				d	-0.9076	0.5975	891.7328
				BrgCtr	0.0154	1.0000	891.7340
S4-G2	6.5008	BT-54	2.5000				
				a	0.9255	0.5693	891.2778
				b	0.9384	1.4025	891.2802
				c	-0.8948	1.4307	891.2802
				d	-0.9076	0.5975	891.2778
				BrgCtr	0.0154	1.0000	891.2790
S4-G3	6.5008	BT-54	2.5000				
				a	0.9255	0.5693	890.8227
				b	0.9384	1.4025	890.8252
				c	-0.8948	1.4307	890.8252
				d	-0.9076	0.5975	890.8227
				BrgCtr	0.0154	1.0000	890.8240
RIGHT	2.0012						

***** End of Report *****

Filename: N:\TRA\255717\Eng\BR42\Geomath\I-575 BR42.gmd

PIER CAP BEAM SEAT REPORT

PIER: B5 LEFT OF PIER CL

GIRDER	WORK PT DISTANCE (ft)	GIRDER TYPE	PAD THICK (in)		DISTANCE FROM WORK PT ALONG CL (ft)	PERP TO CL (ft)	ELEVATION (ft)
S5-G1	2.9973	BT-54	2.5000				
				a	-0.9076	-0.5975	891.7364
				b	-0.8948	-1.4307	891.7440
				c	0.9384	-1.4025	891.7440
				d	0.9255	-0.5693	891.7364
				BrgCtr	0.0154	-1.0000	891.7402
S5-G2	6.5008	BT-54	2.5000				
				a	-0.9076	-0.5975	891.2814
				b	-0.8948	-1.4307	891.2890
				c	0.9384	-1.4025	891.2890
				d	0.9255	-0.5693	891.2814
				BrgCtr	0.0154	-1.0000	891.2852
S5-G3	6.5008	BT-54	2.5000				
				a	-0.9076	-0.5975	890.8264
				b	-0.8948	-1.4307	890.8340
				c	0.9384	-1.4025	890.8340
				d	0.9255	-0.5693	890.8264
				BrgCtr	0.0154	-1.0000	890.8302
RIGHT	2.0012						

***** End of Report *****

Filename: N:\TRA\255717\Eng\BR42\Geomath\I-575 BR42.gmd

PIER CAP BEAM SEAT REPORT

PIER: B6 RIGHT OF PIER CL

GIRDER	WORK PT DISTANCE (ft)	GIRDER TYPE	PAD THICK (in)		DISTANCE FROM WORK PT ALONG CL (ft)	PERP TO CL (ft)	ELEVATION (ft)
S5-G1	2.9973	BT-54	2.5000				
				a	0.9255	0.5693	892.1970
				b	0.9384	1.4025	892.1958
				c	-0.8948	1.4307	892.1958
				d	-0.9076	0.5975	892.1970
				BrgCtr	0.0154	1.0000	892.1964
S5-G2	6.5008	BT-54	2.5000				
				a	0.9255	0.5693	891.7420
				b	0.9384	1.4025	891.7408
				c	-0.8948	1.4307	891.7408
				d	-0.9076	0.5975	891.7420
				BrgCtr	0.0154	1.0000	891.7414
S5-G3	6.5008	BT-54	2.5000				
				a	0.9255	0.5693	891.2870
				b	0.9384	1.4025	891.2858
				c	-0.8948	1.4307	891.2858
				d	-0.9076	0.5975	891.2870
				BrgCtr	0.0154	1.0000	891.2864
RIGHT	2.0012						

***** End of Report *****

Filename: N:\TRA\255717\Eng\BR42\Geomath\I-575 BR42.gmd

PIER CAP BEAM SEAT REPORT

PIER: B6 LEFT OF PIER CL

GIRDER	WORK PT DISTANCE (ft)	GIRDER TYPE	PAD THICK (in)		DISTANCE FROM WORK PT ALONG CL (ft)	PERP TO CL (ft)	ELEVATION (ft)
S6-G1	2.9973	BT-54	2.5000				
				a	-0.9076	-0.5975	892.2064
				b	-0.8948	-1.4307	892.2176
				c	0.9384	-1.4025	892.2176
				d	0.9255	-0.5693	892.2064
				BrgCtr	0.0154	-1.0000	892.2120
S6-G2	6.5008	BT-54	2.5000				
				a	-0.9076	-0.5975	891.7514
				b	-0.8948	-1.4307	891.7627
				c	0.9384	-1.4025	891.7627
				d	0.9255	-0.5693	891.7514
				BrgCtr	0.0154	-1.0000	891.7571
S6-G3	6.5008	BT-54	2.5000				
				a	-0.9076	-0.5975	891.2965
				b	-0.8948	-1.4307	891.3077
				c	0.9384	-1.4025	891.3077
				d	0.9255	-0.5693	891.2965
				BrgCtr	0.0154	-1.0000	891.3021
RIGHT	2.0012						

***** End of Report *****

Filename: N:\TRA\255717\Eng\BR42\Geomath\I-575 BR42.gmd

PIER CAP BEAM SEAT REPORT

PIER: B7 RIGHT OF PIER CL

GIRDER	WORK PT DISTANCE (ft)	GIRDER TYPE	PAD THICK (in)		DISTANCE FROM WORK PT ALONG CL (ft)	PERP TO CL (ft)	ELEVATION (ft)
S6-G1	2.9973	BT-54	2.5000				
				a	0.9332	1.0693	893.0374
				b	0.9460	1.9025	893.0327
				c	-0.8871	1.9307	893.0327
				d	-0.8999	1.0975	893.0374
				BrgCtr	0.0231	1.5000	893.0350
S6-G2	6.5008	BT-54	2.5000				
				a	0.9332	1.0693	892.5824
				b	0.9460	1.9025	892.5776
				c	-0.8871	1.9307	892.5776
				d	-0.8999	1.0975	892.5824
				BrgCtr	0.0231	1.5000	892.5800
S6-G3	6.5008	BT-54	2.5000				
				a	0.9332	1.0693	892.1273
				b	0.9460	1.9025	892.1226
				c	-0.8871	1.9307	892.1226
				d	-0.8999	1.0975	892.1273
				BrgCtr	0.0231	1.5000	892.1250
RIGHT	1.5012						

***** End of Report *****

CALCULATION COVER SHEET

PROJECT	JOB NO.	CALC NO.	SHEET
I-75 / I-575 NORTHWEST CORRIDOR	NH000-0575-01(028)	BR#42	1
SUBJECT	DISCIPLINE		
Slab Design	STRUCTURAL		

CALCULATION STATUS DESIGNATION	PRELIMINARY	CONFIRMED	SUPSEDED	VOIDED	INCOMPLETE
	☐	☐	☐	☐	X

COMPUTER PROGRAM/TYPE	SCP	MAINFRAME	PC	PROGRAM	VERSION/RELEASE NO.
	(X) YES ( ) NO	( )	(X)	Excel	2003

Note 1: Georgia Department of Transportation (GDOT) terminated Contract Number TOURDPPI60072 for its convenience prior the completion of all work under that contract and directed that the work with respect to these calculations be discontinued.
(a) These calculations were not completed at the time of GDOT's direction and the information contained herein is not complete and/or has not been fully verified or checked. These calculations are a work-in-progress and are presented only as such.
(b) Any user is cautioned that the use of these calculations and any related information or calculations, without access to factors and without proper regard for their purpose, could lead to erroneous conclusions.
(c) If any such calculations or any information contained herein is used in future work efforts or any follow on design work activity, a complete confirmation of the information contained herein should be performed prior to any such use.
(d) GTP has no responsibility for the use of this information not under its direct control.

Slab Design calculations are included for spans 1-6.

NO.	REASON FOR REVISION	TOTAL NO. OF SHEETS	LAST SHEET NO.	BY	CHECKED	APPROVED/ ACCEPTED	DATE
A	As per GDOT's termination for convenience direction	8	8	JCR			11/30/09

RECORD OF REVISIONS

CALCULATION SHEET

PROJECT: I-75 / I-575 NORTHWEST CORRIDOR
JOB NUMBER NH000-0575-01(028)
CALC NO. BR#42

SUBJECT: Slab Design
BY: JCR DATE: 11/30/2009

SHEET NO.
SHEET REV.

Sufficient sample calculations representative of the scope and conditions in the design calculation were performed and the results compared to demonstrate the computer program adequacy.

BRIDGE: **I-575 over Little River**
COUNTY: **CHEROKEE**
P.I. NO: **713640**
PROJECT: **NH000-0575-01(028)**

J.B. TRIMBLE, INC.

ALL SPANS

JOB NO: **31-6036**
DESIGNED BY: **WBN**
CHECKED BY: **JCR**

10-5-09 JCR

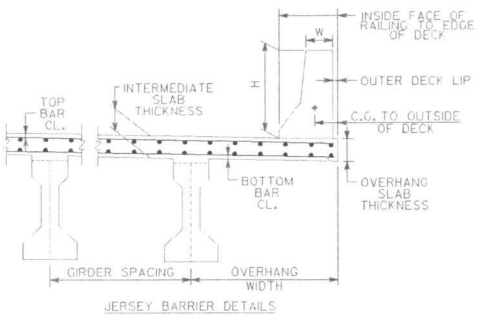
PRELIMINARY INFORMATION

Georgia County	North of Fall Line?	ADT?	Standard Loading	BARRIER TYPE:	FENCING OPTION:
Cherokee	Y	>= 2000	HS-20	Jersey Barrier	None

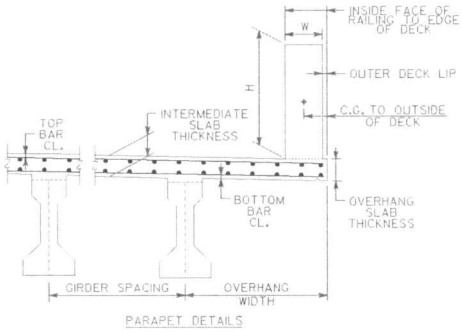
INTERIOR BEAM TYPE: Bulb-T (TB, PSC, BULB-T)

FASCIA BEAM TYPE: Bulb-T (TB, PSC, BULB-T)

INTERIOR BEAM TOP FLANGE WIDTH =	**42 in.**	
FASCIA BEAM TOP FLANGE WIDTH =	**42 in.**	
INTERMEDIATE SLAB THICKNESS =	**7.375 in.**	
OVERHANG SLAB THICKNESS =	**7.375 in.**	
GIRDER SPACING =	**6.500 ft.**	
NUMBER OF GIRDERS =	**3**	
OVERHANG WIDTH =	**2.964 ft.**	
CONCRETE STRENGTH, f'c =	**3500 psi.**	
STEEL STRENGTH, fy =	**60000 psi.**	
RAILING HEIGHT (H) =	**2.667 ft.**	
RAILING WIDTH (W) =	**0.750 ft.**	
OUTER DECK LIP =	**1.500 in.**	
INSIDE FACE OF RAILING TO EDGE OF DECK =	**1.625 ft.**	
C.G. FROM OUTSIDE =	**7.955 in.**	
TOP BAR CLEARANCE =	**2.750 in.**	
BOTTOM BAR CLEARANCE =	**1.000 in.**	
GROOVED DEPTH =	**0.250 in.**	
DESIGN SPEED =	**70.00 mph**	(IF CENTRIFUGAL CONSIDERED)
RADIUS =	**2860.000 ft.**	(IF CENTRIFUGAL CONSIDERED)
WHEEL LOAD =	**16 kips**	
IMPACT FACTOR =	**1.30**	
FUTURE WEARING SURFACE =	**30.00 psf**	
RAILING LOAD =	**10.00 kip**	AT TOP OF PARAPET



JERSEY BARRIER DETAILS



PARAPET DETAILS

DECK SLOPE = 2.0000 %

INTERMEDIATE SLAB DESIGN

EFFECTIVE SPAN LENGTH = 4.750 ft. *AASHTO 3.24.1.2*

DEAD LOAD

SLAB D.L. = 0.092 kips / ft. / lf.
ADDITIONAL D.L. = 0.030 kips / ft. / lf.

TOTAL D.L.= 0.122 kips / ft. / lf.

DEAD LOAD MOMENT = 1.3 * (WT DL) * (SPAN)^2 / 10 = 0.358 kip-ft. / lf.

LIVE LOAD

WHEEL LOAD = 16.00 kips

CONT. FACTOR = 0.80
IMPACT = 1.30

LIVE LOAD MOMENT = 2.17 * ((S + 2)/32) * P(LL + I) * 0.8 = 7.617 kip-ft. / lf. *AASHTO 3.24.3.1*

CENTRIFUGAL LOAD *AASHTO 3.10.1*

C = 6.68 * S^2/ R = 0.114 FRACTION OF LIVE LOAD

CENTRIFUGAL FORCE MOMENT = 1.3 * ((S + 2)/32) * P (LL+ I) * 0.8 * C = 0.522 kip-ft. / lf. *AASHTO TABLE 3.22.1A*

TOTAL DESIGN MOMENT (∅ Mu) = 8.497 kip-ft. / lf. = 101.97 k-in. / lf.

FLEXURE STRENGTH *AASHTO 8.16.3.2*

∅ Mn > Mu ∅ = 0.90

∅ Mn = ∅ * [As * fy * (d - a/2)] where a = As * fy / [0.85 * f'c * b]

a = 1.681 As

d_{top} = 4.313 in. USE **5 BAR** As = 0.31 in.^2 / lf.

d_{bot} = 5.813 in. USE **5 BAR** As = 0.31 in.^2 / lf.

TOP STEEL

232.875 As - 45.38 As^2 = 101.97 k-in. / lf.

TOP BAR = NO.	5	SPACED AT	7.500 in.	As =	0.50 in.^2 / lf.

∅ Mn = 104.34 k-in. / lf. ≥ ∅ Mu = 101.97 k-in. / lf. OK

BOTTOM STEEL

313.875 As - 45.38 As^2 = 101.97 k-in. / lf.

BOT BAR = NO.	5	SPACED AT	7.500 in.	As =	0.50 in.^2 / lf.

∅ Mn = 144.52 k-in. / lf. ≥ ∅ Mu = 101.97 k-in. / lf. OK

BRIDGE: **I-575 over Little River**
COUNTY: **CHEROKEE**
P.I. NO: **713640**
PROJECT: **NH000-0575-01(028)**

J.B. TRIMBLE, INC.

ALL SPANS

JOB NO: **31-6036**
DESIGNED BY: **WBN**
CHECKED BY: **JCR**

OVERHANG SLAB DESIGN

EFFECTIVE SPAN LENGTH = 2.089 ft. *AASHTO 3.24.5.1*

DEAD LOAD

BARRIER WEIGHT = 0.405 klf
FENCING WEIGHT = 0.000 klf

SLAB D.L. = 0.092 kips / ft. / lf.
ADDITIONAL D.L. = 0.030 kips / ft. / lf.
PARAPET D.L.= 0.405 kips / ft. / lf.

DL MOMENT @ FLANGE:

SLAB MOM = 0.201 kip-ft. / lf.
ADD'L MOM = 0.003 kip-ft. / lf.
PARAPET MOM = 0.578 kip-ft. / lf.

TOTAL MOM = 0.782 kip-ft. / lf. KIP-FT/LF

DL MOMENT @ EDGE OF BARRIER:

SLAB MOM = 0.122 kip-ft. / lf.
ADD'L MOM = 0.000 kip-ft. / lf.
PARAPET MOM = 0.390 kip-ft. / lf.

TOTAL MOM = 0.512 kip-ft. / lf.

DEAD LOAD MOMENT @ FLANGE= 1.3 * TOTAL MOMENT = 1.017 kip-ft. / lf.
D.L. MOMENT @ EDGE OF BARRIER= 1.3 * TOTAL MOMENT = 0.665 kip-ft. / lf.

LIVE LOAD

WHEEL LOAD 16 kips

IMPACT = 1.30
MOM ARM (X)= 0.34 ft.
E = 0.8 * X + 3.75 = 4.02 ft.

LIVE LOAD MOMENT = 2.17 * (P(LL + I) / E) * X = 3.800 kip-ft. / lf. *AASHTO 3.24.5.1.1*

CENTRIFUGAL LOAD

C = 6.68 * S^2/ R = 0.114 FRACTION OF LIVE LOAD

CENTRIFUGAL FORCE MOMENT = 1.3 * (P(LL + I) / E) * X * C = 0.435 kip-ft. / lf.

RAILING LOAD *AASHTO 3.24.5.2*

RAILING LOAD = 10.00 kips

RAILING LOAD @ FLANGE:

MOM ARM (H) = 3.08 ft.
DISTANCE (X) = 1.43 ft.
E = 0.8 * X + 5.00 = 6.14 ft.

RAILING LOAD @ EDGE OF BARRIER:

MOM ARM (H) = 3.08 ft.
DISTANCE (X) = 0.96 ft.
E = 0.8 * X + 5.00 = 5.77 ft.

RAIL MOM @ FLANGE= 2.17 * (P_{rail}/ E) * H = 10.872 kip-ft. / lf.

RAIL MOM @ EDGE OF BARRIER= 2.17 * (P_{rail}/ E) * H = 11.570 kip-ft. / lf.

SUMMARY OF MOMENTS:

DL + LL @ FLANGE = 5.251 kip-ft. / lf.
DL + RAIL @ FLANGE = 11.888 kip-ft. / lf.
DL + RAIL @ BARRIER = 12.235 kip-ft. / lf.

TOTAL DESIGN MOMENT (∅ Mu) = 12.235 KIP-FT / LF = 146.83 k-in / lf.

FLEXURE STRENGTH

AASHTO 8.16.3.2

∅ Mn > Mu ∅ = 0.90

∅ Mn = ∅ * [As * fy * (d - a/2)] where a = As * fy / [0.85 * f'c * b]

a = 1.681 As
d_{top} = 4.313 in.

USE **5 BAR** As = 0.31 in.^2 / lf.

PROVIDE ADDITIONAL OVERHANG STEEL = **5 BAR** As = 0.31 in.^2 / lf.

TOP STEEL

232.875 As - 45.38 As^2 = 146.83 k-in. / lf.

✓ **TOP BAR = NO. 5 SPACED AT 7.50 in. As = 0.50 in.^2 / lf.**

∅ Mn = 104.34 k-in. / lf. < ∅ Mu = 146.83 k-in. / lf. ADD. REINF. NEEDED!!

✓ **ADD'L BAR = NO. 5 SPACED AT 15.00 in. As = 0.25 in.^2 / lf.**

Mn = 148.14 k-in. / lf. ≥ Mu = 146.83 k-in. / lf. OK

SERVICE LOAD DESIGN OF BRIDGE SLAB

Georgia Department of Transportation 13-MAY-04
Office of Bridge and Structural Design 07:49:26
October 2003

WHEEL LOAD (Kips)	fc (ksi)	fs (ksi)	n	SLAB COVER (in)	FUTURE PAVING (kips/ft^2)	CONTINUITY FACTOR
16.00	1.400	24.000	9	2.750	0.030	0.8

EFFECTIVE SPAN LENGTH (ft-in)	SLAB THICKNESS MINIMUM (in)	SLAB THICKNESS ACTUAL (in)	SIZE AND SPACING OF MAIN REINFORCEMENT (in)	DISTRUBUTION REINFORCEMENT MIDDLE HALF	DISTRUBUTION REINFORCEMENT OUTER QUARTERS
3 - 6	6.8150	7.000	# 5 at 8.625	3 -# 4	2 -# 4
3 - 7	6.8463	7.000	# 5 at 8.375	3 -# 4	2 -# 4
3 - 8	6.8774	7.000	# 5 at 8.250	3 -# 4	2 -# 4
3 - 9	6.9083	7.000	# 5 at 8.125	3 -# 4	2 -# 4
3 - 10	6.9391	7.000	# 5 at 8.000	3 -# 4	2 -# 4
3 - 11	6.9698	7.000	# 5 at 7.875	4 -# 4	2 -# 4
4 - 0	7.0018	7.125	# 5 at 8.000	4 -# 4	2 -# 4
4 - 1	7.0323	7.125	# 5 at 7.875	4 -# 4	2 -# 4
4 - 2	7.0626	7.125	# 5 at 7.750	4 -# 4	2 -# 4
4 - 3	7.0927	7.125	# 5 at 7.625	4 -# 4	2 -# 4
4 - 4	7.1228	7.125	# 5 at 7.500	4 -# 4	2 -# 4
4 - 5	7.1544	7.250	# 5 at 7.625	4 -# 4	2 -# 4
4 - 6	7.1843	7.250	# 5 at 7.500	4 -# 4	2 -# 4
4 - 7	7.2140	7.250	# 5 at 7.500	4 -# 4	2 -# 4
4 - 8	7.2436	7.250	# 5 at 7.375	4 -# 4	2 -# 4
4 - 9	7.2751	7.375	# 5 at 7.500	4 -# 4	2 -# 4
4 - 10	7.3045	7.375	# 5 at 7.375	5 -# 4	4 -# 4
4 - 11	7.3338	7.375	# 5 at 7.250	5 -# 4	4 -# 4
5 - 0	7.3630	7.375	# 5 at 7.125	5 -# 4	4 -# 4
5 - 1	7.3943	7.500	# 5 at 7.250	5 -# 4	4 -# 4
5 - 2	7.4234	7.500	# 5 at 7.125	5 -# 4	4 -# 4
5 - 3	7.4524	7.500	# 5 at 7.000	5 -# 4	4 -# 4
5 - 4	7.4812	7.500	# 5 at 7.000	5 -# 4	4 -# 4
5 - 5	7.5124	7.625	# 5 at 7.000	5 -# 4	4 -# 4
5 - 6	7.5412	7.625	# 5 at 7.000	5 -# 4	4 -# 4
5 - 7	7.5698	7.625	# 5 at 6.875	6 -# 4	4 -# 4
5 - 8	7.5984	7.625	# 5 at 6.750	6 -# 4	4 -# 4
5 - 9	7.6295	7.750	# 5 at 6.875	6 -# 4	4 -# 4
5 - 10	7.6579	7.750	# 5 at 6.750	6 -# 4	4 -# 4
5 - 11	7.6863	7.750	# 5 at 6.750	6 -# 4	4 -# 4
6 - 0	7.7145	7.750	# 5 at 6.625	6 -# 4	4 -# 4
6 - 1	7.7427	7.750	# 5 at 6.500	6 -# 4	4 -# 4
6 - 2	7.7738	7.875	# 5 at 6.625	6 -# 4	4 -# 4
6 - 3	7.8019	7.875	# 5 at 6.500	6 -# 4	4 -# 4
6 - 4	7.8299	7.875	# 5 at 6.500	7 -# 4	4 -# 4
6 - 5	7.8578	7.875	# 5 at 6.375	7 -# 4	4 -# 4

SECTION IV – CONCRETE AND REINFORCING STEEL

BRIDGE DECK DESIGN No. 4.01

When designing bridge decks, the following criteria shall be applied:

For cast-in-place decks north of the fall line:

1. Specify Class AA concrete except for post-tensioned concrete boxes which shall have Class AA as a minimum, but may require a higher 28-day strength.
2. **Specify 2 ¾" (70 mm) cover to top bar reinforcement for bridge decks on interstate routes, state routes and routes with design year ADT equal to or greater than 2000.**
3. Specify 2 ½" (65 mm) cover to top bar reinforcement for bridge decks on all other routes.

For cast-in-place decks south of the fall line:

1. Specify Class AA concrete except for post-tensioned concrete boxes which shall have Class AA as a minimum, but may require a higher 28-day strength.
2. Specify 2 ¼" (60 mm) cover to top bar reinforcement for bridge decks on interstate routes, state routes and routes with design year ADT equal to or greater than 2000.
3. Specify 2" (50 mm) cover to top bar reinforcement for bridge decks on all other routes.

For bridge decks of precast concrete elements, specify 2" cover to top bar reinforcement statewide.

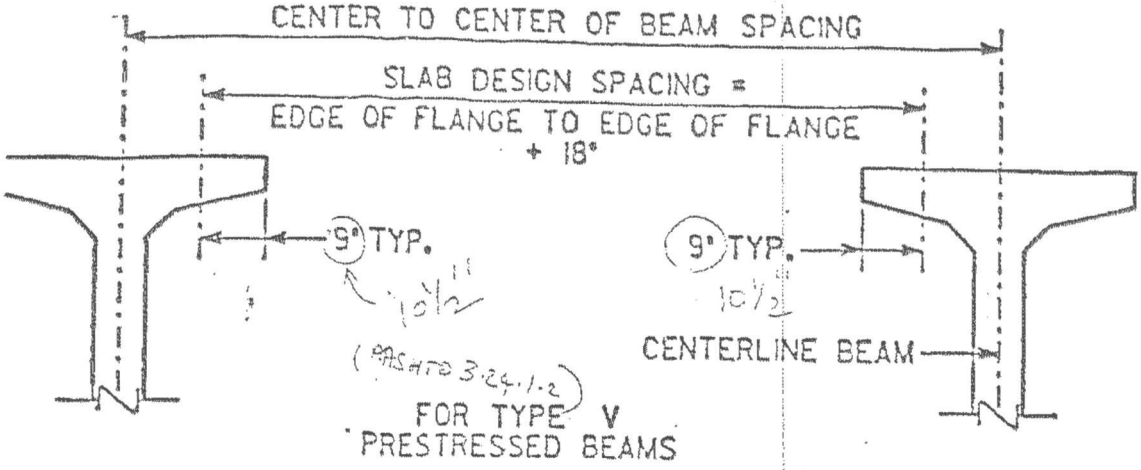
Note that ¼" of concrete thickness may be planed off of the top of cast-in-place decks on interstate routes, state routes and routes with design year ADT equal to or greater than 2000. Therefore, reduce slab thickness accordingly for strength calculations of composite slabs on steel or PSC beams and post-tensioned boxes.

Deck slabs shall be designed by the Service Load method with f_c = 1400 psi (10 MPa), as a rule.

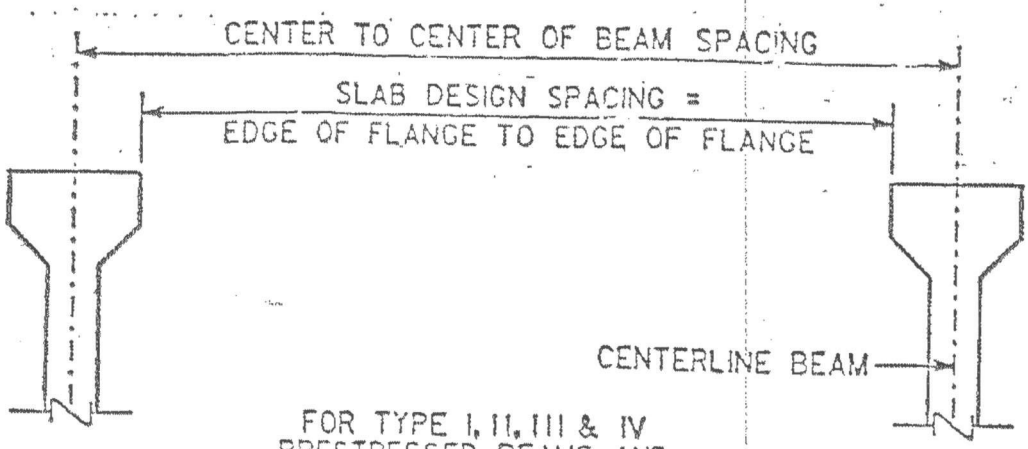
The minimum 28 day strength (f'_c) for the deck concrete shall be 3500 psi (25 MPa). Slabs shall be designed so that the main slab reinforcement is the same in the bottom of the slab as in the top. To achieve this, the effective depth shall be taken as the distance from the bottom of the slab to the centroid of the top main reinforcing steel for both positive and negative moment. Positive and negative moments shall be assumed to be equal and shall be calculated in accordance with the AASHTO Specifications.

See Fig. 4-01 for a location map of the fall line for Georgia.

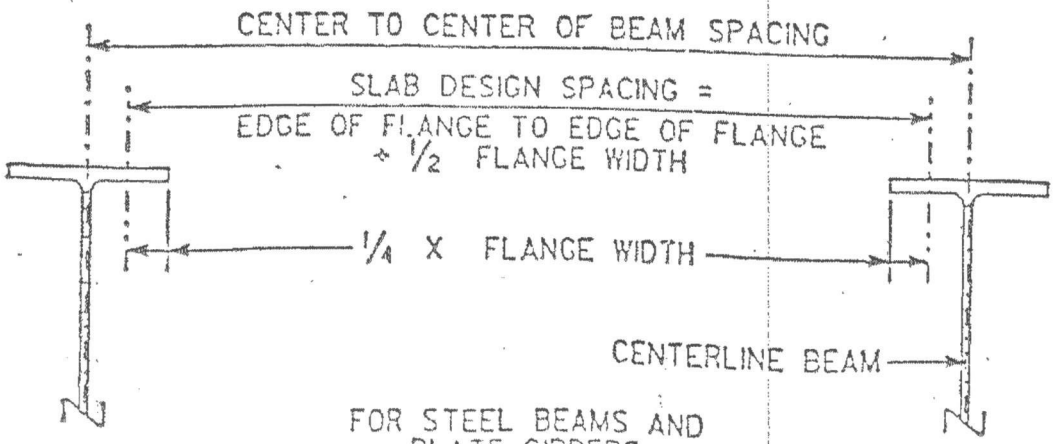
FALL LINE MAP
Figure 4-01



FOR TYPE V
PRESTRESSED BEAMS



FOR TYPE I, II, III & IV
PRESTRESSED BEAMS AND
CONCRETE T-BEAMS



FOR STEEL BEAMS AND
PLATE GIRDERS

FIG. NO. 1 (cont'd)

CALCULATION COVER SHEET

PROJECT	JOB NO.	CALC NO.	SHEET
I-75 / I-575 NORTHWEST CORRIDOR	NH000-0575-01(028)	BR#42	1
SUBJECT	DISCIPLINE		
Beam Design Input	STRUCTURAL		

CALCULATION STATUS DESIGNATION	PRELIMINARY	CONFIRMED	SUPSEDED	VOIDED	INCOMPLETE
	☐	☐	☐	☐	X

COMPUTER PROGRAM/TYPE	SCP	MAINFRAME	PC	PROGRAM	VERSION/RELEASE NO.
	(X) YES ( ) NO	( )	(X)	Excel	2003

Note 1: Georgia Department of Transportation (GDOT) terminated Contract Number TOURDPPI60072 for its convenience prior the completion of all work under that contract and directed that the work with respect to these calculations be discontinued.
(a) These calculations were not completed at the time of GDOT's direction and the information contained herein is not complete and/or has not been fully verified or checked. These calculations are a work-in-progress and are presented only as such.
(b) Any user is cautioned that the use of these calculations and any related information or calculations, without access to factors and without proper regard for their purpose, could lead to erroneous conclusions.
(c) If any such calculations or any information contained herein is used in future work efforts or any follow on design work activity, a complete confirmation of the information contained herein should be performed prior to any such use.
(d) GTP has no responsibility for the use of this information not under its direct control.

Beam Design Input calculations are included for spans 1-6.

NO.	REASON FOR REVISION	TOTAL NO. OF SHEETS	LAST SHEET NO.	BY	CHECKED	APPROVED/ ACCEPTED	DATE
A	As per GDOT's termination for convenience direction	6	6	JCR			11/30/09

RECORD OF REVISIONS

CALCULATION SHEET

PROJECT: I-75 / I-575 NORTHWEST CORRIDOR
JOB NUMBER NH000-0575-01(028)
CALC NO. BR#42

SUBJECT: Beam Design Input - Spans 1-6 SHEET NO.
BY: JCR DATE: 11/30/2009 SHEET REV.

Sufficient sample calculations representative of the scope and conditions in the design calculation were performed and the results compared to demonstrate the computer program adequacy.

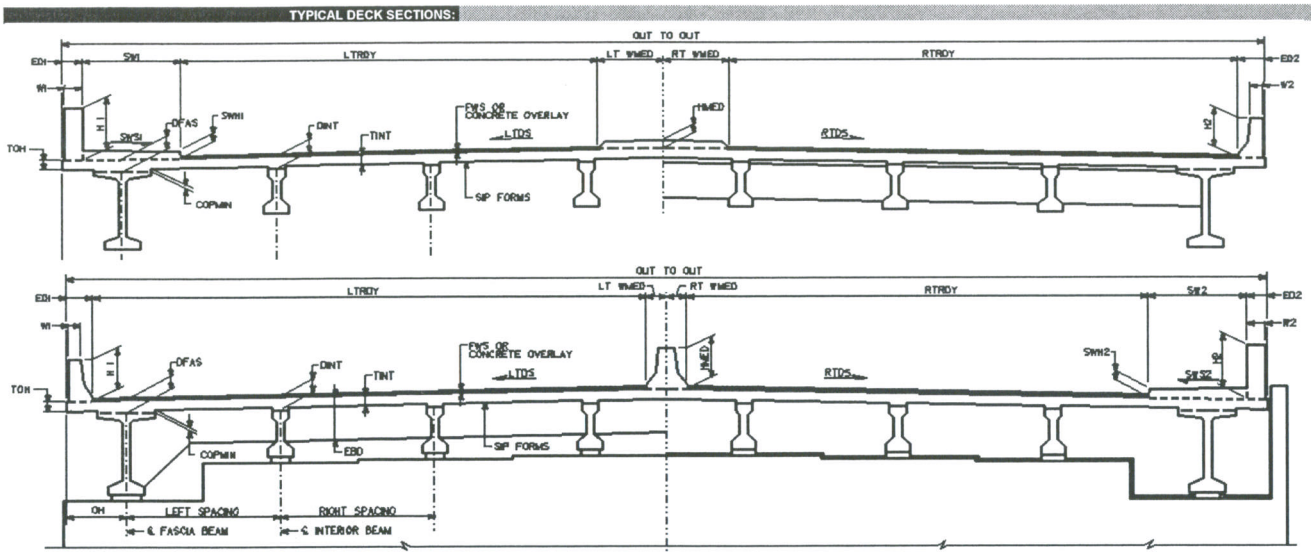
BRIDGE: **I-575 over Little River**
COUNTY: **CHEROKEE**
P.I. NO: **713640**
PROJECT: **NH000-0575-01(028)**

Description: BT 54 at 6.5ft
Design Span Length: 86.704 ft.
Span No.: All Spans Right Bridge Widening

J.B. TRIMBLE, INC.
JBT

JOB NO: **31-6036**
DESIGNED BY: **WBN**
CHECKED BY: **JCR**
10-5-09 JCR

TYPICAL DECK SECTIONS:



SECTION THRU EDGE BEAM

SECTION THRU ENDWALL

Description: BT 54 at 6.5ft
Design Span Length: 86.704 ft.
Span No.: All Spans Right Bridge Widening

NON-COMPOSITE DEAD LOADS PER BEAM:

SLAB:

D_{INT} =	12.25 in.
T_{INT} =	7.375 in.
INTEGRAL WEARING SURFACE THICKNESS =	0.25 in.
DESIGN T_{INT} =	7.125 in.
INT. COP_{MIN} =	1.5 in.
INT. COP_{MAX} =	4.875 in.
INT. COP. DEPTH DESIGN METHOD:	Average Coping
INT. COP_{WIDTH} =	42 in.
AVG. INT. COP DEPTH =	3.1875 in.
SIP FORMS:	Yes
SLAB CONC.$_{WEIGHT}$ =	0.150 k/ft^3
BEAM CONC.$_{WEIGHT}$ =	0.150 k/ft^3

INT. $SLAB_{WEIGHT}$ =	0.599 klf
INTEGRAL WEARING $SURFACE_{WEIGHT}$ =	0.020 klf
INT. COP_{WEIGHT} =	0.139 klf
INT. SIP_{WEIGHT} =	0.048 klf
INT. $BEAM_{WEIGHT}$ =	0.686 klf
NON-COMPOSITE DEAD LOAD PER BEAM =	1.473 klf

INTERIOR BEAM PROPERTIES:

INT. BEAM TYPE: BT 54

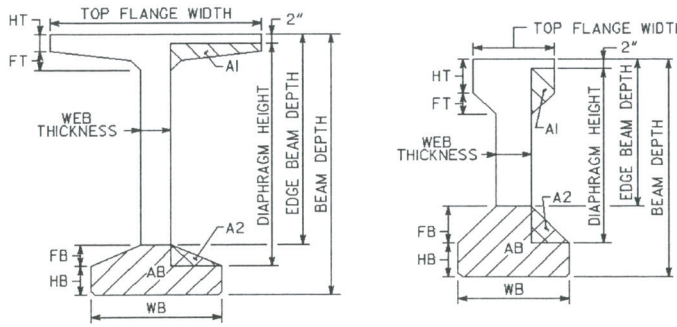
Top Flange Width =	42 in.
Beam Depth =	54 in.
Web Thickness =	6 in.
H_T =	3.5 in.
F_T =	2.43 in.
H_B =	6 in.
W_B =	26 in.
F_B =	4.5 in.
E.B. Depth (no coping) =	43.5 in.
Diaphragm Height =	46 in.
Cross Sectional Area =	659 in^2
A1 =	49 in^2
A2 =	22.5 in^2
AB =	228 in^2
INT. $BEAM_{WEIGHT}$ =	0.686 klf

CONCRETE STRENGTHS:

$f'_{C\ BEAM}$ =	5000 psi
$f'_{CI\ BEAM}$ =	4500 psi
$f'_{C\ SLAB}$ =	3500 psi
SIT =	0.201 k / in^2
SFB =	0.424 k / in^2

TYPE OF STRANDS = 0.5 in. dia. low-relax
DRAPED STRANDS ? Yes

STRAND AREA = 0.167 sq. in.
RB_{FPU} = 0.75
RT_{FPU} = 0.22



DEFINITION OF BEAM AREAS FOR EB. & DIAPH. CALCS

BRIDGE: **I-575 over Little River**
COUNTY: **CHEROKEE**
P.I. NO: **713640**
PROJECT: **NH000-0575-01(028)**
Description: BT 54 at 6.5ft
Design Span Length: 86.704 ft.
Span No.: All Spans Right Bridge Widening

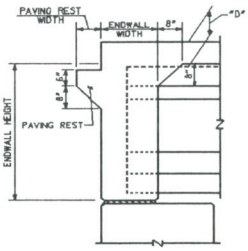
J.B. TRIMBLE, INC.

JOB NO: **31-6036**
DESIGNED BY: **WBN**
CHECKED BY: **JCR**

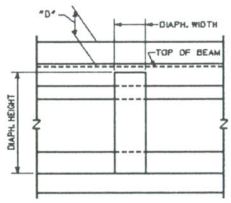
EW., DIAPH., EDGE BEAM DIMENSIONS & CALCS:

SPAN TYPE:	End Span
	Endwall 1:
EW. TYPE:	Expansion
INT. EW. WIDTH =	1.50 ft.
INT. EW. HEIGHT =	5.16 ft.
BM. EMBED. FOR EW. =	7 in.
PAV. REST WIDTH =	8 in.
INT. EW. WEIGHT =	7.899 kips
DIAPH. WIDTH =	10 in.
DIAPH. HEIGHT =	46 in.
INT. DIAPH. WEIGHT =	2.751 kips
INT. EB. HEIGHT =	48.375 in.
INT. EB. WIDTH =	12 in.
BM. EMBED. FOR EB. =	7 in.
INT. EB. WEIGHT =	3.669 kips

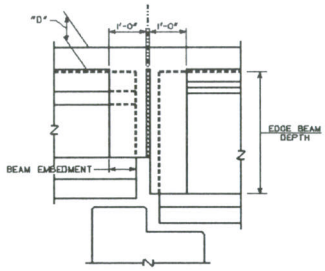
DIAPHRAGMS
1



SECTION AT ENDWALL



SECTION THRU DIAPHRAGM



SECTION THRU EDGE BEAM

INT. P-LOADS:	LOAD	POSITION	REACTION	MOMENT
EW. =	7.899 kips	0.00 ft.	7.899 kips	0.000 k-ft.
DIAPH. =	2.751 kips	43.35 ft.	1.375 kips	59.628 k-ft.
DIAPH. =	N/A	N/A	N/A	N/A
DIAPH. =	N/A	N/A	N/A	N/A
EB. =	3.669 kips	86.70 ft.	0.000 kips	0.000 k-ft.
	TOTAL POINT DEAD LOAD PER BEAM =		9.274 kips	59.628 k-ft.

DECK SECTION DIMENSIONS & CALCS:

LEFT BARRIER
BARRIER TYPE: Jersey Barrier
FENCING OPTION: None
ED_1 = 1.625 ft.
W_1 = 0.75 ft.
H_1 = 2.667 ft.
LTDS = 7.0000 %

MEDIAN
MEDIAN TYPE: None

EXISTING RIGHT BARRIER
BARRIER TYPE: Jersey Barrier
FENCING OPTION: None
ED_2 = 1.625 ft.
W_2 = 0.75 ft.
H_2 = 2.667 ft.
RTDS = 7.0000 %

BRIDGE TYPE = Bridge Widening
SPAN LENGTH = 86.704 ft.
SKEW ANGLE = 90.0000 degrees

LEFT SPACING = 6.5 ft.
RIGHT SPACING = 6.5 ft.
LEFT OVERHANG = 2.9635 ft.

LEFT OFFSET TO BARRIER = 1.5 in.
RIGHT OFFSET TO BARRIER = 1.5 in.
SPACING TO SET BEAM = 4.75 ft.
NO. OF NEW BEAMS = 3 beams
NO. OF BEAMS IN EXISTING BRIDGE = 7 beams
NO. OF SET BEAMS W/ COMP. LOADS = 7 beams
TOTAL NO. OF BEAMS SUPPORTING WIDENING = 10 beams
NO. OF NEW BAYS = 3 bays

WIDENED BRIDGE OUT TO OUT = 20.714 ft.
EXISTING BRIDGE OUT TO OUT = 43.708 ft.
FINISHED BRIDGE OUT TO OUT = 64.422 ft.

Ignore Median only for RDWY Width Calculations = No

LT RDWY = 30.586 ft.
RT RDWY = 30.586 ft.
TOTAL WIDENED RDWY WIDTH = 61.172 ft. NOT Including median with

NOTE: BRIDGE WIDENING IS TO ONE SIDE ONLY !

Description: BT 54 at 6.5ft
Design Span Length: 86.704 ft.
Span No.: All Spans Right Bridge Widening

SUPERIMPOSED DEAD LOADS:

LEFT BARRIER
BARRIER WEIGHT = 0.405 klf
FENCING WEIGHT = 0.000 klf

MEDIAN
MEDIAN WEIGHT = 0.000 klf

RIGHT BARRIER
BARRIER WEIGHT = 0.405 klf
FENCING WEIGHT = 0.000 klf

NOTE: BARRIER WEIGHT INCLUDES SIDEWALK WEIGHT, IF PRESENT

FWS DESIGN METHOD: Avg. Beam Sp.
WEIGHT OF FWS = 30 lb/sf

DECK OVERLAY: No
AVG. THICKNESS = 0 in.

DIST. MEDIAN AND/OR BARR. TO ALL BEAMS ? No

OVERRIDE NO. OF BM. TO DIST. LT BARRIER ? No
NO. OF BEAMS DIST. TO LT BARRIER = 10 beams

BEAMS SUPPORTING LT BARRIER
BM 1 - BM 10

OVERRIDE NO. OF BM. TO DIST. RT BARRIER ? No
NO. OF BEAMS DIST. TO RT BARRIER = 10 beams

BEAMS SUPPORTING RT BARRIER
BM 1 - BM 10

SUPERIMPOSED LOADS PER BRIDGE:
FWS WEIGHT = 1.835 klf per bridge
DECK OVERLAY WT. = 0.000 klf per bridge
UTILITY WEIGHT TO SUPERSTRUCTURE = 0.000 klf per bridge
TOTAL SUPERIMPOSED DEAD LOAD = 2.646 klf per bridge

SUPERIMPOSED LOADS PER BEAM:
FWS WEIGHT = 0.195 klf per beam
DECK OVERLAY WT. = 0.000 klf per beam
UTILITY WEIGHT TO SUPERSTRUCTURE = 0.000 klf per beam

LT BARRIER DEAD LOAD = 0.041 klf per beam
RT BARRIER DEAD LOAD = 0.041 klf per beam
DOUBLE LOADING DEAD LOAD = 0.082 klf per beam

DOUBLE LOADING GOVERNS DESIGN

CONTROLLING SUPERIMPOSED DEAD LOAD = 0.277 klf per beam

BRIDGE CONFIGURATION OVERLAPS BARRIER AND / OR MEDIAN LOADS, CREATING WORST BEAM LOADING CASE

DOUBLED LOADING CASES

	BARRIER ONLY	RAISED MEDIAN	MED. BAR.
WITHOUT OVERRIDE	0.082 klf per beam	0.082 klf per beam	0.041 klf per beam
WITH OVERRIDE	0.082 klf per beam	0.082 klf per beam	0.041 klf per beam

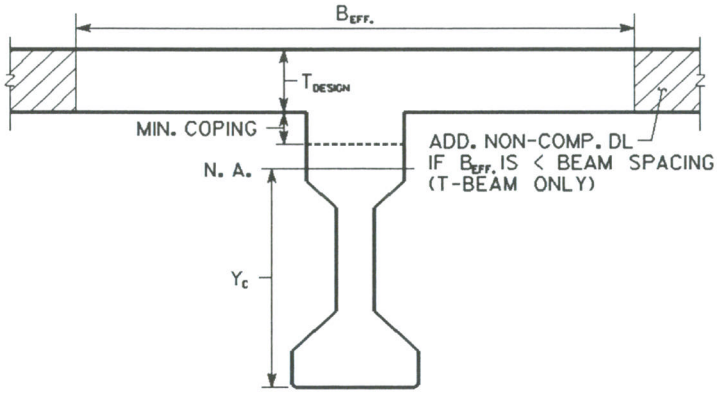
BRIDGE: **I-575 over Little River**
COUNTY: **CHEROKEE**
P.I. NO: **713640**
PROJECT: **NH000-0575-01(028)**

J.B. TRIMBLE, INC.

JOB NO: **31-6036**
DESIGNED BY: **WBN**
CHECKED BY: **JCR**

COMPOSITE SECTION MODULUS CALC:

SPAN LENGTH = **86.704 ft.**



BEAM MOMENT OF INERTIA =	268,051 in^4
BEAM Y_{BN} =	27.63 in.
INT. COP_{MIN} =	1.5 in.
DESIGN T_{INT} =	7.125 in.
E_{BM} =	4.29 x 10^6 psi
E_{SLAB} =	3.59 x 10^6 psi
modular ratio =	1.19

AASHTO 8.10.1.1 - Compression Flange Width

wBM FLANGE =	42.00	in.
B_{eff} = Bm Spacing =	**78.00**	**in. CONTROLS**
B_{eff} = ¼ Span Length =	**260.11**	in.
B_{eff} = WBM FLANGE + 2[6 tSLAB] =	**127.50**	in.

Add. Non-Comp. DL (WDLNC) = 0.000 klf (T-Beam Only)

Y_C =	40.63 in.
COMPOSITE MOM. OF INERTIA =	539,400 in^4

COMPOSITE SECTION MODULI:

SECTION MOD. AT TOP OF SLAB =	24,529 in^3
SECTION MOD. AT TOP OF BEAM =	40,358 in^3
SECTION MOD. AT BOT. OF BEAM =	13,274 in^3

Description: BT 54 at 6.5ft
Design Span Length: 86.704 ft.
Span No.: All Spans Right Bridge Widening

DISTRIBUTION & DEFLECTION FACTOR CALCS:

DISTRIBUTION FACTOR CALCS:

MOMENT	1.182	WHEEL
	0.591	AXLE
SHEAR	1.462	WHEEL
	0.731	AXLE

DEFLECTION FACTOR CALCS:

ALLOW USER TO DEFINE NO. OF LANES ?	No	
CALCULATED NO. OF LANES =	5	6.5 ft.
		6.5 ft.
ALLOW USER TO DEFINE NO. OF BEAMS ?	No	
CALCULATED NO. OF BEAMS =	10	-> 10 beams will be used for DFD calcs.
REDUCTION FACTOR =	0.75	
DFD =	0.750	

(ASHTO 8.7.3) =

LIVE LOAD CALCS:

LEFT SIDEWALK LIVE LOAD:

		REACTION	MOMENT
SW_1 =	0 ft.	0.00 kips	0.000 k-ft.
LEFT SW. LL. =	0.060 kips / ft^2		
SW LL PER BEAM =	0.000 klf		

IMPACT FACTOR: 1.24

RIGHT SIDEWALK LIVE LOAD:

		REACTION	MOMENT
SW_2 =	0 ft.	0.00 kips	0.000 k-ft.
RIGHT SW. LL. =	0.060 kips / ft^2		
SW LL PER BEAM =	0.000 klf		

HS 20 LOADING:

			REACTION	R x DF x I
MIDSPAN:	1277.000 k-ft.	TRUCK:	64.231 kips	52.465 kips
MAX:	1281.532 k-ft.	LANE:	53.680 kips	43.754 kips

	REACTION	MOMENT
TOTAL LL+I =	52.465 kips	932.809 k-ft.
	MAX TOTAL LL+I =	**936.120 k-ft.**

BRIDGE: **I-575 over Little River**
COUNTY: **CHEROKEE**
P.I. NO: **713640**
PROJECT: **NH000-0575-01(028)**

J.B. TRIMBLE, INC.

JOB NO: **31-6036**
DESIGNED BY: **WBN**
CHECKED BY: **JCR**

SUMMARY OF DEAD & LIVE LOADINGS:

NON-COMPOSITE DEAD LOADS PER BEAM:

INT. SLAB $_{WEIGHT}$ =	0.599 klf
INT. COP$_{WEIGHT}$ =	0.139 klf
INT. SIP$_{WEIGHT}$ =	0.048 klf
INT. BEAM$_{WEIGHT}$ =	0.686 klf
TOTAL N-COMP. DL =	**1.473 klf**

SUPERIMPOSED DEAD LOADS PER BEAM:

LEFT BARRIER WEIGHT =	0.041 klf
LEFT FENCING WEIGHT =	0.000 klf
MEDIAN WEIGHT =	0.000 klf
RIGHT BARRIER WEIGHT =	0.041 klf
RIGHT FENCING WEIGHT =	0.000 klf
FWS WEIGHT =	0.195 klf
DECK OVERLAY WT. =	0.000 klf
UTILITY WEIGHT =	0.000 klf
TOTAL SUPERIMPOSED DL =	**0.277 klf**

LOADING RESULTS

	LOADING	REACTION	MOMENT
TOTAL N-COMP. DL =	1.473 klf	63.863 kips	1384.297 k-ft
TOTAL SUPERIMPOSED DL =	0.277 klf	12.009 kips	260.296 k-ft
TOTAL POINT DL =		9.274 kips	59.628 k-ft
TOTAL DL =	**1.750 klf**	**85.146 kips**	**1704.222 k-ft**
LEFT SW LL =	0.000 klf	0.000 kips	0.000 k-ft
RIGHT SW LL =	0.000 klf	0.000 kips	0.000 k-ft
TOTAL SW LL =	**0.000 klf**	**0.000 kips**	**0.000 k-ft**
MAX OF TRUCK OR LANE LL+I =		**52.465 kips**	**932.809 k-ft**
TOTAL DL + SW LL + (LL + I) =		**137.611 kips**	**2637.031 k-ft.**

Description: BT 54 at 6.5ft
Design Span Length: 86.704 ft.
Span No.: All Spans Right Bridge Widening

SUMMARY OF PROGRAM INPUT:

SIMPLE SPAN PROGRAM INPUT:

INTERIOR BEAM

LENGTH =	86.704 ft.	$f'_{C\ BEAM}$ =	5000 psi
Moment Dist. Factor (DFM) =	1.182	$f'_{CI\ BEAM}$ =	4500 psi
End Shear Dist. Factor (DFV) =	1.462	SIT =	0.201 k / in^2
LL Deflection Dist. Factor (DFD) =	0.750	SFB =	0.424 k / in^2
Non- Composite DL (W_{DLNC}) =	0.787 klf	E_{BM} =	4.29 x 10^6 psi
Composite DL (W_{DLC}) =	0.277 klf	E_{SLAB} =	3.59 x 10^6 psi
Sidewalk LL (W_{swk}) =	0.000 klf		
Effective Concrete Width (W_f) =	78.00 in.		
Concrete Slab Thickness (T_f) =	7.125 in.		
Minimum Coping (Df) =	1.500 in.		

P-LOADS:	P1	P2	P3	P4	P5
X	0.000 ft.	43.352 ft.	86.704 ft.	N/A	N/A
LOAD	7.899 kips	2.751 kips	3.669 kips	N/A	N/A

CALCULATION COVER SHEET

PROJECT	JOB NO.	CALC NO.	SHEET
I-75 / I-575 NORTHWEST CORRIDOR	NH000-0575-01(028)	BR#42	1
SUBJECT	DISCIPLINE		
Beam Design Output	STRUCTURAL		

CALCULATION STATUS DESIGNATION	PRELIMINARY	CONFIRMED	SUPSEDED	VOIDED	INCOMPLETE
	☐	☐	☐	☐	X

COMPUTER PROGRAM/TYPE	SCP	MAINFRAME	PC	PROGRAM	VERSION/RELEASE NO.
	(X) YES ( ) NO	( )	(X)	GDOT BRPSBM1	06/26/2008

Note 1: Georgia Department of Transportation (GDOT) terminated Contract Number TOURDPPI60072 for its convenience the completion of all work under that contract and directed that the work with respect to these calculations be discontinued.
(a) These calculations were not completed at the time of GDOT's direction and the information contained herein is not and/or has not been fully verified or checked. These calculations are a work-in-progress and are presented only as such.
(b) Any user is cautioned that the use of these calculations and any related information or calculations, without access to factors and without proper regard for their purpose, could lead to erroneous conclusions.
(c) If any such calculations or any information contained herein is used in future work efforts or any follow on design work a complete confirmation of the information contained herein should be performed prior to any such use.
(d) GTP has no responsibility for the use of this information not under its direct control.

Beam design ouptput is included for spans 1-6.

NO.	REASON FOR REVISION	TOTAL NO. OF SHEETS	LAST SHEET NO.	BY	CHECKED	APPROVED/ ACCEPTED	DATE
A	As per GDOT's termination for convenience direction	8	8	JCR			11/30/09

RECORD OF REVISIONS

CALCULATION SHEET

PROJECT: I-75 / I-575 NORTHWEST CORRIDOR
JOB NUMBER NH000-0575-01(028)
CALC NO. BR#42

SUBJECT: Beam Design Output - Spans 1-6 SHEET NO.
BY: JCR DATE: 11/30/2009 SHEET REV.

Sufficient sample calculations representative of the scope and conditions in the design calculation were performed and the results compared to demonstrate the computer program adequacy.

02-OCT-09
11:29:38

GEORGIA DEPARTMENT OF TRANSPORTATION
PRECONSTUCTION DIVISION - OFFICE OF BRIDGE & STRUCTURAL DESIGN
THE ANALYSIS OR DESIGN OF SIMPLE SPAN PRESTRESSED BEAMS
REVISED: JUNE 26, 2008

PROB. NO. INT.

10-5-09 JCR

31-6036 I-575 over Little River

SPAN DATA

D/A	LL CLASS	LL SK.	LENGTH	DFM	DFV	DFD	WDLNC	WDLC	WSWK	F'C	F'CI	NPL	SIT	SFB	SFTE
D	HS20	0 0 0	86.704	1.182	1.462	0.750	0.787	0.277	0.000	5.000	4.500	3	-0.201	-0.424	-0.001

BEAM DATA

BEAM DIMENSIONS								* COMPOSITE SLAB			* (E X 1,000,000)		* STIRRUP	DECK	
WT	HT	FT	WS	HB	WB	FB	DB	* WF	TF	DF	* E BEAM	E SLAB	* SIZE	PANEL	FSY
42.00	3.50	2.43	6.00	6.00	26.00	4.50	54.00	78.00	7.125	1.500	4.29	3.59	5	0	60.

STRAND DATA

TYPE	NST	XDIST	ACTUAL NO. OR MAX. NO. OF STRANDS PER ROW	ASB	AST	DIAM	TCL	BCL	SPAC.
0	4	0.5830	12 12 8 4 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	0.1670	0.1670	0.500	2.50	2.50	2.00

RBFPU	BFPU	IBLOSS	FBLOSS	RTFPU	TFPU	ITLOSS	FTLOSS	WTC	LOW LAX	ITLENGTH	FTLENGTH	DLENGTH
.75	270.00	0.00	0.00	.22	270.00	0.00	0.00	.150	1	0.00	0.00	0.00

DEBONDING DATA

DEBOND	ACT. # AND LENGTH OR MAX. # AND LENGTH OF STRANDS DEBONDED PER ROW
0	0 .00 0 .00 0 .00 0 .00 0 .00 0 .00 0 .00 0 .00 0 .00 0 .00 0 .00 0 .00 0 .00 0 .00 0 .00 0 .00 0 .00 0 .00 0 .00 0 .00
	0 .00 0 .00 0 .00 0 .00 0 .00 0 .00 0 .00 0 .00 0 .00 0 .00 0 .00 0 .00 0 .00 0 .00 0 .00 0 .00 0 .00 0 .00 0 .00 0 .00

DRAPE DATA

DRAPED	MAX RAISE	HOLD DOWN PT.	ACT. # OR MAX. # OF STRANDS DRAPED PER ROW
1	0.00	.50	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 0 0 0 0

P-LOADS

XP1	P1	XP2	P2	XP3	P3	XP4	P4	XP5	P5
0.000	7.899	43.352	2.751	86.704	3.669				

PRESTRESSED BEAM DESIGN - OUTPUT DATA FOR PROBLEM NO. INT. 31-6036 I-575 over Little River

MOMENTS AT SPAN TWENTIETH POINTS - KIP-FEET

LOADS	BRNG	0.05 L	0.10 L	0.15 L	0.20 L	0.25 L	0.30 L	0.35 L	0.40 L	0.45 L	0.50 L
UNIFORM D.L. BEAM	0.000	122.514	232.131	328.853	412.678	483.607	541.640	586.776	619.017	638.361	644.809
UNIFORM D.L. NON-C.	0.000	140.513	266.235	377.167	473.307	554.657	621.216	672.984	709.961	732.147	739.542
CONCENTRATED P-LOADS	0.000	5.963	11.926	17.889	23.852	29.815	35.778	41.741	47.705	53.668	59.631
UNIFORM D.L. COMP.	0.000	49.456	93.707	132.751	166.590	195.222	218.649	236.870	249.885	257.693	260.296
LIVE LOAD + IMPACT	0.000	192.090	361.376	507.859	631.537	732.411	810.481	869.839	914.575	936.507	935.635
TOTAL D.L. + L.L.	0.000	510.536	965.376	1364.518	1707.964	1995.712	2227.764	2408.210	2541.141	2618.376	2639.914

STRESSES AT SPAN TWENTIETH POINTS - KIPS PER SQ.IN.

LOADS		BRNG	0.05 L	0.10 L	0.15 L	0.20 L	0.25 L	0.30 L	0.35 L	0.40 L	0.45 L	0.50 L
UNIFORM D.L. BEAM	TOP	0.000	0.145	0.274	0.388	0.487	0.571	0.639	0.693	0.731	0.753	0.761
	BOT	0.000	-0.152	-0.287	-0.407	-0.510	-0.598	-0.670	-0.726	-0.766	-0.790	-0.797
TOTAL NONCOMP. D.L.	TOP	0.000	0.317	0.602	0.854	1.074	1.261	1.415	1.536	1.625	1.681	1.704
	BOT	0.000	-0.333	-0.631	-0.895	-1.125	-1.321	-1.482	-1.610	-1.703	-1.761	-1.786
TOTAL COMP.D.L.+L.L.	TOP	0.000	0.072	0.135	0.190	0.237	0.276	0.306	0.329	0.346	0.355	0.355
	BOT	0.000	-0.218	-0.411	-0.579	-0.722	-0.839	-0.930	-1.001	-1.053	-1.080	-1.081
TOTAL COMP.+NONCOMP.	TOP	0.000	0.389	0.738	1.045	1.311	1.536	1.721	1.865	1.971	2.036	2.060
	BOT	0.000	-0.551	-1.043	-1.475	-1.847	-2.160	-2.413	-2.610	-2.755	-2.841	-2.867

SHEARS AT SPAN TWENTIETH POINTS - KIPS

LOADS	BRNG	0.05 L	0.10 L	0.15 L	0.20 L	0.25 L	0.30 L	0.35 L	0.40 L	0.45 L	0.50 L
UNIFORM D.L. BEAM	29.748	26.773	23.798	20.823	17.849	14.874	11.899	8.924	5.950	2.975	0.000
UNIFORM D.L. NON-C.	34.118	30.706	27.294	23.883	20.471	17.059	13.647	10.235	6.824	3.412	0.000
CONCENTRATED P-LOADS	9.274	1.375	1.375	1.375	1.375	1.375	1.375	1.375	1.375	1.375	-1.376
UNIFORM D.L. COMP.	12.009	10.808	9.607	8.406	7.205	6.004	4.803	3.603	2.402	1.201	0.000
LIVE LOAD + IMPACT	52.478	44.486	42.019	39.538	37.040	34.525	31.993	29.441	26.868	24.273	21.654
TOTAL D.L. + L.L.	137.626	114.149	104.094	94.025	83.940	73.838	63.718	53.579	43.418	33.236	20.278

BEAM PROPERTIES

* * * * * NON-COMPOSITE BEAM PROPERTIES * * * * * * * * * * * * *							*	COMPOSITE BEAM PROPERTIES * * * * * * *					
I	YT	YB	ST	SB	A	W	*	I	YT	YB	ST	SB	A	QS
268105.4	26.368	27.632	10167.9	9702.6	658.74	0.686	*	539372.2	13.361	40.639	40369.4	13272.3	1123.81	8568.15

STRAND AND MISC. DATA

MAX # STRDS *	ACT # STRDS *	MIN # STRDS *	E @ C.L. *	E @ END *	PS *	ASE *	NS	(EACT-EEND) *	BPI *	BPF *	TPI *	TPF
38	28	24	21.895	19.353	0.71%	1.57		71.186	748.079	637.100	36.573	31.147

MOMENTS(K-FT.) AND SHEARS(KIPS), STIRRUP SPACING, STRESSES(KSI) AT SPAN TWENTIETH POINTS

LOADS	BRNG	0.05 L	0.10 L	0.15 L	0.20 L	0.25 L	0.30 L	0.35 L	0.40 L	0.45 L	0.50 L
ULT. MOMENT REQD.	0.000	830.182	1568.193	2214.034	2767.706	3229.207	3598.537	3884.562	4096.146	4215.560	4242.803
ULT. MOMENT FURN.	455.712	3682.674	4935.548	4959.221	4982.893	5006.567	5030.240	5053.915	5077.589	5101.264	5124.939
1.2*CRACKING MOMENT	1555.415	3726.517	3642.918	3571.542	3512.389	3465.459	3430.753	3408.271	3398.011	3399.975	3414.162
DIST. TO N.A.(IN.)	0.396	3.280	4.429	4.430	4.430	4.431	4.431	4.432	4.432	4.433	4.433
MAX STEEL RATIO	0.007	0.055	0.075	0.074	0.074	0.074	0.073	0.073	0.073	0.072	0.072
ULT. COMP. SHEAR	129.314	110.439	103.532	96.594	89.621	82.612	75.563	68.473	61.337	54.154	46.918
ULT. TOTAL SHEAR	224.396	186.950	171.741	156.500	141.224	125.913	110.562	95.169	79.731	64.244	45.129
BEAM SHEAR CAPACITY	91.944	136.551	149.894	161.754	149.439	112.246	86.641	67.448	52.078	40.849	41.030
MIN. STIRRUP AREA	0.579	0.261	0.149	0.060	0.060	0.099	0.130	0.136	0.130	0.108	0.060
STRP.(#5) SPAC.(IN.)	12.000*	24.000	24.000	24.000	24.000	24.000	24.000	24.000	24.000	24.000	24.000
PRESTRESS STRESS TOP	-0.071	-0.324	-0.344	-0.363	-0.382	-0.402	-0.421	-0.440	-0.460	-0.479	-0.498
BOT	0.642	2.779	2.799	2.820	2.840	2.860	2.881	2.901	2.921	2.941	2.962
INITIAL STRESSES TOP	-0.071	-0.180	-0.070	0.025	0.105	0.169	0.218	0.252	0.271	0.274	0.263
BOT	0.642	2.628	2.512	2.413	2.330	2.262	2.211	2.175	2.156	2.152	2.164
FINAL STRESSES TOP	-0.071	0.113	0.445	0.736	0.985	1.194	1.362	1.490	1.579	1.628	1.635
BOT	0.642	1.816	1.342	0.927	0.572	0.276	0.040	-0.140	-0.268	-0.336	-0.345
FINAL # TOP STRANDS	1.092	4.000	4.000	4.000	4.000	4.000	4.000	4.000	4.000	4.000	4.000
FINAL # BOT STRANDS	6.554	24.000	24.000	24.000	24.000	24.000	24.000	24.000	24.000	24.000	24.000
DEVELOP. # TOP STRDS	0.349	2.941	4.000	4.000	4.000	4.000	4.000	4.000	4.000	4.000	4.000
DEVELOP. # BOT STRDS	2.092	17.648	24.000	24.000	24.000	24.000	24.000	24.000	24.000	24.000	24.000

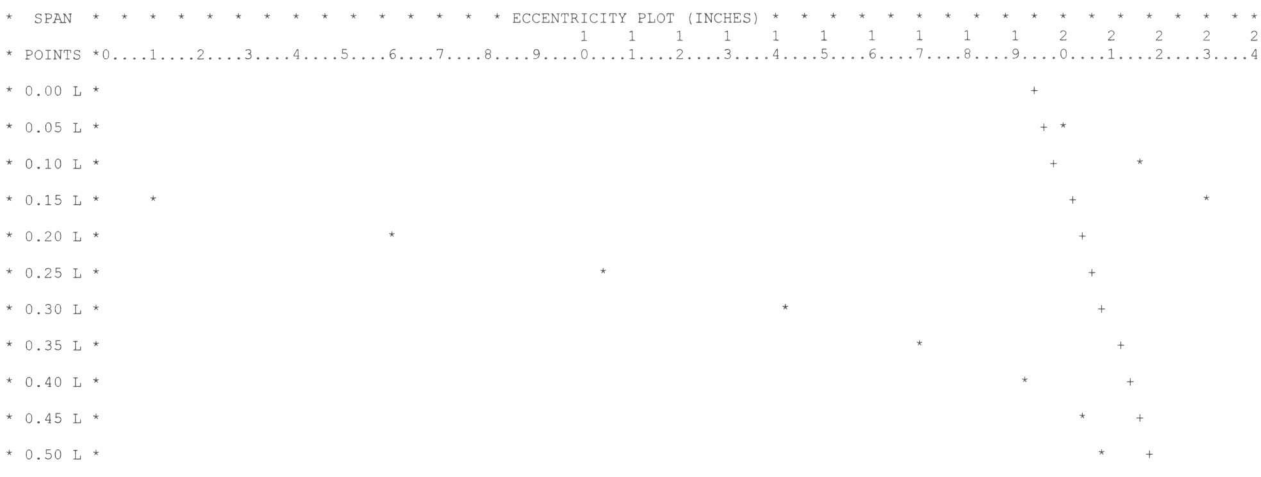
* - FOR "ASE" REQUIREMENTS WITHIN A MAXIMUM DISTANCE OF 11.430" (D/4) FROM THE END OF BEAM USE EITHER
3 LOCATIONS OF 2-#5 STIRRUPS AT A MAXIMUM SPACING OF 4.715" OR
2 LOCATIONS OF 2-#6 STIRRUPS AT A MAXIMUM SPACING OF 9.430" USING 2" CL. FROM END OF BEAM

DEFLECTIONS(INCHES) AT CENTER LINE OF SPAN

BEAM	WDLNC	P-LOADS	WDLC	INITIAL	FINAL	SIDEWALK	TRUCK	LANE	MILITARY	RAILROAD	PRESTR.	CAMBER
0.759	0.870	0.056	0.152	-1.187	0.180	0.000	0.317	0.248	0.225	0.000	-1.946	-2.086

MAXIMUM, ACTUAL AND MINIMUM ECCENTRICITIES(INCHES)AT SPAN TWENTIETH POINTS

ITEM	BRNG	0.05 L	0.10 L	0.15 L	0.20 L	0.25 L	0.30 L	0.35 L	0.40 L	0.45 L	0.50 L
MAX ECC, SIT= -201	26.636	19.914	21.590	23.069	24.351	25.436	26.324	27.014	27.507	27.803	27.901
MAX ECC, SIB= 2700	128.836	20.531	22.208	23.687	24.969	26.054	26.941	27.632	28.125	28.421	28.519
INITIAL ECCENTRICITY	19.386	19.637	19.888	20.139	20.390	20.641	20.891	21.142	21.393	21.644	21.895
FINAL ECCENTRICITY	19.386	19.637	19.888	20.139	20.390	20.641	20.891	21.142	21.393	21.644	21.895
MIN ECC, SFT= 2000	-96.009	-9.073	-3.774	0.901	4.952	8.379	11.183	13.381	14.992	15.980	16.343
MIN ECC, SFB= -424	-37.274	-12.884	-5.748	0.524	5.931	10.472	14.149	17.015	19.123	20.366	20.745



STRAND ARRANGEMENT (TOP STRANDS NOT SHOWN)= 4

+ + + + + R R + + + + +

+ + + + + R R + + + + +

```
*  SPAN  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *STRAND ARRANGEMENT (INCHES) *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *
                                 1 1 1 1 1 1 1 1 1 1 1 2 2 2 2 2 2 2 2 2 2 3 3 3 3 3 3 3 3 3 3 3 4 4 4 4 4 4 4 4 4 4 5 5 5 5 5 5 5 5 5 5 6
* POINTS *0.1.2.3.4.5.6.7.8.9.0.1.2.3.4.5.6.7.8.9.0.1.2.3.4.5.6.7.8.9.0.1.2.3.4.5.6.7.8.9.0.1.2.3.4.5.6.7.8.9.0.1.2.3.4.5.6.7.8.9.0

*  END   *     +   +                          R   R
*  BRNG  *     +   +                          R   R

* 0.05 L *     +   +                      R   R

* 0.10 L *     +   +                  R   R

* 0.15 L *     +   +               R   R

* 0.20 L *     +   +             R   R

* 0.25 L *     +   +          R   R

* 0.30 L *     +   +       R   R

* 0.35 L *     +   +    R   R

* 0.40 L *     +   + R   R

* 0.45 L *     +  R+  R

* 0.50 L *     R   R
```

FINAL STRAND ARRANGEMENT AT END

ROW	TOTAL #STRDS	VER DIST-STRAIGHT STRDS	#RAISED STRDS	VER DIST-RAISED STRDS	#DEB 1	DEB LENGTH 1	#DEB 2	DEB LENGTH 2
1	12	2.500	2	18.500	0	0.00L	0	0.00L
2	12	4.500	2	20.500	0	0.00L	0	0.00L
TOP	4	51.500						

INITIAL TRANSFER LENGTH = 2.507 FT

FINAL TRANSFER LENGTH = 2.135 FT

DEVELOPMENT LENGTH = 6.689 FT

LOSSES (KSI)

TOP STRANDS INITIAL LOSSES= 4.650 TOP STRANDS ADDITIONAL LOSSES= 8.122 TOP STRANDS FINAL LOSSES= 12.773

BOT STRANDS INITIAL LOSSES= 15.853 BOT STRANDS ADDITIONAL LOSSES= 27.690 BOT STRANDS FINAL LOSSES= 43.543

TOTAL LOSSES FOR ALL STRANDS= 39.147

CALCULATION COVER SHEET

PROJECT	JOB NO.	CALC NO.	SHEET
I-75 / I-575 NORTHWEST CORRIDOR	NH000-0575-01(028)	BR#42	1
SUBJECT	DISCIPLINE		
Substructure Design Input	STRUCTURAL		

CALCULATION STATUS DESIGNATION	PRELIMINARY	CONFIRMED	SUPSEDED	VOIDED	INCOMPLETE
	☐	☐	☐	☐	X

COMPUTER PROGRAM/TYPE	SCP	MAINFRAME	PC	PROGRAM	VERSION/RELEASE NO.
	(X) YES ( ) NO	( )	(X)	Excel	2003

Note 1: Georgia Department of Transportation (GDOT) terminated Contract Number TOURDPPI60072 for its convenience prior the completion of all work under that contract and directed that the work with respect to these calculations be discontinued.
(a) These calculations were not completed at the time of GDOT's direction and the information contained herein is not complete and/or has not been fully verified or checked. These calculations are a work-in-progress and are presented only as such.
(b) Any user is cautioned that the use of these calculations and any related information or calculations, without access to factors and without proper regard for their purpose, could lead to erroneous conclusions.
(c) If any such calculations or any information contained herein is used in future work efforts or any follow on design work activity, a complete confirmation of the information contained herein should be performed prior to any such use.
(d) GTP has no responsibility for the use of this information not under its direct control.

Substructure Design Input calculations are included for bents 1&7, bent 3, bent 4, and bent 6.

NO.	REASON FOR REVISION	TOTAL NO. OF SHEETS	LAST SHEET NO.	BY	CHECKED	APPROVED/ ACCEPTED	DATE
A	As per GDOT's termination for convenience direction	18	18	JCR			11/30/09

RECORD OF REVISIONS

CALCULATION SHEET

PROJECT: I-75 / I-575 NORTHWEST CORRIDOR
JOB NUMBER NH000-0575-01(028)
CALC NO. BR#42

SUBJECT: Bent Design Input - Bents 1&7 SHEET NO.
BY: JCR DATE: 11/30/2009 SHEET REV.

Sufficient sample calculations representative of the scope and conditions in the design calculation were performed and the results compared to demonstrate the computer program adequacy.

BRIDGE: **I-575 over Little River**
COUNTY: **CHEROKEE**
P.I. NO: **713640**
PROJECT: **NH000-0575-01(028)**

J.B. TRIMBLE, INC.

JOB NO: **255717**
DESIGNED BY: **WBN**
CHECKED BY: **JCR**

END BENT REACTIONS: BENTS 1 & 7

APPROACH SLAB LENGTH =	30.00	feet	CAP DEPTH =	2.00	ft
			CAP WIDTH =	3.00	ft
SKEW =	90.00	degrees			
BEAM SPACING =	6.500	feet			
SPACING ALONG SKEW =	6.500	feet			
DEAD LOAD REACTION =	85.146	kips			
DL OF APPROACH =	8.122	kips			
WEIGHT OF CAP =	5.85	kips			
TOTAL DL =	99.12	kips			
LIVE LOAD =	42.44	kips	Pile Type:	**Steel HP**	
TOTAL PILE REACTION =	**141.56**	**kips =**	**71**	**tons**	**Use--> HP14x73**

WINGWALL LENGTH CALCULATIONS:

BENT	**1**		**7**	
SKEW =	90.00	degrees	90.00	degrees
"D" =	12.25	IN	12.25	IN
BEARING PAD THICKNESS =	2.500	IN	2.500	IN
CAP DEPTH =	2.00	FT	2.00	FT
BEAM DEPTH =	54	IN	54	IN
BERM =	2	FT	2	FT
CAP WIDTH =	3	FT	3	FT
H =	7.73	FT	7.73	FT
WINGWALL HEIGHT USED =	8.25	FT	8.25	FT
THEORETICAL WINGWALL LENGTH =	13.46	FT	13.46	FT
ACTUAL WING WALL LENGTH =	13.50	FT	13.50	FT
NUMBER OF PILES PER WINGWALL =	1		1	

CALCULATION SHEET

PROJECT: I-75 / I-575 NORTHWEST CORRIDOR
JOB NUMBER NH000-0575-01(028)
CALC NO. BR#42

SUBJECT: Bent Design Input - Bent 3 SHEET NO.
BY: JCR DATE: 11/30/2009 SHEET REV.

Sufficient sample calculations representative of the scope and conditions in the design calculation were performed and the results compared to demonstrate the computer program adequacy.

BRIDGE: **I-575 over Little River**
COUNTY: **CHEROKEE**
P.I. NO: **713640**
PROJECT: **NH000-0575-01(028)**

J.B. TRIMBLE, INC.

JOB NO: **255717**
DESIGNED BY: **WBN**
CHECKED BY: **JCR**

PIER DESIGN CALCULATIONS

BENT 3

~~DRILLED SHAFT~~ → PILE FOOTING

GENERAL REQUIREMENTS:

Live Load cases:		See GDOT Program BRLLCA		
Skew Angle:		90.0000	° FROM CL BRIDGE	
		0.0000	° FROM CL BENT	
Concrete Strength:		3500	psi	
Rebar Strength:		60000	psi	
	Ec =	3587	ksi	AASHTO 8.7.1
	Es =	29000	ksi	AASHTO 8.7.2
Allowable Steel Stress:		24000	psi	AASHTO 8.15.2.2
	n = Ec/Es =	8		AASHTO 8.15.3.4
Cap Bar size:		11	#	
Stirup Size:		5	#	
Max bars / row in top of cap:		12	bars	
Max bars / row in bot of cap:		13	bars	
Column Steel Ratios:		1	% min.	
		8	% max.	

Impact Factor	Length (ft)	Impact
LEFT SPAN	88.00	1.2347
RIGHT SPAN	88.00	1.2347
	Avg. Impact =	1.2347

Soil Weight 0.120 kcf

Columns: CLEAR 2.500
TYPE C (S-SQUARE or RECTANGULAR, C-CIRCULAR, P-PILES)

Pile Spacing: 3.00 ft. MIN 5 ft. MAX
1.00 ft. EMBED 1.5 ft. EDGE

Pile Capacity:

TYPE	14 HP 73			
ALLOWABLE LOAD	192	KIPS =	96	TONS
UPLIFT	0	KIPS		

BRIDGE: **I-575 over Little River**
COUNTY: **CHEROKEE**
P.I. NO: **713640**
PROJECT: **NH000-0575-01(028)**

J.B. TRIMBLE, INC.

JOB NO: **255717**
DESIGNED BY: **WBN**
CHECKED BY: **JCR**

PIER DESIGN CALCULATIONS

BENT 3 ~~DRILLED SHAFT~~ → PILE FOOTING

WIND ON SUPERSTRUCTURE — AASHTO 3.15.2.1.1

	Left Span	Right Span			
Parapet Height =	32	32	in.		
Beam Height =	54	54	in.		
'D' or 'H' Dimension =	12.25	12.25	in.		
Beam + Coping + Slab =	5.52	5.52	ft.		
Total Height =	8.19	8.19	ft.		
Span Lengths =	88.00	88.00	ft.	TOTAL	
Wind Force Area =	360.3	360.3	$ft.^2$	721	$ft.^2$
Height of Cap =	3.00	3.00	ft.		
Wind Force Arm =	5.594	ft.			

WIND ON SUBSTRUCTURE: — AASHTO 3.15.2.2

Wind Force =	0.040	ksf	PARA. & PERP.
Length of Cap =	16.00	ft.	
Width of Cap =	4.50	ft.	
CG of Cap ELEV =	890.00		
Ground Line ELEV=	853.00		
Depth to Point of Fixity =	2.00		
Pt. of Fixity ELEV =	851.00		
Bot. Cap to Pt. of Fixity =	37.50	ft.	
Design Height of Column =	39.00	ft.	CG Cap to Pt. of Fixity
Exposed Height of Column =	35.50	ft.	
Width of Column =	4.50	ft.	
Depth of Column =	4.50	ft.	
No. of Columns =	1	columns	

	PARA.	PERP.	
M_{CAP} =	21.060	74.880	k-ft.
M_{COL} =	126.203	126.203	k-ft.
M_{TOTAL} =	147.263	201.083	k-ft.
P_T =	3.776	5.156	kips

WIND ON LIVE LOAD — AASHTO 3.15.2.1.2

Length =	88.0	ft.			
APT = APL =	13.021	ft.	Use-->	13.021	ft.

TRACTION & CENT. FORCES: For One lane — AASHTO 3.9 & 3.10

			(SPEED)	70	mph	D	2 (degrees)
LF =	3.72	k	CF =	7.526	k		

BRIDGE: **I-575 over Little River**
COUNTY: **CHEROKEE**
P.I. NO: **713640**
PROJECT: **NH000-0575-01(028)**

J.B. TRIMBLE, INC.

JOB NO: **255717**
DESIGNED BY: **WBN**
CHECKED BY: **JCR**

PIER DESIGN CALCULATIONS

BENT 3

~~DRILLED SHAFT~~ → PILE FOOTING

TEMPERATURE FORCE: AASHTO 3.16

Friction Force due to Temperature:

Δ = Temp. Deflection = ALPHA x Length x Change in Temp.

T_{RISE} =	30	° T_{FALL} =	40	° (Fahrenheit)
Material (C or S):	C	ALPHA =	0.000006	/° (Fahrenheit)

Force in Pad = Fs = [G x L x W x Deflection] / (Telas)

	LEFT	RIGHT		
Expansion Length =	88.00	0.00	ft	
Δ =	0.253	0.000	in	
G = Shear Modulus of Pad =	200	200	psi	
L= Length of Pad =	10.00	10.00	in	
W = Width of Pad =	22.00	22.00	in	
Telas = Bearing Elastomer Depth =	2.500	2.500	in	
Fs =	4.461	0.000	KIPS /pad	
No. of Beams =	3	3		
Total Temperature Force =	13.382	0.000	kips @ top of seat	
	13.896	0.000	kips @ center of cap	
P_L =	13.896	0.000	kips	
P_T =	0.000	0.000	kips	

Difference =	P_L =	13.896	kips	AT ℄ CAP	
	P_T =	0.000	kips	AT ℄ CAP	
	P_L =	14.698	kips	AT ℄ CAP ----->	Use Total Lateral Force
	P_T =	0.000	kips	AT ℄ CAP	= PL + Equiv. Lateral Force from MDL due to eccentricity

Expansion of Concrete Cap =	**0.00018**	in/in
Contraction of Concrete Cap =	**0.00044**	in/in which includes 0.0002 for creep

STREAM FORCE: AASHTO 3.18.1

100 yr Flood ELEV. =	853.56	ft.
Design Height of Column =	39.00	ft.
Bottom of Stream ELEV =	853.00	ft.
Pt. of Fixity ELEV =	851.00	
V_{AVG} =	5.8	FPS @ 100 yr. Flood
K =	0.7	for circular end piers
$P_{AVG} = K * (V_{AVG})^2$ =	23.55	psf AASHTO Eq. (3-4)
$P_{MAX} = 2 * P_{AVG}$ =	47.10	psf
Piers Aligned with stream flow:		
P_S =	0.059	kips
M =	0.14	k-ft.
$P_{CL\ CAP}$ =	0.004	k

BRIDGE: **I-575 over Little River**
COUNTY: **CHEROKEE**
P.I. NO: **713640**
PROJECT: **NH000-0575-01(028)**

J.B. TRIMBLE, INC.

JOB NO: **255717**
DESIGNED BY: **WBN**
CHECKED BY: **JCR**

PIER DESIGN CALCULATIONS

BENT 3 ~~DRILLED SHAFT~~ PILE FOOTING

DEAD LOAD: AASHTO 3.3

LENGTH = 16.00 feet
SKEW = 90.00 degrees

SPAN 2

BEAM	BEAM SPC. ALONG BENT	DISTANCE BETWEEN	DISTANCE ALONG	R dl	Add'l DL	DL
1		1.500	1.500	80.916	0.000	80.916
2	6.500	6.500	8.000	80.916	0.000	80.916
3	6.500	6.500	14.500	80.916	0.000	80.916
		1.500	16.000			
TOTAL		16.000				242.747
					CL Brg to CL Bent =	1.0000

SPAN 3

BEAM	BEAM SPC. ALONG BENT	DISTANCE BETWEEN	DISTANCE ALONG	R dl	Add'l DL	DL
1		1.500	1.500	80.916	0.000	80.916
2	6.500	6.500	8.000	80.916	0.000	80.916
3	6.500	6.500	14.500	80.916	0.000	80.916
		1.500	16.000			
TOTAL		16.000				242.747
					CL Brg to CL Bent =	1.0000
						485.494

COMBINED LOADS

COLUMN = 2.250 FT - checking ¼ points on column

	POINT	MEMBER	DISTANCE BETWEEN	DISTANCE ALONG	R dl	Add'l DL	DL	CHECK POINT
8.00	G1	1	6.500	1.500	161.831	0.000	161.831	1
	EC	1	5.375	6.875				2
	G2	AT COL. ℄	1.125	8.000	161.831	0.000	161.831	3
	EC	2	1.125	9.125				4
8.00	G3	2	5.375	14.500	161.831	0.000	161.831	5
				1.500				
			16.000					

ADDITIONAL DL MOMENT DUE TO ECCENTRICITY:

M_{DL} = 0.000 KIP-FT

(EQUIV. LONG FORCE) $F_{EL} = M_{DL} / H_{DESIGN\ OF\ COLUMN}$ = 0.000 KIP

(TOTAL LONG FORCE) $F_L = F_{EL} + P_{L\ TEMP}$ = 14.698 KIP

LIVE LOADS: AASHTO 3.4

	LEFT	RIGHT			
Span Lengths =	88.00	88.00	ft.		
LIVE LOAD REACTION		65.64	KIPS	AXLE LOAD NO IMPACT	VERIFY !!!!
		82.32	KIPS	LANE LOAD NO IMPACT	
AVERAGE IMPACT		1.2347			
P-LOAD FOR BRLLCA INPUT		50.822	KIPS		

END BENT REACTIONS: BENT 4 CENTER

APPROACH SLAB LENGTH = 30.00 feet
SKEW = 90.00 degrees
BEAM SPACING = 9.000 feet
SPACING ALONG SKEW = 9.000 feet
DEAD LOAD REACTION = 85.146 kips
DL OF APPROACH = 11.25 kips
WEIGHT OF CAP = 8.10 kips
TOTAL DL = 104.49 kips
LIVE LOAD = 42.44 kips

CAP DEPTH = 2.00 ft
CAP WIDTH = 3.00 ft

TOTAL PILE REACTION = 146.93 kips = 73 tons Use--> 14 X 73

CALCULATION SHEET

PROJECT: I-75 / I-575 NORTHWEST CORRIDOR
JOB NUMBER NH000-0575-01(028)
CALC NO. BR#42

SUBJECT: Bent Design Input - Bent 4 SHEET NO.
BY: JCR DATE: 11/30/2009 SHEET REV.

Sufficient sample calculations representative of the scope and conditions in the design calculation were performed and the results compared to demonstrate the computer program adequacy.

BRIDGE: **I-575 over Little River**
COUNTY: **CHEROKEE**
P.I. NO: **713640**
PROJECT: **NH000-0575-01(028)**

J.B. TRIMBLE, INC.

JOB NO: **255717**
DESIGNED BY: **WBN**
CHECKED BY: **JCR**

PIER DESIGN CALCULATIONS

BENT 4 — **DRILLED SHAFT**

GENERAL REQUIREMENTS:

Live Load cases:		See GDOT Program BRLLCA		
Skew Angle:		90.0000	° FROM CL BRIDGE	
		0.0000	° FROM CL BENT	
Concrete Strength:		3500	psi	
Rebar Strength:		60000	psi	
	Ec =	3587	ksi	AASHTO 8.7.1
	Es =	29000	ksi	AASHTO 8.7.2
Allowable Steel Stress:		24000	psi	AASHTO 8.15.2.2
	n = Ec/Es =	8		AASHTO 8.15.3.4
Cap Bar size:		11	#	
Stirup Size:		5	#	
Max bars / row in top of cap:		18	bars	
Max bars / row in bot of cap:		18	bars	
Column Steel Ratios:		1	% min.	
		8	% max.	

Impact Factor	Length (ft)	Impact
LEFT SPAN	88.00	1.2347
RIGHT SPAN	88.00	1.2347
	Avg. Impact =	1.2347

Columns:

TYPE	C	(S-SQUARE or RECTANGULAR, C-CIRCULAR, P-PILES)
CLEAR	2.500	

Soil Weight	0.120	kcf
Allow. Soil Press. :	99.999	ksf

BRIDGE: **I-575 over Little River**
COUNTY: **CHEROKEE**
P.I. NO: **713640**
PROJECT: **NH000-0575-01(028)**

J.B. TRIMBLE, INC.

JOB NO: **255717**
DESIGNED BY: **WBN**
CHECKED BY: **JCR**

PIER DESIGN CALCULATIONS

BENT 4 — **DRILLED SHAFT**

WIND ON SUPERSTRUCTURE — AASHTO 3.15.2.1.1

	Left Span	Rigtht Span			
Parapet Height =	32	32	in.		
Beam Height =	54	54	in.		
'D' or 'H' Dimension =	12.25	12.25	in.		
Beam + Coping + Slab =	5.52	5.52	ft.		
Total Height =	8.19	8.19	ft.		
Span Lengths =	88.00	88.00	ft.	TOTAL	
Wind Force Area =	360.3	360.3	$ft.^2$	721	$ft.^2$
Height of Cap =	3.00	3.00	ft.		
Wind Force Arm =	5.594	ft.			

WIND ON SUBSTRUCTURE: — AASHTO 3.15.2.2

Wind Force =	0.040	ksf	PARA. & PERP.
Length of Cap =	16.00	ft.	
Width of Cap =	6.00	ft.	
CG of Cap ELEV =	889.70		
Ground Line ELEV=	833.00		
Depth to Point of Fixity =	10.00		
Pt. of Fixity ELEV =	823.00		
Bot. Cap to Pt. of Fixity =	65.20	ft.	
Design Height of Column =	66.70	ft.	CG Cap to Pt. of Fixity
Exposed Height of Column =	55.20	ft.	
Width of Column =	6.00	ft.	
Depth of Column =	6.00	ft.	
No. of Columns =	1	columns	

	PARA.	PERP.	
M_{CAP} =	48.024	128.064	k-ft.
M_{COL} =	498.125	498.125	k-ft.
M_{TOTAL} =	546.149	626.189	k-ft.
P_T =	8.188	9.388	kips

For Bent 4

2 yr Flood Elev. =	843.92
2 yr Flood Elev. + 1' =	844.92
Ground Line Elev. - 1' =	832.00
For Top of Caisson on Plans, use:	845
For Column Height on Plans, use:	**43.20 ft.**
For Caisson Height on Plans, use:	**38.00 ft.**

For Similar Bent 5

CG of Cap Elev. =	889.79
Ground Line Elev.=	838.64
Ground Line Elev. - 1' =	837.64
Rock Elev. From BFI =	824
Bottom of Caisson Elev. =	809
For Top of Caisson Elev. on Plans, use:	845
For Column Height on Plans, use:	**43.29 ft.**
For Caisson Height on Plans, use:	**36.00 ft.**

WIND ON LIVE LOAD — AASHTO 3.15.2.1.2

Length =	88.0	ft.		
APT = APL =	13.021	ft.	Use-->	13.021 ft.

TRACTION & CENT. FORCES: For One lane — AASHTO 3.9 & 3.10

			(SPEED)	70 mph	D	2 (degrees)
LF =	3.72	k	CF =	7.526 k		

BRIDGE: **I-575 over Little River**
COUNTY: **CHEROKEE**
P.I. NO: **713640**
PROJECT: **NH000-0575-01(028)**

J.B. TRIMBLE, INC.

JOB NO: **255717**
DESIGNED BY: **WBN**
CHECKED BY: **JCR**

PIER DESIGN CALCULATIONS

BENT 4 — **DRILLED SHAFT**

TEMPERATURE FORCE: AASHTO 3.16

Friction Force due to Temperature:

Δ = Temp. Deflection = ALPHA x Length x Change in Temp.

T_{RISE} =	30	° T_{FALL} =	40	° (Fahrenheit)
Material (C or S):	C	ALPHA =	0.000006	/° (Fahrenheit)

Force in Pad = Fs = [G x L x W x Deflection] / (Telas)

	LEFT	RIGHT	
Expansion Length =	88.00	0.00	ft
Δ =	0.253	0.000	in
G = Shear Modulus of Pad =	200	200	psi
L= Length of Pad =	10.00	10.00	in
W = Width of Pad =	22.00	22.00	in
Telas = Bearing Elastomer Depth =	2.500	2.500	in
Fs =	4.461	0.000	KIPS /pad
No. of Beams =	3	3	
Total Temperature Force =	13.382	0.000	kips @ top of seat
	13.683	0.000	kips @ center of cap
P_L =	13.683	0.000	kips
P_T =	0.000	0.000	kips

Difference =	P_L =	13.683	kips	AT ℄ CAP	
	P_T =	0.000	kips	AT ℄ CAP	
	P_L =	14.298	kips	AT ℄ CAP ----->	Use Total Lateral Force
	P_T =	0.000	kips	AT ℄ CAP	= PL + Equiv. Lateral Force from MDL due to eccentricity

Expansion of Concrete Cap =	**0.00018**	in/in	
Contraction of Concrete Cap =	**0.00044**	in/in	which includes 0.0002 for creep

STREAM FORCE: AASHTO 3.18.1

100 yr Flood ELEV. =	853.56	ft.	
Design Height of Column =	66.70	ft.	
Bottom of Stream ELEV =	833.00	ft.	
Pt. of Fixity ELEV =	823.00		
V_{AVG} =	5.8	FPS @ 100 yr. Flood	
K =	0.7	for circular end piers	
$P_{AVG} = K * (V_{AVG})^2$ =	23.55	psf	AASHTO Eq. (3-4)
$P_{MAX} = 2 * P_{AVG}$ =	47.10	psf	
Piers Aligned with stream flow:			
P_S =	2.905	kips	
M =	68.87	k-ft.	
$P_{CL\ CAP}$ =	1.032	k	

BRIDGE: **I-575 over Little River**
COUNTY: **CHEROKEE**
P.I. NO: **713640**
PROJECT: **NH000-0575-01(028)**

J.B. TRIMBLE, INC.

JOB NO: **255717**
DESIGNED BY: **WBN**
CHECKED BY: **JCR**

PIER DESIGN CALCULATIONS

BENT 4 — **DRILLED SHAFT**

DEAD LOAD: — AASHTO 3.3

LENGTH = 16.00 feet
SKEW = 90.00 degrees

SPAN 3

BEAM	BEAM SPC. ALONG BENT	DISTANCE BETWEEN	DISTANCE ALONG	R dl	Add'l DL	DL
1		1.500	1.500	80.916	0.000	80.916
2	6.500	6.500	8.000	80.916	0.000	80.916
3	6.500	6.500	14.500	80.916	0.000	80.916
		1.500	16.000			
TOTAL		16.000				242.747
					CL Brg to CL Bent =	1.0000

SPAN 4

BEAM	BEAM SPC. ALONG BENT	DISTANCE BETWEEN	DISTANCE ALONG	R dl	Add'l DL	DL
1		1.500	1.500	80.916	0.000	80.916
2	6.500	6.500	8.000	80.916	0.000	80.916
3	6.500	6.500	14.500	80.916	0.000	80.916
		1.500	16.000			
TOTAL		16.000				242.747
					CL Brg to CL Bent =	1.0000
						485.494

COMBINED LOADS

COLUMN = 3.000 FT - checking ¼ points on column

	POINT	MEMBER	DISTANCE BETWEEN	DISTANCE ALONG	R dl	Add'l DL	DL	CHECK POINT
	G1	1	6.500	1.500	161.831	0.000	161.831	1
8.00	EC	1	5.000	6.500				2
	G2	AT COL. ℄	1.500	8.000	161.831	0.000	161.831	3
	EC	2	1.500	9.500				4
8.00	G3	2	5.000	14.500	161.831	0.000	161.831	5
				1.500				
			16.000					

ADDITIONAL DL MOMENT DUE TO ECCENTRICITY:

M_{DL} = 0.000 KIP-FT

(EQUIV. LONG FORCE) $F_{EL} = M_{DL} / H_{DESIGN\ OF\ COLUMN}$ = 0.000 KIP

(TOTAL LONG FORCE) $F_L = F_{EL} + P_{L\ TEMP}$ = 14.298 KIP

LIVE LOADS: — AASHTO 3.4

	LEFT	RIGHT			
Span Lengths =	88.00	88.00	ft.		
LIVE LOAD REACTION		65.64	KIPS	AXLE LOAD NO IMPACT	VERIFY !!!!
		82.32	KIPS	LANE LOAD NO IMPACT	
AVERAGE IMPACT		1.2347			
P-LOAD FOR BRLLCA INPUT		50.822	KIPS		

CALCULATION SHEET

PROJECT: I-75 / I-575 NORTHWEST CORRIDOR
JOB NUMBER NH000-0575-01(028)
CALC NO. BR#42

SUBJECT: Bent Design Input - Bent 6 SHEET NO.
BY: JCR DATE: 11/30/2009 SHEET REV.

Sufficient sample calculations representative of the scope and conditions in the design calculation were performed and the results compared to demonstrate the computer program adequacy.

BRIDGE: **I-575 over Little River**
COUNTY: **CHEROKEE**
P.I. NO: **713640**
PROJECT: **NH000-0575-01(028)**

J.B. TRIMBLE, INC.

JOB NO: **255717**
DESIGNED BY: **WBN**
CHECKED BY: **JCR**

PIER DESIGN CALCULATIONS

BENT 6 — **DRILLED SHAFT**

GENERAL REQUIREMENTS:

Live Load cases:	See GDOT Program BRLLCA		
Skew Angle:	90.0000	° FROM CL BRIDGE	
	0.0000	° FROM CL BENT	
Concrete Strength:	3500	psi	
Rebar Strength:	60000	psi	
Ec =	3587	ksi	AASHTO 8.7.1
Es =	29000	ksi	AASHTO 8.7.2
Allowable Steel Stress:	24000	psi	AASHTO 8.15.2.2
n = Ec/Es =	8		AASHTO 8.15.3.4
Cap Bar size:	11	#	
Stirup Size:	5	#	
Max bars / row in top of cap:	18	bars	
Max bars / row in bot of cap:	18	bars	
Column Steel Ratios:	1	% min.	
	8	% max.	

Impact Factor

	Length (ft)	Impact
LEFT SPAN	88.00	1.2347
RIGHT SPAN	88.00	1.2347
	Avg. Impact =	1.2347

Columns:

TYPE	C	(S-SQUARE or RECTANGULAR, C-CIRCULAR, P-PILES)
CLEAR	2.500	

Soil Weight	0.120	kcf
Allow. Soil Press. :	99.999	ksf

BRIDGE: **I-575 over Little River**
COUNTY: **CHEROKEE**
P.I. NO: **713640**
PROJECT: **NH000-0575-01(028)**

J.B. TRIMBLE, INC.

JOB NO: **255717**
DESIGNED BY: **WBN**
CHECKED BY: **JCR**

PIER DESIGN CALCULATIONS

BENT 6 — **DRILLED SHAFT**

WIND ON SUPERSTRUCTURE — AASHTO 3.15.2.1.1

	Left Span	Right Span			
Parapet Height =	32	32	in.		
Beam Height =	54	54	in.		
'D' or 'H' Dimension =	12.25	12.25	in.		
Beam + Coping + Slab =	5.52	5.52	ft.		
Total Height =	8.19	8.19	ft.		
Span Lengths =	88.00	88.00	ft.	TOTAL	
Wind Force Area =	360.3	360.3	$ft.^2$	721	$ft.^2$
Height of Cap =	3.00	3.00	ft.		
Wind Force Arm =	5.594	ft.			

WIND ON SUBSTRUCTURE: — AASHTO 3.15.2.2

Wind Force =	0.040	ksf	PARA. & PERP.
Length of Cap =	16.00	ft.	
Width of Cap =	6.00	ft.	
CG of Cap ELEV =	890.26		
Ground Line ELEV=	852.49		
Depth to Point of Fixity =	10.00		
Pt. of Fixity ELEV =	842.49		
Bot. Cap to Pt. of Fixity =	46.27	ft.	
Design Height of Column =	47.77	ft.	CG Cap to Pt. of Fixity
Exposed Height of Column =	36.27	ft.	
Width of Column =	6.00	ft.	
Depth of Column =	6.00	ft.	
No. of Columns =	1	columns	

	PARA.	PERP.	
M_{CAP} =	34.394	91.718	k-ft.
M_{COL} =	244.910	244.910	k-ft.
M_{TOTAL} =	279.304	336.628	k-ft.
P_T =	5.847	7.047	kips

For Bent 6	
2 yr Flood Elev. =	843.92
2 yr Flood Elev. + 1' =	844.92
Ground Line Elev. - 1' =	851.49
For Top of Caisson on Plans, use:	851.5
For Column Height on Plans, use:	**37.26 ft.**
For Caisson Height on Plans, use:	**24.50 ft.**

WIND ON LIVE LOAD — AASHTO 3.15.2.1.2

Length =	88.0	ft.		
APT = APL =	13.021	ft.	Use-->	13.021 ft.

TRACTION & CENT. FORCES: For One lane — AASHTO 3.9 & 3.10

(SPEED) 70 mph — D 2 (degrees)

LF = **3.72** k — CF = 7.526 k

BRIDGE: **I-575 over Little River**
COUNTY: **CHEROKEE**
P.I. NO: **713640**
PROJECT: **NH000-0575-01(028)**

J.B. TRIMBLE, INC.

JOB NO: **255717**
DESIGNED BY: **WBN**
CHECKED BY: **JCR**

PIER DESIGN CALCULATIONS

BENT 6 — **DRILLED SHAFT**

TEMPERATURE FORCE: AASHTO 3.16

Friction Force due to Temperature:

Δ = Temp. Deflection = ALPHA x Length x Change in Temp.

T_{RISE} =	30	° T_{FALL} =	40	° (Fahrenheit)
Material (C or S):	C	ALPHA =	0.000006	/ ° (Fahrenheit)

Force in Pad = Fs = [G x L x W x Deflection] / (Telas)

	LEFT	RIGHT		
Expansion Length =	88.00	0.00	ft	
Δ =	0.253	0.000	in	
G = Shear Modulus of Pad =	200	200	psi	
L= Length of Pad =	10.00	10.00	in	
W = Width of Pad =	22.00	22.00	in	
Telas = Bearing Elastomer Depth =	2.500	2.500	in	
Fs =	4.461	0.000	KIPS /pad	
No. of Beams =	3	3		
Total Temperature Force =	13.382	0.000	kips @ top of seat	
	13.802	0.000	kips @ center of cap	
P_L =	13.802	0.000	kips	
P_T =	0.000	0.000	kips	

Difference =	P_L =	13.802	kips	AT ℄ CAP	
	P_T =	0.000	kips	AT ℄ CAP	
	P_L =	14.669	kips	AT ℄ CAP ----->	Use Total Lateral Force
	P_T =	0.000	kips	AT ℄ CAP	= PL + Equiv. Lateral Force from MDL due to eccentricity

Expansion of Concrete Cap =	**0.00018**	in/in	
Contraction of Concrete Cap =	**0.00044**	in/in	which includes 0.0002 for creep

STREAM FORCE: AASHTO 3.18.1

100 yr Flood ELEV. =	853.56	ft.	
Design Height of Column =	47.77	ft.	
Bottom of Stream ELEV =	852.49	ft.	
Pt. of Fixity ELEV =	842.49		
V_{AVG} =	5.8	FPS @ 100 yr. Flood	
K =	0.7	for circular end piers	
$P_{AVG} = K * (V_{AVG})^2$ =	23.55	psf	AASHTO Eq. (3-4)
$P_{MAX} = 2 * P_{AVG}$ =	47.10	psf	
Piers Aligned with stream flow:			
P_S =	0.151	kips	
M =	1.62	k-ft.	
$P_{CL\ CAP}$ =	0.034	k	

BRIDGE: **I-575 over Little River**
COUNTY: **CHEROKEE**
P.I. NO: **713640**
PROJECT: **NH000-0575-01(028)**

J.B. TRIMBLE, INC.

JOB NO: **255717**
DESIGNED BY: **WBN**
CHECKED BY: **JCR**

PIER DESIGN CALCULATIONS

BENT 6 — **DRILLED SHAFT**

DEAD LOAD: — AASHTO 3.3

LENGTH = 16.00 feet
SKEW = 90.00 degrees

SPAN 2

BEAM	BEAM SPC. ALONG BENT	DISTANCE BETWEEN	DISTANCE ALONG	R dl	Add'l DL	DL
1		1.500	1.500	80.916	0.000	80.916
2	6.500	6.500	8.000	80.916	0.000	80.916
3	6.500	6.500	14.500	80.916	0.000	80.916
		1.500	16.000			
TOTAL		16.000				242.747
					CL Brg to CL Bent =	1.0000

SPAN 3

BEAM	BEAM SPC. ALONG BENT	DISTANCE BETWEEN	DISTANCE ALONG	R dl	Add'l DL	DL
1		1.500	1.500	80.916	0.000	80.916
2	6.500	6.500	8.000	80.916	0.000	80.916
3	6.500	6.500	14.500	80.916	0.000	80.916
		1.500	16.000			
TOTAL		16.000				242.747
					CL Brg to CL Bent =	1.0000
						485.494

COMBINED LOADS

COLUMN = 3.000 FT - checking ¼ points on column

	POINT	MEMBER	DISTANCE BETWEEN	DISTANCE ALONG	R dl	Add'l DL	DL	CHECK POINT
8.00	G1	1	6.500	1.500	161.831	0.000	161.831	1
	EC	1	5.000	6.500				2
	G2	AT COL. ℄	1.500	8.000	161.831	0.000	161.831	3
	EC	2	1.500	9.500				4
8.00	G3	2	5.000	14.500	161.831	0.000	161.831	5
				1.500				
			16.000					

ADDITIONAL DL MOMENT DUE TO ECCENTRICITY:

M_{DL} = 0.000 KIP-FT

(EQUIV. LONG FORCE) $F_{EL} = M_{DL} / H_{DESIGN\ OF\ COLUMN}$ = 0.000 KIP

(TOTAL LONG FORCE) $F_L = F_{EL} + P_{L\ TEMP}$ = 14.669 KIP

LIVE LOADS: — AASHTO 3.4

	LEFT	RIGHT			
Span Lengths =	88.00	88.00	ft.		
LIVE LOAD REACTION		65.64	KIPS	AXLE LOAD NO IMPACT	VERIFY !!!!
		82.32	KIPS	LANE LOAD NO IMPACT	
AVERAGE IMPACT		1.2347			
P-LOAD FOR BRLLCA INPUT		50.822	KIPS		

CALCULATION COVER SHEET

PROJECT	JOB NO.	CALC NO.	SHEET
I-75 / I-575 NORTHWEST CORRIDOR	NH000-0575-01(028)	BR#42	1

SUBJECT	DISCIPLINE
Live Load Case Output	STRUCTURAL

CALCULATION STATUS DESIGNATION	PRELIMINARY	CONFIRMED	SUPSEDED	VOIDED	INCOMPLETE
	☐	☐	☐	☐	X

COMPUTER PROGRAM/TYPE	SCP	MAINFRAME	PC	PROGRAM	VERSION/RELEASE NO.
	X YES ◯ NO	◯	X	GDOT BRLLCA	06/26/2008

Note 1: Georgia Department of Transportation (GDOT) terminated Contract Number TOURDPPI60072 for its convenience the completion of all work under that contract and directed that the work with respect to these calculations be discontinued.
(a) These calculations were not completed at the time of GDOT's direction and the information contained herein is not and/or has not been fully verified or checked. These calculations are a work-in-progress and are presented only as such.
(b) Any user is cautioned that the use of these calculations and any related information or calculations, without access to factors and without proper regard for their purpose, could lead to erroneous conclusions.
(c) If any such calculations or any information contained herein is used in future work efforts or any follow on design work a complete confirmation of the information contained herein should be performed prior to any such use.
(d) GTP has no responsibility for the use of this information not under its direct control.

Live Load Case ouptput is included for bents 2-6.

NO.	REASON FOR REVISION	TOTAL NO. OF SHEETS	LAST SHEET NO.	BY	CHECKED	APPROVED/ ACCEPTED	DATE
A	As per GDOT's termination for convenience direction	3	3	JCR			11/30/09

RECORD OF REVISIONS

CALCULATION SHEET

PROJECT: I-75 / I-575 NORTHWEST CORRIDOR
JOB NUMBER NH000-0575-01(028)
CALC NO. BR#42

SUBJECT: Live Load Case Output - Bents 2-6 SHEET NO.
BY: JCR DATE: 11/30/2009 SHEET REV.

Sufficient sample calculations representative of the scope and conditions in the design calculation were performed and the results compared to demonstrate the computer program adequacy.

07-OCT-09
12:01:21

GEORGIA DEPARTMENT OF TRANSPORTATION
PRECONSTUCTION DIVISION - OFFICE OF BRIDGE & STRUCTURAL DESIGN
SUMMARY OF THE LIVE LOAD CASE PROGRAM
REVISED: JUNE 26, 2008

PROB. NO. 1111

✓ JCR 10-8-2009

I-575 OVER LITTLE RIVER - ALL SPANS

BRIDGE WIDTH	X1	X2	CENTER LINE DISTANCE	# OF BEAMS	REACTION FORCE	MAXIMUM # OF TRUCKS	# OF COLUMNS	COLUMN WIDTH	SKEW ANGLE
64.422	3.625	3.625	32.211	10	50.822	5	0	0.000	0

D1	D2	D3	D4	D5	D6	D7	D8	D9	D10	D11	D12	D13	D14	D15	D16	D17	D18	D19	D20
2.964	6.500	6.500	4.750	6.750	6.750	6.750	6.750	6.750	6.750										

		NO. OF TRUCKS	BEAM 1	BEAM 2	BEAM 3	BEAM 4	BEAM 5	BEAM 6	BEAM 7	BEAM 8	BEAM 9	BEAM 10
LL CASE	1	1	45.654	54.731	1.259	0.000	0.000	0.000	0.000	0.000	0.000	0.000
LL CASE	2	2	45.654	73.019	45.444	39.170	0.000	0.000	0.000	0.000	0.000	0.000
LL CASE	3	3	45.654	73.019	45.444	68.075	56.469	16.271	0.000	0.000	0.000	0.000
LL CASE	4	4	45.654	73.019	45.444	68.075	60.904	72.739	40.740	0.000	0.000	0.000
LL CASE	5	5	45.654	73.019	45.444	68.075	60.904	72.739	71.527	56.469	14.388	0.000
LL CASE	6	1	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	51.455	50.189
LL CASE	7	2	0.000	0.000	0.000	0.000	0.000	0.000	21.963	56.469	74.667	50.189
LL CASE	8	3	0.000	0.000	0.000	0.000	0.000	47.690	75.917	56.469	74.667	50.189
LL CASE	9	4	0.000	0.000	0.000	20.080	56.469	72.785	75.917	56.469	74.667	50.189
LL CASE	10	5 → 1	0.000	9.125	41.697	70.277	57.094	72.785	75.917	56.469	74.667	50.189
LL CASE	11	1	0.000	0.000	0.000	22.588	56.469	22.588	0.000	0.000	0.000	0.000
LL CASE	12	2 → 1	0.000	11.728	41.769	70.735	56.469	22.588	0.000	0.000	0.000	0.000
LL CASE	13	3	0.000	11.728	41.769	70.735	56.469	75.292	48.940	0.000	0.000	0.000
LL CASE	14	4 → 2	39.094	66.460	49.587	70.735	56.469	75.292	48.940	0.000	0.000	0.000
LL CASE	15	5	39.094	66.460	49.587	70.735	56.469	75.292	73.410	56.469	20.705	0.000
LL CASE	16	2	0.000	0.000	0.000	24.492	56.491	77.152	45.153	0.000	0.000	0.000
LL CASE	17	3 → 1	0.000	13.706	42.497	69.933	56.491	77.152	45.153	0.000	0.000	0.000
LL CASE	18	4	0.000	13.706	42.497	69.933	56.491	77.152	71.527	56.469	18.800	0.000
LL CASE	19	5 → 2	41.072	68.438	48.338	69.933	56.491	77.152	71.527	56.469	18.800	0.000
LL CASE	20	2 → 1	45.654	54.731	1.259	0.000	0.000	0.000	0.000	0.000	51.455	50.189
LL CASE	21	3 → 2	45.654	73.019	45.444	39.170	0.000	0.000	0.000	0.000	51.455	50.189
LL CASE	22	4	45.654	73.019	45.444	39.170	0.000	0.000	21.963	56.469	74.667	50.189
LL CASE	23	5	45.654	73.019	45.444	68.075	56.469	16.271	21.963	56.469	74.667	50.189

EXISTING BEAMS

CALCULATION COVER SHEET

PROJECT	JOB NO.	CALC NO.	SHEET
I-75 / I-575 NORTHWEST CORRIDOR	NH000-0575-01(028)	BR#42	1
SUBJECT	DISCIPLINE		
Intermediate Bent Design Output	STRUCTURAL		

CALCULATION STATUS DESIGNATION	PRELIMINARY	CONFIRMED	SUPSEDED	VOIDED	INCOMPLETE
	☐	☐	☐	☐	X

COMPUTER PROGRAM/TYPE	SCP	MAINFRAME	PC	PROGRAM	VERSION/RELEASE NO.
	(X) YES ( ) NO	( )	(X)	GDOT BRPIER	06/26/2008

Note 1: Georgia Department of Transportation (GDOT) terminated Contract Number TOURDPPI60072 for its convenience the completion of all work under that contract and directed that the work with respect to these calculations be discontinued.
(a) These calculations were not completed at the time of GDOT's direction and the information contained herein is not and/or has not been fully verified or checked. These calculations are a work-in-progress and are presented only as such.
(b) Any user is cautioned that the use of these calculations and any related information or calculations, without access to factors and without proper regard for their purpose, could lead to erroneous conclusions.
(c) If any such calculations or any information contained herein is used in future work efforts or any follow on design work a complete confirmation of the information contained herein should be performed prior to any such use.
(d) GTP has no responsibility for the use of this information not under its direct control.

Intermediate bent design ouptput is included for bent 3, bent 4, and bent 6.

NO.	REASON FOR REVISION	TOTAL NO. OF SHEETS	LAST SHEET NO.	BY	CHECKED	APPROVED/ ACCEPTED	DATE
A	As per GDOT's termination for convenience direction	13	13	JCR			11/30/09

RECORD OF REVISIONS

CALCULATION SHEET

PROJECT: I-75 / I-575 NORTHWEST CORRIDOR
JOB NUMBER NH000-0575-01(028)
CALC NO. BR#42

SUBJECT: Bent Design Output - Bent 3 SHEET NO.
BY: JCR DATE: 11/30/2009 SHEET REV.

Sufficient sample calculations representative of the scope and conditions in the design calculation were performed and the results compared to demonstrate the computer program adequacy.

THE ANALYSIS AND DESIGN OF PIERS FOR BRIDGES - V 4.2.07 - AASHTO SPECS 1984 INTERIM
REVISED: JUNE 30, 2008
I-575 OVER LITTLE RIVER - BENT 3

DESIGN DATA

DESIGN OPTIONS	NO. CAN	NO. COL	NO. LLC	SKEW ANG D M S	F'C PSI	FC PSI	N	FY PSI	FS PSI	EC KSI	ES KSI	CONC. STRAIN	Z FACT	* * * CAP REINFORCING STEEL * * * MAIN SIZE	STR SIZ	MAX TOP	MAX BOT	MIN SIZE	MIN NO.	TOP CL.	MIN S.SP	CAP DEPTH INCR.	BOT CL.
D D D L	2	1	9	0-00-00	3500.	1400.	8.	60000.	24000.	3587.	29000.	0.0030	170.	11	5	12	13	6	4	2.00	4.00	3.00	2.00

COLUMN REINFORCING STEEL MIN.P	MAX.P	CL.SP.	CLEAR	R MODE	KL COEF	OC	OF	CM	BD1	BD2	IMPACT %	SOIL WT KCF	ALL.S.P. KSF	MIN PL SP	MAX PL SP	EDGE DIST	PILE DEPTH	REBAR CLEAR	ALL.PILE CAPACITY	ALL.PILE UPLIFT	I P
1.00	8.00	2.25	2.500	1	2.00	0.70	0.90	1.00	1.00	0.00	23.47	0.120	0.000	3.00	5.00	1.500	1.000	3.000	192.000	0.000	P

CAP DATA

CN	C	L	A	DE	BC	BE	DH	LH	XB1	XB2	XB3	XB4	XB5	XB6	XB7	XB8
11	C	8.000	0.000	3.000	4.500	4.500	0.000	0.000	6.500	5.375						
12	C	8.000	0.000	3.000	4.500	4.500	0.000	0.000	1.125	5.375						

COLUMN DATA

CN	P	I	T	S	HT	A	DT	BT	DB	BB	DL	FLEX	ND	NB	SZ	ND	NB	SZ	ND	NB	SZ	ND	NB	SZ	SLOPE	EP	AP
21	1	C	R		39.000	0.000	4.500	0.000	0.000	0.000	1.500	0.000	15	0	11	15	0	11	29	0	11	29	0	11		0.000	0.000	0.000

FOOTING DATA

CN	S/P	B	D	T	DEL.B	DEL.D	DEL.T	R.B/D	R.D/B	S.HT.	NP	SYM.	BP	DP	SET.
31	P	8.000	8.000	3.500	0.500	0.500	0.250	1.000	1.000	0.000	4	1	0.000	0.000	0.000

GROUP II WIND

SUPERSTRUCTURE AREA* TRANS.	STD. LONG.	WIND	WIND ON SUPERSTRUCTURE INTENSITIES FT1	FL1	FT2	FL2	FT3	FL3	FT4	FL4	FT5	FL5	* WIND FORCE ARM APT	APL	* WIND ON PIER PT	PL
360.	360.	1	50	0	44	6	41	12	33	16	17	19	5.594	5.594	3.776	5.156

GROUP III WIND

STD. WIND	* WIND ON SUPERSTRUCTURE INTENSITIES FT1	FL1	FT2	FL2	FT3	FL3	FT4	FL4	FT5	FL5	* STD. WIND	* WIND ON LIVE LOAD INTENSITIES FT1	FL1	FT2	FL2	FT3	FL3	FT4	FL4	FT5	FL5	* LENGTHS OF LL TRANS.	LONGI.	* WIND ON LL ARMS APT	APL
1	50	0	44	6	41	12	33	16	17	19	1	100	0	88	12	82	24	66	32	34	38	88.0	88.0	13.021	13.021

MISCELLANEOUS FORCES

CENTRI. FT	TRACTION FORCE AND ARMS FL	APT	APL	EXPANSION COEFFICIENT	SHRINKAGE COEFFICIENT	STREAM FLOW PT	PL
7.526	3.716	13.021	13.021	0.00018000	0.00044000	0.004	14.698

DEAD LOAD SUPERSTRUCTURE AND LIVE LOAD CASES

I.D.	NL	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12
D L	0	161.831	0.000	161.831	0.000	161.831							
LL 1	1	45.653	0.000	54.731	0.000	1.258							
LL 2	2	45.653	0.000	73.019	0.000	45.444							
LL 3	1	0.000	0.000	9.124	0.000	41.697							
LL 4	1	0.000	0.000	11.728	0.000	41.768							
LL 5	2	39.093	0.000	66.459	0.000	49.587							
LL 6	1	0.000	0.000	13.706	0.000	42.497							
LL 7	2	41.072	0.000	68.437	0.000	48.338							
LL 8	1	45.653	0.000	54.731	0.000	1.258							
LL 9	2	45.653	0.000	73.019	0.000	45.444							

MEMBER PROPERTIES

COLUMN PROPERTIES

CN	KT	COTB	COTBM	TLR	TRC	TLC	DFC	KL	FKBR	PCBR	PCL	UFMT	EITTB	PSIT	RGTB
	KTM	COBT	COBTM	TRL	TCR	TCL	DFL	PDF	FKUBR	PCUBR	FLU	UFMB	EILTB	PSIB	RGL
1	1066373.2	0.5000	0.0000	0.0000	0.0000	0.0000	0.0000	0.012216	70.3	5233.3	5233.3	41014.4	500967.5	0.0	13.8
	0.0	0.5000	0.0000	0.0000	0.0000	0.0000	0.0000	1.0000	70.3	5233.3	40.5	41014.4	500967.5	0.0	13.8

COLUMN MOMENTS(KIP-FEET), SHEARS(KIPS), REACTIONS(KIPS)

		TRANSVERSE						*	LONGITUDINAL			
LOAD	COL	PC	MT	V	MB	RF	ML	MR	MT	V	MB	MF
UNIT F.AT CL.CAP	1	0.000	-1.500	1.000	39.000	0.000	0.000	0.000	1.500	1.000	39.000	39.000
DEAD LOAD TOTAL	1	517.893 607.355	0.000	0.000	0.000	607.355	1116.702	-1116.702	0.000	0.000	0.000	0.000
STREAM FLOW	1	0.000	-0.006	0.004	0.156	0.000	0.000	0.000	22.047	14.698	573.222	573.222
TRAC. FORCE 1 LN	1	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-53.960	-3.716	-193.310	-193.310
CENT. FORCE 1 LN	1	0.000	-109.285	7.526	391.510	0.000	0.000	0.000	0.000	0.000	0.000	0.000
WIND ON SUBSTR.	1	0.000	-5.664	3.776	147.264	0.000	0.000	0.000	-7.734	-5.156	-201.084	-201.084
GROUP 2 WIND 1 1	1	0.000	-133.356	21.776	949.956	0.000	0.000	0.000	-7.734	-5.156	-201.084	-201.084
GROUP 2 WIND 1 2	1	0.000	-133.356	21.776	949.956	0.000	0.000	0.000	7.734	5.156	201.084	201.084
GROUP 2 WIND 2 1	1	0.000	-118.033	19.616	853.633	0.000	0.000	0.000	-23.057	-7.316	-297.407	-297.407
GROUP 2 WIND 2 2	1	0.000	-118.033	19.616	853.633	0.000	0.000	0.000	23.057	7.316	297.407	297.407
GROUP 2 WIND 3 1	1	0.000	-110.371	18.536	805.471	0.000	0.000	0.000	-38.380	-9.476	-393.730	-393.730
GROUP 2 WIND 3 2	1	0.000	-110.371	18.536	805.471	0.000	0.000	0.000	38.380	9.476	393.730	393.730
GROUP 2 WIND 4 1	1	0.000	-89.941	15.656	677.041	0.000	0.000	0.000	-48.595	-10.916	-457.945	-457.945
GROUP 2 WIND 4 2	1	0.000	-89.941	15.656	677.041	0.000	0.000	0.000	48.595	10.916	457.945	457.945
GROUP 2 WIND 5 1	1	0.000	-49.079	9.896	420.179	0.000	0.000	0.000	-56.257	-11.996	-506.107	-506.107
GROUP 2 WIND 5 2	1	0.000	-49.079	9.896	420.179	0.000	0.000	0.000	56.257	11.996	506.107	506.107
GROUP 3 WIND 1 1	1	0.000	-167.792	15.333	742.772	0.000	0.000	0.000	-2.320	-1.547	-60.325	-60.325
GROUP 3 WIND 1 2	1	0.000	-167.792	15.333	742.772	0.000	0.000	0.000	2.320	1.547	60.325	60.325
GROUP 3 WIND 2 1	1	0.000	-147.861	13.629	658.940	0.000	0.000	0.000	-22.251	-3.251	-144.156	-144.156
GROUP 3 WIND 2 2	1	0.000	-147.861	13.629	658.940	0.000	0.000	0.000	22.251	3.251	144.156	144.156
GROUP 3 WIND 3 1	1	0.000	-137.895	12.777	617.025	0.000	0.000	0.000	-42.182	-4.955	-227.987	-227.987
GROUP 3 WIND 3 2	1	0.000	-137.895	12.777	617.025	0.000	0.000	0.000	42.182	4.955	227.987	227.987
GROUP 3 WIND 4 1	1	0.000	-111.320	10.505	505.250	0.000	0.000	0.000	-55.470	-6.091	-283.875	-283.875
GROUP 3 WIND 4 2	1	0.000	-111.320	10.505	505.250	0.000	0.000	0.000	55.470	6.091	283.875	283.875
GROUP 3 WIND 5 1	1	0.000	-58.171	5.961	281.701	0.000	0.000	0.000	-65.435	-6.943	-325.790	-325.790
GROUP 3 WIND 5 2	1	0.000	-58.171	5.961	281.701	0.000	0.000	0.000	65.435	6.943	325.790	325.790
LIVE LOAD LL 1	1	101.642	-288.568	0.000	288.568	101.642	296.745	-8.177	0.000	0.000	0.000	0.000
LIVE LOAD LL 2	1	164.116	-1.359	0.000	1.359	164.116	296.745	-295.386	0.000	0.000	0.000	0.000
LIVE LOAD LL 3	1	50.821	271.030	0.000	-271.030	50.821	0.000	-271.030	0.000	0.000	0.000	0.000
LIVE LOAD LL 4	1	53.496	271.492	0.000	-271.492	53.496	0.000	-271.492	0.000	0.000	0.000	0.000
LIVE LOAD LL 5	1	155.139	68.211	0.000	-68.211	155.139	254.104	-322.316	0.000	0.000	0.000	0.000
LIVE LOAD LL 6	1	56.203	276.230	0.000	-276.230	56.203	0.000	-276.230	0.000	0.000	0.000	0.000
LIVE LOAD LL 7	1	157.847	47.229	0.000	-47.229	157.847	266.968	-314.197	0.000	0.000	0.000	0.000
LIVE LOAD LL 8	1	101.642	-288.568	0.000	288.568	101.642	296.745	-8.177	0.000	0.000	0.000	0.000
LIVE LOAD LL 9	1	164.116	-1.359	0.000	1.359	164.116	296.745	-295.386	0.000	0.000	0.000	0.000

CAP ANALYSIS AND DESIGN DATA

CAP MOMENTS AND SHEARS

	MOMENTS (KIP-FEET)							**	SHEARS (KIPS)					
POINT	D.L.TOT.	G1 MAX.+	G1 MAX.-	G2 MAX.+	G2 MAX.-	G3 MAX.+	G3 MAX.-		DL T.LT	DL T.RT	G1 + LT	G1 + RT	G1 - LT	G1 - RT
P 1	-2.962	-2.962	-2.962	-2.962	-2.962	-2.962	-2.962		-3.949	-214.329	-3.949	-214.329	-3.949	-313.442
P 2	-1193.007	-1193.007	-1725.738	-1193.007	-1193.007	-1193.007	-1512.008		-228.479	-228.479	-228.479	-228.479	-327.591	-327.591
C 1L	-1451.712	-1451.712	-2095.944	-1451.712	-1451.712	-1451.712	-1837.480		-231.440		-231.440		-330.553	
C 1R	-1451.712	-1451.712	-2151.459	-1451.712	-1451.712	-1451.712	-1870.722			231.440		339.094		231.440
P 4	-1193.007	-1193.007	-1771.644	-1193.007	-1193.007	-1193.007	-1539.497		228.479	228.479	336.132	336.132	228.479	228.479
P 5	-2.962	-2.962	-2.962	-2.962	-2.962	-2.962	-2.962		214.329	3.949	321.982	3.949	214.329	3.949

CAP DESIGN DATA

PT.	M+ UNF. K-FT.	M- UNF. K-FT.	TOP REINFORCE. AS	NO.SIZE	BOT.REINFORCE. AS	NO.SIZE	LEFT STIRRUPS M.SP.	AV/IN	BAR&SPAC	RIGHT STIRRUPS M.SP.	AV/IN	BAR&SPAC	D IN.	FC PSI	PS %	FS/FF RATIO	FS/FZ RATIO
P 1	-2.278	-2.278	1.76	4 # 11	1.76	4 # 11	0.00	0.000	#5@ 0.00	15.98	0.086	#5@ 7.23	36.00		0.10	0.000	0.007
P 2	-917.698	-1163.083	12.46	8 # 11	1.76	4 # 11	16.50	0.088	#5@ 7.03	16.50	0.088	#5@ 7.03	36.00		0.76	0.581	1.089
C 1	-1116.702	-1439.017	15.80	11 # 11	1.76	4 # 11	16.50	0.090	#5@ 6.90	16.50	0.095	#5@ 6.53	36.00		0.96	0.524	0.894
P 4	-917.698	-1184.228	12.81	9 # 11	1.76	4 # 11	16.50	0.093	#5@ 6.65	16.50	0.093	#5@ 6.65	36.00		0.78	0.523	0.952
P 5	-2.278	-2.278	1.76	4 # 11	1.76	4 # 11	15.98	0.091	#5@ 6.81	0.00	0.000	#5@ 0.00	36.00		0.10	0.000	0.007

NOTE: *** FS/FZ RATIO EXCEEDS 1.0! ***

COLUMN ANALYSIS AND DESIGN OUTPUT

CRITICAL COLUMN LOADS

CN	T B	GR	LLC	WC	R	E S	C F	S F	PF	MTF	MLF	PM	MTM	MLM	PU	MTU	MLU	PU/PM	B	D
1	T	1	LL 1	0.0			C	S	893.9	-768.6	28.7	893.9	1038.4	271.8	2568.3	2986.5	781.6	2.875	54.00	54.00
1	B	3	LL 2	3.2			C	S	1002.9	1822.0	1544.2	1002.9	2455.2	2080.8	1001.6	2452.1	2078.1	0.999	54.00	54.00

COLUMN DESIGN DATA

CN	T B	B FACE 1 NO.SIZE	B FACE 2 NO.SIZE	D FACE 3 NO.SIZE	D FACE 4 NO.SIZE	AS	PS	BD12	BD	SUMPU	SUMPC	DEL.T	DEL.L	CM	R	PHIC
1	T	15 # 11	0 # 0	0 # 0	0 # 0	23.40	1.022	1.00	0.000	952.	3663.	1.351	1.351	1.000	1	0.70
1	B	20 # 11	0 # 0	0 # 0	0 # 0	31.20	1.362	1.00	0.000	945.	3663.	1.348	1.348	1.000	1	0.70

FOOTING 1 IS BEING GOVERNED BY UPLIFT OF -0.010 KIPS WITH 7 PILES

FOOTING 1 IS BEING GOVERNED BY UPLIFT OF -0.010 KIPS WITH 7 PILES

FOOTING 1 DESIGN LOADS

F	G	LLID	WC	ES	C	S	P	MT	VT	ML	VL	P4	P3	P2	P1	MTF	VBF	VPF	LOAD
1	3	LL 2	3.2		C	S	740.274	1401.301	27.833	1187.829	27.085	96.658	5.699	111.848	202.807	98.629	19.363	28.600	MAX.P1
1	3	LL 2	1.2		C	S	962.357	1985.162	39.505	1326.217	30.780	111.184	9.476	159.874	261.582	132.319	25.972	37.180	MAX.MT
1	3	LL 2	1.2		C	S	962.357	1985.162	39.505	1326.217	30.780	111.184	9.476	159.874	261.582	132.319	25.972	37.180	MAX.VT
1	3	LL 2	1.2		C	S	962.357	1985.162	39.505	1326.217	30.780	111.184	9.476	159.874	261.582	132.319	25.972	37.180	MAX.VP
1	3	LL 2	5.2		C	S	962.357	1385.770	27.322	1671.322	37.795	147.018	19.123	124.040	251.935	124.877	24.521	37.180	MAX.ML
1	3	LL 2	5.2		C	S	962.357	1385.770	27.322	1671.322	37.795	147.018	19.123	124.040	251.935	124.877	24.521	37.180	MAX.VL
1	3	LL 2	3.2		C	S	740.274	1401.301	27.833	1187.829	27.085	96.658	5.699	111.848	202.807	98.629	19.363	28.600	MAX.P3

FOOTING 1 ANALYSIS/DESIGN RESULTS

FOOTING SIZE			* BAR REINFORCEMENT STEEL				* SECTION CAPACITIES				
B	D	T	P1/PA	AS	NO.SIZE	SPAC. PLACEMENT	MT.	VB	VP	DS	FC
12.500	12.500	4.000	0.845	0.90	19 # 7	@ 7.875 TOP LONG	126.900	38.243	76.486	31.688	0.000
				0.93	20 # 7	@ 7.500 BOT.TRAN	137.185	39.299	78.598	32.562	0.000

NUMBER OF PILES = 8 BP = 4.750 DP = 4.750

CALCULATION SHEET

PROJECT: I-75 / I-575 NORTHWEST CORRIDOR
JOB NUMBER NH000-0575-01(028)
CALC NO. BR#42

SUBJECT: Bent Design Output - Bent 4 SHEET NO.
BY: JCR DATE: 11/30/2009 SHEET REV.

Sufficient sample calculations representative of the scope and conditions in the design calculation were performed and the results compared to demonstrate the computer program adequacy.

THE ANALYSIS AND DESIGN OF PIERS FOR BRIDGES - V 4.2.07 - AASHTO SPECS 1984 INTERIM
REVISED: JUNE 30, 2008
I-575 OVER LITTLE RIVER - BENT 4

DESIGN DATA

DESIGN OPTIONS	NO. CAN	NO. COL	NO. LLC	SKEW ANG D M S	F'C PSI	FC PSI	N	FY PSI	FS PSI	EC KSI	ES KSI	CONC. STRAIN	Z FACT	* * * CAP REINFORCING STEEL * * * MAIN SIZE	STR SIZ	MAX TOP	MAX BOT	MIN SIZE	MIN NO.	TOP CL.	MIN S.SP	CAP DEPTH INCR.	BOT CL.
D D D L	2	1	9	0-00-00	3500.	1400.	8.	60000.	24000.	3587.	29000.	0.0030	170.	11	5	18	18	6	4	2.00	4.00	3.00	2.00

COLUMN REINFORCING STEEL MIN.P	MAX.P	CL.SP.	R CLEAR	MODE	KL COEF	OC	OF	CM	BD1	BD2	IMPACT %	SOIL WT KCF	ALL.S.P. KSF	MIN PL SP	MAX PL SP	EDGE DIST	PILE DEPTH	REBAR CLEAR	ALL.PILE CAPACITY	ALL.PILE UPLIFT	I P
1.00	8.00	2.25	2.500	1	2.00	0.70	0.90	1.00	1.00	0.00	23.47	0.120	99.999	2.50	5.00	1.250	1.000	3.000	0.000	0.000	P

CAP DATA

CN	C	L	A	DE	BC	BE	DH	LH	XB1	XB2	XB3	XB4	XB5	XB6	XB7	XB8
11	C	8.000	0.000	3.000	6.000	6.000	0.000	0.000	6.500	5.000						
12	C	8.000	0.000	3.000	6.000	6.000	0.000	0.000	1.500	5.000						

40 bars max. to allow for 2½" CL. btw (col. bar spliced w caisson bar) & adjacent (col. bar spliced w caisson bar)

COLUMN DATA

CN	P	I	T	S	HT	A	DT	BT	DB	BB	DL	FLEX	ND	NB	SZ	ND	NB	SZ	ND	NB	SZ	ND	NB	SZ	SLOPE	EP	AP
21	1	C	R		66.700	0.000	6.000	0.000	0.000	0.000	1.500	0.000	31	0	11	31	0	11	40	0	11	40	0	11	0.000	0.000	0.000

FOOTING DATA

CN	S/P	B	D	T	DEL.B	DEL.D	DEL.T	R.B/D	R.D/B	S.HT.	NP	SYM.	BP	DP	SET.
31	S	8.000	8.000	3.000	0.500	0.500	0.250	1.000	1.000	0.000	0	0	0.000	0.000	0.000

31 bars based on 1% of Caisson Area

Note; ½ super area used because it is assumed that ½ super wind is transmitted to exist. struc.

GROUP II WIND

SUPERSTRUCTURE AREA* TRANS.	LONG.	STD. WIND	WIND ON SUPERSTRUCTURE INTENSITIES FT1	FL1	FT2	FL2	FT3	FL3	FT4	FL4	FT5	FL5	* WIND FORCE ARM APT	APL	* WIND ON PIER PT	PL
360.	360.	1	50	0	44	6	41	12	33	16	17	19	5.594	5.594	8.188	9.388

GROUP III WIND

STD. WIND	WIND ON SUPERSTRUCTURE INTENSITIES FT1	FL1	FT2	FL2	FT3	FL3	FT4	FL4	FT5	FL5	* STD. WIND	WIND ON LIVE LOAD INTENSITIES FT1	FL1	FT2	FL2	FT3	FL3	FT4	FL4	FT5	FL5	* LENGTHS OF LL TRANS.	LONGI.	* WIND ON LL ARMS APT	APL
1	50	0	44	6	41	12	33	16	17	19	1	100	0	88	12	82	24	66	32	34	38	88.0	88.0	13.021	13.021

MISCELLANEOUS FORCES

CENTRI. FT	TRACTION FORCE AND ARMS FL	APT	APL	EXPANSION COEFFICIENT	SHRINKAGE COEFFICIENT	STREAM FLOW PT	PL
7.526	3.716	13.021	13.021	0.00018000	0.00044000	1.032	14.298

DEAD LOAD SUPERSTRUCTURE AND LIVE LOAD CASES

I.D.	NL	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12
D L	0	161.831	0.000	161.831	0.000	161.831							
LL 1	1	45.653	0.000	54.731	0.000	1.258							
LL 2	2	45.653	0.000	73.019	0.000	45.444							
LL 3	1	0.000	0.000	9.124	0.000	41.697							
LL 4	1	0.000	0.000	11.728	0.000	41.768							
LL 5	2	39.093	0.000	66.459	0.000	49.587							
LL 6	1	0.000	0.000	13.706	0.000	42.497							
LL 7	2	41.072	0.000	68.437	0.000	48.338							
LL 8	1	45.653	0.000	54.731	0.000	1.258							
LL 9	2	45.653	0.000	73.019	0.000	45.444							

Note, $\frac{KL}{r} = 88.2 < 100$

AASHTO 8.16.5.2.6 allows for col. design using magnified moments. as is done by BRPIER.

MEMBER PROPERTIES

COLUMN PROPERTIES

CN	KT	COTB	COTBM	TLR	TRC	TLC	DFC	KL	FKBR	PCBR	PCL	UFMT	EITTB	PSIT	RGTB
	KTM	COBT	COBTM	TRL	TCR	TCL	DFL	PDF	FKUBR	PCUBR	FLU	UFMB	EILTB	PSIB	RGL
1	1970620.6	0.5000	0.0000	0.0000	0.0000	0.0000	0.0000	0.007718	✓	88.2	6355.0	6355.0	44316.8	1725065.5	0.0	18.6
	0.0	0.5000	0.0000	0.0000	0.0000	0.0000	0.0000	1.0000	✓	88.2	6355.0	68.2	44316.8	1725065.5	0.0	18.6

COLUMN MOMENTS(KIP-FEET), SHEARS(KIPS), REACTIONS(KIPS)

		TRANSVERSE						*	LONGITUDINAL			
LOAD	COL	PC	MT	V	MB	RF	ML	MR	MT	V	MB	MF
UNIT F.AT CL.CAP	1	0.000	-1.500	1.000	66.700	0.000	0.000	0.000	1.500	1.000	66.700	66.700
DEAD LOAD TOTAL	1	528.693 805.216	0.000	0.000	0.000	805.216	1138.302	-1138.302	0.000	0.000	0.000	0.000
STREAM FLOW	1	0.000	-1.548	1.032	68.834	0.000	0.000	0.000	21.447	14.298	953.677	953.677
TRAC. FORCE 1 LN	1	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-53.960	-3.716	-296.243	-296.243
CENT. FORCE 1 LN	1	0.000	-109.285	7.526	599.980	0.000	0.000	0.000	0.000	0.000	0.000	0.000
WIND ON SUBSTR.	1	0.000	-12.282	8.188	546.140	0.000	0.000	0.000	-14.082	-9.388	-626.180	-626.180
GROUP 2 WIND 1 1	1	0.000	-139.974	26.188	1847.432	0.000	0.000	0.000	-14.082	-9.388	-626.180	-626.180
GROUP 2 WIND 1 2	1	0.000	-139.974	26.188	1847.432	0.000	0.000	0.000	14.082	9.388	626.180	626.180
GROUP 2 WIND 2 1	1	0.000	-124.651	24.028	1691.276	0.000	0.000	0.000	-29.405	-11.548	-782.335	-782.335
GROUP 2 WIND 2 2	1	0.000	-124.651	24.028	1691.276	0.000	0.000	0.000	29.405	11.548	782.335	782.335
GROUP 2 WIND 3 1	1	0.000	-116.989	22.948	1613.199	0.000	0.000	0.000	-44.728	-13.708	-938.490	-938.490
GROUP 2 WIND 3 2	1	0.000	-116.989	22.948	1613.199	0.000	0.000	0.000	44.728	13.708	938.490	938.490
GROUP 2 WIND 4 1	1	0.000	-96.559	20.068	1404.992	0.000	0.000	0.000	-54.943	-15.148	-1042.593	-1042.593
GROUP 2 WIND 4 2	1	0.000	-96.559	20.068	1404.992	0.000	0.000	0.000	54.943	15.148	1042.593	1042.593
GROUP 2 WIND 5 1	1	0.000	-55.697	14.308	988.579	0.000	0.000	0.000	-62.605	-16.228	-1120.670	-1120.670
GROUP 2 WIND 5 2	1	0.000	-55.697	14.308	988.579	0.000	0.000	0.000	62.605	16.228	1120.670	1120.670
GROUP 3 WIND 1 1	1	0.000	-169.777	16.656	1255.774	0.000	0.000	0.000	-4.225	-2.816	-187.854	-187.854
GROUP 3 WIND 1 2	1	0.000	-169.777	16.656	1255.774	0.000	0.000	0.000	4.225	2.816	187.854	187.854
GROUP 3 WIND 2 1	1	0.000	-149.846	14.952	1124.742	0.000	0.000	0.000	-24.156	-4.520	-318.886	-318.886
GROUP 3 WIND 2 2	1	0.000	-149.846	14.952	1124.742	0.000	0.000	0.000	24.156	4.520	318.886	318.886
GROUP 3 WIND 3 1	1	0.000	-139.880	14.100	1059.226	0.000	0.000	0.000	-44.087	-6.224	-449.918	-449.918
GROUP 3 WIND 3 2	1	0.000	-139.880	14.100	1059.226	0.000	0.000	0.000	44.087	6.224	449.918	449.918
GROUP 3 WIND 4 1	1	0.000	-113.306	11.828	884.517	0.000	0.000	0.000	-57.374	-7.360	-537.272	-537.272
GROUP 3 WIND 4 2	1	0.000	-113.306	11.828	884.517	0.000	0.000	0.000	57.374	7.360	537.272	537.272
GROUP 3 WIND 5 1	1	0.000	-60.156	7.284	535.099	0.000	0.000	0.000	-67.340	-8.212	-602.788	-602.788
GROUP 3 WIND 5 2	1	0.000	-60.156	7.284	535.099	0.000	0.000	0.000	67.340	8.212	602.788	602.788
LIVE LOAD LL 1	1	101.642	-288.568	0.000	288.568	101.642	296.745	-8.177	0.000	0.000	0.000	0.000
LIVE LOAD LL 2	1	164.116	-1.359	0.000	1.359	164.116	296.745	-295.386	0.000	0.000	0.000	0.000
LIVE LOAD LL 3	1	50.821	271.030	0.000	-271.030	50.821	0.000	-271.030	0.000	0.000	0.000	0.000
LIVE LOAD LL 4	1	53.496	271.492	0.000	-271.492	53.496	0.000	-271.492	0.000	0.000	0.000	0.000
LIVE LOAD LL 5	1	155.139	68.211	0.000	-68.211	155.139	254.104	-322.316	0.000	0.000	0.000	0.000
LIVE LOAD LL 6	1	56.203	276.230	0.000	-276.230	56.203	0.000	-276.230	0.000	0.000	0.000	0.000
LIVE LOAD LL 7	1	157.847	47.229	0.000	-47.229	157.847	266.968	-314.197	0.000	0.000	0.000	0.000
LIVE LOAD LL 8	1	101.642	-288.568	0.000	288.568	101.642	296.745	-8.177	0.000	0.000	0.000	0.000
LIVE LOAD LL 9	1	164.116	-1.359	0.000	1.359	164.116	296.745	-295.386	0.000	0.000	0.000	0.000

CAP ANALYSIS AND DESIGN DATA

CAP MOMENTS AND SHEARS

	MOMENTS(KIP-FEET)							** SHEARS(KIPS)					
POINT	D.L.TOT.	G1 MAX.+	G1 MAX.-	G2 MAX.+	G2 MAX.-	G3 MAX.+	G3 MAX.-	DL T.LT	DL T.RT	G1 + LT	G1 + RT	G1 - LT	G1 - RT
P 1	-3.949	-3.949	-3.949	-3.949	-3.949	-3.949	-3.949	-5.265	-215.645	-5.265	-215.645	-5.265	-314.758
P 2	-1126.050	-1126.050	-1621.614	-1126.050	-1126.050	-1126.050	-1422.795	-233.195	-233.195	-233.195	-233.195	-332.308	-332.308
C 1L	-1479.792	-1479.792	-2124.024	-1479.792	-1479.792	-1479.792	-1865.560	-238.460		-238.460		-337.573	
C 1R	-1479.792	-1479.792	-2179.539	-1479.792	-1479.792	-1479.792	-1898.802		238.460		346.114		238.460
P 4	-1126.050	-1126.050	-1664.317	-1126.050	-1126.050	-1126.050	-1448.366	233.195	233.195	340.849	340.849	233.195	233.195
P 5	-3.949	-3.949	-3.949	-3.949	-3.949	-3.949	-3.949	215.645	5.265	323.299	5.265	215.645	5.265

CAP DESIGN DATA

PT.	M+ UNF. K-FT.	M- UNF. K-FT.	TOP REINFORCE. AS	NO.SIZE	BOT.REINFORCE. AS	NO.SIZE	LEFT STIRRUPS M.SP.	AV/IN	BAR&SPAC	RIGHT STIRRUPS M.SP.	AV/IN	BAR&SPAC	D IN.	FC PSI	PS %	FS/FF RATIO	FS/FZ RATIO
P 1	-3.038	-3.038	1.76	4 # 11	1.76	4 # 11	0.00	0.000	#5@ 0.00	15.98	0.060	#5@10.33	36.00		0.08	0.000	0.010
P 2	-866.192	-1094.457	11.48	8 # 11	1.76	4 # 11	16.50	0.060	#5@10.33	16.50	0.060	#5@10.33	36.00		0.50	0.510	1.115
C 1	-1138.302	-1460.617	15.69	11 # 11	1.76	4 # 11	16.50	0.060	#5@10.33	16.50	0.064	#5@ 9.74	36.00		0.70	0.520	0.986
P 4	-866.193	-1114.128	11.80	8 # 11	1.76	4 # 11	16.50	0.061	#5@10.24	16.50	0.061	#5@10.24	36.00		0.52	0.554	1.135
P 5	-3.038	-3.038	1.76	4 # 11	1.76	4 # 11	15.98	0.060	#5@10.33	0.00	0.000	#5@ 0.00	36.00		0.08	0.000	0.010

NOTE: *** FS/FZ RATIO EXCEEDS 1.0! ***

COLUMN ANALYSIS AND DESIGN OUTPUT

CRITICAL COLUMN LOADS

CN	T B	GR	LLC	WC	R	E S	C F	S F	PF	MTF	MLF	PM	MTM	MLM	PU	MTU	MLU	PU/PM	B	D
1	T	1	LL 1	0.0			C	S	908.0	-770.6	27.9	908.0	1020.0	360.5	5854.4	6598.0	2332.4	6.460	72.00	72.00
1	B	3	LL 2	3.2			C	S	1260.1	3028.2	2594.9	1260.1	3999.6	3427.3	1722.0	5464.0	4682.2	1.366	72.00	72.00

COLUMN DESIGN DATA

CN	T B	B FACE 1 NO.SIZE	B FACE 2 NO.SIZE	D FACE 3 NO.SIZE	D FACE 4 NO.SIZE	AS	PS	BD12	BD	SUMPU	SUMPC	DEL.T	DEL.L	CM	R	PHIC
1	T	31 # 11	0 # 0	0 # 0	0 # 0	48.36	1.188	1.00	0.000	1088.	4448.	1.324	1.324	1.000	1	0.70
1	B	31 # 11	0 # 0	0 # 0	0 # 0	48.36	1.188	1.00	0.000	1080.	4448.	1.321	1.321	1.000	1	0.70

FOOTING 1 DESIGN LOADS

F	G	LLID	WC	ES	C	S	P	MT	VT	ML	VL	P4	P3	P2	P1	MTF	VBF	VPF	LOAD
1	3	LL 2	1.2		C	S	938.136	2525.669	32.740	1734.017	24.546	-36.978	-124.252	11.172	98.446	58.126	0.000	56.012	MAX.P1
1	3	LL 2	1.2		C	S	1219.576	3283.370	42.563	2254.222	31.910	-48.072	-161.528	14.523	127.980	75.564	0.000	72.816	MAX.MT
1	3	LL 2	3.2		C	S	1219.576	3027.858	39.240	2594.905	36.341	-26.754	-155.635	-1.082	127.800	67.269	0.000	67.077	MAX.VT
1	3	LL 2	1.2		C	S	1219.576	3283.370	42.563	2254.222	31.910	-48.072	-161.528	14.523	127.980	75.564	0.000	72.816	MAX.VP
1	3	LL 7	5.2		C	S	1212.976	2295.335	30.379	2793.636	38.925	10.115	-104.059	-10.489	103.685	62.282	0.000	39.286	MAX.ML
1	3	LL 2	3.2		C	S	1219.576	3027.858	39.240	2594.905	36.341	-26.754	-155.635	-1.082	127.800	53.045	0.000	67.077	MAX.VL
1	3	LL 2	1.2		C	S	938.136	2525.669	32.740	1734.017	24.546	-36.978	-124.252	11.172	98.446	58.126	0.000	56.012	MAX.P3

FOOTING 1 ANALYSIS/DESIGN RESULTS

FOOTING SIZE			* BAR REINFORCEMENT STEEL				* SECTION CAPACITIES				
B	D	T	P1/PA	AS	NO.SIZE	SPAC. PLACEMENT	MT.	VB	VP	DS	FC
8.500	8.500	3.000	0.788	0.58	25 # 4 @ 4.000	TOP LONG	83.728	38.771	77.542	32.125	0.000
				0.69	20 # 5 @ 5.000	BOT.TRAN	105.280	39.450	78.900	32.688	0.000

CALCULATION SHEET

PROJECT: I-75 / I-575 NORTHWEST CORRIDOR
JOB NUMBER NH000-0575-01(028)
CALC NO. BR#42

SUBJECT: Bent Design Output - Bent 6 SHEET NO.
BY: JCR DATE: 11/30/2009 SHEET REV.

Sufficient sample calculations representative of the scope and conditions in the design calculation were performed and the results compared to demonstrate the computer program adequacy.

THE ANALYSIS AND DESIGN OF PIERS FOR BRIDGES - V 4.2.07 - AASHTO SPECS 1984 INTERIM
REVISED: JUNE 30, 2008
I-575 OVER LITTLE RIVER - BENT 6

DESIGN DATA

DESIGN OPTIONS	NO. CAN	NO. COL	NO. LLC	SKEW ANG D M S	F'C PSI	FC PSI	N	FY PSI	FS PSI	EC KSI	ES KSI	CONC. STRAIN	Z FACT	* * * CAP REINFORCING STEEL * * * MAIN SIZE	STR SIZ	MAX TOP	MAX BOT	MIN SIZE	MIN NO.	TOP CL.	MIN S.SP	CAP DEPTH INCR.	BOT CL.
D D D L	2	1	9	0-00-00	3500.	1400.	8.	60000.	24000.	3587.	29000.	0.0030	170.	11	5	18	18	6	4	2.00	4.00	3.00	2.00

COLUMN REINFORCING STEEL MIN.P	MAX.P	CL.SP.	CLEAR	R MODE	KL COEF	OC	OF	CM	BD1	BD2	IMPACT %	SOIL WT KCF	ALL.S.P. KSF	MIN PL SP	MAX PL SP	EDGE DIST	PILE DEPTH	REBAR CLEAR	ALL.PILE CAPACITY	ALL.PILE UPLIFT	I P
1.00	8.00	2.25	2.500	1	2.00	0.70	0.90	1.00	1.00	0.00	23.47	0.120	99.999	2.50	5.00	1.250	1.000	3.000	0.000	0.000	P

CAP DATA

CN	C	L	A	DE	BC	BE	DH	LH	XB1	XB2	XB3	XB4	XB5	XB6	XB7	XB8
11	C	8.000	0.000	3.000	6.000	6.000	0.000	0.000	6.500	5.000						
12	C	8.000	0.000	3.000	6.000	6.000	0.000	0.000	1.500	5.000						

COLUMN DATA

CN	P	I	T	S	HT	A	DT	BT	DB	BB	DL	FLEX	ND	NB	SZ	ND	NB	SZ	ND	NB	SZ	ND	NB	SZ	SLOPE	EP	AP
21	1	C	R		47.770	0.000	6.000	0.000	0.000	0.000	1.500	0.000	31	0	11	31	0	11	40	0	11	40	0	11	0.000	0.000	0.000

FOOTING DATA

CN	S/P	B	D	T	DEL.B	DEL.D	DEL.T	R.B/D	R.D/B	S.HT.	NP	SYM.	BP	DP	SET.
31	S	8.000	8.000	3.000	0.500	0.500	0.250	1.000	1.000	0.000	0	0	0.000	0.000	0.000

½ super wind is assumed to be transmitted to exist. struc.

GROUP II WIND

SUPERSTRUCTURE AREA* TRANS.	STD. LONG.	WIND	FT1	FL1	FT2	FL2	FT3	FL3	FT4	FL4	FT5	FL5	* WIND FORCE ARM APT	APL	* WIND ON PIER PT	PL
360.	360.	1	50	0	44	6	41	12	33	16	17	19	5.594	5.594	5.847	7.047

GROUP III WIND

STD. WIND	* WIND ON SUPERSTRUCTURE INTENSITIES FT1	FL1	FT2	FL2	FT3	FL3	FT4	FL4	FT5	FL5	* STD. WIND	* WIND ON LIVE LOAD INTENSITIES FT1	FL1	FT2	FL2	FT3	FL3	FT4	FL4	FT5	FL5	* LENGTHS OF LL TRANS.	LONGI.	* WIND ON LL ARMS APT	APL
1	50	0	44	6	41	12	33	16	17	19	1	100	0	88	12	82	24	66	32	34	38	88.0	88.0	13.021	13.021

MISCELLANEOUS FORCES

CENTRI. FT	TRACTION FORCE AND ARMS FL	APT	APL	EXPANSION COEFFICIENT	SHRINKAGE COEFFICIENT	STREAM FLOW PT	PL
7.526	3.716	13.021	13.021	0.00018000	0.00044000	0.034	14.669

DEAD LOAD SUPERSTRUCTURE AND LIVE LOAD CASES

I.D.	NL	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12
D L	0	161.831	0.000	161.831	0.000	161.831							
LL 1	1	45.653	0.000	54.731	0.000	1.258							
LL 2	2	45.653	0.000	73.019	0.000	45.444							
LL 3	1	0.000	0.000	9.124	0.000	41.697							
LL 4	1	0.000	0.000	11.728	0.000	41.768							
LL 5	2	39.093	0.000	66.459	0.000	49.587							
LL 6	1	0.000	0.000	13.706	0.000	42.497							
LL 7	2	41.072	0.000	68.437	0.000	48.338							
LL 8	1	45.653	0.000	54.731	0.000	1.258							
LL 9	2	45.653	0.000	73.019	0.000	45.444							

MEMBER PROPERTIES

COLUMN PROPERTIES

CN	KT	COTB	COTBM	TLR	TRC	TLC	DFC	KL	FKBR	PCBR	PCL	UFMT	EITTB	PSIT	RGTB
	KTM	COBT	COBTM	TRL	TCR	TCL	DFL	PDF	FKUBR	PCUBR	FLU	UFMB	EILTB	PSIB	RGL
1	2751525.8	0.5000	0.0000	0.0000	0.0000	0.0000	0.0000	0.021009	63.7	12176.4	12176.4	86399.2	1725065.5	0.0	18.6
	0.0	0.5000	0.0000	0.0000	0.0000	0.0000	0.0000	1.0000	63.7	12176.4	49.3	86399.2	1725065.5	0.0	18.6

COLUMN MOMENTS(KIP-FEET), SHEARS(KIPS), REACTIONS(KIPS)

		TRANSVERSE						*	LONGITUDINAL			
LOAD	COL	PC	MT	V	MB	RF	ML	MR	MT	V	MB	MF
UNIT F.AT CL.CAP	1	0.000	-1.500	1.000	47.770	0.000	0.000	0.000	1.500	1.000	47.770	47.770
DEAD LOAD TOTAL	1	528.693 724.931	0.000	0.000	0.000	724.931	1138.302	-1138.302	0.000	0.000	0.000	0.000
STREAM FLOW	1	0.000	-0.051	0.034	1.624	0.000	0.000	0.000	22.003	14.669	700.738	700.738
TRAC. FORCE 1 LN	1	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-53.960	-3.716	-225.899	-225.899
CENT. FORCE 1 LN	1	0.000	-109.285	7.526	457.513	0.000	0.000	0.000	0.000	0.000	0.000	0.000
WIND ON SUBSTR.	1	0.000	-8.771	5.847	279.311	0.000	0.000	0.000	-10.570	-7.047	-336.635	-336.635
GROUP 2 WIND 1 1	1	0.000	-136.462	23.847	1239.863	0.000	0.000	0.000	-10.570	-7.047	-336.635	-336.635
GROUP 2 WIND 1 2	1	0.000	-136.462	23.847	1239.863	0.000	0.000	0.000	10.570	7.047	336.635	336.635
GROUP 2 WIND 2 1	1	0.000	-121.139	21.687	1124.597	0.000	0.000	0.000	-25.894	-9.207	-451.901	-451.901
GROUP 2 WIND 2 2	1	0.000	-121.139	21.687	1124.597	0.000	0.000	0.000	25.894	9.207	451.901	451.901
GROUP 2 WIND 3 1	1	0.000	-113.478	20.607	1066.964	0.000	0.000	0.000	-41.217	-11.367	-567.168	-567.168
GROUP 2 WIND 3 2	1	0.000	-113.478	20.607	1066.964	0.000	0.000	0.000	41.217	11.367	567.168	567.168
GROUP 2 WIND 4 1	1	0.000	-93.047	17.727	913.276	0.000	0.000	0.000	-51.432	-12.807	-644.012	-644.012
GROUP 2 WIND 4 2	1	0.000	-93.047	17.727	913.276	0.000	0.000	0.000	51.432	12.807	644.012	644.012
GROUP 2 WIND 5 1	1	0.000	-52.186	11.967	605.899	0.000	0.000	0.000	-59.093	-13.887	-701.645	-701.645
GROUP 2 WIND 5 2	1	0.000	-52.186	11.967	605.899	0.000	0.000	0.000	59.093	13.887	701.645	701.645
GROUP 3 WIND 1 1	1	0.000	-168.724	15.954	906.920	0.000	0.000	0.000	-3.171	-2.114	-100.991	-100.991
GROUP 3 WIND 1 2	1	0.000	-168.724	15.954	906.920	0.000	0.000	0.000	3.171	2.114	100.991	100.991
GROUP 3 WIND 2 1	1	0.000	-148.792	14.250	808.145	0.000	0.000	0.000	-23.102	-3.818	-199.766	-199.766
GROUP 3 WIND 2 2	1	0.000	-148.792	14.250	808.145	0.000	0.000	0.000	23.102	3.818	199.766	199.766
GROUP 3 WIND 3 1	1	0.000	-138.827	13.398	758.757	0.000	0.000	0.000	-43.033	-5.522	-298.541	-298.541
GROUP 3 WIND 3 2	1	0.000	-138.827	13.398	758.757	0.000	0.000	0.000	43.033	5.522	298.541	298.541
GROUP 3 WIND 4 1	1	0.000	-112.252	11.126	627.057	0.000	0.000	0.000	-56.321	-6.658	-364.391	-364.391
GROUP 3 WIND 4 2	1	0.000	-112.252	11.126	627.057	0.000	0.000	0.000	56.321	6.658	364.391	364.391
GROUP 3 WIND 5 1	1	0.000	-59.103	6.582	363.656	0.000	0.000	0.000	-66.286	-7.510	-413.779	-413.779
GROUP 3 WIND 5 2	1	0.000	-59.103	6.582	363.656	0.000	0.000	0.000	66.286	7.510	413.779	413.779
LIVE LOAD LL 1	1	101.642	-288.568	0.000	288.568	101.642	296.745	-8.177	0.000	0.000	0.000	0.000
LIVE LOAD LL 2	1	164.116	-1.359	0.000	1.359	164.116	296.745	-295.386	0.000	0.000	0.000	0.000
LIVE LOAD LL 3	1	50.821	271.030	0.000	-271.030	50.821	0.000	-271.030	0.000	0.000	0.000	0.000
LIVE LOAD LL 4	1	53.496	271.492	0.000	-271.492	53.496	0.000	-271.492	0.000	0.000	0.000	0.000
LIVE LOAD LL 5	1	155.139	68.211	0.000	-68.211	155.139	254.104	-322.316	0.000	0.000	0.000	0.000
LIVE LOAD LL 6	1	56.203	276.230	0.000	-276.230	56.203	0.000	-276.230	0.000	0.000	0.000	0.000
LIVE LOAD LL 7	1	157.847	47.229	0.000	-47.229	157.847	266.968	-314.197	0.000	0.000	0.000	0.000
LIVE LOAD LL 8	1	101.642	-288.568	0.000	288.568	101.642	296.745	-8.177	0.000	0.000	0.000	0.000
LIVE LOAD LL 9	1	164.116	-1.359	0.000	1.359	164.116	296.745	-295.386	0.000	0.000	0.000	0.000

CAP ANALYSIS AND DESIGN DATA

CAP MOMENTS AND SHEARS

	MOMENTS(KIP-FEET)						**	SHEARS(KIPS)					
POINT	D.L.TOT.	G1 MAX.+	G1 MAX.-	G2 MAX.+	G2 MAX.-	G3 MAX.+	G3 MAX.-	DL T.LT	DL T.RT	G1 + LT	G1 + RT	G1 - LT	G1 - RT
P 1	-3.949	-3.949	-3.949	-3.949	-3.949	-3.949	-3.949	-5.265	-215.645	-5.265	-215.645	-5.265	-314.758
P 2	-1126.050	-1126.050	-1621.614	-1126.050	-1126.050	-1126.050	-1422.795	-233.195	-233.195	-233.195	-233.195	-332.308	-332.308
C 1L	-1479.792	-1479.792	-2124.024	-1479.792	-1479.792	-1479.792	-1865.560	-238.460		-238.460		-337.573	
C 1R	-1479.792	-1479.792	-2179.539	-1479.792	-1479.792	-1479.792	-1898.802		238.460		346.114		238.460
P 4	-1126.050	-1126.050	-1664.317	-1126.050	-1126.050	-1126.050	-1448.366	233.195	233.195	340.849	340.849	233.195	233.195
P 5	-3.949	-3.949	-3.949	-3.949	-3.949	-3.949	-3.949	215.645	5.265	323.299	5.265	215.645	5.265

CAP DESIGN DATA

PT.	M+ UNF. K-FT.	M- UNF. K-FT.	TOP REINFORCE. AS	NO.SIZE	BOT.REINFORCE. AS	NO.SIZE	LEFT STIRRUPS M.SP.	AV/IN	BAR&SPAC	RIGHT STIRRUPS M.SP.	AV/IN	BAR&SPAC	D IN.	FC PSI	PS %	FS/FF RATIO	FS/FZ RATIO
P 1	-3.038	-3.038	1.76	4 # 11	1.76	4 # 11	0.00	0.000	#5@ 0.00	15.98	0.060	#5@10.33	36.00		0.08	0.000	0.010
P 2	-866.192	-1094.457	11.48	8 # 11	1.76	4 # 11	16.50	0.060	#5@10.33	16.50	0.060	#5@10.33	36.00		0.50	0.510	1.115
C 1	-1138.302	-1460.617	15.69	11 # 11	1.76	4 # 11	16.50	0.060	#5@10.33	16.50	0.064	#5@ 9.74	36.00		0.70	0.520	0.986
P 4	-866.193	-1114.128	11.80	8 # 11	1.76	4 # 11	16.50	0.061	#5@10.24	16.50	0.061	#5@10.24	36.00		0.52	0.554	1.135
P 5	-3.038	-3.038	1.76	4 # 11	1.76	4 # 11	15.98	0.060	#5@10.33	0.00	0.000	#5@ 0.00	36.00		0.08	0.000	0.010

NOTE: *** FS/FZ RATIO EXCEEDS 1.0! ***

COLUMN ANALYSIS AND DESIGN OUTPUT

CRITICAL COLUMN LOADS

CN	T B	GR	LLC	WC	R	E S	C F	S F	PF	MTF	MLF	PM	MTM	MLM	PU	MTU	MLU	PU/PM	B	D
1	T	1	LL 1	0.0			C	S	908.0	-768.6	28.6	908.0	874.9	310.1	6369.1	6166.9	2185.5	7.032	72.00	72.00
1	B	3	LL 2	3.2			C	S	1155.8	2179.8	1886.4	1155.8	2478.8	2145.2	2799.6	6005.9	5197.5	2.423	72.00	72.00

COLUMN DESIGN DATA

CN	T B	B FACE 1 NO.SIZE	B FACE 2 NO.SIZE	D FACE 3 NO.SIZE	D FACE 4 NO.SIZE	AS	PS	BD12	BD	SUMPU	SUMPC	DEL.T	DEL.L	CM	R	PHIC
1	T	31 # 11	0 # 0	0 # 0	0 # 0	48.36	1.188	1.00	0.000	1036.	8523.	1.138	1.138	1.000	1	0.70
1	B	31 # 11	0 # 0	0 # 0	0 # 0	48.36	1.188	1.00	0.000	1028.	8523.	1.137	1.137	1.000	1	0.70

FOOTING 1 DESIGN LOADS

F	G	LLID	WC	ES	C	S	P	MT	VT	ML	VL	P4	P3	P2	P1	MTF	VBF	VPF	LOAD
1	3	LL 2	3.2		C	S	857.851	1676.508	28.484	1451.078	27.623	0.343	-63.367	8.958	72.669	32.673	0.000	0.000	MAX.P1
1	3	LL 2	1.2		C	S	1115.206	2372.072	40.352	1629.585	31.480	-9.154	-81.773	20.720	93.339	45.623	0.000	0.000	MAX.MT
1	3	LL 2	3.2		C	S	1115.206	2179.460	37.029	1886.401	35.910	0.446	-82.378	11.646	94.469	42.475	0.000	0.000	MAX.VT
1	3	LL 2	3.2		C	S	1115.206	2179.460	37.029	1886.401	35.910	0.446	-82.378	11.646	94.469	42.475	0.000	0.000	MAX.VP
1	3	LL 2	5.2		C	S	1115.206	1665.829	28.169	2036.210	38.494	17.230	-59.403	4.529	81.161	39.876	0.000	0.000	MAX.ML
1	3	LL 2	3.2		C	S	1115.206	2179.460	37.029	1886.401	35.910	0.446	-82.378	11.646	94.469	38.001	0.000	0.000	MAX.VL
1	3	LL 2	3.2		C	S	857.851	1676.508	28.484	1451.078	27.623	0.343	-63.367	8.958	72.669	32.673	0.000	0.000	MAX.P3

FOOTING 1 ANALYSIS/DESIGN RESULTS

FOOTING SIZE			* BAR REINFORCEMENT STEEL				* SECTION CAPACITIES				
B	D	T	P1/PA	AS	NO.SIZE	SPAC. PLACEMENT	MT.	VB	VP	DS	FC
8.000	8.000	3.000	0.581	0.37	15 # 4	@ 6.375 TOP LONG	53.890	38.922	77.844	32.250	0.000
				0.42	17 # 4	@ 5.625 BOT.TRAN	61.951	39.525	79.051	32.750	0.000

CALCULATION COVER SHEET

PROJECT	JOB NO.	CALC NO.	SHEET
I-75 / I-575 NORTHWEST CORRIDOR	NH000-0575-01(028)	BR#42	1
SUBJECT	DISCIPLINE		
Caisson Lateral Stability Design Input	STRUCTURAL		

CALCULATION STATUS DESIGNATION	PRELIMINARY	CONFIRMED	SUPSEDED	VOIDED	INCOMPLETE
	☐	☐	☐	☐	X

COMPUTER PROGRAM/TYPE	SCP	MAINFRAME	PC	PROGRAM	VERSION/RELEASE NO.
	(X) YES ( ) NO	( )	(X)	Excel	2003

Note 1: Georgia Department of Transportation (GDOT) terminated Contract Number TOURDPPI60072 for its convenience prior the completion of all work under that contract and directed that the work with respect to these calculations be discontinued.
(a) These calculations were not completed at the time of GDOT's direction and the information contained herein is not complete and/or has not been fully verified or checked. These calculations are a work-in-progress and are presented only as such.
(b) Any user is cautioned that the use of these calculations and any related information or calculations, without access to factors and without proper regard for their purpose, could lead to erroneous conclusions.
(c) If any such calculations or any information contained herein is used in future work efforts or any follow on design work activity, a complete confirmation of the information contained herein should be performed prior to any such use.
(d) GTP has no responsibility for the use of this information not under its direct control.

Caisson lateral stability design input calculations are included for bents 4&6.

NO.	REASON FOR REVISION	TOTAL NO. OF SHEETS	LAST SHEET NO.	BY	CHECKED	APPROVED/ ACCEPTED	DATE
A	As per GDOT's termination for convenience direction	5	5	JCR			11/30/09

RECORD OF REVISIONS

CALCULATION SHEET

PROJECT: I-75 / I-575 NORTHWEST CORRIDOR
JOB NUMBER NH000-0575-01(028)
CALC NO. BR#42

SUBJECT: Caisson Lateral Stability Design Input - Bent 4 SHEET NO.
BY: JCR DATE: 11/30/2009 SHEET REV.

Sufficient sample calculations representative of the scope and conditions in the design calculation were performed and the results compared to demonstrate the computer program adequacy.

BRIDGE: **I-575 over Little River**
COUNTY: **CHEROKEE**
P.I. NO: **713640**
PROJECT: **NH000-0575-01(028)**

J.B. TRIMBLE, INC.

JOB NO: **255717**
DESIGNED BY: **WBN**
CHECKED BY: **JCR**

LPILE ANALYSIS - BENT 4

PILE PROPERTIES

Concrete Weight =	150	lbs/ft^3	DIAMETER	Use =	6.50	ft.	Depth of Caisson (ft.)	Weight of Caisson (k)	Dmain-rebar	Amain-rebar [in^2]
f'c =	3500	lbs/in^2			78	in.			1.41	1.56
Ec	3586616	lbs/in^2		Area =	4778.4	in^2	26.00	129	Dstirrup [in]	# main rebar
fy	60000	lbs/in^2		Moment of Inertia (I) =	1816972	in^4	312 (in.)		0.5	31
Es	29000000	lbs/in^2							Clear Cover [in]	
Ground Slope	0	degrees		Ground Elev. =	833	ft.			5	
				Top of Rock Elev. =	822	ft.			Cover from main rebar center [in]	
				Depth of Socket =	15	ft.			6.205	
				Bot. of Caisson Elev. =	807					

SOIL PROPERTIES - OBTAINED FROM HOLE NO. B-19

			INPUT				Lateral Subgrade Modulus	Uniaxial Comp. Strength				Internal Angle of Friction	
Soil		Submerged	LAYER (ft)			N	K(pci)	UCS (psi)	Unit Weight γ (pcf)	Effective γ (pcf)	Cohesion c (psf)	ϕ	Strain e (in/in)
Loose	Sand	YES	0	to	11	8	20	N/A	100	37.6	0	29	0
	Rock	YES	11	to	50	N/A	N/A	3000	145	145	0	N/A	0

SOIL LAYERS

		ADJUSTED UNITS								
		LAYER (in.)			γ (pci)	K(pci)	UCS (psi)	c (psi)	ϕ	e (in/in)
Loose	Sand	0	to	132	0.022	20	N/A	0.00	29	0
	Rock	132	to	600	0.084	N/A	3000	0.00	N/A	0

SERVICE LOADS

CASE	P (k)	Weight of Cssn (k)	P_{TOT} (lbs)	Trans V (kips)	Long V (kips)	Resultant V(lbs)	Trans M(kip-ft)	Long M(kip-ft)	Resultant M(lbs-in)
1	938.136	129.414	1067550	32.740	24.546	40920	2525.669	1734.017	36763541

FACTORED LOADS [GROUP III LOADING CONTROLS]

CASE	P (lbs)	Weight of Cssn (lbs)	P_{TOT} (lbs)	Trans V (kips)	Long V (kips)	Resultant V(lbs)	Trans M(kip-ft)	Long M(kip-ft)	Resultant M(lbs-in)
1	1219577	168238	1387815	42.562	31.910	53195	3283.370	2254.222	47792603

[4.6.5.1] Axial Capacity in Soil

For compression,	(bearing) [ksf]	Qt [k]	Service Load P_{TOT} (k)	
Qt = (Area)*(bearing)	100	3318	1068	OK

CALCULATION SHEET

PROJECT: I-75 / I-575 NORTHWEST CORRIDOR
JOB NUMBER NH000-0575-01(028)
CALC NO. BR#42

SUBJECT: Caisson Lateral Stability Design Input - Bent 6 SHEET NO.
BY: JCR DATE: 11/30/2009 SHEET REV.

Sufficient sample calculations representative of the scope and conditions in the design calculation were performed and the results compared to demonstrate the computer program adequacy.

BRIDGE: **I-575 over Little River**
COUNTY: **CHEROKEE**
P.I. NO: **713640**
PROJECT: **NH000-0575-01(028)**

J.B. TRIMBLE, INC.

JOB NO: **255717**
DESIGNED BY: **WBN**
CHECKED BY: **JCR**

LPILE ANALYSIS - BENT 6

PILE PROPERTIES

Concrete Weight =	150	lbs/ft^3	DIAMETER	Use =	6.50	ft.	Depth of Caisson (ft.)	Weight of Caisson (k)	Dmain-rebar	Amain-rebar [in^2]
f'c =	3500	lbs/in^2			78	in.			1.41	1.56
Ec	3586616	lbs/in^2		Area =	4778.4	in^2	**25.49**	127	Dstirrup [in]	# main rebar
fy	60000	lbs/in^2		Moment of Inertia (I) =	1816972	in^4	305.88 (in.)		0.5	31
Es	29000000	lbs/in^2							Clear Cover [in]	
Ground Slope	0	degrees		Ground Elev. =	852.49	ft.			5	
				Top of Rock Elev. =	842	ft.			Cover from main rebar center [in]	
				Depth of Socket =	15	ft.			6.205	
				Bot. of Caisson Elev. =	827					

SOIL PROPERTIES - OBTAINED FROM HOLE NO. B-23

			INPUT				Lateral Subgrade Modulus	Uniaxial Comp. Strength	Unit Weight	Effective	Cohesion	Internal Angle of Friction	Strain
Soil		Submerged	LAYER (ft)			N	K(pci)	UCS (psi)	γ (pcf)	γ (pcf)	c (psf)	ϕ	e (in/in)
Medium Dense	Sand	YES	0	to	6.99	16	60	N/A	120	57.6	0	33	0
Dense	Sand	YES	6.99	to	9.49	26	125	N/A	125	62.6	0	37	0
Very Dense	Sand	YES	9.49	to	10.49	60	125	N/A	130	67.6	0	37	0
	Rock	YES	10.49	to	50	N/A	N/A	3000	145	145	0	40	0

SOIL LAYERS

		ADJUSTED UNITS								
		LAYER (in.)			γ (pci)	K(pci)	UCS (psi)	c (psi)	ϕ	e (in/in)
Medium Dense	Sand	0	to	83.88	0.033	60	N/A	0.00	33	0
Dense	Sand	83.88	to	113.88	0.036	125	N/A	0.00	37	0
Very Dense	Sand	113.88	to	125.88	0.039	125	N/A	0.00	37	0
	Rock	125.88	to	600	0.084	N/A	3000	0.00	40	0

SERVICE LOADS

CASE	P (k)	Weight of Cssn (k)	P_{TOT} (lbs)	Trans V (kips)	Long V (kips)	Resultant V(lbs)	Trans M(kip-ft)	Long M(kip-ft)	Resultant M(lbs-in)
1	857.851	126.875	984726	28.484	27.623	39678	1676.508	1451.078	26607295

FACTORED LOADS [GROUP III LOADING CONTROLS]

CASE	P (lbs)	Weight of Cssn (lbs)	P_{TOT} (lbs)	Trans V (kips)	Long V (kips)	Resultant V(lbs)	Trans M(kip-ft)	Long M(kip-ft)	Resultant M(lbs-in)
1	1115206	164938	1280144	37.029	35.910	51582	2179.460	1886.401	34589483

[4.6.5.1] Axial Capacity in Soil

			Service Load P_{TOT} (k)	
For compression,	(bearing) [ksf]	Qt [k]		
Qt = (Area)*(bearing)	100	3318	985	OK

CALCULATION COVER SHEET

PROJECT	JOB NO.	CALC NO.	SHEET
I-75 / I-575 NORTHWEST CORRIDOR	NH000-0575-01(028)	BR#42	1
SUBJECT		DISCIPLINE	
Caisson Lateral Stability Design Output		STRUCTURAL	

CALCULATION STATUS DESIGNATION	PRELIMINARY	CONFIRMED	SUPSEDED	VOIDED	INCOMPLETE
	☐	☐	☐	☐	X

COMPUTER PROGRAM/TYPE	SCP	MAINFRAME	PC	PROGRAM	VERSION/RELEASE NO.
	X YES ◯ NO	◯	X	LPILE	4.0

Note 1: Georgia Department of Transportation (GDOT) terminated Contract Number TOURDPPI60072 for its convenience the completion of all work under that contract and directed that the work with respect to these calculations be discontinued.
(a) These calculations were not completed at the time of GDOT's direction and the information contained herein is not and/or has not been fully verified or checked. These calculations are a work-in-progress and are presented only as such.
(b) Any user is cautioned that the use of these calculations and any related information or calculations, without access to factors and without proper regard for their purpose, could lead to erroneous conclusions.
(c) If any such calculations or any information contained herein is used in future work efforts or any follow on design work a complete confirmation of the information contained herein should be performed prior to any such use.
(d) GTP has no responsibility for the use of this information not under its direct control.

Caisson lateral stability design ouptput is included for bents 4&6.

A	As per GDOT's termination for convenience direction	21	21	JCR			11/30/09
NO.	REASON FOR REVISION	TOTAL NO. OF SHEETS	LAST SHEET NO.	BY	CHECKED	APPROVED/ ACCEPTED	DATE
RECORD OF REVISIONS							

CALCULATION SHEET

PROJECT: I-75 / I-575 NORTHWEST CORRIDOR
JOB NUMBER NH000-0575-01(028)
CALC NO. BR#42

SUBJECT: Caisson Lateral Stability Design Output - Bent 4 SHEET NO.
BY: JCR DATE: 11/30/2009 SHEET REV.

Sufficient sample calculations representative of the scope and conditions in the design calculation were performed and the results compared to demonstrate the computer program adequacy.

LPILE Plus for Windows, Version 4.0 (4.0.10)

Analysis of Individual Piles and Drilled Shafts
Subjected to Lateral Loading Using the p-y Method

(c) Copyright ENSOFT, Inc., 1985-2003
All Rights Reserved

This program is licensed to:

HMM
HMMG

Path to file locations: N:\TRA\255717\Eng\BR42\Substructure\LPILE\
Name of input data file: B4.lpd
Name of output file: B4.lpo
Name of plot output file: B4.lpp
Name of runtime file: B4.lpr

Time and Date of Analysis

Date: October 25, 2009 Time: 17:39:50

Problem Title

I-575 over Little River [BENT 4] [B-19 BORING]

Program Options

Units Used in Computations - US Customary Units, inches, pounds

Basic Program Options:

Analysis Type 4:
- Computation of Nonlinear Bending Stiffness and Ultimate Bending Moment Capacity with Pile Response Using User-specified Constant EI

Computation Options:
- Only internally-generated p-y curves used in analysis
- Analysis does not use p-y multipliers (individual pile or shaft action only)
- Analysis assumes no shear resistance at pile tip
- Analysis includes automatic computation of pile-top deflection vs. pile embedment length
- No computation of foundation stiffness matrix elements
- Output pile response for full length of pile
- Analysis assumes no soil movements acting on pile
- No additional p-y curves to be computed at user-specified depths

Solution Control Parameters:

- Number of pile increments = 100
- Maximum number of iterations allowed = 100
- Deflection tolerance for convergence = 1.0000E-05 in
- Maximum allowable deflection = 2.0000E+00 in

Printing Options:
- Values of pile-head deflection, bending moment, shear force, and soil reaction are printed for full length of pile.
- Printing Increment (spacing of output points) = 10

Pile Structural Properties and Geometry

Pile Length = 312.00 in
Depth of ground surface below top of pile = .00 in
Slope angle of ground surface = .00 deg.

Structural properties of pile defined using 2 points

Point	Depth X in	Pile Diameter in	Moment of Inertia in**4	Pile Area Sq.in	Modulus of Elasticity lbs/Sq.in
1	0.0000	78.000	1.81697E+06	4778.4000	3586616.000
2	312.0000	78.000	1.81697E+06	4778.4000	3586616.000

Please note that because this analysis makes computations of ultimate moment capacity and pile response using nonlinear bending stiffness that the above values of moment of inertia and modulus of are not used for any computations other than total stress due to combined axial loading and bending.

Soil and Rock Layering Information

The soil profile is modelled using 2 layers

Layer 1 is sand, p-y criteria by Reese et al., 1974
Distance from top of pile to top of layer = .000 in
Distance from top of pile to bottom of layer = 132.000 in
p-y subgrade modulus k for top of soil layer = 20.000 lbs/in**3
p-y subgrade modulus k for bottom of layer = 20.000 lbs/in**3

Layer 2 is strong rock (vuggy limestone)
Distance from top of pile to top of layer = 132.000 in
Distance from top of pile to bottom of layer = 600.000 in

(Depth of lowest layer extends 288.00 in below pile tip)

Effective Unit Weight of Soil vs. Depth

Distribution of effective unit weight of soil with depth
is defined using 4 points

Point	Depth X	Eff. Unit Weight

No.	in	lbs/in**3
1	.00	.02200
2	132.00	.02200
3	132.00	.08400
4	600.00	.08400

**** WARNING - POSSIBLE INPUT DATA ERROR ****

Values entered for effective unit weights of soil were outside
the limits of 0.011574 pci (20 pcf) or 0.0810019 pci (140 pcf)
This data may be erroneous. Please check your data.

Shear Strength of Soils

Distribution of shear strength parameters with depth
defined using 4 points

Point No.	Depth X in	Cohesion c lbs/in**2	Angle of Friction Deg.	E50 or k_rm	RQD %
1	.000	.00000	29.00	------	------
2	132.000	.00000	29.00	------	------
3	132.000	3000.00000	.00	------	------
4	600.000	3000.00000	.00	------	------

Notes:

(1) Cohesion = uniaxial compressive strength for rock materials.
(2) Values of E50 are reported for clay strata.
(3) Default values will be generated for E50 when input values are 0.
(4) RQD and k_rm are reported only for weak rock strata.

Loading Type

Static loading criteria was used for computation of p-y curves

---

Pile-head Loading and Pile-head Fixity Conditions

Number of loads specified = 1

Load Case Number 1

Pile-head boundary conditions are Shear and Moment (BC Type 1)
Shear force at pile head = 40920.000 lbs
Bending moment at pile head = 36763541.000 in-lbs
Axial load at pile head = 938136.000 lbs

Non-zero moment at pile head for this load case indicates the pile-head

may rotate under the applied pile-head loading, but is not a free-head (zero moment) condition.

Computations of Ultimate Moment Capacity and Nonlinear Bending Stiffness

---

Pile Description:

The sectional shape is a circular drilled shaft (bored pile).

Outside Diameter = 78.0000 In

Material Properties:

Compressive Strength of Concrete = 3.500 Kip/In**2
Yield Stress of Reinforcement = 60. Kip/In**2
Modulus of Elasticity of Reinforcement = 29000. Kip/In**2
Number of Reinforcing Bars = 31
Area of Single Bar = 1.56000 In**2
Number of Rows of Reinforcing Bars = 31
Cover Thickness (edge to bar center) = 6.205 In

Ultimate Axial Squash Load Capacity = 16973.36 Kip

Distribution and Area of Steel Reinforcement

Row Number	Area of Reinforcement In**2	Distance to Centroidal Axis In
1	1.560000	32.7529
2	1.560000	32.4168
3	1.560000	31.7481
4	1.560000	30.7536
5	1.560000	29.4435
6	1.560000	27.8313
7	1.560000	25.9335
8	1.560000	23.7696
9	1.560000	21.3618
10	1.560000	18.7347
11	1.560000	15.9155
12	1.560000	12.9329
13	1.560000	9.8176
14	1.560000	6.6016
15	1.560000	3.3178
16	1.560000	.0000
17	1.560000	-3.3178
18	1.560000	-6.6016
19	1.560000	-9.8176
20	1.560000	-12.9329
21	1.560000	-15.9155
22	1.560000	-18.7347
23	1.560000	-21.3618
24	1.560000	-23.7696
25	1.560000	-25.9335
26	1.560000	-27.8313
27	1.560000	-29.4435
28	1.560000	-30.7536
29	1.560000	-31.7481
30	1.560000	-32.4168

31 1.560000 -32.7529

Axial Thrust Force = 938136.00 lbs

Bending Moment in-lbs	Bending Stiffness lb-in2	Bending Curvature rad/in	Maximum Strain in/in	Neutral Axis Position inches
6758844.330	6.75884E+12	.00000100	.00009329	93.294
22417199.699	4.48344E+12	.00000500	.00022537	45.075
30204590.188	3.35607E+12	.00000900	.00032949	36.610
36922577.950	2.84020E+12	.00001300	.00042570	32.746
43278291.504	2.54578E+12	.00001700	.00051877	30.516
49438598.984	2.35422E+12	.00002100	.00061024	29.059
55482316.121	2.21929E+12	.00002500	.00070140	28.056
61412301.343	2.11767E+12	.00002900	.00079196	27.309
67274474.104	2.03862E+12	.00003300	.00088353	26.774
73038675.544	1.97402E+12	.00003700	.00097474	26.344
78727529.453	1.92018E+12	.00004100	.00106681	26.020
84352481.657	1.87450E+12	.00004500	.00116114	25.803
88430855.837	1.80471E+12	.00004900	.00124773	25.464
91401438.063	1.72456E+12	.00005300	.00132983	25.091
93772018.482	1.64512E+12	.00005700	.00140955	24.729
95765070.621	1.56992E+12	.00006100	.00148953	24.419
97379003.252	1.49814E+12	.00006500	.00156477	24.073
98764002.095	1.43136E+12	.00006900	.00163912	23.755
99996908.027	1.36982E+12	.00007300	.00171309	23.467
101061987.556	1.31249E+12	.00007700	.00178960	23.241
101978453.957	1.25899E+12	.00008100	.00186094	22.975
102731096.044	1.20860E+12	.00008500	.00193137	22.722
103461677.921	1.16249E+12	.00008900	.00200247	22.500
104049668.204	1.11881E+12	.00009300	.00207258	22.286
104641148.989	1.07877E+12	.00009700	.00214371	22.100
105203169.123	1.04162E+12	.00010100	.00222027	21.983
107691014.072	8.22069E+11	.00013100	.00273246	20.858
109043713.876	6.77290E+11	.00016100	.00325368	20.209
109481764.723	5.73203E+11	.00019100	.00378119	19.797
109481764.723	4.95393E+11	.00022100	.00440146	19.916

Ultimate Moment Capacity at a Concrete Strain of 0.003 = 108385.351 In-Kip

---

Computed Values of Load Distribution and Deflection
for Lateral Loading for Load Case Number 1

Pile-head boundary conditions are Shear and Moment (BC Type 1)
Specified shear force at pile head = 40920.000 lbs
Specified bending moment at pile head = 36763541.000 in-lbs
Specified axial load at pile head = 938136.000 lbs

Non-zero moment for this load case indicates the pile-head may rotate under the applied pile-head loading, but is not a free-head (zero moment)condition.

Depth X in	Deflect. y in	Moment M lbs-in	Shear V lbs	Slope S Rad.	Total Stress lbs/in**2	Flx. Rig. EI lbs-in**2	Soil Res p lbs/in
0.000	.111788	3.68E+07	4.09E+04	-.001161	985.4	6.52E+12	0.000

31.200	.078357	3.81E+07	4.01E+04	-9.81E-04	1013.3	6.52E+12	-48.894
62.400	.050610	3.93E+07	3.82E+04	-7.96E-04	1040.1	6.52E+12	-63.162
93.600	.028735	4.05E+07	3.64E+04	-6.05E-04	1065.5	6.52E+12	-53.792
124.800	.012908	4.16E+07	3.50E+04	-4.09E-04	1089.7	6.52E+12	-32.218
156.000	.003251	3.67E+07	-4.07E+05	-2.14E-04	983.2	6.52E+12	-9754.295
187.200	-.001052	2.18E+07	-4.76E+05	-7.36E-05	665.1	6.52E+12	3156.243
218.400	-.002059	9.30E+06	-3.13E+05	-1.15E-06	396.0	6.52E+12	6177.361
249.600	-.001604	2.43E+06	-1.35E+05	2.47E-05	248.6	6.52E+12	4812.385
280.800	-7.28E-04	1.58E+05	-2.48E+04	2.96E-05	199.7	6.52E+12	2184.422
312.000	1.98E-04	0.0	0.0	2.97E-05	196.3	6.52E+12	-592.996

Please note that because this analysis makes computations of ultimate moment capacity and pile response using nonlinear bending stiffness that the above values of total stress due to combined axial stress and bending may not be representative of actual conditions.

Output Verification:

Computed forces and moments are within specified convergence limits.

Output Summary for Load Case No. 1:

Pile-head deflection	=	.11178779 in
Computed slope at pile head	=	-.00116055
Maximum bending moment	=	41949868.498 lbs-in
Maximum shear force	=	-494203.764 lbs
Depth of maximum bending moment	=	134.160 in
Depth of maximum shear force	=	174.720 in
Number of iterations	=	5
Number of zero deflection points	=	2

Summary of Pile-head Response

Definition of symbols for pile-head boundary conditions:

y = pile-head displacment, in
M = pile-head moment, lbs-in
V = pile-head shear force, lbs
S = pile-head slope, radians
R = rotational stiffness of pile-head, in-lbs/rad

BC Type	Boundary Condition 1	Boundary Condition 2	Axial Load lbs	Pile Head Deflection in	Maximum Moment in-lbs	Maximum Shear lbs
1	V= 40920.000	M= 3.68E+07	938136.0000	.1118	4.195E+07	-494203.7638

Pile-head Deflection vs. Pile Length

Boundary Condition Type 1, Shear and Moment

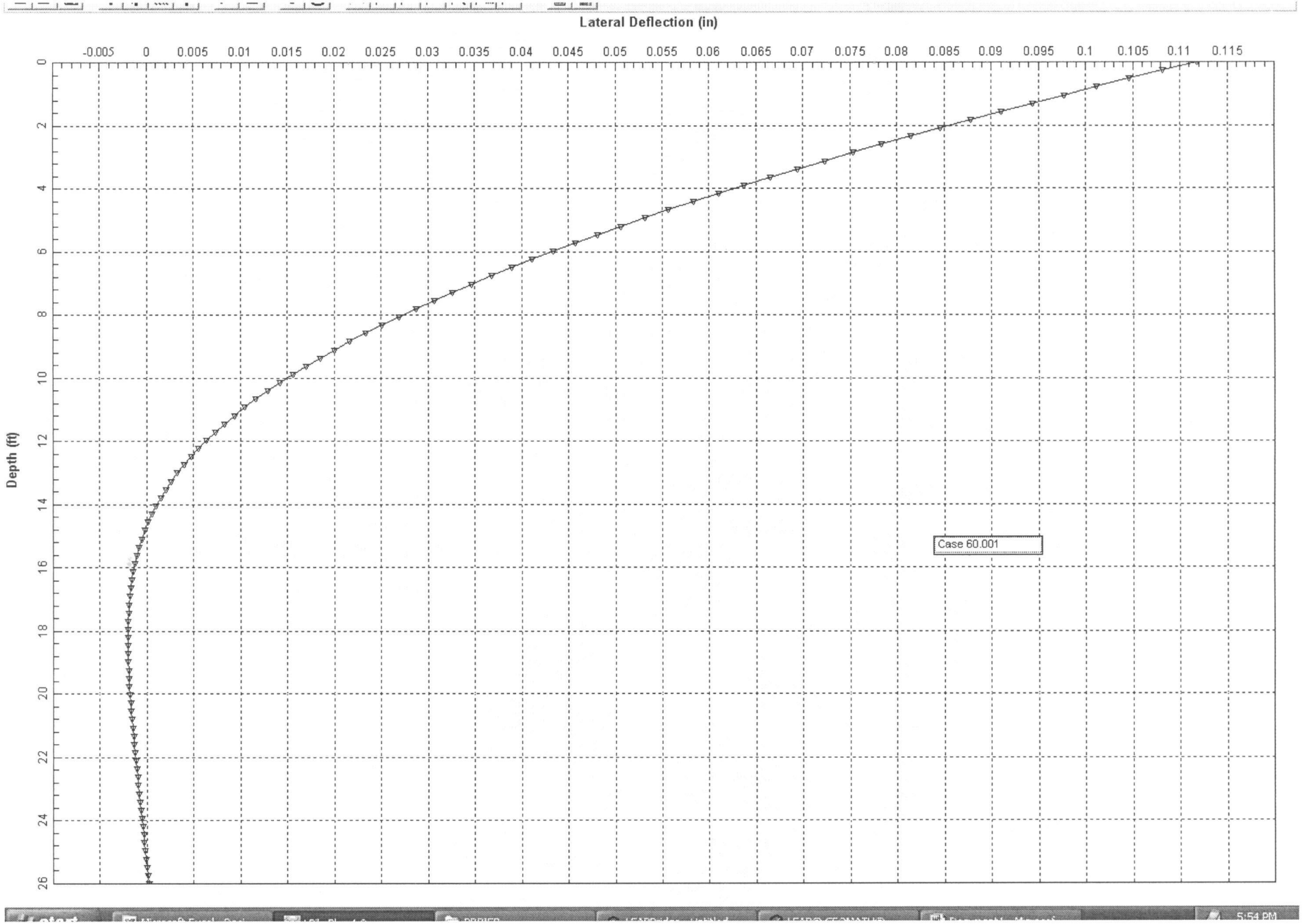
Shear = 40920. lbs

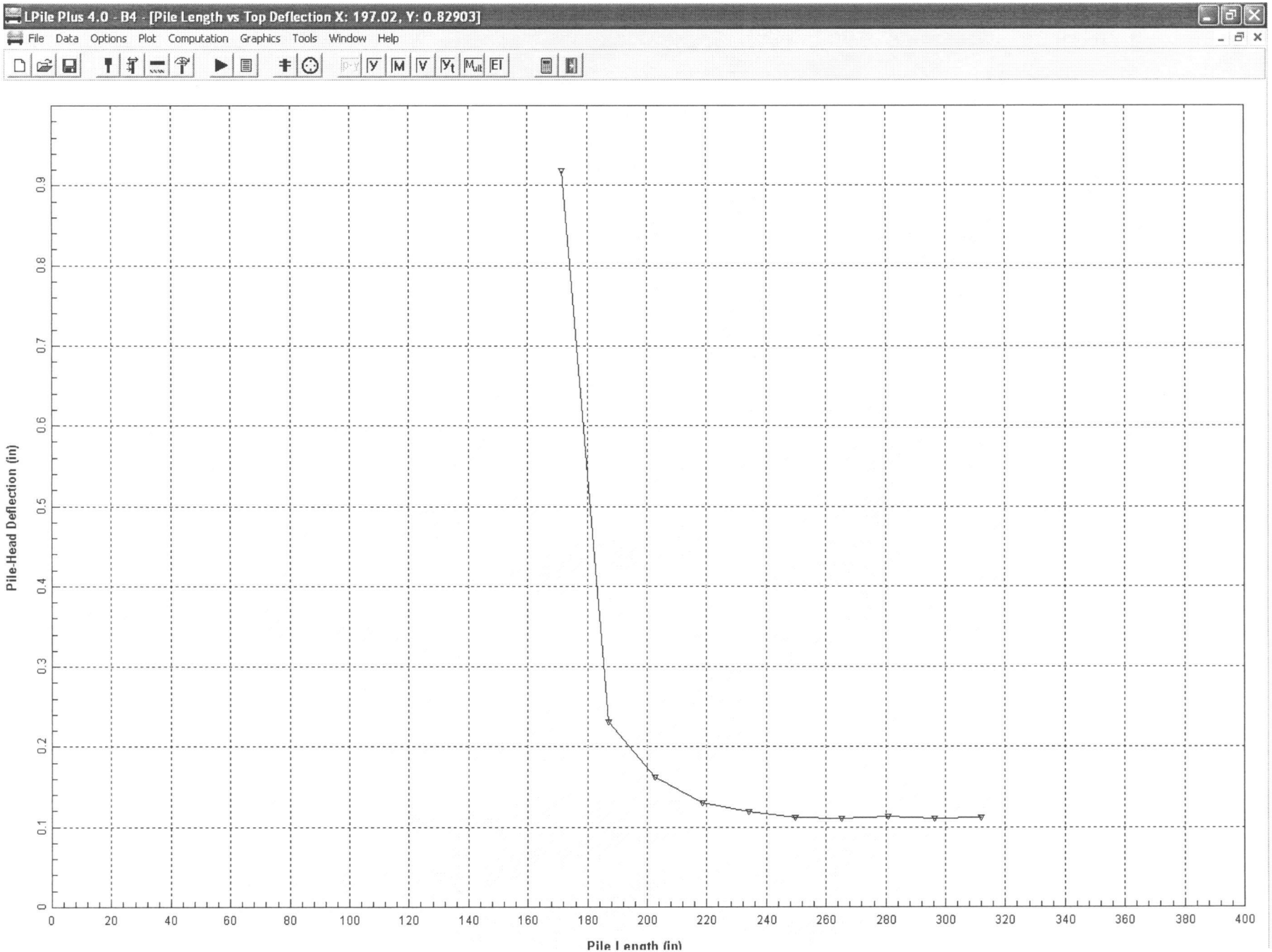
Moment = 36763541. in-lbs
Axial Load = 938136. lbs

Pile Length in	Pile Head Deflection in	Maximum Moment in-lbs	Maximum Shear lbs
312.000	.11178779	41949868.498	-494203.764
296.400	.11091670	41926334.317	-494353.046
280.800	.11288480	41966566.587	-501197.749
265.200	.11075416	41899320.694	-515557.439
249.600	.11214533	41882406.440	-551551.229
234.000	.11874161	41892921.533	-624480.601
218.400	.13048711	41841262.492	-730413.130
202.800	.16213485	41739740.488	-897790.920
187.200	.23185235	41461428.747	-1129812.263
171.600	.91895079	40044754.878	-1721158.563

NOTE: This output is for 15' socket. If a rock socket less than 15' is used, the program warns that the defl. has exceeded the failure defl. for the rock.

The analysis ended normally.


Lateral Deflection (in)
-0.005
0
0.005
0.01
0.015
0.02
0.025
0.03
0.035
0.04
0.045
0.05
0.055
0.06
0.065
0.07
0.075
0.08
0.085
0.09
0.095
0.1
0.105
0.11
0.115
Depth (ft)
0
2
4
6
8
10
12
14
16
18
20
22
24
26
Case 60.001


LPile Plus 4.0 - B4 - [Pile Length vs Top Deflection X: 197.02, Y: 0.82903]
File Data Options Plot Computation Graphics Tools Window Help
Pile-Head Deflection (in)
0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9
0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400
Pile Length (in)

CALCULATION SHEET

PROJECT: I-75 / I-575 NORTHWEST CORRIDOR
JOB NUMBER NH000-0575-01(028)
CALC NO. BR#42

SUBJECT: Caisson Lateral Stability Design Output - Bent 6 SHEET NO.
BY: JCR DATE: 11/30/2009 SHEET REV.

Sufficient sample calculations representative of the scope and conditions in the design calculation were performed and the results compared to demonstrate the computer program adequacy.

LPILE Plus for Windows, Version 4.0 (4.0.10)

Analysis of Individual Piles and Drilled Shafts
Subjected to Lateral Loading Using the p-y Method

(c) Copyright ENSOFT, Inc., 1985-2003
All Rights Reserved

This program is licensed to:

HMM
HMMG

Path to file locations: N:\TRA\255717\Eng\BR42\Substructure\LPILE\
Name of input data file: B6.lpd
Name of output file: B6.lpo
Name of plot output file: B6.lpp
Name of runtime file: B6.lpr

Time and Date of Analysis

Date: October 26, 2009 Time: 17:53:23

Problem Title

I-575 over Little River [BENT 6] [B-23 BORING]

Program Options

Units Used in Computations - US Customary Units, inches, pounds

Basic Program Options:

Analysis Type 4:
- Computation of Nonlinear Bending Stiffness and Ultimate Bending Moment Capacity with Pile Response Using User-specified Constant EI

Computation Options:
- Only internally-generated p-y curves used in analysis
- Analysis does not use p-y multipliers (individual pile or shaft action only)
- Analysis assumes no shear resistance at pile tip
- Analysis includes automatic computation of pile-top deflection vs. pile embedment length
- No computation of foundation stiffness matrix elements
- Output pile response for full length of pile
- Analysis assumes no soil movements acting on pile
- No additional p-y curves to be computed at user-specified depths

Solution Control Parameters:

- Number of pile increments = 100
- Maximum number of iterations allowed = 100
- Deflection tolerance for convergence = 1.0000E-05 in
- Maximum allowable deflection = 2.0000E+00 in

Printing Options:
- Values of pile-head deflection, bending moment, shear force, and soil reaction are printed for full length of pile.
- Printing Increment (spacing of output points) = 10

Pile Structural Properties and Geometry

Pile Length = 305.88 in
Depth of ground surface below top of pile = .00 in
Slope angle of ground surface = .00 deg.

Structural properties of pile defined using 2 points

Point	Depth X in	Pile Diameter in	Moment of Inertia in**4	Pile Area Sq.in	Modulus of Elasticity lbs/Sq.in
1	0.0000	78.000	1.81697E+06	4778.4000	3586616.000
2	305.8800	78.000	1.81697E+06	4778.4000	3586616.000

Please note that because this analysis makes computations of ultimate moment capacity and pile response using nonlinear bending stiffness that the above values of moment of inertia and modulus of are not used for any computations other than total stress due to combined axial loading and bending.

Soil and Rock Layering Information

The soil profile is modelled using 4 layers

Layer 1 is sand, p-y criteria by Reese et al., 1974
Distance from top of pile to top of layer = .000 in
Distance from top of pile to bottom of layer = 83.880 in
p-y subgrade modulus k for top of soil layer = 60.000 lbs/in**3
p-y subgrade modulus k for bottom of layer = 60.000 lbs/in**3

Layer 2 is sand, p-y criteria by Reese et al., 1974
Distance from top of pile to top of layer = 83.880 in
Distance from top of pile to bottom of layer = 113.880 in
p-y subgrade modulus k for top of soil layer = 125.000 lbs/in**3
p-y subgrade modulus k for bottom of layer = 125.000 lbs/in**3

Layer 3 is sand, p-y criteria by Reese et al., 1974
Distance from top of pile to top of layer = 113.880 in
Distance from top of pile to bottom of layer = 125.880 in
p-y subgrade modulus k for top of soil layer = 125.000 lbs/in**3
p-y subgrade modulus k for bottom of layer = 125.000 lbs/in**3

Layer 4 is strong rock (vuggy limestone)
Distance from top of pile to top of layer = 125.880 in
Distance from top of pile to bottom of layer = 600.000 in

(Depth of lowest layer extends 294.12 in below pile tip)

Effective Unit Weight of Soil vs. Depth

Distribution of effective unit weight of soil with depth
is defined using 8 points

Point No.	Depth X in	Eff. Unit Weight lbs/in**3
1	.00	.03300
2	83.88	.03300
3	83.88	.03600
4	113.88	.03600
5	113.88	.03900
6	125.88	.03900
7	125.88	.08400
8	600.00	.08400

**** WARNING - POSSIBLE INPUT DATA ERROR ****

Values entered for effective unit weights of soil were outside
the limits of 0.011574 pci (20 pcf) or 0.0810019 pci (140 pcf)
This data may be erroneous. Please check your data.

Shear Strength of Soils

Distribution of shear strength parameters with depth
defined using 8 points

Point No.	Depth X in	Cohesion c lbs/in**2	Angle of Friction Deg.	E50 or k_rm	RQD %
1	.000	.00000	33.00	------	------
2	83.880	.00000	33.00	------	------
3	83.880	.00000	37.00	------	------
4	113.880	.00000	37.00	------	------
5	113.880	.00000	37.00	------	------
6	125.880	.00000	37.00	------	------
7	125.880	3000.00000	.00	------	------
8	600.000	3000.00000	.00	------	------

Notes:

(1) Cohesion = uniaxial compressive strength for rock materials.
(2) Values of E50 are reported for clay strata.
(3) Default values will be generated for E50 when input values are 0.
(4) RQD and k_rm are reported only for weak rock strata.

Static loading criteria was used for computation of p-y curves

Pile-head Loading and Pile-head Fixity Conditions

Number of loads specified = 1

Load Case Number 1

Pile-head boundary conditions are Shear and Moment (BC Type 1)
Shear force at pile head = 39678.000 lbs
Bending moment at pile head = 26607295.000 in-lbs
Axial load at pile head = 857851.000 lbs

Non-zero moment at pile head for this load case indicates the pile-head may rotate under the applied pile-head loading, but is not a free-head (zero moment) condition.

Computations of Ultimate Moment Capacity and Nonlinear Bending Stiffness

Pile Description:

The sectional shape is a circular drilled shaft (bored pile).

Outside Diameter = 78.0000 In

Material Properties:

Compressive Strength of Concrete = 3.500 Kip/In**2
Yield Stress of Reinforcement = 60. Kip/In**2
Modulus of Elasticity of Reinforcement = 29000. Kip/In**2
Number of Reinforcing Bars = 31
Area of Single Bar = 1.56000 In**2
Number of Rows of Reinforcing Bars = 31
Cover Thickness (edge to bar center) = 6.205 In

Ultimate Axial Squash Load Capacity = 16973.36 Kip

Distribution and Area of Steel Reinforcement

Row Number	Area of Reinforcement In**2	Distance to Centroidal Axis In
1	1.560000	32.7529
2	1.560000	32.4168
3	1.560000	31.7481
4	1.560000	30.7536
5	1.560000	29.4435
6	1.560000	27.8313
7	1.560000	25.9335
8	1.560000	23.7696
9	1.560000	21.3618
10	1.560000	18.7347

11	1.560000	15.9155
12	1.560000	12.9329
13	1.560000	9.8176
14	1.560000	6.6016
15	1.560000	3.3178
16	1.560000	.0000
17	1.560000	-3.3178
18	1.560000	-6.6016
19	1.560000	-9.8176
20	1.560000	-12.9329
21	1.560000	-15.9155
22	1.560000	-18.7347
23	1.560000	-21.3618
24	1.560000	-23.7696
25	1.560000	-25.9335
26	1.560000	-27.8313
27	1.560000	-29.4435
28	1.560000	-30.7536
29	1.560000	-31.7481
30	1.560000	-32.4168
31	1.560000	-32.7529

Axial Thrust Force = 857851.00 lbs

Bending Moment in-lbs	Bending Stiffness lb-in2	Bending Curvature rad/in	Maximum Strain in/in	Neutral Axis Position inches
6775453.275	6.77545E+12	.00000100	.00008861	88.606
21482167.717	4.29643E+12	.00000500	.00021760	43.520
29024612.931	3.22496E+12	.00000900	.00031963	35.515
35653718.987	2.74259E+12	.00001300	.00041446	31.881
41978867.300	2.46935E+12	.00001700	.00050669	29.805
48123294.691	2.29159E+12	.00002100	.00059740	28.448
54138406.605	2.16554E+12	.00002500	.00068702	27.481
60090809.199	2.07210E+12	.00002900	.00077766	26.816
65943653.379	1.99829E+12	.00003300	.00086780	26.297
71745579.968	1.93907E+12	.00003700	.00096017	25.951
77443620.439	1.88887E+12	.00004100	.00105134	25.642
83027578.333	1.84506E+12	.00004500	.00114326	25.406
86963400.860	1.77476E+12	.00004900	.00122881	25.078
89870013.304	1.69566E+12	.00005300	.00131021	24.721
92246979.430	1.61837E+12	.00005700	.00139106	24.405
94155355.223	1.54353E+12	.00006100	.00146714	24.051
95745149.916	1.47300E+12	.00006500	.00154182	23.720
97104825.511	1.40732E+12	.00006900	.00161555	23.414
98362282.589	1.34743E+12	.00007300	.00169181	23.175
99360683.369	1.29040E+12	.00007700	.00176256	22.890
100254969.703	1.23772E+12	.00008100	.00183311	22.631
101020786.489	1.18848E+12	.00008500	.00190312	22.390
101743432.007	1.14318E+12	.00008900	.00197358	22.175
102392620.545	1.10100E+12	.00009300	.00204903	22.033
102934897.539	1.06118E+12	.00009700	.00211730	21.828
103445319.107	1.02421E+12	.00010100	.00218568	21.640
105996535.545	8.09134E+11	.00013100	.00270268	20.631
107309249.508	6.66517E+11	.00016100	.00320055	19.879
107309249.508	5.61829E+11	.00019100	.00372447	19.500
107309249.508	4.85562E+11	.00022100	.00432518	19.571

Ultimate Moment Capacity at a Concrete Strain of 0.003 = 106780.463 In-Kip

---

Computed Values of Load Distribution and Deflection
for Lateral Loading for Load Case Number 1

Pile-head boundary conditions are Shear and Moment (BC Type 1)
Specified shear force at pile head = 39678.000 lbs
Specified bending moment at pile head = 26607295.000 in-lbs
Specified axial load at pile head = 857851.000 lbs

Non-zero moment for this load case indicates the pile-head may rotate under the applied pile-head loading, but is not a free-head (zero moment)condition.

Depth X in	Deflect. y in	Moment M lbs-in	Shear V lbs	Slope S Rad.	Total Stress lbs/in**2	Flx. Rig. EI lbs-in**2	Soil Res p lbs/in
0.000	.077518	2.66E+07	3.97E+04	-8.28E-04	750.6	6.52E+12	0.000
30.588	.054133	2.78E+07	3.80E+04	-7.00E-04	776.7	6.52E+12	-99.349
61.176	.034741	2.89E+07	3.43E+04	-5.67E-04	800.8	6.52E+12	-127.520
91.764	.019504	2.99E+07	3.00E+04	-4.29E-04	822.4	6.52E+12	-195.633
122.352	.008564	3.08E+07	2.51E+04	-2.86E-04	840.5	6.52E+12	-116.450
152.940	.001994	2.62E+07	-3.17E+05	-1.47E-04	742.4	6.52E+12	-5982.011
183.528	-8.82E-04	1.54E+07	-3.46E+05	-4.94E-05	510.1	6.52E+12	2645.274
214.116	-.001519	6.54E+06	-2.24E+05	6.27E-07	319.9	6.52E+12	4557.582
244.704	-.001168	1.72E+06	-9.67E+04	1.85E-05	216.4	6.52E+12	3504.447
275.292	-5.32E-04	1.16E+05	-1.80E+04	2.19E-05	182.0	6.52E+12	1595.148
305.880	1.39E-04	0.0	0.0	2.19E-05	179.5	6.52E+12	-417.123

Please note that because this analysis makes computations of ultimate moment capacity and pile response using nonlinear bending stiffness that the above values of total stress due to combined axial stress and bending may not be representative of actual conditions.

Output Verification:

Computed forces and moments are within specified convergence limits.

Output Summary for Load Case No. 1:

Pile-head deflection = .07751825 in
Computed slope at pile head = -.00082792
Maximum bending moment = 30946989.669 lbs-in
Maximum shear force = -364670.397 lbs
Depth of maximum bending moment = 128.470 in
Depth of maximum shear force = 171.293 in
Number of iterations = 5
Number of zero deflection points = 2

Summary of Pile-head Response

Definition of symbols for pile-head boundary conditions:

y = pile-head displacment, in
M = pile-head moment, lbs-in
V = pile-head shear force, lbs
S = pile-head slope, radians
R = rotational stiffness of pile-head, in-lbs/rad

BC Type	Boundary Condition 1	Boundary Condition 2	Axial Load lbs	Pile Head Deflection in	Maximum Moment in-lbs	Maximum Shear lbs
1	V= 39678.000	M= 2.66E+07	857851.0000	.077518	3.095E+07	-364670.3969

Pile-head Deflection vs. Pile Length

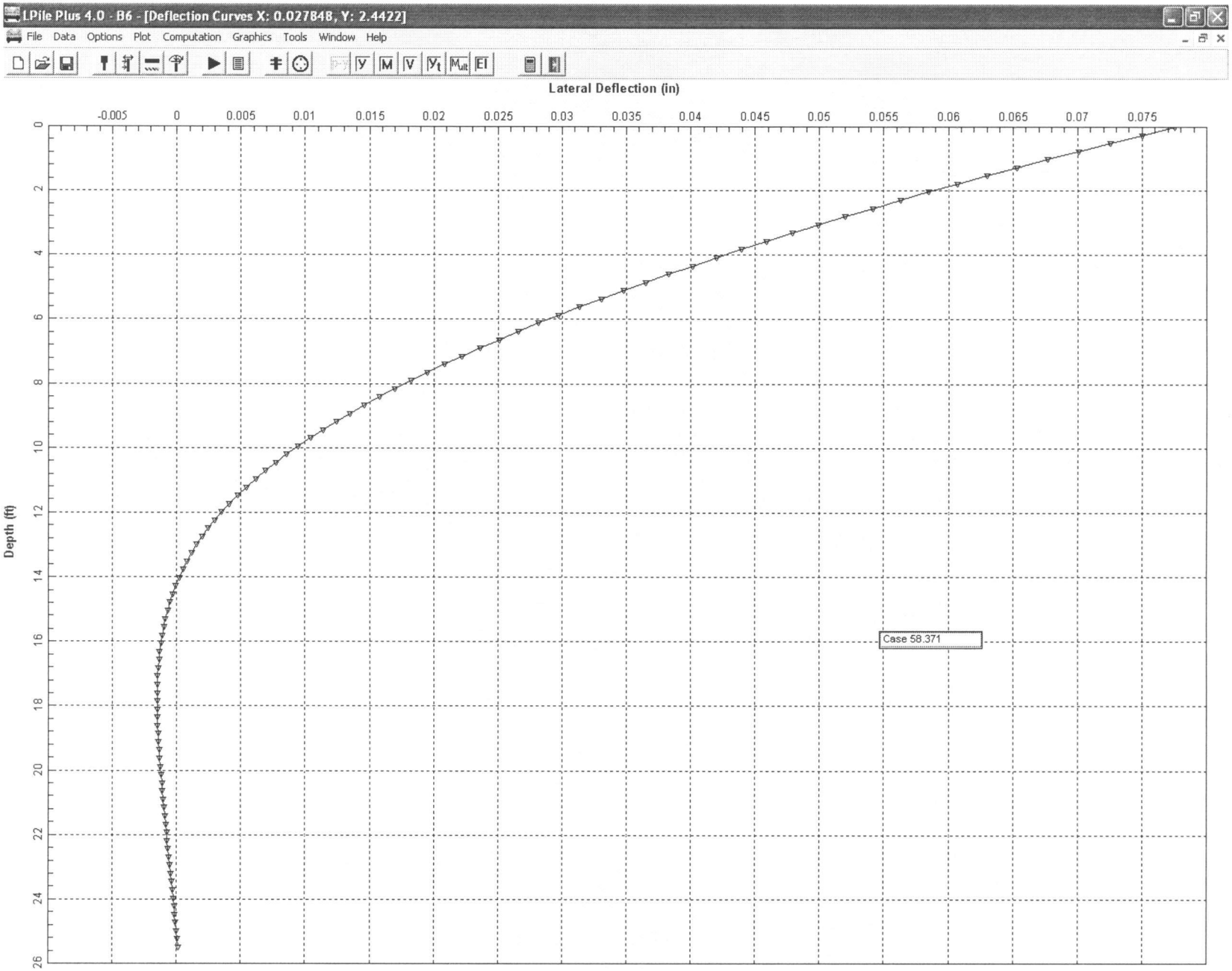
Boundary Condition Type 1, Shear and Moment

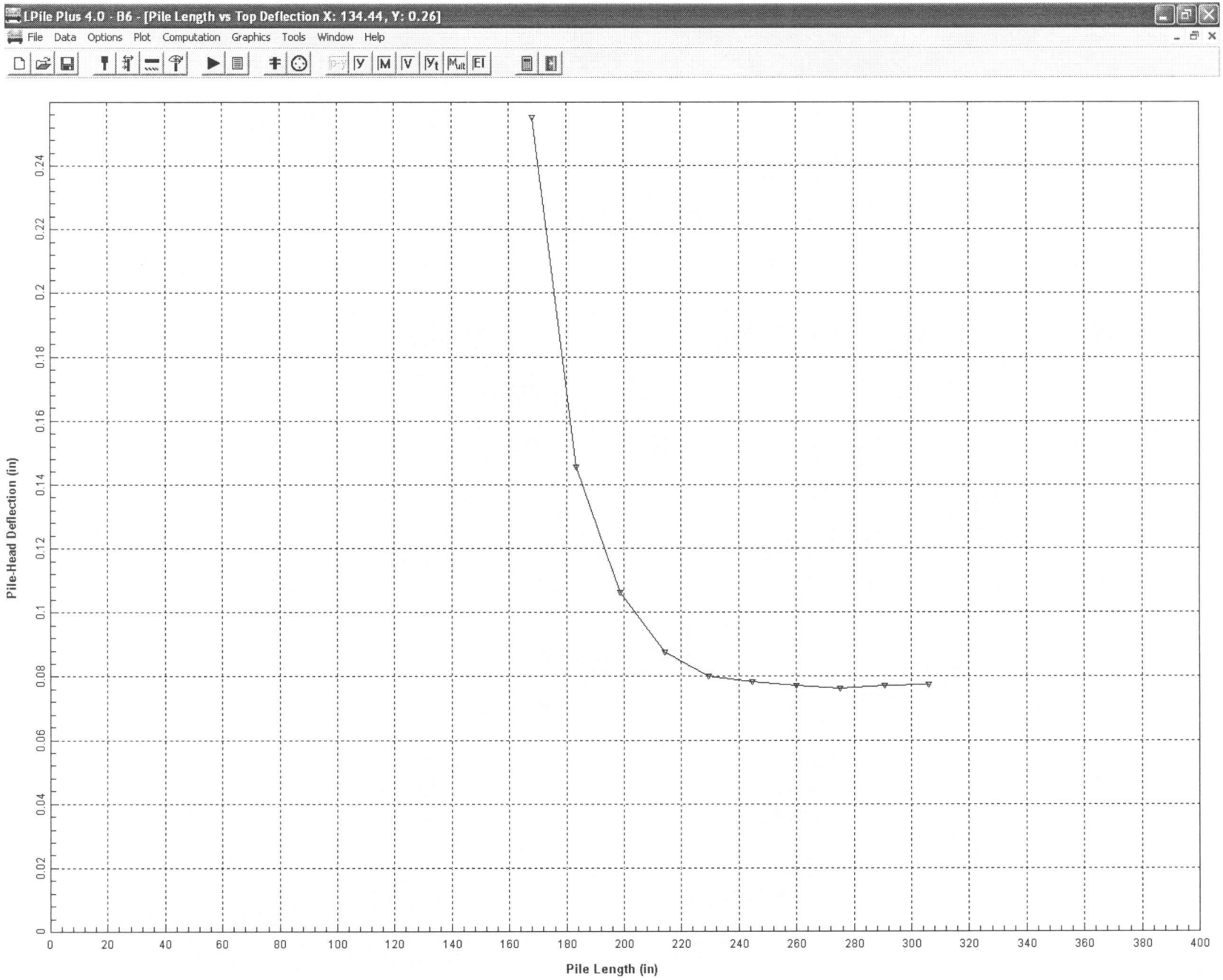
Shear = 39678. lbs
Moment = 26607295. in-lbs
Axial Load = 857851. lbs

Pile Length in	Pile Head Deflection in	Maximum Moment in-lbs	Maximum Shear lbs
305.880	.07751825	30946989.669	-364670.397
290.586	.07704496	30933532.933	-364596.425
275.292	.07613492	30920948.618	-367933.737
259.998	.07722509	30925807.726	-380345.574
244.704	.07831347	30905612.385	-406592.853
229.410	.08019986	30851448.933	-449289.062
214.116	.08742998	30763444.996	-520948.454
198.822	.10621749	30537589.248	-631987.115
183.528	.14551036	30039588.519	-779082.466
168.234	.25516490	29147178.141	-1002642.545

Note: This output is for a 15' socket. If a lesser socket is used, the program warns that the defl. has exceeded the failure defl. for the rock.

The analysis ended normally.


LPile Plus 4.0 - B6 - [Deflection Curves X: 0.027848, Y: 2.4422]
File Data Options Plot Computation Graphics Tools Window Help
Lateral Deflection (in)
-0.005 0 0.005 0.01 0.015 0.02 0.025 0.03 0.035 0.04 0.045 0.05 0.055 0.06 0.065 0.07 0.075
Depth (ft)
0 2 4 6 8 10 12 14 16 18 20 22 24 26
Case 58.371


LPile Plus 4.0 - B6 - [Pile Length vs Top Deflection X: 134.44, Y: 0.26]
File Data Options Plot Computation Graphics Tools Window Help
Pile-Head Deflection (in)
0 0.02 0.04 0.06 0.08 0.1 0.12 0.14 0.16 0.18 0.2 0.22 0.24
Pile Length (in)
0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400

CALCULATION COVER SHEET

PROJECT	JOB NO.	CALC NO.	SHEET
I-75 / I-575 NORTHWEST CORRIDOR	NH000-0575-01(028)	BR#42	1
SUBJECT	DISCIPLINE		
Caisson Structural Design Input	STRUCTURAL		

CALCULATION STATUS DESIGNATION	PRELIMINARY	CONFIRMED	SUPSEDED	VOIDED	INCOMPLETE
	☐	☐	☐	☐	X

COMPUTER PROGRAM/TYPE	SCP	MAINFRAME	PC	PROGRAM	VERSION/RELEASE NO.
	(X) YES ( ) NO	( )	(X)	Excel	2003

Note 1: Georgia Department of Transportation (GDOT) terminated Contract Number TOURDPPI60072 for its convenience prior the completion of all work under that contract and directed that the work with respect to these calculations be discontinued.
(a) These calculations were not completed at the time of GDOT's direction and the information contained herein is not complete and/or has not been fully verified or checked. These calculations are a work-in-progress and are presented only as such.
(b) Any user is cautioned that the use of these calculations and any related information or calculations, without access to factors and without proper regard for their purpose, could lead to erroneous conclusions.
(c) If any such calculations or any information contained herein is used in future work efforts or any follow on design work activity, a complete confirmation of the information contained herein should be performed prior to any such use.
(d) GTP has no responsibility for the use of this information not under its direct control.

Caisson structural design input calculations are included for bents 4&6.

NO.	REASON FOR REVISION	TOTAL NO. OF SHEETS	LAST SHEET NO.	BY	CHECKED	APPROVED/ ACCEPTED	DATE
A	As per GDOT's termination for convenience direction	5	5	JCR			11/30/09

RECORD OF REVISIONS

CALCULATION SHEET

PROJECT: I-75 / I-575 NORTHWEST CORRIDOR
JOB NUMBER NH000-0575-01(028)
CALC NO. BR#42

SUBJECT: Caisson Structural Design Input - Bent 4 SHEET NO.
BY: JCR DATE: 11/30/2009 SHEET REV.

Sufficient sample calculations representative of the scope and conditions in the design calculation were performed and the results compared to demonstrate the computer program adequacy.

BRIDGE: **I-575 over Little River**
COUNTY: **CHEROKEE**
P.I. NO: **713640**
PROJECT: **NH000-0575-01(028)**

JOB NO: **255717**
DESIGNED BY: **WBN**
CHECKED BY: **JCR**

PCA COL ANALYSIS - BENT 4 - 78" caisson w/ 39-#11

GENERAL INFORMATION

RUN OPTION	**Investigation**
COLUMN	**Nonslender**
UNITS	**in-lb**
CODE	**ACI 318-89**
RUN AXIS	**About X-Axis**

MATERIAL PROPERTIES

f'c	**3.5**	ksi
Ec	**3586.6**	ksi
fc	**2.975**	ksi
β1	**0.85**	
ε u	**0.003**	in/in
fy	**60**	ksi
Es	**29000**	ksi
ε rup	**0**	in/in

REINFORCEMENT

CONFINEMENT

TYPE	**Tied**
TIE SIZES	**#4 ties with #11 bars**

ALL SIDES EQUAL

NO. OF BARS	**31**	
BAR SIZE	**#11**	
CLEAR COVER	**5**	in
COVER TO	**Transverse Bars**	

LOADS

NOTE: GROUP III LOADING CONTROLS

FACTORED

BENT	4
LOAD CASE	1
LOAD [k]	**938**
X-MOMENT [ft-k]	**4545**

NOTE: FOR THIS CAISSON THE SHEAR CAPACITY OF THE CONCRETE IS LESS THAN TWICE THE MAXIMUM FACTORED SHEAR. THEREFORE, THE STIRRUP SPACING NEEDS TO BE CALCULATED.

[AASHTO 8.16.6]

BENT	4		
LOAD CASE	1		
V_U [k]	**642**	ΦV_C [k]	**563**

$V_C = 2(f'c)^{0.5}$(diameter of caisson)[(diameter of caisson)-(cover from main rebar center)] * [1lb / 1000 k]

[AASHTO 8.19.1.2 & 8.19.3]

Minimum Shear Reinforcement

A_V is area of stirrup per spacing, s

$A_V = (50 * b_W * s) / f_Y$

Maximum spacing is 12 in. per GDOT

A_V = 0.78 in^2 per foot

#4 stirrup used, s = 6 in. ← Considers two legs of reinforcement

$\Phi V_S = \Phi(A_V * f_Y * d) / s$ = 244 kips

ΦVn = ΦVc + ΦVs = 807.21 kips

CALCULATION SHEET

PROJECT: I-75 / I-575 NORTHWEST CORRIDOR
JOB NUMBER NH000-0575-01(028)
CALC NO. BR#42

SUBJECT: Caisson Structural Design Input - Bent 6 SHEET NO.
BY: JCR DATE: 11/30/2009 SHEET REV.

Sufficient sample calculations representative of the scope and conditions in the design calculation were performed and the results compared to demonstrate the computer program adequacy.

BRIDGE: **I-575 over Little River**
COUNTY: **CHEROKEE**
P.I. NO: **713640**
PROJECT: **NH000-0575-01(028)**

JOB NO: **255717**
DESIGNED BY: **WBN**
CHECKED BY: **JCR**

PCA COL ANALYSIS - BENT 6 - 78" caisson w/ 31-#11

GENERAL INFORMATION

RUN OPTION	**Investigation**
COLUMN	**Nonslender**
UNITS	**in-lb**
CODE	**ACI 318-89**
RUN AXIS	**About X-Axis**

MATERIAL PROPERTIES

f'c	**3.5**	ksi
Ec	**3586.6**	ksi
fc	**2.975**	ksi
β1	**0.85**	
ε u	**0.003**	in/in
fy	**60**	ksi
Es	**29000**	ksi
ε rup	**0**	in/in

REINFORCEMENT

CONFINEMENT

TYPE	**Tied**
TIE SIZES	**#4 ties with #11 bars**

ALL SIDES EQUAL

NO. OF BARS	**31**	
BAR SIZE	**#11**	
CLEAR COVER	**5**	in
COVER TO	**Transverse Bars**	

LOADS

NOTE: GROUP III LOADING CONTROLS

FACTORED

BENT	4
LOAD CASE	1
LOAD [k]	**858**
X-MOMENT [ft-k]	**3353**

NOTE: FOR THIS CAISSON THE SHEAR CAPACITY OF THE CONCRETE IS LESS THAN TWICE THE MAXIMUM FACTORED SHEAR. THEREFORE, THE STIRRUP SPACING NEEDS TO BE CALCULATED.

[AASHTO 8.16.6]

BENT	4		
LOAD CASE	1		
V_U [k]	**474**	ΦV_C [k]	**563**

$V_C = 2(f'c)^{0.5}$(diameter of caisson)[(diameter of caisson)-(cover from main rebar center)] * [1lb / 1000 k]

[AASHTO 8.19.1.2 & 8.19.3]

Minimum Shear Reinforcement

$A_V = (50 * b_W * s) / f_Y$

A_V = 0.78 in^2 per foot

A_V is area of stirrup per spacing, s

Maximum spacing is 12 in. per GDOT

#4 stirrup used, s = 6 in. ← Considers two legs of reinforcement

$\Phi V_S = \Phi(A_V * f_Y * d) / s$ = 244 kips

ΦVn = ΦVc + ΦVs = 807 kips

CALCULATION COVER SHEET

PROJECT	JOB NO.	CALC NO.	SHEET
I-75 / I-575 NORTHWEST CORRIDOR	NH000-0575-01(028)	BR#42	1
SUBJECT	DISCIPLINE		
Caisson Structural Design Output	STRUCTURAL		

CALCULATION STATUS DESIGNATION	PRELIMINARY	CONFIRMED	SUPSEDED	VOIDED	INCOMPLETE
	☐	☐	☐	☐	X

COMPUTER PROGRAM/TYPE	SCP	MAINFRAME	PC	PROGRAM	VERSION/RELEASE NO.
	X YES ◯ NO	◯	X	LPILE	4.0

Note 1: Georgia Department of Transportation (GDOT) terminated Contract Number TOURDPPI60072 for its convenience the completion of all work under that contract and directed that the work with respect to these calculations be discontinued.
(a) These calculations were not completed at the time of GDOT's direction and the information contained herein is not and/or has not been fully verified or checked. These calculations are a work-in-progress and are presented only as such.
(b) Any user is cautioned that the use of these calculations and any related information or calculations, without access to factors and without proper regard for their purpose, could lead to erroneous conclusions.
(c) If any such calculations or any information contained herein is used in future work efforts or any follow on design work a complete confirmation of the information contained herein should be performed prior to any such use.
(d) GTP has no responsibility for the use of this information not under its direct control.

Caisson structural design ouptput is included for bents 4&6.

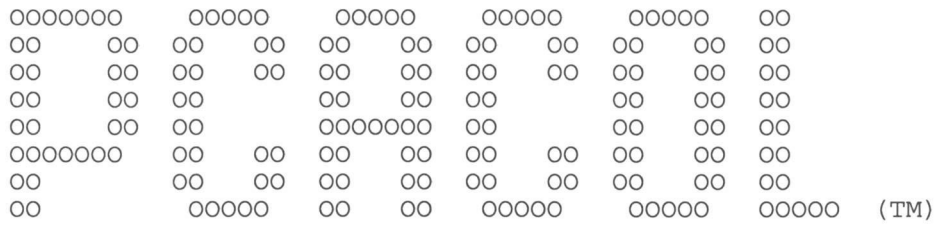
A	As per GDOT's termination for convenience direction	11	11	JCR			11/30/09
NO.	REASON FOR REVISION	TOTAL NO. OF SHEETS	LAST SHEET NO.	BY	CHECKED	APPROVED/ ACCEPTED	DATE
RECORD OF REVISIONS							

CALCULATION SHEET

PROJECT: I-75 / I-575 NORTHWEST CORRIDOR
JOB NUMBER NH000-0575-01(028)
CALC NO. BR#42

SUBJECT: Caisson Structural Design Output - Bent 4 SHEET NO.
BY: JCR DATE: 11/30/2009 SHEET REV.

Sufficient sample calculations representative of the scope and conditions in the design calculation were performed and the results compared to demonstrate the computer program adequacy.



==========
Computer program for the Strength Design of Reinforced Concrete Sections
==========

Licensee stated above acknowledges that Portland Cement Association (PCA) is not and cannot be responsible for either the accuracy or adequacy of the material supplied as input for processing by the PCACOL(tm) computer program. Furthermore, PCA neither makes any warranty expressed nor implied with respect to the correctness of the output prepared by the PCACOL(tm) program. Although PCA has endeavored to produce PCACOL(tm) error free, the program is not and can't be certified infallible. The final and only responsibility for analysis, design and engineering documents is the licensees. Accordingly, PCA disclaims all responsibility in contract, negligence or other tort for any analysis, design or engineering documents prepared in connection with the use of the PCACOL(tm) program.

General Information:
==========
File Name: N:\TRA\255717\ENG\BR42\SUBSTR~1\PCACOL~1\B4.COL
Project: I-575 O/ LITTLE RIVER Code: ACI 318-89
Column: BENT 4 Units: US in-lbs
Engineer: JCR Date: 10/25/09 Time: 8:00:00

Run Option: Investigation Short (nonslender) column
Run Axis: X-axis Column Type: Structural

Material Properties:
==========
f'c = 3.5 ksi fy = 60 ksi
Ec = 3586.62 ksi Es = 29000 ksi
fc = 2.975 ksi erup = 0 in/in
eu = 0.003 in/in
Stress Profile: Block Beta1 = 0.85

Geometry:
==========
Circular: Diameter = 78 in

Gross section area, Ag = 4778.36 in^2
Ix = 1.81697e+006 in^4 Xo = 0 in
Iy = 1.81697e+006 in^4 Yo = 0 in

Reinforcement:
==========
Rebar Database: ASTM

Size	Diam	Area	Size	Diam	Area	Size	Diam	Area
3	0.38	0.11	4	0.50	0.20	5	0.63	0.31
6	0.75	0.44	7	0.88	0.60	8	1.00	0.79
9	1.13	1.00	10	1.27	1.27	11	1.41	1.56
14	1.69	2.25	18	2.26	4.00			

Confinement: Tied; phi(c) = 0.7, phi(b) = 0.9, a = 0.8
#4 ties with #11 bars, #4 with larger bars.

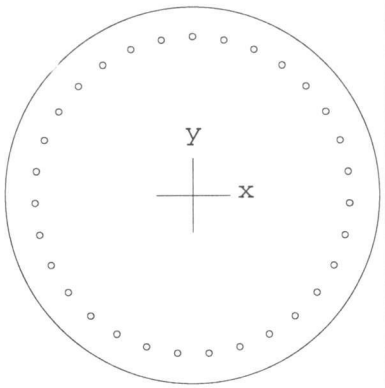
Layout: Circular
Pattern: All Sides Equal [Cover to transverse reinforcement (ties)]

Total steel area, As = 48.36 in^2 at 1.01%

31-#11 Cover = 5 in

Pt.	Applied Loads P (kips)	Mx (ft-k)	Computed Strength P (kips)	Mx (ft-k)	Computed/ Applied Ray length
1	938	4545	1627	7881	1.734

Program completed as requested!



78.0 inch diam.

f'c = 3.5 ksi

fy = 60.0 ksi

Confinement: Tied

clr cover = 5.50 in

spacing = 5.23 in

-#11 at 1.01%

= 48 in^2

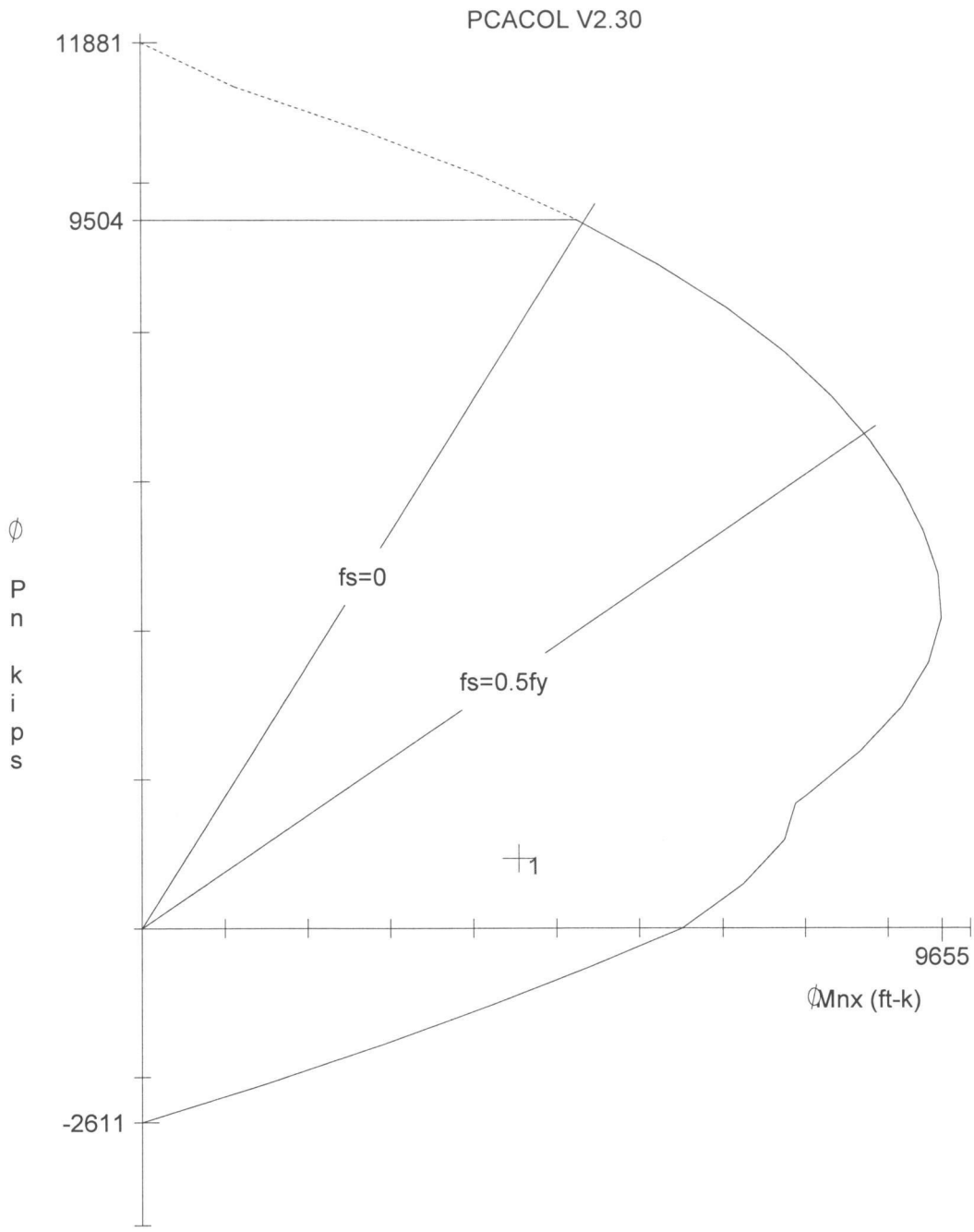
Ix = 1816972 in^4

Iy = 1816972 in^4

Xo = 0.00 in

Yo = 0.00 in

© 1993 PCA



Licensed To: Licensee name not yet specified.

File name: N:\TRA\255717\ENG\BR42\SUBSTR~1\PCACOL~1\B4.COL

Project: I-575 O/ LITTLE RIVER

Column Id: BENT 4

Engineer: JCR

Date: 10/25/09 Time: 8:00:00

de: ACI 318-89

Units: in-lb

X-axis slenderness is not considered.

Material Properties:

Ec = 3587 ksi eu = 0.003 in/in

fc = 2.97 ksi Es = 29000 ksi

Beta1 = 0.85

Stress Profile: Block

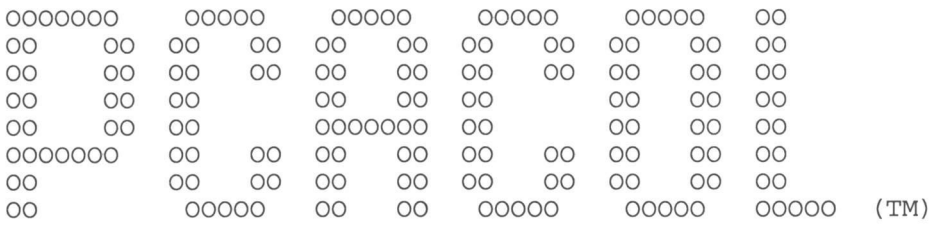
phi(c) = 0.70, phi(b) = 0.90

CALCULATION SHEET

PROJECT: I-75 / I-575 NORTHWEST CORRIDOR
JOB NUMBER NH000-0575-01(028)
CALC NO. BR#42

SUBJECT: Caisson Structural Design Output - Bent 6 SHEET NO.
BY: JCR DATE: 11/30/2009 SHEET REV.

Sufficient sample calculations representative of the scope and conditions in the design calculation were performed and the results compared to demonstrate the computer program adequacy.



==========
Computer program for the Strength Design of Reinforced Concrete Sections
==========

Licensee stated above acknowledges that Portland Cement Association (PCA) is not and cannot be responsible for either the accuracy or adequacy of the material supplied as input for processing by the CACOL(tm) computer program. Furthermore, PCA neither makes any warranty expressed nor implied with respect to the correctness of the output prepared by the PCACOL(tm) program. Although PCA has endeavored to produce PCACOL(tm) error free, the program is not and can't be certified infallible. The final and only responsibility for analysis, design and engineering documents is the licensees. Accordingly, PCA disclaims all responsibility in contract, negligence or other tort for any analysis, design or engineering documents prepared in connection with the use of the PCACOL(tm) program.

General Information:
==========
File Name: N:\TRA\255717\ENG\BR42\SUBSTR~1\PCACOL~1\B6.COL
Project: I-575 O/ LITTLE RIVER Code: ACI 318-89
Column: BENT 6 Units: US in-lbs
Engineer: JCR Date: 10/26/09 Time: 8:00:00

Run Option: Investigation Short (nonslender) column
Run Axis: X-axis Column Type: Structural

Material Properties:
==========
f'c = 3.5 ksi fy = 60 ksi
Ec = 3586.62 ksi Es = 29000 ksi
fc = 2.975 ksi erup = 0 in/in
eu = 0.003 in/in
Stress Profile: Block Beta1 = 0.85

Geometry:
==========
Circular: Diameter = 78 in

Gross section area, Ag = 4778.36 in^2
Ix = 1.81697e+006 in^4 Xo = 0 in
Iy = 1.81697e+006 in^4 Yo = 0 in

Reinforcement:
==========
Rebar Database: ASTM

Size	Diam	Area	Size	Diam	Area	Size	Diam	Area
3	0.38	0.11	4	0.50	0.20	5	0.63	0.31
6	0.75	0.44	7	0.88	0.60	8	1.00	0.79
9	1.13	1.00	10	1.27	1.27	11	1.41	1.56
14	1.69	2.25	18	2.26	4.00			

Confinement: Tied; phi(c) = 0.7, phi(b) = 0.9, a = 0.8
#4 ties with #11 bars, #4 with larger bars.

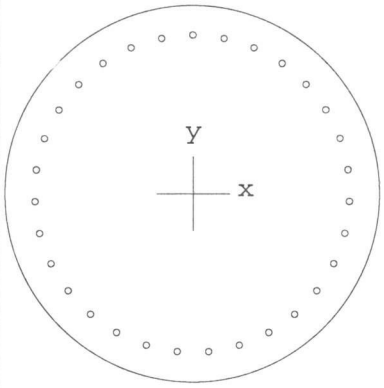
Layout: Circular
Pattern: All Sides Equal [Cover to transverse reinforcement (ties)]

Total steel area, As = 48.36 in^2 at 1.01%

31-#11 Cover = 5 in

Pt.	Applied Loads P (kips)	Mx (ft-k)	Computed Strength P (kips)	Mx (ft-k)	Computed/ Applied Ray length
1	858	3353	2092	8371	2.493

Program completed as requested!



78.0 inch diam.

f'c = 3.5 ksi

fy = 60.0 ksi

Confinement: Tied

clr cover = 5.50 in

spacing = 5.23 in

'-#11 at 1.01%

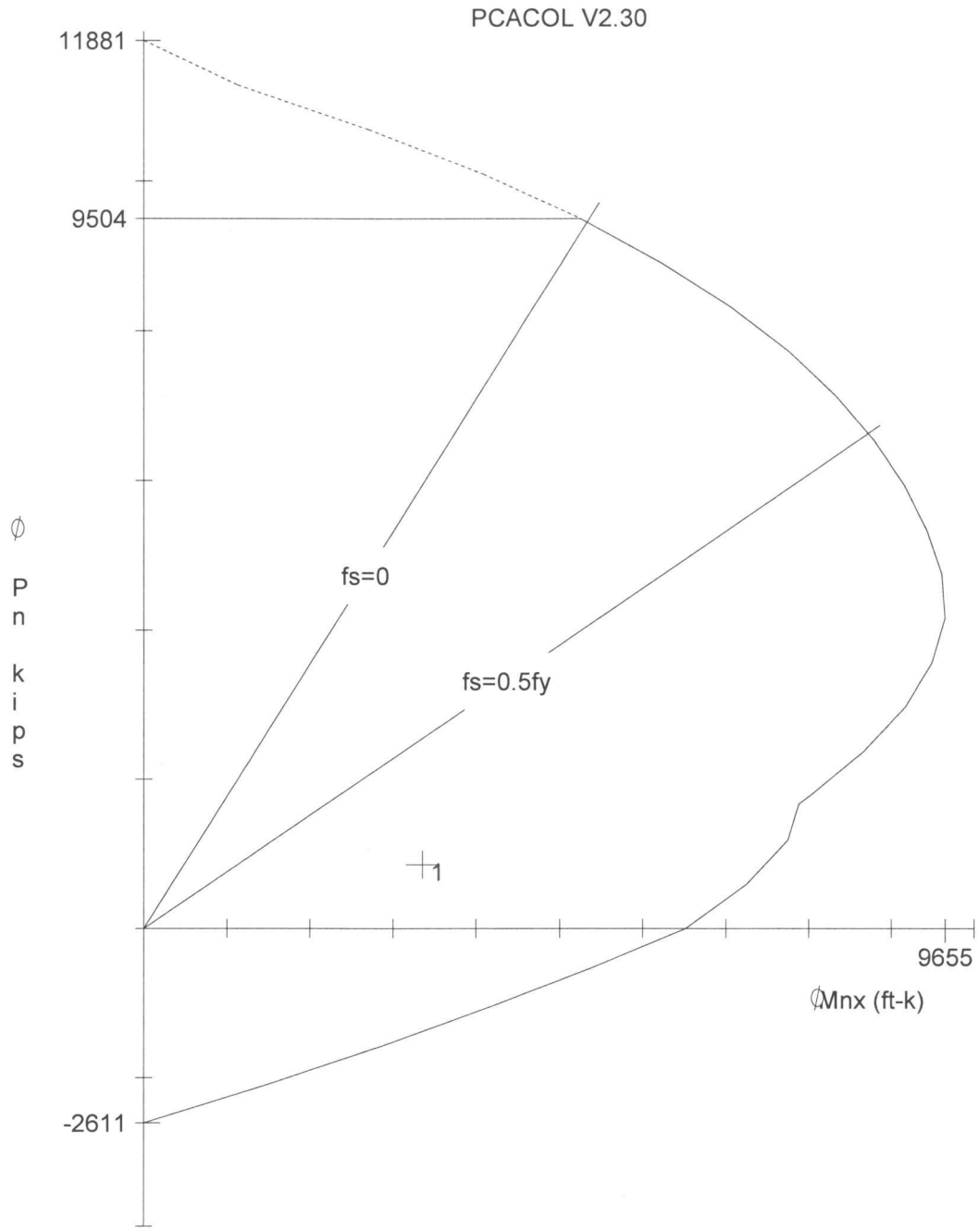
As = 48 in^2

Ix = 1816972 in^4

Iy = 1816972 in^4

Xo = 0.00 in

Yo = 0.00 in



© 1993 PCA

Licensed To: Licensee name not yet specified.

File name: N:\TRA\255717\ENG\BR42\SUBSTR~1\PCACOL~1\B6.COL

Project: I-575 O/ LITTLE RIVER

Column Id: BENT 6

Engineer: JCR

Date: 10/26/09 Time: 8:00:00

Code: ACI 318-89

Units: in-lb

X-axis slenderness is not considered.

Material Properties:

Ec = 3587 ksi eu = 0.003 in/in

fc = 2.97 ksi Es = 29000 ksi

Beta1 = 0.85

Stress Profile: Block

phi(c) = 0.70, phi(b) = 0.90

CALCULATION COVER SHEET

PROJECT	JOB NO.	CALC NO.	SHEET
I-75 / I-575 NORTHWEST CORRIDOR	NH000-0575-01(028)	BR#42	1
SUBJECT	DISCIPLINE		
References for Design	STRUCTURAL		

CALCULATION STATUS DESIGNATION	PRELIMINARY	CONFIRMED	SUPSEDED	VOIDED	INCOMPLETE
	☐	☐	☐	☐	X

COMPUTER PROGRAM/TYPE	SCP	MAINFRAME	PC	PROGRAM	VERSION/RELEASE NO.
	◯ YES ◯ NO	◯	◯	NONE	

Note 1: Georgia Department of Transportation (GDOT) terminated Contract Number TOURDPPI60072 for its convenience the completion of all work under that contract and directed that the work with respect to these calculations be discontinued.
(a) These calculations were not completed at the time of GDOT's direction and the information contained herein is not and/or has not been fully verified or checked. These calculations are a work-in-progress and are presented only as such.
(b) Any user is cautioned that the use of these calculations and any related information or calculations, without access to factors and without proper regard for their purpose, could lead to erroneous conclusions.
(c) If any such calculations or any information contained herein is used in future work efforts or any follow on design work a complete confirmation of the information contained herein should be performed prior to any such use.
(d) GTP has no responsibility for the use of this information not under its direct control.

Included Reference Information:

- Roadway information
- Bridge Survey Shots
- Existing Bridge Plans
- Existing Bridge Maintenance Reports
- Existing Bridge Groundline Survey Elevations
- Hydraulic Information
- BFI

NO.	REASON FOR REVISION	TOTAL NO. OF SHEETS	LAST SHEET NO.	BY	CHECKED	APPROVED/ ACCEPTED	DATE
A	As per GDOT's termination for convenience direction	96	96	JCR			11/30/09

RECORD OF REVISIONS

CALCULATION SHEET

PROJECT: I-75 / I-575 NORTHWEST CORRIDOR
JOB NUMBER NH000-0575-01(028)
CALC NO. BR#42

SUBJECT: Roadway Information
BY: JCR DATE: 11/30/2009

SHEET NO.
SHEET REV.

CC	( )		1501664.0618	2184019.9655
PT	( )	1546+84.3439	1501446.3650	2187888.8456
Radius:		3875.0000		
Delta:		32°48'45.0755" Left		
Degree of Curvature (Arc):		1°28'42.9628"		
Length:		2219.1603		
Tangent:		1140.9346		
Chord:		2188.9586		
Middle Ordinate:		157.7779		
External:		164.4748		
Tangent Direction:		N 36°01'59.0978" E		
Radial Direction:		S 53°58'00.9022" E		
Chord Direction:		N 19°37'36.5599" E		
Radial Direction:		S 86°46'45.9779" E		
Tangent Direction:		N 3°13'14.0222" E		

Element: Linear

PT	( )	1546+84.3439	1501446.3650	2187888.8456
PC	( )	1562+35.2081	1502994.7799	2187975.9729
Tangential Direction:		N 3°13'14.0222" E		
Tangential Length:		1550.8642		

Element: Circular

PC	( )	✓1562+35.2081	✓1502994.7799	✓2187975.9729
PI	( )	1571+36.5840	✓1503894.7322	✓2188026.6120
CC	( )		1502834.1056	2190831.4560
PT	( )	✓1579+81.5938	✓1504603.0189	✓2188584.1140
Radius:		✓2860.0000		
Delta:		34°59'10.3236" Right		
Degree of Curvature (Arc):		2°00'12.0562"		
Length:		1746.3858		
Tangent:		901.3759		
Chord:		1719.3802		
Middle Ordinate:		132.2660		
External:		138.6795		
Tangent Direction:		N 3°13'14.0222" E		
Radial Direction:		S 86°46'45.9779" E		
Chord Direction:		N 20°42'49.1840" E		
Radial Direction:		S 51°47'35.6544" E		
Tangent Direction:		N 38°12'24.3458" E		

BR#42 575 o/ Little River

Element: Linear

PT	( )	1579+81.5938	1504603.0189	2188584.1140
PC	( )	1589+24.4199	1505343.8764	2189167.2530
Tangential Direction:		N 38°12'24.3458" E		
Tangential Length:		942.8260		

Element: Circular

PC	( )	1589+24.4199	1505343.8764	2189167.2530
PI	( )	1596+60.6336	1505922.3813	2189622.6021
CC	( )		1508949.7381	2184586.1329

PROJECT:	NW Corridor
COUNTY:	CHEROKEE
BRIDGE:	42
DESCRIPTION:	I-575 over Little River

VERTICAL GRADE DATA FOR NEW ALIGNMENT, ADJUSTED FOR SURVEY DIFF.:

PVC =	1567+59.5	PVI =	1573+59.5	PVT =	1579+59.5
PVI EL. =	904.3712	PVI EL. =	886.88	PVI EL. =	904.8800
		VC Length (ft) =	1200		

ELEVATION COMPARISON, ADJUSTED FOR SURVEY DIFF.

BENT 1R LEFT SIDE		BENT 1R RIGHT SIDE	
Geomath Rdy EL. =	898.314	Geomath Rdy EL. =	895.325
Survey EL. =	898.175	Survey EL. =	895.129
DIFFERENCE =	0.139	DIFFERENCE =	0.196

BENT 2R LEFT SIDE		BENT 2R RIGHT SIDE	
Geomath Rdy EL. =	897.247	Geomath Rdy EL. =	894.309
Survey EL. =	897.253	Survey EL. =	894.293
DIFFERENCE =	-0.006	DIFFERENCE =	0.016

BENT 3R LEFT SIDE		BENT 3R RIGHT SIDE	
Geomath Rdy EL. =	896.565	Geomath Rdy EL. =	893.636
Survey EL. =	896.582	Survey EL. =	893.634
DIFFERENCE =	-0.017	DIFFERENCE =	0.002

BENT 4R LEFT SIDE		BENT 4R RIGHT SIDE	
Geomath Rdy EL. =	896.268	Geomath Rdy EL. =	893.348
Survey EL. =	896.258	Survey EL. =	893.344
DIFFERENCE =	0.010	DIFFERENCE =	0.004

BENT 5R LEFT SIDE		BENT 5R RIGHT SIDE	
Geomath Rdy EL. =	896.357	Geomath Rdy EL. =	893.428
Survey EL. =	896.398	Survey EL. =	893.465
DIFFERENCE =	-0.041	DIFFERENCE =	-0.037

BENT 6R LEFT SIDE		BENT 6R RIGHT SIDE	
Geomath Rdy EL. =	896.825	Geomath Rdy EL. =	893.914
Survey EL. =	896.822	Survey EL. =	893.972
DIFFERENCE =	0.003	DIFFERENCE =	-0.058

BENT 7R LEFT SIDE		BENT 7R RIGHT SIDE	
Geomath Rdy EL. =	897.703	Geomath Rdy EL. =	894.688
Survey EL. =	897.781	Survey EL. =	894.767
DIFFERENCE =	-0.078	DIFFERENCE =	-0.079

Mean EL. Difference =	0.004

CALCULATION SHEET

PROJECT: I-75 / I-575 NORTHWEST CORRIDOR
JOB NUMBER NH000-0575-01(028)
CALC NO. BR#42

SUBJECT: Bridge Survey Shots
BY: JCR DATE: 11/30/2009

SHEET NO.
SHEET REV.

Little River, Br. 16

SVXO10692	1503989.966	2188150.384	895.770	BT 2	LT, In
SVXO10705	1504006.482	2188112.001	898.740	BT 2	LT, Out
SVXO10693	1504072.041	2188187.136	895.502	BT 3	LT, In
SVXO10706	1504089.642	2188149.421	898.381	BT 3	LT, Out
SVXO10694	1504152.413	2188226.441	895.641	BT 4	LT, In
SVXO10707	1504171.509	2188189.255	898.546	BT 4	LT, Out
SVXO10695	1504232.171	2188268.488	896.107	BT 5	LT, In
SVXO10708	1504252.015	2188231.878	898.978	BT 5	LT, Out
SVXO10696	1504309.745	2188312.918	896.952	BT 6	LT, In
SVXO10709	1504331.408	2188276.165	899.900	BT 6	LT, Out
SVXO10704	1503922.668	2188076.770	899.400	BT 1	LT, Out
SVXO10691	1503906.897	2188116.459	896.409	BT 1	LT, In
SVXO10703	1503805.377	2188133.588	898.175	BT 1	RT, In
SVXO10716	1503791.061	2188173.784	895.129	BT 1	RT, Out
SVXO10702	1503887.523	2188164.766	897.253	BT 2	RT, In
SVXO10715	1503872.291	2188203.839	894.293	BT 2	RT, Out
SVXO10701	1503968.974	2188198.455	896.582	BT 3	RT, In
SVXO10714	1503952.746	2188236.995	893.634	BT 3	RT, Out
SVXO10697	1504283.842	2188357.173	897.781	BT 7	RT, In
SVXO10710	1504262.023	2188394.311	894.767	BT 7	RT, Out
SVXO10698	1504206.995	2188314.243	896.822	BT 6	RT, In
SVXO10711	1504187.029	2188350.729	893.972	BT 6	RT, Out
SVXO10699	1504128.926	2188273.234	896.398	BT 5	RT, In
SVXO10712	1504109.989	2188310.554	893.465	BT 5	RT, Out
SVXO10700	1504049.531	2188234.641	896.258	BT 4	RT, In
SVXO10713	1504032.014	2188272.498	893.344	BT 4	RT, Out

CALCULATION SHEET

PROJECT: I-75 / I-575 NORTHWEST CORRIDOR
JOB NUMBER NH000-0575-01(028)
CALC NO. BR#42

SUBJECT: Existing Bridge Plans
BY: JCR DATE: 11/30/2009

SHEET NO.
SHEET REV.

STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
GA.	I-575-1(6)07	69A	173

Cont. of 1 — Added 10-17-79

B-5

P.I. STA. 705+34.14
Δ = 351°03'10" RT.
D = 2°00'
T = 304.71
L = 1758.64
SE = .077 FT.
R = 2870 FT.

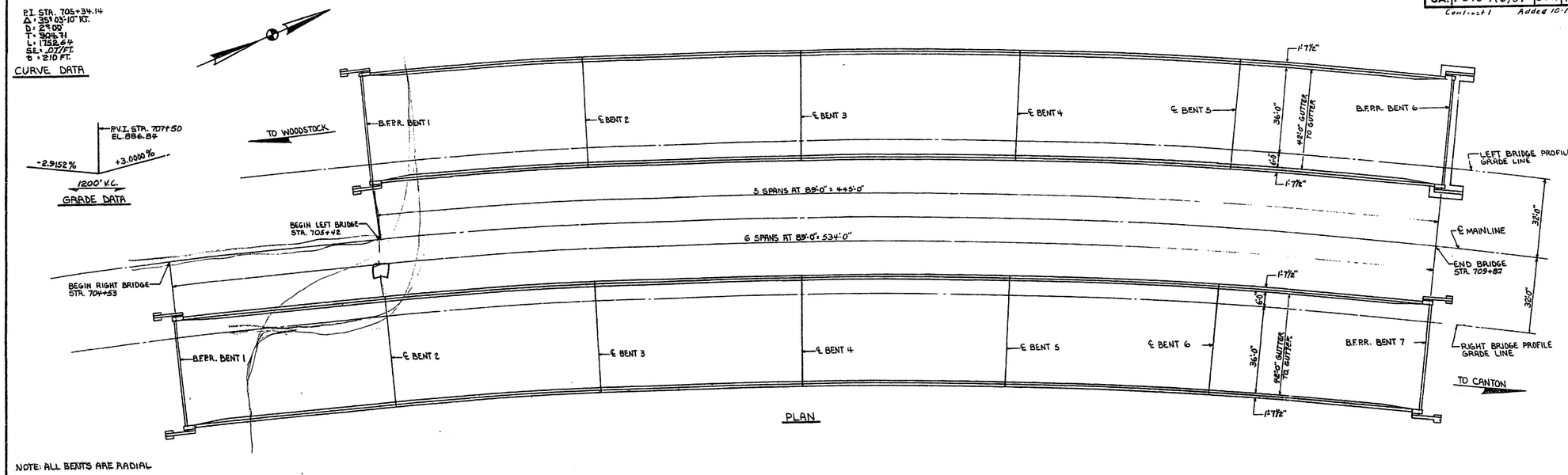
CURVE DATA

PVI STA. 707+50
EL. 886.84

-2.9152% +3.0000%

1200' V.C.

GRADE DATA

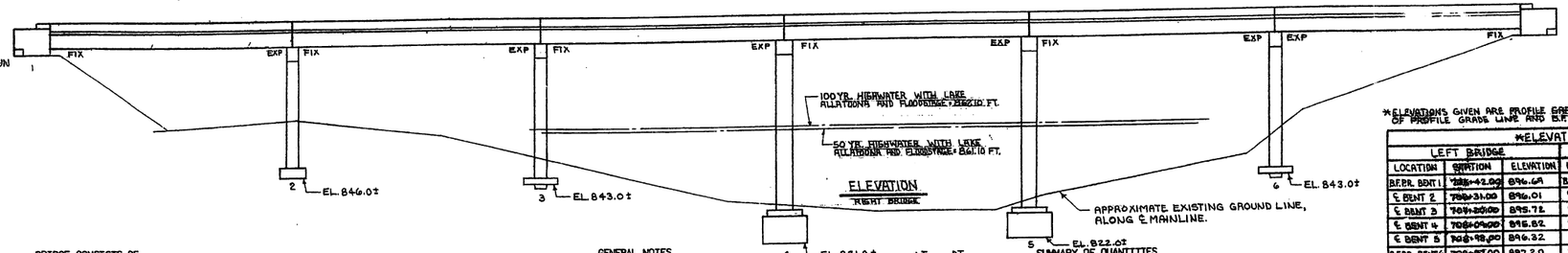


PLAN

NOTE: ALL BENTS ARE RADIAL

NOTE: PILES NOT SHOWN

NOTE: RIP RAP DETAILS NOT SHOWN FOR DETAILS SEE BRIDGE SHEET 18 OF 22.



ELEVATION
RIGHT BRIDGE

*ELEVATIONS GIVEN ARE PROFILE GRADE ELEVATIONS AT INTERSECTION OF PROFILE GRADE LINE AND B.F.P.R. OR ℄ BENT.

*ELEVATIONS					
LEFT BRIDGE			RIGHT BRIDGE		
LOCATION	STATION	ELEVATION	LOCATION	STATION	ELEVATION
B.F.P.R. BENT 1	705+42.00	896.69	B.F.P.R. BENT 1	704+53.00	897.76
℄ BENT 2	706+31.00	896.01	℄ BENT 2	705+42.00	896.69
℄ BENT 3	707+20.00	895.72	℄ BENT 3	706+31.00	896.01
℄ BENT 4	708+09.00	895.82	℄ BENT 4	707+20.00	895.72
℄ BENT 5	708+98.00	896.32	℄ BENT 5	708+09.00	895.82
B.F.P.R. BENT 6	709+87.00	897.20	℄ BENT 6	708+98.00	896.32
			B.F.P.R. BENT 7	709+87.00	897.20

DESIGN DATA

SPECIFICATIONS - AASHTO 1977

TYPICAL HS20-44 AND/OR MILITARY LOADING - IMPACT ALLOWED

FUTURE PAVING ALLOWANCE = 30 LBS PER SQ FT

CONCRETE: SUPERSTRUCTURE f'c = 3500 psi
SUBSTRUCTURE f'c = 3000 psi

REINFORCEMENT: GRADE 40, fy = 40 psi

BRIDGE CONSISTS OF

LT.	RT.	
5	6	89'-0" PSC GIRDER SIMPLE SPANS----------SPECIAL DESIGN
1	2	STEEL H-PILE END BENTS----------SPECIAL DESIGN
4	5	CONCRETE INTERMEDIATE BENTS----------SPECIAL DESIGN
1	-	SPREAD FOOTING END BENTS----------SPECIAL DESIGN
✓	✓	BAR BENDING DETAILS----------GA. STD. NO.3901
✓	✓	TYPICAL FILL DETAIL AT END OF BRIDGE--------GA. STD. NO.9037(9-1-70)
✓	✓	END POST AND END POST GUARDRAIL ATTACHMENTS—GA. STD. NO.3053 (2-1-75) W = 1'-1"; H = 2'-8"; L = 4'-0"

UTILITIES

NONE

DRAINAGE DATA

DRAINAGE AREA = 139 SQ MI

FLOOD FREQUENCY	DISCHARGE	VELOCITY	AREA OF OPENING UNDER HIGHWATER
Q_{50}	12,700 CFS	2.30 FT/SEC	5500 SQ FT
Q_{100}	14,300 CFS	2.50 FT/SEC	5850 SQ FT

GENERAL NOTES

SPECIFICATIONS - GEORGIA STANDARD DATED 1977

WAITING PERIOD - NO WORK SHALL BE STARTED AT BENT 1 LEFT BRIDGE OR BENTS 1 AND 2 RIGHT BRIDGE UNTIL THE COMPLETED END FILLS HAVE BEEN IN PLACE FOR AN ESTIMATED PERIOD OF 60 DAYS.

END BENT EXCAVATION - EXCAVATION FOR END BENT NO. 6 LT. SHALL BE PAID FOR AS CU YD BR EXCAV, STREAM CROSS.

PROTECTIVE SURFACE TREATMENT - PER SECTION 500.13C WILL BE REQUIRED AT THIS SITE.

REINFORCEMENT - ALL REINFORCEMENT SHALL BE PLACED AND TIED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS AND SPECIAL PROVISIONS.

COFFERDAMS - COFFERDAMS PROVIDED FOR IN THE SUMMARY OF QUANTITIES ARE LOCATED AT BENTS 3 AND 4 LEFT BRIDGE AND BENTS 4 AND 5 RIGHT BRIDGE.

DRIVING DATA PILES - ONE REQUIRED AT EACH OF BENTS 1 LT. & RT., BT 3 RT, BT 7 RT.

GROOVED SURFACE FINISH OF CONCRETE DECK SHALL BE REQUIRED AT THIS SITE. SEE SPECIAL PROVISIONS.

PLAN DRIVING OBJECTIVE - SEE SUBSTRUCTURE DETAILS.

PILE TIP REINFORCEMENT- PROTECTIVE PREFABRICATED POINTS AS MANUFACTURED BY PRUYN # 75752 OR MACELROY TYPE M POINTS AND/OR EQUAL SHALL BE FURNISHED FOR ALL PILES AT BENT 7 RIGHT BRIDGE. PAYMENT WILL BE INCLUDED WITH PAYMENT FOR LIN FT PILING IN PLACE. THIS TIP REINFORCEMENT SHALL SUPERSEDE THE REQUIREMENT OF SECTION 520.03V AND 520.05E OF THE STANDARD SPECIFICATIONS.

SUMMARY OF QUANTITIES

LT.	RT.	
1720	–	CU YD BR EXCAV, STREAM CROSS - BR NO. 1 LT
–	1560	CU YD BR EXCAV, STREAM CROSS - BR NO. 1 RT
LUMP	–	SUPERSTR CONC (CL AA) - BR NO. 1 LT (684)
–	LUMP	SUPERSTR CONC (CL AA) - BR NO. 1 RT (797)
1	–	EACH BRIDGE DECK JOINT SEAL, BT. NO. 5
–	1	EACH BRIDGE DECK JOINT SEAL, BT. NO. 6
LUMP	–	PSC BEAMS, AASHO TYPE 4-40 BR NO. 1 LT
LUMP	–	PSC BEAMS, AASHO TYPE 4-42 BR NO. 1 LT
–	LUMP	PSC BEAMS, AASHO TYPE 4-40 BR NO. 1 RT
–	LUMP	PSC BEAMS, AASHO TYPE 4-42 BR NO. 1 RT
140,965	153,395	LB BAR REINF STEEL
LUMP	–	SUPERSTR REINF STEEL - BR NO. 1 LT (84,634)
–	LUMP	SUPERSTR REINF STEEL - BR NO. 1 RT (100,644)
830	2630	LIN FT PILING IN PLACE, STEEL H, 12BP53
1	1	EACH LOAD TEST, STEEL H, 12BP53 (IF REQD)
4	4	EACH COFFERDAM
1490	3040	SQ YD STN DUMPED RIP RAP, 24 IN, TYPE II.
LUMP	–	EPOXY COATED SUPERSTR. REINF. STEEL BR. NO. 1 LT. (64,332)
–	LUMP	EPOXY COATED SUPERSTR. REINF. STEEL BR. NO. 1 RT. (75,400)
813	816	CU YD CL A CONC
358	362	CU YD SEAL CONC
2010	2335	SQ YD GROOVING CONC

BRIDGE SHEET 1 OF 22

BRIDGE NO. 1 LT. & RT.

GEORGIA
DEPARTMENT OF TRANSPORTATION
HIGHWAY DIVISION-BRIDGE DESIGN

PLAN AND ELEVATION

I-575 OVER LITTLE RIVER

CHEROKEE COUNTY I-575-1(6)07

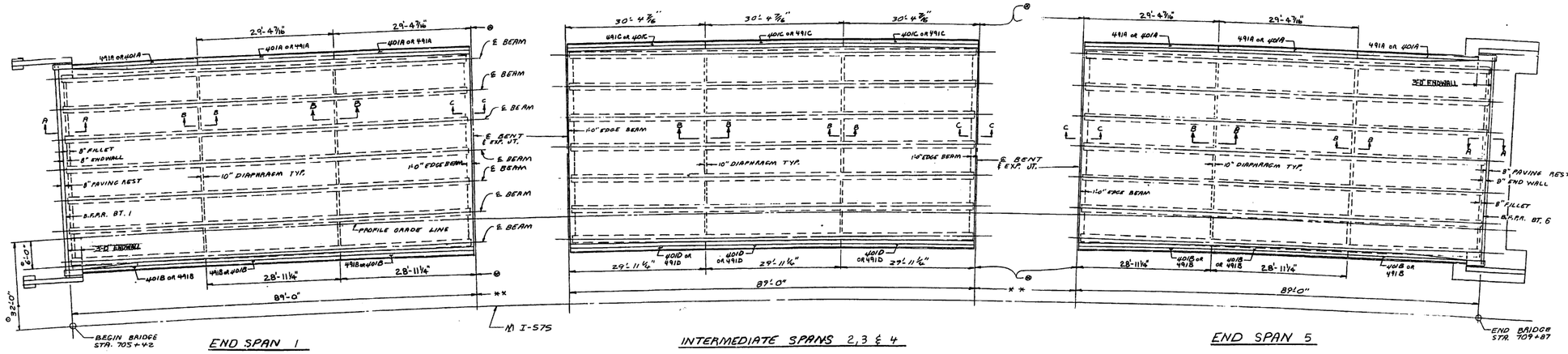
SCALE: 1"=20'-0" JULY 1979

DESIGNED W.A.M. - P.V.L. TRACED
DRAWN M.B.M. CHECKED H.W.C.
REVIEWED L.A.P.
APPROVED

DATE | REVISIONS | BY

STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
GA.	I-575-1(6)07	89-B	173

CT. 1 Added 10-17-79



0 RADIAL DIMENSIONS

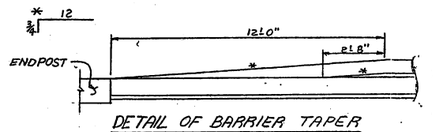
LEFT BRIDGE

NOTE: ALL BENTS ARE RADIAL BASED ON 89'-0" SPANS MEASURED AT ℄ SURVEY. ALL BEAMS ARE CHORDS OF CONCENTRIC CIRCLES MEASURED BETWEEN ℄ BENTS OR BACK FACE PAVING REST. CONCENTRIC CIRCLES ARE LOCATED AT 6'-9" SPACING. BEAM 7 CONCENTRIC CIRCLE IS LOCATED 2675 FT. LEFT OF ℄ MAINLINE.

ALL DIAPHRAGMS ARE RADIAL LOCATED AT SPAN 1/3 POINTS.

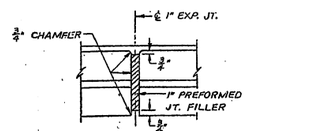
℗ SPACING FOR 1" EXP. JTS. IN BARRIER ALONG GUTTER LINE.

** DIMENSIONS ALONG ℄

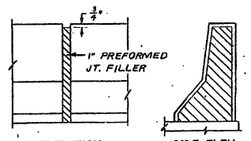


DETAIL OF BARRIER TAPER

NO SCALE



PLAN



ELEVATION SIDE ELEV.

DETAILS OF 1" EXPANSION JOINT IN BARRIER

NO SCALE

TABLE OF QUANTITIES

ITEM \ SPAN	1	2	3	4	5	TOTAL
LUMP, SUPERSTR. CLASS AA CONC., CU. YDS.	139.29	135.10	135.10	135.10	139.49	684.28
LUMP, SUPERSTR. BAR REINF. STEEL, LBS.	16,907	16,960	16,960	16,960	16,907	83,694
LUMP, EPOXY COATED SUPERSTR. BAR REINF. STEEL, LBS.	12,819	12,898	12,898	12,898	12,819	64,332

NOTE: END POST CONCRETE AND BAR REINFORCEMENT STEEL INCLUDED IN END SPAN QUANTITIES

BRIDGE NO. 1 LT.

GEORGIA
DEPARTMENT OF TRANSPORTATION
HIGHWAY DIVISION-BRIDGE DESIGN

SUPERSTRUCTURE DETAILS

I-575 OVER LITTLE RIVER

CHEROKEE COUNTY I-575-1(6)07

SCALE 1 3/32"=1'-0" SEPT. 1979

DESIGNED JAM TRACED REVIEWED LAP

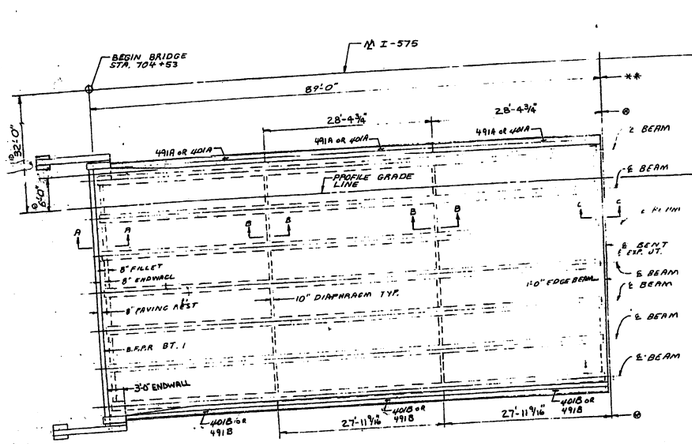
DRAWN KHM CHECKED HWG - RVL APPROVED

BRIDGE SHEET 2 OF 22

DATE | REVISIONS | BY

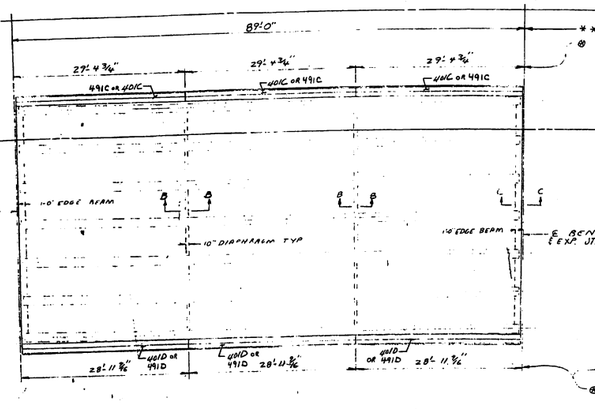
STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
GA.	I-575-1(6)07	89-C	173

Ct. 1 Added 10-17-79

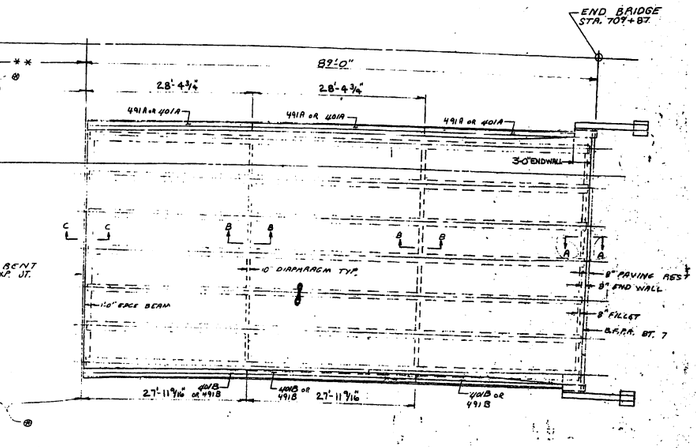


℗ RADIAL DIMENSIONS

END SPAN 1



INTERMEDIATE SPANS 2, 3, 4 & 5

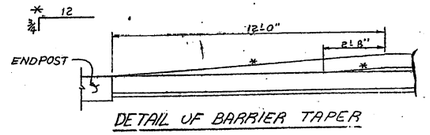


END SPAN 6

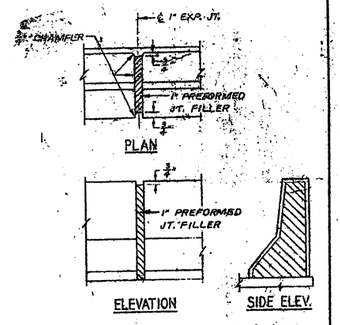
℗ SPACING FOR 1" EXP. JTS. IN BARRIER ALONG GUTTER LINE.
** DIMENSIONS ALONG N

RIGHT BRIDGE

NOTE: ALL BENTS ARE RADIAL BASED ON 89'-0" SPANS MEASURED AT ℄ SURVEY. ALL BEARING AND CHORDS OF CONCENTRIC CIRCLES MEASURED BETWEEN ℄ BENTS OR BACK FACE PAVING REST. CONCENTRIC CIRCLES ARE LOCATED AT 8'-3" SPACING, BEAM 1 CONCENTRIC CIRCLE IS LOCATED 26.75 FT. RIGHT OF ℄ N-BOUND.
ALL DIAPHRAGMS ARE RADIAL LOCATED AT SPAN 1/3 POINTS.



DETAIL OF BARRIER TAPER
¼" SCALE



DETAILS OF 1" EXPANSION JOINT IN BARRIER
NO SCALE

NOTE: END POST CONCRETE AND BAR REINFORCEMENT STEEL INCLUDED IN END SPAN QUANTITIES.

TABLE OF QUANTITIES

ITEM \ SPAN	1	2	3	4	5	6	TOTAL
LUMP, SUPERSTR. CLASS AA CONC. CU. YDS.	135.88	131.89	131.89	131.89	131.89	135.88	796.52
LUMP, SUPERSTR. BAR REINF. STEEL, LBS.	10,162	10,749	10,749	10,844	10,844	10,926	64,274
LUMP, EPOXY COATED SUPERSTR. BAR REINF. STEEL, LBS.	12,332	16,934	16,934	16,934	16,934	16,532	96,600

BRIDGE SHEET 3 OF 22

BRIDGE NO. 1 RI

GEORGIA
DEPARTMENT OF TRANSPORTATION
HIGHWAY DIVISION-BRIDGE DESIGN

SUPERSTRUCTURE DETAILS

I-575 OVER LITTLE RIVER

CHEROKEE COUNTY I-575-1(6)07

SCALE: 1/8" = 1'-0"

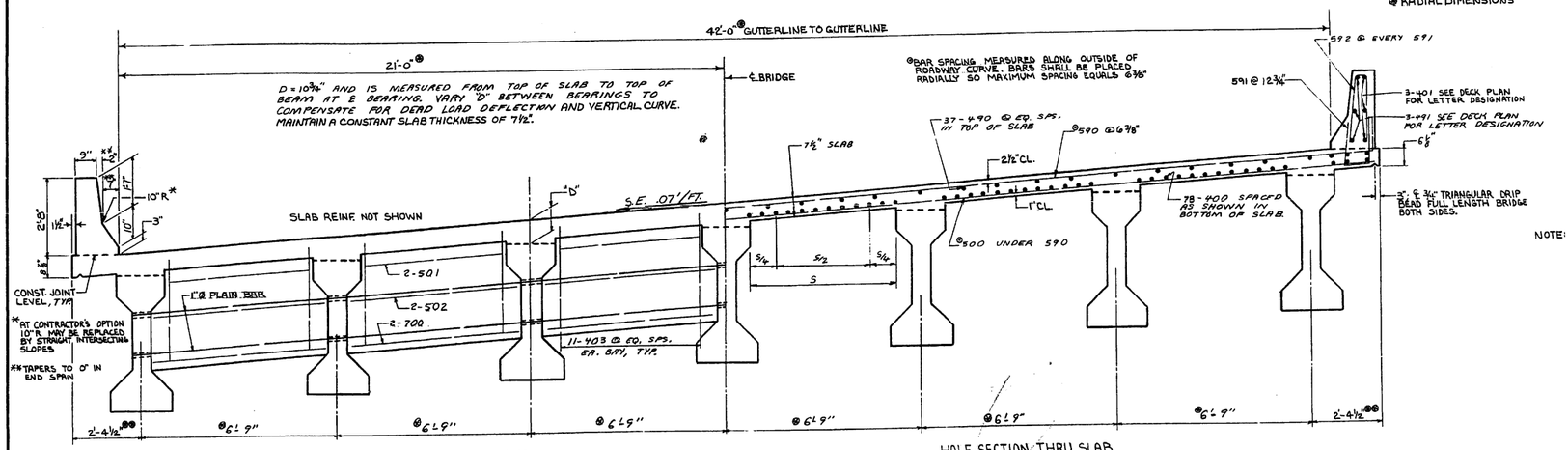
DESIGNED JJP/AA DATE
DRAWN AMG CHECKED HMC DATE

REVISIONS
NO. BY DATE

STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
GA.	I-575-1(6)07	89-D	173

Cr. 1 Added 10-11-79

@ RADIAL DIMENSIONS

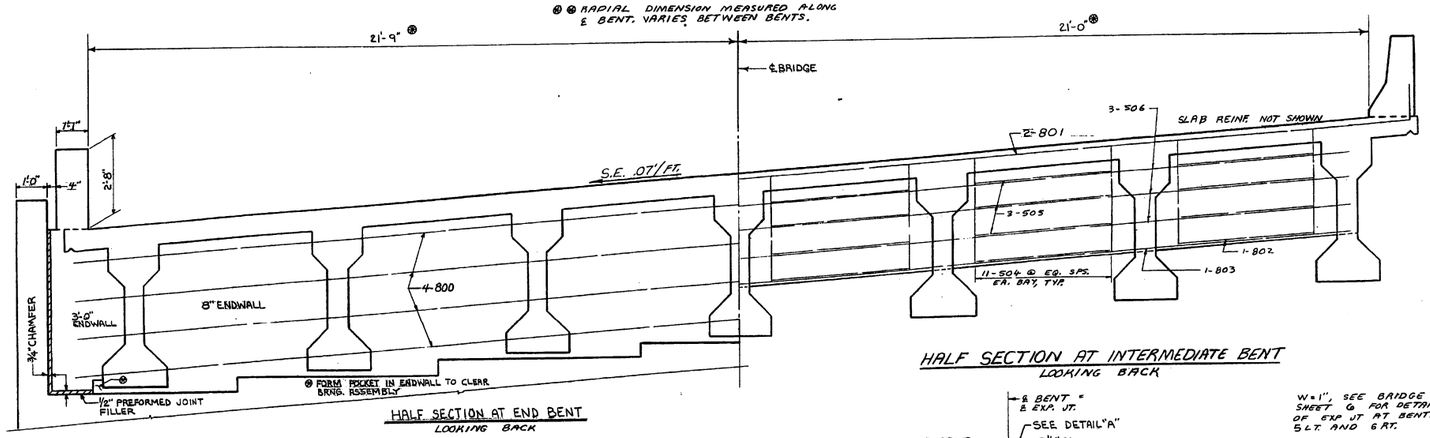


HALF SECTION AT DIAPHRAGMS
LOOKING BACK

HALF SECTION THRU SLAB
LOOKING BACK

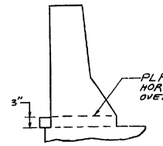
NOTE: AT CONTRACTOR'S OPTION; 400, 401, 490, 491 BARS MAY BE SPLICED. BARS SHALL HAVE A MINIMUM LAP OF 2'-0". SPLICES SHALL BE ALTERNATED. ADDITIONAL LENGTH HAS BEEN ADDED TO LENGTH OF BARS.

@@ RADIAL DIMENSION MEASURED ALONG ℄ BENT. VARIES BETWEEN BENTS.



HALF SECTION AT END BENT
LOOKING BACK

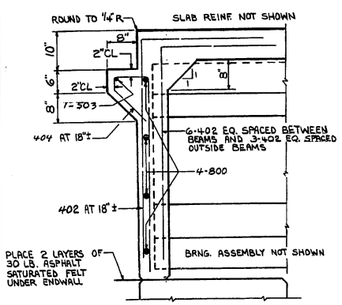
NOTE: AT CONTRACTOR'S OPTION, HOLE FOR DECK DRAIN MAY BE FORMED, AND RECTANGULAR PLASTIC DRAIN GROUTED INTO PLACE AFTER BARRIER IS CONSTRUCTED.



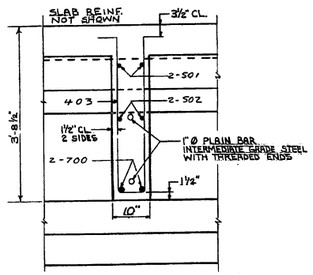
PLACE 3" x 6" I.D. RECTANGULAR PLASTIC DRAINS HORIZONTALLY THRU THE BARRIER TO PROTRUDE OVER EDGE OF SLAB

DECK DRAIN DETAIL

PLACE DECK DRAINS ON LOW SIDE OF BRIDGE. DON'T OVER END FILLS. SPACE AT 10'-0" ℄ BEGINNING 5'-0" FROM ℄ INTERMEDIATE BENTS. AT STA. 707+41.40 LOW POINT IN VERT. CURVE PLACE 5 ADDITIONAL DECK DRAINS AT 2'-6" ON BOTH SIDES OF LOW POINT.

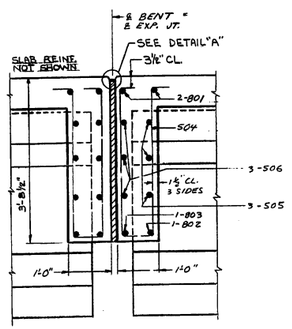


SECTION A-A



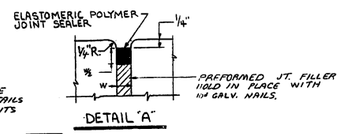
SECTION B-B

HALF SECTION AT INTERMEDIATE BENT
LOOKING BACK

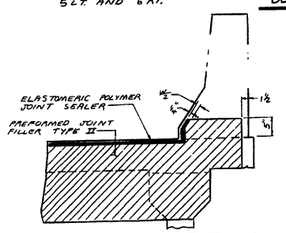


SECTION C-C

W = 1", SEE BRIDGE SHEET 6 FOR DETAILS OF EXP JT AT BENTS 5 LT. AND 6 RT.



DETAIL "A"



DETAIL OF EXP. JT. AT BARRIER

BRIDGE NO. 1

GEORGIA
DEPARTMENT OF TRANSPORTATION
HIGHWAY DIVISION - BRIDGE DESIGN

SUPERSTRUCTURE DETAILS

I-575 OVER LITTLE RIVER

CHEROKEE COUNTY I-575-1(6)07

NO SCALE AUGUST 1979

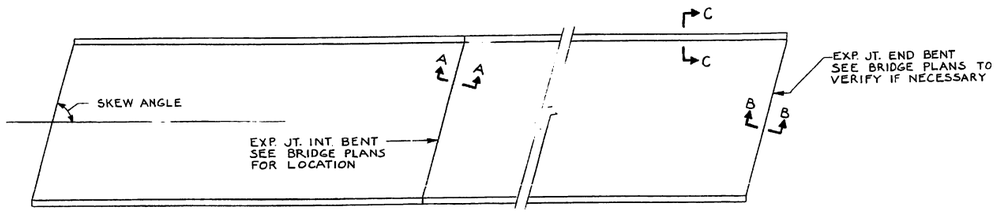
DESIGNED J.G.H. - P.V.L. TRACED
DRAWN D.K.M. - R.M.M. CHECKED H.W.C.
REVIEWED L.R.P.
APPROVED

BRIDGE SHEET 4 OF 22

DATE | REVISIONS | BY

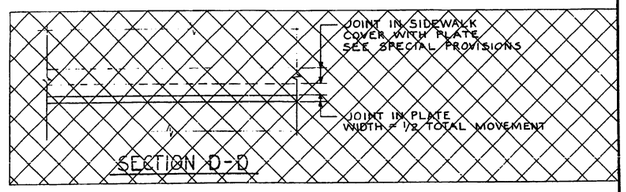
FED. ROAD DIV. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
3	GA.	I-575-1 (6)07		89-F	173

Ct. 1 Added 10-17-79



NOTE: SEE BRIDGE PLANS FOR PROPER SKEW ANGLE AND LOCATION OF EXPANSION JOINTS.

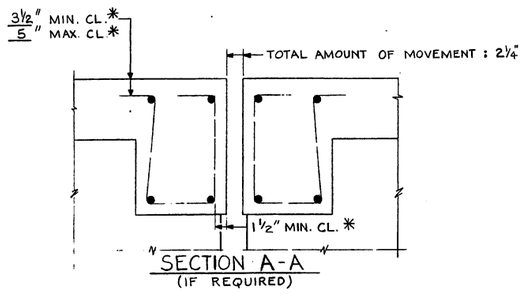
GENERAL DECK PLAN



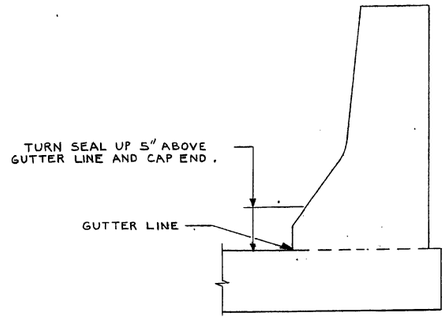
GENERAL NOTES:

1. EXPANSION JOINT SELECTED WILL BE AS PER SPECIAL PROVISION.
2. ALL EXPANSION JOINTS ARE TO TURN RADIALLY AT GUTTER LINE, UNLESS OTHERWISE NOTED.
3. THE FOLLOWING TYPES OF SEALS ARE TO BE UTILIZED IN THE CONTRACTOR'S SELECTION OF EXPANSION JOINT: BT. 5, LT. BR., TYPE I. BT. 6, RT. BR., TYPE I.

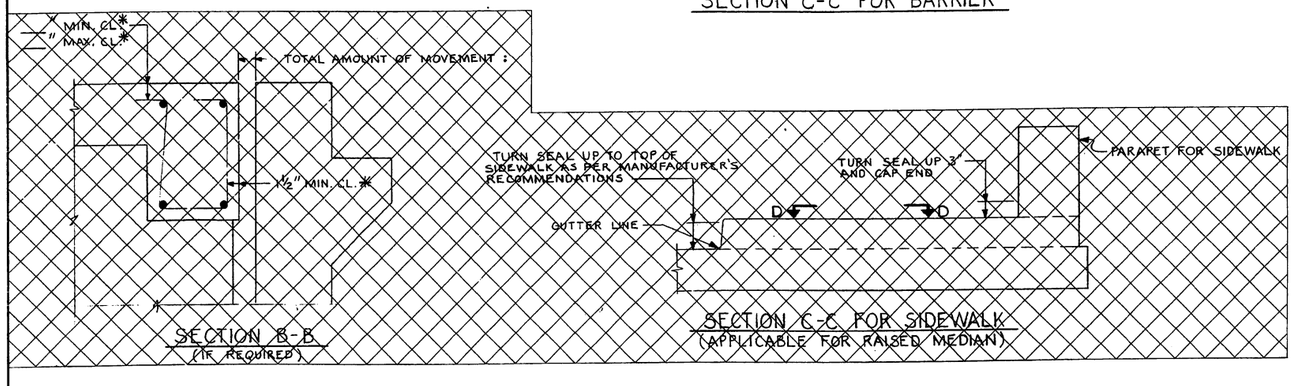
* IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO CO-ORDINATE THESE DIMENSIONS WITH THE MANUFACTURER OF THE SELECTED EXPANSION JOINT, STRUCTURAL STEEL FABRICATOR AND REINFORCING STEEL FABRICATOR.



SECTION A-A
(IF REQUIRED)



SECTION C-C FOR BARRIER



SECTION B-B
(IF REQUIRED)

SECTION C-C FOR SIDEWALK
(APPLICABLE FOR RAISED MEDIAN)

BRIDGE NO. 1 LT. & RT.

GEORGIA
DEPARTMENT OF TRANSPORTATION
HIGHWAY DIVISION - BRIDGE DESIGN

GENERAL DETAILS SHEET
EXPANSION JOINTS
I-575 OVER LITTLE RIVER
CHEROKEE CO. I-575-1(6)07
NO SCALE SEPTEMBER, 1976

DATE | REVISIONS | BY

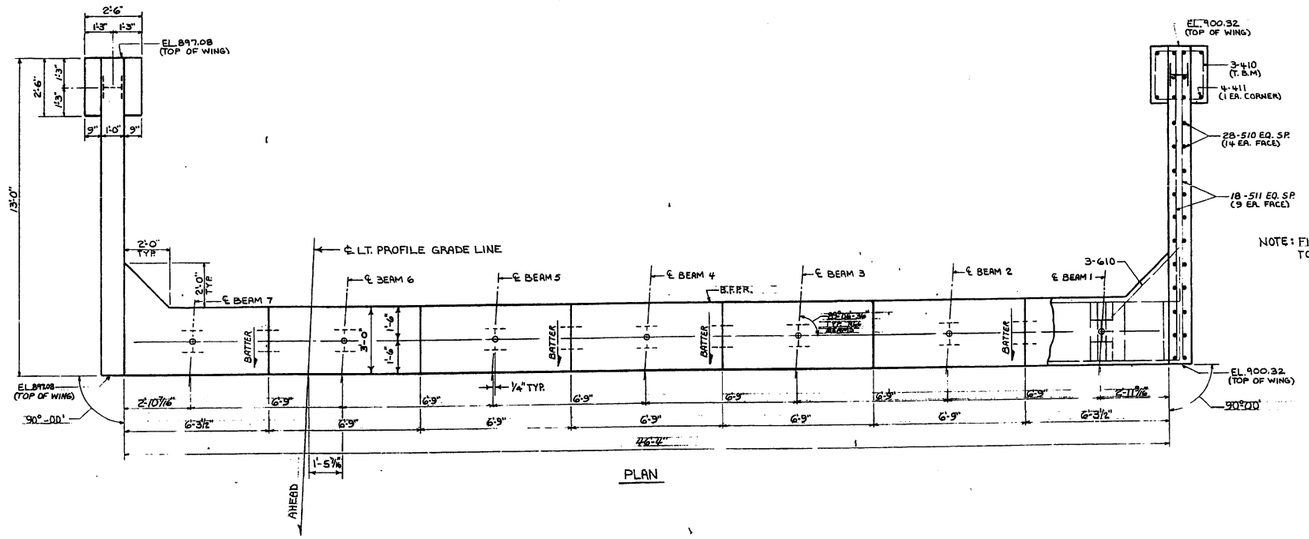
BRIDGE SHEET 6 OF 22

DESIGNED J.A.M.-P.V.L. | TRACED | REVIEWED L.R.P.
DRAWN B.L.O. | CHECKED H.W.C. | APPROVED

FED. ROAD DIV. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
3	GA.	I-575-1 (6)07		89-G	173

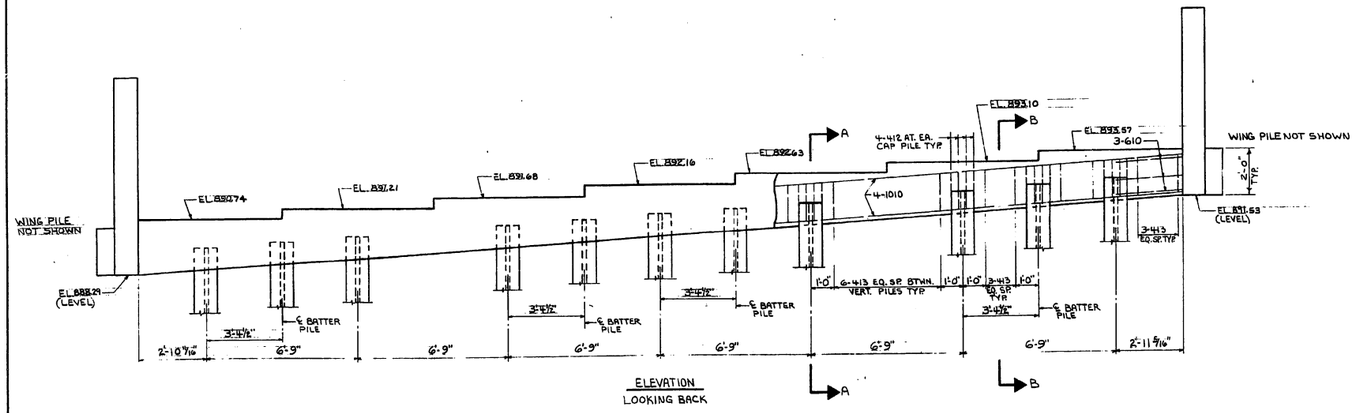
C.T.-1

ADDED 10-17-79



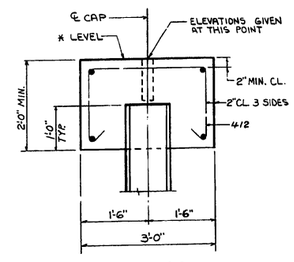
PLAN

NOTE: FIELD CLIP BARS #10, & #11, AS NECESSARY TO AVOID WING PILES.

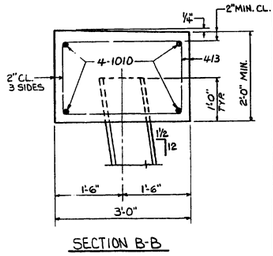


ELEVATION
LOOKING BACK

* FINISH LEVEL ONLY AT BEARING AREA SLOPE 1/4" ACROSS CAP BETWEEN BEARMS



SECTION A-A



SECTION B-B

MAINTAIN 2" CLEARANCE ON ALL REINFORCEMENT UNLESS OTHERWISE NOTED.

ALL PILES SHALL BE STEEL H12BP53

QUANTITIES	
CU. YDS. CLASS A CONC.	60.87
LBS. BAR REINF. STEEL	2492

PLAN DRIVING OBJECTIVE

DRIVE ALL PILES TO A DRIVING RESISTANCE OF 70 TONS AFTER A MINIMUM TIP ELEVATION OF 850 IS ACHIEVED.

BRIDGE NO. 1 LEFT

GEORGIA

DEPARTMENT OF TRANSPORTATION

HIGHWAY DIVISION - BRIDGE DESIGN

END BENT 1 DETAILS

I-575 OVER LITTLE RIVER

CHEROKEE COUNTY I-575-1(6)07

NO SCALE SEPTEMBER 1979

DESIGNED J.A.M. - H.W.O. TRACED

DRAWN M.B.M. CHECKED P.V.L. REVIEWED L.R.R

APPROVED

BRIDGE SHEET 7 OF 22

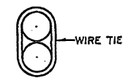
DATE | REVISIONS | BY

STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
GA.	I-575-1(6)07	89-H	173

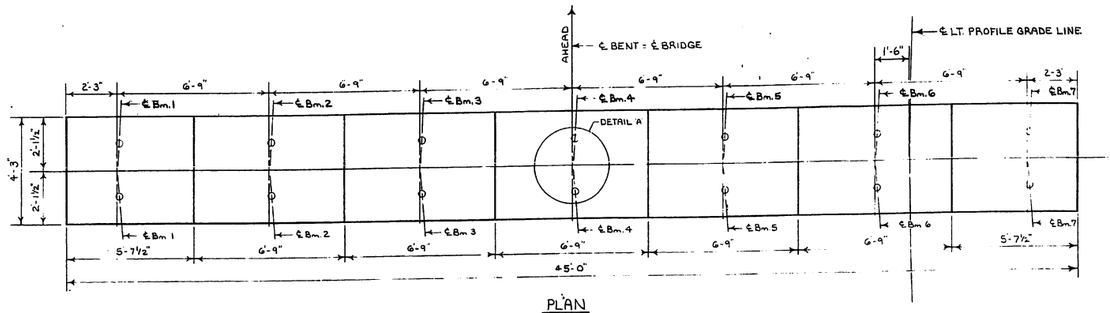
Cr. 1

Added 10-17-79
Rev. 9-26-80

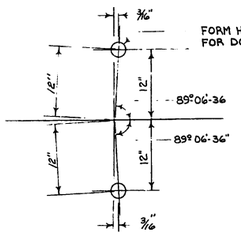
BARS TO BE BUNDLED SHALL BE BUNDLED VERTICALLY



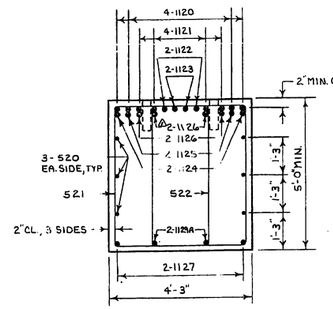
BUNDLING DETAILS



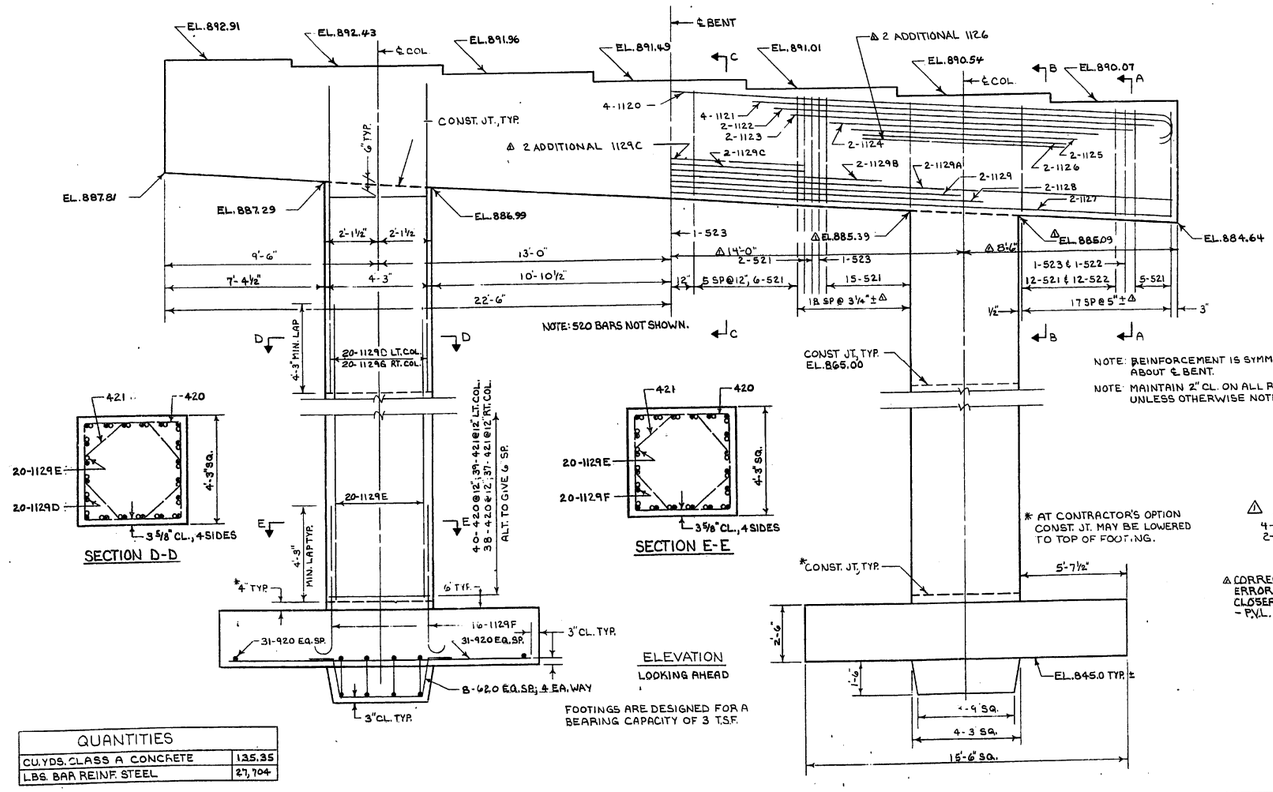
PLAN



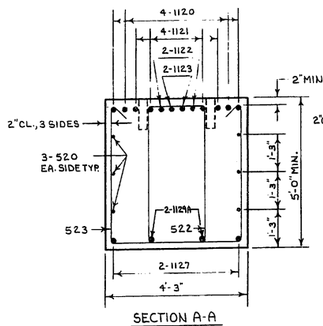
DETAIL 'A'



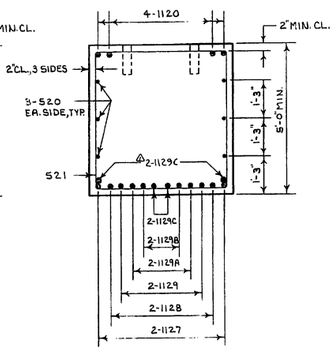
SECTION B-B



ELEVATION
LOOKING AHEAD



SECTION A-A



SECTION C-C

NOTE: REINFORCEMENT IS SYMMETRICAL ABOUT ℄ BENT.

NOTE: MAINTAIN 2" CL. ON ALL REINFORCEMENT UNLESS OTHERWISE NOTED.

SECTION D-D

SECTION E-E

FOOTINGS ARE DESIGNED FOR A BEARING CAPACITY OF 3 T.S.F.

QUANTITIES	
CU. YDS. CLASS A CONCRETE	135.35
LBS. BAR REINF. STEEL	27,704

Δ ADDITIONAL STE[illegible]
4-1126 (2 BARS OVER [illegible]UMN)
2-1129 C

Δ CORRECTIONS TO ACCOMODATE LAYOUT ERROR. RIGHT FOOTING PLACED 1'-0" CLOSER TO SURVEY E.
- P.V.L. 9/11/80

BRIDGE NO. 1 LEFT

GEORGIA
DEPARTMENT OF TRANSPORTATION
HIGHWAY DIVISION - BRIDGE DESIGN

INTERMEDIATE BENT 2 DETAILS

I-575 OVER LITTLE RIVER

CHEROKEE CO. I-575-1(6)07

NO SCALE AUGUST 1979

REVISIONS	BY	DATE
GENERAL REVISIONS	P.V.L.	11-7-80

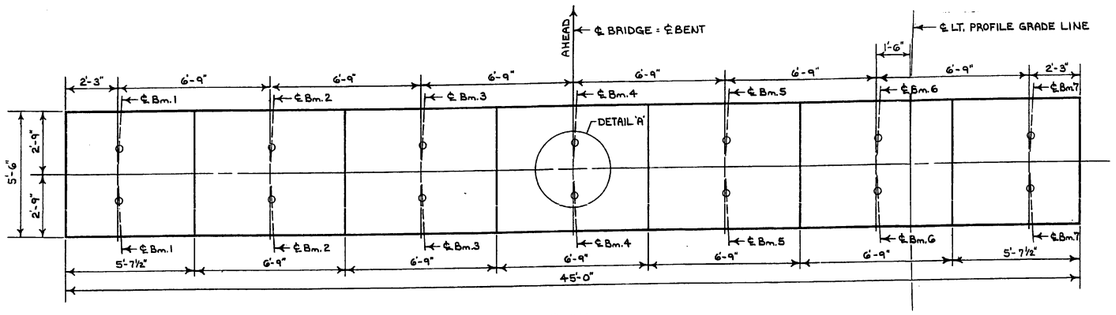
DESIGNED J.A.M. - H.W.C. TRACED
DRAWN B.L.O. CHECKED P.V.L.
REVIEWED L.A.P.
APPROVED

BRIDGE SHEET 8 OF 22

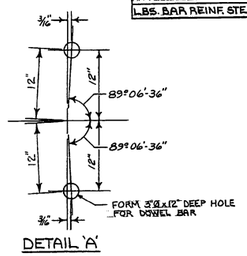
STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
GA.	I-575-1(6)07	89-1	173

ct.1 Added 10-17-79

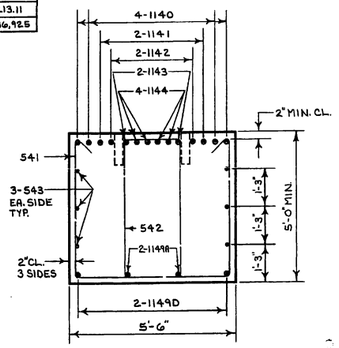
QUANTITIES		
ITEM	BT. 3	BT. 4
CU. YDS. CLASS A CONCRETE	212.89	213.11
LBS. BAR REINF. STEEL	36,801	36,925



PLAN



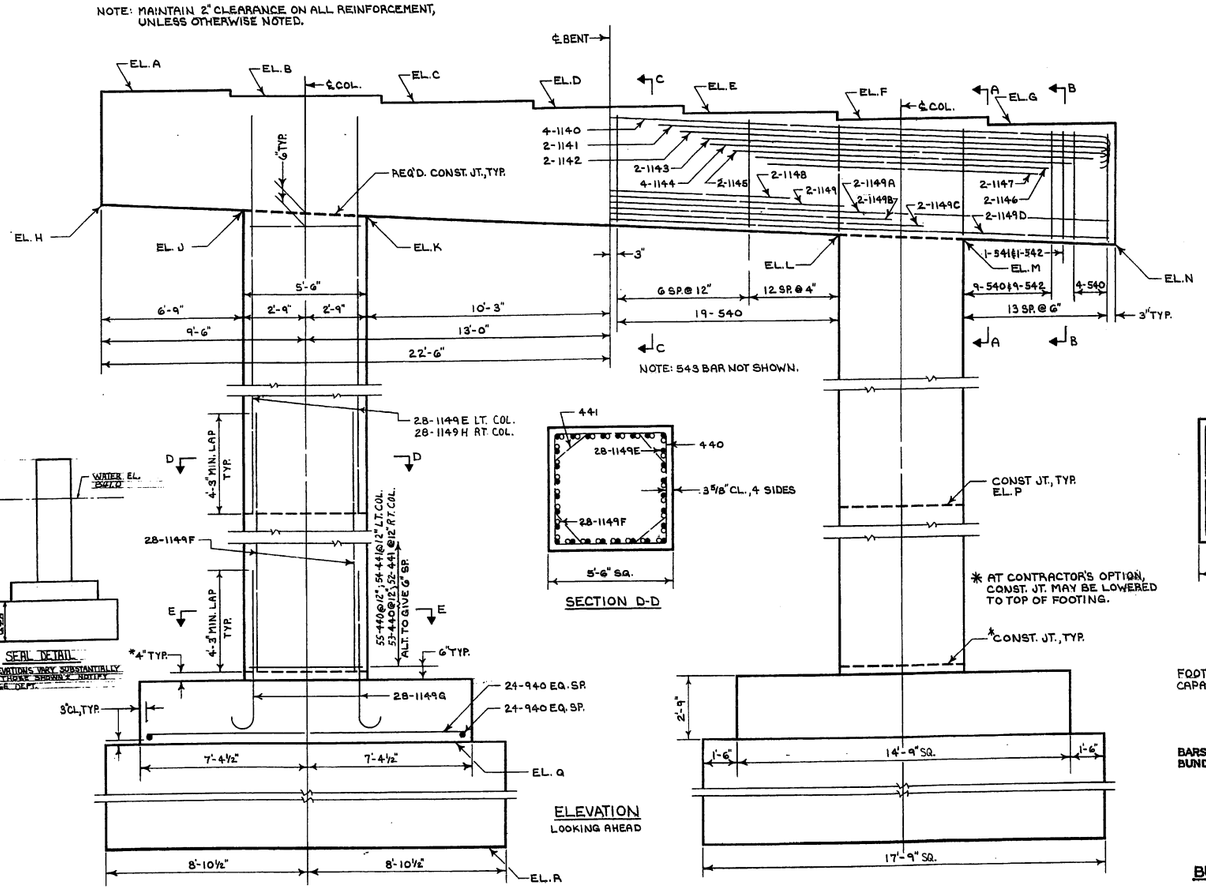
DETAIL 'A'



SECTION B-B

NOTE: REINFORCEMENT IS SYMMETRICAL ABOUT ℄ BENT.

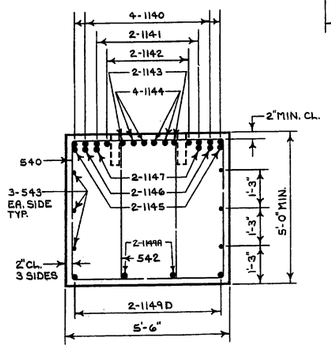
NOTE: MAINTAIN 2" CLEARANCE ON ALL REINFORCEMENT, UNLESS OTHERWISE NOTED.



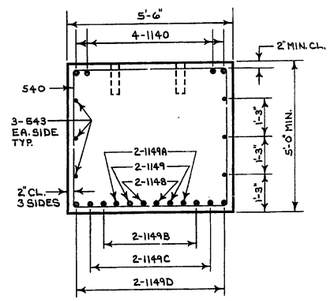
ELEVATION
LOOKING AHEAD

SECTION D-D

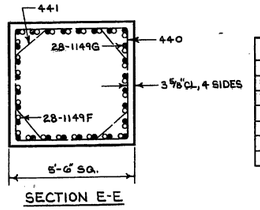
NOTE: AT CONTRACTOR'S OPTION, CONST. JT. MAY BE LOWERED TO TOP OF FOOTING.



SECTION A-A



SECTION C-C

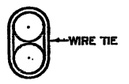


SECTION E-E

ELEVATIONS									
	A	B	C	D	E	F	G	H	J
BT. 3	892.62	892.15	891.67	891.20	890.73	890.26	889.78	887.52	887.04
BT. 4	892.72	892.25	891.77	891.30	890.83	890.36	889.88	887.62	887.14
	K	L	M	N	P	Q	R		
BT. 3	886.66	885.21	884.83	884.35	859.00	829.50	822.0±		
BT. 4	886.76	885.31	884.93	884.45	859.00	829.50	822.0±		

FOOTINGS ARE DESIGNED FOR A BEARING CAPACITY OF 5 T.S.F.

BARS TO BE BUNDLED SHALL BE BUNDLED VERTICALLY



BUNDLING DETAILS

BRIDGE SHEET 9 OF 22

BRIDGE NO. 1 LEFT

GEORGIA
DEPARTMENT OF TRANSPORTATION
HIGHWAY DIVISION-BRIDGE DESIGN

INTERMEDIATE BENTS 3 & 4 DETAILS

I-575 OVER LITTLE RIVER

CHEROKEE CO. I-575-1(6)-07

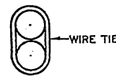
NO SCALE SEPT. 1979

DESIGNED	J.A.M.	TRACED		REVIEWED	L.A.P.
DRAWN	B.L.D.	CHECKED	P.V.L.	APPROVED	

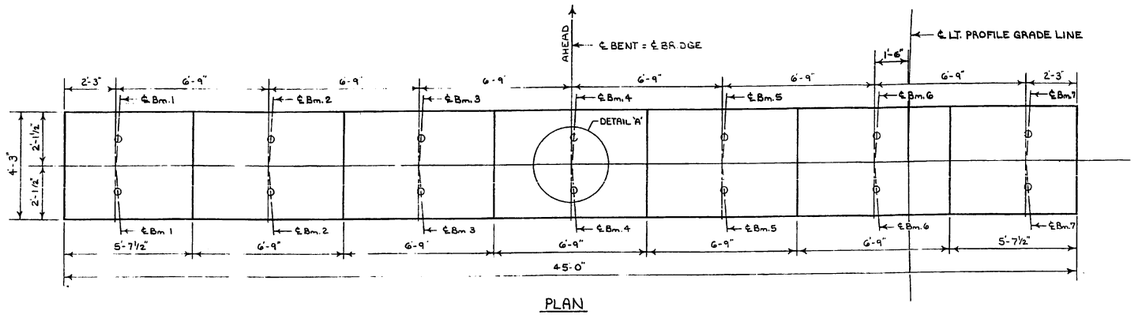
DATE | REVISIONS | BY

STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
GA.	I-575-1(6)07	89-J	173
	C.T. 1	Added 10-11-79	

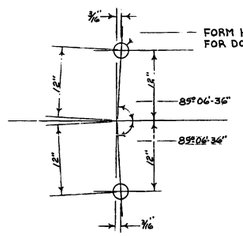
BARS TO BE BUNDLED SHALL BE BUNDLED VERTICALLY



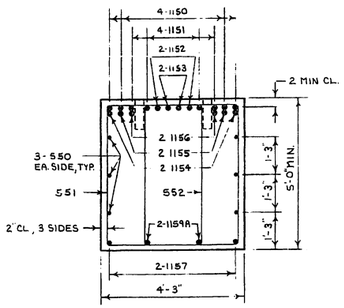
BUNDLING DETAILS



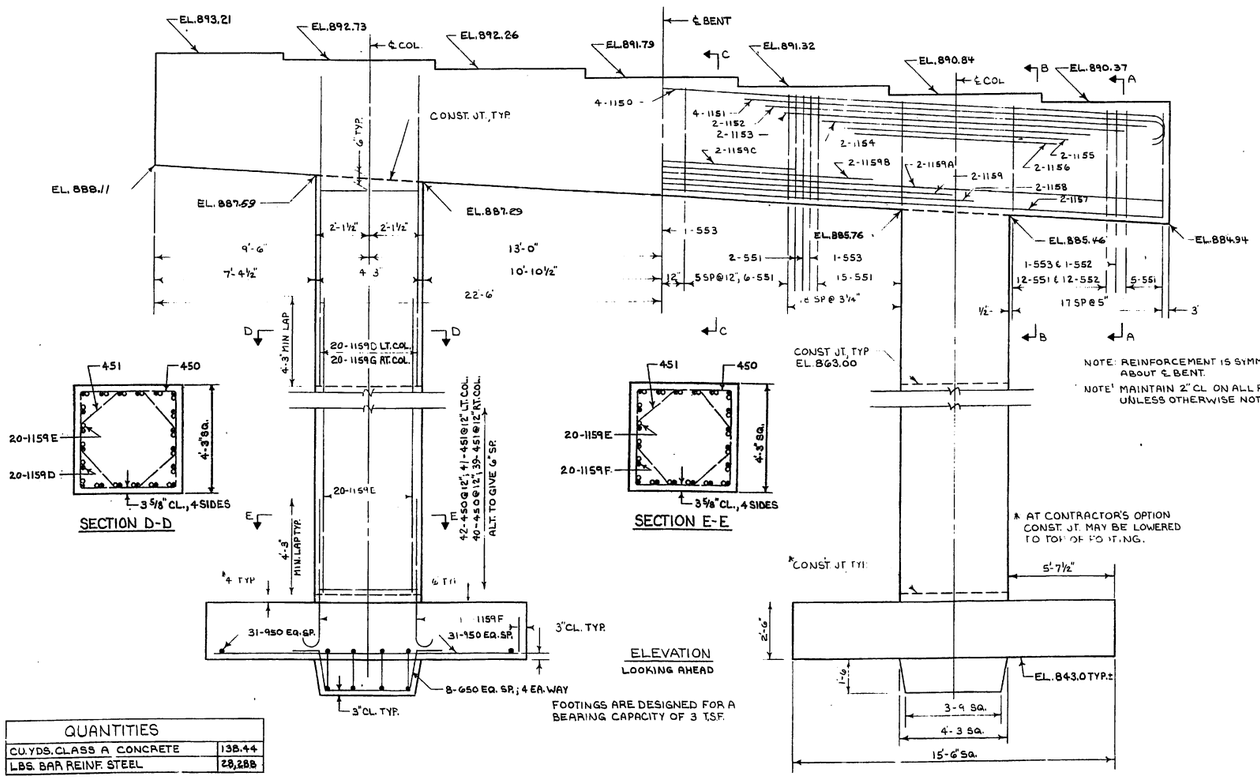
PLAN



DETAIL 'A'



SECTION B-B



ELEVATION
LOOKING AHEAD

NOTE: REINFORCEMENT IS SYMMETRICAL ABOUT ℄ BENT.

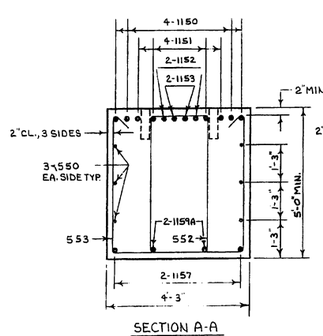
NOTE: MAINTAIN 2" CL ON ALL REINFORCEMENT UNLESS OTHERWISE NOTED.

* AT CONTRACTOR'S OPTION CONST. JT. MAY BE LOWERED TO TOP OF FOOTING.

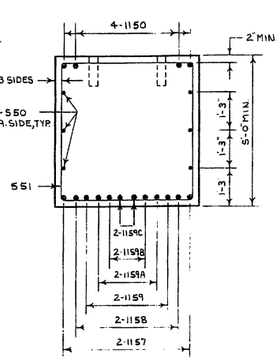
FOOTINGS ARE DESIGNED FOR A BEARING CAPACITY OF 3 T.S.F.

SECTION D-D

SECTION E-E



SECTION A-A



SECTION C-C

QUANTITIES	
CU.YDS. CLASS A CONCRETE	138.44
LBS. BAR REINF. STEEL	28,288

BRIDGE NO. 1 LEFT

GEORGIA
DEPARTMENT OF TRANSPORTATION
HIGHWAY DIVISION-BRIDGE DESIGN

INTERMEDIATE BENT 5 DETAILS

I-575 OVER LITTLE RIVER

CHEROKEE CO. I-575-1(6)-07

NO SCALE AUGUST 1979

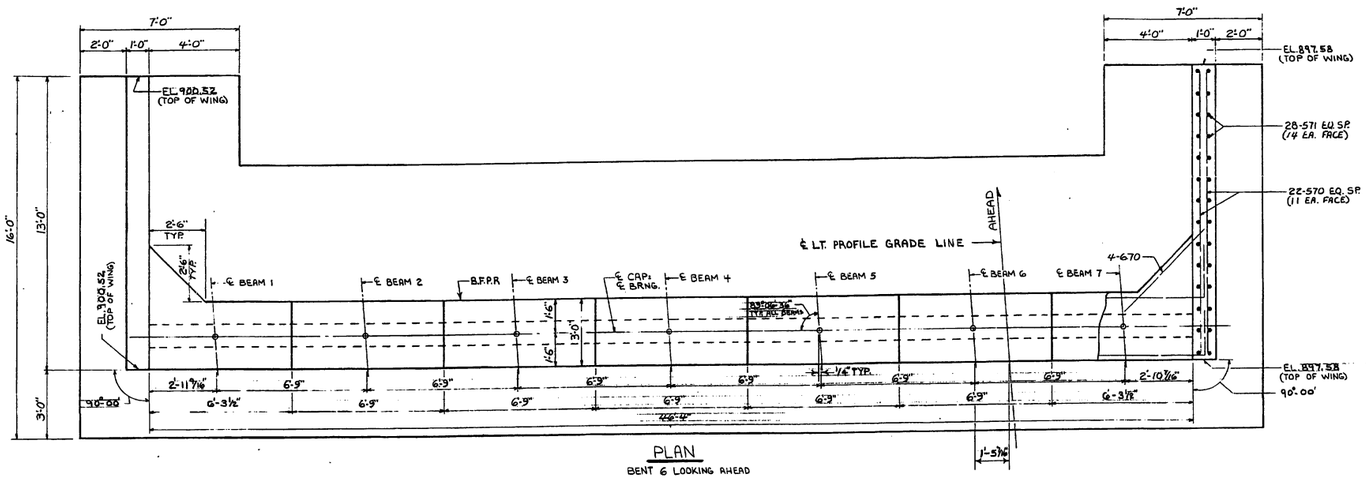
DESIGNED J.A.M.-H.W.C. TRACED
DRAWN B.L.O. CHECKED P.V.L. REVIEWED L.R.P.
APPROVED

DATE | REVISIONS | BY

BRIDGE SHEET 10 OF 22

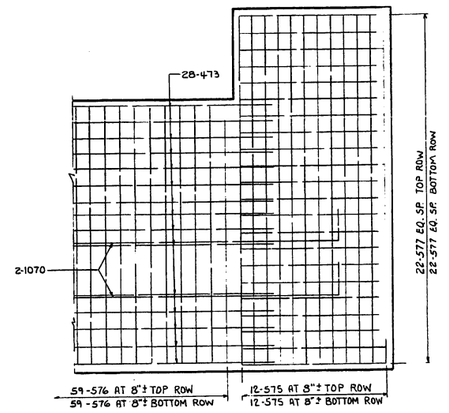
STATE	PROJECT NUMBER	SHEET NO	TOTAL SHEETS
GA.	I-575-1(6)07	89-K	173

C.T.1 Added 10-17-79

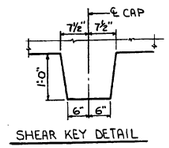


PLAN

BENT 6 LOOKING AHEAD

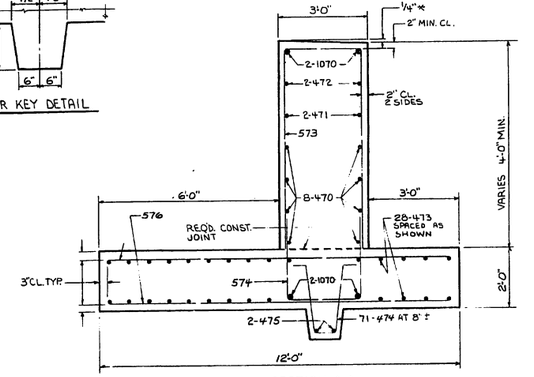


FOOTING REINFORCEMENT DETAIL

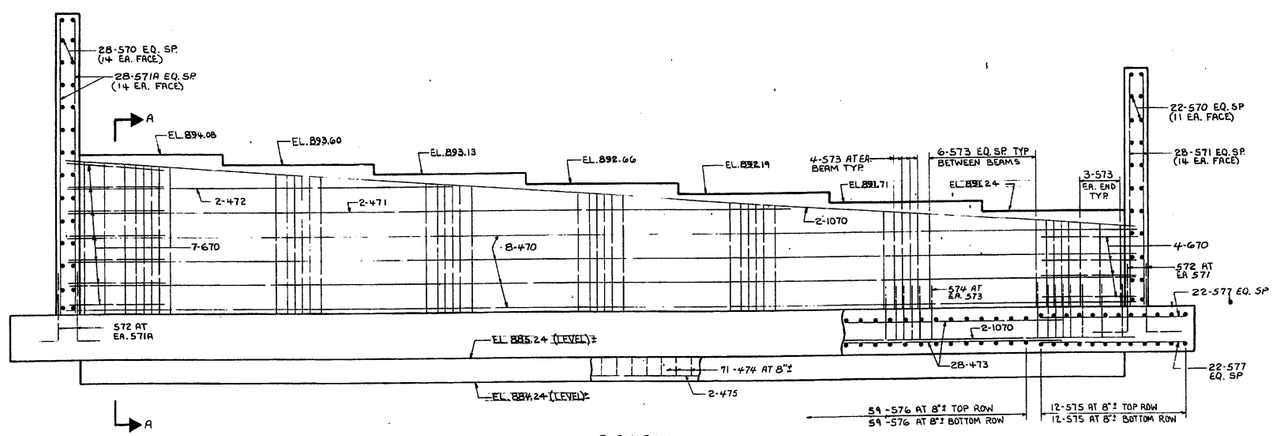


SHEAR KEY DETAIL

* FINISH LEVEL AT BEARING AREAS. SLOPE ¼" ACROSS CAP BETWEEN BEAMS

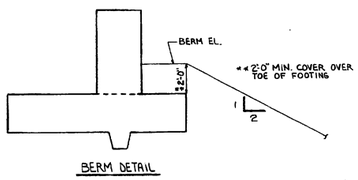


SECTION A-A



ELEVATION

BENT 6 LOOKING AHEAD



BERM DETAIL

FOOTING DESIGNED FOR A BEARING CAPACITY OF 3 TONS PER SQ. FT.

QUANTITIES	
CU. YDS. CLASS A CONC.	91.87
LBS. BAR REINF. STEEL	8855

BRIDGE NO. 1 LEFT

GEORGIA

DEPARTMENT OF TRANSPORTATION

HIGHWAY DIVISION - BRIDGE DESIGN

END BENT 6 DETAILS

I-575 OVER LITTLE RIVER

CHEROKEE COUNTY — I-575-1(6)07

NO SCALE — SEPTEMBER 1979

DESIGNED: W.A.M. - P.W.L. | TRACED: | RECOMMENDED: L.A.P.

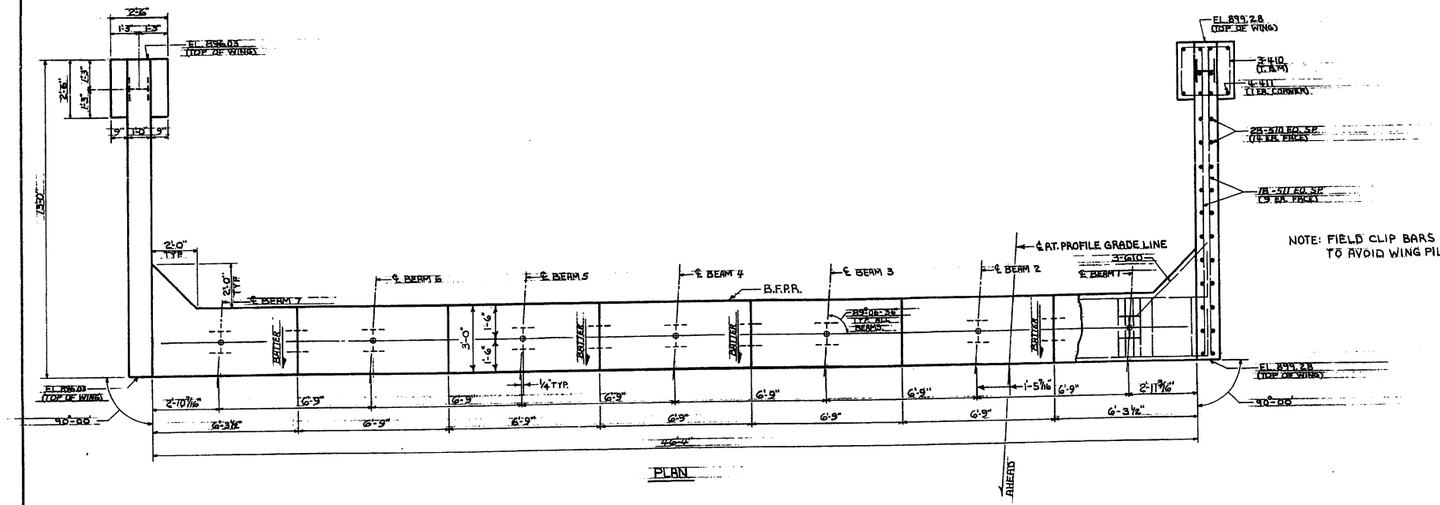
DRAWN: M.B.M. | CHECKED: H.W.C. | APPROVED:

BRIDGE SHEET 11 OF 22

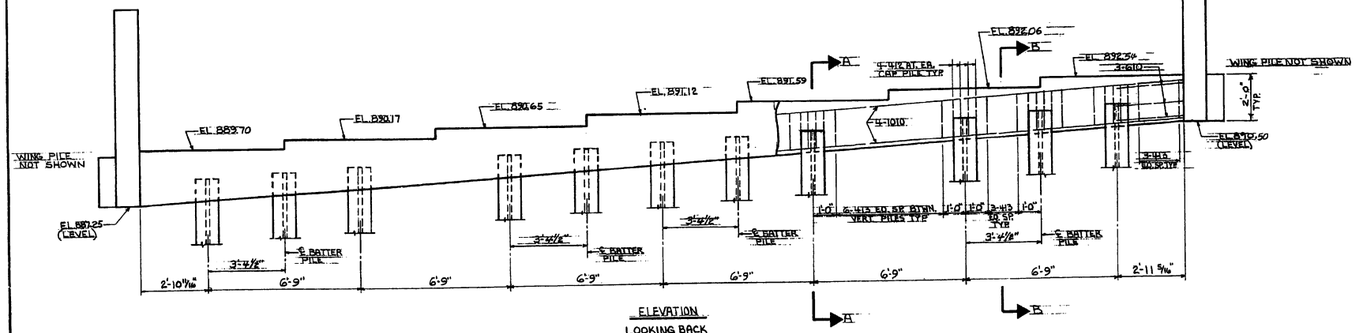
REVISIONS | BY | C.T.1

FED. ROAD DIV. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
3	GA.	I-575-1(6)07		89-L	173

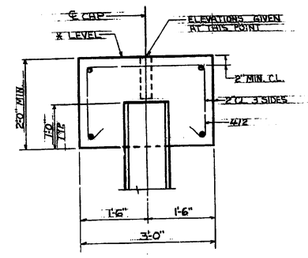
CT. 1 Added 10-17-79

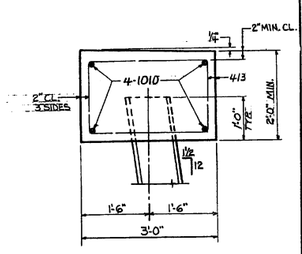


NOTE: FIELD CLIP BARS 510, & 511, TO AVOID WING PILES.



FINISH LEVEL ONLY AT BEARING AREA SLOPE IN TRANSVERSE DIRECTION BY SHRINKAGE MORTAR





MAINTAIN 2" CLEARANCE ON ALL REINFORCEMENT UNLESS OTHERWISE NOTED.

ALL PILES SHALL BE STEEL H12 BP 53

QUANTITIES	
CU. YDS. CLASS A CONC.	20.84
LBS. BAR REINF. STEEL	2492

PLAN DRIVING OBJECTIVE

DRIVE ALL PILES TO A DRIVING RESISTANCE OF 70 TONS METRIC A MINIMUM TIP ELEVATION OF 821 IS ACHIEVED.

BRIDGE NO. 1 RIGHT

GEORGIA

DEPARTMENT OF TRANSPORTATION

HIGHWAY DIVISION - BRIDGE DESIGN

END BENT 1 DETAILS

I-575 OVER LITTLE RIVER

CHEROKEE COUNTY I-575-1(6)07

NO SCALE SEPTEMBER 1979

BRIDGE SHEET 12 OF 22

BY	DATE	REVISIONS

DESIGNED J.A.M.-H.W.C. TRACED

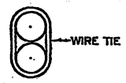
DRAWN M.A.B. CHECKED P.V.L. REVIEWED L.R.E.

APPROVED

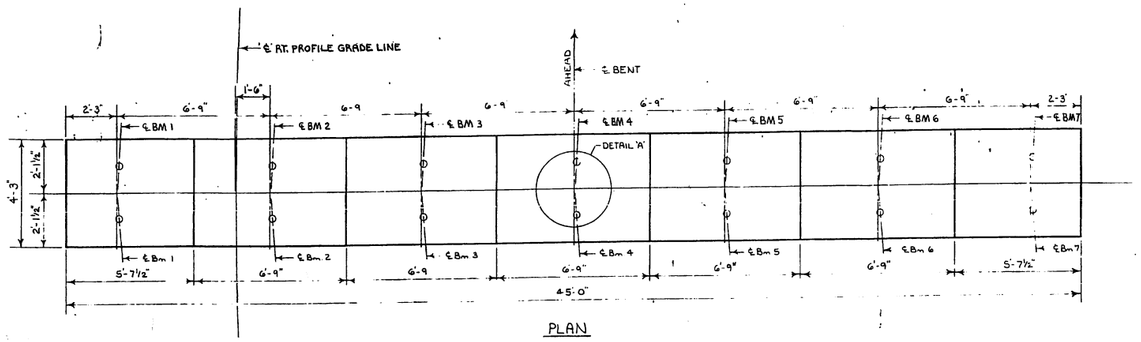
STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
GA.	I-575-1(6)07 Ct. 1	89-M	173

Added 10-17-79

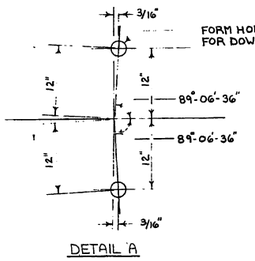
BARS TO BE BUNDLED SHALL BE BUNDLED VERTICALLY



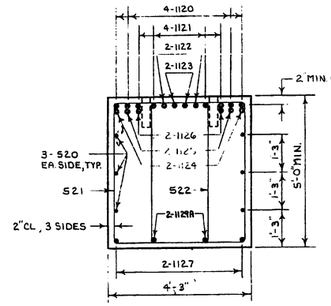
BUNDLING DETAILS



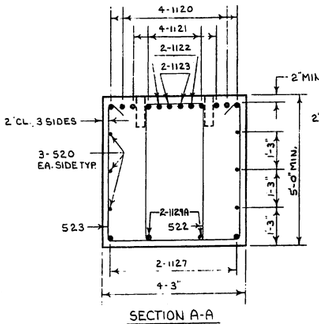
PLAN



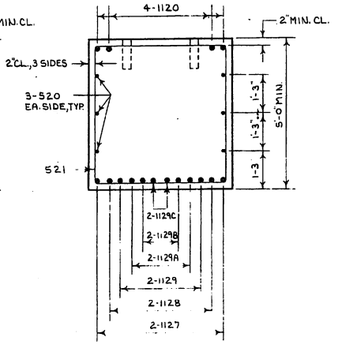
DETAIL 'A'



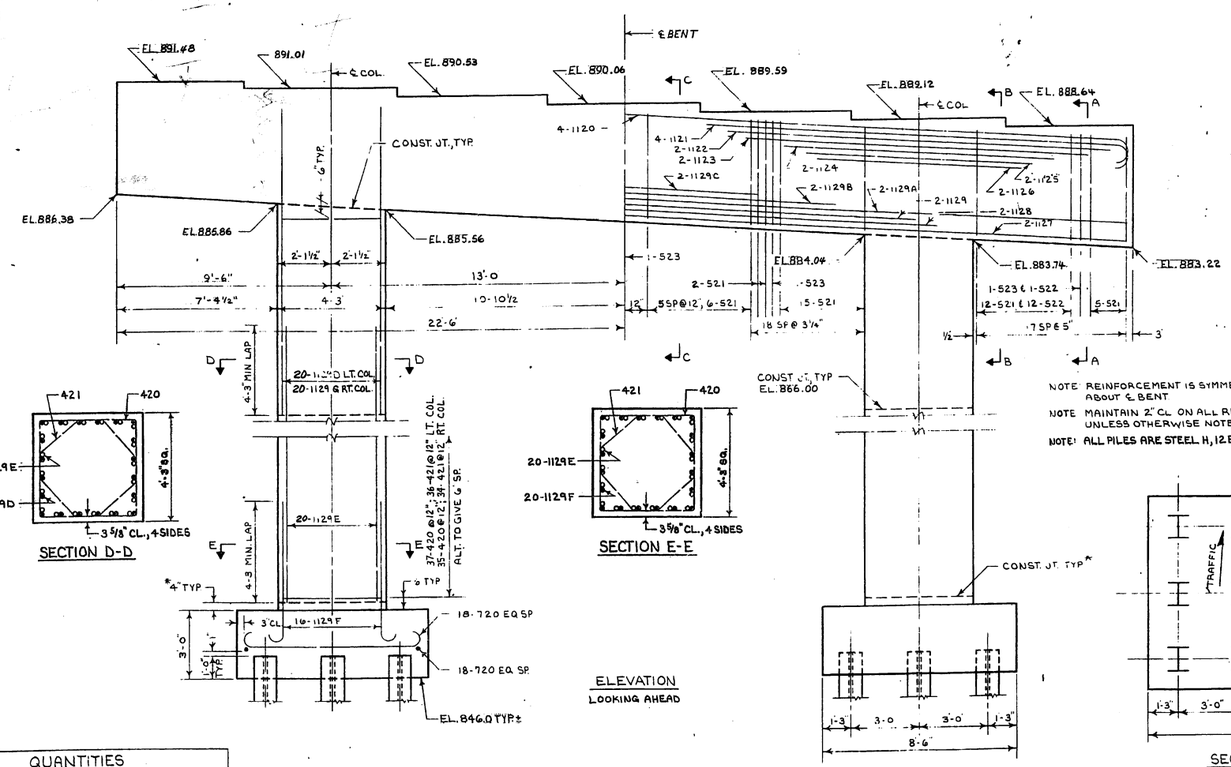
SECTION B-B



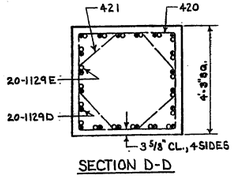
SECTION A-A



SECTION C-C

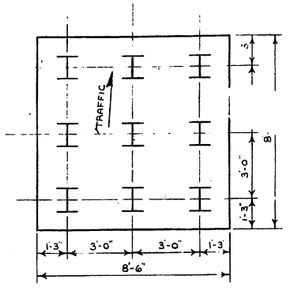


ELEVATION
LOOKING AHEAD



SECTION D-D

SECTION E-E



SECTION E-E

NOTE: REINFORCEMENT IS SYMMETRICAL ABOUT ℄ BENT

NOTE: MAINTAIN 2" CL. ON ALL REINFORCEMENT UNLESS OTHERWISE NOTED

NOTE: ALL PILES ARE STEEL H, 12 BP 53.

* AT CONTRACTOR'S OPTION, CONST JT. MAY BE LOWERED TO TOP OF FOOTING.

PLAN DRIVING OBJECTIVE

DRIVE ALL PILES TO A DRIVING RESISTANCE OF 70 TONS AFTER A MINIMUM TIP EL. OF 819 IS ACHIEVED.

QUANTITIES	
CU. YDS. CLASS A CONCRETE	101.15
LBS. BAR REINF. STEEL	21,953

BRIDGE NO. 1 RIGHT

GEORGIA
DEPARTMENT OF TRANSPORTATION
HIGHWAY DIVISION - BRIDGE DESIGN

INTERMEDIATE BENT 2 DETAILS

I-575 OVER LITTLE RIVER

CHEROKEE CO. I-575-1(6)-07

NO SCALE AUGUST 1979

DESIGNED J.A.M.-H.W.C. TRACED
DRAWN B.L.O. CHECKED P.V.L. REVIEWED L.A.P.
APPROVED

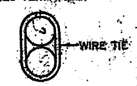
BRIDGE SHEET 13 OF 22

DATE BY REVISIONS

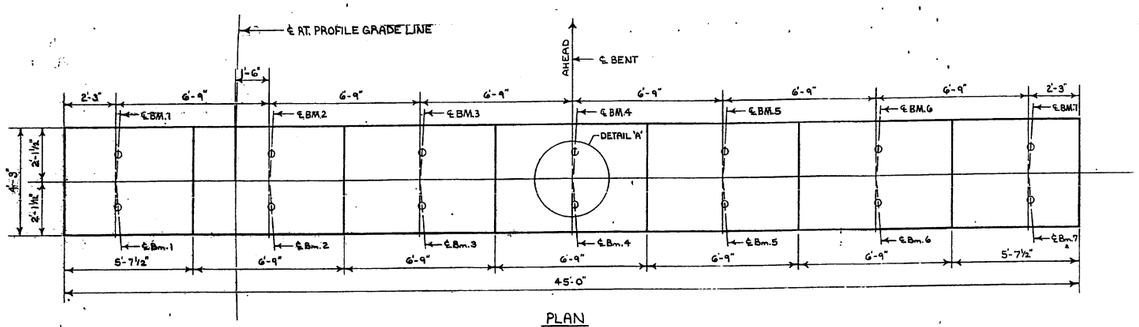
STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
GA.	I-575-1(6)07 Ct. 1	89-N	173

Added 10-17-79

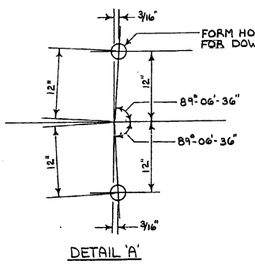
BARS TO BE BUNDLED SHALL BE BUNDLED VERTICALLY



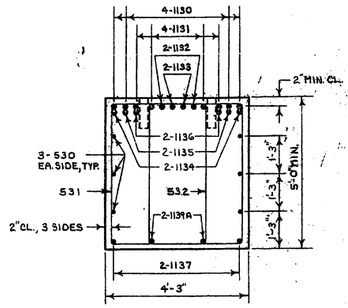
BUNDLING DETAILS



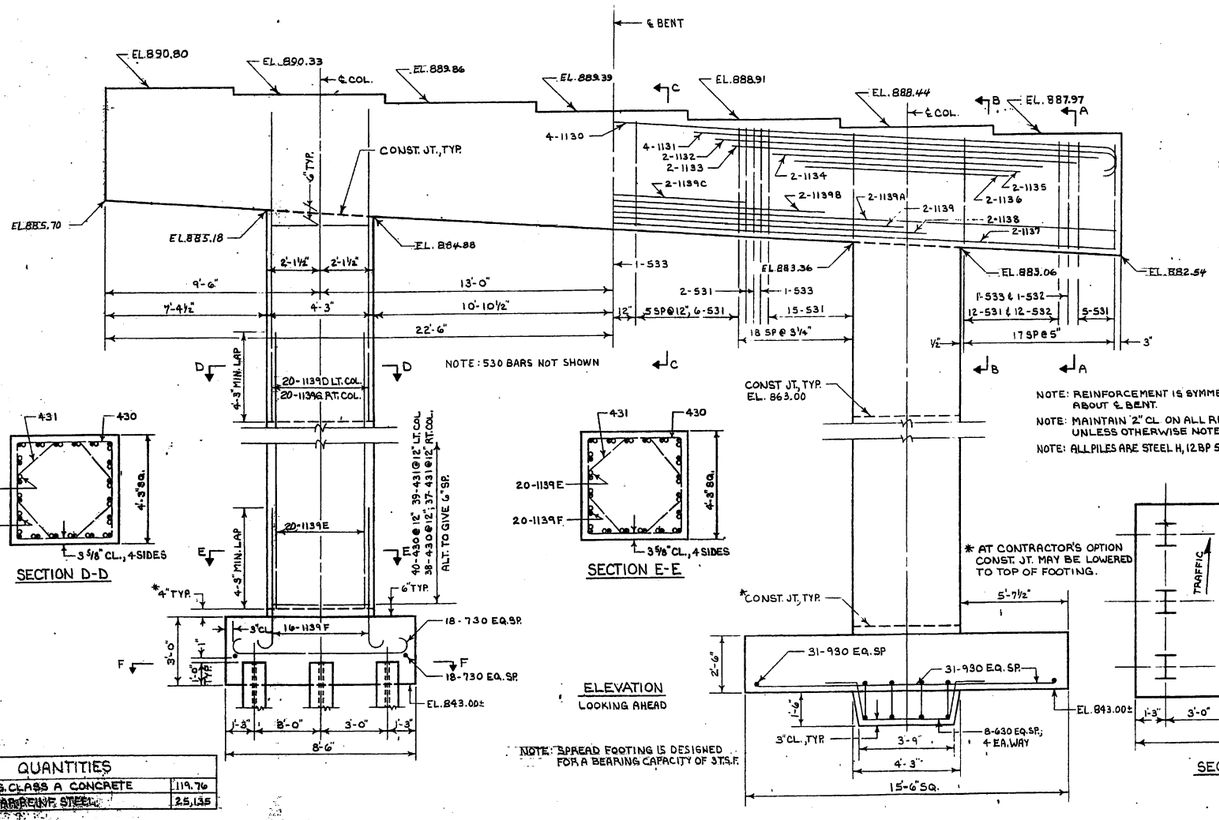
PLAN

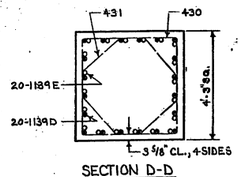


DETAIL 'A'



SECTION B-B



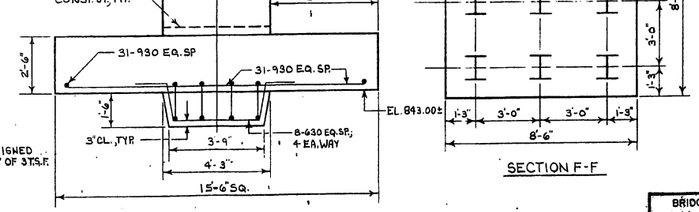


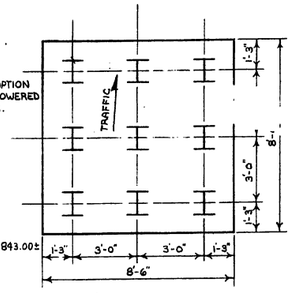
SECTION D-D

SECTION E-E

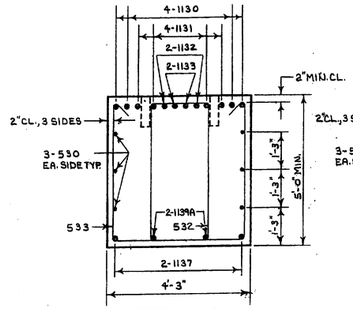
ELEVATION
LOOKING AHEAD

NOTE: SPREAD FOOTING IS DESIGNED FOR A BEARING CAPACITY OF 3 T.S.F.

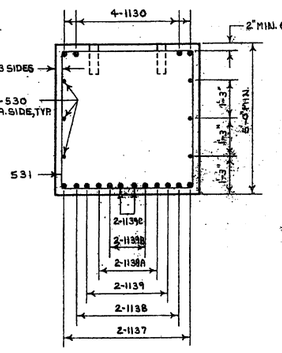




SECTION F-F



SECTION A-A



SECTION C-C

PLAN DRIVING OBJECTIVE

DRIVE ALL PILES TO A DRIVING RESISTANCE OF 70 TONS AFTER A MINIMUM TIP EL. OF 828 IS ACHIEVED.

QUANTITIES	
CU YDS. CLASS A CONCRETE	119.76
LBS. REINF. STEEL	25,135

BRIDGE NO. 1 RIGHT

GEORGIA
DEPARTMENT OF TRANSPORTATION
HIGHWAY DIVISION - BRIDGE DESIGN

INTERMEDIATE BENT 3 DETAILS

I-575 OVER LITTLE RIVER

CHEROKEE CO. I-575-1(6)-07

NO SCALE AUGUST 1979

DESIGNED Y.D.M. - A.M.C. TRACED
DRAWN B.L.D. CHECKED P.V.L. REVIEWED
APPROVED

DATE | REVISIONS | BY

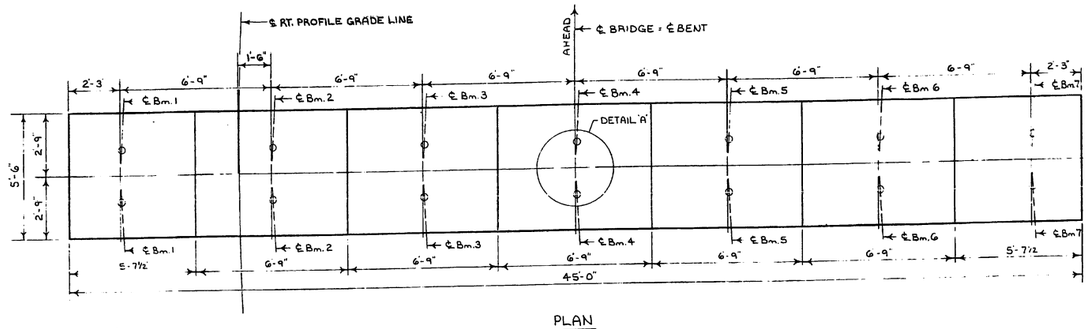
BRIDGE SHEET 14 OF 22

STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
GA.	I-575-1(6)07	89-0	173

ET. 1

Added 10-17-79

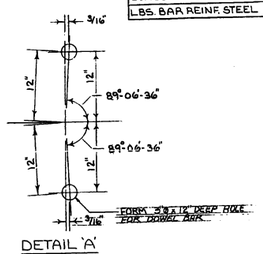
QUANTITIES		
ITEM	BT. 4	BT. 5
CU.YDS. CLASS A CONCRETE	209.30	208.41
LBS. BAR REINF. STEEL	36,968	36,968



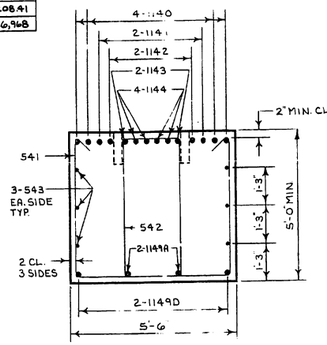
PLAN

NOTE: REINFORCEMENT IS SYMMETRICAL ABOUT ℄ BENT.

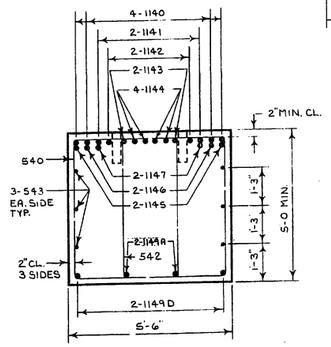
NOTE MAINTAIN 2" CLEARANCE ON ALL REINFORCEMENT, UNLESS OTHERWISE NOTED.



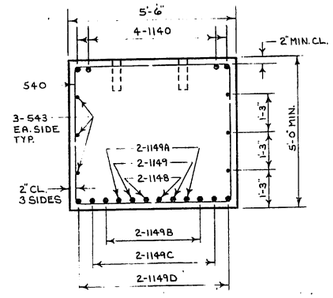
DETAIL 'A'



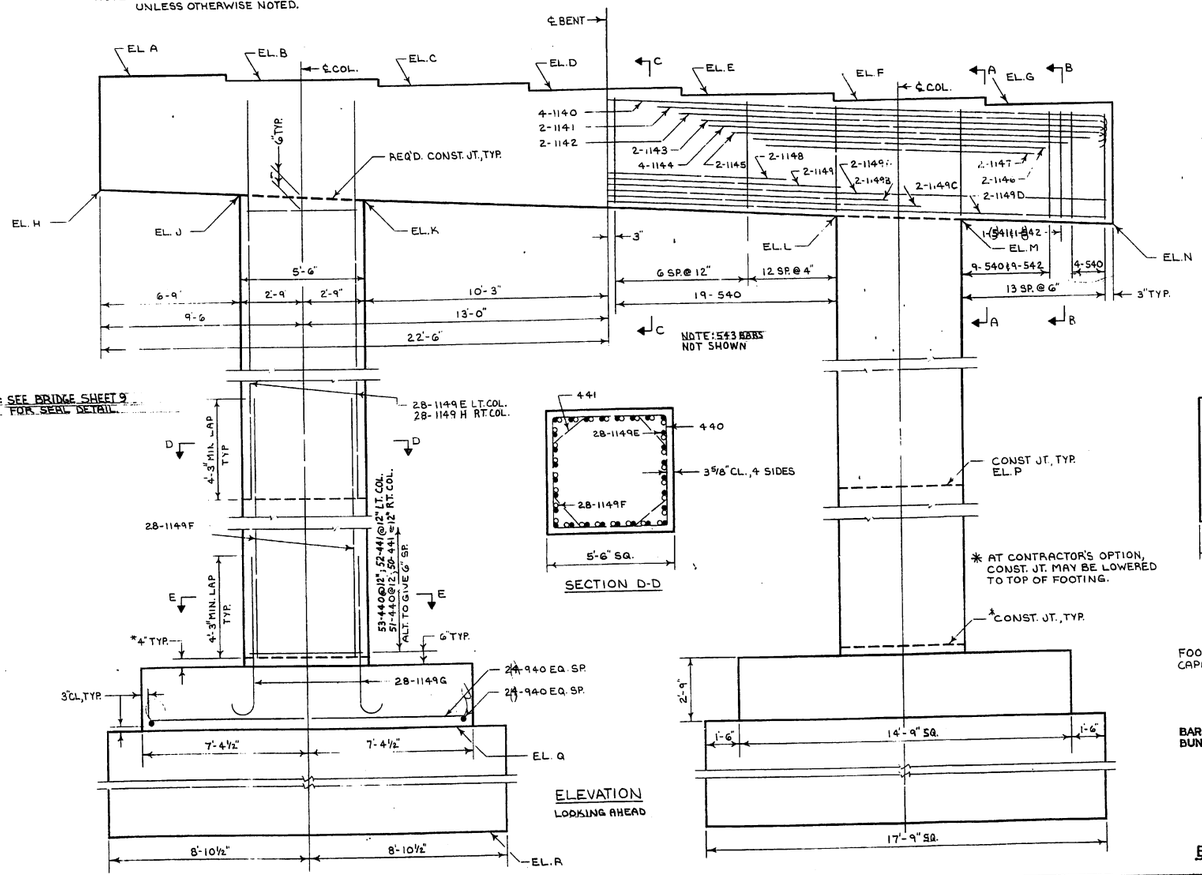
SECTION B-B



SECTION A-A

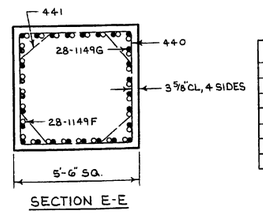


SECTION C-C



ELEVATION
LOOKING AHEAD

SECTION D-D

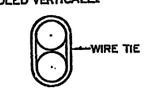


SECTION E-E

ELEVATIONS									
	A	B	C	D	E	F	G	H	J
BT. 4	890.52	890.05	889.57	889.10	888.63	888.16	887.68	886.42	884.94
BT. 5	890.62	890.15	889.67	889.20	888.73	888.26	887.78	886.52	885.04
	K	L	M	N	P	Q	R		
BT. 4	884.56	883.11	882.73	882.25	856.00	829.00	841.00±		
BT. 5	884.66	883.21	882.83	882.35	857.00	829.50	842.00±		

FOOTINGS ARE DESIGNED FOR A BEARING CAPACITY OF 5 T.S.F.

BARS TO BE BUNDLED SHALL BE BUNDLED VERTICALLY



BUNDLING DETAILS

BRIDGE NO. 1 RIGHT

GEORGIA
DEPARTMENT OF TRANSPORTATION
HIGHWAY DIVISION-BRIDGE DESIGN

INTERMEDIATE BENTS 4 & 5 DETAILS

I-575 OVER LITTLE RIVER

CHEROKEE CO. I-575-1(6)-07

NO SCALE SEPT. 1979

DESIGNED J.A.M. TRACED
DRAWN B.L.O. CHECKED P.V.L.-H.W.C. REVIEWED L.A.P.
APPROVED

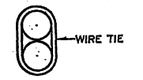
BRIDGE SHEET 15 OF 22

DATE | REVISIONS | BY

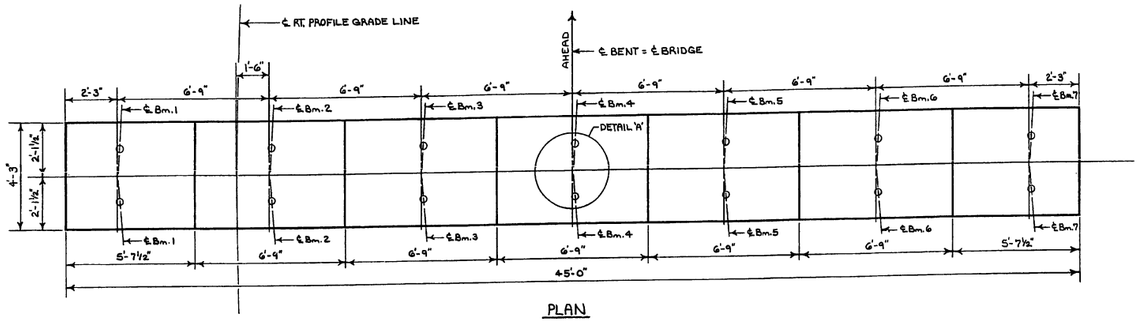
STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
GA.	I-575-1(6)07	89-P	173

C7.1 Added 10-17-79

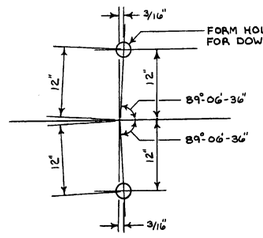
BARS TO BE BUNDLED SHALL BE BUNDLED VERTICALLY



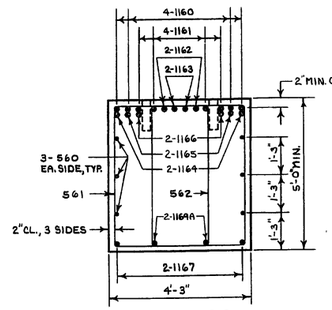
BUNDLING DETAILS



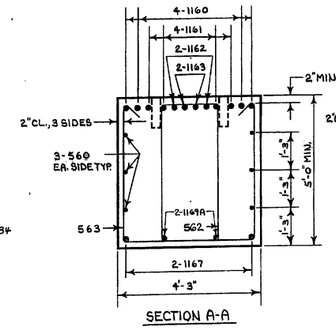
PLAN



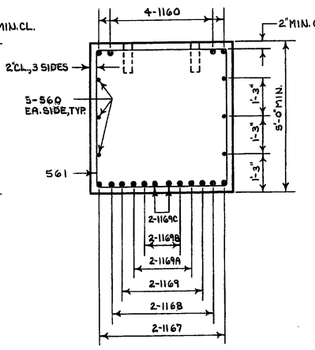
DETAIL 'A'



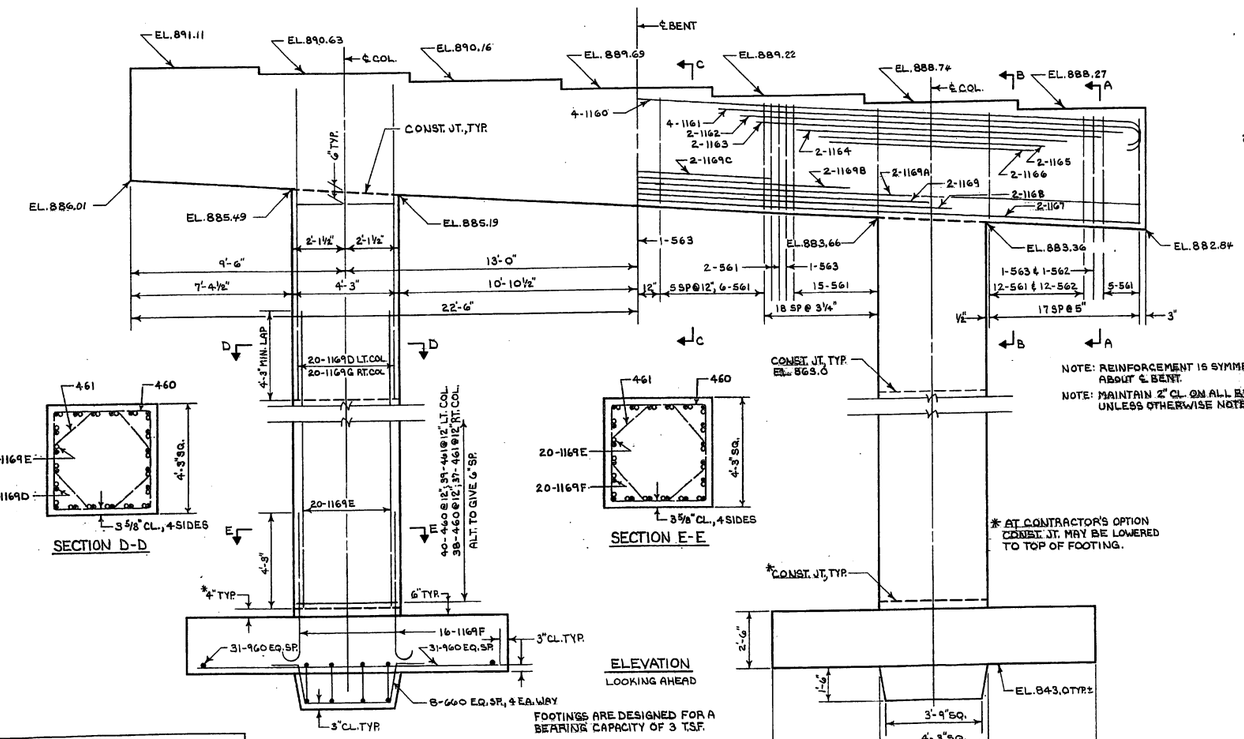
SECTION B-B



SECTION A-A



SECTION C-C

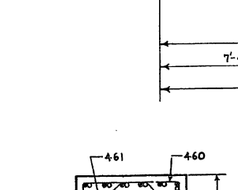


ELEVATION
LOOKING AHEAD

NOTE: REINFORCEMENT IS SYMMETRICAL ABOUT ℄ BENT.

NOTE: MAINTAIN 2" CL. ON ALL REINFORCEMENT UNLESS OTHERWISE NOTED.

FOOTINGS ARE DESIGNED FOR A BEARING CAPACITY OF 3 T.S.F.



SECTION D-D

SECTION E-E

QUANTITIES	
CU.YDS. CLASS A CONCRETE	135.63
LBS. BAR REINF. STEEL	21,659

BRIDGE NO. 1 RIGHT

GEORGIA
DEPARTMENT OF TRANSPORTATION
HIGHWAY DIVISION-BRIDGE DESIGN

INTERMEDIATE BENT 6 DETAILS

I-575 OVER LITTLE RIVER

CHEROKEE CO. I-575-1(6)-07

NO SCALE AUGUST 1979

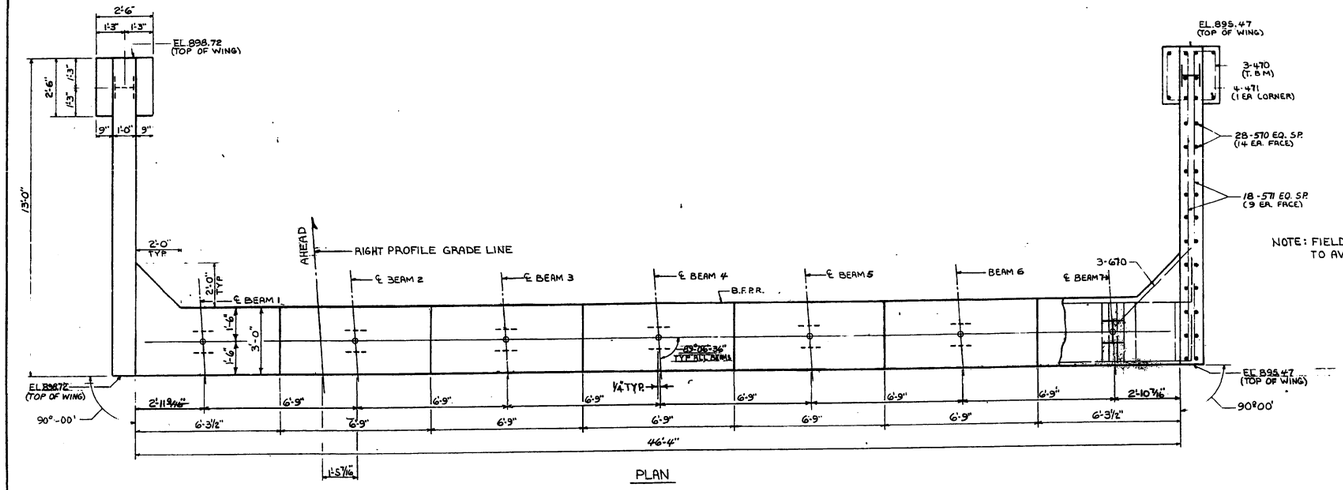
DESIGNED J.A.M. - P.K.L. TRACED
DRAWN A.L.O. CHECKED H.W.C. REVIEWED L.R.P
APPROVED

BRIDGE SHEET 16 OF 22

DATE | REVISIONS | BY

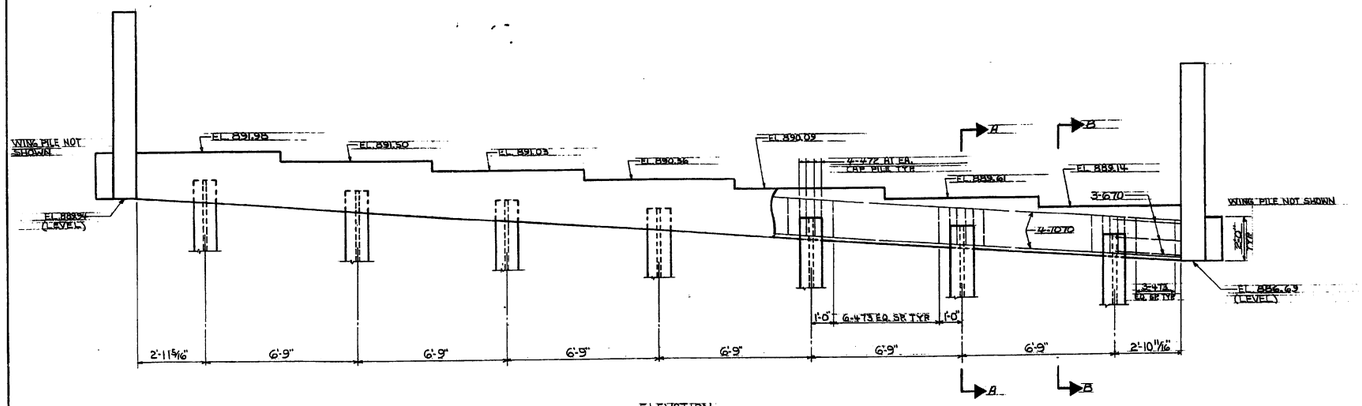
FED. ROAD DIV. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
3	GA.	I-575-1 (6)07		89-Q	173

Ct. 1 Added 10-17-79

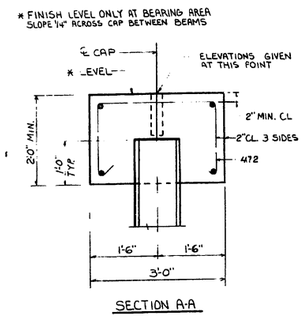


PLAN

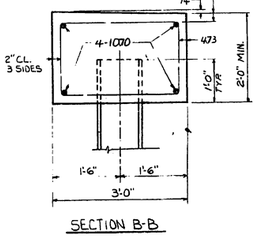
NOTE: FIELD CLIP BARS 570, & 571, AS NECESSARY TO AVOID WING PILES.



ELEVATION
BENT 7 LOOKING AHEAD



SECTION A-A



SECTION B-B

QUANTITIES	
CU. YDS. CLASS A CONC.	20.86
LBS. BAR REINF. STEEL	2320

PLAN DRIVING OBJECTIVE

DRIVE ALL PILES TO A DRIVING RESISTANCE OF 70 TONS AFTER A MINIMUM TIP ELEVATION OF 865 IS ACHIEVED.

BRIDGE NO. 1 RIGHT

GEORGIA
DEPARTMENT OF TRANSPORTATION
HIGHWAY DIVISION - BRIDGE DESIGN

END BENT 7 DETAILS

I-575 OVER LITTLE RIVER

CHEROKEE COUNTY — I-575-1(6)07

NO SCALE — SEPTEMBER 1979

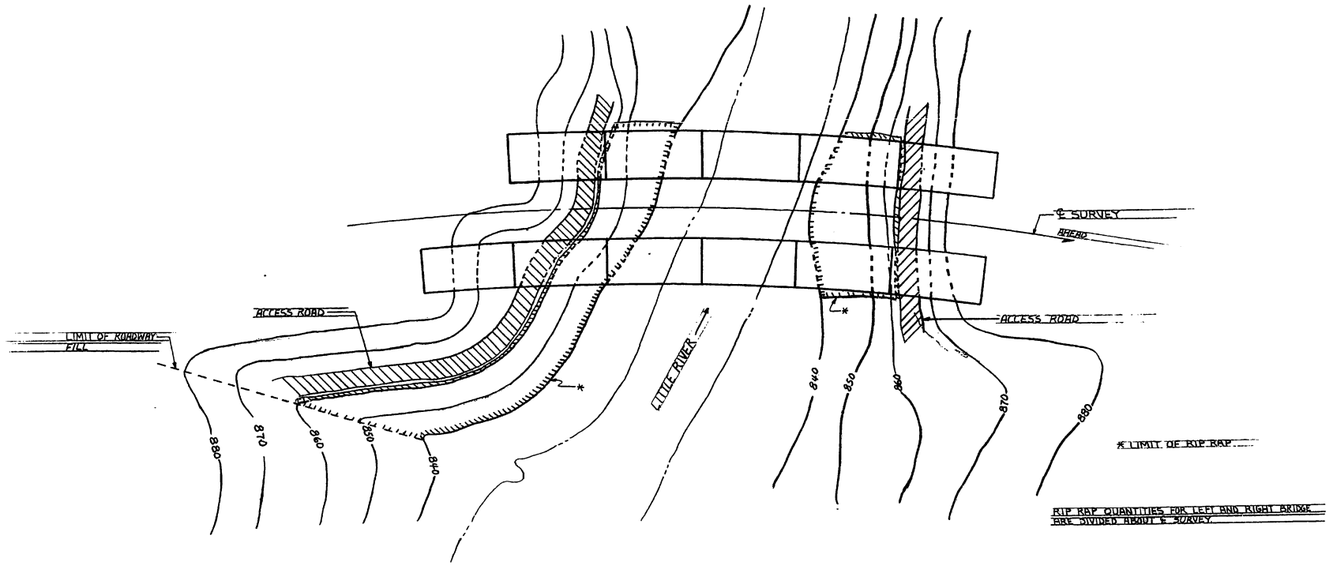
DESIGNED J.A.M. | TRACED | REVIEWED L.R.P.
DRAWN M.B.M. | CHECKED P.V.L. | APPROVED

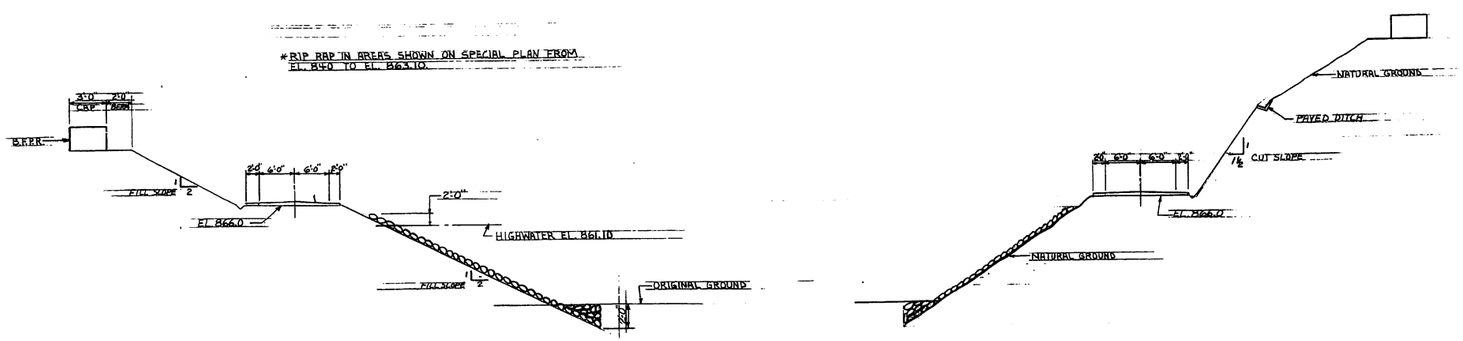
DATE / REVISIONS / BY

BRIDGE SHEET 17 OF 22

STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
GA.	I-575-1(6)07	89-R	173

Ct 1 Added 10-17-79
Rev. 11-7-79





FOR ACCESS ROAD DETAILS, PAVED DITCH DETAILS, ETC. SEE ROADWAY PLANS.

BRIDGE NO. 1 LT. & RT.

GEORGIA
DEPARTMENT OF TRANSPORTATION
HIGHWAY DIVISION-BRIDGE DESIGN

RIP RAP DETAILS

I-575 OVER LITTLE RIVER

CHEROKEE COUNTY I-575-1(6)07

NO SCALE NOVEMBER, 1979

BY	REVISIONS	DATE
R.V.L.	REVISED RIP RAP DETAIL & ADDED ACCESS ROAD	11-7-79

BRIDGE SHEET 18 OF 22

DESIGNED P.V.L. TRACED
DRAWN M.B.M. CHECKED H.W.C.
REVIEWED L.R.R.
APPROVED

CALCULATION SHEET

PROJECT: I-75 / I-575 NORTHWEST CORRIDOR
JOB NUMBER NH000-0575-01(028)
CALC NO. BR#42

SUBJECT: Existing Bridge Maintenance Reports
BY: JCR DATE: 11/30/2009

SHEET NO.
SHEET REV.

BRIDGE INVENTORY DATA LISTING GEOI A DEPARTMENT OF TRANSPORTATION

Structure ID: 057-0044-0 **Cherokee** SUFF. RATING 92.64

Location & Geography

*	Structure I.D.No:	057-0044-0	
	200 Bridge Information	01	
*	6A Feature Int:	LITTLE RIVER	
*	6B Critical Bridge:	0	
*	7A Route Number Carried:	SR00417	
*	7B Facility Carried:	I-575 (NBL)	
*	9 Location:	2.2 MI N OF WOODSTOCK	
	2 DOT District:	6	
	207 Year Photo:	2006	
*	91 Inspection Frequency:	24 Date: 03/29/2006	
	92A Fract Crit Insp Freq:	00 Date: 02/01/1901	
	92B Underwater Insp Freq:	60 Date: 12/02/2002	
	92C Other Spc. Insp Freq:	00 Date: 02/01/1901	
*	4 Place Code:	00000	
*	5 Inventory Route (O/U):	1	
	Type:	1	
	Designation:	1	
	Number:	00575	
	Direction:	0	
*	16 Latitude: 34-08.0	MMS Prefix: SR	
*	17 Longitude: 84-31.5	MMS Suffix: 00 MP: 27.30	
	98 Border Bridge: 000	%Shared: 00	
	99 ID Number: 000000000000000		
*	100 STRAHNET: 1		
	12 Base Highway Network:	1	
	13A LRS Inventory Route:	571041700	
	13B Sub Inventory Route:	0	
*	101 Parallel Structure:	R	
*	102 Direction of Traffic:	1	
*	264 Road Inventory Mile Post:	004.22	
*	208 Inspection Area: 09	Initials: JMC	
	Engineer's Initial: sgm		

* Location I.D. No.: 057-00417D-010.44N

*	104 Highway System:	1	
*	26 Functional Classification:	11	
*	204 Federal Route Type:	I No.: 05751	
	105 Federal Lands Highway:	0	
*	110 Truck Route:	1	
	206 School Bus Route:	1	
	217 Benchmark Elevation:	0000.00	
	218 Datum:	0	
*	19 Bypass Length:	01	
*	20 Toll:	3	
*	21 Maintenance:	01	
*	22 Owner:	01	
*	31 Design Load:	6	
	37 Historical Significance:	5	
	205 Congressional District:	06	
	27 Year Constructed:	1982	
	106 Year Reconstructed:	0000	
	33 Bridge Median:	1	
	34 Skew:	00	
	35 Structure Flared:	0	
	38 Navigation Control:	0	
	213 Special Steel Design:	0	
	267 Type of Paint:	0	
*	42 Type of Service on:	1	
		5	
	214 Movable Bridge:	0	
	203 Type Bridge:	A-O-O-O	
	259 Pile Encasement:	3	
*	43 Structure Type Main:	5 02	
	45 No. Spans Main:	006	
	44 Structure Type Appr:	0 00	
	46 No. Spans Appr:	0000	
	226 Bridge Curve Horz:	1 Vert: 1	
	111 Pier Protection:	0	
	107 Deck Structure Type:	1	
	108 Wearing Surface Type:	1	
	M	0	
	F	1	

Signs & Attachments

	225 Expansion Joint Type:	15	
	242 Deck Drains:	1	
	243 Parapet Location:	0	
	Height:		0.00
	Width:		0.00
	238 Curb:		0.00 0
	239 Handrail:	9 9	
*	240 Median Barrier Rail:	0	
	241 Bridge Median Height:		0.00
	Width:		0.00
*	230 Guardrail Loc Dir Rear:	6	
	Fwrd:	0	
	Oppo Dir Rear:	0	
	Fwrd:	0	
	244 Approach Slab:	3	
	224 Retaining Wall:	0	
	233 Posted Speed Limit:	65	
	236 Warning Sign:	0	
	234 Delineator:	1	
	235 Hazard Boards:	0	
	237 Utilities Gas:	00	
	W	00	
	Ele	00	
	Telephone:	00	
	Se	00	
	247 Lighting Street:	0	
	Naviagtion:	0	
	Aerial:	0	
*	248 County Continuity No.:	02	

Programming Data

201 Project No.: I-575-1 (6) 07 CT.1
202 Plans Available: 1
249 Prop. Proj. No. 0000000000000000
250 Approval Status: 0000
251 P.I. No.: 0000000
252 Contract Date: 02/01/1901
260 Seismic No.: 00012
75 Type Work: 00 0
94 Bridge Imp. Cost: $ 0
95 Roadway Imp. Cost: $ 0
96 Total Imp Cost: $ 0
76 Imp. Length: 000000
97 Imp. Year: 0000
114 Future ADT: 107130 Year: 2025

Hydraulic Data

215 Waterway Data
Highwater Elev.: 0862.1 Year: 1973
Avg. Streambed Elev.: 0861.1 Freq.: 050
Drainage Area: 00139
Area Of Opening: 005500
113 Scour Critical: 5
216 Water Depth: 4 Br. Height: 57.8
222 Slope Protection: 1
221 Spur Dikes Rear: 0 Fwrd: 0
219 Fender System: 0
220 Dolphin: 0
223 Culvert Cover: 000
Type: 0
No. Barrels: 0
Width: 0.00 Height: 0.00
Length: 0 Apron: 0
* 265 U/W Insp. Area: 1 Diver: RM

* Location I.D. No.: 057-00417D-010.44N

Measurements

* 29 ADT: 071420 Year: 2005
109 % Trucks: 0
* 28 Lanes On: 02 Under: 00
210 No. Tracks On: 00 Under: 00
* 48 Max. Span Length: 0089
* 49 Structure Length: 534
51 Br. Rwdy. Width: 42.00
52 Deck Width: 45.20
* 47 Tot. Horz. Cl: 42.00
50 Curb/Sdewlk Width: 0.00/0.00
32 Approach Rdwy Width: 038
* 229 Shoulder Width:
Rear Lt: 4.00 Type: 2 Rt: 10.00
Fwrd Lt: 4.00 Type: 2 Rt: 10.00
Pavement Width:
Rear: 24.00 Type: 2
Fwrd: 24.00 Type: 2
Intersection Rear: 0 Fwrd: 0
36 Safety Features Br. Rail: 1
Transition: 1
App. G. Rail: 1
App. Rail End: 1
53 Minimum Cl.Over: 99 ' 99 "
Under: N 00 ' 00 "
* 228 Min. Vertical Cl
Act. Odm Dir: 99 ' 99 "
Oppo. Dir: 99 ' 99 "
Posted Odm. Dir: 00 ' 00 "
Oppo. Dir: 00 ' 00 "
55 Lateral Undercl. Rt: N 99.90
56 Lateral Undercl. Lt: 0.00
* 10 Max Min Vert Cl: 99 ' 99 " Dir: 0
39 Nav Vert Cl: 000 Horz: 0000
116 Nav Vert Cl Closed: 000
245 Deck Thickness Main: 7.50
Deck Thick Approach: 0.00
246 Overlay Thickness: 0.00
212 Year Last Painted: Sup: 0000 Sub: 0000

Ratings

65 Inventory Rating Method: 2
63 Inventory Rating Method: 2
66 Inventory Type: 2 Rating: 36
64 Operating Type: 2 Rating: 51
231 Calculated Loads
H-Modified: 20 0
HS-Modified: 25 0
Type 3: 28 0
Type 3s2: 40 0
Timber: 36 0
Piggyback: 40 0
261 H Inventory Rating: 20
262 H Operating Rating: 28
67 Structural Evaluation: 7
58 Deck Condition: 7
59 Superstructure Condition: 8
* 227 Collision Damage: 0
60A Substructure Condition: 7
60B Scour Condition: 7
60C Underwater Condition: 7
71 Waterway Adequacy: 8
61 Channel Protection Cond: 8
68 Deck Geometry: 8
69 UnderClr. Horz/Vert: N
72 Appr. Alignment: 8
62 Culvert: N

Posting Data

70 Bridge Posting Required: 5
41 Struct Open, Posted, Cl: A
* 103 Temporary Structure: 0
232 Posted Loads H-Modified: 00
HS-Modified: 00
Type 3: 00
Type3s2: 00
Timber: 00
Piggyback: 00
253 Notification Date 02/01/1901
253 Fed Notify Date: 02/01/1901 0

GEORGIA DEPARTMENT OF TRANSPORTATION

Bridge Inspection Report

District: 6 **Inspection Date:** 3/29/2006 **Inspection Area:** 09
Bridge Inspector: Jerry Cooper **Over:** LITTLE RIVER **Bridge Status:** 01
Location ID: 057-00417D-010.44N **County:** Cherokee
Structure ID: 057-0044-0 **Road Name:** I-575 (NBL)

EVALUATION & DEFICIENCIES

SubStructure: **Year Painted:** 0000

Concrete caps at both abutments.
Bents 2, 3, 4, 5, and 6 have a concrete cap and 2 concrete columns.
Minor settlement at abutment 7.
Minor cracks in both abutment caps.
Very minor cracks in caps at bent 2 ,3, & 4.

SuperStructure: **Year Painted:** 0000

6 span p.s.c. "I" beam - 7 beams per span.
Neoprene bearings.
All beams are in good condition.
HS-20 Design

Deck:

7.5" concrete slab.
Concrete s.i.p. deck forms.
Minor longitudinal cracking appears to be over the beams on top. .
HS-20 Design

General:

Built in 1982 - Project # I-575-1 (6) 7 CT.1 .
Special note : This bridge is scheduled for an underwater inspection. .

12/02/02 RMO Light scale/abrasion from 9' above the waterline down.

Condition Rating

Component	Material	Rating
Substructure	Concrete	7
Superstructure	Concrete	8
Deck	Concrete	7

Temp Shored: **No**

Truck Type	Gross/H-Mod	HSMod	Tand	3-S-2	Log	Piggy
Calculated Posting	20	25	28	40	36	40
Posting Required	No	No	No	No	No	No
Existing Posting	00	00	00	00	00	00

*****School Bus Route.******

Structure Does Not Require Posting

GEORGIA DEPARTMEN . OF TRANSPORTATION

Bridge Component Report

District: 6
Bridge Inspector: Jerry Cooper
Location ID: 057-00417D-010.44N
Structure ID: 057-0044-0

Inspection Date: 3/29/2006
Over: LITTLE RIVER
County: Cherokee
Road Name: I-575 (NBL)

Inspection Area: 09

SubStructure Data

Bent#	Type	Foundation	Col	#Cols	Piling	#Piles	Sway	CAP	Remarks
1	A	ZZ		0		0		C	
2	B	SF	C	2		0		C	
3	B	SF	C	2		0		C	
4	B	SF	C	2		2		C	
5	B	SF	C	2		0		C	
6	B	SF	C	2		0		C	
7	A	ZZ		0		0		C	

SuperStructure Data

Span#	Beam Type	Spacing	Length	#Beams	Remarks
1	Concrete "I" Beam	6.80	89.00	7	P. S. C. Type IV
2	Concrete "I" Beam	6.80	89.00	7	P. S. C. Type IV
3	Concrete "I" Beam	6.80	89.00	7	P. S. C. Type IV
4	Concrete "I" Beam	6.80	89.00	7	P. S. C. Type IV
5	Concrete "I" Beam	6.80	89.00	7	P. S. C. Type IV
6	Concrete "I" Beam	6.80	89.00	7	P. S. C. Type IV

Bearing Data

Span#	Rear Type Bearing	FWD Type Bearing	Remarks
1	03 - Elastomeric	03 - Elastomeric	
2	03 - Elastomeric	03 - Elastomeric	
3	03 - Elastomeric	03 - Elastomeric	
4	03 - Elastomeric	03 - Elastomeric	
5	03 - Elastomeric	03 - Elastomeric	
6	03 - Elastomeric	03 - Elastomeric	

BRIDGE INVENTORY DATA LISTING GEOI A DEPARTMENT OF TRANSPORTATION

Structure ID: 057-0045-0 **Cherokee** SUFF. RATING 92.64

Location & Geography

*	Structure I.D.No:	057-0045-0	
	200 Bridge Information	01	
*	6A Feature Int:	LITTLE RIVER	
*	6B Critical Bridge:	0	
*	7A Route Number Carried:	SR00417	
*	7B Facility Carried:	I-575 (SBL)	
*	9 Location:	2.2 MI N OF WOODSTOCK	
	2 DOT District:	6	
	207 Year Photo:	2006	
*	91 Inspection Frequency:	24	Date: 03/29/2006
	92A Fract Crit Insp Freq:	00	Date: 02/01/1901
	92B Underwater Insp Freq:	60	Date: 12/02/2002
	92C Other Spc. Insp Freq:	00	Date: 02/01/1901
*	4 Place Code:	00000	
*	5 Inventory Route (O/U):	1	
	Type:	1	
	Designation:	1	
	Number:	00575	
	Direction:	0	
*	16 Latitude: 34-08.0	MMS Prefix: SR	
*	17 Longitude: 84-31.5	MMS Suffix: 00	MP: 27.31
	98 Border Bridge: 000	%Shared: 00	
	99 ID Number: 000000000000000		
*	100 STRAHNET: 1		
	12 Base Highway Network:	1	
	13A LRS Inventory Route:	571041700	
	13B Sub Inventory Route:	0	
*	101 Parallel Structure:	L	
*	102 Direction of Traffic:	1	
*	264 Road Inventory Mile Post:	004.23	
*	208 Inspection Area: 09	Initials: JMC	
	Engineer's Initial: sgm		

* Location I.D. No.: 057-00417D-010.45N

*	104 Highway System:	1	
*	26 Functional Classification:	11	
*	204 Federal Route Type:	I	No.: 05751
	105 Federal Lands Highway:	0	
*	110 Truck Route:	1	
	206 School Bus Route:	1	
	217 Benchmark Elevation:	0000.00	
	218 Datum:	0	
*	19 Bypass Length:	01	
*	20 Toll:	3	
*	21 Maintenance:	01	
*	22 Owner:	01	
*	31 Design Load:	6	
	37 Historical Significance:	5	
	205 Congressional District:	06	
	27 Year Constructed:	1982	
	106 Year Reconstructed:	0000	
	33 Bridge Median:	1	
	34 Skew:	00	
	35 Structure Flared:	0	
	38 Navigation Control:	0	
	213 Special Steel Design:	0	
	267 Type of Paint:	0	
*	42 Type of Service on:	1	
		5	
	214 Movable Bridge:	0	
	203 Type Bridge:	A-O-O-O	
	259 Pile Encasement:	3	
*	43 Structure Type Main:	5	02
	45 No. Spans Main:	005	
	44 Structure Type Appr:	0	00
	46 No. Spans Appr:	0000	
	226 Bridge Curve Horz:	1	Vert: 1
	111 Pier Protection:	0	
	107 Deck Structure Type:	1	
	108 Wearing Surface Type:	1	
	M	0	
	F	1	

Signs & Attachments

	225 Expansion Joint Type:	15	
	242 Deck Drains:	1	
	243 Parapet Location:	0	
	Height:		0.00
	Width:		0.00
	238 Curb:		0.00 0
	239 Handrail:	9	9
*	240 Median Barrier Rail:	0	
	241 Bridge Median Height:		0.00
	Width:		0.00
*	230 Guardrail Loc Dir Rear:	6	
	Fwrd:	6	
	Oppo Dir Rear:	0	
	Fwrd:	0	
	244 Approach Slab:	3	
	224 Retaining Wall:	0	
	233 Posted Speed Limit:	65	
	236 Warning Sign:	0	
	234 Delineator:	1	
	235 Hazard Boards:	0	
	237 Utilities Gas:	00	
	W	00	
	Ele	00	
	Telephone:	00	
	Se	00	
	247 Lighting Street:	0	
	Naviagtion:	0	
	Aerial:	0	
*	248 County Continuity No.:	02	

BRIDGE INVENTORY DATA LISTING GEOI A DEPARTMENT OF TRANSPORTATION

Structure ID: 057-0045-0 **Cherokee** SUFF. RATING 92.64

Programming Data

201 Project No.: I-575-1 (6) 07 CT.1
202 Plans Available: 1
249 Prop. Proj. No. 0000000000000000
250 Approval Status: 0000
251 P.I. No.: 0000000
252 Contract Date: 02/01/1901
260 Seismic No.: 00012
75 Type Work: 00 0
94 Bridge Imp. Cost: $ 0
95 Roadway Imp. Cost: $ 0
96 Total Imp Cost: $ 0
76 Imp. Length: 000000
97 Imp. Year: 0000
114 Future ADT: 107130 Year: 2025

Hydraulic Data

215 Waterway Data
Highwater Elev.: 0862.1 Year: 1973
Avg. Streambed Elev.: 0861.1 Freq.: 050
Drainage Area: 00139
Area Of Opening: 005500
113 Scour Critical: 5
216 Water Depth: 05.0 Br. Height: 62.9
222 Slope Protection: 1
221 Spur Dikes Rear: 0 Fwrd: 0
219 Fender System: 0
220 Dolphin: 0
223 Culvert Cover: 000
Type: 0
No. Barrels: 0
Width: 0.00 Height: 0.00
Length: 0 Apron: 0
* 265 U/W Insp. Area: 1 Diver: RM

* Location I.D. No.: 057-00417D-010.45N

Measurements

* 29 ADT: 071420 Year: 2005
109 % Trucks: 0
* 28 Lanes On: 02 Under: 00
210 No. Tracks On: 00 Under: 00
* 48 Max. Span Length: 0089
* 49 Structure Length: 445
51 Br. Rwdy. Width: 42.00
52 Deck Width: 45.20
* 47 Tot. Horz. Cl: 42.00
50 Curb/Sdewlk Width: 0.00/0.00
32 Approach Rdwy Width: 038
* 229 Shoulder Width:
Rear Lt: 4.00 Type: 2 Rt: 10.00
Fwrd Lt: 4.00 Type: 2 Rt: 10.00
Pavement Width:
Rear: 24.00 Type: 2
Fwrd: 24.00 Type: 2
Intersection Rear: 0 Fwrd: 0
36 Safety Features Br. Rail: 1
Transition: 1
App. G. Rail: 1
App. Rail End: 1
53 Minimum Cl.Over: 99 ' 99 "
Under: N 00 ' 00 "
* 228 Min. Vertical Cl
Act. Odm Dir: 99 ' 99 "
Oppo. Dir: 99 ' 99 "
Posted Odm. Dir: 00 ' 00 "
Oppo. Dir: 00 ' 00 "
55 Lateral Undercl. Rt: N 99.90
56 Lateral Undercl. Lt: 0.00
* 10 Max Min Vert Cl: 99 ' 99 " Dir: 0
39 Nav Vert Cl: 000 Horz: 0000
116 Nav Vert Cl Closed: 000
245 Deck Thickness Main: 7.50
Deck Thick Approach: 0.00
246 Overlay Thickness: 0.00
212 Year Last Painted: Sup: 0000 Sub: 0000

Ratings

65 Inventory Rating Method: 2
63 Inventory Rating Method: 2
66 Inventory Type: 2 Rating: 36
64 Operating Type: 2 Rating: 51
231 Calculated Loads
H-Modified: 20 0
HS-Modified: 25 0
Type 3: 28 0
Type 3s2: 40 0
Timber: 36 0
Piggyback: 40 0
261 H Inventory Rating: 20
262 H Operating Rating: 28
67 Structural Evaluation: 7
58 Deck Condition: 7
59 Superstructure Condition: 8
* 227 Collision Damage: 0
60A Substructure Condition: 7
60B Scour Condition: 7
60C Underwater Condition: 7
71 Waterway Adequacy: 8
61 Channel Protection Cond: 8
68 Deck Geometry: 8
69 UnderClr. Horz/Vert: N
72 Appr. Alignment: 8
62 Culvert: N

Posting Data

70 Bridge Posting Required: 5
41 Struct Open, Posted, Cl: A
* 103 Temporary Structure: 0
232 Posted Loads H-Modified: 00
HS-Modified: 00
Type 3: 00
Type3s2: 00
Timber: 00
Piggyback: 00
253 Notification Date 02/01/1901
253 Fed Notify Date: 02/01/1901 0

GEORGIA DEPARTMENT OF TRANSPORTATION

Bridge Inspection Report

District: 6 **Inspection Date:** 3/29/2006 **Inspection Area:** 09
Bridge Inspector: Jerry Cooper **Over:** LITTLE RIVER **Bridge Status:** 01
Location ID: 057-00417D-010.45N **County:** Cherokee
Structure ID: 057-0045-0 **Road Name:** I-575 (SBL)

EVALUATION & DEFICIENCIES

SubStructure: **Year Painted:** 0000

Concrete caps at both abutments.
Bents 2, 3, 4, and 5 Have a concrete cap and 2 concrete columns.
Minor cracks in both abutment caps .
Very minor cracks in caps at the step downs.

SuperStructure: **Year Painted:** 0000

5 span p.s.c. "I" beam - 7 beams per span.
Neoprene bearings.
All beams with are in good condition.

Deck:

7.5" concrete slab.
Concrete s.i.p. deck forms.
Minor longitudinal cracking which appears to be along edge of beams.

General:

Built in 1982 - Project # I-575-1 (6) 7 CT.1.
Special note : This bridge is scheduled for an underwater inspection.

12/02/02 RMO Light scale/abrasion from 9' above the waterline down.

Condition Rating

Component	Material	Rating
Substructure	Concrete	7
Superstructure	Concrete	8
Deck	Concrete	7

Temp Shored: **No**

Truck Type	Gross/H-Mod	HSMod	Tand	3-S-2	Log	Piggy
Calculated Posting	20	25	28	40	36	40
Posting Required	No	No	No	No	No	No
Existing Posting	00	00	00	00	00	00

*****School Bus Route.******

Structure Does Not Require Posting

GEORGIA DEPARTMEN. OF TRANSPORTATION

Bridge Component Report

District: 6
Bridge Inspector: Jerry Cooper
Location ID: 057-00417D-010.45N
Structure ID: 057-0045-0

Inspection Date: 3/29/2006
Over: LITTLE RIVER
County: Cherokee
Road Name: I-575 (SBL)

Inspection Area: 09

SubStructure Data

Bent#	Type	Foundation	Col	#Cols	Piling	#Piles	Sway	CAP	Remarks
1	A	ZZ		0		0		C	
2	B	SF	C	2		0		C	
3	B	SF	C	2		0		C	
4	B	SF	C	2		2		C	
5	B	SF	C	2		0		C	
6	A	ZZ		0		0		C	

SuperStructure Data

Span#	Beam Type	Spacing	Length	#Beams	Remarks
1	Concrete "I" Beam	6.80	89.00	7	P. S. C. Type IV
2	Concrete "I" Beam	6.80	89.00	7	P. S. C. Type IV
3	Concrete "I" Beam	6.80	89.00	7	P. S. C. Type IV
4	Concrete "I" Beam	6.80	89.00	7	P. S. C. Type IV
5	Concrete "I" Beam	6.80	89.00	7	P. S. C. Type IV

Bearing Data

Span#	Rear Type Bearing	FWD Type Bearing	Remarks
1	03 - Elastomeric	03 - Elastomeric	
2	03 - Elastomeric	03 - Elastomeric	
3	03 - Elastomeric	03 - Elastomeric	
4	03 - Elastomeric	03 - Elastomeric	
5	03 - Elastomeric	03 - Elastomeric	

GEORGIA DEPARTMENT OF TRANSPORTATION

UnderWater Report

District: 6 **Inspection Date:** 3/29/2006 **Inspection Area:** 09

Bridge Inspector: Bob O'Daniels **Over:** LITTLE RIVER

Location ID: 057-00417D-010.44N **County:** Cherokee **Skew:** 00

Structure ID: 057-0044-0

Bents Inspected: Bent 4 *** Boat Used:** No

Bent Construction: Concrete columns on ftgs *** Surface Air:** No

Bridge Height: 57.8 **Location of Bridge Height** -5' Bent 5 downstr

Water Depth: 4

Condition Rating:

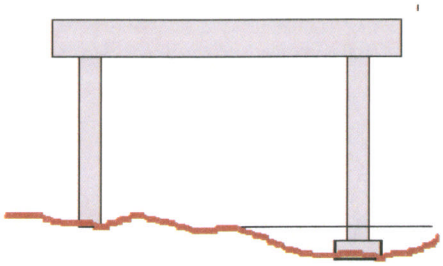
SubStructure: 7 **Channel Protection:** 8

Scour: 7 **Underwater:** 7

Waterway Adeq: 8

Detail Inspection:

12/02/02 RMO Light scale/abrasion from 9' above the waterline down.



Bent #: 4

Bent Type:

Pi c Type: 2 Column Footing

Col.	RTG	WD	FTG	FSX
1	7	dry	na	0
2	7	4	7	2

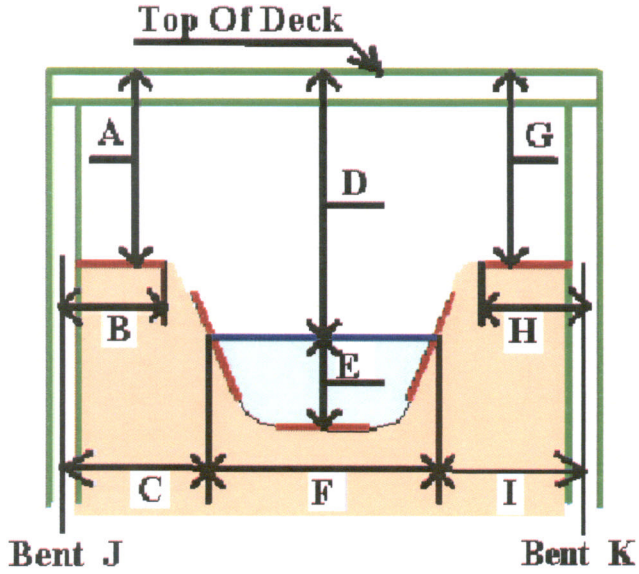
GEORGIA DEPARTMENT OF TRANSPORTATION

Waterway Report

District: 6
Bridge Inspector: Jerry Cooper
Location ID: 057-00417D-010.44N
Structure ID: 057-0044-0

Inspection Date: 3/29/2006
Over: LITTLE RIVER
County: Cherokee
Road Name: I-575 (NBL)

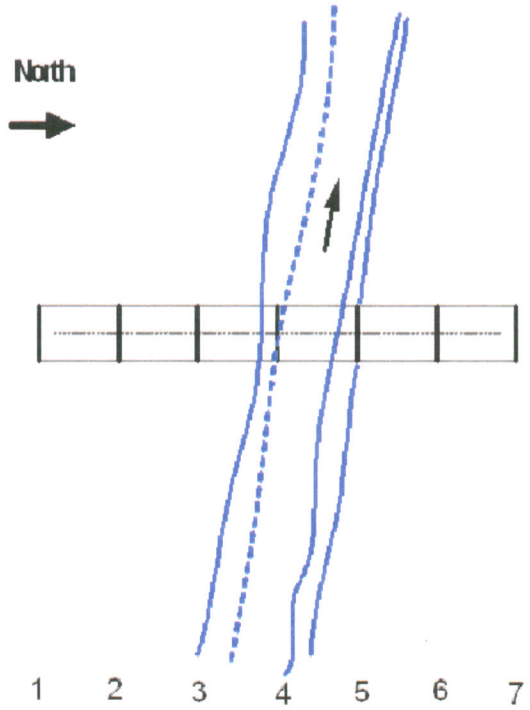
Inspection Area: 09
Skew: 00



Side view at the Channel.

B, C, H, & I are measured to center of bent or B.F.P.R.

A:	49
B:	62
C:	88
D:	57.8
E:	4
F:	75
G:	53
H:	0
I:	15
J:	3
K:	5



Location of Bridge Height At bent 4

Scour Condition: 7 **Waterway Adequacy:** 8 **Channel Protection:** 8

0 = **SubStructure**
15 = **Channel Skew**

15 = **Stream Angle**

Comments:

12/02/02 Bridge curves to the right and is super elevated on left, runs up hill.

GEORGIA DEPARTMENT OF TRANSPORTATION

Waterway Report

District: 6 **Inspection Date:** 3/29/2006 **Inspection Area:** 09

Bridge Inspector: Jerry Cooper **Over:** LITTLE RIVER

Location ID: 057-00417D-010.44N **County:** Cherokee **Skew:** 00

Structure ID: 057-0044-0 **Road Name:** I-575 (NBL)

Span #:	1	2	3	4	5	6
Length:	**89.0**	**89.0**	**89.0**	**89.0**	**89.0**	**89.0**

Upstream -

Upstream +		1	2	3	4	5	6	7
05/26/1999	RMO/WSR		26.00	42.00	57.00	52.00	44.00	10.00
12/02/2002	RMO TSP		25.80	41.90	56.00	50.10	42.30	11.00
03/29/2006	JMC-WBR		26.20	42.20	60.10	50.70	43.80	10.20

Downstream -

Downstream +		1	2	3	4	5	6	7
05/26/1999	RMO/WSR		25.00	38.00	59.00	61.00	44.00	7.00
12/02/2002	RMO TSP		24.90	39.90	59.40	61.00	44.10	9.30
03/29/2006	JMC-WBR		24.80	37.00	60.20	59.50	43.30	8.20

GEORGIA DEPARTMENT OF TRANSPORTATION

UnderWater Report

District: 6
Bridge Inspector: Bob O'Daniels
Location ID: 057-00417D-010.45N
Structure ID: 057-0045-0

Inspection Date: 3/29/2006
Over: LITTLE RIVER
County: Cherokee

Inspection Area: 09
Skew: 00

Bents Inspected: Bent 4
Bent Construction: Concrete columns on ftgs

*** Boat Used:** No
*** Surface Air:** No

Bridge Height: 62.9
Location of Bridge Height -5' Bent 4 downstr
Water Depth: 05.0

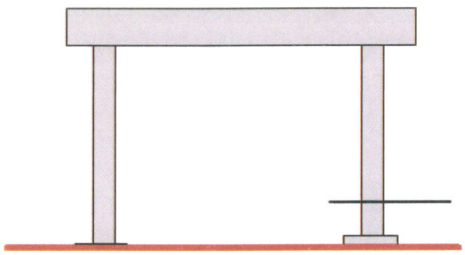
Condition Rating:

SubStructure: 7
Scour: 7
Waterway Adeq: 8

Channel Protection: 8
Underwater: 7

Detail Inspection:

12/02/02 RMO Light scale/abrasion from 9' above the waterline down.



Bent #: 4
Bent Type:
Pi c Type: 2 Column Footing

Col.	RTG	WD	FTG	FSX
1	7	1	7	1
2	7	2	7	1

GEORGIA DEPARTMENT OF TRANSPORTATION

Waterway Report

District: 6
Bridge Inspector: Jerry Cooper
Location ID: 057-00417D-010.45N
Structure ID: 057-0045-0

Inspection Date: 3/29/2006
Over: LITTLE RIVER
County: Cherokee
Road Name: I-575 (SBL)

Inspection Area: 09
Skew: 00

Span #:	1	2	3	4	5
Length:	**89.0**	**89.0**	**89.0**	**89.0**	**89.0**

Upstream -

Upstream +		1	2	3	4	5	6
05/26/1999	RMO/WSR		33.00	55.00	61.00	43.00	8.00
12/02/2002	RMO TSP		33.50	53.70	59.80	42.20	7.00
03/29/2006	JMC-WBR		34.00	55.30	64.80	43.50	7.90

Downstream -

Downstream +		1	2	3	4	5	6
05/26/1999	RMO/WSR		33.00	52.00	63.00	42.00	9.00
12/02/2002	RMO TSP		33.30	52.00	62.60	41.80	9.00
03/29/2006	JMC-WBR		34.80	52.50	66.50	42.00	8.30

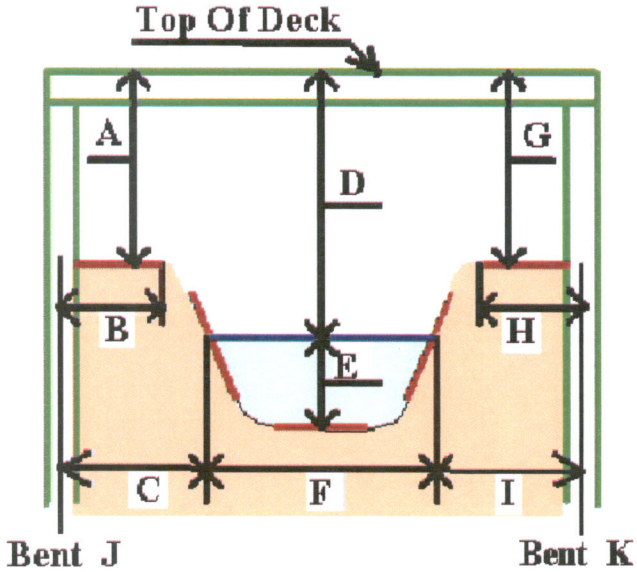
GEORGIA DEPARTMENT OF TRANSPORTATION

Waterway Report

District: 6
Bridge Inspector: Jerry Cooper
Location ID: 057-00417D-010.45N
Structure ID: 057-0045-0

Inspection Date: 3/29/2006
Over: LITTLE RIVER
County: Cherokee
Road Name: I-575 (SBL)

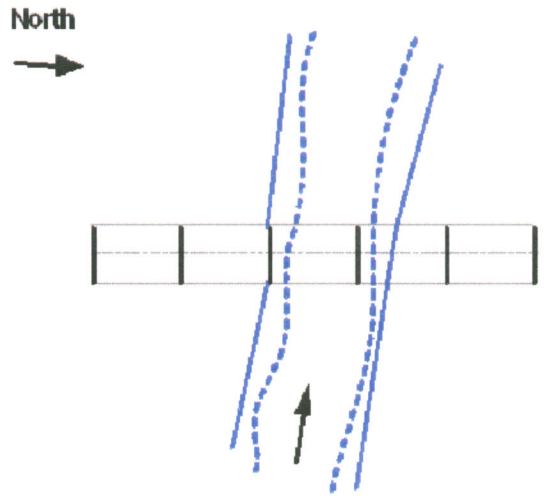
Inspection Area: 09
Skew: 00



Side view at the Channel.

B, C, H, & I are measured to center of bent or B.F.P.R.

A:	58
B:	0
C:	11
D:	62.9
E:	05.0
F:	92
G:	55
H:	59
I:	75
J:	3
K:	5



Location of Bridge Height -18' from bt. 4

Scour Condition: 7 **Waterway Adequacy:** 8 **Channel Protection:** 8

0 = **SubStructure**
10 = **Channel Skew**
10 = **Stream Angle**

Comments:

12/02/02 Bridge curves to the right and is super elevated on the left, runs up hill.

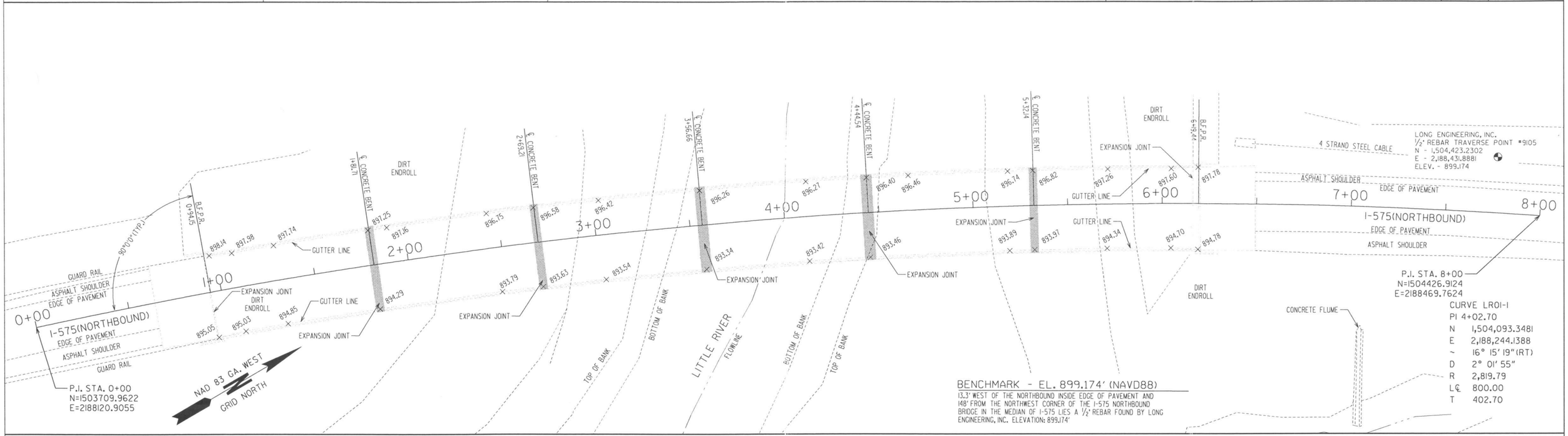
CALCULATION SHEET

PROJECT: I-75 / I-575 NORTHWEST CORRIDOR
JOB NUMBER NH000-0575-01(028)
CALC NO. BR#42

SUBJECT: Existing Bridge Groundline Survey Elevations
BY: JCR DATE: 11/30/2009

SHEET NO.
SHEET REV.

DATE$$$	TIME$$$	PRF	DGN	COUNTY	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
$USER$		$$PENTABLE$$		$COUNTY2$	$PROJECT$	$BR18$	SH

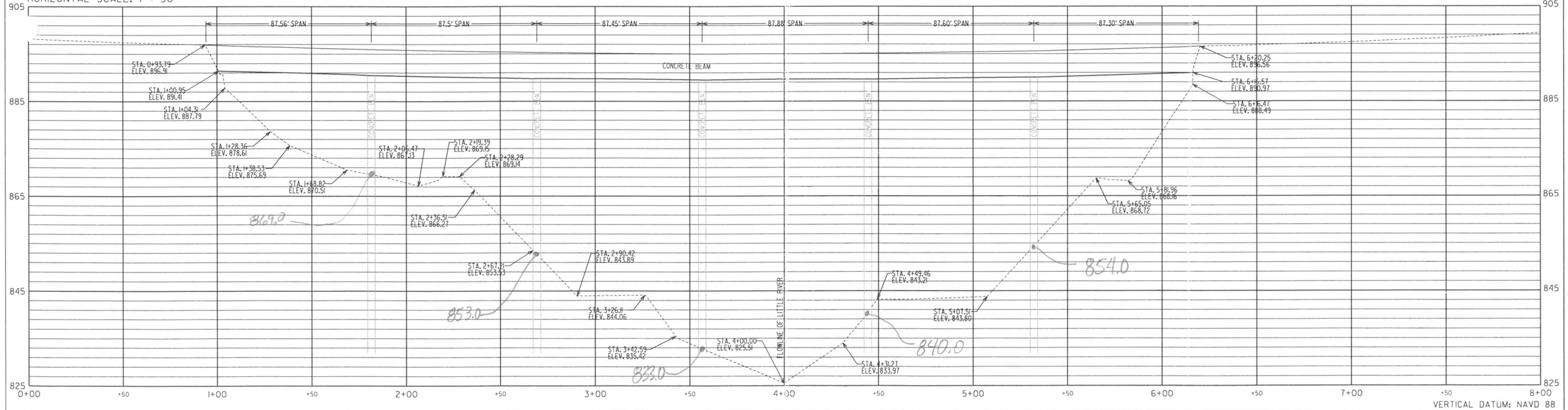


CURVE LROI-I
PI 4+02.70
N 1,504,093.3481
E 2,188,244.1388
~ 16° 15' 19"(RT)
D 2° 01' 55"
R 2,819.79
L℄ 800.00
T 402.70

BENCHMARK - EL. 899.174' (NAVD88)
13.3' WEST OF THE NORTHBOUND INSIDE EDGE OF PAVEMENT AND 148' FROM THE NORTHWEST CORNER OF THE I-575 NORTHBOUND BRIDGE IN THE MEDIAN OF I-575 LIES A ½" REBAR FOUND BY LONG ENGINEERING, INC. ELEVATION: 899.174'

VERTICAL SCALE: 1" = 20'
HORIZONTAL SCALE: 1" = 50'

I-575 (NORTHBOUND) OVER LITTLE RIVER (VIEWING NOR



VERTICAL DATUM: NAVD 88

NOTE: THIS PROFILE INDICATES ELEVATIONS ALONG THE CENTERLINE OF I-575 (NORTHBOUND).

P.I. NO. $PROJECT$	LONG JOB NO. $LEI JOB$
DRAWN BY $DRAWN$	DATE DATE$$$
CHECKED BY $CHECKED$	SCALE 1" = 50'

LONG ENGINEERING, INC.
1780 Corporate Drive
Suite 400
Norcross, Georgia 30093
Tel 770.931.8005
Fax 770.931.8555
www.longeng.com

SCALE IN FEET
0 25 50 100

REVISION DATES

STATE OF GEORGIA
DEPARTMENT OF TRANSPORTATION

BRIDGE DETAIL

I-575 FROM BARRETT PARKWAY TO SIXES ROAD

I-575 (NORTHBOUND) OVER LITTLE RIVER

RT

DRAWING No. $BR18$

CALCULATION SHEET

PROJECT: I-75 / I-575 NORTHWEST CORRIDOR
JOB NUMBER NH000-0575-01(028)
CALC NO. BR#42

SUBJECT: Hydraulic Information
BY: JCR DATE: 11/30/2009

SHEET NO.
SHEET REV.

HYDRAULIC TABLE (50-YEAR STORM)

River Floods
NH000-0575-01(028) Cherokee County
I-575 over Little River
PI # 713640

	FULL VALLEY CONDITIONS	*EXISTING / PROPOSED CONDITIONS*
FLOODSTAGE ELEVATION BRIDGE SECTION (ft)	851.65	852.13
FLOODSTAGE ELEVATION APPROACH SECTION (ft)	852.62	852.78
AREA OF OPENING UNDER FLOODSTAGE (ft^2)	-	2846
DISCHARGE THROUGH BRIDGE (cfs)	-	15780
DISCHARGE OVER ROADWAY (cfs)	-	0
CHANNEL VELOCITY (ft/s)	6.85	6.99
MEAN VELOCITY (ft/s)	5.33	5.55
2-YEAR FLOODSTAGE ELEVATION BRIDGE SECTION (ft)	843.85	843.67
BACKWATER HEIGHT (ft)	-	0.16

HYDRAULIC TABLE (100-YEAR STORM)

River Floods
NH000-0575-01(028) Cherokee County
I-575 over Little River
PI # 713640

	FULL VALLEY CONDITIONS	*EXISTING / PROPOSED CONDITIONS*
FLOODSTAGE ELEVATION BRIDGE SECTION (ft)	853.37	853.56
FLOODSTAGE ELEVATION APPROACH SECTION (ft)	854.12	854.29
AREA OF OPENING UNDER FLOODSTAGE (ft^2)	-	3145
DISCHARGE THROUGH BRIDGE (cfs)	-	18250
DISCHARGE OVER ROADWAY (cfs)	-	0
CHANNEL VELOCITY (ft/s)	7.33	7.46
MEAN VELOCITY (ft/s)	5.58	5.80
2-YEAR FLOODSTAGE ELEVATION BRIDGE SECTION (ft)	843.85	843.67
BACKWATER HEIGHT (ft)	-	0.17

HYDRAULIC TABLE (500-YEAR STORM)

River Floods
NH000-0575-01(028) Cherokee County
I-575 over Little River
PI # 713640

	FULL VALLEY CONDITIONS	*EXISTING / PROPOSED CONDITIONS*
FLOODSTAGE ELEVATION BRIDGE SECTION (ft)	856.77	857.00
FLOODSTAGE ELEVATION APPROACH SECTION (ft)	857.72	857.92
AREA OF OPENING UNDER FLOODSTAGE (ft^2)	-	3901
DISCHARGE THROUGH BRIDGE (cfs)	-	24913
DISCHARGE OVER ROADWAY (cfs)	-	0
CHANNEL VELOCITY (ft/s)	8.45	8.48
MEAN VELOCITY (ft/s)	6.15	6.39
2-YEAR FLOODSTAGE ELEVATION BRIDGE SECTION (ft)	843.85	843.67
BACKWATER HEIGHT (ft)	-	0.20

NH000-0575-01(028) Cherokee County
I-575 over Little River
PI # 713640

Proposed bridge
River Floods

MIN PROFILE GRADE ELEVATION	896.13
DEPTH OF CROSS SLOPE	2.34
DEPTH OF SLAB AND BEAM	5.13
BOTTOM OF BEAM ELEVATION	888.67

MINIMUM BOTTOM OF BEAM ELEVATION	888.67
50 YEAR FLOODSTAGE ELEVATION*	852.13
CLEARANCE	36.54

MINIMUM BOTTOM OF BEAM ELEVATION	888.67
100 YEAR FLOODSTAGE ELEVATION*	853.56
CLEARANCE	35.11

*Floodstage taken from proposed conditions model.

ABNORMAL FLOODS

HYDRAULIC TABLE (50-YEAR STORM)

Abnormal Floods
NH000-0575-01(028) Cherokee County
I-575 over Little River
PI # 713640

	FULL VALLEY CONDITIONS	*EXISTING / PROPOSED CONDITIONS*
FLOODSTAGE ELEVATION BRIDGE SECTION (ft)	860.04	860.10
FLOODSTAGE ELEVATION APPROACH SECTION (ft)	860.31	860.37
AREA OF OPENING UNDER FLOODSTAGE (ft^2)	-	4705
DISCHARGE THROUGH BRIDGE (cfs)	-	15780
DISCHARGE OVER ROADWAY (cfs)	-	0
CHANNEL VELOCITY (ft/s)	4.58	4.56
MEAN VELOCITY (ft/s)	3.21	3.35
2-YEAR FLOODSTAGE ELEVATION BRIDGE SECTION (ft)	*****	*****
BACKWATER HEIGHT (ft)	-	0.06

HYDRAULIC TABLE (100-YEAR STORM)

Abnormal Floods
NH000-0575-01(028) Cherokee County
I-575 over Little River
PI # 713640

	FULL VALLEY CONDITIONS	*EXISTING / PROPOSED CONDITIONS*
FLOODSTAGE ELEVATION BRIDGE SECTION (ft)	861.04	861.12
FLOODSTAGE ELEVATION APPROACH SECTION (ft)	861.37	861.45
AREA OF OPENING UNDER FLOODSTAGE (ft^2)	-	4945
DISCHARGE THROUGH BRIDGE (cfs)	-	18250
DISCHARGE OVER ROADWAY (cfs)	-	0
CHANNEL VELOCITY (ft/s)	5.08	5.05
MEAN VELOCITY (ft/s)	3.53	3.69
2-YEAR FLOODSTAGE ELEVATION BRIDGE SECTION (ft)	*****	*****
BACKWATER HEIGHT (ft)	-	0.08

HYDRAULIC TABLE (500-YEAR STORM)

Abnormal Floods
NH000-0575-01(028) Cherokee County
I-575 over Little River
PI # 713640

	FULL VALLEY CONDITIONS	*EXISTING / PROPOSED CONDITIONS*
FLOODSTAGE ELEVATION BRIDGE SECTION (ft)	862.06	862.19
FLOODSTAGE ELEVATION APPROACH SECTION (ft)	862.62	862.75
AREA OF OPENING UNDER FLOODSTAGE (ft^2)	-	5187
DISCHARGE THROUGH BRIDGE (cfs)	-	24913
DISCHARGE OVER ROADWAY (cfs)	-	0
CHANNEL VELOCITY (ft/s)	6.68	6.61
MEAN VELOCITY (ft/s)	4.60	4.80
2-YEAR FLOODSTAGE ELEVATION BRIDGE SECTION (ft)	*****	*****
BACKWATER HEIGHT (ft)	-	0.13

NH000-0575-01(028) Cherokee County
I-575 over Little River
PI # 713640

Proposed bridge
Abnormal Flood

MIN PROFILE GRADE ELEVATION	896.13
DEPTH OF CROSS SLOPE	2.34
DEPTH OF SLAB AND BEAM	5.13
BOTTOM OF BEAM ELEVATION	888.67
MINIMUM BOTTOM OF BEAM ELEVATION	888.67
50 YEAR FLOODSTAGE ELEVATION*	860.10
CLEARANCE	28.57
MINIMUM BOTTOM OF BEAM ELEVATION	888.67
100 YEAR FLOODSTAGE ELEVATION*	861.12
CLEARANCE	27.55

*Floodstage taken from proposed conditions model.

CALCULATION SHEET

PROJECT: I-75 / I-575 NORTHWEST CORRIDOR
JOB NUMBER NH000-0575-01(028)
CALC NO. BR#42

SUBJECT: Bridge Foundation Investigation
BY: JCR DATE: 11/30/2009

SHEET NO.
SHEET REV.

Bridge Foundation Investigation

Project Number: CSNHS-0008-00(256)
P.I. Number: 0008256
I-575 Bridge over Little River
Cherokee County, Georgia

Prepared for:
Georgia Transportation Partners
Atlanta, Georgia

Document No: ATL-171-3099J
Revision: 2
Issue Date: November 14, 2008
Document Status: Issued for Use

Subconsultant to:
Willmer Engineering, Inc.
3772 Pleasantdale Road, Suite 165
Atlanta, Georgia 30340

Prepared by:
Professional Service Industries, Inc.
95 Chastain Road, Suite 301
Kennesaw, Georgia 30144

psi Information To Build On
Engineering • Consulting • Testing

Attachments: **Bridge Foundation Investigation**

Special Provision

Section 520	Piling
Section 524	Drilled Caisson Foundations

Figures

Figure 1	Site Location Plan
Figure 2	Boring Location Plan
Figure 3	Generalized Subsurface Profile A-A'
Figure 4	Generalized Subsurface Profile B-B'

Appendix I

New Boring Logs – BD-5, BD-6, BD-8 and BD-9
Laboratory Test Results
Test Procedures

Appendix II

Existing BFI Report Boring Logs

Revision History:

Revision	Issue Date	Document Status
A	December 10, 2007	Issued for Review
0	January 7, 2008	Issued for Use
1	September 4, 2008	Issued for Use
2	November 14, 2008	Issued for Use

BRIDGE FOUNDATION INVESTIGATION	
GDOT Project Number	CSNHS-0008-00(256)
Project P.I. Number	0008256
Location	I-575 Bridge over Little River, Cherokee County, Georgia (see Figure 1)
GENERAL INFORMATION	
Project Description	Current bridge foundation investigation was performed for the proposed widening of I-575 Bridge Over Little River. The widening involves adding one new parallel bridge in the center median. The new bridge will be a reinforced concrete structure with six spans totaling 534 feet long. The design length is 89 feet for each span. The left bridge will not be widened. The existing bridges are supported on H-piles and spread footings. End bents on the south side of the bridges are supported with spread footings. The existing BFI report and pile driving data dated October 11, 1979 were provided by GDOT. Eleven old and four new borings were performed in the existing and current BFI studies, respectively. The subsurface information from the existing borings was incorporated in the current BFI report and recommendations.
Geologic Information	The project alignment is geologically sited within the Piedmont Physiographic Province of Georgia, and is underlain by Biotite Gneiss, Mica Schist, and Amphibolite Formation.
Subsurface Features	Subsurface information for this bridge was obtained from 4 borings (BD-5, BD-6, BD-8 and BD-9) as part of the present study and 11 borings performed by GDOT in year 1979 for the existing bridges. The subsurface conditions include silty sand fill underlain by residuum and alluvium consisting of silty sand, clayey sand and sandy silt. The alluvium and residuum are underlain by hard and partially weathered rock. Groundwater was encountered from EL. 820 to EL. 830 in the current borings BD-5 and BD-6 performed in October, 2007. Groundwater was encountered from EL. 840 to EL. 852 in the borings performed in August, 1979.

PWR AND AUGER REFUSAL ELEVATIONS (feet)			
Bent No.	**Reference Boring No.**	**Top of PWR**	**Auger Refusal**
1	B-14	---	798
	BD-5	823	805
2	B-15	805	802
3	B-17	826	811
	B-4	846	839
4	B-19	---	822
	B-6	---	826
5	B-21	---	823
	B-7	---	824
6	B-23	843	841
	B-10	842	838
7	B-25	860	---
	BD-9	892	855

MAXIMUM PILE DESIGN LOADS			
Pile Type	**Load Transfer (%)**		**Design Load**
	Friction	**End Bearing**	
H-Piles	20	80	10 BP 42 = 55 Tons
			12 BP 53 = 70 Tons
			14 BP 73 = 96 Tons
			14 BP 89 = 117 Tons

FOUNDATION RECOMMENDATIONS				
Bent No.	**Drilled Shaft (Bearing)**	**Spread Footing (Bearing)**	**Pile FTG (Type)**	**Pile Bent (Type)**
1L	---	---	---	Steel H
1R				
2L	---	---	Steel H	---
2R				
3L	100 ksf on Rock	10 ksf on PWR (ALT)	---	---
3R	---	20 ksf on Rock (ALT)	Steel H	
4L	100 ksf on Rock	20 ksf on Rock (ALT)	---	---
4R				
5L	100 ksf on Rock	20 ksf on Rock (ALT)	---	---
5R				
6L	100 ksf on Rock	10 ksf on PWR (ALT)	---	---
6R				
7L	---	8 ksf on very dense soil/PWR	---	Steel H (ALT)
7R				

ELEVATIONS (feet)				
Bent No.	Bottom of FTG	Bottom of Shaft	H-Pile Tip Elevations	
			Minimum Tip	Estimated Tip
1L	---	---	840	820
1R	---		820	800
2L	---	---	840	815
2R	---		820	800
3L	838 (ALT)	832	---	---
3R	820 (ALT)	---	825	815
4L	821 (ALT)	814	---	---
4R	820 (ALT)	812		
5L	822 (ALT)	815	---	---
5R	822 (ALT)	814		
6L	839 (ALT)	832	---	---
6R				
7L	888	---	859 (ALT)	857 (ALT)
7R				

NOTES: GENERAL	
Theoretical Scour	The theoretical scour line may be raised to Elevation 822 and 823 feet at Bents 4 and 5, respectively, because of the presence of scour-resistant rock that was encountered in the borings at these bent locations.
Erosion	We recommend the use of 24 inches of Type I riprap and filter fabric.
As-built Information	As-built information should be forwarded to the Geotechnical Engineering Bureau upon completion of the foundation system.

NOTES: SPREAD FOOTINGS	
Embedment	Spread footings (if used) should be embedded three feet into partially weathered rock or a minimum of one foot into hard rock to protect the footing from scour. The footing elevations reflect this embedment.
Excavation	Spread footings at the intermediate bents (if used) should be protected from standing water and surface runoff. Footings should be poured as soon as practical after excavation.
Temporary Shoring	Temporary shoring may be required to construct spread footings if used. Care should be exercised not to undermine the spread footings for the existing bridges. Because groundwater was encountered above the possible footing bottom elevations at Bents 4, 5 and 6, dewatering of the excavations will also be required at these locations.

Cofferdams	Cofferdams may also be needed to construct the spread footings at bents 3-6 if used. Seal concrete and dewatering of the excavations will also be required if they fall within the stream crossing.
NOTES: PILE BENTS/FOOTING	
PDO	Driving resistance after Minimum Tip Elevations are achieved.
Waiting Period	None required.
Groundwater	Due to the high groundwater elevations near the footing elevations, we recommend that 12 inches of Type II Foundation Backfill Material be set up for use in the footing area. The use of this material should be at the direction of the Engineer and may be eliminated on construction if the footing area is dry.
Pilot Holes	Pilot Holes should be set up for H-piles due to the potential for hard driving at Bent 7. This work should be done at the direction of the Engineer if the Minimum Tip Elevations cannot be achieved. The diameter of the holes should be determined from the table given below. The holes should be filled with concrete to the top of the rock after the piles are driven.

Pile Size	**Maximum Pilot Hole Size**
10"	24 "
12"	24 "
14"	24 "

NOTES: DRILLED SHAFTS	
Drilled Shaft Special Provision	The drilled shafts should be constructed as per Special Provision Section 524: Drilled Caisson Foundations.
Rock Socket	A minimum 10-foot socket into sound rock will be required for all drilled shafts at this site.
Minimum Shaft Diameter	A minimum shaft diameter of 48 inches shall be used to allow for inspection of the bearing surface.
Temporary Casing	Temporary steel casing may be needed at drilled shaft locations to provide for inspection of the rock bearing surface and test hole. If needed, the casing should be extended below the top of the bedrock surface if the bedrock is fractured and/or broken. The casing should be of sufficient strength to withstand handling stresses, concrete pressure, and surrounding earth and/or fluid pressures.

Permanent Casing	Permanent casing will be needed at all shafts that fall in the stream.
Ground Water	At locations adjacent to the river, groundwater should be expected at or slightly above the river water level. Thus, seepage into the shaft excavations should be expected. It is anticipated that this seepage can be handled by pumping from the shaft excavations. Also, if the soil-bedrock interface becomes a conduit for groundwater infiltration or if fractures and/or voids in the rock produce groundwater seepage into the drilled shaft excavation, the temporary steel casing should be extended into the rock to seal off the groundwater flow.
Special Problems	Erratic pile lengths can be expected.

Prepared By	Lauren F. Hill, E.I.T.
Senior Review By	GEORGIA REGISTERED 11/13/08 No 19002 PROFESSIONAL ENGINEER KARL E. SUTER Karl E. Suter, P.E.

SPECIAL PROVISION

Section 520 – Piling

Section 524 – Drilled Caisson Foundations

Revised: May 8, 2006

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

SPECIAL PROVISION

PROJECT NO. CSNHS-0008-00(256)
P.I. NO. 0008256

SECTION 520—PILING

Delete Sub-Section 520.3.05.B and substitute the following:

520.3.05.B. Drill Pilot Holes

When pilot holes are required, drill them to the diameter and approximate depth specified on the Plans.

Backfill voids and holes with Class A or better concrete. Furnishing and placing backfill concrete is an incidental part of the work.

The following are not considered pilot holes:

- Holes created by spudding (punching)
- Holes dug to drive piling that is too long to fit leads
- Holes dug to replace a template (if permitted)

Where pilot holes are required in granular material and the material cannot be sealed off using "mudding" drilling methods, drill the pilot hole as follows:

1. Place a casing pipe with a large enough diameter around the boring device.
2. Hold the casing in position until the pilot hole is completed and the pile driving progresses deep enough into the hard material to keep loose material out of the pilot hole.

Drilling pilot holes using casing is incidental to the work.

Revised: November 9, 2006

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

SPECIAL PROVISION

PROJECT NO. CSNHS-0008-00(256)
P.I. NO. 0008256

SECTION 524 – DRILLED CAISSON FOUNDATIONS

524.1 General Description

This Work consists of furnishing all labor, materials, equipment, tools and services necessary for construction of drilled caisson foundations and includes all incidentals and additional work in conjunction therewith. Adhere to the Department's Plans, Special Provisions and Standard and Supplemental Specifications for all Work.

524.2 Materials

Use materials that meet the requirements of the Standard Specifications with the following exceptions:

- Use non-air-entrained Class AA concrete with a coarse aggregate size of No. 67 stone and a slump at time of placement of between 7 and 9 inches (178 mm and 229 mm). Use 10 percent additional cement and a retarder or water reducing agent in all concrete.
- Use Grade 60 (Grade 420) reinforcing bars that conform to ASTM 615 (ASTM A 615M). If wire spirals are used, use spirals that conform to ASTM A 82.
- Use Grade 2 steel casing that conforms to ASTM A 252.

524.3 Construction Requirements

524.3.01 Personnel

Construct drilled caissons and supervise the work with personnel who are experienced in this type work. Visit and examine the work site and all conditions, and take into consideration all such

conditions that may affect the work. At least 30 days prior to beginning drilled caisson work, submit to the Engineer for review and approval the following proof of the ability of the personnel to construct drilled caisson foundations:

1. Evidence of the successful completion of at least five projects similar in concept and scope to the proposed foundation. Include names, addresses and telephone numbers of the owners' representatives for verification.
2. Résumés of foreman and drilling operators to be employed on this project. Provide evidence showing that the drill operator has experience and knowledge of the drill rig to be used on the project. The Department will be sole judge of the qualifications of the foreman and drill rig operator.
3. A detailed sequence of construction for drilled caisson work that describes all materials, methods and equipment to be used, including, but not limited to the following:
    - casing sizes with proposed top and tip elevations
    - drilling equipment including the manufacturer's specifications on the drill rig
    - methods and equipment for stabilizing and cleaning shaft excavations
    - methods of materials handling and disposal
    - methods and equipment for placing concrete
    - details of tremie and sealing methods, if required
    - details of reinforcement placement, including support and centralization methods

Do not begin drilled caisson construction until the qualifications, construction plan and methods have been approved in writing by the Engineer.

524.3.02 Equipment

Use excavation and drilling equipment with a rated capacity (including power, torque and downward thrust) to excavate a caisson of the maximum specified diameter to a depth of 30 feet (9.1 meters) or 20 percent deeper than the deepest caisson indicated on the Plans, as measured from the ground or water surface elevation, whichever is higher.

524.3.03 Casing

Use casing that is a metal shell of a thickness to withstand handling, internal and external pressures, and that is watertight, smooth and clean. If the elevation of the top of the caisson is below ground level or water level at the time of concrete placement, use an oversize casing from ground elevation to a point below the top of the caisson to prevent caving into the fresh concrete. Do not allow the top of the permanent casing, if required, to extend above the top of the drilled caisson. Use casing in all

materials that do not have sufficient strength to safely remain open and stable during and after excavation.

When casing is used, do not use casing with an outside diameter less than the specified diameter of the caisson. That portion of the caisson below the casing may be slightly smaller than the normal outside diameter of the caisson. However, use drilling tools to excavate the caisson below the casing that are no smaller than the outside diameter of the casing minus 2 inches (51 mm). Do not leave casing in place unless permitted by the Engineer, and cut off any permanent casing as shown on the Plans.

Provide adequate equipment during concrete placement to prevent pulling up the reinforcing cage during casing extraction. The casing may be pulled in partial stages. Maintain a sufficient head of concrete above the bottom of the casing to overcome hydrostatic pressure. Extract the casing at a slow uniform rate with pull in line with the center of the caisson.

524.3.04 Protection of Existing Structures

Monitor structures for settlement that are within a distance of ten shaft diameters or the estimated shaft depth, whichever is greater, in a manner approved by the Engineer. Record elevations to an accuracy of 0.01 foot (3 mm). Record elevations before construction begins, during the driving of any required casings, during excavation or blasting, or as directed by the Engineer.

Document thoroughly the condition of the structures with descriptions and photographs made both before and after drilled caissons are constructed. Document all existing cracks, and provide copies of all documentation to the Engineer.

At any time settlement of 0.05 foot (15 mm) or damage to the structure is detected, immediately stop the source of vibrations, backfill any open drilled shaft excavations and contact the Engineer for instructions.

524.3.05 Excavation

Drill and excavate all caissons through whatever substances and to the elevations required. Excavate near the tip elevation in the presence of the Engineer. The Engineer may adjust the tip elevations depending on the quality of the bearing material found. Embed the caisson tips 10 feet (3 meters) into and on top of sound rock in accordance with Plan requirements and as determined by the Engineer. Sound rock is indicated by material that cannot be drilled with a conventional earth auger, and requires the use of special rock augers, core barrels, air tools, blasting and/or other methods of hand excavation. Sound rock is defined as material on which the rock auger penetration is equal to or less than 2 inches (51 mm) per five minutes of drilling with the auger subjected to a torque of 600,000 inch-pounds (67,791 kN-m) with a down thrust of 37,000 pounds (165 kN). There will be no additional compensation for removal of rock.

The Engineer will inspect the bottom of each caisson prior to setting the reinforcing cage and placing concrete. Obtain the Engineer's approval prior to placing the reinforcing cage. Remove water, sediment and debris from the bottom of the caissons to allow for a down-hole inspection. Bore the bottom of the caisson excavation a minimum of 6 feet (1.8 meters) into rock as outlined in

Specification 211.3.05.C, "Boring of Foundations and Seals". The Engineer will make a determination of the soundness and consistency of the rock and may adjust the tips of the caissons based on this information.

Where drilled caissons are located in other than open water areas, use casings or other methods approved by the Engineer to stabilize the excavation and control the hole size. When casing is not specifically required on the plans, fill in any over-excavations with Class AA concrete at no additional cost to the Department. Dispose of excess concrete, grout, displaced water and materials removed from the caisson excavation in areas approved by the Engineer, and in accordance with any Federal, State, or local code or ordinance. Verify the accuracy and existence of all applicable codes, ordinances or other regulations prior to disposing materials.

524.3.06 Reinforcing Steel

Assemble a cage of reinforcing steel and place it as a unit immediately prior to concrete placement. Assemble the cage so that the clearance between the cage and side of the caisson will be at least 5 inches (127 mm), and the clearance between the cage and bottom of the caisson will be 3 inches (76 mm).

If the caisson is lengthened, extend all reinforcement to within 3 inches (76 mm) of the bottom. If a splice is required, place it in the lower one-third of the caisson, or as shown on the Plans. Tie hoops or spirals to the caisson and column steel (vertical bars) at 100% of the junctions with double wire figure-eight ties. Do not weld the reinforcing steel. Support the cage from the top in a concentric manner to minimize its slumping downward during concrete placement and/or extracting the casing.

Check the elevation of the top of the steel cage before and after casing extraction. Any upward movement of the steel not exceeding 2 inches (51 mm) or any downward movement thereof not exceeding 6 inches (152 mm) will be acceptable. Any upward movement of the concrete or displacement of the steel beyond the above limits will be cause for rejection. Tie and support the reinforcing steel in the caisson so that the reinforcing steel will remain within allowable tolerances. In uncased caissons, use only heavy-duty plastic rollers (wheels). In cased caissons, use heavy-duty non-corrosive plastic rollers (wheels) or steel chairs. Place rollers at maximum intervals of 8 feet (2.4 meters) along the cage to ensure concentric spacing for the entire cage length. Use one roller for each one foot (305 mm) of diameter of the cage, with a minimum of four rollers at each interval. Do not use concrete spacer blocks. Use rollers that are constructed of a material approved by the Engineer and that have sufficient bearing surface to provide lateral support to the reinforcing cage.

Use rollers of adequate dimension to provide the annular spacing between the outside of the reinforcing cage and the side of the excavated hole or casing as shown on the Plans. If an oversize casing is used, use rollers that will provide concentric spacing. Use pre-cast concrete or heavy-duty plastic bottom supports (feet/boots) to provide a spacing of 3 inches (76 mm) between the cage and caisson bottom.

524.3.07 Concrete

Mix and place all concrete in accordance with Section 500 of the Specifications where applicable and the requirements herein stated.

Place concrete as soon as possible after all excavation is completed and reinforcing placed and supported. Place concrete continuously in the caisson to the top elevation of the caisson. The Engineer may allow free falling of concrete to a maximum of 60 feet (18.3 meters), if satisfactory methods are demonstrated.

If ground water is encountered and the hole can not be pumped dry, or if the Engineer does not approve free fall of concrete, place concrete using a gravity feed watertight tremie. Use a tremie pipe of at least 8 inches (203 mm) in diameter with a concrete hopper at the top. The Engineer may allow concrete to be placed by pumping through a supply line if satisfactory methods are demonstrated. If this method is allowed, use pump supply lines with watertight couplings. Seal the end of the pump line with a foam plug or other device approved by the Engineer to prevent concrete within the tremie or pump supply line from mixing with fluid in the excavation.

If a tremie is used, place it on the bottom of the excavation at the beginning of concrete placement, and keep it there until the tremie pipe and hopper are filled with concrete. Then raise the tremie only enough to induce concrete flow and do not lift the tremie further until the discharge end is immersed at least 10 feet (3.1 meters) into the deposited concrete. If concrete placement by pumping is used, secure the supply line in place so that the discharge end will not lift off the bottom of the excavation more than 6 inches (152 mm) until at least 10 feet (3.1 meters) of concrete has been placed. Embed the discharge end of the tremie or pump supply line a minimum of 10 feet (3.1 meters) in the concrete throughout the remainder of the concrete pour.

Complete the placement of all concrete in the caisson in two hours. Adjusted the retarder or water reducing agent as approved by the Engineer for the conditions encountered on the job so the concrete remains in a workable plastic state throughout the pour.

Prepare and cure the top surface of the construction joint in accordance with the requirements of Section 500. Locate construction joints as indicated on the Plans.

Do not place concrete under water in the caisson excavation without the permission of the Engineer. When permission is granted, place the concrete in accordance with the requirements of Section 500. Provide a sump to channel displaced water away from the caisson. Contain all displaced water to prevent water from entering into any body of water.

During the twenty-four hour period immediately following the completion of the placement of concrete in the caisson, do not install or extract casing within 50 feet (15.2 meters) of the completed caisson, and do not excavate any caissons within 15 feet (4.6 meters) of the completed caisson. If the Engineer determines that any construction adversely affects the recently constructed caisson, cease such activities immediately.

Protect any portion of drilled caissons exposed to a body of water from the action of water by leaving the forms in place for a minimum of seven days after pouring the concrete. Remove the forms prior to 7 days only if the concrete strength has reached 3000 psi (20.7 Mpa) or greater as tested by cylinder breaks.

524.3.08 Inspection and Safety

1. Check the dimensions and alignment of the caisson excavation under the observation of the Engineer.

2. Provide, use and maintain in good working order the following safety devices for the purpose of entering the caisson excavation for cleaning or inspection work:

   a. A safety harness attached to a separate safety line.

   b. OSHA-approved personnel lifting devices. Do not suspend any crane weights, blocks or other heavy weights above the head of any person entering the caisson excavation.

   c. Approved gas-testing equipment that tests for both oxygen level and percent explosion level. Provide and use an approved blower for fresh air if the testing equipment indicates the need.

   d. Casing of adequate thickness, size and depth to safely support the excavation.

   e. Non-electric pump(s) to adequately remove water from the excavation.

In addition, prior to entering the excavation, remove all loose and unnecessary objects from around the top of the caisson. Secure any caissons that will not be immediately poured after inspection and approval to prevent persons or objects from falling into the excavation.

524.3.08 Tolerances

Adhere to the following construction tolerances for drilled caissons:

1. Construct the drilled caisson to within 3 inches (76 mm) of the plan position plane, at the top-of-caisson elevation. Adhere to a vertical alignment tolerance of ¼-inch per 12 inches (6 mm per 305 mm) of depth.

2. Place reinforcement in accordance with the requirements of Section 511 of the Standard Specifications and Sub-section 524.3.06. Tie column steel (vertical bars) to hoops and spirals at 100% of the junctions with double wire figure-eight ties.

3. Placed vertical caisson reinforcing bars, including bars extending into columns or footings to within ½-inch (13 mm) of plan location. Place hoops or spirals to within 1 inch (25 mm) of their specified location. Adhere to a side form clearance of within ¼-inch (6 mm) of plan requirements.

4. Place the construction joint of the top of caissons used as caisson/column intermediate bents to within a tolerance of plus or minus 3 inches (76 mm) of the plan elevation.

524.4 Acceptability

In the event that significant voids are suspected in the concrete that were created during placement, verify the integrity of the caisson using a method that has been approved by the Engineer. If the caisson in question is found to be structurally deficient or out of tolerance in any way, the caisson will not be accepted unless corrective measures as approved by the Engineer are accomplished. Furnish additional materials and work necessary to effect corrections at no cost to the Department and with no increase in contract time.

524.5 Measurement

The length of accepted caisson foundation is measured in linear feet (meters) of caisson in place in the completed work. The length is measured from the final approved bottom elevation to 1 foot (305 mm) above the bottom of the footing cap where caissons are used in a footing or to the top of the caisson elevation detailed in the plans.

524.6 Payment

Drilled in place caisson foundations is paid for at the unit price bid per linear feet (meters) complete and in place as specified. The payment is full compensation for all excavation, furnishing and placement of reinforcing steel and concrete in the caisson, all temporary and permanent casing, disposal of excavated materials, and the cost of furnishing all tools, safety devices, labor, equipment and all other necessary items to complete the work.

Payment will be made under:

Item No. 524 DRILLED CAISSON_____INCHES (mm) DIA.....PER LINEAR FOOT (METER)

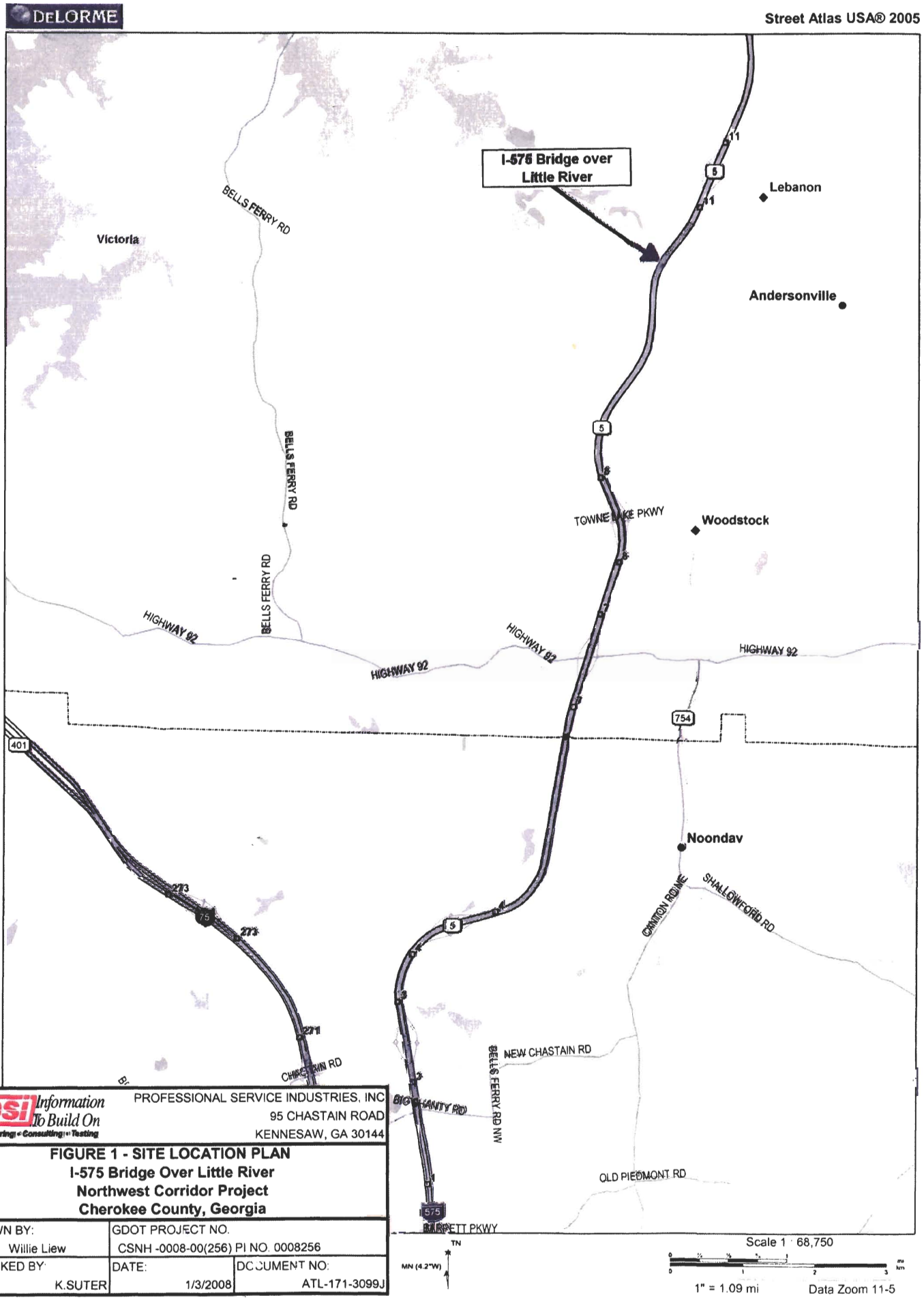
FIGURES

Site Location Plan

Boring Location Plan

Generalized Subsurface Profile A-A'

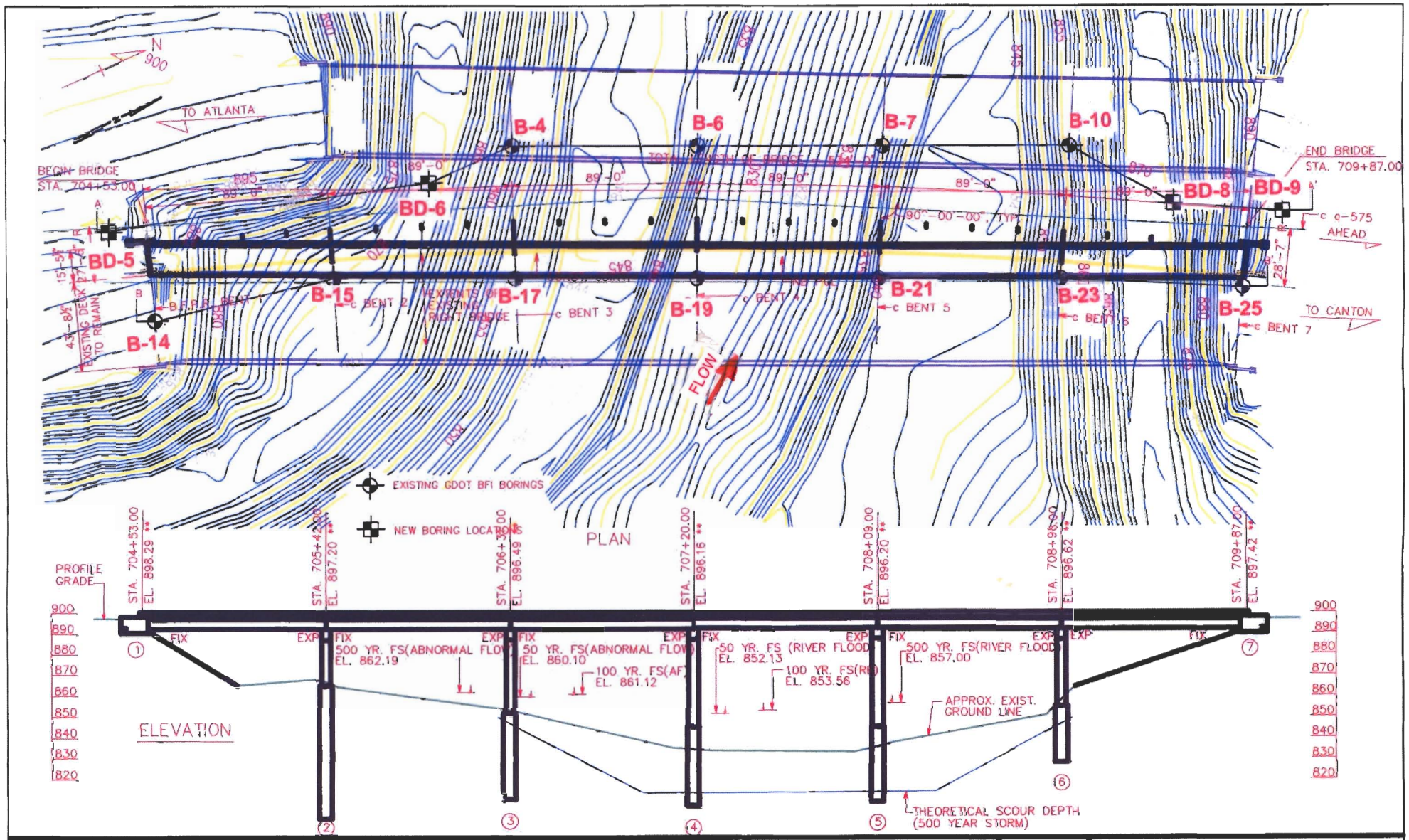
Generalized Subsurface Profile B-B'



PROFESSIONAL SERVICE INDUSTRIES, INC
95 CHASTAIN ROAD
KENNESAW, GA 30144

FIGURE 1 - SITE LOCATION PLAN
I-575 Bridge Over Little River
Northwest Corridor Project
Cherokee County, Georgia

DRAWN BY:	GDOT PROJECT NO.	
Willie Liew	CSNH -0008-00(256) PI NO. 0008256	
CHECKED BY:	DATE:	DOCUMENT NO:
K.SUTER	1/3/2008	ATL-171-3099J



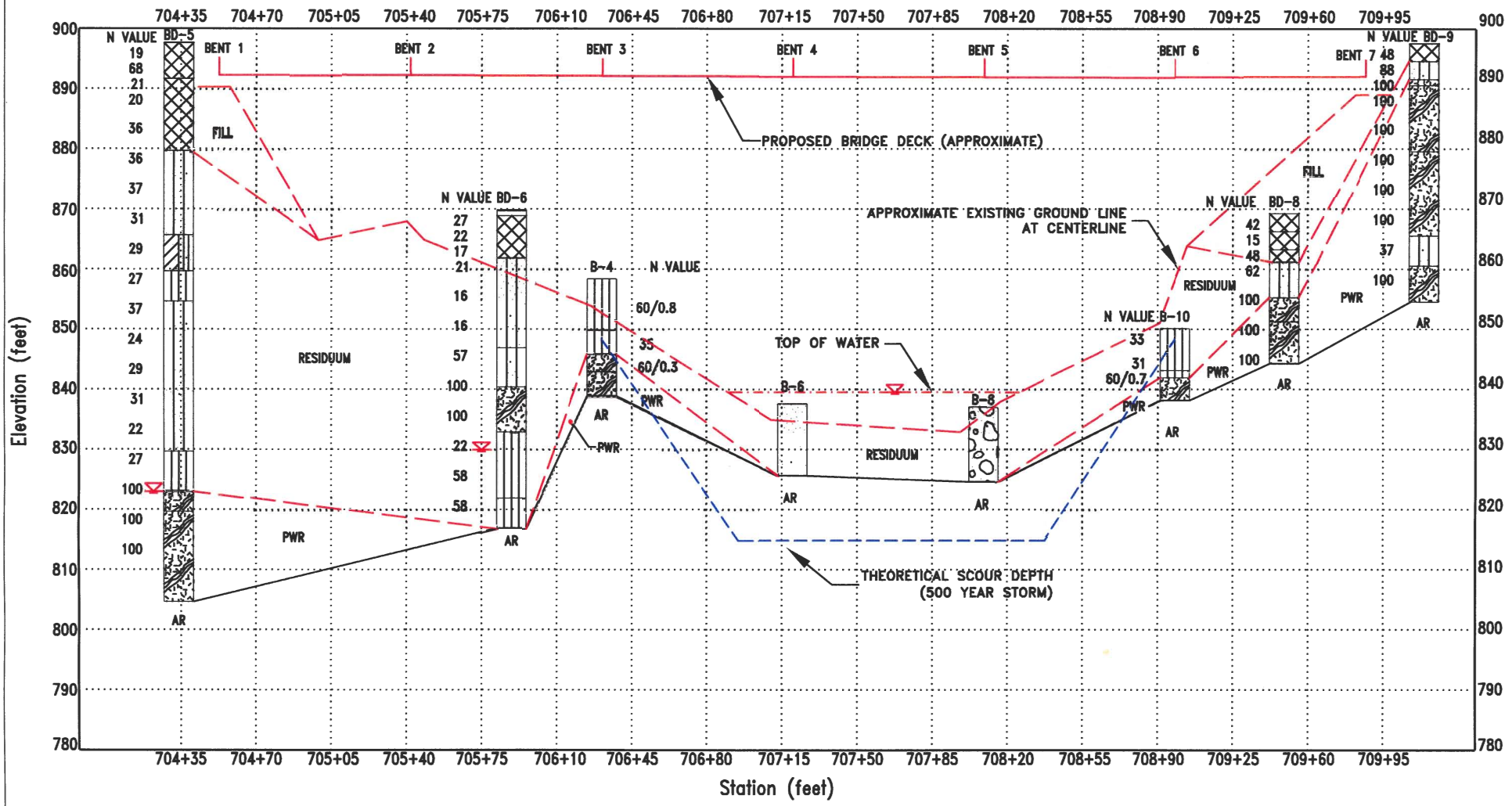
DRAWING NOT TO SCALE

PROFESSIONAL SERVICE INDUSTRIES, INC.
95 CHASTAIN ROAD
KENNESAW, GA 30144

FIGURE 2 – BORING LOCATION PLAN

I-575 BRIDGE OVER LITTLE RIVER
I-575 NORTHWEST CORRIDOR PROJECT
CHEROKEE COUNTY, GA

GDOT NO:
CSNHS-0008-00(238) PI NO. 0008256



LEGEND:

- ⊻ GROUNDWATER TABLE AT TIME OF BORING
- AR AUGER REFUSAL
- BT BORING TERMINATED
- PWR PARTIALLY WEATHERED ROCK

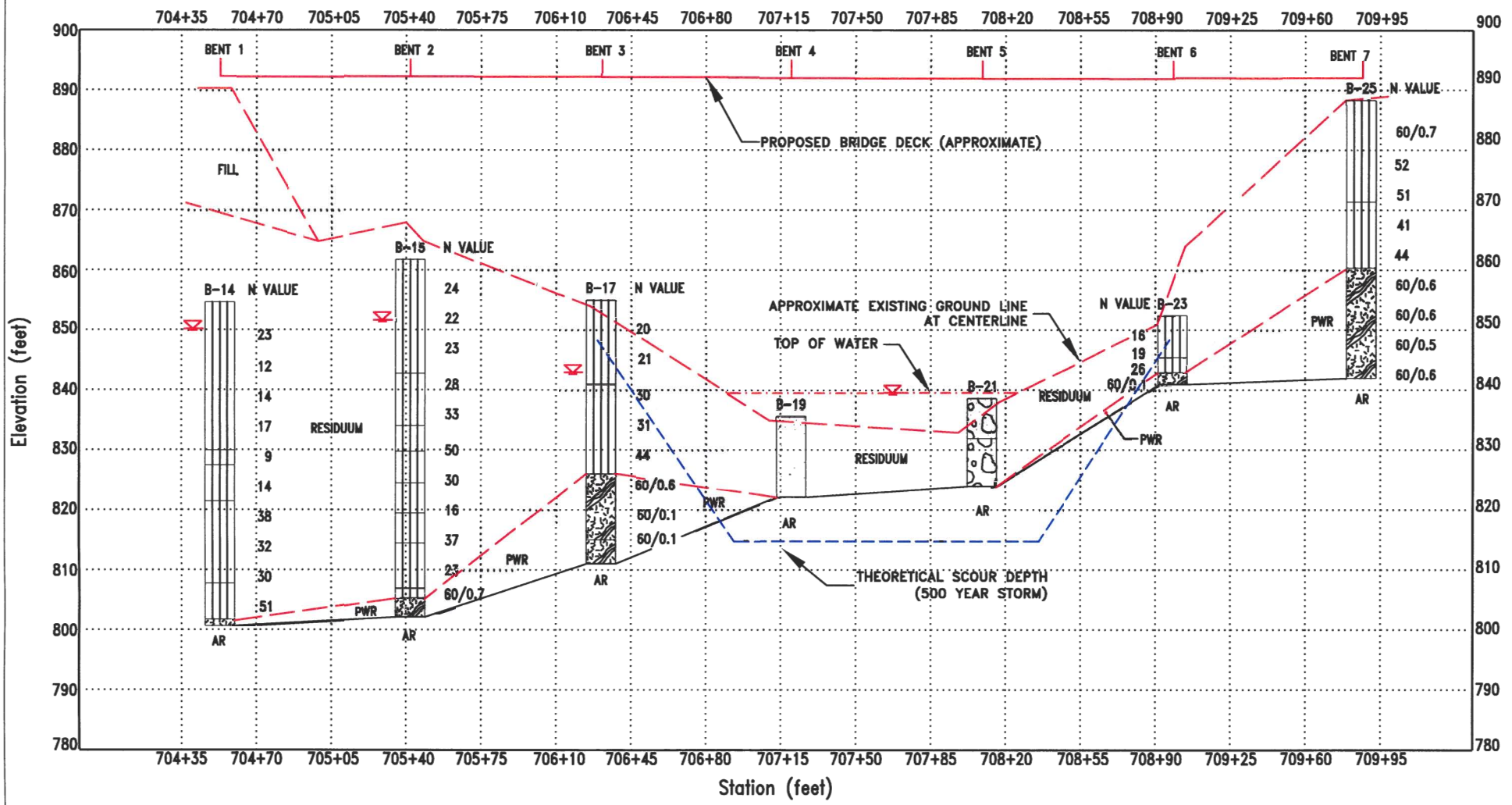
SCALE: 1 INCH = 25' (VERTICAL)
1 INCH = 70' (HORIZONTAL)

NOTES:
1. BORINGS B-4, B-6, B-7 AND B-10 WERE PERFORMED BY GDOT IN 1979.
2. BORINGS B-6 AND B-7 WERE WASH BORINGS. N-VALUE NOT AVAILABLE.

psi Information To Build On
Engineering • Consulting • Testing
PROFESSIONAL SERVICE INDUSTRIES, INC
95 CHASTAIN ROAD
KENNESAW, GA 30144

FIGURE 3 - GENERALIZED SUBSURFACE PROFILE A-A'
I-575 Bridge Over Little River
Northwest Corridor Project
Cherokee County, Georgia

DRAWN BY:	GDOT PROJECT NO.	
W. Donaldson	CSNH -0008-00(256) PI NO. 0008256	
CHECKED BY:	DATE:	DOCUMENT NO:
K.SUTER	Revised 11/07/08	ATL-171-3099J



LEGEND:

- ▽ GROUNDWATER TABLE AT TIME OF BORING
- AR AUGER REFUSAL
- BT BORING TERMINATED
- PWR PARTIALLY WEATHERED ROCK

SCALE: 1 INCH = 25' (VERTICAL)
1 INCH = 70' (HORIZONTAL)

NOTES:
1. BORINGS B-14, B-15, B-17, B-19, B-21 AND B-23 WERE PERFORMED BY GDOT IN 1979.
2. BORINGS B-19 AND B-21 WERE WASH BORINGS. N-VALUE NOT AVAILABLE.

psi Information To Build On
Engineering • Consulting • Testing
PROFESSIONAL SERVICE INDUSTRIES, INC
95 CHASTAIN ROAD
KENNESAW, GA 30144

FIGURE 4 - GENERALIZED SUBSURFACE PROFILE B-B'

I-575 Bridge Over Little River
Northwest Corridor Project
Cherokee County, Georgia

DRAWN BY:	GDOT PROJECT NO.	
W. Donaldson	CSNH -0008-00(256) PI NO. 0008256	
CHECKED BY:	DATE:	DOCUMENT NO:
K.SUTER	Revised 11/07/08	ATL-171-3099J

APPENDIX I

New Boring Logs – BD-5 through BD-9

Laboratory Test Results

Test Procedures

BORING LOG

PSI No.: **476-65003 (Document No. ATL-171-3099J)**

Client: **Willmer Engineering/Georgia Transportation Partners** GDOT Project No.: CSNHS-0008-00(256) PI No.: 0008256

Project: **I-575 Bridge Over Little River Cherokee County, Georgia**

Boring No.: **BD-5 (1 of 2)** Total Depth **93.0'** Elev: **898 ±** Location: **Sta. 704+34 at CL**

Type of Boring: **Hollow Stem Auger** Started: **10/4/07** Completed: **10/4/07** Driller: **Gable Drilling**

Elevation	Depth	DESCRIPTION OF MATERIALS (Classification)	* Sample Blows / REC/RQD	Sample Depth (Feet)	N VALUE (bpf) PL %MC LL (10 20 30 40 50 60 70 80 90)	N
897.6	0.1	Topsoil Thickness = 1 inch		1.0		
		FILL: Medium Dense to Very Dense Tan Moist Silty SAND (SM), with rock fragments	9-10-9	2.5		19
				3.5		
			22-26-42	5.0		68
891.7	6.0			6.0		
		FILL: Medium Dense to Dense Tan Moist Silty SAND (SM), with rock fragments (Non-Plastic)	9-9-12	7.5		21
				8.5		
			8-10-10	10.0		20
				13.5		
			7-14-22	15.0	▲	36
879.7	18.0					
		RESIDUUM: Dense Brown to Black/Tan Moist Silty SAND (SM), with rock fragments		18.5		
			12-14-22	20.0		36
				23.5		
			14-16-21	25.0		37
				28.5		
			13-14-17	30.0		31
865.7	32.0					
		Medium Dense Reddish Brown Moist Silty Clayey SAND (SC-SM), with rock fragments		33.5		
			9-11-18	35.0		29
859.7	38.0					
		Very Stiff Red Moist Clayey Sandy SILT (ML)		38.5		
			10-11-16	40.0		27
854.7	43.0					
		Dense to Medium Dense Red/Tan Moist Silty SAND (SM)		43.5		
			15-17-20	45.0		37
				48.5		
			11-11-13	50.0		24
				53.5		
			11-11-18	55.0		29
				58.5		
			9-13-18	60.0		31
				63.5		
			6-10-12	65.0		22

BL_STD 47665003.GPJ PSI_CORP.GDT 1/3/08

*Number of blows required for a 140 lb hammer dropping 30" to drive 2" O.D., 1.375" I.D. sampler a total of 18 inches in three 6" increments. The sum of the last two increments of penetration is termed the standard penetration resistance, N.

BORING LOG

PSI No.: **476-65003 (Document No. ATL-171-3099J)**

Client: **Willmer Engineering/Georgia Transportation Partners** GDOT Project No.: CSNHS-0008-00(256) PI No.: 0008256

Project: **I-575 Bridge Over Little River Cherokee County, Georgia**

Boring No.: **BD-5 (2 of 2)** Total Depth **93.0'** Elev: **898±** Location: **Sta. 704+34 at CL**

Type of Boring: **Hollow Stem Auger** Started: **10/4/07** Completed: **10/4/07** Driller: **Gable Drilling**

Elevation	Depth	DESCRIPTION OF MATERIALS (Classification)	* Sample Blows REC/RQD	Sample Depth (Feet)	N VALUE (bpf) PL %MC LL (10 20 30 40 50 60 70 80 90)	N
829.7	68.0	Hard to Very Stiff Brown/Tan Moist Sandy SILT (ML)	5-11-16	68.5 70.0	●	27
823.2	74.5	PARTIALLY WEATHERED ROCK: Sampled as Hard to Very Stiff Brown/Tan Wet Sandy SILT (ML)	22-30-50/2	73.5 75.0	●	100
819.7	78.0	PARTIALLY WEATHERED ROCK: Sampled as Very Dense Brown/Orange Silty SAND (SM)	50/4	78.5 80.0	●	100
			50/4	83.5 85.0	●	100
804.7	93.0	Auger Refusal at 93 feet Groundwater at Time of Drilling = 73 feet				

BL_STD 47665003.GPJ PSI_CORP.GDT 1/3/08

*Number of blows required for a 140 lb hammer dropping 30" to drive 2" O.D., 1.375" I.D. sampler a total of 18 inches in three 6" increments. The sum of the last two increments of penetration is termed the standard penetration resistance, N.

BORING LOG

PSI No.: **476-65003 (Document No. ATL-171-3099J)**

Client: **Willmer Engineering/Georgia Transportation Partners** GDOT Project No.: CSNHS-0008-00(256) PI No.: 0008256

Project: **I-575 Bridge Over Little River Cherokee County, Georgia**

Boring No.: **BD-6 (1 of 1)** Total Depth **53.0'** Elev: **870 ±** Location: **Sta. 705+89, 10' LT CL**

Type of Boring: **Hollow Stem Auger** Started: **10/5/07** Completed: **10/5/07** Driller: **Gable Drilling**

Elevation	Depth	DESCRIPTION OF MATERIALS (Classification)	* Sample Blows REC/RQD	Sample Depth (Feet)	N VALUE (bpf) PL %MC LL 10 20 30 40 50 60 70 80 90	N
869.7	0.2	Asphalt Thickness = 2 inches		1.0		
868.9	1.0	Auger Refusal at 1 foot Offset Boring 10 feet West	9-15-12	2.5 3.5	●	27
		FILL: Medium Dense Brown/Red Moist Silty SAND (SM), with rock fragments	6-10-12	5.0 6.0	●	22
			7-8-9	7.5 8.5	●	17
861.9	8.0	RESIDUUM: Medium Dense Red/Orange/Green Moist Micaceous Silty SAND (SM) (Non-Plastic)	6-9-12	10.0	●▲	21
			5-7-9	13.5 15.0	●	16
			5-7-9	18.5 20.0	●	16
846.9	23.0	Very Dense Gray/Orange/Tan Moist Micaceous Silty SAND (SM)	15-22-35	23.5 25.0	●	57
840.4	29.5	PARTIALLY WEATHERED ROCK: Sampled as Very Dense Gray/Orange/Tan Moist Micaceous Silty SAND (SM)	28-32-50/5	28.5 30.0	●	100
			50/4	33.5 35.0	●	100
832.9	37.0	Very Stiff Brown/Orange Wet Micaceous Sandy SILT (ML)	6-9-13	38.5 40.0	●	22
			17-24-34	43.5 45.0	●	58
821.9	48.0	Very Stiff Brown/Orange Wet Micaceous Sandy SILT (ML), with quartz fragments	7-27-31	48.5 50.0	●	58
816.9	53.0	Auger Refusal at 53 feet Groundwater at Time of Drilling = 40 feet				

BL_STD 47665003.GPJ PSI_CORP.GDT 1/3/08

*Number of blows required for a 140 lb hammer dropping 30" to drive 2" O.D., 1.375" I.D. sampler a total of 18 inches in three 6" increments. The sum of the last two increments of penetration is termed the standard penetration resistance, N.

BORING LOG

PSI No.: **476-65003 (Document No. ATL-171-3099J)**

Client: **Willmer Engineering/Georgia Transportation Partners** GDOT Project No.: CSNHS-0008-00(256) PI No.: 0008256

Project: **I-575 Bridge Over Little River Cherokee County, Georgia**

Boring No.: **BD-8 (1 of 1)** Total Depth **25.0'** Elev: **869±** Location: **Sta. 709+49 at CL**

Type of Boring: **Hollow Stem Auger** Started: **10/3/07** Completed: **10/3/07** Driller: **Gable Drilling**

Elevation	Depth	DESCRIPTION OF MATERIALS (Classification)	* Sample Blows / REC/RQD	Sample Depth (Feet)	N VALUE (bpf) PL %MC LL (10 20 30 40 50 60 70 80 90)	N
		FILL: Dense Reddish Brown Moist Silty SAND (SM)		1.0		
			16-18-24	2.5		42
866.3	3.0			3.5		
		FILL: Medium Dense Reddish Brown Moist Silty SAND (SM), with rock fragments	9-8-7	5.0		15
863.3	6.0			6.0		
		FILL: Dense Tan Moist Silty SAND (SM), with rock fragments	13-23-25	7.5		48
861.3	8.0			8.5		
		RESIDUUM: Very Dense Tan Moist Silty SAND (SM)	25-28-34	10.0		62
855.3	14.0			13.5		
		PARTIALLY WEATHERED ROCK: Sampled as Very Dense Brown Moist Silty SAND (SM)	14-50/5	15.0		100
851.3	18.0			18.5		
		PARTIALLY WEATHERED ROCK: Sampled as Very Dense Gray Silty GRAVEL (GP)	50/5	20.0		100
				23.5		
844.3	25.0		50/1	25.0		100
		Auger Refusal at 25 feet Groundwater at Time of Drilling = Not Encountered				

BL_STD 47665003.GPJ PSI_CORP.GDT 1/3/08

*Number of blows required for a 140 lb hammer dropping 30" to drive 2" O.D., 1.375" I.D. sampler a total of 18 inches in three 6" increments. The sum of the last two increments of penetration is termed the standard penetration resistance, N.

BORING LOG

PSI No.: **476-65003 (Document No. ATL-171-3099J)**

Client: **Willmer Engineering/Georgia Transportation Partners** GDOT Project No.: CSNHS-0008-00(256) PI No.: 0008256

Project: **I-575 Bridge Over Little River Cherokee County, Georgia**

Boring No.: **BD-9 (1 of 1)** Total Depth **43.0'** Elev: **898±** Location: **Sta. 710+14, 10' LT CL**

Type of Boring: **Hollow Stem Auger** Started: **10/3/07** Completed: **10/3/07** Driller: **Gable Drilling**

Elevation	Depth	DESCRIPTION OF MATERIALS (Classification)	* Sample Blows REC/RQD	Sample Depth (Feet)	N VALUE (bpf) PL %MC LL 10 20 30 40 50 60 70 80 90	N
897.5	0.1	Topsoil Thickness = 1 inch		1.0		
		FILL: Dense Red/Tan Moist Silty SAND (SM), with rock fragments	17-20-28	2.5	●	48
894.6	3.0			3.5		
		RESIDUUM: Very Dense Brown/Orange/White Moist Silty SAND (SM), with rock fragments	38-47-41	5.0	●	88
891.6	6.0			6.0		
890.6	7.0	PARTIALLY WEATHERED ROCK: Sampled as Very Dense Red Moist Silty SAND (SM), with rock fragments	50/5	7.5	●	100
				8.5		
			21-28-50/1	10.0	▲ ●	100
		Auger Refusal at 7 feet Offset 10 feet North Auger Refusal at 2 feet Offset 15 feet Southwest to 710+10 10 feet Left		13.5		
			50/5	15.0	●	100
		PARTIALLY WEATHERED ROCK: Sampled as Very Dense Orange/Gray/Brown Moist Silty SAND (SM), with rock fragments				
879.6	18.0			18.5		
		PARTIALLY WEATHERED ROCK: Sampled as Very Dense Orange/Tan/Black Moist Silty SAND (SM), with rock fragments	2-30-50/3	20.0	●	100
				23.5		
			49-50/5	25.0	●	100
				28.5		
			50/5	30.0	●	100
865.6	32.0					
		Dense Brown/Black/Tan Moist Silty SAND (SM), with rock fragments		33.5		
			8-16-21	35.0	●	37
860.6	37.0					
		PARTIALLY WEATHERED ROCK: Sampled as Very Dense Orange/Brown/White Moist Silty SAND (SM), with quartz fragments		38.5		
			13-23-50/4	40.0	●	100
854.6	43.0					
		Auger Refusal at 43 feet Groundwater at Time of Drilling = Not Encountered				

BL_STD 47665003.GPJ PSI_CORP.GDT 1/3/08

*Number of blows required for a 140 lb hammer dropping 30" to drive 2" O.D., 1.375" I.D. sampler a total of 18 inches in three 6" increments. The sum of the last two increments of penetration is termed the standard penetration resistance, N.

LIQUID AND PLASTIC LIMIT TEST DATA

Client:
Project: Northwest Corridor Metro Atlanta
Project Number: 476-65003

Sample Data

Source:
Sample No.: B-1/S-5
Elev. or Depth: 13.5-15.0' **Sample Length(in./cm.):**
Location: I-575 Over Little River
Description: Brown micaceous Silty SAND
Water Content: 14.5 % **USCS:** SM **AASHTO:**
Testing Remarks: % Passing Sieve #200 = 20.7

Liquid Limit= _____
Plastic Limit= NP
Plasticity Index= NP

LIQUID AND PLASTIC LIMIT TEST DATA

Client:
Project: Northwest Corridor Metro Atlanta
Project Number: 476-65003

Sample Data

Source:
Sample No.: B-2/S-4
Elev. or Depth: 8.5-10.0' **Sample Length(in./cm.):**
Location: I-575 Over Little River
Description: Red Silty SAND
Water Content: 38.6 % **USCS:** SM **AASHTO:**
Testing Remarks: % Passing Sieve #200 = 42.6

Liquid Limit= _____
Plastic Limit= NP
Plasticity Index= NP

TEST PROCEDURES

The general field procedures employed by Professional Service Industries, Inc. (PSI) are summarized in the American Society for Testing and Materials (ASTM) Standard D420 which is entitled "Investigating and Sampling Soil and Rock". This recommended practice lists recognized methods for determining soil and rock distribution and groundwater conditions. These methods include geophysical and in-situ methods as well as borings.

Standard Drilling Techniques

To obtain subsurface samples, borings are drilled using one of several alternate techniques depending upon the subsurface conditions. Some of these techniques are:

In Soils:

a) Continuous hollow stem augers.
b) Rotary borings using roller cone bits or drag bits, and water or drilling mud to flush the hole.
c) "Hand" augers.

In Rock:

a) Core drilling with diamond-faced, double or triple tube core barrels.
b) Core boring with roller cone bits.

The drilling method used during this exploration is presented in the following paragraph.

Hollow Stem Augering: A hollow stem augers consists of a hollow steel tube with a continuous exterior spiral flange termed a flight. The auger is turned into the ground, returning the cuttings along the flights. The hollow center permits a variety of sampling and testing tools to be used without removing the auger.

Sampling and Testing in Boreholes

Several techniques are used to obtain samples and data in soils in the field; however the most common methods in this area are:

a) Standard Penetrating Testing
b) Undisturbed Sampling
c) Dynamic Cone Penetrometer Testing
d) Water Level Readings

The procedures utilized for this project are presented below.

Standard Penetration Testing: At regular intervals, the drilling tools are removed and soil samples obtained with a standard 2 inch diameter split tube sampler connected to an A or N-size rod. The sampler is first seated 6 inches to penetrate any loose cuttings, and then driven an additional 12 inches with blows of a 140 pound safety hammer falling 30 inches. Generally, the number of hammer blows required to drive the sampler the final 12 inches is designated the "penetration resistance" or "N" value, in blows per foot (bpf).

The split barrel sampler is designed to retain the soil penetrated, so that it may be returned to the surface for observation. Representative portions of the soil samples obtained from each split barrel sample are placed in jars, sealed and transported to our laboratory.

The standard penetration test, when properly evaluated, provides an indication of the soil strength and compressibility. The tests are conducted according to ASTM Standard D1586. The depths and N-values of standard penetration tests are shown on the Boring Logs. Split barrel samples are suitable for visual observation and classification tests but are not sufficiently intact for quantitative laboratory testing.

Water Level Readings: Water table readings are normally taken in the borings and are recorded on the Boring Logs. In sandy soils, these readings indicate the approximate location of the hydrostatic water table at the time of our field exploration. In clayey soils, the rate of water seepage into the borings is low and it is generally not possible to establish the location of the hydrostatic water table through short term water level readings. Also, fluctuation in the water table should be expected with variations in precipitation, surface run-off, evaporation, and other factors. For long-term monitoring of water levels, it is necessary to install piezometers.

The water levels reported on the Boring Logs are determined by field crews immediately after the drilling tools are removed, and several hours after the borings are completed, if possible. The time lag is intended to permit stabilization of the groundwater table which may have been disrupted by the drilling operation.

Occasionally the borings will cave-in, preventing water level readings from being obtained or trapping drilling water above the cave-in zone. The cave-in depth is measured and recorded on the Boring Logs.

BORING LOGS

The subsurface conditions encountered during drilling are reported on a field boring log prepared by the Driller. The log contains information concerning the boring method, samples attempted and recovered, indications of the presence of coarse gravel, cobbles, etc., and observations of groundwater. It also contains the driller's interpretation of the soil conditions between samples. Therefore, these boring records contain both factual and interpretive information. The field boring records are kept on file in our office.

After the drilling is completed, a geotechnical professional classifies the soil samples and prepares the final Boring Logs which are the basis for our evaluations and recommendations.

SOIL CLASSIFICATION

Soil classifications provide a general guide to the engineering properties of various soil types and enable the engineer to apply his past experience to current problems. In our investigations, samples obtained during drilling operations are examined in our laboratory and visually classified by an engineer. The soils are classified according to consistency (based on number of blows from standard penetration tests), color and texture. These classification descriptions are included on our Boring Logs.

The classification system discussed above is primarily qualitative and for detailed soil classification two laboratory tests are necessary; grain size tests and plasticity tests. Using these test results the soil can be classified according to the AASHTO or Unified Classification Systems (ASTM D-2487). Each of these

classification systems and the in-place physical soil properties provides an index for estimating the soil's behavior. The soil classification and physical properties are presented in this report.

The table below presents criteria that are typically utilized in the classification and description of soil and rock samples for preparation of the Boring Logs.

Relative Density of Cohesionless Soils From Standard Penetration Test		**Consistency of Cohesive Soils**	
Very Loose	≤ 4 bpf	Very Soft	≤ 2 bpf
Loose	5 - 10 bpf	Soft	3 - 4 bpf
Medium Dense	11 - 30 bpf	Medium Stiff	5 - 8 bpf
Dense	31 - 50 bpf	Stiff	9 - 15 bpf
Very Dense	> 50 bpf	Very Stiff	16 - 30 bpf
		Hard	31 – 50 bpf
(bpf = blows per foot, ASTM D 1586)		Very Hard	> 50 bpf
Relative Hardness of Rock		**Particle Size Identification**	
Very Soft	Hard Rock disintegrates or easily compresses to touch; can be hard to very hard soil.	Boulders	Larger than 12"
Soft	May be broken with fingers.	Cobbles	3" - 12"
Moderately Soft	May be scratched with a nail, Corners and edges may be broken with fingers.	Gravel	
		Coarse	3/4" - 3"
		Fine	4.76mm - 3/4"
		Sand	
		Coarse	2.0 - 4.76 mm
Moderately Hard	Light blow of hammer required to break samples.	Medium	0.42 - 2.00 mm
		Fine	0.42 - 0.074 mm
Hard	Hard blow of hammer required to break sample.	Fines (Silt or Clay)	Smaller than 0.074 mm
Rock Continuity		**Relative Quality of Rocks**	
RECOVERY = $\frac{\text{Total Length of Core}}{\text{Length of Core Run}}$ x 100 %		**RQD** = $\frac{\text{Total core, counting only pieces > 4" long}}{\text{Length of Core Run}}$ x 100%	
Description	Core Recovery %	Description	RQD %
Incompetent	Less than 40	Very Poor	0 - 25 %
Competent	40 - 70	Poor	26 - 50 %
Fairly Continuous	71 - 90	Fair	51 - 75 %
Continuous	91 -100	Good	76 - 90 %
		Excellent	91 - 100 %

APPENDIX II

Existing BFI Report Boring logs

DOT 490

DEPARTMENT OF TRANSPORTATION

OFFICE OF MATERIALS AND RESEARCH, FOREST PARK, GEORGIA

GEOTECHNICAL ENGINEERING

BRIDGE SUBSURFACE INVESTIGATION

PROJECT GDOT Project No.: CSNHS-0008-00(256) PI No.: 0008256 COUNTY CHEROKEE DATE 8/14/79

LOCATION I-575 Bridge over Little River BORING NO B-4

BENT NO. 2 FOOTING _____ GROUND ELEV. 858.41

PROPOSED FOOTING ELEV. _____ PARTY CHIEF HOLLIS

ELEV.	BORING LOG		BLOW	UNIFIED	γ	W	Gs	% 200	% CLAY	LL	PI	C	ø
	GR. EL. 7												
	V. Dense Mltc Micas Sandy Silt W/ Weath. Rock	1s	60=.8'										
850													
	Dense Same	2s	35										
	V. Dense Same	3s	60=.3'										
840	V. Dense Rock												
	Refusal												
830													
820													

The Department of Transportation m... this information report available to contract... assumes no responsibility for its accuracy...

No claim will be considered if the contra... or relies on this information in his bidding... in his construction operations and finds t... it is inaccurate...

This foundation investigation report is considered as a part of the Plans and Sp... for the contract on the job...

DOT 490

DEPARTMENT OF TRANSPORTATION

OFFICE OF MATERIALS AND RESEARCH, FOREST PARK, GEORGIA
GEOTECHNICAL ENGINEERING

BRIDGE SUBSURFACE INVESTIGATION

PROJECT GDOT Project No.: CSNHS-0008-00(256) PI No.: 0008256 COUNTY CHEROKEE DATE 8/16/79

LOCATION I-575 Bridge over Little River BORING NO B-6

BENT NO. 3 FOOTING GROUND ELEV. 837.64

PROPOSED FOOTING ELEV. PARTY CHIEF HOLLIS

WASHBORING

ELEV.	BORING LOG		BLOW	UNIFIED	γ	W	Gs	% 200	% CLAY	LL	PI	C	Ø
840	Top Water												
	GR. EL.												
830	Loose to Med. Dense Sand												
	Washboring Refusal on Rock												
820													
810													

[illegible] the Department of Transportation in making [illegible] to contractors [illegible] the contract- [illegible] bidding or [illegible] and finds that [illegible] investigation report is not [illegible] part of the Plans and Speci- [illegible] on the job

DOT 490

DEPARTMENT OF TRANSPORTATION

OFFICE OF MATERIALS AND RESEARCH, FOREST PARK, GEORGIA
GEOTECHNICAL ENGINEERING

BRIDGE SUBSURFACE INVESTIGATION

PROJECT GDOT Project No.: CSNHS-0008-00(256) PI No.: 0008256 COUNTY CHEROKEE DATE 8/15/79

LOCATION I-575 Bridge over Little River BORING NO. B-7

BENT NO. 4 FOOTING — GROUND ELEV. 837.14

PROPOSED FOOTING ELEV. PARTY CHIEF HOLLIS

WASHBORING

ELEV.	BORING LOG		BLOW	UNIFIED	γ	W	Gs	% 200	% CLAY	LL	PI	C	Ø
840	Top Water												
	GR. EL.												
	Loose to Med. Dense Sand & Gravel												
830													
	Washboring Refusal on Rock												
820													
810													

The Department of Transportation in making this foundation report available to contractors assumes no responsibility for its accuracy

No claim will be considered if [illegible] or relies on this information [illegible] in his construction operations [illegible] it is inaccurate

This foundation investigation report is not considered as a part of the Plans and Specifications or Contract on the job

DOT 490

DEPARTMENT OF TRANSPORTATION

OFFICE OF MATERIALS AND RESEARCH, FOREST PARK, GEORGIA

GEOTECHNICAL ENGINEERING

BRIDGE SUBSURFACE INVESTIGATION

GDOT Project No.: CSNHS-0008-00(256)

PROJECT PI No.: 0008256 COUNTY CHEROKEE DATE 8/15/79

LOCATION I-575 Bridge over Little River BORING NO B-10

BENT NO. 5 FOOTING ——— GROUND ELEV. 850.19

PROPOSED FOOTING ELEV. ——— PARTY CHIEF HOLLIS

ELEV.	BORING LOG		BLOW	UNIFIED	γ	W	Gs	% 200	% CLAY	LL	PI	C	ø
850	GR. EL.												
	Dense Mltc Micas Sandy Silt W/ Weath. Rock	1s	33										
		2s	31										
	V. Dense Same	3s	60=.7'										
840	V. Hard Rock												
	Refusal												
830													
820													

DOT 490

DEPARTMENT OF TRANSPORTATION

OFFICE OF MATERIALS AND RESEARCH, FOREST PARK, GEORGIA
GEOTECHNICAL ENGINEERING

BRIDGE SUBSURFACE INVESTIGATION

PROJECT GDOT Project No.: CSNHS-0008-00(256) PI No.: 0008256 COUNTY CHEROKEE DATE 5/1/79

LOCATION I-575 Bridge over Little River BORING NO B-14

BENT NO. 1 FOOTING GROUND ELEV. 854.68

PROPOSED FOOTING ELEV. PARTY CHIEF HOLLIS

ELEV	BORING LOG		BLOW	UNIFIED	γ	W	Gs	% 200	% CLAY	LL	PI	C	Ø
	GR.EL.												
GWT 850	Med. Mltc Micas Sandy Silt	1s	23										
		2s	12										
840		3s	14										
		4s	17										
830	Loose Same	5s	9										
	Med. Dense Same	6s	14										
820	Dense Same W/ Weath. Rock	7s	38										
		8s	32										
810		9s	30										
	V. Dense Same	10s	51										
800	V. Hard Rock												
	Refusal												

The Department of Transportation in making this foundation [illegible] to contractors assumes no [illegible]

No claim [illegible] or relies [illegible] in his co[illegible] It is in[illegible]

This [illegible] consid[illegible] fica[illegible]

DOT 490

DEPARTMENT OF TRANSPORTATION

OFFICE OF MATERIALS AND RESEARCH, FOREST PARK, GEORGIA

GEOTECHNICAL ENGINEERING

BRIDGE SUBSURFACE INVESTIGATION

GDOT Project No.: CSNHS-0008-00(256)

PROJECT PI No.: 0008256 COUNTY CHEROKEE DATE 5/2/79

LOCATION I-575 Bridge over Little River BORING NO B-15

BENT NO. 2 FOOTING ——— GROUND ELEV. 861.76

PROPOSED FOOTING ELEV. ——— PARTY CHIEF HOLLIS

ELEV.	BORING LOG		BLOW	UNIFIED	γ	W	Gs	% 200	% CLAY	LL	PI	C	ø
	GR. EL.												
860		1s	24										
	Med. Dense Mltc Micas Sandy Silt												
GWT		2s	22										
850													
		3s	23										
		4s	28										
840	Dense Same W/ Weath. Rock												
		5s	33										
	V. Dense Same	6s	50										
830													
	Dense Same	7s	30										
	Med. Dense Mltc Micas Sandy Silt	8s	16										
820													
	Dense Same	9s	37										
	Med Dense Same	10s	23										
810													
	V. Dense Same W/ Wea. Rock	11s	60=.7'										
	V. Hard Rock												
	Refusal												
800													

The Department of Transportation in making this foundation report available to others assumes no responsibility for its accuracy.

No claim will be considered in bid or contract or relief on this information or the assumptions or its construction operations and methods or it is inaccurate.

This foundation investigation report is not considered as a part of the plans and Specifications or contract on the job.

DOT 490

DEPARTMENT OF TRANSPORTATION

OFFICE OF MATERIALS AND RESEARCH, FOREST PARK, GEORGIA

GEOTECHNICAL ENGINEERING

BRIDGE SUBSURFACE INVESTIGATION

GDOT Project No.: CSNHS-0008-00(256)

PROJECT PI No.: 0008256 COUNTY CHEROKEE DATE 8/13/79

LOCATION I-575 Bridge over Little River BORING NO B-17

BENT NO. 3 FOOTING ——— GROUND ELEV. 855.02

PROPOSED FOOTING ELEV. ——— PARTY CHIEF HOLLIS

ELEV.	BORING LOG		BLOW	UNIFIED	γ	W	Gs	% 200	% CLAY	LL	PI	C	ø
	GR. EL.												
850	Med. Dense Mltc Micas Sandy Silt W/ Weath. Rock	1s	20										
		2s	21										
GWT													
840		3s	30										
	Dense Same	4s	31										
830		5s	44										
		6s	60=.6'										
820	V Dense Same	7s	60=.1'										
		8s	60=.1'										
	V. Hard Rock												
810	Refusal												
800													

The Department of Transportation in making this foundation report available to contractors assumes no responsibility for its accuracy.

No claim will be considered if the contract or reliance on this information in his bidding or in his construction operations and funds that it is inaccurate.

This foundation investigation report is not considered as a part of the plans or specifications

DOT 590

DEPARTMENT OF TRANSPORTATION

OFFICE OF MATERIALS AND RESEARCH, FOREST PARK, GEORGIA

GEOTECHNICAL ENGINEERING

BRIDGE SUBSURFACE INVESTIGATION

GDOT Project No.: CSNHS-0008-00(256)

PROJECT PI No.: 0008256 COUNTY CHEROKEE DATE 8/16/79

LOCATION I-575 Bridge over Little River BORING NO B-19

BENT NO. FOOTING GROUND ELEV. 836.64

PROPOSED FOOTING ELEV. PARTY CHIEF HOLLIS

WASHBORING

ELEV.	BORING LOG	BLOW	UNIFIED	γ	W	Gs	% 200	% CLAY	LL	PI	C	ø
840	Top Water ▽											
	GR. EL. ▽											
830	Loose to Med. Dense Sand											
820	Washboring Refusal on Rock											
810												

The Department of Transportation in making this [illegible] assumes no responsibility for [illegible] We [illegible]

DOT 490

DEPARTMENT OF TRANSPORTATION

OFFICE OF MATERIALS AND RESEARCH, FOREST PARK, GEORGIA

GEOTECHNICAL ENGINEERING

BRIDGE SUBSURFACE INVESTIGATION

GDOT Project No.: CSNHS-0008-00(256)

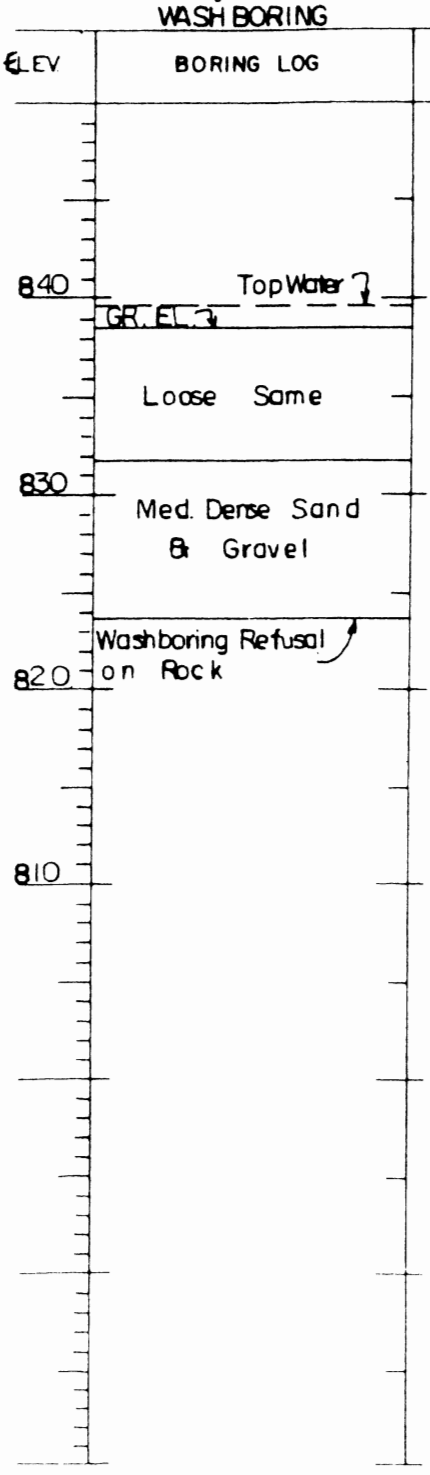
PROJECT PI No.: 0008256 COUNTY CHEROKEE DATE 8/15/79

LOCATION I-575 Bridge over Little River BORING NO B-21

BENT NO. 5 FOOTING _____ GROUND ELEV. 838 64

PROPOSED FOOTING ELEV. _____ PARTY CHIEF HOLLIS

WASH BORING



BLOW	UNIFIED	γ	W	Gs	% 200	% CLAY	LL	PI	C	ø

DOT 490

DEPARTMENT OF TRANSPORTATION

OFFICE OF MATERIALS AND RESEARCH, FOREST PARK, GEORGIA
GEOTECHNICAL ENGINEERING

BRIDGE SUBSURFACE INVESTIGATION

PROJECT GDOT Project No.: CSNHS-0008-00(256) PI No.. 0008256 COUNTY CHEROKEE DATE 8/15/79

LOCATION I-575 Bridge over Little River BORING NO B-23

BENT NO. 6 FOOTING GROUND ELEV. 852.49

PROPOSED FOOTING ELEV. PARTY CHIEF HOLLIS

ELEV.	BORING LOG		BLOW	UNIFIED	γ	W	Gs	% 200	% CLAY	LL	PI	C	Ø
	GR. EL.												
850	Med. Dense Mltc Micas Sandy Silt W/ Weath. Rock	1s	16										
		2s	19										
	Dense Same	3s	26										
	V. Hard Rock	4s	60=.1'										
840	Refusal												
830													
820													

[illegible] report is not [illegible] as a part of the Plans and Specifications [illegible] Contract on the job

DOT 490

DEPARTMENT OF TRANSPORTATION

OFFICE OF MATERIALS AND RESEARCH, FOREST PARK, GEORGIA
GEOTECHNICAL ENGINEERING

BRIDGE SUBSURFACE INVESTIGATION

PROJECT GDOT Project No.: CSNHS-0008-00(256) PI No.: 0008256 COUNTY CHEROKEE DATE 8/16/79

LOCATION I-575 Bridge over Little River BORING NO B-25

BENT NO. 7 FOOTING — GROUND ELEV. 888.47

PROPOSED FOOTING ELEV. PARTY CHIEF HOLLIS

ELEV.	BORING LOG		BLOW	UNIFIED	γ	W	Gs	% 200	% CLAY	LL	PI	C	Ø
	GR.EL.7												
	V. Dense Mltc Micas Sandy Silt W/ Weath. Rock	1s	60=.7'										
880		2s	52										
		3s	51										
870	Dens e Same	4s	41										
		5s	44										
860	V Dense Same	6s	60=.6'										
		7s	60=.6'										
850		8s	60=.5'										
		9s	60=.6'										
840	End Drilling												
830													