GEORGIA DEPARTMENT OF TRANSPORTATION

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

PI No: 713640

JBT Project No. 255717

Bridge No. 40
I-575 REVERSIBLE OVER NOONDAY CREEK NORTH

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

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Purpose of Calculation

Bridge design calculations for Bridge #40 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#40	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.
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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	38	38	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#40

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\BR40\Geomath\I-575 BR40.gmd

Alignment ID: 575align

Start Station: 1433+09.8191

P.I.	North	East	Trans	Spiral-In	Spiral-Out	Radius
1	1,490,915.3065	2,186,382.5409	None			
2	1,491,928.6175	2,186,707.0435	Arc			2,879.9996
3	1,492,909.5117	2,186,294.7963	None			

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

Filename: N:\TRA\255717\Eng\BR40\Geomath\I-575 BR40.gmd

Alignment ID: 575align

Element # 1 Shape: Arc Radius 2,879.9996

	Station	North	East	Direction	Radius
Start:	1433+09.8191	1,490,915.3065	2,186,382.5409	N 17 45 25.70 E	2,879.9996
End:	1453+48.2365	1,492,909.5117	2,186,294.7963	N 22 47 45.21 W	2,879.9996
Length:	2,038.4174	Sense: Left	Delta:	40 33 10.91	

Transition Point: CT Station: 1453+48.2365

Element # 2 Shape: Tangent

	Station	North	East	Direction	Radius
Start:	1453+48.2365	1,492,909.5117	2,186,294.7963	N 22 47 45.32 W	INFINITY
End:	1453+48.2365	1,492,909.5117	2,186,294.7963	N 22 47 45.32 W	INFINITY
Length:	0.0000		Delta:	0 00 00.00	

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

Filename: N:\TRA\255717\Eng\BR40\Geomath\I-575 BR40.gmd

Profile ID: 575vert

VPI	Station	Elevation	Trans	Parabola-1	Parabola-2
1	1437+00.0000	891.5476	None		
2	1443+90.0000	895.8680	Parabola	1,380.0000	
3	1450+80.0000	914.0798	None		

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

Filename: N:\TRA\255717\Eng\BR40\Geomath\I-575 BR40.gmd

Profile ID: 575vert

Elem		Start	End	Apex		Transition
1	Sta	1437+00.0000	1437+00.0000	None	Length	0.0000
	Elev	891.5476	891.5476	None	Type	Tangent
	Grade	0.0063	0.0063			
2	Sta	1437+00.0000	1450+80.0000	None	Length	1,380.0000
	Elev	891.5476	914.0798	None	Type	Parabola
	Grade	0.0063	0.0264			
3	Sta	1450+80.0000	1450+80.0000	None	Length	0.0000
	Elev	914.0798	914.0798	None	Type	Tangent
	Grade	0.0264	0.0264			

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

Filename: N:\TRA\255717\Eng\BR40\Geomath\I-575 BR40.gmd

XSection ID: 575xsect

SLOPE BREAK POINTS: 5

STATION	PGL-OFFSET	POINT	DIST-FR-PGL	GRADE	DESCRIPTION
1437+00.0000	0.0000	1	-35.6250		
				0.070000	EOD-IFBAR
		2	-34.0000		
				0.070000	IFBAR-HOVB
		3	-8.0000		
				0.070000	HOVB
		4	-6.0000		
				0.070000	HOVB-PGL
		5	0.0000		

SLOPE BREAK POINTS: 5

STATION	PGL-OFFSET	POINT	DIST-FR-PGL	GRADE	DESCRIPTION
1442+00.0000	0.0000	1	-35.6250		
				0.070000	EOD-IFBAR
		2	-34.0000		
				0.070000	IFBAR-HOVB
		3	-8.0000		
				0.070000	HOVB
		4	-6.0000		
				0.070000	HOVB-PGL
		5	0.0000		

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

Filename: N:\TRA\255717\Eng\BR40\Geomath\I-575 BR40.gmd

COORDINATE REPORT

Station Ref: 575

ID	STATION	OFFSET (ft)	NORTH (ft)	EAST (ft)	575 ELEV (ft)
B1&PGL	1437+75.2500	0.0000	1,491,368.0814	2,186,488.1333	892.0601
B3&PGL	1439+13.7500	0.0000	1,491,505.5001	2,186,505.2984	893.2193
B4&PGL	1439+83.0000	0.0000	1,491,574.4793	2,186,511.3982	893.9038
B2&PGL	1438+44.5000	0.0000	1,491,436.6876	2,186,497.5420	892.6047

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

Filename: N:\TRA\255717\Eng\BR40\Geomath\I-575 BR40.gmd

SPAN AND GIRDER REPORT

SPAN ID: B1-B2 ROADWAY: 575 ALIGNMENT: 575align NUMBER OF GIRDERS: 5
STARTING PIER: B1 STATION: 1437+75.2500 AZM: N 140.664350 SKEW: 42.166667
ENDING PIER: B2 STATION: 1438+44.5000 AZM: N 140.664350 SKEW: 43.544352

GIRDER	END POINT DISTANCES ALONG PIER CL			LENGTH		
	START	END	AZIMUTH	CL - CL	SEAT-SEAT	RADIUS
S1-G01	3.6899	3.3010	N 7.190959	69.9523	66.8518	INFINITY
S1-G02	11.8560	11.6587	N 7.305120	69.8205	66.7259	INFINITY
S1-G03	20.0074	20.0000	N 7.418589	69.6904	66.6015	INFINITY
S1-G04	28.1445	28.3251	N 7.531372	69.5617	66.4785	INFINITY
S1-G05	36.2673	36.6341	N 7.643478	69.4346	66.3570	INFINITY

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

Filename: N:\TRA\255717\Eng\BR40\Geomath\I-575 BR40.gmd

SPAN AND GIRDER REPORT

SPAN ID: B2-B3 ROADWAY: 575 ALIGNMENT: 575align NUMBER OF GIRDERS: 5
STARTING PIER: B2 STATION: 1438+44.5000 AZM: N 140.664350 SKEW: 43.544352
ENDING PIER: B3 STATION: 1439+13.7500 AZM: N 140.664350 SKEW: 44.922037

GIRDER	END POINT DISTANCES ALONG PIER CL			LENGTH		
	START	END	AZIMUTH	CL - CL	SEAT-SEAT	RADIUS
S2-G01	3.3010	3.3903	N 5.782448	70.0247	67.2021	INFINITY
S2-G02	11.6587	11.9544	N 5.902356	69.8792	67.0624	INFINITY
S2-G03	20.0000	20.5000	N 6.021513	69.7355	66.9246	INFINITY
S2-G04	28.3251	29.0272	N 6.139928	69.5936	66.7884	INFINITY
S2-G05	36.6341	37.5362	N 6.257608	69.4535	66.6539	INFINITY

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

Filename: N:\TRA\255717\Eng\BR40\Geomath\I-575 BR40.gmd

SPAN AND GIRDER REPORT

SPAN ID: B3-B4 ROADWAY: 575 ALIGNMENT: 575align NUMBER OF GIRDERS: 5
STARTING PIER: B3 STATION: 1439+13.7500 AZM: N 140.664350 SKEW: 44.922037
ENDING PIER: B4 STATION: 1439+83.0000 AZM: N 140.664350 SKEW: 46.299722

GIRDER	END POINT DISTANCES ALONG PIER CL			LENGTH		
	START	END	AZIMUTH	CL - CL	SEAT-SEAT	RADIUS
S3-G01	3.3903	3.9389	N 4.372406	70.1045	66.8483	INFINITY
S3-G02	11.9544	12.7255	N 4.498353	69.9439	66.6951	INFINITY
S3-G03	20.5000	21.4911	N 4.623486	69.7853	66.5439	INFINITY
S3-G04	29.0272	30.2359	N 4.747812	69.6288	66.3947	INFINITY
S3-G05	37.5362	38.9603	N 4.871343	69.4743	66.2473	INFINITY

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

Filename: N:\TRA\255717\Eng\BR40\Geomath\I-575 BR40.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	70.0141			
		1438+08.0894	-35.6250	889.8159
		1438+43.5349	-35.6250	890.1029
		1438+78.9804	-35.6250	890.4082
2	69.9780			
		1438+06.5660	-34.0000	889.9177
		1438+41.9730	-34.0000	890.2036
		1438+77.3800	-34.0000	890.5078
3	69.4169			
		1437+82.5240	-8.0000	891.5540
		1438+17.3291	-8.0000	891.8227
		1438+52.1343	-8.0000	892.1090
4	69.3750			
		1437+80.7001	-6.0000	891.6804
		1438+15.4600	-6.0000	891.9478
		1438+50.2199	-6.0000	892.2328
5	69.2500			
		1437+75.2500	0.0000	892.0601
		1438+09.8750	0.0000	892.3236
		1438+44.5000	0.0000	892.6047

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

Filename: N:\TRA\255717\Eng\BR40\Geomath\I-575 BR40.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	70.0927			
		1438+78.9804	-35.6250	890.4082
		1439+14.4657	-35.6250	890.7322
		1439+49.9510	-35.6250	891.0746
2	70.0529			
		1438+77.3800	-34.0000	890.5078
		1439+12.8249	-34.0000	890.8306
		1439+48.2698	-34.0000	891.1717
3	69.4339			
		1438+52.1343	-8.0000	892.1090
		1438+86.9480	-8.0000	892.4131
		1439+21.7616	-8.0000	892.7349
4	69.3876			
		1438+50.2199	-6.0000	892.2328
		1438+84.9862	-6.0000	892.5355
		1439+19.7524	-6.0000	892.8558
5	69.2500			
		1438+44.5000	0.0000	892.6047
		1438+79.1250	0.0000	892.9032
		1439+13.7500	0.0000	893.2193

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

Filename: N:\TRA\255717\Eng\BR40\Geomath\I-575 BR40.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	70.1796			
		1439+49.9510	-35.6250	891.0746
		1439+85.4803	-35.6250	891.4359
		1440+21.0095	-35.6250	891.8155
2	70.1356			
		1439+48.2698	-34.0000	891.1717
		1439+83.7565	-34.0000	891.5317
		1440+19.2433	-34.0000	891.9099
3	69.4525			
		1439+21.7616	-8.0000	892.7349
		1439+56.5846	-8.0000	893.0744
		1439+91.4076	-8.0000	893.4317
4	69.4016			
		1439+19.7524	-6.0000	892.8558
		1439+54.5257	-6.0000	893.1939
		1439+89.2989	-6.0000	893.5495
5	69.2500			
		1439+13.7500	0.0000	893.2193
		1439+48.3750	0.0000	893.5528
		1439+83.0000	0.0000	893.9038

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

Filename: N:\TRA\255717\Eng\BR40\Geomath\I-575 BR40.gmd

GIRDER VERTICAL PLACEMENT

SPAN : B1-B2 ROADWAY: 575 GIRDERS COMPLETED: 5
MIN BUILD UP, in : 0.7500
DECK THICKNESS, in : 7.5000
NUMBER OF CHECK PTS: 3

GIRDER DATA

GIRDER	LENGTH (ft)	GIRDER TYPE	CAMBER (in)	TOTAL DEFL (in)	DAP START (in)	DAP END (in)
S1-G04	66.4785	AASHTO-II	2.3412	1.3884	0.0000	0.0000
S1-G03	66.6015	AASHTO-II	2.3412	1.3884	0.0000	0.0000
S1-G02	66.7259	AASHTO-II	2.3412	1.3884	0.0000	0.0000
S1-G01	66.8518	AASHTO-II	2.3412	1.3884	0.0000	0.0000
S1-G05	66.3570	AASHTO-II	2.3412	1.3884	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-G01	886.1738	886.7368	0.7500	33.7277 L	2.9735	-2.1965 R
S1-G02	886.5503	887.1054	0.7500	33.6632 L	2.9714	-2.1914 R
S1-G03	886.9276	887.4748	0.7500	33.5994 L	2.9693	-2.1863 R
S1-G04	887.3055	887.8451	0.7500	33.5364 L	2.9673	-2.1813 R
S1-G05	887.6841	888.2161	0.7500	33.4741 L	2.9653	-2.1763 R

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

Filename: N:\TRA\255717\Eng\BR40\Geomath\I-575 BR40.gmd

GIRDER VERTICAL PLACEMENT

SPAN : B2-B3 ROADWAY: 575 GIRDERS COMPLETED: 5
MIN BUILD UP, in : 0.7500
DECK THICKNESS, in : 7.5000
NUMBER OF CHECK PTS: 3

GIRDER DATA

GIRDER	LENGTH (ft)	GIRDER TYPE	CAMBER (in)	TOTAL DEFL (in)	DAP START (in)	DAP END (in)
S2-G05	66.6539	AASHTO-II	2.3604	1.4340	0.0000	0.0000
S2-G04	66.7884	AASHTO-II	2.3604	1.4340	0.0000	0.0000
S2-G03	66.9246	AASHTO-II	2.3604	1.4340	0.0000	0.0000
S2-G02	67.0624	AASHTO-II	2.3604	1.4340	0.0000	0.0000
S2-G01	67.2021	AASHTO-II	2.3604	1.4340	0.0000	0.0000

GIRDER	BRG TOP ELEVATION START (ft)	END (ft)	BUILD-UP THICKNESS MIN (in)	LOCATION (ft)	MAX (in)	LOCATION (ft)
S2-G01	886.7636	887.3993	0.7500	34.0990 L	2.9240	-1.9093 R
S2-G02	887.1319	887.7590	0.7500	34.0271 L	2.9218	-1.9042 R
S2-G03	887.5011	888.1196	0.7500	33.9561 L	2.9197	-1.8993 R
S2-G04	887.8710	888.4812	0.7500	33.8860 L	2.9175	-1.8944 R
S2-G05	888.2417	888.8436	0.7500	33.8167 L	2.9154	-1.8895 R

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

Filename: N:\TRA\255717\Eng\BR40\Geomath\I-575 BR40.gmd

GIRDER VERTICAL PLACEMENT

SPAN : B3-B4 ROADWAY: 575 GIRDERS COMPLETED: 5
MIN BUILD UP, in : 0.7500
DECK THICKNESS, in : 7.5000
NUMBER OF CHECK PTS: 3

GIRDER DATA

GIRDER	LENGTH (ft)	GIRDER TYPE	CAMBER (in)	TOTAL DEFL (in)	DAP START (in)	DAP END (in)
S3-G05	66.2473	AASHTO-II	2.3412	1.3896	0.0000	0.0000
S3-G04	66.3947	AASHTO-II	2.3412	1.3896	0.0000	0.0000
S3-G03	66.5439	AASHTO-II	2.3412	1.3896	0.0000	0.0000
S3-G02	66.6951	AASHTO-II	2.3412	1.3896	0.0000	0.0000
S3-G01	66.8483	AASHTO-II	2.3412	1.3896	0.0000	0.0000

GIRDER	BRG TOP ELEVATION START (ft)	END (ft)	BUILD-UP THICKNESS MIN (in)	LOCATION (ft)	MAX (in)	LOCATION (ft)
S3-G01	887.4259	888.1277	0.7500	34.1281 L	2.9543	-1.9703 R
S3-G02	887.7853	888.4777	0.7500	34.0488 L	2.9520	-1.9647 R
S3-G03	888.1455	888.8288	0.7500	33.9705 L	2.9497	-1.9591 R
S3-G04	888.5067	889.1809	0.7500	33.8933 L	2.9475	-1.9536 R
S3-G05	888.8688	889.5341	0.7500	33.8170 L	2.9453	-1.9482 R

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

Filename: N:\TRA\255717\Eng\BR40\Geomath\I-575 BR40.gmd

GIRDER VERTICAL GEOMETRY

SPAN ID: B1-B2 ROADWAY: 575
MIN BUILD-UP,in: 0.7500 DECK THICK,in: 7.5000

GIRDER ID: S1-G01 BRG CO-ORDS ELEVATION DAP HEIGHT
AZIMUTH, deg: N 7.190959 North East (ft) (ft)
WPT-WPT LEN,ft: 66.8518 Start: 1,491,404.3037 2,186,460.0642 886.1738 0.0000
PR-PR LEN,ft: 69.9523 End: 1,491,470.6297 2,186,468.4324 886.7368 0.0000

GIRDER TYPE:AASHTO-II CAMBER,in : 2.3412 TOTAL DEFL,in: 1.3884
TOP WIDTH,in: 12.0000 BOT WIDTH,in: 18.0000 HEIGHT,in: 36.0000

DECK SLOPE ,ft/ft Start: 0.070088 End: 0.069890 Avg: 0.069989
GIRDER PITCH,ft/ft: 0.008421 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	889.9978	889.9978	889.1738	0.8240
2	33.4259	890.2572	890.3729	889.6504	0.7225
3	66.8518	890.5607	890.5607	889.7368	0.8240

BUILD-UP	THICKNESS,in	LOCATION,ft	SIDE
MINIMUM:	0.750	33.7277	L
MAXIMUM:	2.973	-2.1965	R

CHECK POINT	DIST ALONG CENTERLINE END-END (ft)	BUILD-UP LEFT (in)	CL (in)	RIGHT (in)
1	0.0000	2.0597	2.5163	2.9735
2	34.9762	0.7500	1.1699	1.5904
3	69.9523	2.1070	2.4901	2.8737

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

Filename: N:\TRA\255717\Eng\BR40\Geomath\I-575 BR40.gmd

GIRDER VERTICAL GEOMETRY

SPAN ID: B1-B2 ROADWAY: 575
MIN BUILD-UP,in: 0.7500 DECK THICK,in: 7.5000

GIRDER ID: S1-G02 BRG CO-ORDS ELEVATION DAP HEIGHT
AZIMUTH, deg: N 7.305120 North East (ft) (ft)
WPT-WPT LEN,ft: 66.7259 Start: 1,491,397.9841 2,186,465.2433 886.5503 0.0000
PR-PR LEN,ft: 69.8205 End: 1,491,464.1684 2,186,473.7277 887.1054 0.0000

GIRDER TYPE:AASHTO-II CAMBER,in : 2.3412 TOTAL DEFL,in: 1.3884
TOP WIDTH,in: 12.0000 BOT WIDTH,in: 18.0000 HEIGHT,in: 36.0000

DECK SLOPE ,ft/ft Start: 0.070086 End: 0.069892 Avg: 0.069989
GIRDER PITCH,ft/ft: 0.008318 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	890.3742	890.3742	889.5503	0.8238
2	33.3630	890.6298	890.7455	890.0230	0.7225
3	66.7259	890.9292	890.9292	890.1054	0.8238

BUILD-UP	THICKNESS,in	LOCATION,ft	SIDE
MINIMUM:	0.750	33.6632	L
MAXIMUM:	2.971	-2.1914	R

CHECK POINT	DIST ALONG CENTERLINE END-END (ft)	BUILD-UP LEFT (in)	CL (in)	RIGHT (in)
1	0.0000	2.0579	2.5144	2.9714
2	34.9103	0.7500	1.1699	1.5904
3	69.8205	2.1049	2.4881	2.8719

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

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GIRDER VERTICAL GEOMETRY

SPAN ID: B1-B2 ROADWAY: 575
MIN BUILD-UP,in: 0.7500 DECK THICK,in: 7.5000

GIRDER ID: S1-G03 BRG CO-ORDS ELEVATION DAP HEIGHT
AZIMUTH, deg: N 7.418589 North East (ft) (ft)
WPT-WPT LEN,ft: 66.6015 Start: 1,491,391.6757 2,186,470.4132 886.9276 0.0000
PR-PR LEN,ft: 69.6904 End: 1,491,457.7197 2,186,479.0126 887.4748 0.0000

GIRDER TYPE:AASHTO-II CAMBER,in : 2.3412 TOTAL DEFL,in: 1.3884
TOP WIDTH,in: 12.0000 BOT WIDTH,in: 18.0000 HEIGHT,in: 36.0000

DECK SLOPE ,ft/ft Start: 0.070085 End: 0.069893 Avg: 0.069989
GIRDER PITCH,ft/ft: 0.008217 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	890.7512	890.7512	889.9276	0.8237
2	33.3007	891.0031	891.1188	890.3963	0.7225
3	66.6015	891.2985	891.2985	890.4748	0.8237

BUILD-UP	THICKNESS,in	LOCATION,ft	SIDE
MINIMUM:	0.750	33.5994	L
MAXIMUM:	2.969	-2.1863	R

CHECK POINT	DIST ALONG CENTERLINE END-END (ft)	BUILD-UP LEFT (in)	CL (in)	RIGHT (in)
1	0.0000	2.0561	2.5125	2.9693
2	34.8452	0.7500	1.1699	1.5903
3	69.6904	2.1029	2.4863	2.8701

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

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GIRDER VERTICAL GEOMETRY

SPAN ID: B1-B2 ROADWAY: 575
MIN BUILD-UP,in: 0.7500 DECK THICK,in: 7.5000

GIRDER ID: S1-G04 BRG CO-ORDS ELEVATION DAP HEIGHT
AZIMUTH, deg: N 7.531372 North East (ft) (ft)
WPT-WPT LEN,ft: 66.4785 Start: 1,491,385.3786 2,186,475.5739 887.3055 0.0000
PR-PR LEN,ft: 69.5617 End: 1,491,451.2836 2,186,484.2871 887.8451 0.0000

GIRDER TYPE:AASHTO-II CAMBER,in : 2.3412 TOTAL DEFL,in: 1.3884
TOP WIDTH,in: 12.0000 BOT WIDTH,in: 18.0000 HEIGHT,in: 36.0000

DECK SLOPE ,ft/ft Start: 0.070083 End: 0.069895 Avg: 0.069989
GIRDER PITCH,ft/ft: 0.008117 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	891.1290	891.1290	890.3055	0.8235
2	33.2393	891.3772	891.4929	890.7704	0.7225
3	66.4785	891.6686	891.6686	890.8451	0.8235

BUILD-UP	THICKNESS,in	LOCATION,ft	SIDE
MINIMUM:	0.750	33.5364	L
MAXIMUM:	2.967	-2.1813	R

CHECK POINT	DIST ALONG CENTERLINE END-END (ft)	BUILD-UP LEFT (in)	CL (in)	RIGHT (in)
1	0.0000	2.0544	2.5106	2.9673
2	34.7808	0.7500	1.1699	1.5903
3	69.5617	2.1009	2.4844	2.8684

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GIRDER VERTICAL GEOMETRY

SPAN ID: B1-B2 ROADWAY: 575
MIN BUILD-UP,in: 0.7500 DECK THICK,in: 7.5000

GIRDER ID: S1-G05 BRG CO-ORDS ELEVATION DAP HEIGHT
AZIMUTH, deg: N 7.643478 North East (ft) (ft)
WPT-WPT LEN,ft: 66.3570 Start: 1,491,379.0925 2,186,480.7255 887.6841 0.0000
PR-PR LEN,ft: 69.4346 End: 1,491,444.8599 2,186,489.5516 888.2161 0.0000

GIRDER TYPE:AASHTO-II CAMBER,in : 2.3412 TOTAL DEFL,in: 1.3884
TOP WIDTH,in: 12.0000 BOT WIDTH,in: 18.0000 HEIGHT,in: 36.0000

DECK SLOPE ,ft/ft Start: 0.070082 End: 0.069897 Avg: 0.069989
GIRDER PITCH,ft/ft: 0.008017 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	891.5075	891.5075	890.6841	0.8234
2	33.1785	891.7520	891.8677	891.1452	0.7225
3	66.3570	892.0395	892.0395	891.2161	0.8234

BUILD-UP	THICKNESS,in	LOCATION,ft	SIDE
MINIMUM:	0.750	33.4741	L
MAXIMUM:	2.965	-2.1763	R

CHECK POINT	DIST ALONG CENTERLINE END-END (ft)	BUILD-UP LEFT (in)	CL (in)	RIGHT (in)
1	0.0000	2.0526	2.5087	2.9653
2	34.7173	0.7500	1.1699	1.5903
3	69.4346	2.0989	2.4826	2.8667

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GIRDER VERTICAL GEOMETRY

SPAN ID: B2-B3 ROADWAY: 575
MIN BUILD-UP,in: 0.7500 DECK THICK,in: 7.5000

GIRDER ID: S2-G01 BRG CO-ORDS ELEVATION DAP HEIGHT
AZIMUTH, deg: N 5.782448 North East (ft) (ft)
WPT-WPT LEN,ft: 67.2021 Start: 1,491,473.4010 2,186,468.7471 886.7636 0.0000
PR-PR LEN,ft: 70.0247 End: 1,491,540.2611 2,186,475.5178 887.3993 0.0000

GIRDER TYPE:AASHTO-II CAMBER,in : 2.3604 TOTAL DEFL,in: 1.4340
TOP WIDTH,in: 12.0000 BOT WIDTH,in: 18.0000 HEIGHT,in: 36.0000

DECK SLOPE ,ft/ft Start: 0.070101 End: 0.069878 Avg: 0.069989
GIRDER PITCH,ft/ft: 0.009459 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	890.5856	890.5856	889.7636	0.8220
2	33.6010	890.8811	891.0006	890.2782	0.7225
3	67.2021	891.2213	891.2213	890.3993	0.8220

BUILD-UP	THICKNESS,in	LOCATION,ft	SIDE
MINIMUM:	0.750	34.0990	L
MAXIMUM:	2.924	-1.9093	R

CHECK POINT	DIST ALONG CENTERLINE END-END (ft)	BUILD-UP LEFT (in)	CL (in)	RIGHT (in)
1	0.0000	2.0090	2.4662	2.9240
2	35.0123	0.7500	1.1697	1.5900
3	70.0247	2.0841	2.4662	2.8488

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GIRDER VERTICAL GEOMETRY

SPAN ID: B2-B3 ROADWAY: 575
MIN BUILD-UP,in: 0.7500 DECK THICK,in: 7.5000

GIRDER ID: S2-G02 BRG CO-ORDS ELEVATION DAP HEIGHT
AZIMUTH, deg: N 5.902356 North East (ft) (ft)
WPT-WPT LEN,ft: 67.0624 Start: 1,491,466.9335 2,186,474.0474 887.1319 0.0000
PR-PR LEN,ft: 69.8792 End: 1,491,533.6404 2,186,480.9437 887.7590 0.0000

GIRDER TYPE:AASHTO-II CAMBER,in : 2.3604 TOTAL DEFL,in: 1.4340
TOP WIDTH,in: 12.0000 BOT WIDTH,in: 18.0000 HEIGHT,in: 36.0000

DECK SLOPE ,ft/ft Start: 0.070099 End: 0.069879 Avg: 0.069989
GIRDER PITCH,ft/ft: 0.009350 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	890.9538	890.9538	890.1319	0.8218
2	33.5312	891.2451	891.3646	890.6422	0.7225
3	67.0624	891.5808	891.5808	890.7590	0.8218

BUILD-UP	THICKNESS,in	LOCATION,ft	SIDE
MINIMUM:	0.750	34.0271	L
MAXIMUM:	2.922	-1.9042	R

CHECK POINT	DIST ALONG CENTERLINE END-END (ft)	BUILD-UP LEFT (in)	CL (in)	RIGHT (in)
1	0.0000	2.0071	2.4642	2.9218
2	34.9396	0.7500	1.1697	1.5900
3	69.8792	2.0819	2.4642	2.8470

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GIRDER VERTICAL GEOMETRY

SPAN ID: B2-B3 ROADWAY: 575
MIN BUILD-UP,in: 0.7500 DECK THICK,in: 7.5000

GIRDER ID: S2-G03 BRG CO-ORDS ELEVATION DAP HEIGHT
AZIMUTH, deg: N 6.021513 North East (ft) (ft)
WPT-WPT LEN,ft: 66.9246 Start: 1,491,460.4788 2,186,479.3373 887.5011 0.0000
PR-PR LEN,ft: 69.7355 End: 1,491,527.0341 2,186,486.3578 888.1196 0.0000

GIRDER TYPE:AASHTO-II CAMBER,in : 2.3604 TOTAL DEFL,in: 1.4340
TOP WIDTH,in: 12.0000 BOT WIDTH,in: 18.0000 HEIGHT,in: 36.0000

DECK SLOPE ,ft/ft Start: 0.070098 End: 0.069881 Avg: 0.069989
GIRDER PITCH,ft/ft: 0.009242 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	891.3227	891.3227	890.5011	0.8217
2	33.4623	891.6100	891.7295	891.0070	0.7225
3	66.9246	891.9413	891.9413	891.1196	0.8217

BUILD-UP	THICKNESS,in	LOCATION,ft	SIDE
MINIMUM:	0.750	33.9561	L
MAXIMUM:	2.920	-1.8993	R

CHECK POINT	DIST ALONG CENTERLINE END-END (ft)	BUILD-UP LEFT (in)	CL (in)	RIGHT (in)
1	0.0000	2.0052	2.4622	2.9197
2	34.8678	0.7500	1.1697	1.5900
3	69.7355	2.0798	2.4622	2.8451

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GIRDER VERTICAL GEOMETRY

SPAN ID: B2-B3 ROADWAY: 575
MIN BUILD-UP,in: 0.7500 DECK THICK,in: 7.5000

GIRDER ID: S2-G04 BRG CO-ORDS ELEVATION DAP HEIGHT
AZIMUTH, deg: N 6.139928 North East (ft) (ft)
WPT-WPT LEN,ft: 66.7884 Start: 1,491,454.0367 2,186,484.6168 887.8710 0.0000
PR-PR LEN,ft: 69.5936 End: 1,491,520.4419 2,186,491.7602 888.4812 0.0000

GIRDER TYPE:AASHTO-II CAMBER,in : 2.3604 TOTAL DEFL,in: 1.4340
TOP WIDTH,in: 12.0000 BOT WIDTH,in: 18.0000 HEIGHT,in: 36.0000

DECK SLOPE ,ft/ft Start: 0.070096 End: 0.069883 Avg: 0.069990
GIRDER PITCH,ft/ft: 0.009136 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	891.6925	891.6925	890.8710	0.8215
2	33.3942	891.9757	892.0952	891.3728	0.7225
3	66.7884	892.3027	892.3027	891.4812	0.8215

BUILD-UP	THICKNESS,in	LOCATION,ft	SIDE
MINIMUM:	0.750	33.8860	L
MAXIMUM:	2.918	-1.8944	R

CHECK POINT	DIST ALONG CENTERLINE END-END (ft)	BUILD-UP LEFT (in)	CL (in)	RIGHT (in)
1	0.0000	2.0034	2.4602	2.9175
2	34.7968	0.7500	1.1697	1.5900
3	69.5936	2.0776	2.4602	2.8432

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GIRDER VERTICAL GEOMETRY

SPAN ID: B2-B3 ROADWAY: 575
MIN BUILD-UP,in: 0.7500 DECK THICK,in: 7.5000

GIRDER ID: S2-G05 BRG CO-ORDS ELEVATION DAP HEIGHT
AZIMUTH, deg: N 6.257608 North East (ft) (ft)
WPT-WPT LEN,ft: 66.6539 Start: 1,491,447.6070 2,186,489.8861 888.2417 0.0000
PR-PR LEN,ft: 69.4535 End: 1,491,513.8637 2,186,497.1513 888.8436 0.0000

GIRDER TYPE:AASHTO-II CAMBER,in : 2.3604 TOTAL DEFL,in: 1.4340
TOP WIDTH,in: 12.0000 BOT WIDTH,in: 18.0000 HEIGHT,in: 36.0000

DECK SLOPE ,ft/ft Start: 0.070094 End: 0.069885 Avg: 0.069990
GIRDER PITCH,ft/ft: 0.009030 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	892.0631	892.0631	891.2417	0.8214
2	33.3269	892.3423	892.4618	891.7394	0.7225
3	66.6539	892.6650	892.6650	891.8436	0.8214

BUILD-UP	THICKNESS,in	LOCATION,ft	SIDE
MINIMUM:	0.750	33.8167	L
MAXIMUM:	2.915	-1.8895	R

CHECK POINT	DIST ALONG CENTERLINE END-END (ft)	BUILD-UP LEFT (in)	CL (in)	RIGHT (in)
1	0.0000	2.0016	2.4582	2.9154
2	34.7267	0.7500	1.1697	1.5900
3	69.4535	2.0755	2.4582	2.8414

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GIRDER VERTICAL GEOMETRY

SPAN ID: B3-B4 ROADWAY: 575
MIN BUILD-UP,in: 0.7500 DECK THICK,in: 7.5000

GIRDER ID: S3-G01		BRG CO-ORDS		ELEVATION	DAP HEIGHT
AZIMUTH, deg: N 4.372406		North	East	(ft)	(ft)
WPT-WPT LEN,ft: 66.8483	Start:	1,491,543.1082	2,186,475.7704	887.4259	0.0000
PR-PR LEN,ft: 70.1045	End:	1,491,609.7620	2,186,480.8668	888.1277	0.0000

GIRDER TYPE:AASHTO-II CAMBER,in : 2.3412 TOTAL DEFL,in: 1.3896
TOP WIDTH,in: 12.0000 BOT WIDTH,in: 18.0000 HEIGHT,in: 36.0000

DECK SLOPE ,ft/ft Start: 0.070113 End: 0.069867 Avg: 0.069990
GIRDER PITCH,ft/ft: 0.010498 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	891.2498	891.2498	890.4259	0.8238
2	33.4242	891.5786	891.6944	890.9719	0.7225
3	66.8483	891.9515	891.9515	891.1277	0.8238

BUILD-UP	THICKNESS,in	LOCATION,ft	SIDE
MINIMUM:	0.750	34.1281	L
MAXIMUM:	2.954	-1.9703	R

CHECK POINT	DIST ALONG CENTERLINE END-END (ft)	BUILD-UP LEFT (in)	CL (in)	RIGHT (in)
1	0.0000	2.0334	2.4936	2.9543
2	35.0523	0.7500	1.1695	1.5896
3	70.1045	2.1424	2.5211	2.9005

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GIRDER VERTICAL GEOMETRY

SPAN ID: B3-B4 ROADWAY: 575
MIN BUILD-UP,in: 0.7500 DECK THICK,in: 7.5000

GIRDER ID: S3-G02 BRG CO-ORDS ELEVATION DAP HEIGHT
AZIMUTH, deg: N 4.498353 North East (ft) (ft)
WPT-WPT LEN,ft: 66.6951 Start: 1,491,536.4808 2,186,481.2018 887.7853 0.0000
PR-PR LEN,ft: 69.9439 End: 1,491,602.9705 2,186,486.4327 888.4777 0.0000

GIRDER TYPE:AASHTO-II CAMBER,in : 2.3412 TOTAL DEFL,in: 1.3896
TOP WIDTH,in: 12.0000 BOT WIDTH,in: 18.0000 HEIGHT,in: 36.0000

DECK SLOPE ,ft/ft Start: 0.070111 End: 0.069869 Avg: 0.069990
GIRDER PITCH,ft/ft: 0.010382 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	891.6089	891.6089	890.7853	0.8237
2	33.3476	891.9332	892.0490	891.3266	0.7225
3	66.6951	892.3014	892.3014	891.4777	0.8237

BUILD-UP	THICKNESS,in	LOCATION,ft	SIDE
MINIMUM:	0.750	34.0488	L
MAXIMUM:	2.952	-1.9647	R

CHECK POINT	DIST ALONG CENTERLINE END-END (ft)	BUILD-UP LEFT (in)	CL (in)	RIGHT (in)
1	0.0000	2.0315	2.4914	2.9520
2	34.9719	0.7500	1.1695	1.5896
3	69.9439	2.1401	2.5190	2.8985

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GIRDER VERTICAL GEOMETRY

SPAN ID: B3-B4 ROADWAY: 575
MIN BUILD-UP,in: 0.7500 DECK THICK,in: 7.5000

GIRDER ID: S3-G03 BRG CO-ORDS ELEVATION DAP HEIGHT
AZIMUTH, deg: N 4.623486 North East (ft) (ft)
WPT-WPT LEN,ft: 66.5439 Start: 1,491,529.8678 2,186,486.6213 888.1455 0.0000
PR-PR LEN,ft: 69.7853 End: 1,491,596.1951 2,186,491.9853 888.8288 0.0000

GIRDER TYPE:AASHTO-II CAMBER,in : 2.3412 TOTAL DEFL,in: 1.3896
TOP WIDTH,in: 12.0000 BOT WIDTH,in: 18.0000 HEIGHT,in: 36.0000

DECK SLOPE ,ft/ft Start: 0.070110 End: 0.069871 Avg: 0.069990
GIRDER PITCH,ft/ft: 0.010268 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	891.9690	891.9690	891.1455	0.8235
2	33.2719	892.2889	892.4047	891.6823	0.7225
3	66.5439	892.6523	892.6523	891.8288	0.8235

BUILD-UP	THICKNESS,in	LOCATION,ft	SIDE
MINIMUM:	0.750	33.9705	L
MAXIMUM:	2.950	-1.9591	R

CHECK POINT	DIST ALONG CENTERLINE END-END (ft)	BUILD-UP LEFT (in)	CL (in)	RIGHT (in)
1	0.0000	2.0295	2.4893	2.9497
2	34.8926	0.7500	1.1695	1.5896
3	69.7853	2.1378	2.5168	2.8964

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GIRDER VERTICAL GEOMETRY

SPAN ID: B3-B4 ROADWAY: 575
MIN BUILD-UP,in: 0.7500 DECK THICK,in: 7.5000

GIRDER ID: S3-G04		BRG CO-ORDS		ELEVATION	DAP HEIGHT
AZIMUTH, deg: N 4.747812		North	East	(ft)	(ft)
WPT-WPT LEN,ft: 66.3947	Start:	1,491,523.2690	2,186,492.0292	888.5067	0.0000
PR-PR LEN,ft: 69.6288	End:	1,491,589.4358	2,186,497.5247	889.1809	0.0000

GIRDER TYPE:AASHTO-II CAMBER,in : 2.3412 TOTAL DEFL,in: 1.3896
TOP WIDTH,in: 12.0000 BOT WIDTH,in: 18.0000 HEIGHT,in: 36.0000

DECK SLOPE ,ft/ft Start: 0.070108 End: 0.069873 Avg: 0.069990
GIRDER PITCH,ft/ft: 0.010155 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	892.3300	892.3300	891.5067	0.8233
2	33.1973	892.6456	892.7614	892.0389	0.7225
3	66.3947	893.0043	893.0043	892.1809	0.8233

BUILD-UP	THICKNESS,in	LOCATION,ft	SIDE
MINIMUM:	0.750	33.8933	L
MAXIMUM:	2.947	-1.9536	R

CHECK POINT	DIST ALONG CENTERLINE END-END (ft)	BUILD-UP LEFT (in)	CL (in)	RIGHT (in)
1	0.0000	2.0276	2.4872	2.9475
2	34.8144	0.7500	1.1695	1.5896
3	69.6288	2.1355	2.5147	2.8945

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GIRDER VERTICAL GEOMETRY

SPAN ID: B3-B4 ROADWAY: 575
MIN BUILD-UP,in: 0.7500 DECK THICK,in: 7.5000

GIRDER ID: S3-G05 BRG CO-ORDS ELEVATION DAP HEIGHT
AZIMUTH, deg: N 4.871343 North East (ft) (ft)
WPT-WPT LEN,ft: 66.2473 Start: 1,491,516.6842 2,186,497.4256 888.8688 0.0000
PR-PR LEN,ft: 69.4743 End: 1,491,582.6923 2,186,503.0513 889.5341 0.0000

GIRDER TYPE:AASHTO-II CAMBER,in : 2.3412 TOTAL DEFL,in: 1.3896
TOP WIDTH,in: 12.0000 BOT WIDTH,in: 18.0000 HEIGHT,in: 36.0000

DECK SLOPE ,ft/ft Start: 0.070106 End: 0.069875 Avg: 0.069990
GIRDER PITCH,ft/ft: 0.010043 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	892.6920	892.6920	891.8688	0.8232
2	33.1237	893.0032	893.1190	892.3966	0.7225
3	66.2473	893.3573	893.3573	892.5341	0.8232

BUILD-UP	THICKNESS,in	LOCATION,ft	SIDE
MINIMUM:	0.750	33.8170	L
MAXIMUM:	2.945	-1.9482	R

CHECK POINT	DIST ALONG CENTERLINE END-END (ft)	BUILD-UP LEFT (in)	CL (in)	RIGHT (in)
1	0.0000	2.0257	2.4852	2.9453
2	34.7371	0.7500	1.1695	1.5896
3	69.4743	2.1332	2.5126	2.8925

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

Filename: N:\TRA\255717\Eng\BR40\Geomath\I-575 BR40.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-G01	3.6899	AASHTO-II	2.5000				
				a	-1.3822	-0.4889	885.9600
				b	-1.9556	-1.0937	885.9710
				c	-0.9880	-2.0111	885.9710
				d	-0.4146	-1.4063	885.9600
				BrgCtr	-1.1851	-1.2500	885.9655
S1-G02	8.1660	AASHTO-II	2.5000				
				a	-1.3790	-0.4893	886.3365
				b	-1.9512	-1.0952	886.3474
				c	-0.9817	-2.0107	886.3474
				d	-0.4096	-1.4048	886.3365
				BrgCtr	-1.1804	-1.2500	886.3420
S1-G03	8.1515	AASHTO-II	2.5000				
				a	-1.3759	-0.4897	886.7138
				b	-1.9468	-1.0968	886.7246
				c	-0.9756	-2.0103	886.7246
				d	-0.4046	-1.4032	886.7138
				BrgCtr	-1.1757	-1.2500	886.7192
S1-G04	8.1371	AASHTO-II	2.5000				
				a	-1.3727	-0.4901	887.0918
				b	-1.9425	-1.0983	887.1025
				c	-0.9694	-2.0099	887.1025
				d	-0.3997	-1.4017	887.0918
				BrgCtr	-1.1711	-1.2500	887.0972
S1-G05	8.1228	AASHTO-II	2.4996				
				a	-1.3696	-0.4905	887.4705
				b	-1.9382	-1.0998	887.4811
				c	-0.9634	-2.0095	887.4811
				d	-0.3948	-1.4002	887.4705
				BrgCtr	-1.1665	-1.2500	887.4758
RIGHT	5.0455						

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

Filename: N:\TRA\255717\Eng\BR40\Geomath\I-575 BR40.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-G01	3.3010	AASHTO-II	2.5000				
				a	1.1452	0.2389	886.5299
				b	1.7186	0.8437	886.5269
				c	0.7510	1.7611	886.5269
				d	0.1776	1.1563	886.5299
				BrgCtr	0.9481	1.0000	886.5284
S1-G02	8.3577	AASHTO-II	2.5000				
				a	1.1429	0.2393	886.8985
				b	1.7151	0.8452	886.8956
				c	0.7457	1.7607	886.8956
				d	0.1735	1.1548	886.8985
				BrgCtr	0.9443	1.0000	886.8971
S1-G03	8.3413	AASHTO-II	2.5000				
				a	1.1407	0.2397	887.2679
				b	1.7117	0.8468	887.2651
				c	0.7404	1.7603	887.2651
				d	0.1695	1.1532	887.2679
				BrgCtr	0.9406	1.0000	887.2665
S1-G04	8.3250	AASHTO-II	2.5000				
				a	1.1385	0.2401	887.6381
				b	1.7082	0.8483	887.6354
				c	0.7352	1.7599	887.6354
				d	0.1655	1.1517	887.6381
				BrgCtr	0.9369	1.0000	887.6368
S1-G05	8.3090	AASHTO-II	2.5000				
				a	1.1363	0.2405	888.0091
				b	1.7049	0.8498	888.0064
				c	0.7301	1.7595	888.0064
				d	0.1615	1.1502	888.0091
				BrgCtr	0.9332	1.0000	888.0078
RIGHT	3.3659						

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

Filename: N:\TRA\255717\Eng\BR40\Geomath\I-575 BR40.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-G01	3.3010	AASHTO-II	2.5000				
				a	-1.1742	-0.2343	886.5494
				b	-1.7623	-0.8248	886.5611
				c	-0.8175	-1.7657	886.5611
				d	-0.2295	-1.1752	886.5494
				BrgCtr	-0.9959	-1.0000	886.5553
S2-G02	8.3577	AASHTO-II	2.5000				
				a	-1.1717	-0.2347	886.9178
				b	-1.7585	-0.8264	886.9294
				c	-0.8118	-1.7653	886.9294
				d	-0.2250	-1.1736	886.9178
				BrgCtr	-0.9917	-1.0000	886.9236
S2-G03	8.3413	AASHTO-II	2.5000				
				a	-1.1692	-0.2351	887.2869
				b	-1.7547	-0.8280	887.2985
				c	-0.8061	-1.7649	887.2985
				d	-0.2205	-1.1720	887.2869
				BrgCtr	-0.9876	-1.0000	887.2927
S2-G04	8.3250	AASHTO-II	2.5000				
				a	-1.1667	-0.2355	887.6569
				b	-1.7510	-0.8296	887.6684
				c	-0.8004	-1.7645	887.6684
				d	-0.2161	-1.1704	887.6569
				BrgCtr	-0.9835	-1.0000	887.6627
S2-G05	8.3090	AASHTO-II	2.5000				
				a	-1.1642	-0.2358	888.0277
				b	-1.7473	-0.8312	888.0391
				c	-0.7948	-1.7642	888.0391
				d	-0.2117	-1.1688	888.0277
				BrgCtr	-0.9795	-1.0000	888.0334
RIGHT	3.3659						

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

Filename: N:\TRA\255717\Eng\BR40\Geomath\I-575 BR40.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-G01	3.3903	AASHTO-II	2.5000				
				a	1.1742	0.2343	887.1930
				b	1.7623	0.8248	887.1889
				c	0.8175	1.7657	887.1889
				d	0.2295	1.1752	887.1930
				BrgCtr	0.9959	1.0000	887.1909
S2-G02	8.5641	AASHTO-II	2.5000				
				a	1.1717	0.2347	887.5526
				b	1.7585	0.8264	887.5487
				c	0.8118	1.7653	887.5487
				d	0.2250	1.1736	887.5526
				BrgCtr	0.9917	1.0000	887.5506
S2-G03	8.5455	AASHTO-II	2.5000				
				a	1.1692	0.2351	887.9132
				b	1.7547	0.8280	887.9093
				c	0.8061	1.7649	887.9093
				d	0.2205	1.1720	887.9132
				BrgCtr	0.9876	1.0000	887.9113
S2-G04	8.5272	AASHTO-II	2.5000				
				a	1.1667	0.2355	888.2747
				b	1.7510	0.8296	888.2709
				c	0.8004	1.7645	888.2709
				d	0.2161	1.1704	888.2747
				BrgCtr	0.9835	1.0000	888.2728
S2-G05	8.5091	AASHTO-II	2.5000				
				a	1.1642	0.2358	888.6371
				b	1.7473	0.8312	888.6334
				c	0.7948	1.7642	888.6334
				d	0.2117	1.1688	888.6371
				BrgCtr	0.9795	1.0000	888.6353
RIGHT	3.4638						

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

Filename: N:\TRA\255717\Eng\BR40\Geomath\I-575 BR40.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-G01	3.3903	AASHTO-II	2.5000				
				a	-1.2056	-0.2302	887.2112
				b	-1.8080	-0.8060	887.2239
				c	-0.8867	-1.7698	887.2239
				d	-0.2843	-1.1940	887.2112
				BrgCtr	-1.0461	-1.0000	887.2176
S3-G02	8.5641	AASHTO-II	2.5000				
				a	-1.2027	-0.2305	887.5706
				b	-1.8038	-0.8077	887.5832
				c	-0.8804	-1.7695	887.5832
				d	-0.2793	-1.1923	887.5706
				BrgCtr	-1.0416	-1.0000	887.5769
S3-G03	8.5455	AASHTO-II	2.5000				
				a	-1.1998	-0.2309	887.9309
				b	-1.7997	-0.8093	887.9434
				c	-0.8742	-1.7691	887.9434
				d	-0.2743	-1.1907	887.9309
				BrgCtr	-1.0370	-1.0000	887.9372
S3-G04	8.5272	AASHTO-II	2.5000				
				a	-1.1970	-0.2312	888.2921
				b	-1.7956	-0.8110	888.3046
				c	-0.8680	-1.7688	888.3046
				d	-0.2694	-1.1890	888.2921
				BrgCtr	-1.0325	-1.0000	888.2984
S3-G05	8.5091	AASHTO-II	2.5000				
				a	-1.1942	-0.2316	888.6543
				b	-1.7916	-0.8126	888.6666
				c	-0.8619	-1.7684	888.6666
				d	-0.2646	-1.1874	888.6543
				BrgCtr	-1.0281	-1.0000	888.6605
RIGHT	3.4638						

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

Filename: N:\TRA\255717\Eng\BR40\Geomath\I-575 BR40.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-G01	3.9389	AASHTO-II	2.5000				
				a	1.4671	0.4802	887.9217
				b	2.0695	1.0560	887.9169
				c	1.1482	2.0198	887.9169
				d	0.5458	1.4440	887.9217
				BrgCtr	1.3077	1.2500	887.9193
S3-G02	8.7866	AASHTO-II	2.5000				
				a	1.4631	0.4805	888.2717
				b	2.0642	1.0577	888.2670
				c	1.1408	2.0195	888.2670
				d	0.5397	1.4423	888.2717
				BrgCtr	1.3019	1.2500	888.2694
S3-G03	8.7656	AASHTO-II	2.5000				
				a	1.4591	0.4809	888.6227
				b	2.0590	1.0593	888.6182
				c	1.1334	2.0191	888.6182
				d	0.5336	1.4407	888.6227
				BrgCtr	1.2963	1.2500	888.6205
S3-G04	8.7449	AASHTO-II	2.5000				
				a	1.4551	0.4812	888.9748
				b	2.0538	1.0610	888.9704
				c	1.1261	2.0188	888.9704
				d	0.5275	1.4390	888.9748
				BrgCtr	1.2906	1.2500	888.9726
S3-G05	8.7244	AASHTO-II	2.5000				
				a	1.4512	0.4816	889.3280
				b	2.0486	1.0626	889.3236
				c	1.1189	2.0184	889.3236
				d	0.5216	1.4374	889.3280
				BrgCtr	1.2851	1.2500	889.3258
RIGHT	5.9282						

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

CALCULATION COVER SHEET

PROJECT	JOB NO.	CALC NO.	SHEET
I-75 / I-575 NORTHWEST CORRIDOR	NH000-0575-01(028)	BR#40	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, 2, and 3.

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	12	12	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#40

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 Noonday Creek North
COUNTY: CHEROKEE
P.I. NO: 713640
PROJECT: NH000-0575-01(028)

J.B. TRIMBLE, INC.

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

Span 1

✓ JCR 10-9-09

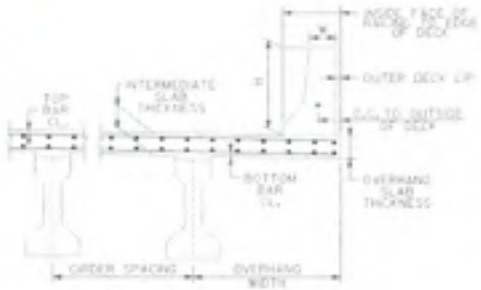
PRELIMINARY INFORMATION

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

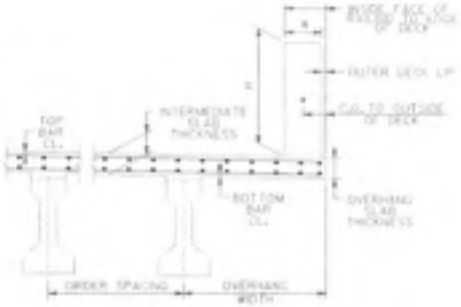
INTERIOR BEAM TYPE: PSC-Type II (TB, PSC, BULB-T)

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

INTERIOR BEAM TOP FLANGE WIDTH =	12 in.	
FASCIA BEAM TOP FLANGE WIDTH =	12 in.	
INTERMEDIATE SLAB THICKNESS =	7.500 in.	
OVERHANG SLAB THICKNESS =	7.500 in.	
GIRDER SPACING =	6.065 ft.	
NUMBER OF GIRDERS =	5	
OVERHANG WIDTH =	2.684 ft.	
CONCRETE STRENGTH, fc =	3500 psi.	
STEEL STRENGTH, fy =	60000 psi.	
RAILING HEIGHT (H) =	2.667 ft.	
RAILING WIDTH (W) =	0.750 ft.	
OUTER DECK LIP =	0.000 in.	
INSIDE FACE OF RAILING TO EDGE OF DECK =	1.500 ft.	
C.G. FROM OUTSIDE =	6.455 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 =	2880.00 ft.	(IF CENTRIFUGAL CONSIDERED)
WHEEL LOAD =	16 kips	DECK SLOPE = 1.0417 %
IMPACT FACTOR =	1.30	
FUTURE WEARING SURFACE =	30.00 psf	
RAILING LOAD =	10.00 kip	AT TOP OF PARAPET



JERSEY BARRIER DETAILS



PARAPET DETAILS

INTERMEDIATE SLAB DESIGN

EFFECTIVE SPAN LENGTH = 5.065 ft. *AASHTO 3.24.1.2*

DEAD LOAD

SLAB D.L. = 0.094 kips / ft. / lf.
ADDITIONAL D.L. = 0.030 kips / ft. / lf.

TOTAL D.L. = 0.124 kips / ft. / lf.

DEAD LOAD MOMENT = 1.3 * (WT DL) * (SPAN)^2 / 10 = 0.413 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 = 7.972 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 = 0.543 kip-ft. / lf. *AASHTO TABLE 3.22.1A*

TOTAL DESIGN MOMENT (∅ Mu) = 8.928 kip-ft. / lf. = 107.13 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} = 4.438 in. USE 5 BAR As = 0.31 in.^2 / lf.

d_{bot} = 5.938 in. USE 5 BAR As = 0.31 in.^2 / lf.

TOP STEEL

239.625 As - 45.38 As^2 = 107.13 k-in. / lf.

TOP BAR = NO.	5	SPACED AT	7.250 in.	As =	0.51 in.^2 / lf.

∅ Mn = 111.01 k-in. / lf.	≥	∅ Mu = 107.13 k-in. / lf.	OK

BOTTOM STEEL

320.625 As - 45.38 As^2 = 107.13 k-in. / lf.

BOT BAR = NO.	5	SPACED AT	7.250 in.	As =	0.51 in.^2 / lf.

∅ Mn = 152.57 k-in. / lf.	≥	∅ Mu = 107.13 k-in. / lf.	OK

BRIDGE: I-575 over Noonday Creek North
COUNTY: CHEROKEE
P.I. NO: 713640
PROJECT: NH000-0575-01(028)

J.B. TRIMBLE, INC.

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

Span 1

OVERHANG SLAB DESIGN

EFFECTIVE SPAN LENGTH = 2.194 ft. *AASHTO 3.24.5.1*

DEAD LOAD

BARRIER WEIGHT = 0.405 klf
FENCING WEIGHT = 0.000 klf

SLAB D.L. = 0.094 kips / ft. / lf.
ADDITIONAL D.L. = 0.030 kips / ft. / lf.
PARAPET D.L. = 0.405 kips / ft. / lf.

DL MOMENT @ FLANGE:

SLAB MOM = 0.226 kip-ft. / lf.
ADD'L MOM = 0.007 kip-ft. / lf.
PARAPET MOM = 0.671 kip-ft. / lf.

TOTAL MOM = 0.904 kip-ft. / lf. KIP-FT/LF

DL MOMENT @ EDGE OF BARRIER:

SLAB MOM = 0.105 kip-ft. / lf.
ADD'L MOM = 0.000 kip-ft. / lf.
PARAPET MOM = 0.390 kip-ft. / lf.

TOTAL MOM = 0.495 kip-ft. / lf.

DEAD LOAD MOMENT @ FLANGE= 1.3 * TOTAL MOMENT = 1.175 kip-ft. / lf.
D.L. MOMENT @ EDGE OF BARRIER= 1.3 * TOTAL MOMENT = 0.644 kip-ft. / lf.

LIVE LOAD

WHEEL LOAD 16 kips

IMPACT = 1.30
MOM ARM (X)= 0.19 ft.
E = 0.8 * X + 3.75 = 3.91 ft.

LIVE LOAD MOMENT = 2.17 * (P(LL + I) / E) * X = 2.244 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 = 0.255 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) = 1.66 ft.
E = 0.8 * X + 5.00 = 6.33 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 = 10.578 kip-ft. / lf.

RAIL MOM @ EDGE OF BARRIER= 2.17 * (P_{rail}/ E) * H = 11.597 kip-ft. / lf.

SUMMARY OF MOMENTS:

DL + LL @ FLANGE = 3.675 kip-ft. / lf.
DL + RAIL @ FLANGE = 11.754 kip-ft. / lf.
DL + RAIL @ BARRIER = 12.240 kip-ft. / lf.

TOTAL DESIGN MOMENT (∅ Mu) = 12.240 KIP-FT / LF = 146.89 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} = 4.438 in. USE 5 BAR As = 0.31 in.^2 / lf.
PROVIDE ADDITIONAL OVERHANG STEEL = 5 BAR As = 0.31 in.^2 / lf.

TOP STEEL

239.625 As - 45.38 As^2 = 146.89 k-in. / lf.

TOP BAR = NO.	5	SPACED AT	7.25 in.	As =	0.51 in.^2 / lf.

∅ Mn =	111.01 k-in. / lf.	<	∅ Mu = 146.89 k-in. / lf.	ADD. REINF. NEEDED!

ADD'L BAR = NO.	5	SPACED AT	14.50 in.	As =	0.26 in.^2 / lf.

Mn =	157.55 k-in. / lf.	≥	Mu = 146.89 k-in. / lf.	OK

BRIDGE: I-575 over Noonday Creek North
COUNTY: CHEROKEE
P.I. NO: 713640
PROJECT: NH000-0575-01(028)

J.B. TRIMBLE, INC.

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

✓ JCR 10-9-09

Span 2

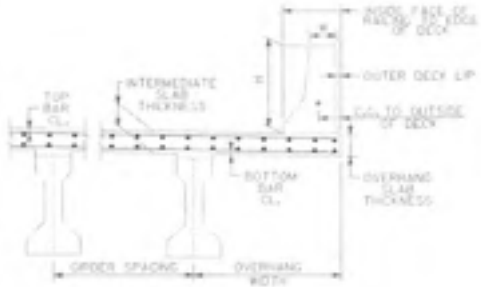
PRELIMINARY INFORMATION

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

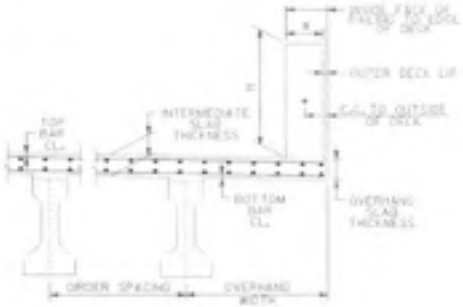
INTERIOR BEAM TYPE: PSC Type III (TB, PSC, BULB-T)

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

INTERIOR BEAM TOP FLANGE WIDTH =	12 in.	
FASCIA BEAM TOP FLANGE WIDTH =	12 in.	
INTERMEDIATE SLAB THICKNESS =	7.500 in.	
OVERHANG SLAB THICKNESS =	7.500 in.	
GIRDER SPACING =	6.068 ft.	
NUMBER OF GIRDERS =	5	
OVERHANG WIDTH =	2.694 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 =	0.000 in.	
INSIDE FACE OF RAILING TO EDGE OF DECK =	1.500 ft.	
C.G. FROM OUTSIDE =	6.455 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 =	2880.00 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 = 1.0417 %

INTERMEDIATE SLAB DESIGN

EFFECTIVE SPAN LENGTH = 5.068 ft. *AASHTO 3.24.1.2*

DEAD LOAD

SLAB D.L. = 0.094 kips / ft. / lf.
ADDITIONAL D.L. = 0.030 kips / ft. / lf.

TOTAL D.L. = 0.124 kips / ft. / lf.

DEAD LOAD MOMENT = 1.3 * (WT DL) * (SPAN)^2 / 10 = 0.413 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 = 7.976 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 = 0.543 kip-ft. / lf. *AASHTO TABLE 3.22.1A*

TOTAL DESIGN MOMENT (∅ Mu) = 8.932 kip-ft. / lf. = 107.18 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} = 4.438 in. USE 5 BAR As = 0.31 in.^2 / lf.

d_{bot} = 5.938 in. USE 5 BAR As = 0.31 in.^2 / lf.

TOP STEEL

239.625 As - 45.38 As^2 = 107.18 k-in. / lf.

TOP BAR = NO.	5	SPACED AT	7.250 in.	As =	0.51 in.^2 / lf.

∅ Mn = 111.01 k-in. / lf.	≥	∅ Mu = 107.18 k-in. / lf.	OK

BOTTOM STEEL

320.625 As - 45.38 As^2 = 107.18 k-in. / lf.

BOT BAR = NO.	5	SPACED AT	7.250 in.	As =	0.51 in.^2 / lf.

∅ Mn = 152.57 k-in. / lf.	≥	∅ Mu = 107.18 k-in. / lf.	OK

BRIDGE: I-575 over Noonday Creek North
COUNTY: CHEROKEE
P.I. NO: 713640
PROJECT: NH000-0575-01(028)

J.B. TRIMBLE, INC.

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

Span 2

OVERHANG SLAB DESIGN

EFFECTIVE SPAN LENGTH = 2.194 ft. *AASHTO 3.24.5.1*

DEAD LOAD

BARRIER WEIGHT = 0.405 klf
FENCING WEIGHT = 0.000 klf

SLAB D.L. = 0.094 kips / ft. / lf.
ADDITIONAL D.L. = 0.030 kips / ft. / lf.
PARAPET D.L. = 0.405 kips / ft. / lf.

DL MOMENT @ FLANGE:

SLAB MOM = 0.226 kip-ft. / lf.
ADD'L MOM = 0.007 kip-ft. / lf.
PARAPET MOM = 0.671 kip-ft. / lf.

TOTAL MOM = 0.904 kip-ft. / lf. KIP-FT/LF

DL MOMENT @ EDGE OF BARRIER:

SLAB MOM = 0.105 kip-ft. / lf.
ADD'L MOM = 0.000 kip-ft. / lf.
PARAPET MOM = 0.390 kip-ft. / lf.

TOTAL MOM = 0.495 kip-ft. / lf.

DEAD LOAD MOMENT @ FLANGE= 1.3 * TOTAL MOMENT = 1.175 kip-ft. / lf.
D.L. MOMENT @ EDGE OF BARRIER= 1.3 * TOTAL MOMENT = 0.644 kip-ft. / lf.

LIVE LOAD

WHEEL LOAD 16 kips

IMPACT = 1.30
MOM ARM (X)= 0.19 ft.
E = 0.8 * X + 3.75 = 3.91 ft.

LIVE LOAD MOMENT = 2.17 * (P(LL + I) / E) * X = 2.246 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 = 0.255 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) = 1.66 ft.
E = 0.8 * X + 5.00 = 6.33 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 = 10.578 kip-ft. / lf.

RAIL MOM @ EDGE OF BARRIER= 2.17 * (P_{rail}/ E) * H = 11.597 kip-ft. / lf.

SUMMARY OF MOMENTS:

DL + LL @ FLANGE = 3.676 kip-ft. / lf.
DL + RAIL @ FLANGE = 11.754 kip-ft. / lf.
DL + RAIL @ BARRIER = 12.240 kip-ft. / lf.

TOTAL DESIGN MOMENT (∅ Mu) = 12.240 KIP-FT / LF = 146.89 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} = 4.438 in. USE **5 BAR** As = 0.31 in.^2 / lf.

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

TOP STEEL

239.625 As - 45.38 As^2 = 146.89 k-in. / lf.

TOP BAR = NO. 5 SPACED AT 7.25 in. As = 0.51 in.^2 / lf.

∅ Mn = 111.01 k-in. / lf. < ∅ Mu = 146.89 k-in. / lf. ADD. REINF. NEEDED!

ADD'L BAR = NO. 5 SPACED AT 14.50 in. As = 0.26 in.^2 / lf.

Mn = 157.55 k-in. / lf. > Mu = 146.89 k-in. / lf. OK

BRIDGE: I-575 over Noonday Creek North
COUNTY: CHEROKEE
P.I. NO: 713640
PROJECT: NH000-0575-01(028)

J.B. TRIMBLE, INC.

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

✓ JCR 10-9-09

Span 3

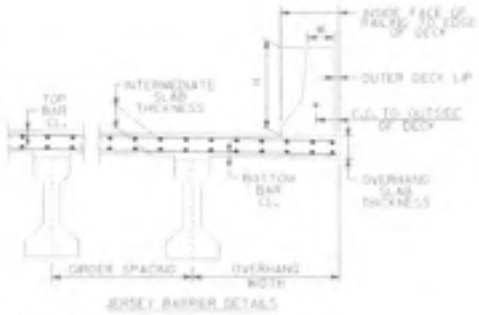
PRELIMINARY INFORMATION

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

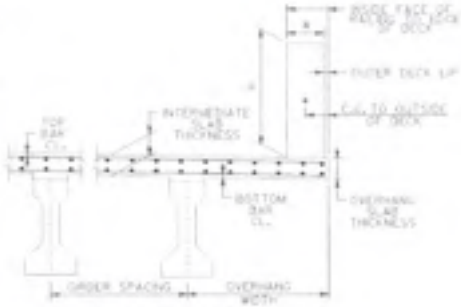
INTERIOR BEAM TYPE: PSC-Type II (TB, PSC, BULB-T)

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

INTERIOR BEAM TOP FLANGE WIDTH =	12 in.	
FASCIA BEAM TOP FLANGE WIDTH =	12 in.	
INTERMEDIATE SLAB THICKNESS =	7.500 in.	
OVERHANG SLAB THICKNESS =	7.500 in.	
GIRDER SPACING =	6.071 ft.	
NUMBER OF GIRDERS =	5	
OVERHANG WIDTH =	2.693 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 =	0.000 in.	
INSIDE FACE OF RAILING TO EDGE OF DECK =	1.500 ft.	
C.G. FROM OUTSIDE =	6.455 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 =	2880.00 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 = 1.0417 %

INTERMEDIATE SLAB DESIGN

EFFECTIVE SPAN LENGTH = 5.071 ft. *AASHTO 3.24.1.2*

DEAD LOAD

SLAB D.L. = 0.094 kips / ft. / lf.
ADDITIONAL D.L. = 0.030 kips / ft. / lf.

TOTAL D.L. = 0.124 kips / ft. / lf.

DEAD LOAD MOMENT = 1.3 * (WT DL) * (SPAN)^2 / 10 = 0.414 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 = 7.979 kip-ft. / lf. *AASHTO 3.24.3.1*

CENTRIFUGAL LOAD *AASHTO 3.10.1*

C = 6.66 * S^2/ R = 0.114 FRACTION OF LIVE LOAD

CENTRIFUGAL FORCE MOMENT = 1.3 * ((S + 2)/32) * P (LL+ I) * 0.8 * C = 0.543 kip-ft. / lf. *AASHTO TABLE 3.22.1A*

TOTAL DESIGN MOMENT (∅ Mu) = 8.936 kip-ft. / lf. = 107.23 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} = 4.438 in. USE 5 BAR As = 0.31 in.^2 / lf.

d_{bot} = 5.938 in. USE 5 BAR As = 0.31 in.^2 / lf.

TOP STEEL

239.625 As - 45.38 As^2 = 107.23 k-in. / lf.

TOP BAR = NO.	5	SPACED AT	7.250 in.	As =	0.51 in.^2 / lf.

∅ Mn = 111.01 k-in. / lf. ≥ ∅ Mu = 107.23 k-in. / lf. OK

BOTTOM STEEL

320.625 As - 45.38 As^2 = 107.23 k-in. / lf.

BOT BAR = NO.	5	SPACED AT	7.250 in.	As =	0.51 in.^2 / lf.

∅ Mn = 152.57 k-in. / lf. ≥ ∅ Mu = 107.23 k-in. / lf. OK

BRIDGE: I-575 over Noonday Creek North
COUNTY: CHEROKEE
P.I. NO: 713640
PROJECT: NH000-0575-01(028)

J.B. TRIMBLE, INC.

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

Span 3

OVERHANG SLAB DESIGN

EFFECTIVE SPAN LENGTH = 2.193 ft. *AASHTO 3.24.5.1*

DEAD LOAD

BARRIER WEIGHT = 0.405 klf
FENCING WEIGHT = 0.000 klf

SLAB D.L. = 0.094 kips / ft. / lf.
ADDITIONAL D.L. = 0.030 kips / ft. / lf.
PARAPET D.L. = 0.405 kips / ft. / lf.

DL MOMENT @ FLANGE:

SLAB MOM = 0.225 kip-ft. / lf.
ADD'L MOM = 0.007 kip-ft. / lf.
PARAPET MOM = 0.671 kip-ft. / lf.

TOTAL MOM = 0.903 kip-ft. / lf. KIP-FT/LF

DL MOMENT @ EDGE OF BARRIER:

SLAB MOM = 0.105 kip-ft. / lf.
ADD'L MOM = 0.000 kip-ft. / lf.
PARAPET MOM = 0.390 kip-ft. / lf.

TOTAL MOM = 0.495 kip-ft. / lf.

DEAD LOAD MOMENT @ FLANGE= 1.3 * TOTAL MOMENT = 1.174 kip-ft. / lf.
D.L. MOMENT @ EDGE OF BARRIER= 1.3 * TOTAL MOMENT = 0.644 kip-ft. / lf.

LIVE LOAD

WHEEL LOAD 16 kips

IMPACT = 1.30
MOM ARM (X)= 0.19 ft.
E = 0.8 * X + 3.75 = 3.90 ft.

LIVE LOAD MOMENT = 2.17 * (P(LL + I) / E) * X = 2.228 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 = 0.253 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) = 1.65 ft.
E = 0.8 * X + 5.00 = 6.32 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 = 10.580 kip-ft. / lf.

RAIL MOM @ EDGE OF BARRIER= 2.17 * (P_{rail}/ E) * H = 11.597 kip-ft. / lf.

SUMMARY OF MOMENTS:

DL + LL @ FLANGE = 3.655 kip-ft. / lf.
DL + RAIL @ FLANGE = 11.754 kip-ft. / lf.
DL + RAIL @ BARRIER = 12.240 kip-ft. / lf.

TOTAL DESIGN MOMENT (∅ Mu) = 12.240 KIP-FT / LF = 146.89 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} = 4.438 in. USE **5 BAR** As = 0.31 in.^2 / lf.

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

TOP STEEL

239.625 As - 45.38 As^2 = 146.89 k-in. / lf.

TOP BAR = NO. 5 SPACED AT 7.25 in. As = 0.51 in.^2 / lf.

∅ Mn = 111.01 k-in. / lf. < ∅ Mu = 146.89 k-in. / lf. ADD. REINF. NEEDED!

ADD'L BAR = NO. 5 SPACED AT 14.50 in. As = 0.26 in.^2 / lf.

Mn = 157.55 k-in. / lf. ≥ Mu = 146.89 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.

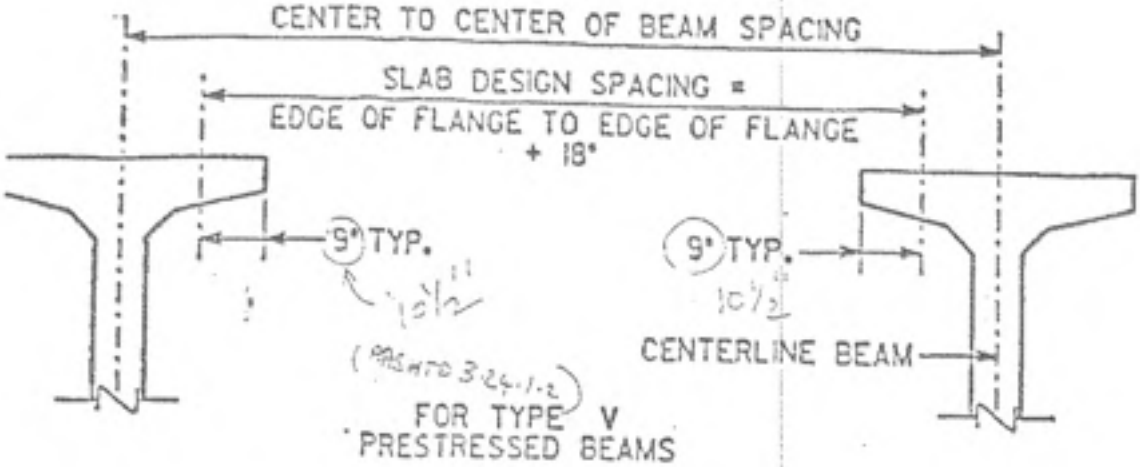
Note that ¼" of concrete thickness may be planed off of the top of cast-in-place decks on interstate routes, state routes and routes with design year ADT equal to or greater than 2000. Therefore, reduce slab thickness accordingly for strength calculations of composite slabs on steel or PSC beams and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

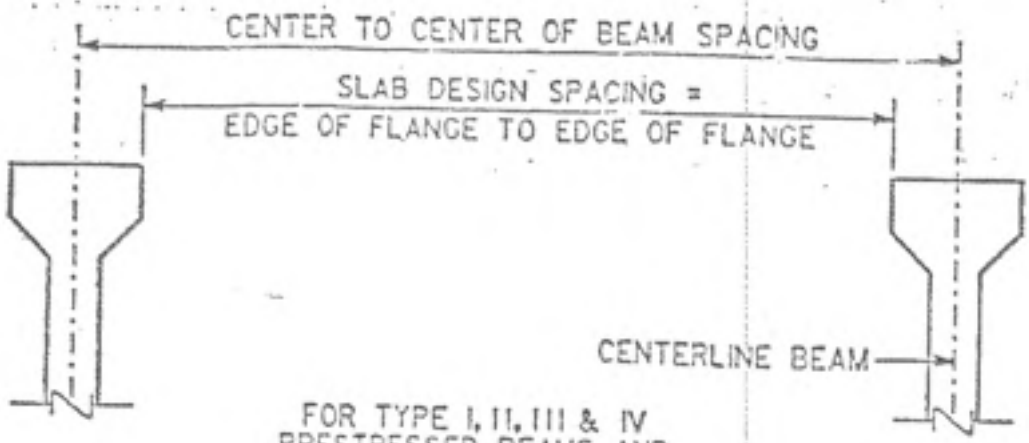
Deck slabs shall be designed by the Service Load method with f_c = 1400 psi (10 MPa), as a rule.

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





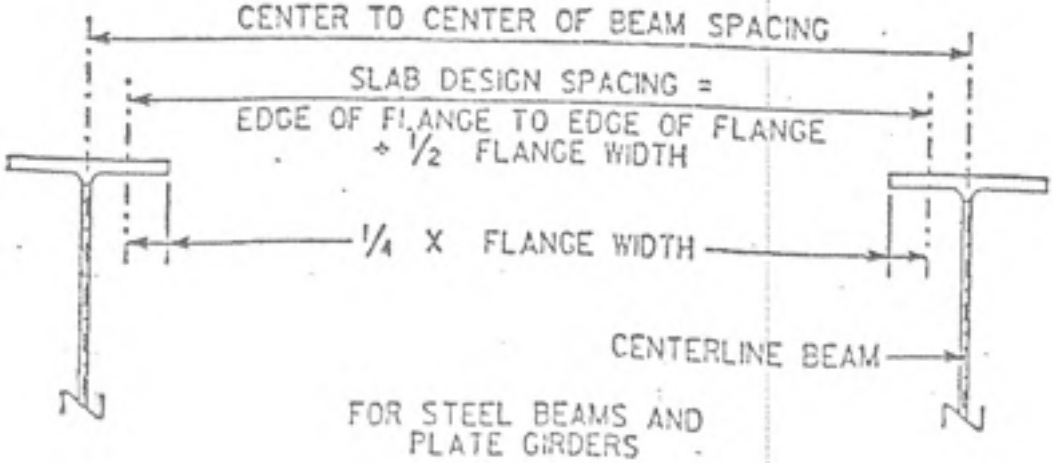


FIG. NO. 1 (cont'd)

CALCULATION COVER SHEET

PROJECT	JOB NO.	CALC NO.	SHEET
I-75 / I-575 NORTHWEST CORRIDOR	NH000-0575-01(028)	BR#40	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, 2, and 3.

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	16	16	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#40

SUBJECT: Beam Design Input - Span 1
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 Noonday Creek North
COUNTY: CHEROKEE
P.I. NO: 713640
PROJECT: NH000-0575-01(028)

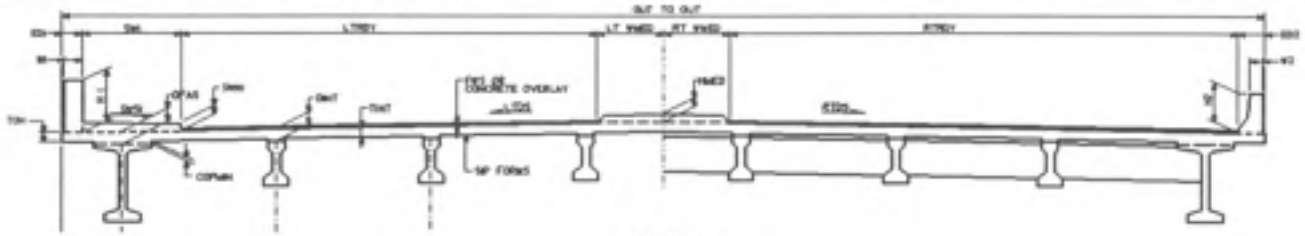
J.B. TRIMBLE, INC.
JBT

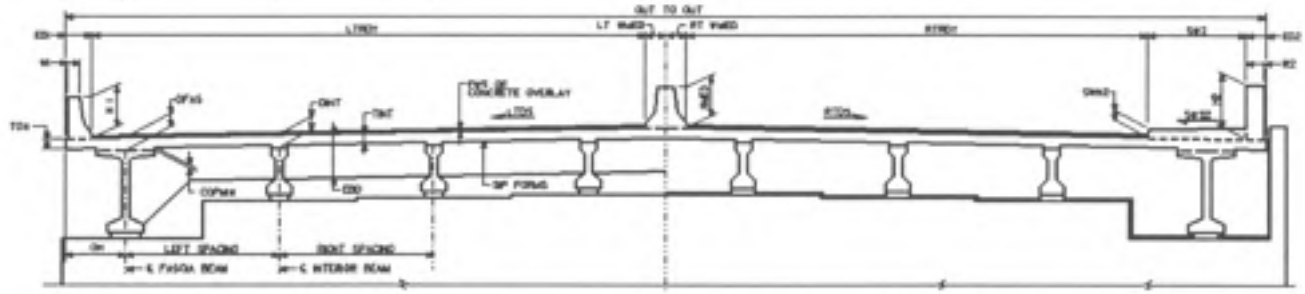
JOB NO: 255717
DESIGNED BY: WBN
CHECKED BY: JCR

JCR 12-7-09

Description: Type II at 6.065ft
Design Span Length: 67.024 ft.
Span No.: 1 Center

TYPICAL DECK SECTIONS





SECTION THRU EDGE BEAM **SECTION THRU ENDWALL**

Description: Type II at 6.065ft
Design Span Length: 67.024 ft.
Span No.: 1 Center

NON-COMPOSITE DEAD LOADS PER BEAM:

SLAB:

D_{INT} = 10 in.

T_{INT} = 7.5 in.
INTEGRAL WEARING SURFACE THICKNESS = 0.25 in.
DESIGN T_{INT} = 7.25 in.

INT. COP_{MIN} = 0.75 in.
INT. COP_{MAX} = 2.5 in.

INT. COP DEPTH DESIGN METHOD: Average Coping

INT. COP_{WIDTH} = 12 in.
AVG. INT. COP DEPTH = 1.625 in.

SIP FORMS: Yes

SLAB CONC $_{WEIGHT}$ = 0.150 k/ft^3

BEAM CONC $_{WEIGHT}$ = 0.150 k/ft^3

INT. $SLAB_{WEIGHT}$ = 0.569 klf

INTEGRAL WEARING $SURFACE_{WEIGHT}$ = 0.019 klf

INT. COP_{WEIGHT} = 0.020 klf

INT. SIP_{WEIGHT} = 0.081 klf

INT. $BEAM_{WEIGHT}$ = 0.384 klf

NON-COMPOSITE DEAD LOAD PER BEAM = 1.054 klf

INTERIOR BEAM PROPERTIES:

INT. BEAM TYPE: Type II

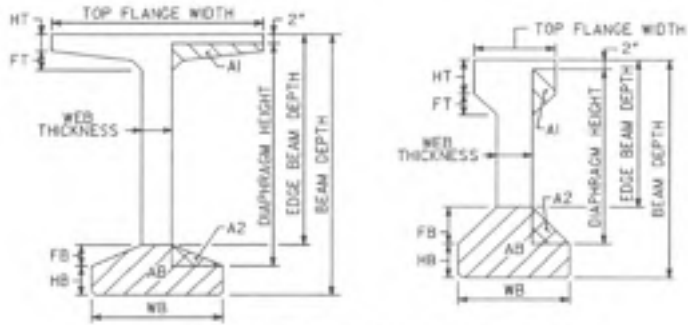
Top Flange Width = 12 in.
Beam Depth = 36 in.
Web Thickness = 6 in.
H_T = 6 in.
F_T = 3 in.
H_B = 6 in.
W_B = 18 in.
F_B = 6 in.
E.B. Depth (no coping) = 24 in.
Diaphragm Height = 28 in.
Cross Sectional Area = 369 in^2
A1 = 16.5 in^2
A2 = 18 in^2
AB = 180 in^2
INT. $BEAM_{WEIGHT}$ = 0.384 klf

CONCRETE STRENGTHS:

$f'_{c\,BEAM}$ = 7800 psi
$f'_{c\,BEAM}$ = 6800 psi
$f'_{c\,SLAB}$ = 3500 psi

SIT = 0.247 k / in^2
SFB = 0.530 k / in^2

TYPE OF STRANDS = 0.6 in. dia. low-relax 0.2217 sq. in.
DRAPED STRANDS ? Yes
RB_{FIN} = 0.75
RT_{FIN} = 0.75



DEFINITION OF BEAM AREAS FOR EB. & DIAPH. CALCS

BRIDGE: I-575 over Noonday Creek North
COUNTY: CHEROKEE
P.I. NO: 713640
PROJECT: NH000-0575-01(028)
Description: Type II at 6.065ft
Design Span Length: 67.024 ft.
Span No.: 1 Center

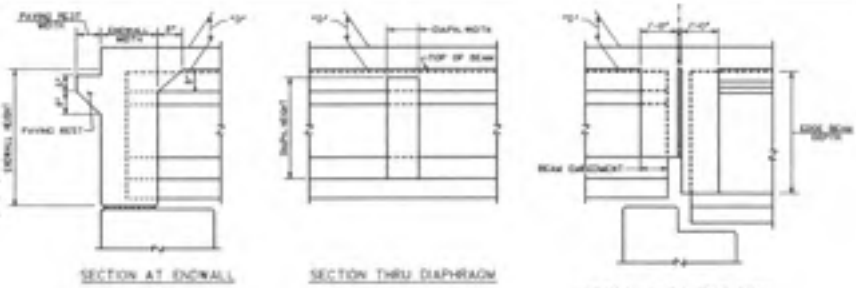
J.B. TRIMBLE, INC.

JOB NO: 258717
DESIGNED BY: WBN
CHECKED BY: JCR

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

SPAN TYPE:	End Span
EW. TYPE:	Endwall 1: Expansion
INT. EW. WIDTH =	1.50 ft.
INT. EW. HEIGHT =	3.46 ft.
BM. EMBED. FOR EW. =	7 in.
PAV. REST WIDTH =	8 in.
INT. EW. WEIGHT =	7.254 kips
DIAPH. WIDTH =	10 in.
DIAPH. HEIGHT =	28 in.
INT. DIAPH. WEIGHT =	1.563 kips
INT. EB. HEIGHT =	26.5 in.
INT. EB. WIDTH =	12 in.
BM. EMBED. FOR EB. =	0 in.
INT. EB. WEIGHT =	2.769 kips

DIAPHRAGMS
1



SECTION AT ENDWALL — SECTION THRU DIAPHRAGM — SECTION THRU EDGE BEAM

INT. P-LOADS	LOAD	POSITION	REACTION	MOMENT
EW. =	7.254 kips	0.00 ft.	7.254 kips	0.000 k-ft.
DIAPH. =	1.563 kips	33.51 ft.	0.782 kips	26.194 k-ft.
DIAPH. =	N/A	N/A	N/A	N/A
DIAPH. =	N/A	N/A	N/A	N/A
EB. =	2.769 kips	67.02 ft.	0.000 kips	0.000 k-ft.
	TOTAL POINT DEAD LOAD PER BEAM =		8.036 kips	26.194 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: NEW Barrier

RIGHT BARRIER

BARRIER TYPE:	None
FENCING OPTION:	None
ED_2 =	0.000 ft.
W_2 =	0 ft.
H_2 =	0 ft.
RTDS =	7.0000 %

IS MEDIAN BARRIER CENTERED?	No
OFFSET TO LEFT OR RIGHT?	Left
OFFSET DISTANCE =	21.759 ft.

BRIDGE TYPE =	Bridge Widening
SPAN LENGTH =	67.024 ft.
SKEW ANGLE =	46.5266 degrees
LEFT SPACING =	6.0652 ft.
RIGHT SPACING =	6.0652 ft.
LEFT OVERHANG =	0 ft.
RIGHT OVERHANG =	2.6942 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 =	5 beams
NO. OF BEAMS IN EXISTING BRIDGE =	12 beams
NO. OF SET BEAMS W/ COMP. LOADS =	0 beams
TOTAL NO. OF BEAMS SUPPORTING WIDENING =	5 beams
NO. OF NEW BAYS =	5 bays

WIDENED BRIDGE OUT TO OUT =	31.795 ft.	NOTE: BRIDGE WIDENING IS TO ONE SIDE ONLY!
EXISTING BRIDGE OUT TO OUT =	69.072 ft.	
FINISHED BRIDGE OUT TO OUT =	100.777 ft.	
Ignore Median only for RDWY Width Calculations <	No	Width of Median = 2 ft.
LT RDWY =	26.005 ft.	
RT RDWY =	71.148 ft.	
TOTAL WIDENED RDWY WIDTH =	99.152 ft.	Including median width

Description: Type II at 6.065ft
Design Span Length: 67.024 ft.
Span No.: 1 Center

SUPERIMPOSED DEAD LOADS:

LEFT BARRIER

BARRIER WEIGHT =	0.405 klf
FENCING WEIGHT =	0.000 klf

MEDIAN

MEDIAN WEIGHT = 0.472 klf

RIGHT BARRIER

BARRIER WEIGHT =	0.000 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.

OUT TO OUT DIST. GREATER THAN 66'-5. DISTRIBUTE BARRIER DL et. al. ONTO OUTER BEAMS!

BEAM ON CENTERLINE ?	Yes
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 =	4 beams
OVERRIDE NO. OF BM. TO DIST. MED. BARRIER ?	Yes
NO. OF BEAMS DIST. TO MED. BARRIER =	4 beams
OVERRIDE NO. OF BM. TO DIST. RT BARRIER ?	No
NO. OF BEAMS DIST. TO RT BARRIER =	0 beams

BEAMS SUPPORTING LT BARRIER: **BM 1 - BM 4**

BEAMS SUPPORTING MED BARRIER: BM 4 - BM 7

BEAMS SUPPORTING RT BARRIER:

SUPERIMPOSED LOADS PER BRIDGE:

FWS WEIGHT =	2.975 klf per bridge
DECK OVERLAY WT. =	0.000 klf per bridge
UTILITY WEIGHT TO SUPERSTRUCTURE =	0.000 klf per bridge
TOTAL SUPERIMPOSED DEAD LOAD =	**3.891 klf per bridge**

SUPERIMPOSED LOADS PER BEAM:

FWS WEIGHT =	0.182 klf per beam
DECK OVERLAY WT. =	0.000 klf per beam
UTILITY WEIGHT TO SUPERSTRUCTURE =	0.000 klf per beam
LT BARRIER DEAD LOAD =	0.101 klf per beam
MED. BARRIER DEAD LOAD =	0.118 klf per beam
RT BARRIER DEAD LOAD =	0.000 klf per beam
DOUBLE LOADING DEAD LOAD =	0.219 klf per beam
CONTROLLING SUPERIMPOSED DEAD LOAD =	0.401 klf per beam

DOUBLE LOADING GOVERNS DESIGN

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

DOUBLED LOADING CASES

	BARRIER ONLY	RAISED MEDIAN	MED. BAR.
WITHOUT OVERRIDE	0.101 klf per beam	0.258 klf per beam	0.219 klf per beam
WITH OVERRIDE	0.101 klf per beam	0.258 klf per beam	0.219 klf per beam

COMPOSITE SECTION MODULUS CALC:

SPAN LENGTH = 67.024 ft.

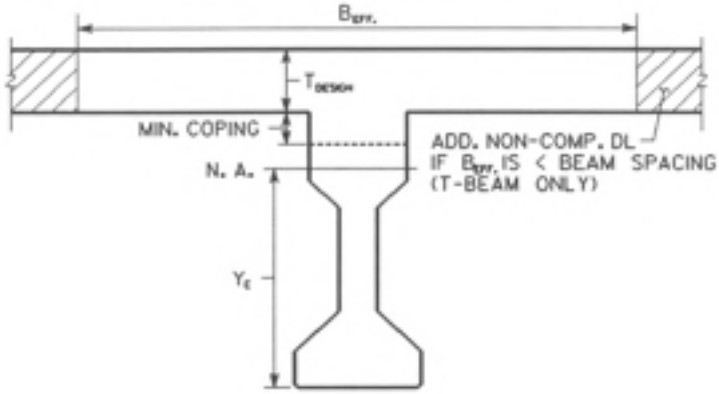
BEAM MOMENT OF INERTIA =	50,879 in^4	
BEAM Y_{BM} =	15.83 in.	
INT. COP_{MIN} =	0.75 in.	
DESIGN T_{DIST} =	7.25 in.	
E_{BM} =	5.35 x 10^6 psi	
E_{SLAB} =	3.59 x 10^6 psi	
modular ratio =	1.49	

AASHTO 8.10.1.1 - Compression Flange Width

wBM FLANGE =	12.00	in.
B_{eff} = Bm Spacing =	**72.78**	**in. CONTROLS**
B_{eff} = ¼ Span Length =	**201.07**	in.
B_{eff} = WBM FLANGE + 2[6 tSLAB] =	**99.00**	in.
Add. Non-Comp. DL (WDLNC) =	0.000 klf	(T Beam Only)
Y_C =	27.92 in.	
COMPOSITE MOM. OF INERTIA =	161,826 in^4	

COMPOSITE SECTION MODULI:

SECTION MOD. AT TOP OF SLAB =	10,064 in^3
SECTION MOD. AT TOP OF BEAM =	20,028 in^3
SECTION MOD. AT BOT. OF BEAM =	5,796 in^3



Description: Type II at 6.065ft
Design Span Length: 67.024 ft.
Span No.: 1 Center

DISTRIBUTION & DEFLECTION FACTOR CALCS:

DISTRIBUTION FACTOR CALCS:

MOMENT	1.103	WHEEL
	0.551	AXLE
SHEAR	1.351	WHEEL
	0.676	AXLE

DEFLECTION FACTOR CALCS:

ALLOW USER TO DEFINE NO. OF LANES ?	Yes	
USER DEFINED NO. OF LANES =	9	6.0652 ft.
		6.0652 ft.
ALLOW USER TO DEFINE NO. OF BEAMS ?	Yes	
USER DEFINED NO. OF BEAMS =	17	-> 17 beams will be used for DFD calcs.
REDUCTION FACTOR =	0.75	
DFD =	0.794	

(ASHTO 4.7.3) =

LIVE LOAD CALCS:

LEFT SIDEWALK LIVE LOAD:

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

RIGHT SIDEWALK LIVE LOAD:

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

IMPACT FACTOR: 1.26

HS 20 LOADING:

			REACTION	R x DF x I
MIDSPAN:	926.000 k-ft.	TRUCK:	61.970 kips	48.080 kips
MAX:	931.851 k-ft.	LANE:	47.440 kips	37.045 kips

	REACTION	MOMENT
TOTAL LL+I =	48.080 kips	643.526 k-ft.
	MAX TOTAL LL+I =	**647.592 k-ft.**

BRIDGE: I-575 over Noonday Creek North
COUNTY: CHEROKEE
P.I. NO: 713640
PROJECT: NH000-0575-01(028)

J.B. TRIMBLE, INC.

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

SUMMARY OF DEAD & LIVE LOADINGS:

NON-COMPOSITE DEAD LOADS PER BEAM:

INT. SLAB $_{WEIGHT}$ =	0.569 klf
INT. COP $_{WEIGHT}$ =	0.020 klf
INT. SIP $_{WEIGHT}$ =	0.081 klf
INT. BEAM $_{WEIGHT}$ =	0.384 klf
TOTAL N-COMP. DL =	1.054 klf

SUPERIMPOSED DEAD LOADS PER BEAM:

LEFT BARRIER WEIGHT =	0.101 klf
LEFT FENCING WEIGHT =	0.000 klf
MEDIAN WEIGHT =	0.118 klf
RIGHT BARRIER WEIGHT =	#DIV/0!
RIGHT FENCING WEIGHT =	#DIV/0!
FWS WEIGHT =	0.182 klf
DECK OVERLAY WT. =	0.000 klf
UTILITY WEIGHT =	0.000 klf
TOTAL SUPERIMPOSED DL =	0.401 klf

LOADING RESULTS

	LOADING	REACTION	MOMENT
TOTAL N-COMP. DL =	1.054 klf	35.333 kips	592.044 k-ft
TOTAL SUPERIMPOSED DL =	0.401 klf	13.437 kips	225.148 k-ft
TOTAL POINT DL =		8.036 kips	26.194 k-ft
TOTAL DL =	**1.455 klf**	**56.806 kips**	**843.387 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 =		**48.080 kips**	**643.526 k-ft**
TOTAL DL + SW LL + (LL + I) =		**104.886 kips**	**1486.913 k-ft.**

Description: Type II at 6.065ft
Design Span Length: 67.024 ft.
Span No.: 1 Center

SUMMARY OF PROGRAM INPUT:

SIMPLE SPAN PROGRAM INPUT:

INTERIOR BEAM

LENGTH =	67.024 ft.	$f'_{c\ DECK}$ =	7800 psi
Moment Dist. Factor (DFM) =	1.103	$f'_{c\ BEAM}$ =	6800 psi
End Shear Dist. Factor (DFV) =	1.351	SIT =	0.247 k / in^2
LL Deflection Dist. Factor (DFD) =	0.794	SFB =	0.530 k / in^2
Non- Composite DL ($W_{N.C.}$) =	0.670 klf	E_{BM} =	5.35 x 10^6 psi
Composite DL ($W_{D.C.}$) =	0.401 klf	$E_{D.K}$ =	3.59 x 10^6 psi
Sidewalk LL (W_{LL}) =	0.000 klf		
Effective Concrete Width (W) =	72.76 in.		
Concrete Slab Thickness (T) =	7.250 in.		
Minimum Coping (D) =	0.750 in.		

P-LOADS:	P1	P2	P3	P4	P5
X	0.000 ft.	33.5/12 ft.	67.024 ft.	N/A	N/A
LOAD	7.254 kips	1.563 kips	2.769 kips	N/A	N/A

CALCULATION SHEET

PROJECT: I-75 / I-575 NORTHWEST CORRIDOR
JOB NUMBER NH000-0575-01(028)
CALC NO. BR#40

SUBJECT: Beam Design Input - Span 2
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 Noonday Creek North
COUNTY: CHEROKEE
P.I. NO: 713640
PROJECT: NH000-0575-01(028)

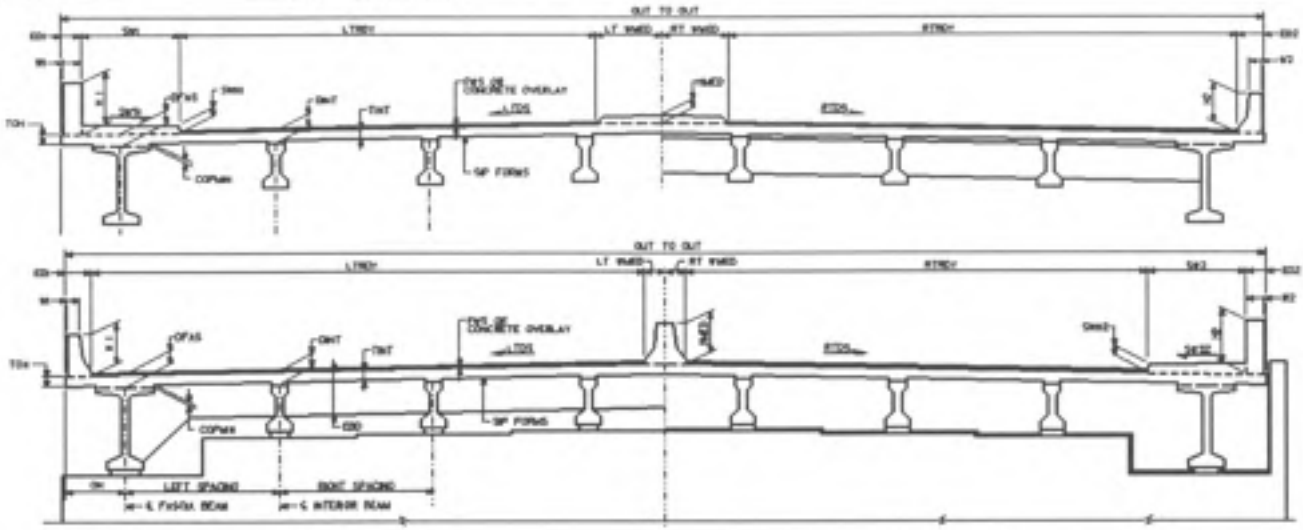
J.B. TRIMBLE, INC.
JBT

JOB NO: 285717
DESIGNED BY: WBN
CHECKED BY: JCR

✓ JCR 10-7-09

Description: Type II at 6.06ft
Design Span Length: 67.555 ft.
Span No.: 2 Center

TYPICAL DECK SECTIONS



SECTION THRU EDGE BEAM

SECTION THRU ENDWALL

Description: Type II at 6.06ft
Design Span Length: 67.555 ft.
Span No.: 2 Center

NON-COMPOSITE DEAD LOADS PER BEAM:

SLAB

D_{INT} = 10 in. ✓

T_{INT} = 7.5 in. ✓

INTEGRAL WEARING SURFACE THICKNESS = 0.25 in. ✓

DESIGN T_{INT} = 7.25 in. ✓

INT. COP_{MIN} = 0.75 in. ✓

INT. COP_{MAX} = 2.5 in.

INT. COP. DEPTH DESIGN METHOD: Average Coping

INT. COP_{WIDTH} = 12 in. ✓

AVG. INT. COP DEPTH = 1.625 in. ✓

SIP FORMS: Yes ✓

SLAB $CONC._{WEIGHT}$ = 0.150 k/ft^3 ✓

BEAM $CONC._{WEIGHT}$ = 0.150 k/ft^3 ✓

INT. $SLAB_{WEIGHT}$ = 0.569 klf ✓

INTEGRAL WEARING $SURFACE_{WEIGHT}$ = 0.019 klf ✓

INT. COP_{WEIGHT} = 0.020 klf ✓

INT. SIP_{WEIGHT} = 0.081 klf ✓

INT. $BEAM_{WEIGHT}$ = 0.384 klf ✓

NON-COMPOSITE DEAD LOAD PER BEAM = 1.055 klf ✓

INTERIOR BEAM PROPERTIES:

INT. BEAM TYPE: Type II ✓

Top Flange Width = 12 in. ✓
Beam Depth = 36 in. ✓
Web Thickness = 6 in.
H_1 = 6 in.
F_1 = 3 in. ✓
H_2 = 6 in. ✓
W_2 = 18 in. ✓
F_2 = 6 in. ✓
E.B. Depth (no coping) = 24 in.
Diaphragm Height = 28 in.
Cross Sectional Area = 369 in^2 ✓
A1 = 16.5 in^2
A2 = 18 in^2
AB = 180 in^2
INT. $BEAM_{WEIGHT}$ = 0.384 klf ✓

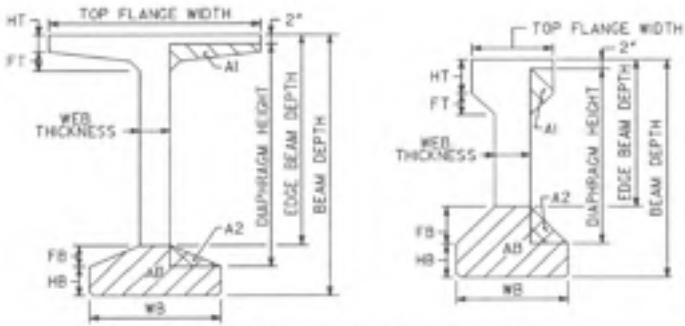
CONCRETE STRENGTHS

$f'_{c\,BEAM}$ = 7800 psi
$f'_{c\,DIA}$ = 6800 psi
$f'_{c\,SLAB}$ = 3500 psi

S/T = 0.247 k / in^2
S/B = 0.530 k / in^2

TYPE OF STRANDS = 0.6 in. dia. low-relax — 0.217 sq. in.
DRAPED STRANDS ? Yes

RS_{EXL} = 0.75
RT_{EXL} = 0.75



DEFINITION OF BEAM AREAS FOR EB. & DIAPH. CALCS

BRIDGE: I-575 over Noonday Creek North
COUNTY: CHEROKEE
P.I. NO: 713640
PROJECT: NH000-0575-01(028)
Description: Type II at 6.0685
Design Span Length: 67.555 ft.
Span No.: 2 Center

J.B. TRIMBLE, INC.

JOB NO: 258717
DESIGNED BY: WBN
CHECKED BY: JCR

EW, DIAPH, EDGE BEAM DIMENSIONS & CALCS:

SPAN TYPE: Intermediate Span

SECTION AT ENDWALL — SECTION THRU DIAPHRAGM — SECTION THRU EDGE BEAM

		# DIAPHRAGMS
DIAPH. WIDTH =	10 in.	
DIAPH. HEIGHT =	28 in.	1
INT. DIAPH. WEIGHT =	1.564 kips	
INT. EB. HEIGHT =	28.5 in.	
INT. EB. WIDTH =	12 in.	
BM. EMBED. FOR EB. =	0 in.	
INT. EB. WEIGHT =	2.837 kips	

INT. P-LOADS:	LOAD	POSITION	REACTION	MOMENT
EB. =	2.837 kips	0.00 ft.	2.837 kips	0.000 k-ft.
DIAPH. =	1.564 kips	33.78 ft.	0.782 kips	26.417 k-ft.
DIAPH. =	N/A	N/A	N/A	N/A
DIAPH. =	N/A	N/A	N/A	N/A
EB. =	2.837 kips	67.55 ft.	0.000 kips	0.000 k-ft.
	TOTAL POINT DEAD LOAD PER BEAM =		3.619 kips	26.417 k-ft.

DECK SECTION DIMENSIONS & CALCS:

LEFT BARRIER

BARRIER TYPE: Jersey Barrier
FENCING OPTION: None
ED_L = 1.625 ft.
W_L = 0.75 ft.
H_L = 2.667 ft.
LTDS = 7.0000 %

MEDIAN

MEDIAN TYPE: Jersey Barrier

RIGHT BARRIER

BARRIER TYPE: None
FENCING OPTION: None
ED_R = 0.000 ft.
W_R = 0 ft.
H_R = 0 ft.
RTDS = 7.0000 %

IS MEDIAN BARRIER CENTERED? No
OFFSET TO LEFT OR RIGHT? Left
OFFSET DISTANCE = 23.413 ft.

BRIDGE TYPE = Bridge Widening
SPAN LENGTH = 67.555 ft.
SKEW ANGLE = 45.1181 degrees

LEFT SPACING = 6.0682 ft.
RIGHT SPACING = 6.0682 ft.
LEFT OVERHANG = 0 ft.
RIGHT OVERHANG = 2.6843 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 = 5 beams
NO. OF BEAMS IN EXISTING BRIDGE = 12 beams
NO. OF SET BEAMS W/ COMP. LOADS = 0 beams
TOTAL NO. OF BEAMS SUPPORTING WIDENING = 5 beams
NO. OF NEW BAYS = 5 bays

WIDENED BRIDGE OUT TO OUT = 31.717 ft.
EXISTING BRIDGE OUT TO OUT = 72.365 ft.
FINISHED BRIDGE OUT TO OUT = 104.082 ft.

NOTE: BRIDGE WIDENING IS TO ONE SIDE ONLY!

Ignore Median strip for RDWY Width Calculations = No — Width of Median = 2 ft.

LT RDWY = 26.003 ft.
RT RDWY = 74.454 ft.
TOTAL WIDENED RDWY WIDTH = 102.457 ft. Including median width

Description: Type II at 6.0685
Design Span Length: 67.555 ft.
Span No.: 2 Center

SUPERIMPOSED DEAD LOADS:

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

MEDIAN
MEDIAN WEIGHT = 0.472 klf

RIGHT BARRIER
BARRIER WEIGHT = 0.000 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.

OUT TO OUT DIST. GREATER THAN 66'-0, DISTRIBUTE BARRIER DL wt. at. ONTO OUTER BEAMS!

BEAM ON CENTERLINE ? Yes

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 = 4 beams

BEAMS SUPPORTING LT BARRIER
BM 1 - BM 4

OVERRIDE NO. OF BM. TO DIST. MED. BARRIER ? Yes

NO. OF BEAMS DIST. TO MED. BARRIER = 4 beams

BEAMS SUPPORTING MED BARRIER
BM 4 - BM 7

OVERRIDE NO. OF BM. TO DIST. RT BARRIER ? No
NO. OF BEAMS DIST. TO RT BARRIER = 0 beams

BEAMS SUPPORTING RT BARRIER

SUPERIMPOSED LOADS PER BRIDGE:

FWS WEIGHT = 3.874 klf per bridge
DECK OVERLAY WT. = 0.000 klf per bridge
UTILITY WEIGHT TO SUPERSTRUCTURE = 0.000 klf per bridge
TOTAL SUPERIMPOSED DEAD LOAD = 3.951 klf per bridge

SUPERIMPOSED LOADS PER BEAM:

FWS WEIGHT = 0.182 klf per beam
DECK OVERLAY WT. = 0.000 klf per beam
UTILITY WEIGHT TO SUPERSTRUCTURE = 0.000 klf per beam

LT BARRIER DEAD LOAD = 0.101 klf per beam
MED. BARRIER DEAD LOAD = 0.118 klf per beam
RT BARRIER DEAD LOAD = 0.000 klf per beam
DOUBLE LOADING DEAD LOAD = 0.219 klf per beam

DOUBLE LOADING GOVERNS DESIGN

CONTROLLING SUPERIMPOSED DEAD LOAD = 0.401 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	0.101 klf per beam	0.256 klf per beam	0.219 klf per beam
WITH OVERRIDE	0.101 klf per beam	0.256 klf per beam	0.219 klf per beam

BRIDGE: I-575 over Noonday Creek North
COUNTY: CHEROKEE
P.I. NO: 713640
PROJECT: NH000-0575-01(028)

J.B. TRIMBLE, INC.

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

COMPOSITE SECTION MODULUS CALC:

SPAN LENGTH = 67.555 ft.

BEAM MOMENT OF INERTIA =	50,979 in^4
BEAM Y_{bc} =	15.83 in.
INT. COP$_{min}$ =	0.75 in.
DESIGN T_{DEC} =	7.25 in.
E_{DM} =	5.35 x 10^6 psi
E_{SLAB} =	3.59 x 10^6 psi
modular ratio =	1.49

AASHTO 8.10.1.1 - Compression Flange Width

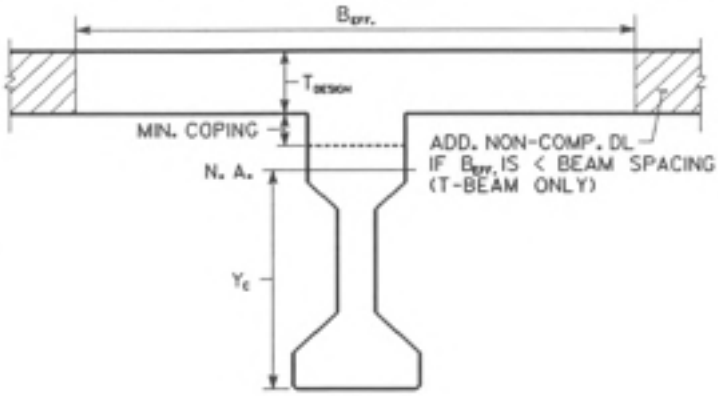
wBM FLANGE =	12.00	in.
B_{eff} = Brn Spacing =	**72.82**	**in. CONTROLS**
B_{eff} = ¼ Span Length =	**202.66**	in.
B_{eff} = WBM FLANGE + 2(8 tSLAB) =	**99.00**	in.

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

Y_c =	27.92 in.
COMPOSITE MOM. OF INERTIA =	161,854 in^4

COMPOSITE SECTION MODULI:

SECTION MOD. AT TOP OF SLAB =	10,067 in^3
SECTION MOD. AT TOP OF BEAM =	20,039 in^3
SECTION MOD. AT BOT. OF BEAM =	5,796 in^3



Description: Type II at 6.06ft
Design Span Length: 67.555 ft.
Span No.: 2 Center

DISTRIBUTION & DEFLECTION FACTOR CALCS:

DISTRIBUTION FACTOR CALCS:

MOMENT	1.103	WHEEL
	0.552	AXLE
SHEAR	1.352	WHEEL
	0.676	AXLE

DEFLECTION FACTOR CALCS:

ALLOW USER TO DEFINE NO. OF LANES ?	Yes	
USER DEFINED NO. OF LANES =	9	6.0682 ft.
		6.0682 ft.
ALLOW USER TO DEFINE NO. OF BEAMS ?	Yes	
USER DEFINED NO. OF BEAMS =	17	-> 17 beams will be used for DFD calcs.
REDUCTION FACTOR =	0.75	
DFD =	0.794	

(Kd=0.673) =

LIVE LOAD CALCS:

LEFT SIDEWALK LIVE LOAD:

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

RIGHT SIDEWALK LIVE LOAD:

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

IMPACT FACTOR: 1.26

HS 20 LOADING:

			REACTION	R x DF x I
MIDSPAN:	935.000 k-ft.	TRUCK:	62.044 kips	48.134 kips
MAX:	940.807 k-ft.	LANE:	47.600 kips	37.163 kips

	REACTION	MOMENT
TOTAL LL+I =	48.134 kips	649.732 k-ft.
	MAX TOTAL LL+I =	**653.768 k-ft.**

BRIDGE: I-575 over Noonday Creek North
COUNTY: CHEROKEE
P.I. NO: 713640
PROJECT: NH000-0575-01(028)

J.B. TRIMBLE, INC.

JOB NO: 256717
DESIGNED BY: WBN
CHECKED BY: JCR

SUMMARY OF DEAD & LIVE LOADINGS:

NON-COMPOSITE DEAD LOADS PER BEAM:

INT. SLAB $_{WEIGHT}$ =	0.569 klf
INT. COP $_{WEIGHT}$ =	0.020 klf
INT. SIP $_{WEIGHT}$ =	0.081 klf
INT. BEAM $_{WEIGHT}$ =	0.384 klf
TOTAL N-COMP. DL =	1.055 klf

SUPERIMPOSED DEAD LOADS PER BEAM:

LEFT BARRIER WEIGHT =	0.101 klf
LEFT FENCING WEIGHT =	0.000 klf
MEDIAN WEIGHT =	0.118 klf
RIGHT BARRIER WEIGHT =	#DIV/0!
RIGHT FENCING WEIGHT =	#DIV/0!
FWS WEIGHT =	0.182 klf
DECK OVERLAY WT. =	0.000 klf
UTILITY WEIGHT =	0.000 klf
TOTAL SUPERIMPOSED DL =	0.401 klf

LOADING RESULTS

	LOADING	REACTION	MOMENT
TOTAL N-COMP. DL =	1.055 klf	35.624 kips	601.646 k-ft
TOTAL SUPERIMPOSED DL =	0.401 klf	13.546 kips	228.780 k-ft
TOTAL POINT DL =		3.619 kips	26.417 k-ft
TOTAL DL =	**1.456 klf**	**52.789 kips**	**856.843 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 =		**48.134 kips**	**649.732 k-ft**
TOTAL DL + SW LL + (LL + I) =		**100.923 kips**	**1506.575 k-ft.**

Description: Type II at 6.066ft
Design Span Length: 67.555 ft.
Span No.: 2 Center

SUMMARY OF PROGRAM INPUT:

SIMPLE SPAN PROGRAM INPUT:

INTERIOR BEAM

LENGTH =	67.555 ft.	$f'_{c\ slab}$ =	7800 psi
Moment Dist. Factor (DFM) =	1.103	$f'_{c\ beam}$ =	6800 psi
End Shear Dist. Factor (DFV) =	1.352	SIT =	0.247 k / in^2
LL Deflection Dist. Factor (DFD) =	0.794	SIB =	0.530 k / in^2
Non- Composite DL ($W_{N.C.}$) =	0.670 klf	E_{beam} =	5.35 x 10^6 psi
Composite DL ($W_{D.C.}$) =	0.401 klf	$E_{D.C.}$ =	3.59 x 10^6 psi
Sidewalk LL (W_{sw}) =	0.000 klf		
Effective Concrete Width (W) =	72.82 in.		
Concrete Slab Thickness (T) =	7.250 in.		
Minimum Coping (Df) =	0.750 in.		

P-LOADS:	P1	P2	P3	P4	P5
X	0.000 ft.	33.777 ft.	67.555 ft.	N/A	N/A
LOAD	2.837 kips	1.564 kips	2.837 kips	N/A	N/A

CALCULATION SHEET

PROJECT: I-75 / I-575 NORTHWEST CORRIDOR
JOB NUMBER NH000-0575-01(028)
CALC NO. BR#40

SUBJECT: Beam Design Input - Span 3
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 Noonday Creek North
COUNTY: CHEROKEE
P.I. NO: 713640
PROJECT: NH000-0575-01(028)

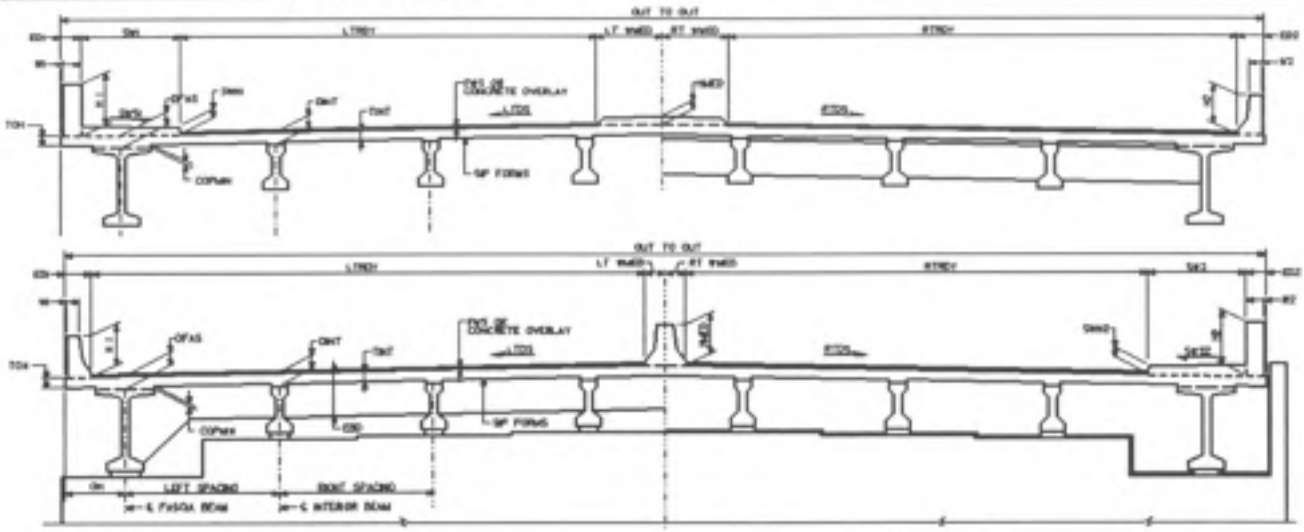
J.B. TRIMBLE, INC.
JBT

JOB NO: 258717
DESIGNED BY: WBN
CHECKED BY: JCR

✓ JCR 10-7-09

Description: Type II at 6.0715
Design Span Length: 67.029 ft.
Span No.: 3 Center

TYPICAL DECK SECTIONS:



SECTION THRU EDGE BEAM

SECTION THRU ENDWALL

Description: Type II at 6.0715
Design Span Length: 67.029 ft.
Span No.: 3 Center

NON-COMPOSITE DEAD LOADS PER BEAM:

SLAB

D_{INT} = 10 in. ✓

T_{INT} = 7.5 in. ✓

INTEGRAL WEARING SURFACE THICKNESS = 0.25 in. ✓

DESIGN T_{INT} = 7.25 in. ✓

INT. COP_{MIN} = 0.75 in. ✓

INT. COP_{MAX} = 2.5 in.

INT. COP. DEPTH DESIGN METHOD: Average Coping

INT. COP_{WIDTH} = 12 in. ✓

AVG. INT. COP DEPTH = 1.625 in. ✓

SIP FORMS: Yes ✓

SLAB $CONC._{WEIGHT}$ = 0.150 k/ft^3 ✓

BEAM $CONC._{WEIGHT}$ = 0.150 k/ft^3 ✓

INT. $SLAB_{WEIGHT}$ = 0.569 kif ✓

INTEGRAL WEARING $SURFACE_{WEIGHT}$ = 0.019 kif ✓

INT. COP_{WEIGHT} = 0.020 kif ✓

INT. SIP_{WEIGHT} = 0.081 kif ✓

INT. $BEAM_{WEIGHT}$ = 0.384 kif ✓

NON-COMPOSITE DEAD LOAD PER BEAM = 1.055 kif ✓

INTERIOR BEAM PROPERTIES:

INT. BEAM TYPE: Type II ✓

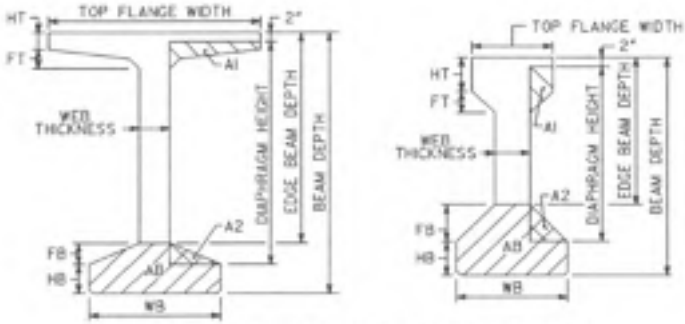
Top Flange Width =	12 in.
Beam Depth =	36 in.
Web Thickness =	6 in.
H_1 =	6 in. ✓
F_1 =	3 in. ✓
H_2 =	6 in.
W_2 =	18 in.
F_2 =	6 in. ✓
E.B. Depth (no coping) =	24 in.
Diaphragm Height =	28 in.
Cross Sectional Area =	369 in^2
A1 =	16.5 in^2
A2 =	18 in^2
AB =	180 in^2
INT. $BEAM_{WEIGHT}$ =	0.384 kif ✓

CONCRETE STRENGTHS

$f'_{c\,BEAM}$ =	7800 psi
$f'_{c\,SLAB}$ =	6800 psi
$f'_{c\,EJ\,SLAB}$ =	3500 psi
SIT =	0.247 k / in^2
SFB =	0.530 k / in^2

TYPE OF STRANDS = 0.6 in. dia. low-relax 0.217 sq. in.
DRAPED STRANDS ? Yes

RB_{FAC} = 0.75
RT_{FAC} = 0.75



DEFINITION OF BEAM AREAS FOR EB, & DIAPH. CALCS

BRIDGE: I-575 over Noonday Creek North
COUNTY: CHEROKEE
P.I. NO: 713640
PROJECT: NH000-0575-01(028)
Description: Type II at 6.071ft
Design Span Length: 67.029 ft.
Span No.: 3 Center

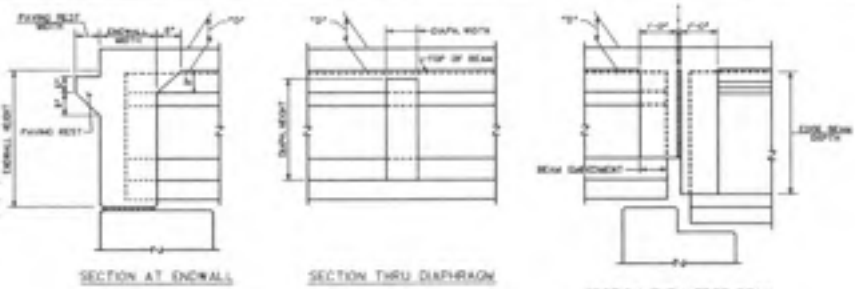
J.B. TRIMBLE, INC.

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

EW, DIAPH, EDGE BEAM DIMENSIONS & CALCS:

SPAN TYPE:	End Span
EW. TYPE:	Endwall 1: Expansion
INT. EW. WIDTH =	1.50 ft.
INT. EW. HEIGHT =	3.46 ft.
BM. EMBED. FOR EW. =	7 in.
PAV. REST WIDTH =	8 in.
INT. EW. WEIGHT =	7.638 kips
DIAPH. WIDTH =	10 in.
DIAPH. HEIGHT =	28 in.
INT. DIAPH. WEIGHT =	1.565 kips
INT. EB. HEIGHT =	26.5 in.
INT. EB. WIDTH =	12 in.
BM. EMBED. FOR EB. =	0 in.
INT. EB. WEIGHT =	2.911 kips

DIAPHRAGMS
1



SECTION AT ENDWALL — SECTION THRU DIAPHRAGM — SECTION THRU EDGE BEAM

INT. P-LOADS:	LOAD	POSITION	REACTION	MOMENT
EW. =	7.638 kips	0.00 ft.	7.638 kips	0.000 k-ft.
DIAPH. =	1.565 kips	33.51 ft.	0.783 kips	26.227 k-ft.
DIAPH. =	N/A	N/A	N/A	N/A
DIAPH. =	N/A	N/A	N/A	N/A
EB. =	2.911 kips	67.03 ft.	0.000 kips	0.000 k-ft.
	TOTAL POINT DEAD LOAD PER BEAM =		8.421 kips	26.227 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: Hill Barrier

RIGHT BARRIER

BARRIER TYPE:	None
FENCING OPTION:	None
ED_2 =	0.000 ft.
W_2 =	0 ft.
H_2 =	0 ft.
RTDS =	7.0000 %

BRIDGE TYPE =	Bridge Widening
SPAN LENGTH =	67.029 ft.
SKEW ANGLE =	43.7081 degrees
LEFT SPACING =	6.0714 ft.
RIGHT SPACING =	6.0714 ft.
LEFT OVERHANG =	0 ft.
RIGHT OVERHANG =	2.6927 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 =	5 beams
NO. OF BEAMS IN EXISTING BRIDGE =	12 beams
NO. OF SET BEAMS W/ COMP. LOADS =	0 beams
TOTAL NO. OF BEAMS SUPPORTING WIDENING =	5 beams
NO. OF NEW BAYS =	5 bays

IS MEDIAN BARRIER CENTERED?	No
OFFSET TO LEFT OR RIGHT?	Left
OFFSET DISTANCE =	24.999 ft.
WIDENED BRIDGE OUT TO OUT =	31.728 ft.
EXISTING BRIDGE OUT TO OUT =	75.532 ft.
FINISHED BRIDGE OUT TO OUT =	107.261 ft.
Ignore Median only for RDWY Width Calculations =	Yes
LT RDWY =	26.006 ft.
RT RDWY =	77.629 ft.
TOTAL WIDENED RDWY WIDTH =	105.636 ft.

NOTE: BRIDGE WIDENING IS TO ONE SIDE ONLY!

Width of Median = 2 ft.

Including median width

Description: Type II at 6.071ft
Design Span Length: 67.029 ft.
Span No.: 3 Center

SUPERIMPOSED DEAD LOADS:

LEFT BARRIER

BARRIER WEIGHT =	0.405 klf
FENCING WEIGHT =	0.000 klf

MEDIAN

MEDIAN WEIGHT = 0.472 klf

RIGHT BARRIER

BARRIER WEIGHT =	0.000 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.

OUT TO OUT DIST. GREATER THAN 66'-5. DISTRIBUTE BARRIER DL wt. at. ONTO OUTER BEAMS!

BEAM ON CENTERLINE ?	Yes
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 =	4 beams
OVERRIDE NO. OF BM. TO DIST. MED. BARRIER ?	Yes
NO. OF BEAMS DIST. TO MED. BARRIER =	4 beams
OVERRIDE NO. OF BM. TO DIST. RT BARRIER ?	No
NO. OF BEAMS DIST. TO RT BARRIER =	0 beams

BEAMS SUPPORTING LT BARRIER
BM 1 - BM 4

BEAMS SUPPORTING MED BARRIER
BM 4 - BM 7

BEAMS SUPPORTING RT BARRIER

SUPERIMPOSED LOADS PER BRIDGE

FWS WEIGHT =	3.169 klf per bridge
DECK OVERLAY WT. =	0.000 klf per bridge
UTILITY WEIGHT TO SUPERSTRUCTURE =	0.000 klf per bridge
TOTAL SUPERIMPOSED DEAD LOAD =	**4.046 klf per bridge**

SUPERIMPOSED LOADS PER BEAM

FWS WEIGHT =	0.182 klf per beam
DECK OVERLAY WT. =	0.000 klf per beam
UTILITY WEIGHT TO SUPERSTRUCTURE =	0.000 klf per beam
LT BARRIER DEAD LOAD =	0.101 klf per beam
MED. BARRIER DEAD LOAD =	0.118 klf per beam
RT BARRIER DEAD LOAD =	0.000 klf per beam
DOUBLE LOADING DEAD LOAD =	0.219 klf per beam
CONTROLLING SUPERIMPOSED DEAD LOAD =	**0.401 klf per beam**

DOUBLE LOADING GOVERNS DESIGN

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

DOUBLED LOADING CASES

	BARRIER ONLY	RAISED MEDIAN	MED. BAR.
WITHOUT OVERRIDE	0.101 klf per beam	0.258 klf per beam	#VALUE!
WITH OVERRIDE	0.101 klf per beam	0.258 klf per beam	0.219 klf per beam

BRIDGE: I-575 over Noonday Creek North
COUNTY: CHEROKEE
P.I. NO: 713640
PROJECT: NH000-0575-01(028)

J.B. TRIMBLE, INC.

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

COMPOSITE SECTION MODULUS CALC:

SPAN LENGTH = 67.029 ft.

BEAM MOMENT OF INERTIA =	50,979 in^4	
BEAM Y_{BM} =	15.83 in.	
INT. COP_{BTM} =	0.75 in.	
DESIGN T_{DEC} =	7.25 in.	
E_{BM} =	5.35 x 10^6 psi	
E_{SLAB} =	3.59 x 10^6 psi	
modular ratio =	1.49	

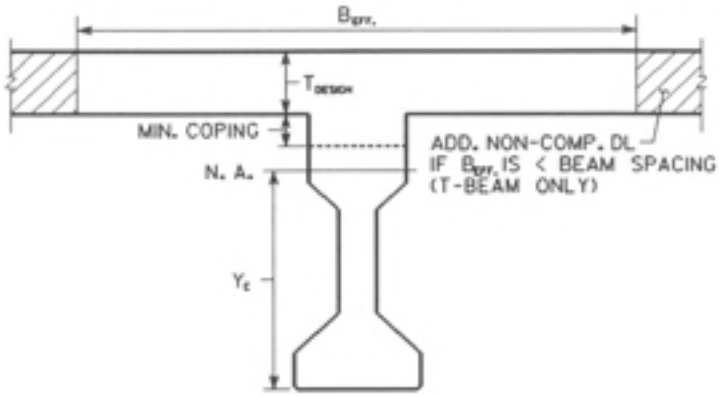
AASHTO 8.10.1.1 - Compression Flange Width

wBM FLANGE =	12.00	in.
B_{eff} = Brn Spacing =	**72.00**	**in. CONTROLS**
B_{eff} = ¼ Span Length =	**201.09**	in.
B_{eff} = WBM FLANGE + 2[6 tSLAB] =	**99.00**	in.

Add. Non-Comp. DL (WDLNC) =	0.000 klf	(T-Beam Only)
Y_C =	27.93 in.	
COMPOSITE MOM. OF INERTIA =	161,884 in^4	

COMPOSITE SECTION MODULI:

SECTION MOD. AT TOP OF SLAB =	10,071 in^3
SECTION MOD. AT TOP OF BEAM =	20,050 in^3
SECTION MOD. AT BOT. OF BEAM =	5,797 in^3



Description: Type II at 6.0714ft
Design Span Length: 67.029 ft.
Span No.: 3 Center

DISTRIBUTION & DEFLECTION FACTOR CALCS:

DISTRIBUTION FACTOR CALCS:

MOMENT	1.104	WHEEL
	0.552	AXLE
SHEAR	1.353	WHEEL
	0.676	AXLE

(AASHTO 6.7.3) =

DEFLECTION FACTOR CALCS:

ALLOW USER TO DEFINE NO. OF LANES ?	Yes	
USER DEFINED NO. OF LANES =	9	6.0714 ft.
		6.0714 ft.
ALLOW USER TO DEFINE NO. OF BEAMS ?	Yes	
USER DEFINED NO. OF BEAMS =	17	-> 17 beams will be used for DFD calcs.
REDUCTION FACTOR =	0.75	
DFD =	0.794	

LIVE LOAD CALCS:

LEFT SIDEWALK LIVE LOAD:

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

RIGHT SIDEWALK LIVE LOAD:

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

IMPACT FACTOR: 1.26

HS 20 LOADING:

			REACTION	R x DF x I
MIDSPAN:	926.000 k-ft.	TRUCK:	61.970 kips	48.135 kips
MAX:	931.851 k-ft.	LANE:	47.440 kips	37.089 kips

	REACTION	MOMENT
TOTAL LL+I =	48.135 kips	644.181 k-ft.
	MAX TOTAL LL+I =	**648.251 k-ft.**

BRIDGE: I-575 over Noonday Creek North
COUNTY: CHEROKEE
P.I. NO: 713640
PROJECT: NH000-0575-01(028)

J.B. TRIMBLE, INC.

JOB NO: 250717
DESIGNED BY: WBN
CHECKED BY: JCR

SUMMARY OF DEAD & LIVE LOADINGS:

NON-COMPOSITE DEAD LOADS PER BEAM:

INT. SLAB $_{WEIGHT}$ =	0.569 klf
INT. COP $_{WEIGHT}$ =	0.020 klf
INT. SIP $_{WEIGHT}$ =	0.081 klf
INT. BEAM $_{WEIGHT}$ =	0.384 klf
TOTAL N-COMP. DL =	1.055 klf

SUPERIMPOSED DEAD LOADS PER BEAM:

LEFT BARRIER WEIGHT =	0.101 klf
LEFT FENCING WEIGHT =	0.000 klf
MEDIAN WEIGHT =	0.118 klf
RIGHT BARRIER WEIGHT =	#DIV/0!
RIGHT FENCING WEIGHT =	#DIV/0!
FWS WEIGHT =	0.182 klf
DECK OVERLAY WT. =	0.000 klf
UTILITY WEIGHT =	0.000 klf
TOTAL SUPERIMPOSED DL =	0.401 klf

LOADING RESULTS

	LOADING	REACTION	MOMENT
TOTAL N-COMP. DL =	1.055 klf	35.358 kips	592.516 k-ft
TOTAL SUPERIMPOSED DL =	0.401 klf	13.444 kips	225.287 k-ft
TOTAL POINT DL =		8.421 kips	26.227 k-ft
TOTAL DL =	**1.456 klf**	**57.223 kips**	**844.030 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 =		**48.135 kips**	**644.181 k-ft**
TOTAL DL + SW LL + (LL + I) =		**105.359 kips**	**1488.211 k-ft.**

Description: Type II at 6.071ft
Design Span Length: 67.029 ft.
Span No.: 3 Center

SUMMARY OF PROGRAM INPUT:

SIMPLE SPAN PROGRAM INPUT:

INTERIOR BEAM

LENGTH =	67.029 ft.	$f'_{c\ deck}$ =	7800 psi
Moment Dist. Factor (DFM) =	1.104	$f'_{c\ beam}$ =	6800 psi
End Shear Dist. Factor (DFV) =	1.353	γ_{cl} =	0.247 k / in^2
LL Deflection Dist. Factor (DFD) =	0.794	γ_{PB} =	0.530 k / in^2
Non-Composite DL ($W_{D,NC}$) =	0.671 klf	E_{beam} =	5.35 x 10^6 psi
Composite DL ($W_{D,C}$) =	0.401 klf	$E_{D,C}$ =	3.59 x 10^6 psi
Sidewalk LL (W_{sw}) =	0.000 klf		
Effective Concrete Width (W) =	72.86 in.		
Concrete Slab Thickness (T) =	7.250 in.		
Minimum Coping (Df) =	0.750 in.		

P-LOADS:	P1	P2	P3	P4	P5
X	0.000 ft.	33.515 ft.	67.029 ft.	N/A	N/A
LOAD	7.638 kips	1.565 kips	2.911 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#40	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, 2, and 3.

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	22	22	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#40

SUBJECT: Beam Design Output - Span 1
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.

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.

31-6036 I-575 over Noonday Creek North Span 1

✓ JCR 10-7-09

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	67.024	1.103	1.351	0.794	0.670	0.401	0.000	7.800	6.800	3	-0.247	-0.530	-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
12.00	6.00	3.00	6.00	6.00	18.00	6.00	36.00	72.78	7.250	0.750	5.35	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	2	0.5830	8	6	6	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	0.2170	0.2170	0.600	2.50	3.00	2.00

BBFPU	BFPU	IBLOSS	FBLOSS	BTFPU	TFPU	ITLOSS	FTLOSS	WTC	LOW LAX	ITLENGTH	FTLENGTH	DLENGTH
.75	270.00	0.00	0.00	.75	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

DRAPE DATA

DRAPED	MAX RAISE	HOLD DOWN FT.	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	0	0	0	0

P-LOADS

XP1	P1	XP2	P2	XP3	P3	XP4	P4	XP5	P5
0.000	7.254	33.512	1.563	67.024	2.769				

PRESTRESSED BEAM DESIGN - OUTPUT DATA FOR PROBLEM NO. INT. 31-6036 I-575 over Noonday Creek North Span 1

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	41.009	77.701	110.077	138.136	161.878	181.303	196.412	207.204	213.679	215.837
UNIFORM D.L. NON-C.	0.000	71.482	135.440	191.874	240.783	282.167	316.027	342.363	361.174	372.461	376.223
CONCENTRATED P-LOADS	0.000	2.619	5.238	7.857	10.476	13.095	15.714	18.333	20.952	23.571	26.190
UNIFORM D.L. COMP.	0.000	42.783	81.062	114.838	144.110	168.879	189.145	204.907	216.165	222.921	225.172
LIVE LOAD + IMPACT	0.000	135.977	255.183	357.416	443.278	512.168	564.286	603.524	633.776	647.256	643.965
TOTAL D.L. + L.L.	0.000	293.870	554.624	782.262	976.783	1138.187	1266.475	1365.539	1439.271	1479.887	1487.387

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	0.195	0.369	0.523	0.656	0.769	0.861	0.933	0.984	1.015	1.025
	BOT	0.000	-0.153	-0.290	-0.410	-0.515	-0.603	-0.676	-0.732	-0.772	-0.796	-0.804
TOTAL NONCOMP. D.L.	TOP	0.000	0.547	1.037	1.471	1.849	2.171	2.436	2.645	2.798	2.895	2.935
	BOT	0.000	-0.429	-0.814	-1.154	-1.451	-1.703	-1.912	-2.076	-2.196	-2.272	-2.304
TOTAL COMP.D.L.+L.L.	TOP	0.000	0.108	0.204	0.286	0.356	0.413	0.457	0.490	0.515	0.527	0.527
	BOT	0.000	-0.370	-0.696	-0.978	-1.216	-1.410	-1.560	-1.674	-1.760	-1.802	-1.800
TOTAL COMP.+NONCOMP.	TOP	0.000	0.655	1.241	1.757	2.205	2.583	2.893	3.135	3.313	3.422	3.462
	BOT	0.000	-0.799	-1.510	-2.133	-2.667	-3.114	-3.472	-3.750	-3.956	-4.074	-4.103

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	12.881	11.593	10.305	9.017	7.729	6.441	5.152	3.864	2.576	1.288	0.000
UNIFORM D.L. NON-C.	22.453	20.208	17.962	15.717	13.472	11.227	8.981	6.736	4.491	2.245	0.000
CONCENTRATED P-LOADS	8.036	0.782	0.782	0.782	0.782	0.782	0.782	0.782	0.782	0.782	0.782
UNIFORM D.L. COMP.	13.438	12.094	10.751	9.407	8.063	6.719	5.375	4.031	2.688	1.344	0.000
LIVE LOAD + IMPACT	48.079	40.725	38.358	35.977	33.581	31.170	28.742	26.296	23.784	21.203	18.622
TOTAL D.L. + L.L.	104.887	85.401	78.157	70.899	63.626	56.338	49.032	41.710	34.320	26.862	19.403

BEAM PROPERTIES

* * * * * NON-COMPOSITE BEAM PROPERTIES *							* * * * * * * * * * * COMPOSITE BEAM PROPERTIES * * * * * * *						
I	YT	YB	ST	SB	A	W	*	I	YT	YB	ST	SB	A	QS
50978.7	20.171	15.829	2527.4	3220.5	369.00	0.364	*	161394.6	6.151	27.849	19800.0	5795.4	723.07	4435.19

STRAND AND MISC. DATA

MAX # STRDS	* ACT # STRDS	* MIN # STRDS	* E @ C.L.	* E @ END	* PS	* ASE	* MS(EACT-EEND)	* BPI	* BPF	* TPI	* TPF
22	22	20	8.420	6.238	1.291	1.76	48.000	799.763	636.366	79.976	63.637

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	499.883	942.178	1326.886	1654.006	1923.539	2135.484	2298.275	2420.346	2484.831	2491.727
ULT. MOMENT FURN.	264.951	1726.041	3087.027	3414.367	3437.298	3460.231	3483.164	3506.099	3529.035	3551.973	3574.911
1.2*CRACKING MOMENT	834.742	2190.377	2118.313	2057.609	2008.266	1970.283	1943.661	1928.400	1924.500	1931.959	1950.780
DIST. TO N.A.(IN.)	0.286	1.899	3.455	3.818	3.819	3.820	3.821	3.822	3.823	3.824	3.825
MAX STEEL RATIO	0.007	0.047	0.084	0.092	0.092	0.091	0.091	0.090	0.090	0.089	0.089
ULT. COMP. SHEAR	121.643	103.961	97.086	90.180	83.242	76.271	69.263	62.217	55.027	47.687	40.348
ULT. TOTAL SHEAR	178.024	146.318	134.849	123.350	111.819	100.254	88.653	77.014	65.229	53.297	41.364
BEAM SHEAR CAPACITY	79.193	141.510	157.310	160.090	114.017	86.073	67.086	53.013	41.822	32.769	32.963
MIN. STIRRUP AREA	0.689	0.122	0.060	0.060	0.060	0.143	0.176	0.181	0.170	0.145	0.071
STRP.(#5) SPAC.(IN.)	10.804*	24.000	24.000	24.000	24.000	24.000	24.000	24.000	24.000	24.000	24.000
PRESTRESS STRESS TOP	0.038	0.125	0.050	-0.024	-0.099	-0.174	-0.248	-0.323	-0.398	-0.472	-0.547
BOT	0.778	4.157	4.216	4.274	4.333	4.391	4.450	4.508	4.567	4.626	4.684
INITIAL STRESSES TOP	0.038	0.320	0.419	0.498	0.557	0.595	0.613	0.610	0.586	0.542	0.478
BOT	0.778	4.004	3.926	3.864	3.818	3.788	3.774	3.777	3.795	3.829	3.880
FINAL STRESSES TOP	0.038	0.754	1.281	1.738	2.126	2.445	2.695	2.878	2.997	3.047	3.027
BOT	0.778	2.509	1.844	1.268	0.780	0.381	0.069	-0.162	-0.322	-0.393	-0.376
FINAL # TOP STRANDS	0.477	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000
FINAL # BOT STRANDS	4.771	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000
DEVELOP. # TOP STRDS	0.144	0.973	1.803	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000
DEVELOP. # BOT STRDS	1.443	9.735	18.027	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000

* - FOR "ASE" REQUIREMENTS WITHIN A MAXIMUM DISTANCE OF 6.602" (D/4) FROM THE END OF BEAM USE EITHER
3 LOCATIONS OF 2-#5 STIRRUPS AT A MAXIMUM SPACING OF 2.301" OR
2 LOCATIONS OF 2-#6 STIRRUPS AT A MAXIMUM SPACING OF 4.602" USING 2" CL. FROM END OF BEAM

DEFLECTIONS(INCHES) AT CENTER LINE OF SPAN

BEAM	WDLNC	P-LOADS	WDGC	INITIAL	FINAL	SIDEWALK	TRUCK	LANE	MILITARY	RAILROAD	PRESTR.	CAMBER
0.640	1.115	0.062	0.211	-1.376	0.424	0.000	0.406	0.281	0.300	0.000	-2.016	-2.341

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= -247	10.587	8.118	8.619	9.060	9.443	9.767	10.032	10.238	10.385	10.473	10.503
MAX ECC, SIB= 4080	69.956	6.768	7.268	7.710	8.092	8.416	8.681	8.887	9.035	9.123	9.152
INITIAL ECCENTRICITY	6.276	6.490	6.705	6.919	7.133	7.348	7.562	7.777	7.991	8.206	8.420
FINAL ECCENTRICITY	6.276	6.490	6.705	6.919	7.133	7.348	7.562	7.777	7.991	8.206	8.420
MIN ECC, SFT= 3120	-40.370	-2.051	0.064	1.929	3.545	4.911	6.028	6.904	7.547	7.941	8.085
MIN ECC, SFB= -530	-18.949	-7.490	-4.219	-1.354	1.105	3.158	4.806	6.086	7.033	7.576	7.712

```
*  SPAN  * * * * * * * * * * * * * * * * ECCENTRICITY PLOT (INCHES) * * * * * * * * * * * * * * * * * *
                                                   1    1    1    1    1    1    1    1    1    1    2    2    2    2    2
* 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
* 0.00 L *                              +                    *
* 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. AND MIN. ECCENTRICITY, + = ACTUAL ECCENTRICITY, HOLD-DOWN POINT IS  0.00 FEET FROM CENTER LINE OF SPAN
```

STRAND ARRANGEMENT (TOP STRANDS NOT SHOWN)= 2

```
          + + R R + +
          + + R R + +
        + + + R R + + +
```

```
*  SPAN  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *STRAND ARRANGEMENT (INCHES) *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *
                                 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 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   R
*  BRNG  *      +   +   +       R   R   R

* 0.05 L *      +   +   +     R   R   R

* 0.10 L *      +   +   +    R   R   R

* 0.15 L *      +   +   + R   R   R

* 0.20 L *      +   +   +R   R   R

* 0.25 L *      +   +   R   R   R

* 0.30 L *      +   + R + R   R

* 0.35 L *      +   +R  +R   R

* 0.40 L *      +  R+  R+  R

* 0.45 L *      + R + R + R

* 0.50 L *      R   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	8	3.000	2	11.000	0	0.00L	0	0.00L
2	6	5.000	2	13.000	0	0.00L	0	0.00L
3	6	7.000	2	15.000	0	0.00L	0	0.00L
TOP	2	33.500						

INITIAL TRANSFER LENGTH = 3.071 FT

FINAL TRANSFER LENGTH = 2.444 FT

DEVELOPMENT LENGTH = 8.083 FT

LOSSES (KSI)

TOP STRANDS INITIAL LOSSES= 18.223 TOP STRANDS ADDITIONAL LOSSES= 37.649 TOP STRANDS FINAL LOSSES= 55.872

BOT STRANDS INITIAL LOSSES= 18.223 BOT STRANDS ADDITIONAL LOSSES= 37.649 BOT STRANDS FINAL LOSSES= 55.872

TOTAL LOSSES FOR ALL STRANDS= 55.872

CALCULATION SHEET

PROJECT: I-75 / I-575 NORTHWEST CORRIDOR
JOB NUMBER NH000-0575-01(028)
CALC NO. BR#40

SUBJECT: Beam Design Output - Span 2
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.

07-OCT-09
15:15:15

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.

✓ JCR 10-7-09

31-6036 I-575 over Noonday Creek North Span 2

SPAN DATA

D/A	LL CLASS	LL SK.	LENGTH	DFM	DFV	DFD	WDLNC	WDGC	WSNK	F'C	F'CI	NPL	SIT	SFB	SFTE
D	HS20	0 0 0	67.555	1.103	1.352	0.794	0.670	0.401	0.000	7.800	6.800	3	-0.247	-0.530	-0.001

BEAM DATA

BEAM DIMENSIONS								* COMPOSITE SLAB			* (E X 1,000,000)		* STIRRUP	DECK	
WT	HT	FT	WS	HB	WB	TB	DB	* WF	TF	DF	* E BEAM	E SLAB	* SIZE	PANEL	FSY
12.00	6.00	3.00	6.00	6.00	18.00	6.00	36.00	72.82	7.250	0.750	5.35	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	2	0.5830	8	6	6	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	0.2170	0.2170	0.600	2.50	3.00	2.00

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

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	2.837	33.777	1.564	67.555	2.837				

PRESTRESSED BEAM DESIGN - OUTPUT DATA FOR PROBLEM NO. INT. 31-6036 I-575 over Noonday Creek North Span 2

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	41.661	78.937	111.828	140.333	164.453	184.187	199.536	210.500	217.078	219.270
UNIFORM D.L. NON-C.	0.000	72.620	137.595	194.926	244.613	286.656	321.055	347.809	366.920	378.386	382.208
CONCENTRATED P-LOADS	0.000	2.641	5.283	7.924	10.566	13.207	15.849	18.490	21.132	23.773	26.414
UNIFORM D.L. COMP.	0.000	43.463	82.352	116.665	146.403	171.566	192.154	208.166	219.604	226.467	228.754
LIVE LOAD + IMPACT	0.000	137.161	257.428	360.799	447.275	516.856	569.542	609.223	639.790	653.461	650.238
TOTAL D.L. + L.L.	0.000	297.547	561.594	792.142	989.190	1152.738	1282.786	1383.225	1457.945	1499.165	1506.884

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	0.198	0.375	0.531	0.666	0.781	0.875	0.947	0.999	1.031	1.041
	BOT	0.000	-0.155	-0.294	-0.417	-0.523	-0.613	-0.686	-0.743	-0.784	-0.809	-0.817
TOTAL NONCOMP. D.L.	TOP	0.000	0.555	1.053	1.494	1.878	2.205	2.474	2.687	2.842	2.940	2.981
	BOT	0.000	-0.436	-0.827	-1.173	-1.474	-1.730	-1.942	-2.108	-2.230	-2.307	-2.340
TOTAL COMP.D.L.+L.L.	TOP	0.000	0.109	0.206	0.289	0.360	0.417	0.461	0.495	0.521	0.533	0.532
	BOT	0.000	-0.374	-0.703	-0.989	-1.229	-1.425	-1.577	-1.692	-1.779	-1.822	-1.820
TOTAL COMP.+NONCOMP.	TOP	0.000	0.665	1.259	1.783	2.237	2.622	2.936	3.182	3.362	3.473	3.514
	BOT	0.000	-0.810	-1.530	-2.161	-2.703	-3.155	-3.519	-3.801	-4.010	-4.129	-4.159

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	12.983	11.685	10.387	9.088	7.790	6.492	5.193	3.895	2.597	1.298	0.000
UNIFORM D.L. NON-C.	22.631	20.368	18.105	15.842	13.579	11.315	9.052	6.789	4.526	2.263	0.000
CONCENTRATED P-LOADS	3.619	0.782	0.782	0.782	0.782	0.782	0.782	0.782	0.782	0.782	-0.782
UNIFORM D.L. COMP.	13.545	12.190	10.836	9.481	8.127	6.772	5.418	4.063	2.709	1.354	0.000
LIVE LOAD + IMPACT	48.127	40.757	38.392	36.013	33.619	31.210	28.784	26.340	23.840	21.259	18.678
TOTAL D.L. + L.L.	100.905	85.782	78.501	71.206	63.897	56.572	49.230	41.870	34.454	26.957	17.896

BEAM PROPERTIES

* * * * * NON-COMPOSITE BEAM PROPERTIES *							*	* * * * * * * * * * * COMPOSITE BEAM PROPERTIES * * * * * * *						
I	YT	YB	ST	SB	A	W	*	I	YT	YB	ST	SB	A	QS
50978.7	20.171	15.829	2527.4	3220.5	369.00	0.384	*	161425.9	8.148	27.852	19812.0	5795.8	723.27	4436.43

STRAND AND MISC. DATA

MAX # STRDS *	ACT # STRDS *	MIN # STRDS *	E @ C.L. *	E @ END *	PS *	ASE *	NS(EACT-ENND) *	BPI *	BPF *	TPI *	TPF
22	22	20	8.420	6.238	1.29%	1.76	48.000	799.897	637.321	79.990	63.732

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	505.689	953.185	1342.489	1673.600	1946.518	2161.244	2326.206	2449.834	2515.269	2522.510
ULT. MOMENT FURN.	265.179	1738.592	3110.092	3414.531	3437.465	3460.401	3483.338	3506.275	3529.215	3552.155	3575.097
1.2*CRACKING MOMENT	834.795	2191.633	2118.040	2055.990	2005.484	1966.522	1939.102	1923.226	1918.893	1926.103	1944.857
DIST. TO N.A.(IN.)	0.286	1.912	3.480	3.816	3.817	3.818	3.819	3.820	3.821	3.822	3.823
MAX STEEL RATIO	0.007	0.047	0.085	0.092	0.092	0.091	0.091	0.090	0.090	0.089	0.089
ULT. COMP. SHEAR	121.884	104.155	97.271	90.355	83.408	76.427	69.410	62.354	55.177	47.824	40.470
ULT. TOTAL SHEAR	172.888	146.840	135.326	123.781	112.204	100.593	88.946	77.260	65.453	53.470	39.454
BEAM SHEAR CAPACITY	79.183	141.875	157.964	158.687	112.926	85.175	66.323	52.357	41.266	32.769	32.963
MIN. STIRRUP AREA	0.656	0.123	0.060	0.060	0.067	0.150	0.182	0.186	0.174	0.146	0.060
STRP.(#5) SPAC.(IN.)	11.349*	24.000	24.000	24.000	24.000	24.000	24.000	24.000	24.000	24.000	24.000
PRESTRESS STRESS TOP	0.038	0.125	0.050	-0.024	-0.099	-0.174	-0.248	-0.323	-0.398	-0.472	-0.547
BOT	0.778	4.158	4.216	4.275	4.333	4.392	4.451	4.509	4.568	4.626	4.685
INITIAL STRESSES TOP	0.038	0.323	0.425	0.507	0.567	0.607	0.626	0.624	0.602	0.558	0.494
BOT	0.778	4.002	3.922	3.858	3.811	3.779	3.764	3.766	3.783	3.818	3.868
FINAL STRESSES TOP	0.038	0.764	1.299	1.764	2.159	2.483	2.738	2.924	3.046	3.097	3.078
BOT	0.778	2.503	1.829	1.245	0.750	0.344	0.027	-0.208	-0.370	-0.443	-0.427
FINAL # TOP STRANDS	0.476	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000
FINAL # BOT STRANDS	4.764	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000
DEVELOP. # TOP STRDS	0.144	0.981	1.817	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000
DEVELOP. # BOT STRDS	1.444	9.809	18.174	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000

* - FOR "ASE" REQUIREMENTS WITHIN A MAXIMUM DISTANCE OF 6.602" (D/4) FROM THE END OF BEAM USE EITHER
3 LOCATIONS OF 2-#5 STIRRUPS AT A MAXIMUM SPACING OF 2.301" OR
2 LOCATIONS OF 2-#6 STIRRUPS AT A MAXIMUM SPACING OF 4.602" 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
0.660	1.151	0.064	0.218	-1.388	0.461	0.000	0.417	0.289	0.307	0.000	-2.049	-2.360

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= -247	10.587	8.127	8.635	9.084	9.473	9.802	10.071	10.280	10.430	10.519	10.549
MAX ECC, SIB= 4080	69.956	6.774	7.282	7.731	8.120	8.449	8.718	8.927	9.077	9.166	9.196
INITIAL ECCENTRICITY	6.275	6.490	6.704	6.919	7.133	7.348	7.562	7.777	7.991	8.206	8.420
FINAL ECCENTRICITY	6.275	6.490	6.704	6.919	7.133	7.348	7.562	7.777	7.991	8.206	8.420
MIN ECC, SFT= 3120	-40.370	-2.003	0.140	2.030	3.668	5.052	6.184	7.072	7.723	8.122	8.268
MIN ECC, SFB= -530	-18.949	-7.443	-4.134	-1.235	1.254	3.333	5.002	6.297	7.257	7.806	7.946

```
*  SPAN  * * * * * * * * * * * * * * * * * ECCENTRICITY PLOT (INCHES) * * * * * * * * * * * * * * * * * * *
                                                   1   1   1   1   1   1   1   1   1   1   2   2   2   2   2
* 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
* 0.00 L *                              +                    *
* 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. AND MIN. ECCENTRICITY, + = ACTUAL ECCENTRICITY, HOLD-DOWN POINT IS  0.00 FEET FROM CENTER LINE OF SPAN
```

STRAND ARRANGEMENT (TOP STRANDS NOT SHOWN)= 2

```
          + + R R + +
          + + R R + +
         + + + R R + + +
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```
*  SPAN  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *STRAND ARRANGEMENT (INCHES) *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *
                                 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 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   R
*  BRNG  *      +   +   +       R   R   R

* 0.05 L *      +   +   +     R   R   R

* 0.10 L *      +   +   +    R   R   R

* 0.15 L *      +   +   + R   R   R

* 0.20 L *      +   +   +R   R   R

* 0.25 L *      +   +   R   R   R

* 0.30 L *      +   + R + R   R

* 0.35 L *      +   +R  +R   R

* 0.40 L *      +  R+  R+  R

* 0.45 L *      + R + R + R

* 0.50 L *      R   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	8	3.000	2	11.000	0	0.00L	0	0.00L
2	6	5.000	2	13.000	0	0.00L	0	0.00L
3	6	7.000	2	15.000	0	0.00L	0	0.00L
TOP	2	33.500						

INITIAL TRANSFER LENGTH = 3.072 FT

FINAL TRANSFER LENGTH = 2.447 FT

DEVELOPMENT LENGTH = 8.076 FT

LOSSES (KSI)

TOP STRANDS INITIAL LOSSES= 18.192 TOP STRANDS ADDITIONAL LOSSES= 37.460 TOP STRANDS FINAL LOSSES= 55.652

BOT STRANDS INITIAL LOSSES= 18.192 BOT STRANDS ADDITIONAL LOSSES= 37.460 BOT STRANDS FINAL LOSSES= 55.652

TOTAL LOSSES FOR ALL STRANDS= 55.652

CALCULATION SHEET

PROJECT: I-75 / I-575 NORTHWEST CORRIDOR
JOB NUMBER NH000-0575-01(028)
CALC NO. BR#40

SUBJECT: Beam Design Output - Span 3
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.

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.

✓ JCR 10-7-09

31-6036 I-575 over Noonday Creek North Span 3

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	67.029	1.104	1.353	0.794	0.671	0.401	0.000	7.800	6.800	3	-0.247	-0.530	-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
12.00	6.00	3.00	6.00	6.00	18.00	6.00	36.00	72.86	7.250	0.750	5.35	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	2	0.5830	8	6	6	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	0.2170	0.2170	0.600	2.50	3.00	2.00

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

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	7.638	33.515	1.565	67.029	2.911				

PRESTRESSED BEAM DESIGN - OUTPUT DATA FOR PROBLEM NO. INT. 31-6036 I-575 over Noonday Creek North Span 3

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	41.015	77.713	110.093	138.156	161.902	181.330	196.441	207.234	213.710	215.869
UNIFORM D.L. NON-C.	0.000	71.600	135.663	192.189	241.178	282.631	316.546	342.925	361.767	373.072	376.841
CONCENTRATED P-LOADS	0.000	2.622	5.245	7.867	10.490	13.112	15.735	18.357	20.980	23.602	26.225
UNIFORM D.L. COMP.	0.000	42.789	81.074	114.855	144.132	168.904	189.173	204.937	216.198	222.954	225.206
LIVE LOAD + IMPACT	0.000	136.112	255.435	357.970	443.717	512.676	564.847	604.125	634.408	647.902	644.608
TOTAL D.L. + L.L.	0.000	294.138	555.130	782.975	977.674	1139.226	1267.631	1366.786	1440.587	1481.241	1488.748

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	0.195	0.369	0.523	0.656	0.769	0.861	0.933	0.984	1.015	1.025
	BOT	0.000	-0.153	-0.290	-0.410	-0.515	-0.603	-0.676	-0.732	-0.772	-0.796	-0.804
TOTAL NONCOMP. D.L.	TOP	0.000	0.547	1.038	1.473	1.851	2.173	2.439	2.648	2.801	2.898	2.939
	BOT	0.000	-0.429	-0.815	-1.156	-1.453	-1.705	-1.914	-2.078	-2.198	-2.274	-2.306
TOTAL COMP.D.L.+L.L.	TOP	0.000	0.108	0.204	0.286	0.356	0.413	0.456	0.490	0.515	0.527	0.527
	BOT	0.000	-0.370	-0.697	-0.979	-1.217	-1.411	-1.561	-1.675	-1.761	-1.803	-1.801
TOTAL COMP.+NONCOMP.	TOP	0.000	0.655	1.242	1.759	2.207	2.585	2.895	3.138	3.316	3.425	3.465
	BOT	0.000	-0.800	-1.511	-2.135	-2.670	-3.116	-3.475	-3.753	-3.959	-4.077	-4.107

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	12.882	11.594	10.306	9.017	7.729	6.441	5.153	3.865	2.576	1.288	0.000
UNIFORM D.L. NON-C.	22.488	20.239	17.991	15.742	13.493	11.244	8.995	6.746	4.498	2.249	0.000
CONCENTRATED P-LOADS	8.420	0.782	0.782	0.782	0.782	0.782	0.782	0.782	0.782	0.782	0.782
UNIFORM D.L. COMP.	13.439	12.095	10.751	9.408	8.064	6.720	5.376	4.032	2.688	1.344	0.000
LIVE LOAD + IMPACT	48.139	40.762	38.393	36.010	33.612	31.199	28.768	26.321	23.806	21.223	18.639
TOTAL D.L. + L.L.	105.369	85.473	78.223	70.959	63.680	56.386	49.075	41.746	34.350	26.886	19.422

BEAM PROPERTIES

* * * * * NON-COMPOSITE BEAM PROPERTIES * * * * *							*	* * * * * * * * COMPOSITE BEAM PROPERTIES * * * * * * *						
I	YT	YB	ST	SB	A	W	*	I	YT	YB	ST	SB	A	QS
50978.7	20.171	15.829	2527.4	3220.5	369.00	0.384	*	161457.3	8.145	27.855	19824.1	5796.2	723.46	4437.67

STRAND AND MISC. DATA

MAX # STRDS	* ACT # STRDS	* MIN # STRDS	* E @ C.L.	* E @ END	* PS	* ASE	* NS(EACT-EEND)	* BPI	* BPF	* TPI	* TPF
22	22	20	8.420	6.238	1.29%	1.76	48.000	799.764	636.409	79.976	63.641

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	500.348	943.054	1329.120	1655.545	1925.330	2137.473	2300.417	2422.604	2487.149	2494.054
ULT. MOMENT FURN.	264.945	1726.186	3087.436	3414.737	3437.668	3460.601	3483.535	3506.471	3529.407	3552.344	3575.283
1.2*CRACKING MOMENT	834.865	2190.684	2118.483	2057.660	2008.212	1970.142	1943.449	1928.133	1924.193	1931.630	1950.444
DIST. TO N.A.(IN.)	0.286	1.897	3.452	3.814	3.815	3.816	3.817	3.818	3.819	3.820	3.821
MAX STEEL RATIO	0.007	0.047	0.084	0.092	0.092	0.091	0.091	0.090	0.090	0.089	0.089
ULT. COMP. SHEAR	121.773	104.043	97.163	90.252	83.310	76.333	69.321	62.270	55.075	47.730	40.386
ULT. TOTAL SHEAR	178.701	146.443	134.965	123.457	111.916	100.341	88.731	77.082	65.288	53.346	41.403
BEAM SHEAR CAPACITY	79.184	141.509	157.338	160.079	114.002	86.056	67.067	52.995	41.805	32.769	32.963
MIN. STIRRUP AREA	0.693	0.122	0.060	0.060	0.060	0.143	0.176	0.182	0.170	0.146	0.071
STRP.(#5) SPAC.(IN.)	10.735*	24.000	24.000	24.000	24.000	24.000	24.000	24.000	24.000	24.000	24.000
PRESTRESS STRESS TOP	0.038	0.125	0.050	-0.024	-0.099	-0.174	-0.248	-0.323	-0.398	-0.472	-0.547
BOT	0.778	4.157	4.216	4.274	4.333	4.391	4.450	4.508	4.567	4.626	4.684
INITIAL STRESSES TOP	0.038	0.320	0.419	0.498	0.557	0.595	0.613	0.610	0.586	0.543	0.478
BOT	0.778	4.004	3.926	3.864	3.818	3.788	3.774	3.777	3.795	3.829	3.880
FINAL STRESSES TOP	0.038	0.755	1.282	1.739	2.128	2.447	2.698	2.881	3.000	3.050	3.030
BOT	0.778	2.508	1.843	1.267	0.778	0.378	0.066	-0.166	-0.325	-0.396	-0.380
FINAL # TOP STRANDS	0.477	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000
FINAL # BOT STRANDS	4.771	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000
DEVELOP. # TOP STRDS	0.144	0.974	1.803	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000
DEVELOP. # BOT STRDS	1.443	9.735	18.028	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000

* - FOR "ASE" REQUIREMENTS WITHIN A MAXIMUM DISTANCE OF 6.602" (D/4) FROM THE END OF BEAM USE EITHER
3 LOCATIONS OF 2-#5 STIRRUPS AT A MAXIMUM SPACING OF 2.301" OR
2 LOCATIONS OF 2-#6 STIRRUPS AT A MAXIMUM SPACING OF 4.602" 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
0.640	1.117	0.062	0.211	-1.376	0.426	0.000	0.406	0.281	0.300	0.000	-2.017	-2.341

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= -247	10.587	8.118	8.619	9.061	9.443	9.767	10.032	10.238	10.386	10.474	10.503
MAX ECC, SIB= 4080	69.956	6.768	7.268	7.710	8.093	8.417	8.682	8.888	9.035	9.123	9.153
INITIAL ECCENTRICITY	6.276	6.490	6.705	6.919	7.133	7.348	7.562	7.777	7.991	8.206	8.420
FINAL ECCENTRICITY	6.276	6.490	6.705	6.919	7.133	7.348	7.562	7.777	7.991	8.206	8.420
MIN ECC, SFT= 3120	-40.370	-2.048	0.068	1.935	3.552	4.920	6.037	6.914	7.557	7.951	8.096
MIN ECC, SFB= -530	-18.949	-7.487	-4.213	-1.346	1.115	3.170	4.820	6.100	7.049	7.591	7.728

```
*  SPAN  * * * * * * * * * * * * * * * * ECCENTRICITY PLOT (INCHES) * * * * * * * * * * * * * * * * * *
                                                    1    1    1    1    1    1    1    1    1    2    2    2    2    2
* 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
* 0.00 L *                              *                     *
* 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. AND MIN. ECCENTRICITY, + = ACTUAL ECCENTRICITY, HOLD-DOWN POINT IS  0.00 FEET FROM CENTER LINE OF SPAN
```

STRAND ARRANGEMENT (TOP STRANDS NOT SHOWN)= 2

```
          * * R R * *
          * * R R * *
         * * * R R * * *
```

```
*  SPAN  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *STRAND ARRANGEMENT (INCHES) *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *
                                 1 1 1 1 1 1 1 1 1 1 2 2 2 2 2 2 2 2 2 2 2 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  R
*  BRNG  *     +  +  +      R  R  R

* 0.05 L *     +  +  +    R  R  R

* 0.10 L *     +  +  +   R  R  R

* 0.15 L *     +  +  + R  R  R

* 0.20 L *     +  +  +R  R  R

* 0.25 L *     +  +  R  R  R

* 0.30 L *     +  + R + R  R

* 0.35 L *     +  +R  +R  R

* 0.40 L *     +  R+  R+  R

* 0.45 L *     + R + R + R

* 0.50 L *     R  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	8	3.000	2	11.000	0	0.00L	0	0.00L
2	6	5.000	2	13.000	0	0.00L	0	0.00L
3	6	7.000	2	15.000	0	0.00L	0	0.00L
TOP	2	33.500						

INITIAL TRANSFER LENGTH = 3.071 FT

FINAL TRANSFER LENGTH = 2.444 FT

DEVELOPMENT LENGTH = 8.083 FT

LOSSES (KSI)

TOP STRANDS INITIAL LOSSES= 18.223 TOP STRANDS ADDITIONAL LOSSES= 37.639 TOP STRANDS FINAL LOSSES= 55.862

BOT STRANDS INITIAL LOSSES= 18.223 BOT STRANDS ADDITIONAL LOSSES= 37.639 BOT STRANDS FINAL LOSSES= 55.862

TOTAL LOSSES FOR ALL STRANDS= 55.862

CALCULATION COVER SHEET

PROJECT	JOB NO.	CALC NO.	SHEET
I-75 / I-575 NORTHWEST CORRIDOR	NH000-0575-01(028)	BR#40	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&4, bent 2,and bent 3.

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	11	11	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#40

SUBJECT: Bent Design Input - Bents 1&4
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 Noonday Creek North
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 BENT 1

APPROACH SLAB LENGTH =	30.00	feet	CAP DEPTH =	2.00	ft
			CAP WIDTH =	3.00	ft
SKEW =	46.53	degrees			
MAX BEAM SPACING =	6.063	feet			
SPACING ALONG SKEW =	8.355	feet			
DEAD LOAD REACTION =	56.806	kips			
DL OF APPROACH =	7.58	kips			
WEIGHT OF CAP =	7.52	kips			
TOTAL DL =	71.90	kips			
LIVE LOAD =	38.15	kips	Pile Type:	Steel HP	
TOTAL PILE REACTION =	110.05	kips =	55 tons	Use-->	HP12x53

END BENT REACTIONS BENT 4

APPROACH SLAB LENGTH =	30.00	feet	CAP DEPTH =	2.00	ft
			CAP WIDTH =	3.00	ft
SKEW =	43.71	degrees			
MAX BEAM SPACING =	6.068	feet			
SPACING ALONG SKEW =	8.782	feet			
DEAD LOAD REACTION =	57.223	kips			
DL OF APPROACH =	7.58	kips			
WEIGHT OF CAP =	7.90	kips			
TOTAL DL =	72.71	kips			
LIVE LOAD =	38.19	kips	Pile Type:	Steel HP	
TOTAL PILE REACTION =	110.90	kips =	55 tons	Use-->	HP12x53

WINGWALL LENGTH CALCULATIONS:

BENT	1		4	
SKEW =	46.53	degrees	43.71	degrees
"D" =	10	IN	10	IN
BEARING PAD THICKNESS =	2.500	IN	2.500	IN
CAP DEPTH =	2.00	FT	2.00	FT
BEAM DEPTH =	36	IN	36	IN
BERM =	2	FT	2	FT
CAP WIDTH =	2.5	FT	2.5	FT
H =	6.04	FT	6.04	FT
WINGWALL HEIGHT USED =	6.58	FT	6.58	FT
THEORETICAL WINGWALL LENGTH =	13.89	FT	14.59	FT
ACTUAL WING WALL LENGTH =	14.00	FT	15.00	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#40

SUBJECT: Bent Design Input - Bent 2
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 Noonday Creek North**
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 2 **DRILLED SHAFT**

GENERAL REQUIREMENTS:

Live Load cases:	See GDOT Program BRLLCA		
Skew Angle:	46.4556	* FROM CL BRIDGE	
	43.5444	* 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	#	
Stirrup Size:	5	#	
Max bars / row in top of cap:	10	bars	
Max bars / row in bot of cap:	12	bars	
Column Steel Ratios:	1	% min.	
	8	% max.	

Is Bent Fix "F" or Exp. "E"? E F = Fix E = Exp

Impact Factor

	Length (ft)	Impact
LEFT SPAN	69.25	1.2574
RIGHT SPAN	69.25	1.2574
	Avg. Impact =	1.2574

Soil Weight 0.120 kcf

Columns:

TYPE	C	(S-SQUARE or RECTANGULAR, C-CIRCULAR, P-PILES)
CLEAR	2.5	

Allow. Soil Press. : 99.999

WIND ON SUPERSTRUCTURE

AASHTO 3.15.2.1.1

	Left Span	Rigtht Span			
Parapet Height =	32	32	in.		
Beam Height =	36	36	in.		
'D' or 'H' Dimension =	10	10	in.		
Beam + Coping + Slab =	3.83	3.83	ft.		
Total Height =	6.50	6.50	ft.		
Span Lengths =	69.25	69.25	ft.	TOTAL	
Wind Force Area =	225.1	225.1	$ft.^2$	450	$ft.^2$
Height of Cap =	3.50	3.50	ft.		
Wind Force Arm =	5.000	ft.			

WIND ON SUBSTRUCTURE:

AASHTO 3.15.2.2

Wind Force =	0.040	ksf	PARA. & PERP.
Length of Cap =	40.00	ft.	
Width of Cap =	4.00	ft.	
CG of Cap ELEV =	885.54		
Ground Line ELEV=	874.41		
Depth to Point of Fixity =	10.00		
Pt. of Fixity ELEV =	864.41		
Bot. Cap to Pt. of Fixity =	19.38	ft.	
Design Height of Column =	21.13	ft.	CG Cap to Pt. of Fixity
Exposed Height of Column =	9.38	ft.	
Width of Column =	4.00	ft.	
Depth of Column =	4.00	ft.	
No. of Columns =	2	columns	

For Bent 2	
2 yr Flood Elev. =	879.25
2 yr Flood Elev. + 1' =	880.25
Ground Line Elev. - 1' =	873.41
For Top of Caisson on Plans, use:	880.5
For Column Height on Plans, use:	**3.29 ft.**
For Caisson Height on Plans, use:	**43.50 ft.**

	PARA.	PERP.	
M_{CAP} =	11.83	118.33	k-ft.
M_{COL} =	22.05	44.09	k-ft.
M_{TOTAL} =	33.88	162.42	k-ft.
P_T =	1.60	7.69	kips

BRIDGE: **I-575 over Noonday Creek North**
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 2 — **DRILLED SHAFT**

WIND ON LIVE LOAD — AASHTO 3.15.2.1.2

Length = 69.25 ft.
APT = APL = 11.583 ft. Use--> ✓ 11.583 ft.

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

(SPEED) 65 mph — D 1.9894 (degrees)

LF = ✓ 0.00 k — CF = 6.285 k

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 =	69.25	69.25	ft
Δ =	0.199	0.199	in
G = Shear Modulus of Pad =	200	200	psi
L= Length of Pad =	10.00	10.00	in
W = Width of Pad =	16.00	16.00	in
Telas = Bearing Elastomer Depth =	2.375	2.375	in
Fs =	2.69	2.69	KIPS /pad
No. of Beams =	5	5	
Total Temperature Force =	13.44	13.44	kips @ top of seat
	14.55	14.55	kips @ center of cap
P_L =	10.55	10.55	kips
P_T =	10.02	10.02	kips

Difference = P_L = 0.00 kips AT CL CAP
P_T = 0.00 kips AT CL CAP

P_L = 0.00 kips AT CL CAP ----> Use Total Lateral Force
P_T = 0.00 kips AT CL 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. = ✓ 886.71 ft.
Design Height of Column = ✓ 21.13 ft.
Bottom of Stream ELEV = ✓ 874.41 ft.
Pt. of Fixity ELEV = ✓ 864.41
V_{AVG} = ✓ 6.98 FPS @ 100 yr. Flood
K = 0.7 for circular end piers
$P_{AVG} = K * (V_{AVG})^2$ = 34.10 psf — AASHTO Eq. (3-4)
$P_{MAX} = 2 * P_{AVG}$ = 68.21 psf

Piers Aligned with stream flow:
P_S = 1.678 kips
M = 30.54 k-ft.
$P_{CL\ CAP}$ = ✓ 1.445 k

BRIDGE: **I-575 over Noonday Creek North**
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 2 — **DRILLED SHAFT**

DEAD LOAD: — AASHTO 3.3

LENGTH = 40.00 feet
SKEW = 46.46 degrees

SPAN 1

BEAM	BM SPC ALONG BENT	DISTANCE BETWEEN	DISTANCE ALONG	R dl	Add'l DL	DL
1		3.301	3.301	52.320	0.000	52.320
2	8.358	8.358	11.659	52.320	0.000	52.320
3	8.341	8.341	20.000	52.320	0.000	52.320
4	8.325	8.325	28.325	52.320	0.000	52.320
5	8.309	8.309	36.634	52.320	0.000	52.320
		3.366	40.000			
TOTAL		40.000				261.601
					CL Brg to CL Bent =	1.0000
						525.548

SPAN 2

BEAM	BM SPC ALONG BENT	DISTANCE BETWEEN	DISTANCE ALONG	R dl	Add'l DL	DL
1		3.301	3.301	52.789	0.000	52.789
2	8.358	8.358	11.659	52.789	0.000	52.789
3	8.341	8.341	20.000	52.789	0.000	52.789
4	8.325	8.325	28.325	52.789	0.000	52.789
5	8.309	8.309	36.634	52.789	0.000	52.789
		3.366	40.000			
TOTAL		40.000				263.947
					CL Brg to CL Bent =	1.0000

COMBINED LOADS

COLUMN = 2.000 FT - checking ¼ points on column

	POINT	MEMBER	DISTANCE BETWEEN	DISTANCE ALONG	R dl	Add'l DL	DL	CHECK POINT
8.50	G1	1	5.199	3.301	105.110	0.000	105.110	1
	EC	1	4.199	7.500				2
	EC	2	1.000	9.500				3
	G2	2	2.159	11.659	105.110	0.000	105.110	4
23.00	G3	2	8.341	20.000	105.110	0.000	105.110	5
	G4	2	8.325	28.325	105.110	0.000	105.110	6
	EC	2	2.175	30.500				7
8.50	EC	3	1.000	32.500				8
	G5	3	4.134	36.634	105.110	0.000	105.110	9
				3.366				
			40.000					

ADDITIONAL DL MOMENT DUE TO ECCENTRICITY:

M_{DL} = 2.35 KIP-FT

(EQUIV. LONG FORCE) $F_{EL} = M_{DL} / H_{DESIGN\ OF\ COLUMN}$ = 0.11 KIP

(TOTAL LONG FORCE) $F_L = F_{EL} + P_{L\ TEMP}$ = 0.11 KIP

LIVE LOADS: — AASHTO 3.4

	LEFT	RIGHT	
Span Lengths =	69.25	69.25	ft

LIVE LOAD REACTION	63.91	KIPS	AXLE LOAD NO IMPACT	VERIFY !!!!
	70.32	KIPS	LANE LOAD NO IMPACT	
AVERAGE IMPACT	1.2574			
P-LOAD FOR BRILLCA INPUT	44.210	KIPS		

CALCULATION SHEET

PROJECT: I-75 / I-575 NORTHWEST CORRIDOR
JOB NUMBER NH000-0575-01(028)
CALC NO. BR#40

SUBJECT: Bent Design Input - Bent 3
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 Noonday Creek North**
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**

GENERAL REQUIREMENTS:

Live Load cases: See GDOT Program BRLLCA

Skew Angle: ✓ 45.0781 * FROM CL BRIDGE
44.9219 * FROM CL BENT

Is Bent Fix "F" or Exp. "E"? F F = Fix E = Exp

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:	✓ 10	bars	
Max bars / row in bot of cap:	✓ 12	bars	
Column Steel Ratios:	✓ 1	% min.	
	✓ 8	% max.	

Impact Factor

	Length (ft)	Impact
LEFT SPAN	69.25	1.2574
RIGHT SPAN	✓ 69.25	1.2574
Avg. Impact =		1.2574

Soil Weight ✓ 0.120 kcf

Columns:

TYPE ✓ C (S-SQUARE or RECTANGULAR, C-CIRCULAR, P-PILES)
CLEAR ✓ 2.5

Allow. Soil Press. : ✓ 99.999

WIND ON SUPERSTRUCTURE

AASHTO 3.15.2.1.1

	Left Span	Rigtht Span			
Parapet Height =	32	32	in.		
Beam Height =	✓ 36	✓ 36	in.		
'D' or 'H' Dimension =	10	10	in.		
Beam + Coping + Slab =	3.83	3.83	ft.		
Total Height =	6.50	6.50	ft.		
Span Lengths =	69.25	69.25	ft.	TOTAL	
Wind Force Area =	225.1	225.1	$ft.^2$	450	$ft.^2$
Height of Cap =	✓ 3.50	✓ 3.50	ft.		
Wind Force Arm =	5.000	ft.			

WIND ON SUBSTRUCTURE:

AASHTO 3.15.2.2

Wind Force =	0.040	ksf	PARA. & PERP.
Length of Cap =	✓ 41.00	ft.	
Width of Cap =	✓ 4.00	ft.	
CG of Cap ELEV =	✓ 886.19		
Ground Line ELEV=	✓ 876.72		
Depth to Point of Fixity =	✓ 10.00		
Pt. of Fixity ELEV =	866.72		
Bot. Cap to Pt. of Fixity =	17.72	ft.	
Design Height of Column =	19.47	ft.	CG Cap to Pt. of Fixity
Exposed Height of Column =	7.72	ft.	
Width of Column =	✓ 4.00	ft.	
Depth of Column =	4.00	ft.	
No. of Columns =	2	columns	

For Bent 3	
2 yr Flood Elev. =	879.25
2 yr Flood Elev. + 1' =	880.25
Ground Line Elev. - 1' =	875.72
For Top of Caisson on Plans, use:	880.5
For Column Height on Plans, use:	**3.94 ft.**
For Caisson Height on Plans, use:	**32.50 ft.**

	PARA.	PERP.	
M_{CAP} =	10.90	111.76	k-ft.
M_{COL} =	17.12	34.24	k-ft.
M_{TOTAL} =	28.02	146.00	k-ft.
P_T =	1.44	7.50	kips

BRIDGE: **I-575 over Noonday Creek North**
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**

WIND ON LIVE LOAD — AASHTO 3.15.2.1.2

Length = 69.25 ft.
APT = APL = 11.583 ft. Use--> ✓ 11.583 ft.

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

(SPEED) 65 mph D 1.9894 (degrees)
LF = ✓ 5.33 k CF = 6.285 k

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 =	0.00	0.00	ft
Δ =	0.000	0.000	in
G = Shear Modulus of Pad =	200	200	psi
L= Length of Pad =	10.00	10.00	in
W = Width of Pad =	16.00	16.00	in
Telas = Bearing Elastomer Depth =	2.375	2.375	in
Fs =	0.00	0.00	KIPS /pad
No. of Beams =	5	5	
Total Temperature Force =	0.00	0.00	kips @ top of seat
	0.00	0.00	kips @ center of cap
P_L =	0.00	0.00	kips
P_T =	0.00	0.00	kips

Difference = P_L = 0.00 kips AT CL CAP
P_T = 0.00 kips AT CL CAP

P_L = 0.00 kips AT CL CAP ----> Use Total Lateral Force
P_T = 0.00 kips AT CL 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. = ✓ 886.71 ft.
Design Height of Column = 19.47 ft.
Bottom of Stream ELEV = 876.72 ft.
Pt. of Fixity ELEV = 866.72
V_{AVG} = ✓ 6.98 FPS @ 100 yr. Flood
K = 0.7 for circular end piers
$P_{AVG} = K * (V_{AVG})^2$ = 34.10 psf AASHTO Eq. (3-4)
$P_{MAX} = 2 * P_{AVG}$ = 68.21 psf
Piers Aligned with stream flow:
P_S = 1.363 kips
M = 22.70 k-ft.
$P_{CL\ CAP_L}$ = ✓ 1.166 k

BRIDGE: **I-575 over Noonday Creek North**
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
AASHTO 3.3

DEAD LOAD:

LENGTH = 41.00 feet
SKEW = 45.08 degrees

SPAN 2

BEAM	BM SPC ALONG BENT	DISTANCE BETWEEN	DISTANCE ALONG	R dl	Add'l DL	DL
1		3.390	3.390	52.789	0.000	52.789
2	8.564	8.564	11.954	52.789	0.000	52.789
3	8.546	8.546	20.500	52.789	0.000	52.789
4	8.527	8.527	29.027	52.789	0.000	52.789
5	8.509	8.509	37.536	52.789	0.000	52.789
		3.464	41.000			
TOTAL		41.000				263.947
					CL Brg to CL Bent =	1.0000
						526.427

SPAN 3

BEAM	BM SPC ALONG BENT	DISTANCE BETWEEN	DISTANCE ALONG	R dl	Add'l DL	DL
1		3.390	3.390	52.496	0.000	52.496
2	8.564	8.564	11.954	52.496	0.000	52.496
3	8.546	8.546	20.500	52.496	0.000	52.496
4	8.527	8.527	29.027	52.496	0.000	52.496
5	8.509	8.509	37.536	52.496	0.000	52.496
		3.464	41.000			
TOTAL		41.000				262.480
					CL Brg to CL Bent =	1.0000

COMBINED LOADS

COLUMN = 2.000 FT - checking ¼ points on column

	POINT	MEMBER	DISTANCE BETWEEN	DISTANCE ALONG	R dl	Add'l DL	DL	CHECK POINT
9.00	G1	1	5.610	3.390	105.285	0.000	105.285	1
	EC	1	4.610	8.000				2
	EC	2	1.000	10.000				3
	G2	2	1.954	11.954	105.285	0.000	105.285	4
23.00	G3	2	8.546	20.500	105.285	0.000	105.285	5
	G4	2	8.527	29.027	105.285	0.000	105.285	6
	EC	2	1.973	31.000				7
9.00	EC	3	1.000	33.000				8
	G5	3	4.536	37.536	105.285	0.000	105.285	9
				3.464				
			41.000					

ADDITIONAL DL MOMENT DUE TO ECCENTRICITY:

M_{DL} = 1.47 KIP-FT

(EQUIV. LONG FORCE) $F_{DL} = M_{DL} / H_{DESIGN\ OF\ COLUMN}$ = 0.08 KIP

(TOTAL LONG FORCE) $F_L = F_{DL} + P_{L\ TEMP}$ = 0.08 KIP

LIVE LOADS:

AASHTO 3.4

	LEFT	RIGHT	
Span Lengths =	69.25	69.25	ft

LIVE LOAD REACTION	63.91	KIPS	AXLE LOAD NO IMPACT	VERIFY !!!!
	70.32	KIPS	LANE LOAD NO IMPACT	
AVERAGE IMPACT	1.2574			
P-LOAD FOR BRLLCA INPUT	44.210	KIPS		

CALCULATION COVER SHEET

PROJECT	JOB NO.	CALC NO.	SHEET
I-75 / I-575 NORTHWEST CORRIDOR	NH000-0575-01(028)	BR#40	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 bent 2.

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	4	4	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#40

SUBJECT: Live Load Case Output - Bent 2
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.

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

✓ JCR 10-14-09

I-575 OVER MOONDAY CRK NORTH - BENT 2

BRIDGE WIDTH	X1	X2	CENTER LINE DISTANCE	# OF BEAMS	REACTION FORCE	MAXIMUM # OF TRUCKS	# OF COLUMNS	COLUMN WIDTH	SKEW ANGLE
107.250	3.625	3.625	53.625	17	44.210	10	0	0.000	0

D1	D2	D3	D4	D5	D6	D7	D8	D9	D10	D11	D12	D13	D14	D15	D16	D17	D18	D19	D20
2.377	5.773	5.761	5.750	5.739	4.750	6.817	6.817	6.817	6.817	6.817	6.817	6.817	6.817	6.552	6.728	6.908			

	NO. OF TRUCKS	BEAM 1	BEAM 2	BEAM 3	BEAM 4	BEAM 5	BEAM 6	BEAM 7	BEAM 8	BEAM 9	BEAM 10
		BEAM 11	BEAM 12	BEAM 13	BEAM 14	BEAM 15	BEAM 16	BEAM 17	BEAM 18	BEAM 19	BEAM 20
LL CASE 1	1	34.653	42.448	11.319	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
LL CASE 2	2	34.653	44.643	53.611	43.933	0.000	0.000	0.000	0.000	0.000	0.000
		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
LL CASE 3	3	34.653	44.643	53.611	57.607	35.423	39.324	0.000	0.000	0.000	0.000
		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
LL CASE 4	4	34.653	44.643	53.611	57.607	35.423	60.997	49.508	17.238	0.000	0.000
		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
LL CASE 5	5	34.653	44.643	53.611	57.607	35.423	60.997	50.540	66.746	37.880	0.000
		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
LL CASE 6	6	34.653	44.643	53.611	57.607	35.423	60.997	50.540	66.746	62.479	49.508
		14.313	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
LL CASE 7	7	34.653	44.643	53.611	57.607	35.423	60.997	50.540	66.746	62.479	53.464
		63.821	34.956	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
LL CASE 8	8	34.653	44.643	53.611	57.607	35.423	60.997	50.540	66.746	62.479	53.464
		63.821	62.479	49.508	11.388	0.000	0.000	0.000	0.000	0.000	0.000
LL CASE 9	9	34.653	44.643	53.611	57.607	35.423	60.997	50.540	66.746	62.479	53.464
		63.821	62.479	56.389	59.401	33.326	0.000	0.000	0.000	0.000	0.000
LL CASE 10	10	34.653	44.643	53.611	57.607	35.423	60.997	50.540	66.746	62.479	53.464
		63.821	62.479	56.389	59.401	61.851	49.278	10.617	0.000	0.000	0.000
LL CASE 11	1	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		0.000	0.000	0.000	0.000	2.241	49.383	36.217	0.000	0.000	0.000
LL CASE 12	2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		0.000	0.000	0.000	24.379	50.597	65.648	36.217	0.000	0.000	0.000
LL CASE 13	3	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		0.000	1.582	49.508	61.708	50.597	65.648	36.217	0.000	0.000	0.000
LL CASE 14	4	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		22.225	51.091	66.195	61.708	50.597	65.648	36.217	0.000	0.000	0.000
LL CASE 15	5	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	46.824
		63.821	51.091	66.195	61.708	50.597	65.648	36.217	0.000	0.000	0.000
LL CASE 16	6	0.000	0.000	0.000	0.000	0.000	0.000	0.000	19.300	49.508	66.435
		63.821	51.091	66.195	61.708	50.597	65.648	36.217	0.000	0.000	0.000
LL CASE 17	7	0.000	0.000	0.000	0.000	0.000	0.000	40.974	66.746	49.508	66.435
		63.821	51.091	66.195	61.708	50.597	65.648	36.217	0.000	0.000	0.000
LL CASE 18	→1	0.000	0.000	0.000	0.000	23.501	42.983	63.510	66.746	49.508	66.435
		63.821	51.091	66.195	61.708	50.597	65.648	36.217	0.000	0.000	0.000
LL CASE 19	→2	0.000	0.000	15.654	42.229	54.037	42.383	63.510	66.746	49.508	66.435
		63.821	51.091	66.195	61.708	50.597	65.648	36.217	0.000	0.000	0.000
LL CASE 20	→3	4.020	42.384	57.669	42.229	54.037	42.383	63.510	66.746	49.508	66.435
		63.821	51.091	66.195	61.708	50.597	65.648	36.217	0.000	0.000	0.000
LL CASE 21	1	0.000	0.000	0.000	0.000	0.000	0.000	0.000	19.456	49.508	19.456
		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
LL CASE 22	2	0.000	0.000	0.000	0.000	0.000	0.000	41.285	66.591	49.508	19.456
		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
LL CASE 23	3	0.000	0.000	0.000	0.000	0.000	0.000	41.285	66.591	49.508	66.591
		41.285	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
LL CASE 24	→1	0.000	0.000	0.000	0.000	23.724	42.315	63.666	66.591	49.508	66.591
		41.285	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
LL CASE 25	5	0.000	0.000	0.000	0.000	23.724	42.315	63.666	66.591	49.508	66.591
		63.666	49.508	16.531	0.000	0.000	0.000	0.000	0.000	0.000	0.000

LL CASE 26	6 → 2	0.000	0.000	15.839	42.230	54.076	42.315	63.666	66.591	49.508	66.591	63.666	49.508	16.531	0.000	0.000	0.000	0.000	0.000	0.000	0.000
LL CASE 27	7	0.000	0.000	15.839	42.230	54.076	42.315	63.666	66.591	49.508	66.591	63.666	51.247	66.039	37.173	0.000	0.000	0.000	0.000	0.000	0.000
LL CASE 28	8	4.204	42.385	57.670	42.230	54.076	42.315	63.666	66.591	49.508	66.591	63.666	51.247	66.039	37.173	0.000	0.000	0.000	0.000	0.000	0.000
LL CASE 29	9	4.204	42.385	57.670	42.230	54.076	42.315	63.666	66.591	49.508	66.591	63.666	51.247	66.039	61.714	48.352	15.527	0.000	0.000	0.000	0.000
LL CASE 30	10	4.204	42.385	57.670	42.230	54.076	42.315	63.666	66.591	49.508	66.591	63.666	51.247	66.039	61.714	50.750	65.486	36.063	0.000	0.000	0.000
LL CASE 31	2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	32.271	61.137	56.149	27.283	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
LL CASE 32	3	0.000	0.000	0.000	0.000	0.000	8.703	49.508	62.479	61.137	56.149	27.283	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
LL CASE 33	4	0.000	0.000	0.000	0.000	0.000	8.703	49.508	62.479	61.137	56.149	62.479	49.508	3.716	0.000	0.000	0.000	0.000	0.000	0.000	0.000
LL CASE 34	5 → 1	0.000	0.000	0.000	0.000	42.116	45.442	59.074	62.479	61.137	56.149	62.479	49.508	3.716	0.000	0.000	0.000	0.000	0.000	0.000	0.000
LL CASE 35	6	0.000	0.000	0.000	0.000	42.116	45.442	59.074	62.479	61.137	56.149	62.479	64.061	53.225	24.359	0.000	0.000	0.000	0.000	0.000	0.000
LL CASE 36	7 → 2	0.000	0.000	31.032	42.259	57.245	45.442	59.074	62.479	61.137	56.149	62.479	64.061	53.225	24.359	0.000	0.000	0.000	0.000	0.000	0.000
LL CASE 37	8	0.000	0.000	31.032	42.259	57.245	45.442	59.074	62.479	61.137	56.149	62.479	64.061	53.225	62.233	48.003	2.543	0.000	0.000	0.000	0.000
✓ LL CASE 38	9 → 3	19.337	42.416	57.699	42.259	57.245	45.442	59.074	62.479	61.137	56.149	62.479	64.061	53.225	62.233	48.003	2.543	0.000	0.000	0.000	0.000
LL CASE 39	10	19.337	42.416	57.699	42.259	57.245	45.442	59.074	62.479	61.137	56.149	62.479	64.061	53.225	62.233	63.386	52.163	23.417	0.000	0.000	0.000
LL CASE 40	2	34.653	42.448	11.319	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.241	49.963	36.217	0.000	0.000	0.000
LL CASE 41	3	34.653	44.643	53.611	43.933	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.241	49.963	36.217	0.000	0.000	0.000
LL CASE 42	4	34.653	44.643	53.611	43.933	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	24.379	50.597	65.648	36.217	0.000	0.000	0.000
LL CASE 43	5	34.653	44.643	53.611	57.607	35.423	39.324	0.000	0.000	0.000	0.000	0.000	0.000	0.000	24.379	50.597	65.648	36.217	0.000	0.000	0.000
LL CASE 44	6	34.653	44.643	53.611	57.607	35.423	39.324	0.000	0.000	0.000	0.000	0.000	1.582	49.508	61.708	50.597	65.648	36.217	0.000	0.000	0.000
LL CASE 45	7	34.653	44.643	53.611	57.607	35.423	60.997	49.508	17.238	0.000	0.000	0.000	1.582	49.508	61.708	50.597	65.648	36.217	0.000	0.000	0.000
LL CASE 46	8	34.653	44.643	53.611	57.607	35.423	60.997	49.508	17.238	0.000	0.000	22.225	51.091	66.195	61.708	50.597	65.648	36.217	0.000	0.000	0.000
LL CASE 47	9	34.653	44.643	53.611	57.607	35.423	60.997	50.540	66.746	37.880	0.000	22.225	51.091	66.195	61.708	50.597	65.648	36.217	0.000	0.000	0.000
LL CASE 48	10	34.653	44.643	53.611	57.607	35.423	60.997	50.540	66.746	37.880	46.824	63.821	51.091	66.195	61.708	50.597	65.648	36.217	0.000	0.000	0.000

CALCULATION COVER SHEET

PROJECT	JOB NO.	CALC NO.	SHEET
I-75 / I-575 NORTHWEST CORRIDOR	NH000-0575-01(028)	BR#40	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.
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(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 bents 2&3.

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	19	19	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#40

SUBJECT: Bent Design Output - Bent 2
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.

PRECONSTUCTION DIVISION - OFFICE OF BRIDGE & STRUCTURAL DESIGN
THE ANALYSIS AND DESIGN OF PIERS FOR BRIDGES - V 4.2.07 - AASHTO SPECS 1984 INTERIM
REVISED: JUNE 30, 2008
I-575 OVER NOONDAY CRK NORTH - BENT 2

DESIGN DATA

DESIGN OPTIONS	NO. CAN	NO. COL	NO. LLC	SKEW D	ANG M	ANG S	F'C PSI	FC PSI	N	FY PSI	FS PSI	EC KSI	ES KSI	CONC. STRAIN	Z FACT	* MAIN SIZE	* STR SIZ	* MAX TOP	CAP REINFORCING STEEL MAX BOT	MIN SIZE	MIN NO.	* TOP CL.	* MIN S.SP	* CAP DEPTH INCR.	BOT CL.
D D D L	2	2	11	43-	32-	40	3500.	1400.	8.	60000.	24000.	3587.	29000.	0.0030	170.	11	5	10	12	6	4	2.00	4.00	3.00	2.00

COLUMN MIN.P	REINFORCING STEEL 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 P
1.00	8.00	2.25	2.500	1	2.00	0.70	0.90	0.00	1.00	0.00	25.74	0.120	99.999	2.50	5.00	1.250	1.000	3.000	0.000	0.000	

CAP DATA

CN	C	L	A	DE	BC	BE	DH	LH	XB1	XB2	XB3	XB4	XB5	XB6	XB7	XB8
11	C	8.500	0.000	3.500	4.000	4.000	0.000	0.000	5.199	4.199						
12	C	23.000	0.000	3.500	4.000		0.000	0.000	1.000	2.159	8.341	8.325	2.175			
13	C	8.500	0.000	3.500	4.000	4.000	0.000	0.000	1.000	4.134						

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	0	C	R		21.130	0.000	4.000	0.000	0.000	0.000	1.750	0.000	15	0	11	0	0	0	25	0	11	0	0	0	0.000	0.000	0.000
22	0	C	R		21.130	0.000	4.000	0.000	0.000	0.000	1.750	0.000	15	0	11	0	0	0	25	0	11	0	0	0	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	6.000	6.000	3.000	0.500	0.500	0.250	1.000	1.000	0.000	0	0	0.000	0.000	0.000
32	S	6.000	6.000	3.000	0.500	0.500	0.250	1.000	1.000	0.000	0	0	0.000	0.000	0.000

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
450.	450.	1	50	0	44	6	41	12	33	16	17	19	5.000	5.000	1.603	7.687

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	69.3	69.3	11.583	11.583

MISCELLANEOUS FORCES

CENTRI. FT	TRACTION FORCE AND ARMS FL	APT	APL	EXPANSION COEFFICIENT	SHRINKAGE COEFFICIENT	STREAM FLOW PT	PL
6.285	0.000	11.583	11.583	0.00018000	0.00044000	1.445	0.111

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	105.110	0.000	0.000	105.110	105.110	105.110	0.000	0.000	105.110			
LL 1	1	34.652	0.000	0.000	42.448	11.319	0.000	0.000	0.000	0.000			
LL 2	2	34.652	0.000	0.000	44.642	53.611	43.933	0.000	0.000	0.000			
LL 3	3	34.652	0.000	0.000	44.642	53.611	57.606	0.000	0.000	35.422			
LL 4	1	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	23.501			
LL 5	2	0.000	0.000	0.000	0.000	15.654	42.229	0.000	0.000	54.037			
LL 6	3	4.020	0.000	0.000	42.384	57.669	42.229	0.000	0.000	54.037			
LL 7	1	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	23.724			
LL 8	2	0.000	0.000	0.000	0.000	15.838	42.229	0.000	0.000	54.076			
LL 9	1	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	42.115			
LL10	2	0.000	0.000	0.000	0.000	31.031	42.258	0.000	0.000	57.245			
LL11	3	19.336	0.000	0.000	42.416	57.698	42.258	0.000	0.000	57.245			

MEMBER PROPERTIES

COLUMN PROPERTIES

CN	KT KTM	COTB COBT	COTBM COBTM	TLR TRL	TRC TCR	TLC TCL	DFC DFL	KL PDF	FKBR FKUBR	PCBR PCUBR	PCL FLU	UFMT UFMB	EITTB EILTB	PSIT PSIB	RGTB RGL
1	1228752.2	0.5000	0.5000	0.4768	1.0000	0.5232	0.5232	0.047953	11.4	170577.8	11198.6	87228.0	342134.7	0.7	12.3
	1228752.2	0.5000	0.2743	0.0000	1.0000	0.0000	0.0000	0.5000	22.6	43357.5	19.4	87228.0	342134.7	0.0	12.3
2	1228752.2	0.5000	0.5000	0.0000	0.5232	1.0000	0.5232	0.047953	11.4	170577.8	11198.6	87228.0	342134.7	0.7	12.3
	1228752.2	0.5000	0.2743	0.4768	0.0000	1.0000	0.4768	0.5000	22.6	43357.5	19.4	87228.0	342134.7	0.0	12.3

CAP PROPERTIES

CN	CO K	KML KMR	COMLR COMRL	FMWT UFEM	FMLP1 FMRP1	FMLP2 FMRP2	FMLP3 FMRP3	FMLP4 FMRP4	FMLP5 FMRP5	FMLP6 FMRP6	FMLP7 FMRP7	FMLP8 FMRP8
2	0.5000	1119836.9	0.2803	92.5750	0.9149	2.3508	2.8750	0.3778	0.0416			
	1283834.1	1119836.9	0.2803	83728.3	0.0416	0.3743	2.8750	2.3589	0.9149			

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	0.396	4.556	0.500	6.009	0.396	0.000	-4.556	0.875	0.500	10.565	10.565
	2	-0.396	4.556	0.500	6.009	-0.396	-4.556	0.000	0.875	0.500	10.565	10.565
EXPANSION OF CAP	1	0.000	61.960	8.671	121.261	0.000	0.000	-61.960	0.000	0.000	0.000	0.000
	2	0.000	-61.960	-8.671	-121.261	0.000	61.960	0.000	0.000	0.000	0.000	0.000
SHRINKAGE OF CAP	1	0.000	-151.457	-21.196	-296.415	0.000	0.000	151.457	0.000	0.000	0.000	0.000
	2	0.000	151.457	21.196	296.415	0.000	-151.457	0.000	0.000	0.000	0.000	0.000
DEAD LOAD TOTAL	1	305.101 341.632	40.812	2.933	21.161	341.632	622.329	-663.142	0.000	0.000	0.000	0.000
	2	304.449 340.979	-41.819	-2.933	-20.155	340.979	657.316	-615.497	0.000	0.000	0.000	0.000
STREAM FLOW	1	0.572	6.583	0.723	8.683	0.572	0.000	-6.583	0.097	0.056	1.173	1.173
	2	-0.572	6.583	0.723	8.683	-0.572	-6.583	0.000	0.097	0.056	1.173	1.173
CENT. FORCE 1 LN	1	4.099	20.754	2.278	27.376	4.099	0.000	-20.754	28.865	2.165	70.821	70.821
	2	-4.099	20.754	2.278	27.376	-4.099	-20.754	0.000	28.865	2.165	70.821	70.821
WIND ON SUBSTR.	1	0.635	7.303	0.802	9.633	0.635	0.000	-7.303	-6.726	-3.843	-81.213	-81.213
	2	-0.635	7.303	0.802	9.633	-0.635	-7.303	0.000	-6.726	-3.843	-81.213	-81.213
GROUP 2 WIND 1 1	1	10.641	81.603	8.956	107.637	10.641	0.000	-81.603	45.589	3.907	121.303	121.303
	2	-10.641	81.603	8.956	107.637	-10.641	-81.603	0.000	45.589	3.907	121.303	121.303
GROUP 2 WIND 1 2	1	10.641	81.603	8.956	107.637	10.641	0.000	-81.603	59.041	11.594	283.729	283.729
	2	-10.641	81.603	8.956	107.637	-10.641	-81.603	0.000	59.041	11.594	283.729	283.729
GROUP 2 WIND 2 1	1	10.582	81.161	8.907	107.054	10.582	0.000	-81.161	32.706	1.998	71.432	71.432
	2	-10.582	81.161	8.907	107.054	-10.582	-81.161	0.000	32.706	1.998	71.432	71.432
GROUP 2 WIND 2 2	1	8.299	64.213	7.047	84.699	8.299	0.000	-64.213	59.368	11.642	284.996	284.996
	2	-8.299	64.213	7.047	84.699	-8.299	-64.213	0.000	59.368	11.642	284.996	284.996
GROUP 2 WIND 3 1	1	11.123	85.177	9.348	112.351	11.123	0.000	-85.177	22.962	0.555	33.712	33.712
	2	-11.123	85.177	9.348	112.351	-11.123	-85.177	0.000	22.962	0.555	33.712	33.712
GROUP 2 WIND 3 2	1	6.558	51.281	5.628	67.641	6.558	0.000	-51.281	62.834	12.156	298.414	298.414
	2	-6.558	51.281	5.628	67.641	-6.558	-51.281	0.000	62.834	12.156	298.414	298.414
GROUP 2 WIND 4 1	1	10.282	78.938	8.664	104.122	10.282	0.000	-78.938	10.188	-1.338	-15.737	-15.737
	2	-10.282	78.938	8.664	104.122	-10.282	-78.938	0.000	10.188	-1.338	-15.737	-15.737
GROUP 2 WIND 4 2	1	4.196	33.743	3.703	44.508	4.196	0.000	-33.743	58.867	11.568	283.058	283.058
	2	-4.196	33.743	3.703	44.508	-4.196	-33.743	0.000	58.867	11.568	283.058	283.058
GROUP 2 WIND 5 1	1	7.651	59.399	6.519	78.350	7.651	0.000	-59.399	-9.855	-4.307	-93.327	-93.327
	2	-7.651	59.399	6.519	78.350	-7.651	-59.399	0.000	-9.855	-4.307	-93.327	-93.327
GROUP 2 WIND 5 2	1	0.423	5.730	0.629	7.558	0.423	0.000	-5.730	45.429	9.577	231.037	231.037
	2	-0.423	5.730	0.629	7.558	-0.423	-5.730	0.000	45.429	9.577	231.037	231.037

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

		TRANSVERSE							LONGITUDINAL			
LOAD	COL	PC	MT	V	MB	RF	ML	MR	MT	V	MB	MF
GROUP 3 WIND 1 1	1	7.712	47.365	5.198	62.476	7.712	0.000	-47.365	45.504	3.559	114.480	114.480
	2	-7.712	47.365	5.198	62.476	-7.712	-47.365	0.000	45.504	3.559	114.480	114.480
GROUP 3 WIND 1 2	1	7.712	47.365	5.198	62.476	7.712	0.000	-47.365	49.539	5.865	163.208	163.208
	2	-7.712	47.365	5.198	62.476	-7.712	-47.365	0.000	49.539	5.865	163.208	163.208
GROUP 3 WIND 2 1	1	7.667	47.096	5.169	62.122	7.667	0.000	-47.096	33.801	2.399	80.289	80.289
	2	-7.667	47.096	5.169	62.122	-7.667	-47.096	0.000	33.801	2.399	80.289	80.289
GROUP 3 WIND 2 2	1	5.952	36.792	4.038	48.530	5.952	0.000	-36.792	49.837	5.895	164.077	164.077
	2	-5.952	36.792	4.038	48.530	-5.952	-36.792	0.000	49.837	5.895	164.077	164.077
GROUP 3 WIND 3 1	1	8.074	49.538	5.437	65.343	8.074	0.000	-49.538	24.950	1.521	54.428	54.428
	2	-8.074	49.538	5.437	65.343	-8.074	-49.538	0.000	24.950	1.521	54.428	54.428
GROUP 3 WIND 3 2	1	4.642	28.929	3.175	38.159	4.642	0.000	-28.929	52.985	6.207	173.276	173.276
	2	-4.642	28.929	3.175	38.159	-4.642	-28.929	0.000	52.985	6.207	173.276	173.276
GROUP 3 WIND 4 1	1	7.442	45.745	5.021	60.339	7.442	0.000	-45.745	13.347	0.370	20.526	20.526
	2	-7.442	45.745	5.021	60.339	-7.442	-45.745	0.000	13.347	0.370	20.526	20.526
GROUP 3 WIND 4 2	1	2.867	18.267	2.005	24.094	2.867	0.000	-18.267	49.382	5.850	162.748	162.748
	2	-2.867	18.267	2.005	24.094	-2.867	-18.267	0.000	49.382	5.850	162.748	162.748
GROUP 3 WIND 5 1	1	5.464	33.866	3.717	44.670	5.464	0.000	-33.866	-4.860	-1.435	-32.669	-32.669
	2	-5.464	33.866	3.717	44.670	-5.464	-33.866	0.000	-4.860	-1.435	-32.669	-32.669
GROUP 3 WIND 5 2	1	0.031	1.235	0.136	1.629	0.031	0.000	-1.235	37.175	4.639	127.083	127.083
	2	-0.031	1.235	0.136	1.629	-0.031	-1.235	0.000	37.175	4.639	127.083	127.083
LIVE LOAD LL 1	1	84.186	-6.423	0.014	6.720	84.186	180.156	-173.733	0.000	0.000	0.000	0.000
	2	4.233	-6.819	-0.014	6.522	4.233	6.819	0.000	0.000	0.000	0.000	0.000
LIVE LOAD LL 2	1	112.795	109.206	8.626	73.067	112.795	180.156	-289.362	0.000	0.000	0.000	0.000
	2	64.043	-133.825	-8.626	-48.448	64.043	133.825	0.000	0.000	0.000	0.000	0.000
LIVE LOAD LL 3	1	96.931	65.173	4.733	34.833	96.931	162.140	-227.314	0.000	0.000	0.000	0.000
	2	106.408	-68.168	-4.733	-31.838	106.408	231.839	-163.671	0.000	0.000	0.000	0.000
LIVE LOAD LL 4	1	-4.524	-31.327	-2.813	-28.112	-4.524	0.000	31.327	0.000	0.000	0.000	0.000
	2	28.025	47.925	2.813	11.514	28.025	72.729	-120.654	0.000	0.000	0.000	0.000
LIVE LOAD LL 5	1	2.753	-10.268	-1.675	-25.126	2.753	0.000	10.268	0.000	0.000	0.000	0.000
	2	109.167	36.925	1.675	-1.530	109.167	240.501	-277.426	0.000	0.000	0.000	0.000
LIVE LOAD LL 6	1	59.065	94.022	5.547	23.180	59.065	18.810	-112.832	0.000	0.000	0.000	0.000
	2	121.240	-62.247	-5.547	-54.955	121.240	311.930	-249.683	0.000	0.000	0.000	0.000
LIVE LOAD LL 7	1	-4.567	-31.624	-2.840	-28.379	-4.567	0.000	31.624	0.000	0.000	0.000	0.000
	2	28.291	48.380	2.840	11.623	28.291	73.419	-121.799	0.000	0.000	0.000	0.000
LIVE LOAD LL 8	1	2.838	-9.973	-1.655	-24.999	2.838	0.000	9.973	0.000	0.000	0.000	0.000
	2	109.305	36.657	1.655	-1.685	109.305	240.970	-277.626	0.000	0.000	0.000	0.000
LIVE LOAD LL 9	1	-8.108	-56.139	-5.041	-50.379	-8.108	0.000	56.139	0.000	0.000	0.000	0.000
	2	50.223	85.884	5.041	20.633	50.223	130.334	-216.218	0.000	0.000	0.000	0.000
LIVE LOAD LL10	1	9.828	14.516	0.004	-14.428	9.828	0.000	-14.516	0.000	0.000	0.000	0.000
	2	120.706	14.398	-0.004	-14.487	120.706	279.498	-293.896	0.000	0.000	0.000	0.000
LIVE LOAD LL11	1	75.023	61.806	3.537	12.936	75.023	90.475	-152.282	0.000	0.000	0.000	0.000
	2	122.035	-37.850	-3.537	-36.892	122.035	302.356	-264.506	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	-14.874	-14.874	-14.874	-14.874	-14.874	-14.874	-14.874	-9.012	-145.655	-9.012	-145.655	-9.012	-220.884
P 2	-650.545	-650.545	-966.434	-650.545	-650.545	-650.545	-839.700	-157.118	-157.118	-157.118	-157.118	-232.347	-232.347
C 1L	-809.028	-809.028	-1200.146	-809.028	-809.028	-809.028	-1043.231	-159.848		-159.848		-235.077	
C 1R	-862.084	-740.206	-1552.808	-756.001	-976.726	-724.704	-1365.174		236.784		411.869		219.182
P 3	-626.665	-522.389	-1142.304	-529.806	-731.338	-505.425	-1017.132	234.054	234.054	409.139	409.139	216.452	216.452
P 4	-127.706	7.605	-265.335	-50.763	-210.856	0.028	-275.021	228.160	91.517	403.245	169.684	210.558	73.915
P 5	540.669	1055.034	460.131	540.669	540.669	848.672	492.443	68.746	-67.897	146.913	-67.897	51.144	-143.014
P 6	-119.177	76.990	-346.247	-36.186	-195.972	63.066	-301.767	-90.624	-227.267	-90.624	-227.267	-165.741	-389.069
P 7	-619.941	-593.108	-1139.513	-515.268	-716.800	-532.055	-989.862	-233.205	-233.205	-233.205	-233.205	-395.007	-395.007
C 2L	-854.511	-833.777	-1531.712	-739.869	-960.594	-763.438	-1324.420	-235.935		-235.935		-397.737	
C 2R	-800.146	-800.146	-1438.194	-800.146	-800.146	-800.146	-1182.211		159.848		284.127		159.848
P 8	-641.663	-641.663	-1155.432	-641.663	-641.663	-641.663	-949.309	157.118	157.118	281.397	281.397	157.118	157.118
P 9	-15.465	-15.465	-15.465	-15.465	-15.465	-15.465	-15.465	145.832	9.189	270.111	9.189	145.832	9.189

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/FT RATIO	FS/FZ RATIO
P 1	-11.441	-11.441	1.76	4 # 11	1.76	4 # 11	0.00	0.000	#5 0.00	18.98	0.040	#5 15.50	42.00		0.10	0.000	0.027
P 2	-500.419	-645.923	5.68	4 # 11	1.76	4 # 11	19.50	0.040	#5 15.50	19.50	0.040	#5 15.50	42.00		0.30	0.528	1.206
C 1	-607.003	-1000.595	9.30	6 # 11	1.76	4 # 11	19.50	0.040	#5 15.50	19.50	0.112	#5 5.52	42.00		0.54	0.870	1.103
P 3	-434.019	-737.179	6.76	5 # 11	1.76	4 # 11	19.50	0.111	#5 5.58	19.50	0.111	#5 5.58	42.00		0.37	0.750	1.030
P 4	-35.909	-175.624	2.40	4 # 11	1.76	4 # 11	18.98	0.114	#5 5.46	18.98	0.040	#5 15.50	42.00		0.23	0.316	0.411
P 5	652.825	378.802	1.76	4 # 11	6.22	4 # 11	19.50	0.040	#5 15.50	19.50	0.040	#5 15.50	42.00		0.34	0.867	1.219
P 6	12.651	-196.267	3.02	4 # 11	1.76	4 # 11	18.98	0.040	#5 15.50	18.98	0.106	#5 5.83	42.00		0.29	0.461	0.000
P 7	-454.504	-716.201	6.74	5 # 11	1.76	4 # 11	19.50	0.104	#5 5.97	19.50	0.104	#5 5.97	42.00		0.37	0.658	1.000
C 2	-615.497	-969.246	9.17	6 # 11	1.76	4 # 11	19.50	0.105	#5 5.89	19.50	0.048	#5 12.87	42.00		0.53	0.787	1.068
P 8	-493.587	-730.238	6.84	5 # 11	1.76	4 # 11	19.50	0.047	#5 13.24	19.50	0.047	#5 13.24	42.00		0.38	0.616	1.020
P 9	-11.896	-11.896	1.76	4 # 11	1.76	4 # 11	18.98	0.045	#5 13.82	0.00	0.000	#5 0.00	42.00		0.10	0.000	0.029

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

COLUMN ANALYSIS AND DESIGN OUTPUT

CRITICAL COLUMN LOADS

CN	T B	GR	LLC	MC	R	E S	C F	S F	PF	MTF	MLF	PM	MTM	MLM	PU	MTU	MLU	PU/PM	B	D
1	T	1	LL 2	0.0			C	S	652.9	352.7	75.2	652.9	361.7	142.9	3051.3	1690.7	668.1	4.674	48.00	48.00
1	B	3	LL 3	1.2			C	S	595.3	261.4	462.3	595.3	266.6	498.6	2330.4	1046.2	1956.9	3.919	48.00	48.00
2	T	1	LL 2	0.0			C	S	523.4	-282.4	75.2	523.4	289.6	112.5	3056.0	1691.2	657.3	5.839	48.00	48.00
2	B	5		1.2		S		S	412.2	490.7	356.1	412.2	497.3	374.7	1596.0	1927.9	1452.6	3.875	48.00	48.00

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	1.293	1.00	0.126	1224.	49193.	1.026	1.094	1.000	1	0.70
1	B	15 # 11	0 # 0	0 # 0	0 # 0	23.40	1.293	1.00	0.147	1104.	56808.	1.020	1.079	1.000	1	0.70
2	T	15 # 11	0 # 0	0 # 0	0 # 0	23.40	1.293	1.00	0.364	1224.	49193.	1.026	1.075	1.000	1	0.70
2	B	15 # 11	0 # 0	0 # 0	0 # 0	23.40	1.293	1.00	0.000	808.	60701.	1.013	1.052	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 3	1.2		C	S	438.072	193.937	18.768	355.597	11.766	16.446	-5.801	8.588	30.835	13.773	0.000	0.000	MAX.P1
1	1	LL 2	0.0		C	S	650.273	236.131	25.568	185.659	5.701	15.591	4.326	21.706	32.970	19.264	0.000	0.000	MAX.MT
1	1	LL 3	0.0		C	S	626.613	195.028	20.919	250.106	7.671	18.417	3.244	17.565	32.738	17.773	0.000	0.000	MAX.VT
1	1	LL 3	0.0		C	S	626.613	195.028	20.919	250.106	7.671	18.417	3.244	17.565	32.738	17.773	0.000	0.000	MAX.VP
1	3	LL 3	3.2		C	S	565.503	220.506	21.768	475.365	15.740	22.792	-6.818	9.577	39.187	21.387	0.000	0.000	MAX.ML
1	1	LL 3	0.0		C	S	626.613	195.028	20.919	250.106	7.671	18.417	3.244	17.565	32.738	18.051	0.000	0.000	MAX.VL
1	3	LL 6	1.2		C	S	407.958	184.670	19.415	355.597	11.766	15.774	-6.761	7.469	30.004	13.047	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
6.000	6.000	3.000	0.247	0.18	6 # 4	@12.000	TOP TRAN	28.874	38.922	77.844	32.250	0.000
				0.19	6 # 4	@12.000	BOT.LONG	29.324	39.525	79.051	32.750	0.000

FOOTING 2 DESIGN LOADS

F	G	LLID	WC	ES	C	S	P	MT	VT	ML	VL	P4	P3	P2	P1	MTF	VBF	VPF	LOAD
2	4	LL11	0.0	S	C	S	426.393	329.518	22.322	192.390	5.901	7.016	-5.028	17.416	29.460	16.167	0.000	0.000	MAX.P1
2	4	LL 5	0.0	S	C	S	544.736	440.022	32.335	185.659	5.701	6.334	-5.251	24.962	36.546	21.178	0.000	0.000	MAX.MT
2	1	LL11	0.0		C	S	638.844	17.479	-0.986	250.106	7.671	25.514	10.341	11.147	26.321	13.633	0.000	0.000	MAX.VT
2	1	LL11	0.0		C	S	638.844	17.479	-0.986	250.106	7.671	25.514	10.341	11.147	26.321	13.633	0.000	0.000	MAX.VP
2	3	LL11	3.2		C	S	548.275	92.640	5.592	475.365	15.740	27.288	-1.775	4.331	33.394	20.926	0.000	0.000	MAX.ML
2	1	LL11	0.0		C	S	638.844	17.479	-0.986	250.106	7.671	25.514	10.341	11.147	26.321	18.307	0.000	0.000	MAX.VL
2	4	LL 3	0.0	S	C	S	413.965	333.538	21.372	192.390	5.901	6.603	-5.548	17.088	29.239	15.950	0.000	0.000	MAX.P3

FOOTING 2 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
6.000	6.000	3.000	0.236	0.19	6 # 4	@12.000	TOP LONG	28.874	38.922	77.844	32.250	0.000
				0.19	6 # 4	@12.000	BOT.TRAN	29.324	39.525	79.051	32.750	0.000

CALCULATION SHEET

PROJECT: I-75 / I-575 NORTHWEST CORRIDOR
JOB NUMBER NH000-0575-01(028)
CALC NO. BR#40

SUBJECT: Bent Design Output - Bent 3
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.

PRECONSTUCTION DIVISION - OFFICE OF BRIDGE & STRUCTURAL DESIGN
THE ANALYSIS AND DESIGN OF PIERS FOR BRIDGES - V 4.2.07 - AASHTO SPECS 1984 INTERIM
REVISED: JUNE 30, 2008
I-575 OVER NOONDAY CRK NORTH - BENT 3

DESIGN DATA

DESIGN OPTIONS	NO. CAN	NO. COL	NO. LLC	SKEW D	ANG M	ANG S	F'C PSI	FC PSI	N	FY PSI	FS PSI	EC KSI	ES KSI	CONC. STRAIN	Z FACT	* MAIN SIZE	* STR SIZ	* CAP MAX TOP	REINFORCING STEEL MAX BOT	MIN SIZE	MIN NO.	* TOP CL.	* MIN S.SP	* CAP DEPTH INCR.	BOT CL.
D D D L	2	2	11	44	-55	-19	3500.	1400.	8.	60000.	24000.	3587.	29000.	0.0030	170.	11	5	10	12	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	0.00	1.00	0.00	25.74	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	9.000	0.000	3.500	4.000	4.000	0.000	0.000	5.610	4.610						
12	C	23.000	0.000	3.500	4.000		0.000	0.000	1.000	1.954	8.546	8.527	1.973			
13	C	9.000	0.000	3.500	4.000	4.000	0.000	0.000	1.000	4.536						

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	0	C	R		19.470	0.000	4.000	0.000	0.000	0.000	1.750	0.000	15	0	11	0	0	0	25	0	11	0	0	0	0.000	0.000	0.000
22	0	C	R		19.470	0.000	4.000	0.000	0.000	0.000	1.750	0.000	15	0	11	0	0	0	25	0	11	0	0	0	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	6.000	6.000	3.000	0.500	0.500	0.250	1.000	1.000	0.000	0	0	0.000	0.000	0.000
32	S	6.000	6.000	3.000	0.500	0.500	0.250	1.000	1.000	0.000	0	0	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
450.	450.	1	50	0	44	6	41	12	33	16	17	19	5.000	5.000	1.439	7.499

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	69.3	69.3	11.583	11.583

MISCELLANEOUS FORCES

CENTRI. FT	TRACTION FORCE AND ARMS FL	APT	APL	EXPANSION COEFFICIENT	SHRINKAGE COEFFICIENT	STREAM FLOW PT	PL
6.285	5.332	11.583	11.583	0.00018000	0.00044000	1.166	0.075

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	105.285	0.000	0.000	105.285	105.285	105.285	0.000	0.000	105.285			
LL 1	1	34.652	0.000	0.000	42.448	11.319	0.000	0.000	0.000	0.000			
LL 2	2	34.652	0.000	0.000	44.642	53.611	43.933	0.000	0.000	0.000			
LL 3	3	34.652	0.000	0.000	44.642	53.611	57.606	0.000	0.000	35.422			
LL 4	1	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	23.501			
LL 5	2	0.000	0.000	0.000	0.000	15.654	42.229	0.000	0.000	54.037			
LL 6	3	4.020	0.000	0.000	42.384	57.669	42.229	0.000	0.000	54.037			
LL 7	1	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	23.724			
LL 8	2	0.000	0.000	0.000	0.000	15.838	42.229	0.000	0.000	54.076			
LL 9	1	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	42.115			
LL10	2	0.000	0.000	0.000	0.000	31.031	42.258	0.000	0.000	57.245			
LL11	3	19.336	0.000	0.000	42.416	57.698	42.258	0.000	0.000	57.245			

MEMBER PROPERTIES

COLUMN PROPERTIES

CN	KT KTM	COTB COBT	COTBM COBTM	TLR TRL	TRC TCR	TLC TCL	DFC DFL	KL PDF	FKBR FKUBR	PCBR PCUBR	PCL FLU	UFMT UFMB	EITTB EILTB	PSIT PSIB	RGTB RGL
1	1333514.9	0.5000	0.5000	0.4579	1.0000	0.5421	0.5421	0.061294	10.5	201318.2	13019.2	102736.1	342134.7	0.8	12.3
	1333514.9	0.5000	0.2648	0.0000	1.0000	0.0000	0.0000	0.5000	20.7	51861.4	17.7	102736.1	342134.7	0.0	12.3
2	1333514.9	0.5000	0.5000	0.0000	0.5421	1.0000	0.5421	0.061294	10.5	201318.2	13019.2	102736.1	342134.7	0.8	12.3
	1333514.9	0.5000	0.2648	0.4579	0.0000	1.0000	0.4579	0.5000	20.7	51861.4	17.7	102736.1	342134.7	0.0	12.3

CAP PROPERTIES

CN	CO K	KML KMR	COMLR COMRL	FMWT UFEM	FMLP1 FMRP1	FMLP2 FMRP2	FMLP3 FMRP3	FMLP4 FMRP4	FMLP5 FMRP5	FMLP6 FMRP6	FMLP7 FMRP7	FMLP8 FMRP8
2	0.5000	1126401.0	0.2904	92.5750	0.9149	2.2439	2.8750	0.3346	0.0416			
	1283834.1	1126401.0	0.2904	83728.3	0.0416	0.3307	2.8750	2.2541	0.9149			

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	0.361	4.149	0.500	5.586	0.361	0.000	-4.149	0.875	0.500	9.735	9.735
	2	-0.361	4.149	0.500	5.586	-0.361	-4.149	0.000	0.875	0.500	9.735	9.735
EXPANSION OF CAP	1	0.000	69.105	10.785	140.884	0.000	0.000	-69.105	0.000	0.000	0.000	0.000
	2	0.000	-69.105	-10.785	-140.884	0.000	69.105	0.000	0.000	0.000	0.000	0.000
SHRINKAGE OF CAP	1	0.000	-168.924	-26.364	-344.384	0.000	0.000	168.924	0.000	0.000	0.000	0.000
	2	0.000	168.924	26.364	344.384	0.000	-168.924	0.000	0.000	0.000	0.000	0.000
DEAD LOAD TOTAL	1	306.634 340.035	-3.812	-0.246	-0.972	340.035	675.699	-671.887	0.000	0.000	0.000	0.000
	2	305.891 339.292	2.566	0.246	2.218	339.292	665.342	-667.908	0.000	0.000	0.000	0.000
STREAM FLOW	1	0.421	4.838	0.583	6.513	0.421	0.000	-4.838	0.066	0.038	0.730	0.730
	2	-0.421	4.838	0.583	6.513	-0.421	-4.838	0.000	0.066	0.038	0.730	0.730
TRAC. FORCE 1 LN	1	3.255	15.622	1.883	21.031	3.255	0.000	-15.622	-25.169	-1.888	-58.619	-58.619
	2	-3.255	15.622	1.883	21.031	-3.255	-15.622	0.000	-25.169	-1.888	-58.619	-58.619
CENT. FORCE 1 LN	1	3.847	18.465	2.225	24.858	3.847	0.000	-18.465	29.587	2.219	68.908	68.908
	2	-3.847	18.465	2.225	24.858	-3.847	-18.465	0.000	29.587	2.219	68.908	68.908
WIND ON SUBSTR.	1	0.519	5.971	0.720	8.038	0.519	0.000	-5.971	-6.562	-3.750	-73.003	-73.003
	2	-0.519	5.971	0.720	8.038	-0.519	-5.971	0.000	-6.562	-3.750	-73.003	-73.003
GROUP 2 WIND 1 1	1	9.731	72.074	8.685	97.028	9.731	0.000	-72.074	47.061	4.195	121.390	121.390
	2	-9.731	72.074	8.685	97.028	-9.731	-72.074	0.000	47.061	4.195	121.390	121.390
GROUP 2 WIND 1 2	1	9.731	72.074	8.685	97.028	9.731	0.000	-72.074	60.184	11.694	267.395	267.395
	2	-9.731	72.074	8.685	97.028	-9.731	-72.074	0.000	60.184	11.694	267.395	267.395
GROUP 2 WIND 2 1	1	9.728	72.052	8.683	96.999	9.728	0.000	-72.052	34.174	2.285	74.672	74.672
	2	-9.728	72.052	8.683	96.999	-9.728	-72.052	0.000	34.174	2.285	74.672	74.672
GROUP 2 WIND 2 2	1	7.523	56.231	6.776	75.700	7.523	0.000	-56.231	60.202	11.696	267.459	267.459
	2	-7.523	56.231	6.776	75.700	-7.523	-56.231	0.000	60.202	11.696	267.459	267.459
GROUP 2 WIND 3 1	1	10.277	75.997	9.158	102.310	10.277	0.000	-75.997	24.504	0.853	39.617	39.617
	2	-10.277	75.997	9.158	102.310	-10.277	-75.997	0.000	24.504	0.853	39.617	39.617
GROUP 2 WIND 3 2	1	5.868	44.354	5.345	59.711	5.868	0.000	-44.354	63.437	12.175	279.186	279.186
	2	-5.868	44.354	5.345	59.711	-5.868	-44.354	0.000	63.437	12.175	279.186	279.186
GROUP 2 WIND 4 1	1	9.538	70.694	8.519	95.171	9.538	0.000	-70.694	11.623	-1.055	-7.079	-7.079
	2	-9.538	70.694	8.519	95.171	-9.538	-70.694	0.000	11.623	-1.055	-7.079	-7.079
GROUP 2 WIND 4 2	1	3.659	28.503	3.435	38.372	3.659	0.000	-28.503	59.159	11.542	263.677	263.677
	2	-3.659	28.503	3.435	38.372	-3.659	-28.503	0.000	59.159	11.542	263.677	263.677
GROUP 2 WIND 5 1	1	7.142	53.497	6.447	72.019	7.142	0.000	-53.497	-8.762	-4.076	-80.980	-80.980
	2	-7.142	53.497	6.447	72.019	-7.142	-53.497	0.000	-8.762	-4.076	-80.980	-80.980

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

		TRANSVERSE							* LONGITUDINAL			
LOAD	COL	PC	MT	V	MB	RF	ML	MR	MT	V	MB	MF
GROUP 2 WIND 5 2	1	0.160	3.395	0.409	4.570	0.160	0.000	-3.395	45.226	9.477	213.167	213.167
	2	-0.160	3.395	0.409	4.570	-0.160	-3.395	0.000	45.226	9.477	213.167	213.167
GROUP 3 WIND 1 1	1	7.161	41.982	5.059	56.518	7.161	0.000	-41.982	46.741	3.705	112.397	112.397
	2	-7.161	41.982	5.059	56.518	-7.161	-41.982	0.000	46.741	3.705	112.397	112.397
GROUP 3 WIND 1 2	1	7.161	41.982	5.059	56.518	7.161	0.000	-41.982	50.678	5.955	156.199	156.199
	2	-7.161	41.982	5.059	56.518	-7.161	-41.982	0.000	50.678	5.955	156.199	156.199
GROUP 3 WIND 2 1	1	7.159	41.969	5.057	56.500	7.159	0.000	-41.969	35.035	2.544	80.121	80.121
	2	-7.159	41.969	5.057	56.500	-7.159	-41.969	0.000	35.035	2.544	80.121	80.121
GROUP 3 WIND 2 2	1	5.482	32.349	3.898	43.550	5.482	0.000	-32.349	50.694	5.956	156.242	156.242
	2	-5.482	32.349	3.898	43.550	-5.482	-32.349	0.000	50.694	5.956	156.242	156.242
GROUP 3 WIND 3 1	1	7.577	44.367	5.346	59.729	7.577	0.000	-44.367	26.251	1.673	55.904	55.904
	2	-7.577	44.367	5.346	59.729	-7.577	-44.367	0.000	26.251	1.673	55.904	55.904
GROUP 3 WIND 3 2	1	4.223	25.128	3.028	33.828	4.223	0.000	-25.128	53.633	6.248	164.344	164.344
	2	-4.223	25.128	3.028	33.828	-4.223	-25.128	0.000	53.633	6.248	164.344	164.344
GROUP 3 WIND 4 1	1	7.015	41.143	4.958	55.388	7.015	0.000	-41.143	14.550	0.513	23.643	23.643
	2	-7.015	41.143	4.958	55.388	-7.015	-41.143	0.000	14.550	0.513	23.643	23.643
GROUP 3 WIND 4 2	1	2.544	15.491	1.867	20.855	2.544	0.000	-15.491	49.747	5.862	153.630	153.630
	2	-2.544	15.491	1.867	20.855	-2.544	-15.491	0.000	49.747	5.862	153.630	153.630
GROUP 3 WIND 5 1	1	5.192	30.687	3.698	41.312	5.192	0.000	-30.687	-3.967	-1.323	-27.412	-27.412
	2	-5.192	30.687	3.698	41.312	-5.192	-30.687	0.000	-3.967	-1.323	-27.412	-27.412
GROUP 3 WIND 5 2	1	-0.117	0.225	0.027	0.303	-0.117	0.000	-0.225	37.090	4.607	118.734	118.734
	2	0.117	0.225	0.027	0.303	0.117	-0.225	0.000	37.090	4.607	118.734	118.734
LIVE LOAD LL 1	1	85.034	-15.111	-0.521	4.971	85.034	194.398	-179.287	0.000	0.000	0.000	0.000
	2	3.385	-1.592	0.521	11.731	3.385	1.592	0.000	0.000	0.000	0.000	0.000
LIVE LOAD LL 2	1	113.256	101.349	8.907	72.070	113.256	194.398	-295.747	0.000	0.000	0.000	0.000
	2	63.582	-129.876	-8.907	-43.543	63.582	129.876	0.000	0.000	0.000	0.000	0.000
LIVE LOAD LL 3	1	96.829	53.677	4.255	29.176	96.829	174.958	-228.635	0.000	0.000	0.000	0.000
	2	106.511	-56.793	-4.255	-26.059	106.511	233.280	-176.487	0.000	0.000	0.000	0.000
LIVE LOAD LL 4	1	-4.822	-34.313	-3.383	-31.556	-4.822	0.000	34.313	0.000	0.000	0.000	0.000
	2	28.323	53.512	3.383	12.357	28.323	76.590	-130.102	0.000	0.000	0.000	0.000
LIVE LOAD LL 5	1	1.678	-17.600	-2.596	-32.938	1.678	0.000	17.600	0.000	0.000	0.000	0.000
	2	110.242	49.783	2.596	0.754	110.242	249.365	-299.149	0.000	0.000	0.000	0.000
LIVE LOAD LL 6	1	58.502	87.732	5.344	16.311	58.502	20.297	-108.029	0.000	0.000	0.000	0.000
	2	121.803	-50.992	-5.344	-53.051	121.803	320.226	-269.234	0.000	0.000	0.000	0.000
LIVE LOAD LL 7	1	-4.868	-34.639	-3.415	-31.855	-4.868	0.000	34.639	0.000	0.000	0.000	0.000
	2	28.592	54.020	3.415	12.474	28.592	77.316	-131.336	0.000	0.000	0.000	0.000
LIVE LOAD LL 8	1	1.762	-17.300	-2.574	-32.811	1.762	0.000	17.300	0.000	0.000	0.000	0.000
	2	110.381	49.515	2.574	0.596	110.381	249.850	-299.365	0.000	0.000	0.000	0.000
LIVE LOAD LL 9	1	-8.641	-61.491	-6.063	-56.550	-8.641	0.000	61.491	0.000	0.000	0.000	0.000
	2	50.756	95.896	6.063	22.144	50.756	137.252	-233.149	0.000	0.000	0.000	0.000
LIVE LOAD LL10	1	8.712	7.581	-0.756	-22.307	8.712	0.000	-7.581	0.000	0.000	0.000	0.000
	2	121.822	27.216	0.756	-12.489	121.822	289.693	-316.908	0.000	0.000	0.000	0.000
LIVE LOAD LL11	1	74.602	51.809	2.925	5.139	74.602	97.627	-149.436	0.000	0.000	0.000	0.000
	2	122.456	-24.121	-2.925	-32.826	122.456	309.338	-285.217	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	-15.687	-15.687	-15.687	-15.687	-15.687	-15.687	-15.687		-9.255	-146.125	-9.255	-146.125	-9.255	-221.355
P 2	-718.333	-718.333	-1065.141	-718.333	-718.333	-718.333	-926.003		-158.711	-158.711	-158.711	-158.711	-233.940	-233.940
C 1L	-878.408	-878.408	-1300.446	-878.408	-878.408	-878.408	-1131.125		-161.441		-161.441		-236.670	
C 1R	-873.453	-739.956	-1569.817	-779.756	-973.438	-715.528	-1410.517			237.184		412.556		218.424
P 3	-637.634	-522.897	-1158.626	-552.085	-728.925	-497.724	-1059.243		234.454	234.454	409.826	409.826	215.694	215.694
P 4	-184.723	-67.275	-363.038	-115.094	-259.025	-30.784	-380.734		229.119	92.249	404.491	170.703	210.360	73.489
P 5	503.944	996.098	421.705	503.944	503.944	798.647	454.699		68.918	-67.952	147.372	-67.952	50.159	-144.292
P 6	-174.734	-6.055	-416.936	-100.596	-244.207	15.308	-391.660		-91.231	-228.101	-91.231	-228.101	-167.571	-390.125
P 7	-630.091	-598.538	-1166.451	-538.800	-715.640	-528.895	-1053.993		-233.488	-233.488	-233.488	-233.488	-395.512	-395.512
C 2L	-864.944	-838.106	-1560.155	-764.958	-958.640	-758.733	-1393.750		-236.218		-236.218		-398.242	
C 2R	-868.280	-868.280	-1556.288	-868.280	-868.280	-868.280	-1280.261			161.441		285.719		161.441
P 8	-708.204	-708.204	-1271.933	-708.204	-708.204	-708.204	-1045.767		158.711	158.711	282.989	282.989	158.711	158.711
P 9	-16.379	-16.379	-16.379	-16.379	-16.379	-16.379	-16.379		146.327	9.457	270.606	9.457	146.327	9.457

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	FS %	FS/FF RATIO	FS/FZ RATIO
P 1	-12.067	-12.067	1.76	4 # 11	1.76	4 # 11	0.00	0.000	#5@ 0.00	18.98	0.040	#5@15.50	42.00		0.10	0.000	0.028
P 2	-552.564	-712.310	6.28	5 # 11	1.76	4 # 11	19.50	0.040	#5@15.50	19.50	0.040	#5@15.50	42.00		0.34	0.438	0.995
C 1	-610.396	-1009.401	9.41	7 # 11	1.76	4 # 11	19.50	0.040	#5@15.50	19.50	0.113	#5@ 5.50	42.00		0.54	0.718	0.911
P 3	-437.638	-745.766	6.86	5 # 11	1.76	4 # 11	19.50	0.111	#5@ 5.57	19.50	0.111	#5@ 5.57	42.00		0.38	0.764	1.041
P 4	-87.996	-236.682	3.01	4 # 11	1.76	4 # 11	18.98	0.114	#5@ 5.43	18.98	0.040	#5@15.50	42.00		0.17	0.371	0.554
P 5	614.344	349.768	1.76	4 # 11	5.86	4 # 11	19.50	0.040	#5@15.50	19.50	0.040	#5@15.50	42.00		0.31	0.812	1.147
P 6	-44.289	-245.973	3.64	4 # 11	1.76	4 # 11	18.98	0.040	#5@15.50	18.98	0.107	#5@ 5.80	42.00		0.35	0.454	0.576
P 7	-461.615	-731.742	6.90	5 # 11	1.76	4 # 11	19.50	0.104	#5@ 5.95	19.50	0.104	#5@ 5.95	42.00		0.39	0.684	1.022
C 2	-643.630	-985.568	9.35	6 # 11	1.76	4 # 11	19.50	0.106	#5@ 5.87	19.50	0.049	#5@12.66	42.00		0.54	0.777	1.086
P 8	-544.773	-804.436	7.56	5 # 11	1.76	4 # 11	19.50	0.048	#5@13.02	19.50	0.048	#5@13.02	42.00		0.43	0.707	1.123
P 9	-12.599	-12.599	1.76	4 # 11	1.76	4 # 11	18.98	0.045	#5@13.75	0.00	0.000	#5@ 0.00	42.00		0.10	0.000	0.029

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 2	0.0			C	S	655.1	269.4	77.0	655.1	269.4	141.5	3363.4	1384.1	727.2	5.135	48.00	48.00
1	B	3	LL 3	3.2			C	S	576.0	102.5	662.2	576.0	115.2	705.1	1902.7	380.7	2329.7	3.304	48.00	48.00
2	T	4	LL 5	0.0		S	C	S	530.4	342.0	77.0	530.4	342.0	112.9	2859.3	1851.0	611.3	5.398	48.00	48.00
2	B	3	LL11	3.2			C	S	592.2	26.1	662.2	592.2	118.4	706.4	1942.0	388.5	2317.4	3.280	48.00	48.00

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	1.293	1.00	0.000	1224.	72606.	1.000	1.080	0.400	1	0.70
1	B	15 # 11	0 # 0	0 # 0	0 # 0	23.40	1.293	1.00	0.000	1104.	71165.	1.000	1.065	0.400	1	0.70
2	T	15 # 11	0 # 0	0 # 0	0 # 0	23.40	1.293	1.00	0.008	985.	71818.	1.000	1.064	0.400	1	0.70
2	B	15 # 11	0 # 0	0 # 0	0 # 0	23.40	1.293	1.00	0.135	1096.	68287.	1.000	1.067	0.400	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 3	1.2		C	S	426.223	95.594	9.705	501.253	17.081	24.247	-8.454	-0.435	32.265	11.240	0.000	0.000	MAX.P1
1	1	LL 2	0.0		C	S	648.141	196.269	21.602	180.111	5.818	14.825	5.849	20.353	31.329	18.283	0.000	0.000	MAX.MT
1	3	LL 3	3.2		C	S	550.271	94.776	9.977	662.218	22.586	32.949	-10.363	-2.254	41.058	13.761	0.000	0.000	MAX.VT
1	3	LL 3	3.2		C	S	550.271	94.776	9.977	662.218	22.586	32.949	-10.363	-2.254	41.058	13.761	0.000	0.000	MAX.VP
1	3	LL 3	3.2		C	S	550.271	94.776	9.977	662.218	22.586	32.949	-10.363	-2.254	41.058	25.214	0.000	0.000	MAX.ML
1	3	LL 3	3.2		C	S	550.271	94.776	9.977	662.218	22.586	32.949	-10.363	-2.254	41.058	25.214	0.000	0.000	MAX.VL
1	3	LL 6	1.2		C	S	395.742	85.363	10.571	501.253	17.081	23.803	-10.142	-2.193	31.752	10.388	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
6.000	6.000	3.000	0.258	0.17	6 # 4	@12.000	TOP TRAN	28.874	38.922	77.844	32.250	0.000
				0.23	7 # 4	@10.250	BOT.LONG	34.182	39.525	79.051	32.750	0.000

FOOTING 2 DESIGN LOADS

F	G	LLID	WC	ES	C	S	P	MT	VT	ML	VL	P4	P3	P2	P1	MTF	VBF	VPF	LOAD
2	4	LL11	0.0	S	C	S	425.874	394.125	30.874	186.782	6.029	3.994	-8.535	19.986	32.515	17.973	0.000	0.000	MAX.P1
2	4	LL 5	0.0	S	C	S	544.508	524.460	43.819	180.111	5.818	2.357	-9.837	28.382	40.577	23.574	0.000	0.000	MAX.MT
2	3	LL 6	3.2		C	S	558.894	13.910	0.691	662.218	22.586	36.498	-6.013	-4.993	37.518	11.760	0.000	0.000	MAX.VT
2	3	LL 6	3.2		C	S	558.894	13.910	0.691	662.218	22.586	36.498	-6.013	-4.993	37.518	11.760	0.000	0.000	MAX.VP
2	3	LL11	3.2		C	S	559.569	34.820	3.192	662.218	22.586	35.619	-6.924	-4.091	38.453	25.277	0.000	0.000	MAX.ML
2	3	LL 6	3.2		C	S	558.894	13.910	0.691	662.218	22.586	36.498	-6.013	-4.993	37.518	25.258	0.000	0.000	MAX.VL
2	4	LL 3	0.0	S	C	S	413.192	399.507	29.816	186.782	6.029	3.448	-9.323	19.678	32.448	17.808	0.000	0.000	MAX.P3

FOOTING 2 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
6.000	6.000	3.000	0.260	0.22	7 # 4	@10.250	TOP TRAN	33.657	38.922	77.844	32.250	0.000
				0.23	7 # 4	@10.250	BOT.LONG	34.182	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#40	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 2&3.

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#40

SUBJECT: Caisson Lateral Stability Design Input - Bent 2 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 Noonday Creek North
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 2

PILE PROPERTIES

Concrete Weight =	150	lbs/ft³
f'c =	3500	lbs/in²
Ec	3586616	lbs/in²
fy	60000	lbs/in²
Es	29000000	lbs/in²
Ground Slope	0	degrees

DIAMETER Use =	4.50	ft.
	54	in.
Area =	2290.2	in²
Moment of Inertia (I) =	417393	in⁴
Ground Elev. =	874.41	ft.
Top of Rock Elev. =	844	ft.
Depth of Socket =	7	ft.
Bot. of Caisson Elev. =	837	

Depth of Caisson (ft.)	Weight of Caisson (k)
37.41	89
448.92 (in.)	

Dmain-rebar	Amain-rebar [in²]
1.41	1.56
Dstirrup [in]	# main rebar
0.5	15

Clear Cover [in]
5
Cover from main rebar center [in]
6.205

SOIL PROPERTIES - OBTAINED FROM HOLE NO. B-12

Soil		Submerged	INPUT LAYER (ft)			N	Lateral Subgrade Modulus K(pci)	Uniaxial Comp. Strength UCS (psi)	Unit Weight γ (pcf)	Effective γ (pcf)	Cohesion c (psf)	Internal Angle of Friction φ	Strain e (in/in)
Very Loose	Sand	YES	0	to	9.41	4	20	N/A	85	22.6	0	25	0
Medium Dense	Sand	YES	9.41	to	12.91	13	60	N/A	120	57.6	0	31	0
Medium Dense	Sand	YES	12.91	to	22.91	11	60	N/A	120	57.6	0	30	0
Medium Dense	Sand	YES	22.91	to	25.91	22	60	N/A	120	57.6	0	36	0
Very Dense	Sand	YES	25.91	to	30.41	60	125	N/A	130	67.6	0	37	0
	Rock	YES	30.41	to	60	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)
Very Loose	Sand	0	to	112.92	0.013	20	N/A	0.00	25	0
Medium Dense	Sand	112.92	to	154.92	0.033	60	N/A	0.00	31	0
Medium Dense	Sand	154.92	to	274.92	0.033	60	N/A	0.00	30	0
Medium Dense	Sand	274.92	to	310.92	0.033	60	N/A	0.00	36	0
Very Dense	Sand	310.92	to	364.92	0.039	125	N/A	0.00	37	0
	Rock	364.92	to	720	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	438.072	89.247	527319	18.768	11.766	22151	193.937	355.597	4860530
2	426.393	89.247	515640	22.322	5.901	23089	329.518	192.390	4578846

FACTORED LOADS [GROUP III & IV LOADINGS CONTROL]

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	569494	116021	685515	24.398	15.296	28797	252.118	462.276	6318689
2	554311	116021	670332	29.019	7.671	30015	428.373	250.107	5952499

[4.6.5.1] Axial Capacity in Soil

			Service Load	
For compression,	(bearing) [ksf]	Qt [k]	P_{TOT} (k)	
Qt = (Area)*(bearing)	100	1590	527	OK

CALCULATION SHEET

PROJECT: I-75 / I-575 NORTHWEST CORRIDOR
JOB NUMBER NH000-0575-01(028)
CALC NO. BR#40

SUBJECT: Caisson Lateral Stability 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 Noonday Creek North
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 3

PILE PROPERTIES

Concrete Weight =	150	lbs/ft³
f'c =	3500	lbs/in²
Ec	3586616	lbs/in²
fy	60000	lbs/in²
Es	29000000	lbs/in²
Ground Slope	0	degrees

DIAMETER Use =	4.50	ft.
	54	in.
Area =	2290.2	in²
Moment of Inertia (I) =	417393	in⁴
Ground Elev. =	876.72	ft.
Top of Rock Elev. =	855	ft.
Depth of Socket =	7	ft.
Bot. of Caisson Elev. =	848	

Depth of Caisson (ft.)	Weight of Caisson (k)
28.72	69
344.64 (in.)	

Dmain-rebar	Amain-rebar [in²]
1.41	1.56
Dstirrup [in]	# main rebar
0.5	15
Clear Cover [in]	
5	
Cover from main rebar center [in]	
6.205	

SOIL PROPERTIES - OBTAINED FROM HOLE NO. B-12

Soil		Submerged	INPUT LAYER (ft)			N	Lateral Subgrade Modulus K(pci)	Uniaxial Comp. Strength UCS (psi)	Unit Weight γ (pcf)	Effective γ (pcf)	Cohesion c (psf)	Internal Angle of Friction φ	Strain e (in/in)
Medium Dense	Sand	YES	0	to	2.72	18	60	N/A	120	57.6	0	34	0
Very Loose	Sand	YES	2.72	to	6.72	4	20	N/A	85	22.6	0	25	0
Very Loose	Sand	YES	6.72	to	11.72	3	20	N/A	85	22.6	0	25	0
Medium Dense	Sand	YES	11.72	to	16.72	21	60	N/A	120	57.6	0	35	0
Very Dense	Sand	YES	16.72	to	21.72	50	125	N/A	130	67.6	0	37	0
	Rock	YES	21.72	to	60	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	32.64	0.033	60	N/A	0.00	34	0
Very Loose	Sand	32.64	to	80.64	0.013	20	N/A	0.00	25	0
Very Loose	Sand	80.64	to	140.64	0.013	20	N/A	0.00	25	0
Medium Dense	Sand	140.64	to	200.64	0.033	60	N/A	0.00	35	0
Very Dense	Sand	200.64	to	260.64	0.039	125	N/A	0.00	37	0
	Rock	260.64	to	720	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	426.223	68.516	494739	9.705	17.081	19646	95.594	501.253	6123444
2	413.192	68.516	481708	29.816	6.029	30419	399.507	186.782	5292168

FACTORED LOADS [GROUP III & IV LOADINGS CONTROL]

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	554090	89071	643160	12.617	22.205	25539	124.272	651.629	7960477
2	537150	89071	626220	38.761	7.838	39545	519.359	242.817	6879819

[4.6.5.1] Axial Capacity in Soil

			Service Load	
For compression,	(bearing) [ksf]	Qt [k]	P_{TOT} (k)	
Qt = (Area)*(bearing)	100	1590	495	OK

CALCULATION COVER SHEET

PROJECT	JOB NO.	CALC NO.	SHEET
I-75 / I-575 NORTHWEST CORRIDOR	NH000-0575-01(028)	BR#40	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 2&3.

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	25	25	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#40

SUBJECT: Caisson Lateral Stability Design Output - Bent 2 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

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==========

This program is licensed to:

HMM
HMMG

Path to file locations: N:\TRA\255717\Eng\BR40\Substructure\LPILE\
Name of input data file: B2.lpd
Name of output file: B2.lpo
Name of plot output file: B2.lpp
Name of runtime file: B2.lpr

Time and Date of Analysis

Date: October 30, 2009 Time: 13: 3:48

Problem Title

I-575 over Noonday Ck North [BENT 2] [B-12 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                                  =     448.92 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	54.000	417393.0000	2290.2000	3586616.000
2	448.9200	54.000	417393.0000	2290.2000	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  6 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 =    112.920 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 sand, p-y criteria by Reese et al., 1974
Distance from top of pile to top of layer    =    112.920 in
Distance from top of pile to bottom of layer =    154.920 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  3 is sand, p-y criteria by Reese et al., 1974
Distance from top of pile to top of layer    =    154.920 in
Distance from top of pile to bottom of layer =    274.920 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  4 is sand, p-y criteria by Reese et al., 1974
Distance from top of pile to top of layer    =    274.920 in
Distance from top of pile to bottom of layer =    310.920 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 5 is sand, p-y criteria by Reese et al., 1974
Distance from top of pile to top of layer = 310.920 in
Distance from top of pile to bottom of layer = 364.920 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 6 is strong rock (vuggy limestone)
Distance from top of pile to top of layer = 364.920 in
Distance from top of pile to bottom of layer = 720.000 in

(Depth of lowest layer extends 271.08 in below pile tip)

Effective Unit Weight of Soil vs. Depth

Distribution of effective unit weight of soil with depth
is defined using 12 points

Point No.	Depth X in	Eff. Unit Weight lbs/in**3
1	.00	.01300
2	112.92	.01300
3	112.92	.03300
4	154.92	.03300
5	154.92	.03300
6	274.92	.03300
7	274.92	.03300
8	310.92	.03300
9	310.92	.03900
10	364.92	.03900
11	364.92	.08400
12	720.00	.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 12 points

Point No.	Depth X in	Cohesion c lbs/in**2	Angle of Friction Deg.	E50 or k_rm	RQD %
1	.000	.00000	25.00	------	------
2	112.920	.00000	25.00	------	------
3	112.920	.00000	31.00	------	------
4	154.920	.00000	31.00	------	------
5	154.920	.00000	30.00	------	------

6	274.920	.00000	30.00	------	------
7	274.920	.00000	36.00	------	------
8	310.920	.00000	36.00	------	------
9	310.920	.00000	37.00	------	------
10	364.920	.00000	37.00	------	------
11	364.920	3000.00000	.00	------	------
12	720.000	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 = 2

Load Case Number 1

Pile-head boundary conditions are Shear and Moment (BC Type 1)
Shear force at pile head = 22151.000 lbs
Bending moment at pile head = 4860530.000 in-lbs
Axial load at pile head = 438072.000 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.

Load Case Number 2

Pile-head boundary conditions are Shear and Moment (BC Type 1)
Shear force at pile head = 23089.000 lbs
Bending moment at pile head = 4578846.000 in-lbs
Axial load at pile head = 426393.000 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 = 54.0000 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 = 15
Area of Single Bar = 1.56000 In**2
Number of Rows of Reinforcing Bars = 15
Cover Thickness (edge to bar center) = 6.205 In

Ultimate Axial Squash Load Capacity = 8147.79 Kip

Distribution and Area of Steel Reinforcement

Row Number	Area of Reinforcement In**2	Distance to Centroidal Axis In
1	1.560000	20.6811
2	1.560000	19.7772
3	1.560000	18.0090
4	1.560000	15.4537
5	1.560000	12.2230
6	1.560000	8.4581
7	1.560000	4.3235
8	1.560000	.0000
9	1.560000	-4.3235
10	1.560000	-8.4581
11	1.560000	-12.2230
12	1.560000	-15.4537
13	1.560000	-18.0090
14	1.560000	-19.7772
15	1.560000	-20.6811

Axial Thrust Force = 438072.00 lbs

Bending Moment in-lbs	Bending Stiffness lb-in2	Bending Curvature rad/in	Maximum Strain in/in	Neutral Axis Position inches
1527369.839	1.52737E+12	.00000100	.00007975	79.747
7589307.957	1.51786E+12	.00000500	.00018904	37.808
7967370.033	8.85263E+11	.00000900	.00025631	28.479
9568834.014	7.36064E+11	.00001300	.00032680	25.138
11017032.188	6.48061E+11	.00001700	.00039361	23.153
12394423.999	5.90211E+11	.00002100	.00045842	21.829
13735331.024	5.49413E+11	.00002500	.00052233	20.893
15050859.998	5.18995E+11	.00002900	.00058575	20.198
16348879.268	4.95421E+11	.00003300	.00064923	19.674
17620429.806	4.76228E+11	.00003700	.00071163	19.233
18895985.907	4.60878E+11	.00004100	.00077490	18.900
20133026.070	4.47401E+11	.00004500	.00083800	18.622
21365413.336	4.36029E+11	.00004900	.00090086	18.385
22586357.920	4.26158E+11	.00005300	.00096412	18.191
23795297.772	4.17461E+11	.00005700	.00102780	18.032
24997527.566	4.09796E+11	.00006100	.00109339	17.924
26179905.192	4.02768E+11	.00006500	.00115756	17.809
27349573.571	3.96371E+11	.00006900	.00122222	17.713
28237074.056	3.86809E+11	.00007300	.00128330	17.579

28946991.583	3.75935E+11	.00007700	.00134211	17.430
29555977.545	3.64889E+11	.00008100	.00139977	17.281
30050903.598	3.53540E+11	.00008500	.00145583	17.127
30513555.256	3.42849E+11	.00008900	.00151415	17.013
30939603.630	3.32684E+11	.00009300	.00156902	16.871
31250217.741	3.22167E+11	.00009700	.00162168	16.718
31555517.898	3.12431E+11	.00010100	.00167468	16.581
33160239.217	2.53132E+11	.00013100	.00206902	15.794
33945895.891	2.10844E+11	.00016100	.00245704	15.261
34401698.099	1.80114E+11	.00019100	.00282903	14.812
34694376.773	1.56988E+11	.00022100	.00320149	14.486
34961353.571	1.39288E+11	.00025100	.00359565	14.325
34961353.571	1.24418E+11	.00028100	.00396076	14.095

Ultimate Moment Capacity at a Concrete Strain of 0.003 = 34536.045 In-Kip

Axial Thrust Force = 426393.00 lbs

Bending Moment in-lbs	Bending Stiffness lb-in2	Bending Curvature rad/in	Maximum Strain in/in	Neutral Axis Position inches
1528527.001	1.52853E+12	.00000100	.00007833	78.325
7597955.068	1.51959E+12	.00000500	.00018766	37.532
7860829.882	8.73426E+11	.00000900	.00025369	28.187
9447038.264	7.26695E+11	.00001300	.00032371	24.901
10888892.595	6.40523E+11	.00001700	.00039020	22.953
12263991.515	5.84000E+11	.00002100	.00045482	21.658
13602743.475	5.44110E+11	.00002500	.00051851	20.741
14916330.198	5.14356E+11	.00002900	.00058170	20.059
16213104.189	4.91306E+11	.00003300	.00064490	19.543
17485648.682	4.72585E+11	.00003700	.00070727	19.115
18753700.891	4.57407E+11	.00004100	.00077084	18.801
19998728.674	4.44416E+11	.00004500	.00083327	18.517
21232468.655	4.33316E+11	.00004900	.00089608	18.287
22454438.140	4.23669E+11	.00005300	.00095929	18.100
23671282.252	4.15286E+11	.00005700	.00102446	17.973
24867211.397	4.07659E+11	.00006100	.00108810	17.838
26051154.577	4.00787E+11	.00006500	.00115221	17.726
27215932.650	3.94434E+11	.00006900	.00121669	17.633
28094976.255	3.84863E+11	.00007300	.00127755	17.501
28798278.754	3.74004E+11	.00007700	.00133618	17.353
29408571.694	3.63069E+11	.00008100	.00139378	17.207
29912834.794	3.51916E+11	.00008500	.00145263	17.090
30357657.119	3.41097E+11	.00008900	.00150733	16.936
30776572.851	3.30931E+11	.00009300	.00156193	16.795
31088790.562	3.20503E+11	.00009700	.00161455	16.645
31395324.787	3.10845E+11	.00010100	.00166748	16.510
32997219.665	2.51887E+11	.00013100	.00206006	15.726
33778125.376	2.09802E+11	.00016100	.00244564	15.190
34229990.314	1.79215E+11	.00019100	.00281632	14.745
34525640.153	1.56225E+11	.00022100	.00318811	14.426
34784277.004	1.38583E+11	.00025100	.00357745	14.253
34784277.004	1.23787E+11	.00028100	.00394015	14.022

Ultimate Moment Capacity at a Concrete Strain of 0.003 = 34376.054 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 = 22151.000 lbs
Specified bending moment at pile head = 4860530.000 in-lbs
Specified axial load at pile head = 438072.000 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	.222764	4.86E+06	2.22E+04	-.001352	505.7	1.50E+12	0.000
44.892	.165566	5.85E+06	1.99E+04	-.001191	569.5	1.50E+12	-96.742
89.784	.116219	6.64E+06	1.40E+04	-.001003	620.9	1.50E+12	-162.173
134.676	.075775	7.10E+06	4092.9	-7.96E-04	650.2	1.50E+12	-315.195
179.568	.044813	6.95E+06	-1.11E+04	-5.84E-04	641.0	1.50E+12	-340.309
224.460	.023134	6.14E+06	-2.47E+04	-3.86E-04	588.5	1.50E+12	-247.458
269.352	.009667	4.84E+06	-3.26E+04	-2.21E-04	504.3	1.50E+12	-131.092
314.244	.002686	3.29E+06	-3.59E+04	-9.83E-05	404.2	1.50E+12	-68.509
359.136	1.23E-04	1.64E+06	-3.72E+04	-2.42E-05	297.4	1.50E+12	-3.840
404.028	-2.12E-04	2.87E+05	-1.72E+04	2.24E-06	209.9	1.50E+12	637.427
448.920	-2.78E-05	0.0	0.0	4.62E-06	191.3	1.50E+12	83.352

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 = .22276356 in
Computed slope at pile head = -.00135198
Maximum bending moment = 7124994.286 lbs-in
Maximum shear force = -37243.953 lbs
Depth of maximum bending moment = 148.144 in
Depth of maximum shear force = 363.625 in
Number of iterations = 13
Number of zero deflection points = 1

Computed Values of Load Distribution and Deflection
for Lateral Loading for Load Case Number 2

Pile-head boundary conditions are Shear and Moment (BC Type 1)
Specified shear force at pile head = 23089.000 lbs
Specified bending moment at pile head = 4578846.000 in-lbs
Specified axial load at pile head = 426393.000 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	.220614	4.58E+06	2.31E+04	-.001325	482.4	1.50E+12	0.000
44.892	.164431	5.61E+06	2.09E+04	-.001172	548.9	1.50E+12	-96.548
89.784	.115775	6.44E+06	1.49E+04	-9.91E-04	602.9	1.50E+12	-161.978
134.676	.075754	6.94E+06	5051.2	-7.89E-04	635.0	1.50E+12	-315.166
179.568	.045004	6.84E+06	-1.02E+04	-5.81E-04	628.5	1.50E+12	-340.830
224.460	.023383	6.07E+06	-2.38E+04	-3.86E-04	578.7	1.50E+12	-248.694
269.352	.009876	4.81E+06	-3.18E+04	-2.22E-04	497.0	1.50E+12	-132.713
314.244	.002809	3.29E+06	-3.51E+04	-1.00E-04	399.2	1.50E+12	-71.664
359.136	1.65E-04	1.67E+06	-3.66E+04	-2.57E-05	294.5	1.50E+12	-5.122
404.028	-2.13E-04	3.11E+05	-1.80E+04	1.82E-06	206.3	1.50E+12	637.661
448.920	-3.82E-05	0.0	0.0	4.46E-06	186.2	1.50E+12	114.467

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. 2:

Pile-head deflection	=	.22061384	in
Computed slope at pile head	=	-.00132536	
Maximum bending moment	=	6981337.125	lbs-in
Maximum shear force	=	-36594.797	lbs
Depth of maximum bending moment	=	152.633	in
Depth of maximum shear force	=	363.625	in
Number of iterations	=	13	
Number of zero deflection points	=	1	

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= 22151.000	M= 4.86E+06	438072.0000	.2228	7.125E+06	-37243.9534

1 V= 23089.000 M= 4.58E+06 426393.0000 .2206 6.981E+06 -36594.7967

Pile-head Deflection vs. Pile Length

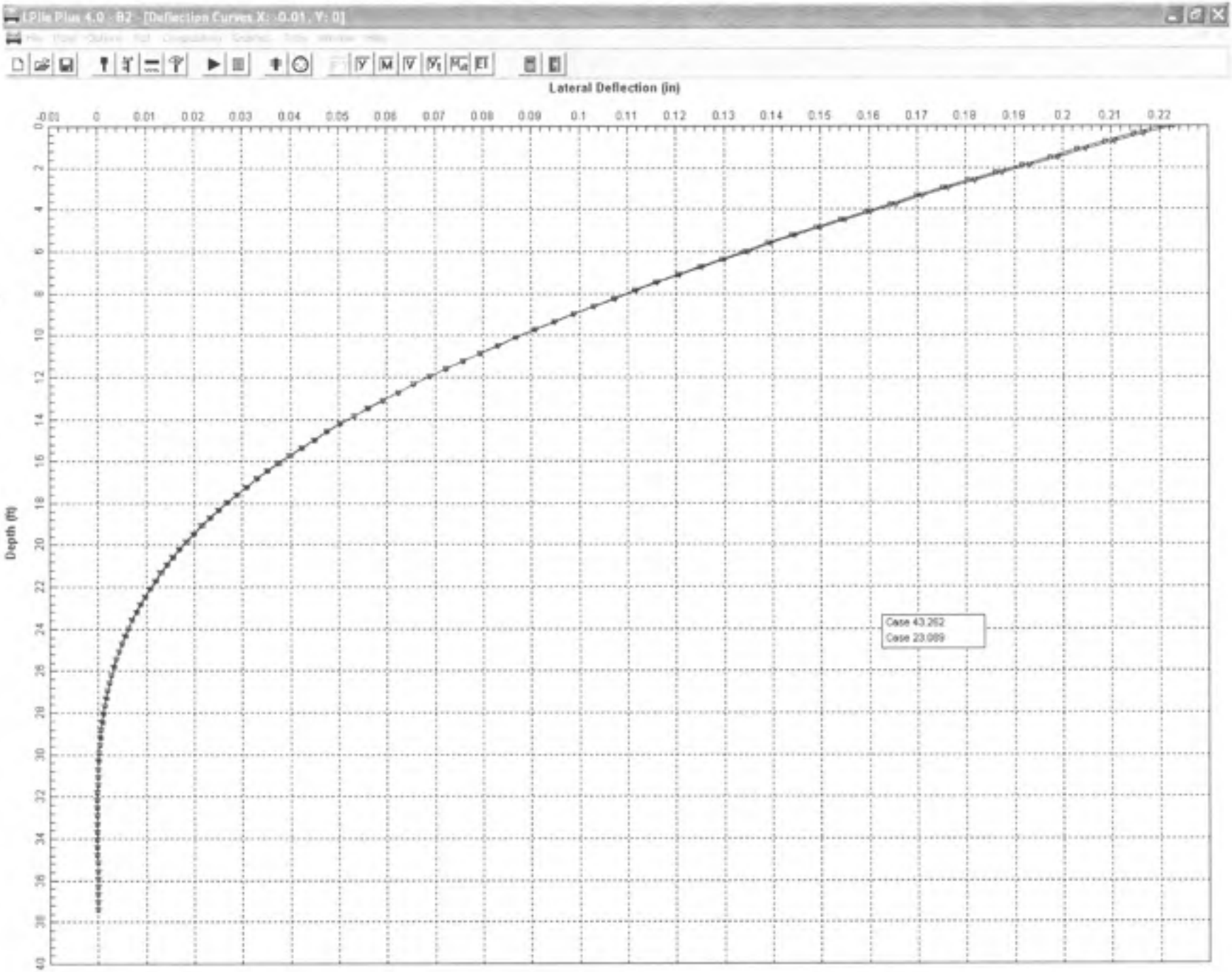
Boundary Condition Type 1, Shear and Moment

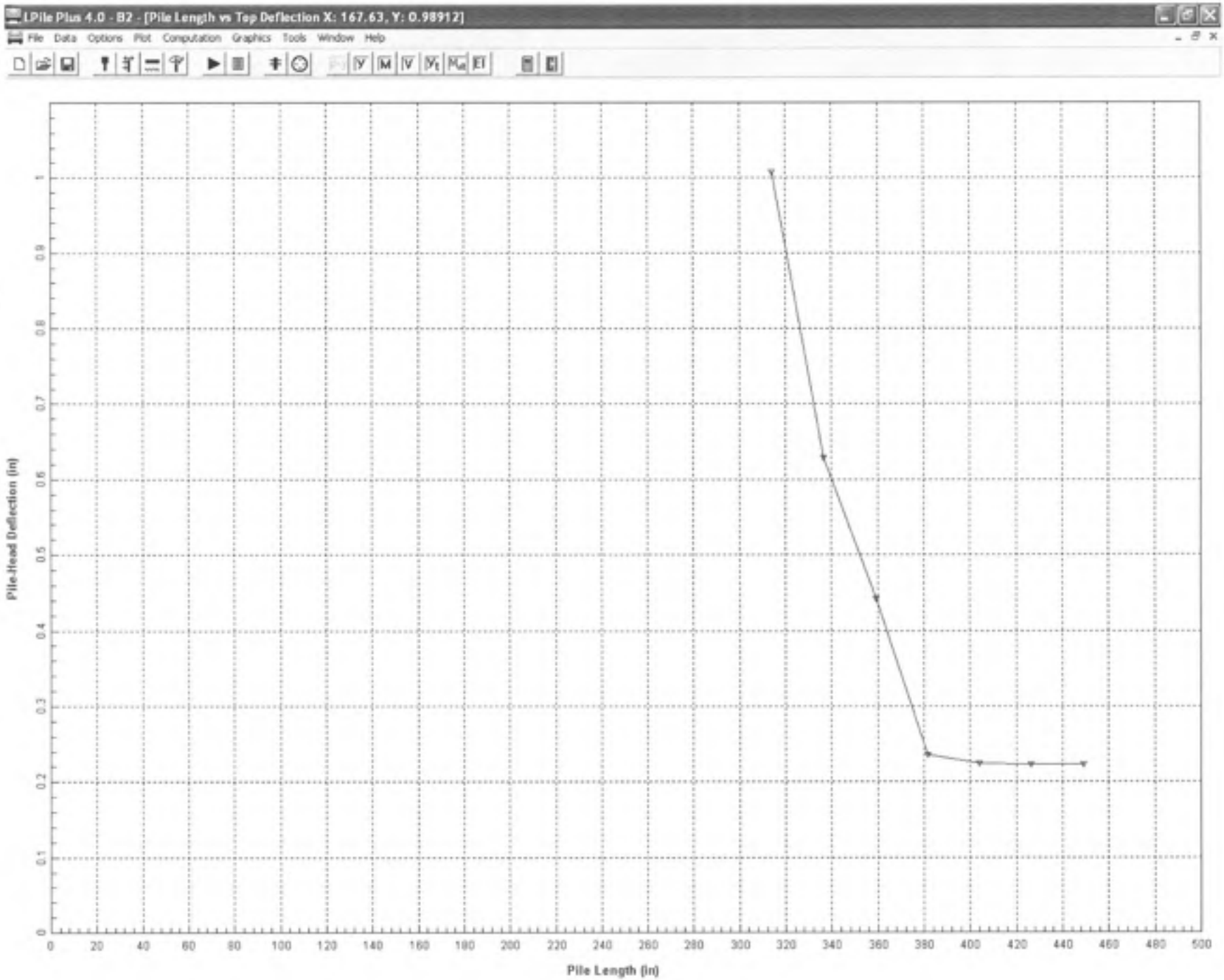
Shear = 22151. lbs
Moment = 4860530. in-lbs
Axial Load = 438072. lbs

7' MIN. SOCKET

Pile Length in	Pile Head Deflection in	Maximum Moment in-lbs	Maximum Shear lbs
448.920	.22276356	7124994.286	-37243.953
426.474	.22244221	7120632.758	-37612.216
404.028	.22448444	7111134.074	-41247.869
381.582	.23610824	7093887.079	-45821.100
359.136	.44267893	6928297.618	-50732.143
336.690	.62912564	6864570.059	-56380.792
314.244	1.00794996	6818995.702	-62008.114

The analysis ended normally.


LPile Plus 4.0 - B2 - [Deflection Curves X: -0.01, Y: 0]
Lateral Deflection (in)
-0.01 0 0.01 0.02 0.03 0.04 0.05 0.06 0.07 0.08 0.09 0.1 0.11 0.12 0.13 0.14 0.15 0.16 0.17 0.18 0.19 0.2 0.21 0.22
Depth (ft)
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40
Case 43.262
Case 23.089


LPile Plus 4.0 - B2 - [Pile Length vs Top Deflection X: 167.63, Y: 0.98912]
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
1
0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460 480 500
Pile Length (in)

CALCULATION SHEET

PROJECT: I-75 / I-575 NORTHWEST CORRIDOR
JOB NUMBER NH000-0575-01(028)
CALC NO. BR#40

SUBJECT: Caisson Lateral Stability 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.

==========

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

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All Rights Reserved

==========

This program is licensed to:

HMM
HMMG

Path to file locations: N:\TRA\255717\Eng\BR40\Substructure\LPILE\
Name of input data file: B3.lpd
Name of output file: B3.lpo
Name of plot output file: B3.lpp
Name of runtime file: B3.lpr

Time and Date of Analysis

Date: October 30, 2009 Time: 14:41:23

Problem Title

I-575 over Noonday Ck North [BENT 3 [BB-2 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                                  =     344.64 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         Pile      Moment of       Pile      Modulus of
           X         Diameter     Inertia        Area      Elasticity
           in           in         in**4        Sq.in      lbs/Sq.in
-----  ---------   -----------   ----------   ----------   -----------
  1       0.0000       54.000   417393.0000    2290.2000   3586616.000
  2     344.6400       54.000   417393.0000    2290.2000   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  6 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 =      32.640 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    =      32.640 in
Distance from top of pile to bottom of layer =      80.640 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  3 is sand, p-y criteria by Reese et al., 1974
Distance from top of pile to top of layer    =      80.640 in
Distance from top of pile to bottom of layer =     140.640 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  4 is sand, p-y criteria by Reese et al., 1974
Distance from top of pile to top of layer    =     140.640 in
Distance from top of pile to bottom of layer =     200.640 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 5 is sand, p-y criteria by Reese et al., 1974
Distance from top of pile to top of layer = 200.640 in
Distance from top of pile to bottom of layer = 260.640 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 6 is strong rock (vuggy limestone)
Distance from top of pile to top of layer = 260.640 in
Distance from top of pile to bottom of layer = 720.000 in

(Depth of lowest layer extends 375.36 in below pile tip)

Effective Unit Weight of Soil vs. Depth

Distribution of effective unit weight of soil with depth
is defined using 12 points

Point No.	Depth X in	Eff. Unit Weight lbs/in**3
1	.00	.03300
2	32.64	.03300
3	32.64	.01300
4	80.64	.01300
5	80.64	.01300
6	140.64	.01300
7	140.64	.03300
8	200.64	.03300
9	200.64	.03900
10	260.64	.03900
11	260.64	.08400
12	720.00	.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 12 points

Point No.	Depth X in	Cohesion c lbs/in**2	Angle of Friction Deg.	E50 or k_rm	RQD %
1	.000	.00000	34.00	------	------
2	32.640	.00000	34.00	------	------
3	32.640	.00000	25.00	------	------
4	80.640	.00000	25.00	------	------
5	80.640	.00000	25.00	------	------

6	140.640	.00000	25.00	------	------
7	140.640	.00000	35.00	------	------
8	200.640	.00000	35.00	------	------
9	200.640	.00000	37.00	------	------
10	260.640	.00000	37.00	------	------
11	260.640	3000.00000	.00	------	------
12	720.000	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 = 2

Load Case Number 1

Pile-head boundary conditions are Shear and Moment (BC Type 1)
Shear force at pile head = 19646.000 lbs
Bending moment at pile head = 6123444.000 in-lbs
Axial load at pile head = 426223.000 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.

Load Case Number 2

Pile-head boundary conditions are Shear and Moment (BC Type 1)
Shear force at pile head = 30419.000 lbs
Bending moment at pile head = 5292168.000 in-lbs
Axial load at pile head = 413192.000 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 = 54.0000 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 = 15
Area of Single Bar = 1.56000 In**2
Number of Rows of Reinforcing Bars = 15
Cover Thickness (edge to bar center) = 6.205 In

Ultimate Axial Squash Load Capacity = 8147.79 Kip

Distribution and Area of Steel Reinforcement

Row Number	Area of Reinforcement In**2	Distance to Centroidal Axis In
1	1.560000	20.6811
2	1.560000	19.7772
3	1.560000	18.0090
4	1.560000	15.4537
5	1.560000	12.2230
6	1.560000	8.4581
7	1.560000	4.3235
8	1.560000	.0000
9	1.560000	-4.3235
10	1.560000	-8.4581
11	1.560000	-12.2230
12	1.560000	-15.4537
13	1.560000	-18.0090
14	1.560000	-19.7772
15	1.560000	-20.6811

Axial Thrust Force = 426223.00 lbs

Bending Moment in-lbs	Bending Stiffness lb-in2	Bending Curvature rad/in	Maximum Strain in/in	Neutral Axis Position inches
1528543.935	1.52854E+12	.00000100	.00007830	78.305
7597974.801	1.51959E+12	.00000500	.00018764	37.528
7859320.626	8.73258E+11	.00000900	.00025365	28.183
9445242.249	7.26557E+11	.00001300	.00032366	24.897
10887044.888	6.40414E+11	.00001700	.00039015	22.950
12262105.737	5.83910E+11	.00002100	.00045477	21.656
13600770.004	5.44031E+11	.00002500	.00051846	20.738
14914346.091	5.14288E+11	.00002900	.00058164	20.056
16210966.048	4.91241E+11	.00003300	.00064484	19.540
17483763.925	4.72534E+11	.00003700	.00070720	19.114
18751740.696	4.57360E+11	.00004100	.00077077	18.799
19996618.232	4.44369E+11	.00004500	.00083319	18.515
21230497.518	4.33275E+11	.00004900	.00089601	18.286
22452647.976	4.23635E+11	.00005300	.00095922	18.098
23669204.997	4.15249E+11	.00005700	.00102438	17.972
24865349.995	4.07629E+11	.00006100	.00108802	17.836
26049218.821	4.00757E+11	.00006500	.00115213	17.725
27214196.517	3.94409E+11	.00006900	.00121662	17.632
28092738.932	3.84832E+11	.00007300	.00127746	17.499

28795887.081	3.73973E+11	.00007700	.00133609	17.352
29406101.808	3.63038E+11	.00008100	.00139368	17.206
29910791.637	3.51892E+11	.00008500	.00145254	17.089
30355555.476	3.41074E+11	.00008900	.00150724	16.935
30774362.957	3.30907E+11	.00009300	.00156184	16.794
31086522.562	3.20480E+11	.00009700	.00161445	16.644
31392537.871	3.10817E+11	.00010100	.00166735	16.508
32994754.382	2.51868E+11	.00013100	.00205993	15.725
33775674.039	2.09787E+11	.00016100	.00244547	15.189
34227316.880	1.79201E+11	.00019100	.00281612	14.744
34523330.947	1.56214E+11	.00022100	.00318793	14.425
34781741.291	1.38573E+11	.00025100	.00357720	14.252
34781741.291	1.23778E+11	.00028100	.00393986	14.021

Ultimate Moment Capacity at a Concrete Strain of 0.003 = 34373.711 In-Kip

Axial Thrust Force = 413192.00 lbs

Bending Moment in-lbs	Bending Stiffness lb-in2	Bending Curvature rad/in	Maximum Strain in/in	Neutral Axis Position inches
1529834.048	1.52983E+12	.00000100	.00007672	76.720
7599408.907	1.51988E+12	.00000500	.00018601	37.202
7746461.644	8.60718E+11	.00000900	.00025087	27.875
9309333.534	7.16103E+11	.00001300	.00032022	24.632
10744065.383	6.32004E+11	.00001700	.00038637	22.727
12122434.631	5.77259E+11	.00002100	.00045111	21.482
13458959.274	5.38358E+11	.00002500	.00051465	20.586
14764310.100	5.09114E+11	.00002900	.00057713	19.901
16059324.939	4.86646E+11	.00003300	.00064002	19.395
17333188.795	4.68465E+11	.00003700	.00070234	18.982
18600265.964	4.53665E+11	.00004100	.00076556	18.672
19846475.675	4.41033E+11	.00004500	.00082793	18.398
21081509.106	4.30235E+11	.00004900	.00089068	18.177
22309736.051	4.20938E+11	.00005300	.00095400	18.000
23521960.671	4.12666E+11	.00005700	.00101857	17.870
24719488.157	4.05238E+11	.00006100	.00108213	17.740
25904955.484	3.98538E+11	.00006500	.00114616	17.633
27062754.791	3.92214E+11	.00006900	.00121043	17.543
27934210.266	3.82660E+11	.00007300	.00127109	17.412
28629609.605	3.71813E+11	.00007700	.00132949	17.266
29241391.189	3.61005E+11	.00008100	.00138702	17.124
29735338.016	3.49828E+11	.00008500	.00144505	17.001
30181388.556	3.39117E+11	.00008900	.00149967	16.850
30592536.936	3.28952E+11	.00009300	.00155398	16.709
30905359.372	3.18612E+11	.00009700	.00160649	16.562
31213069.294	3.09040E+11	.00010100	.00165934	16.429
32812978.735	2.50481E+11	.00013100	.00205002	15.649
33588298.349	2.08623E+11	.00016100	.00243287	15.111
34035760.051	1.78198E+11	.00019100	.00280212	14.671
34453306.572	1.55897E+11	.00022100	.00318242	14.400
34584773.692	1.37788E+11	.00025100	.00355729	14.172
34661812.030	1.23352E+11	.00028100	.00391734	13.941

Ultimate Moment Capacity at a Concrete Strain of 0.003 = 34253.023 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 = 19646.000 lbs
Specified bending moment at pile head = 6123444.000 in-lbs
Specified axial load at pile head = 426223.000 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	.186461	6.12E+06	1.96E+04	-.001316	582.2	1.50E+12	0.000
34.464	.143638	6.76E+06	1.46E+04	-.001167	623.3	1.50E+12	-126.852
68.928	.106164	7.19E+06	9457.8	-.001006	651.5	1.50E+12	-166.934
103.392	.074385	7.43E+06	3217.9	-8.37E-04	666.6	1.50E+12	-182.897
137.856	.048485	7.45E+06	-2618.3	-6.66E-04	667.8	1.50E+12	-152.634
172.320	.028476	7.19E+06	-1.24E+04	-4.96E-04	651.4	1.50E+12	-252.389
206.784	.014154	6.64E+06	-2.01E+04	-3.37E-04	615.5	1.50E+12	-276.768
241.248	.005080	5.82E+06	-2.69E+04	-1.93E-04	562.3	1.50E+12	-121.225
275.712	6.03E-04	4.30E+06	-8.80E+04	-7.22E-05	464.3	1.50E+12	-1809.442
310.176	-6.02E-04	1.23E+06	-6.98E+04	-1.00E-05	265.6	1.50E+12	1807.076
344.640	-7.00E-04	0.0	0.0	-4.85E-07	186.1	1.50E+12	2100.681

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 = .18646084 in
Computed slope at pile head = -.00131560
Maximum bending moment = 7463627.243 lbs-in
Maximum shear force = -96705.019 lbs
Depth of maximum bending moment = 124.070 in
Depth of maximum shear force = 286.051 in
Number of iterations = 5
Number of zero deflection points = 1

Computed Values of Load Distribution and Deflection
for Lateral Loading for Load Case Number 2

Pile-head boundary conditions are Shear and Moment (BC Type 1)
Specified shear force at pile head = 30419.000 lbs
Specified bending moment at pile head = 5292168.000 in-lbs
Specified axial load at pile head = 413192.000 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	.209474	5.29E+06	3.04E+04	-.001402	522.8	1.50E+12	0.000
34.464	.163390	6.30E+06	2.52E+04	-.001268	587.8	1.50E+12	-144.296
68.928	.122287	7.08E+06	1.92E+04	-.001114	638.7	1.50E+12	-192.287
103.392	.086791	7.64E+06	1.20E+04	-9.44E-04	674.7	1.50E+12	-213.401
137.856	.057340	7.95E+06	5159.1	-7.64E-04	694.4	1.50E+12	-180.511
172.320	.034174	7.93E+06	-6545.7	-5.80E-04	693.3	1.50E+12	-302.886
206.784	.017274	7.55E+06	-1.58E+04	-4.02E-04	668.8	1.50E+12	-337.766
241.248	.006342	6.85E+06	-2.42E+04	-2.35E-04	623.3	1.50E+12	-151.333
275.712	8.21E-04	5.26E+06	-1.04E+05	-9.05E-05	520.4	1.50E+12	-2462.384
310.176	-7.21E-04	1.53E+06	-8.63E+04	-1.38E-05	279.5	1.50E+12	2162.160
344.640	-8.88E-04	0.0	0.0	-1.90E-06	180.4	1.50E+12	2664.033

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. 2:

Pile-head deflection	=	.20947418	in
Computed slope at pile head	=	-.00140207	
Maximum bending moment	=	7989827.914	lbs-in
Maximum shear force	=	-116464.317	lbs
Depth of maximum bending moment	=	151.642	in
Depth of maximum shear force	=	286.051	in
Number of iterations	=	5	
Number of zero deflection points	=	1	

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= 19646.000	M= 6.12E+06	426223.0000	.1865	7.464E+06	-96705.0187

1 V= 30419.000 M= 5.29E+06 413192.0000 .2095 7.990E+06-116464.3173

Pile-head Deflection vs. Pile Length

Boundary Condition Type 1, Shear and Moment

Shear = 19646. lbs
Moment = 6123444. in-lbs
Axial Load = 426223. lbs

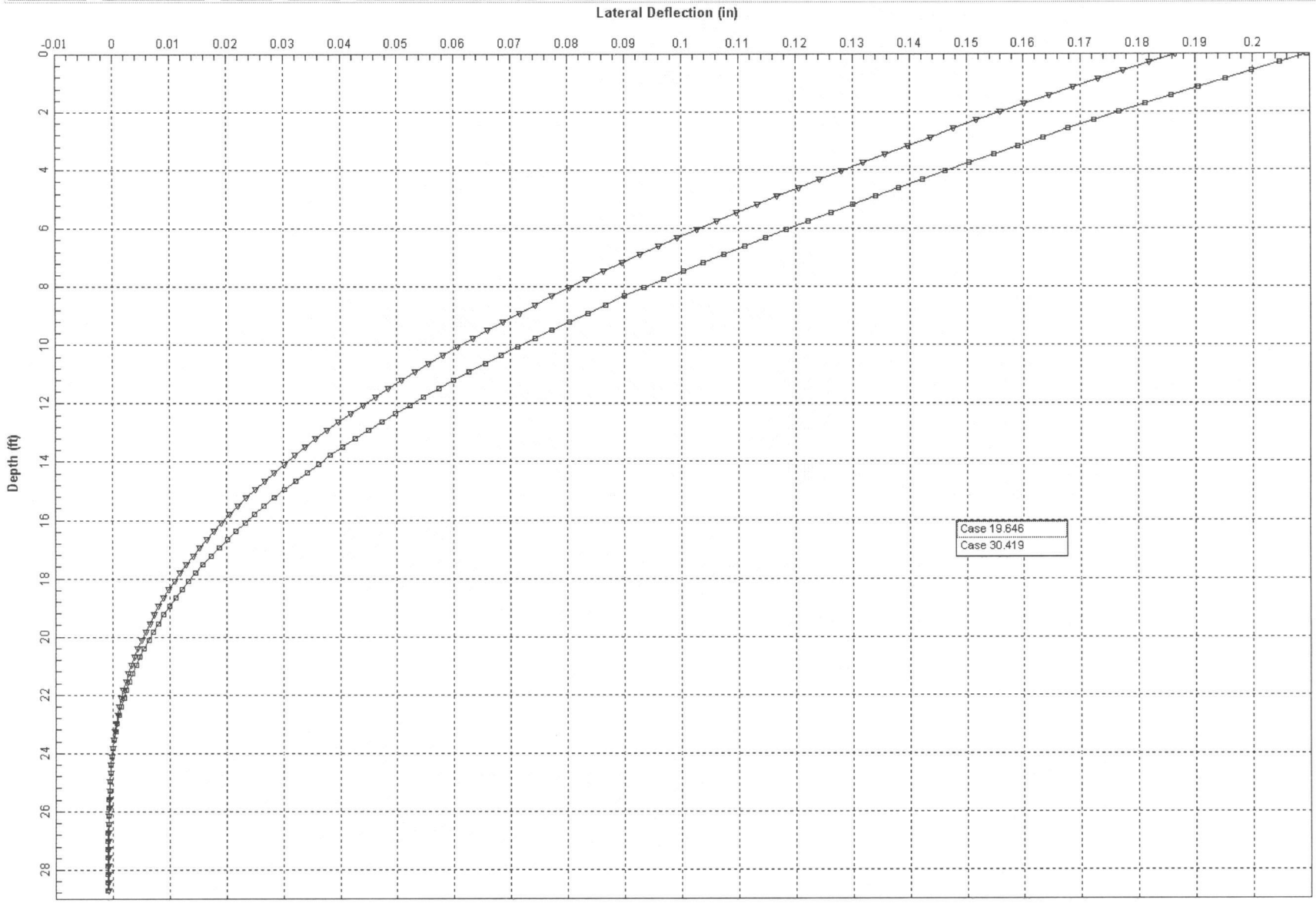
MIN. SOCKET

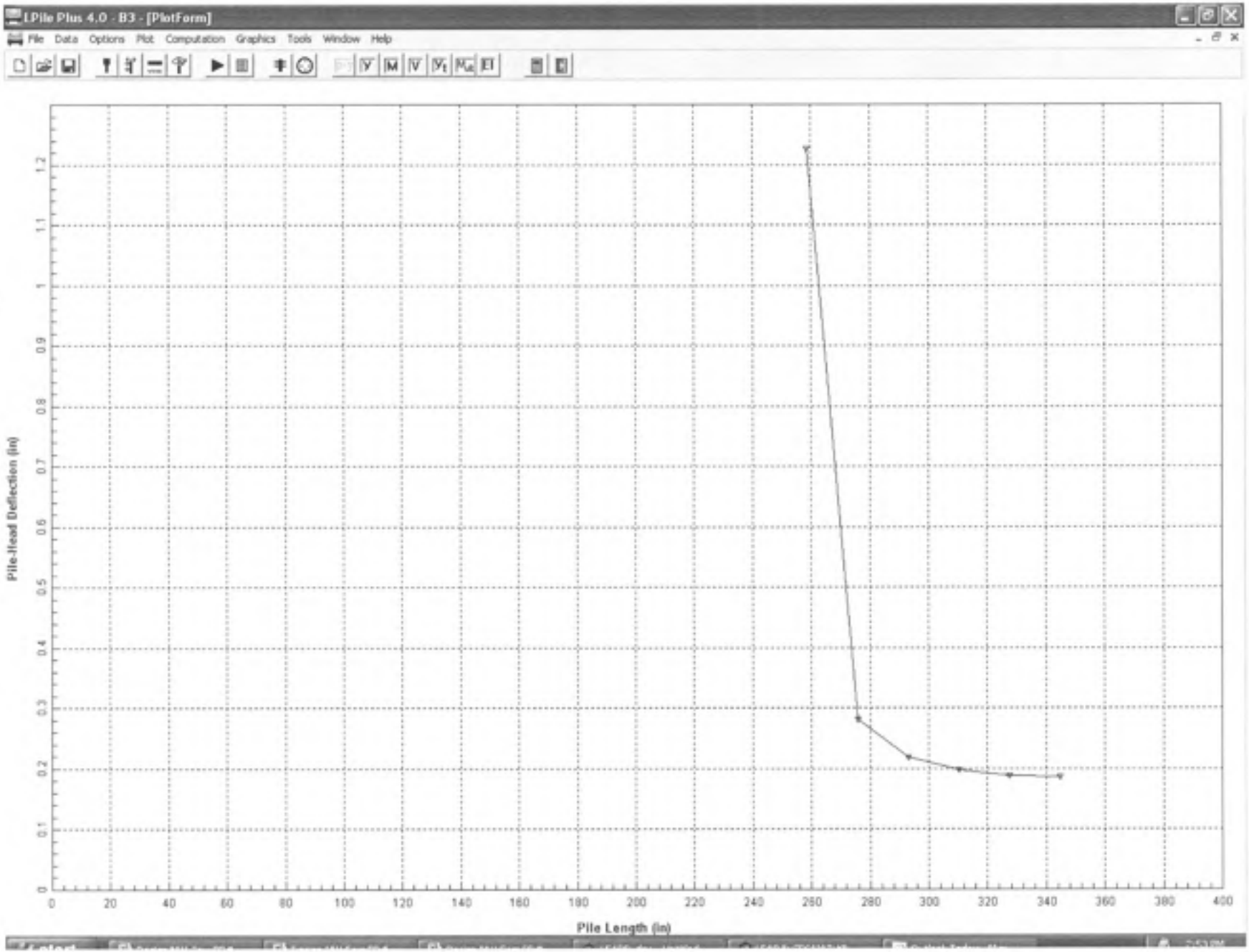
Pile Length in	Pile Head Deflection in	Maximum Moment in-lbs	Maximum Shear lbs
344.640	.18646084	7463627.243	-96705.019
327.408	.18922641	7477444.503	-110938.511
310.176	.19829097	7404073.347	-131730.470
292.944	.21923027	7308826.656	-143421.660
275.712	.28140232	7188081.778	-94886.776
258.480	1.22620544	7019480.136	-73428.039

The analysis ended normally.

LPile Plus 4.0 - B3 - [Deflection Curves X: 0.15099, Y: 7.0627]

File Data Options Plot Computation Graphics Tools Window Help




LPile Plus 4.0 - B3 - [PlotForm]
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
1
1.1
1.2
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 COVER SHEET

PROJECT	JOB NO.	CALC NO.	SHEET
I-75 / I-575 NORTHWEST CORRIDOR	NH000-0575-01(028)	BR#40	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.
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(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 bent 3.

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#40

SUBJECT: Caisson Structural Design Input - Bent 3
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 Noonday Creek North**
COUNTY: **CHEROKEE**
P.I. NO: **713640**
PROJECT: **NH000-0575-01(028)**

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

PCA COL ANALYSIS - BENT 3 - 54" caisson w/ 15-#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	**15**	
BAR SIZE	**#11**	
CLEAR COVER	**5**	in
COVER TO	**Transverse Bars**	

LOADS

NOTE: GROUP III & IV LOADINGS CONTROL

FACTORED

BENT	2	2
LOAD CASE	1	2
LOAD [k]	**426**	**413**
X-MOMENT [ft-k]	**809**	**866**

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	2	2
LOAD CASE	1	2
V_U [k]	**126**	**151**

ΦV_C [k] **260**

$V_C = 2(f'c)^{0.5}$(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 = 503.57 kips

CALCULATION COVER SHEET

PROJECT	JOB NO.	CALC NO.	SHEET
I-75 / I-575 NORTHWEST CORRIDOR	NH000-0575-01(028)	BR#40	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.
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Caisson structural design ouptput is included for bent 3.

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#40

SUBJECT: Caisson Structural Design Output - Bent 3
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.

```
OOOOOOO    OOOOO    OOOOO    OOOOO    OOOOO   OO
OO    OO  OO   OO  OO   OO  OO   OO  OO   OO  OO
OO    OO  OO   OO  OO   OO  OO   OO  OO   OO  OO
OO    OO  OO       OO   OO  OO       OO   OO  OO
OO    OO  OO       OOOOOOO  OO       OO   OO  OO
OOOOOOO   OO   OO  OO   OO  OO   OO  OO   OO  OO
OO        OO   OO  OO   OO  OO   OO  OO   OO  OO
OO         OOOOO   OO   OO   OOOOO    OOOOO   OOOOO  (TM)
```

==========
Computer program for the Strength Design of Reinforced Concrete Sections
==========

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General Information:
==========

File Name: N:\TRA\255717\ENG\BR40\SUBSTR~1\PCACOL~1\B3.COL
Project: I-575 O/ NOONDAY NORTH
Code: ACI 318-89
Column: BENT 3
Units: US in-lbs
Engineer: JCR
Date: 10/30/09 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 = 54 in

Gross section area, Ag = 2290.22 in^2
Ix = 417393 in^4
Xo = 0 in
Iy = 417393 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.

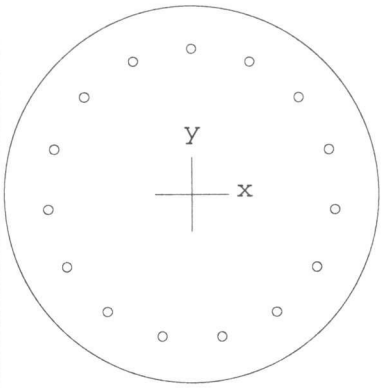
Layout: Circular
Pattern: All Sides Equal [Cover to transverse reinforcement (ties)]

Total steel area, As = 23.40 in^2 at 1.02%

15-#11 Cover = 5 in

Pt.	Applied Loads P (kips)	Applied Loads Mx (ft-k)	Computed Strength P (kips)	Computed Strength Mx (ft-k)	Computed/ Applied Ray length
1	413	866	1341	2899	3.329

Program completed as requested!



54.0 inch diam.

f'c = 3.5 ksi

fy = 60.0 ksi

Confinement: Tied

clr cover = 5.50 in

spacing = 7.24 in

-#11 at 1.02%

As = 23 in^2

Ix = 417393 in^4

Iy = 417393 in^4

Xo = 0.00 in

Yo = 0.00 in

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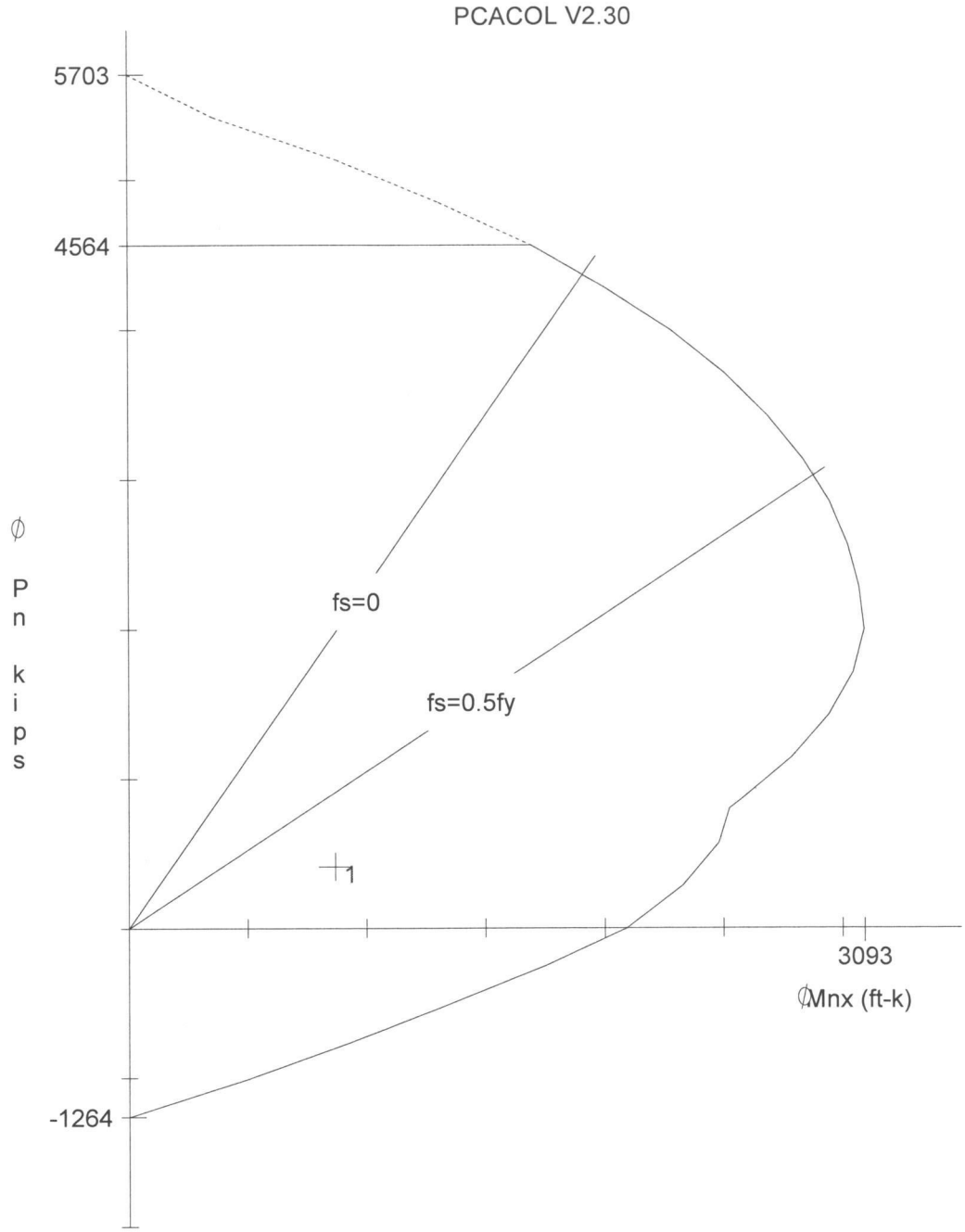

Licensed To: Licensee name not yet specified.

File name: N:\TRA\255717\ENG\BR40\SUBSTR~1\PCACOL~1\B3.COL

Project: I-575 O/ NOONDAY NORTH

Column Id: BENT 3

Engineer: JCR

Date: 10/30/09 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#40	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	

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Included Reference Information:

- Roadway information
- Bridge Survey Shots
- Existing Bridge Plans
- Existing Bridge Maintenance Reports
- 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	62	62	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#40

SUBJECT: Roadway Information
BY: JCR DATE: 11/30/2009

SHEET NO.
SHEET REV.

Delta:	7°53'29.9842" Right
Degree of Curvature (Arc):	0°30'09.3404"
Length:	1570.1846
Tangent:	786.3358
Chord:	1568.9437
Middle Ordinate:	27.0231
External:	27.0873
Tangent Direction:	N 9°58'01.6382" E
Radial Direction:	S 80°01'58.3618" E
Chord Direction:	N 13°54'46.6305" E
Radial Direction:	S 72°08'28.3776" E
Tangent Direction:	N 17°51'31.6226" E

Element: Linear

PT	( )	1368+00.0022	1484719.7330	2184384.4046
PI	( )	1384+47.6847	1486288.0224	2184889.7027
Tangential Direction:		N 17°51'31.6226" E		
Tangential Length:		1647.6825		

Element: Linear

PI	( )	1384+47.6847	1486288.0224	2184889.7027
PI	( )	1389+42.8269	1486759.1245	2185042.1119
Tangential Direction:		N 17°55'38.0529" E		
Tangential Length:		495.1422		

Element: Linear

PI	( )	1389+42.8269	1486759.1245	2185042.1119
PI	( )	1420+82.6016	1489747.2331	2186006.1617
Tangential Direction:		N 17°52'52.3028" E		
Tangential Length:		3139.7746		

Element: Linear

PI	( )	1420+82.6016	1489747.2331	2186006.1617
PI	( )	1426+21.8963	1490260.1577	2186172.7362
Tangential Direction:		N 17°59'29.1404" E		
Tangential Length:		539.2947		

Element: Linear

PI	( )	1426+21.8963	1490260.1577	2186172.7362
PC	( )	1433+09.8191	1490915.3065	2186382.5409
Tangential Direction:		N 17°45'25.6894" E		
Tangential Length:		687.9229		

Element: Circular

PC	( )	✓1433+09.8191	✓1490915.3065	✓2186382.5409
PI	( )	1443+73.8216	✓1491928.6175	✓2186707.0435
CC	( )		1491793.6572	2183639.7504
PT	( )	✓1453+48.2366	✓1492909.5117	✓2186294.7963
Radius:		✓2880.0000		
Delta:		40°33'10.8970" Left		
Degree of Curvature (Arc):		1°59'21.9724"		

BR#40 575 o/ Noonday North & BR#41 575 o/ Towne Lk.

PROJECT:	NW Corridor
COUNTY:	CHEROKEE
BRIDGE:	40 & 41
DESCRIPTION:	I-575 over Noonday Ck North & Towne Lake Pkwy

VERTICAL GRADE DATA FOR NEW ALIGNMENT:

PVC =	1437+00.	PVI =	1443+00.	PVT =	1450+00.
PVI EL. =	891.55	PVI EL. =	895.87	PVI EL. =	914.08
		VC Length (ft) =	1300.00		

BR 40

ELEVATION COMPARISON

BENT 1R LEFT SIDE		BENT 1R RIGHT SIDE	
Geomath Rdy EL. =	891.631	Geomath Rdy EL. =	895.713
Survey EL. =	891.615	Survey EL. =	895.645
DIFFERENCE =	0.036	DIFFERENCE =	0.068
Dist. to PGL =	6.5289	Dist. to PGL =	57.2121
PGL EL. =	892.0720	PGL EL. =	891.6402
PGL STA. =	1437+81.67	PGL STA. =	1437+24.91

BENT 2R LEFT SIDE		BENT 2R RIGHT SIDE	
Geomath Rdy EL. =	892.310	Geomath Rdy EL. =	896.431
Survey EL. =	892.287	Survey EL. =	896.452
DIFFERENCE =	-0.077	DIFFERENCE =	-0.021
Dist. to PGL =	6.3993	Dist. to PGL =	61.9183
PGL EL. =	892.7350	PGL EL. =	892.1806
PGL STA. =	1438+50.77	PGL STA. =	1437+88.59

BENT 3R LEFT SIDE		BENT 3R RIGHT SIDE	
Geomath Rdy EL. =	892.830	Geomath Rdy EL. =	897.335
Survey EL. =	892.860	Survey EL. =	897.360
DIFFERENCE =	-0.030	DIFFERENCE =	-0.025
Dist. to PGL =	6.4707	Dist. to PGL =	65.3974
PGL EL. =	893.3129	PGL EL. =	892.6822
PGL STA. =	1439+20.51	PGL STA. =	1438+56.71

BENT 4R LEFT SIDE		BENT 4R RIGHT SIDE	
Geomath Rdy EL. =	893.487	Geomath Rdy EL. =	898.994
Survey EL. =	893.485	Survey EL. =	898.949
DIFFERENCE =	-0.018	DIFFERENCE =	0.045
Dist. to PGL =	7.2664	Dist. to PGL =	69.8665
PGL EL. =	893.9936	PGL EL. =	893.1583
PGL STA. =	1439+89.94	PGL STA. =	1439+12.05

Cross Slope = 7.0000%

Mean EL. Difference = -0.003

BR 41

ELEVATION COMPARISON

BENT 1R LEFT SIDE		BENT 1R RIGHT SIDE	
Geomath Rdy EL. =	908.631	Geomath Rdy EL. =	911.502
Survey EL. =	908.566	Survey EL. =	911.516
DIFFERENCE =	0.065	DIFFERENCE =	-0.014
Dist. to PGL =	6.3193	Dist. to PGL =	36.2239
PGL EL. =	909.0077	PGL EL. =	908.9803
PGL STA. =	1448+79.16	PGL STA. =	1448+74.61

BENT 2R LEFT SIDE		BENT 2R RIGHT SIDE	
Geomath Rdy EL. =	909.654	Geomath Rdy EL. =	912.453
Survey EL. =	909.619	Survey EL. =	912.426
DIFFERENCE =	0.035	DIFFERENCE =	0.027
Dist. to PGL =	5.9572	Dist. to PGL =	35.7843
PGL EL. =	910.0360	PGL EL. =	909.9211
PGL STA. =	1449+21.16	PGL STA. =	1449+16.64

BENT 3R LEFT SIDE		BENT 3R RIGHT SIDE	
Geomath Rdy EL. =	911.826	Geomath Rdy EL. =	914.578
Survey EL. =	911.878	Survey EL. =	914.602
DIFFERENCE =	-0.052	DIFFERENCE =	-0.024
Dist. to PGL =	5.9049	Dist. to PGL =	35.7445
PGL EL. =	912.2913	PGL EL. =	912.0999
PGL STA. =	1450+88.86	PGL STA. =	1450+82.41

BENT 4R LEFT SIDE		BENT 4R RIGHT SIDE	
Geomath Rdy EL. =	913.057	Geomath Rdy EL. =	915.980
Survey EL. =	913.097	Survey EL. =	915.958
DIFFERENCE =	-0.040	DIFFERENCE =	0.022
Dist. to PGL =	5.4008	Dist. to PGL =	36.8433
PGL EL. =	913.6451	PGL EL. =	913.3830
PGL STA. =	1450+61.93	PGL STA. =	1450+54.65

Cross Slope = 7.0000%

Mean EL. Difference = 0.003

CALCULATION SHEET

PROJECT: I-75 / I-575 NORTHWEST CORRIDOR
JOB NUMBER NH000-0575-01(028)
CALC NO. BR#40

SUBJECT: Bridge Survey Shots
BY: JCR DATE: 11/30/2009

SHEET NO.
SHEET REV.

Noonday North, Br. 13

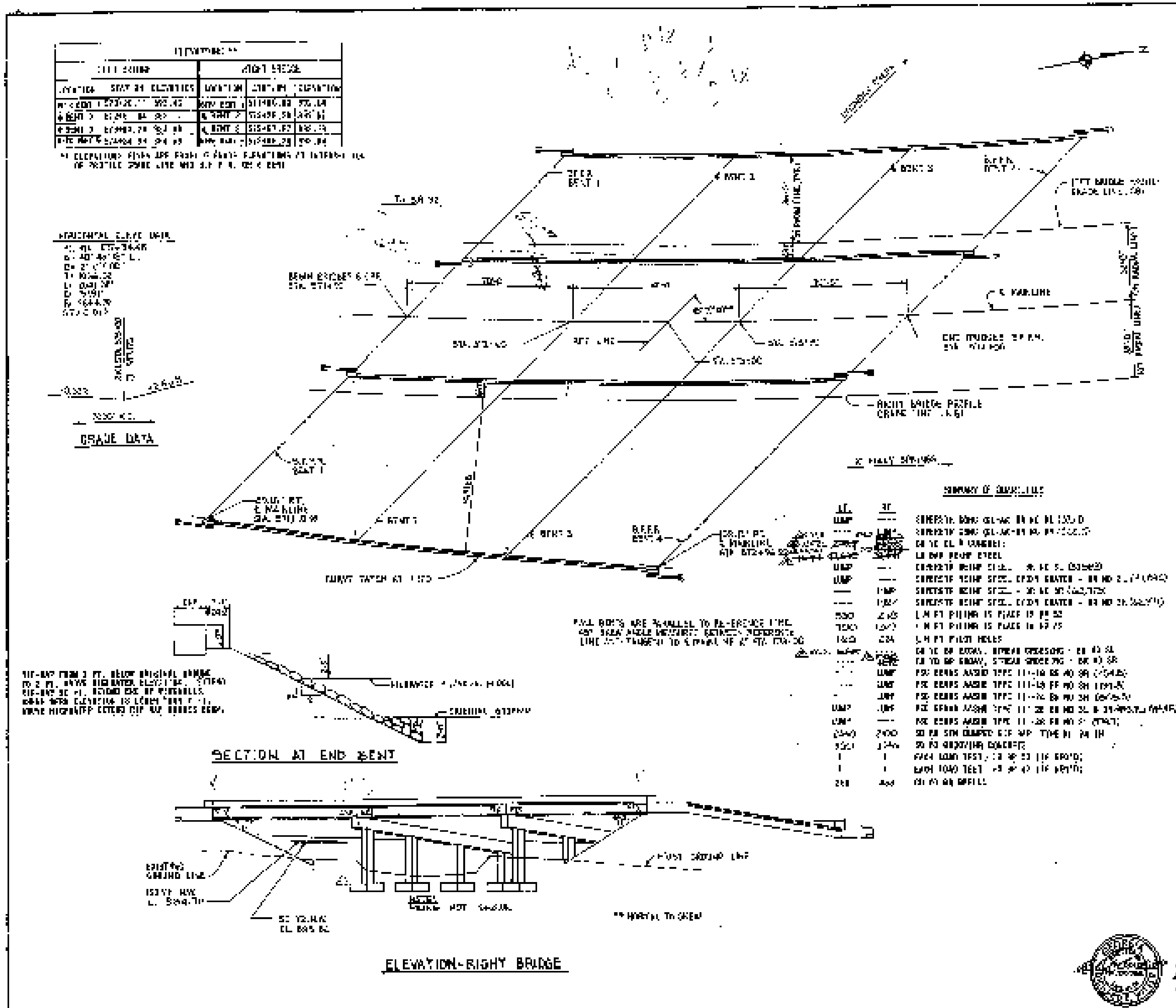
SVXO30294,1491475.085,2186400.254,890.416 BT 1 LT, OUT
SVXO30291,1491429.171,2186438.419,892.958 BT 1 LT, In
SVXO30288,1491640.257,2186457.352,894.941 BT 4 LT, In
SVXO30305,1491689.638,2186416.527,892.553 BT 4 LT, Out
O30289,1491570.437,2186452.153,894.220 BT 3 LT, In
SVXO30302,1491617.202,2186413.675,891.904 BT 3 LT, Out
SVXO30290,1491500.069,2186445.947,893.545 BT 2 LT, In
SVXO30299,1491545.544,2186408.339,891.098 BT 2 LT, OUT
SVXO30270,1491581.931,2186504.671,893.485 BT 4 RT, In
SVXO30309,1491496.781,2186574.640,898.049 BT 4 RT, Out
SVXO30271,1491512.858,2186499.527,892.860 BT 3 RT, In
SVXO30313,1491434.881,2186563.215,897.260 BT 3 RT, Out
SVXO30272,1491443.692,2186491.961,892.287 BT 2 RT, In
SVXO30316,1491372.546,2186550.465,896.452 BT 2 RT, Out
SVXO30273,1491375.379,2186482.615,891.615 BT 1 RT, In
SVXO30317,1491308.923,2186536.688,895.645 BT 1 RT, Out

CALCULATION SHEET

PROJECT: I-75 / I-575 NORTHWEST CORRIDOR
JOB NUMBER NH000-0575-01(028)
CALC NO. BR#40

SUBJECT: Existing Bridge Plans
BY: JCR DATE: 11/30/2009

SHEET NO.
SHEET REV.



DESIGN DATA

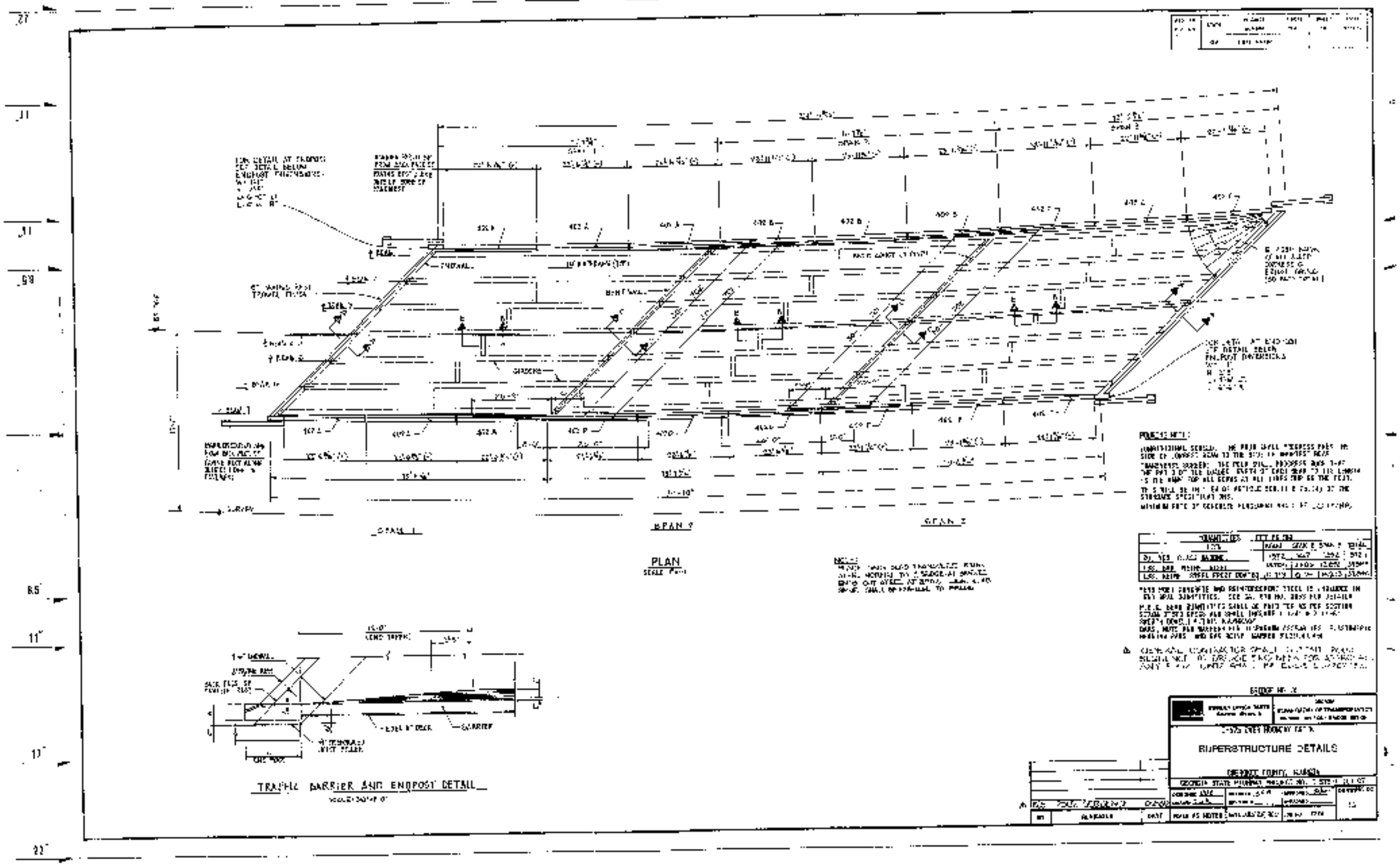
UNIT CONSISTS OF:

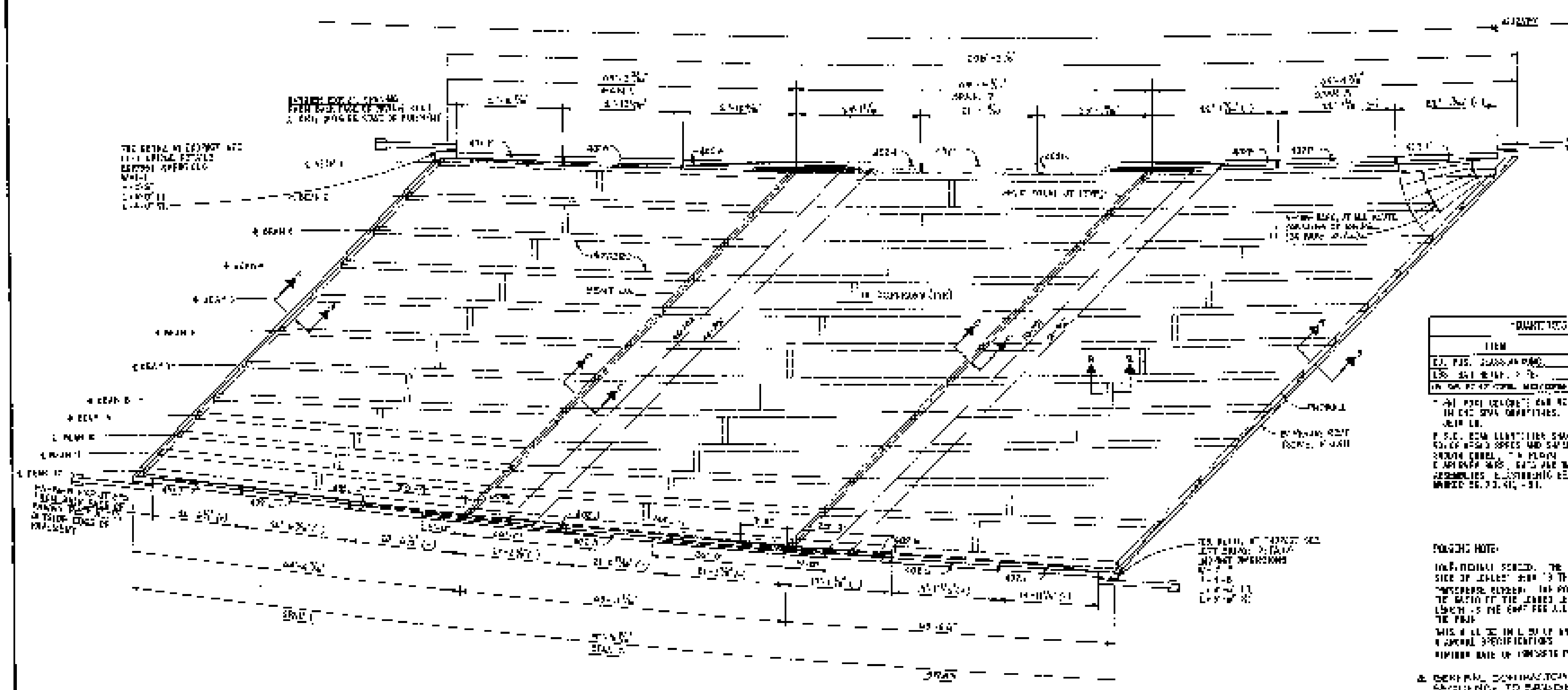
DRAINAGE DATA

GENERAL NOTES

PLAN AND ELEVATION

GEORGIA STATE HIGHWAY PROJECT


PLAN
TRAFFIC BARRIER AND ENDPOST DETAIL
SUPERSTRUCTURE DETAILS



PLAN

QUANTITIES RIGHT BRIDGE				
ITEM	SPAN	[illegible]	[illegible]	TOTAL
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

POURING NOTE:

[illegible]

GENERAL CONTRACTOR SHALL SUBMIT YOUR SEQUENCE TO BRIDGE ENGINEER FOR APPROVAL. ANY [illegible] JOINTS SHALL BE [illegible].

BRIDGE NO. [illegible]

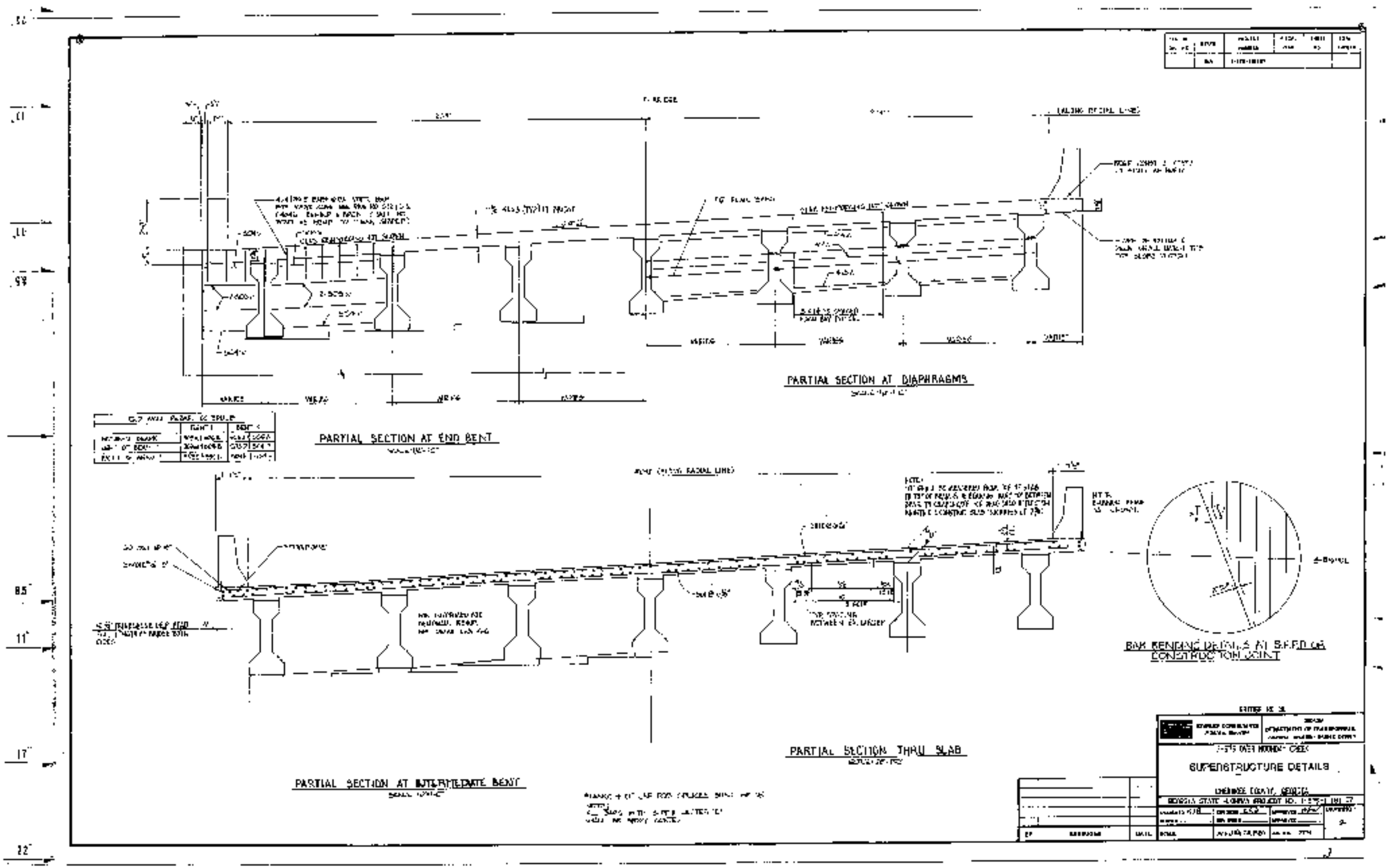
DEPARTMENT OF TRANSPORTATION

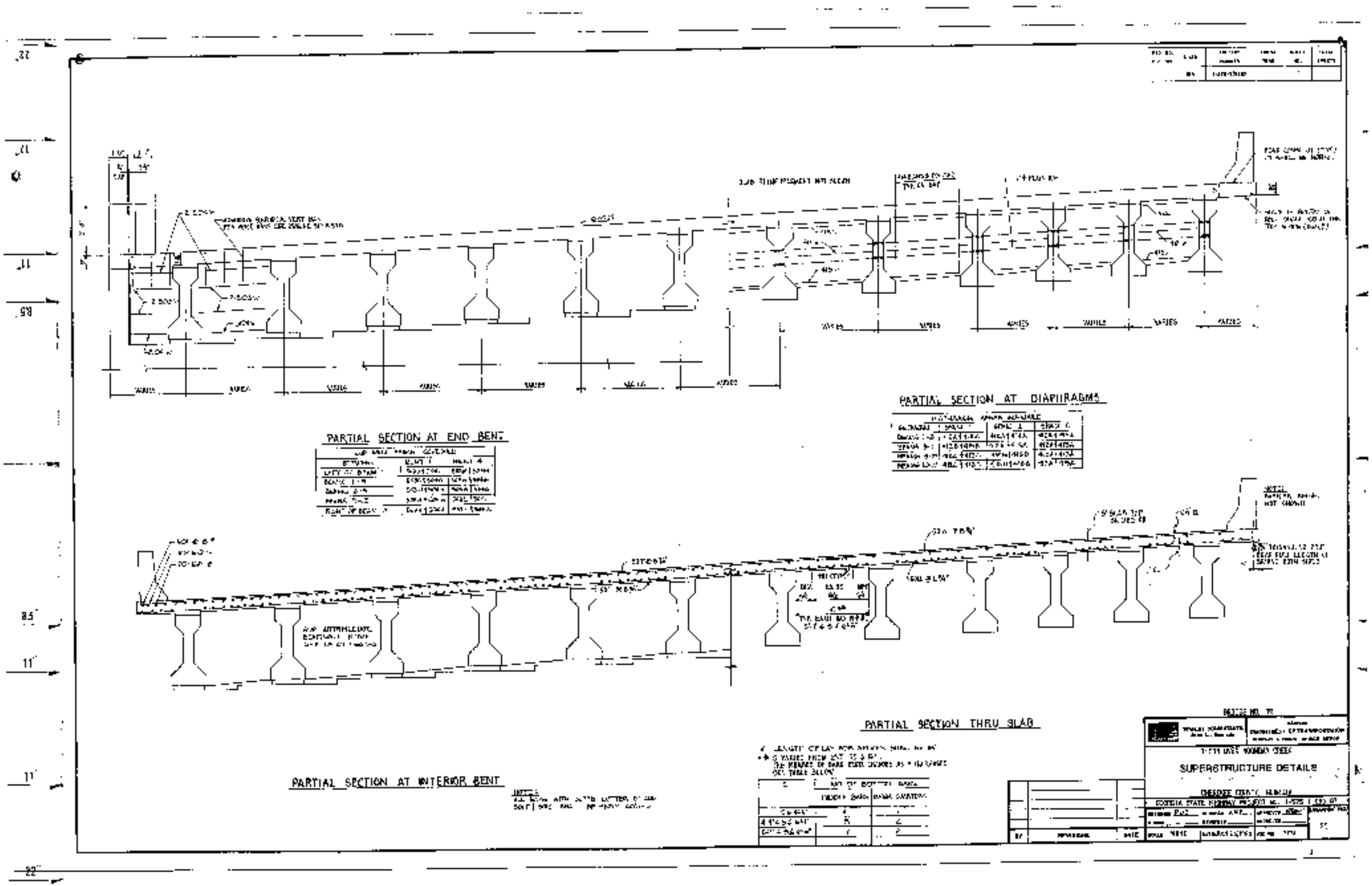
SUPERSTRUCTURE DETAILS

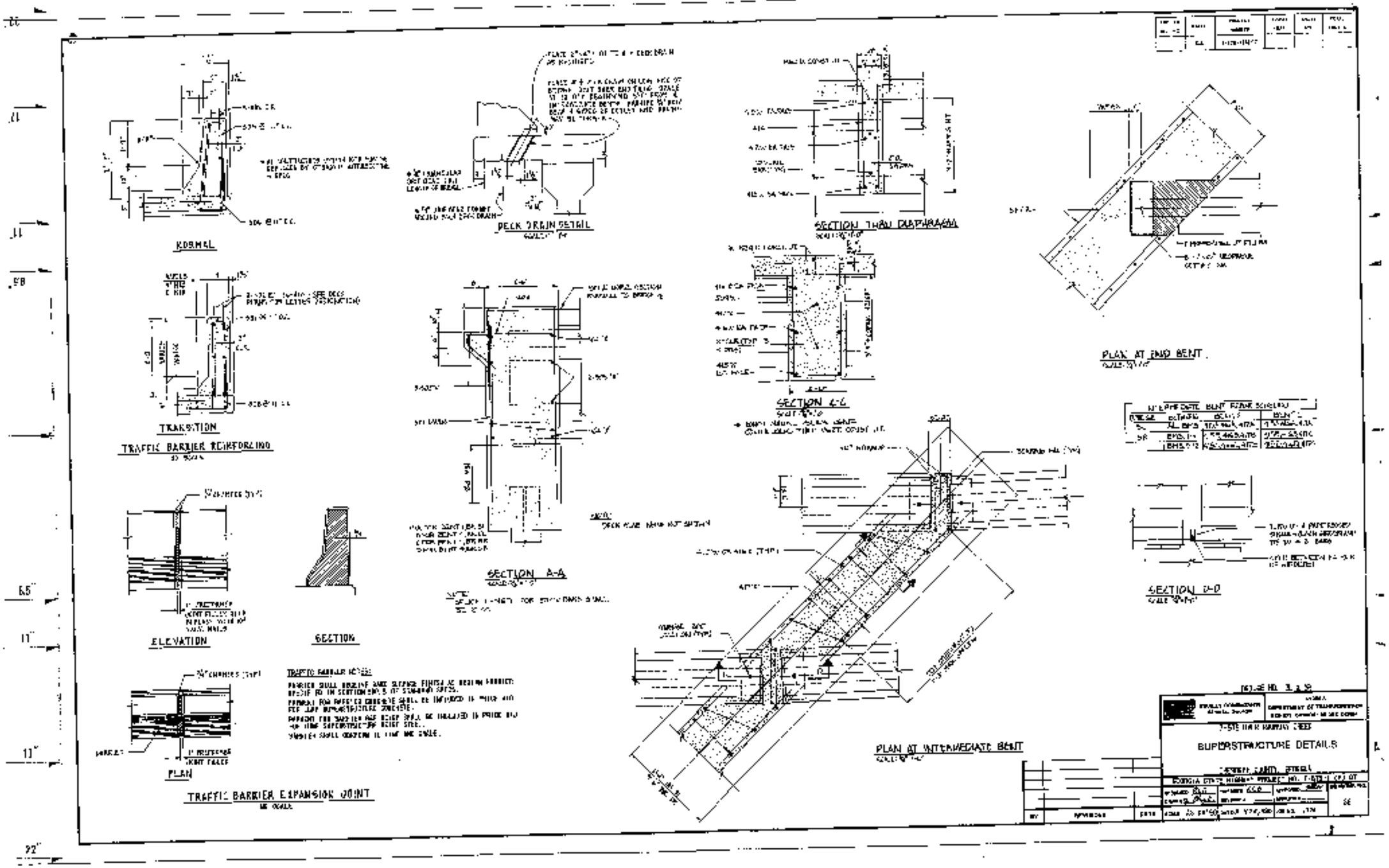
[illegible] COUNTY, [illegible]

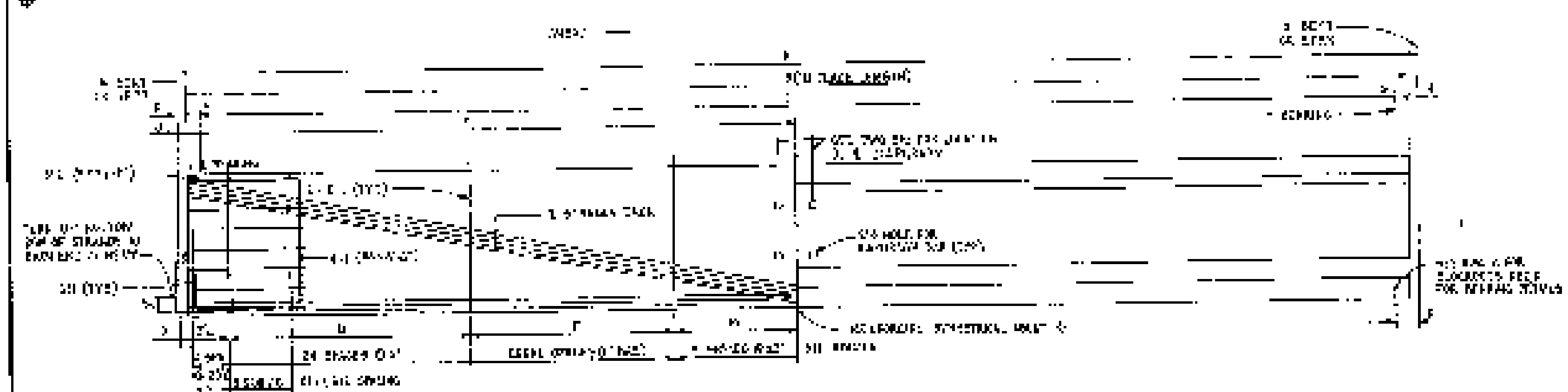
[illegible] HIGHWAY PROJECT NO. [illegible]

REVISED POUR SEQUENCE

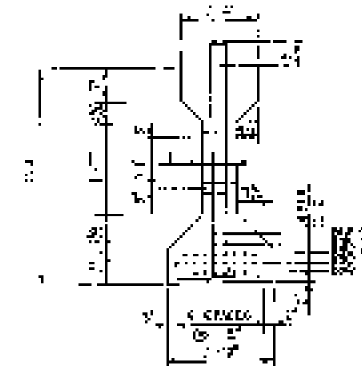

PARTIAL SECTION AT DIAPHRAGMS
PARTIAL SECTION AT END BENT
PARTIAL SECTION AT INTERMEDIATE BENT
PARTIAL SECTION THRU SLAB
BAR BENDING DETAILS AT SPED OR CONSTRUCTION JOINT
SUPERSTRUCTURE DETAILS


PARTIAL SECTION AT END BENT
PARTIAL SECTION AT DIAPHRAGMS
PARTIAL SECTION AT INTERIOR BENT
PARTIAL SECTION THRU SLAB
SUPERSTRUCTURE DETAILS

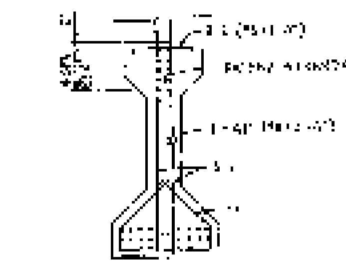

KORMEL
DECK DRAIN DETAIL
SECTION THRU DIAPHRAGM
PLAN AT END BENT
TRANSITION
TRAFFIC BARRIER REINFORCING
SECTION C-C
SECTION A-A
SECTION D-D
ELEVATION
SECTION
PLAN
TRAFFIC BARRIER EXPANSION JOINT
PLAN AT INTERMEDIATE BENT
SUPERSTRUCTURE DETAILS



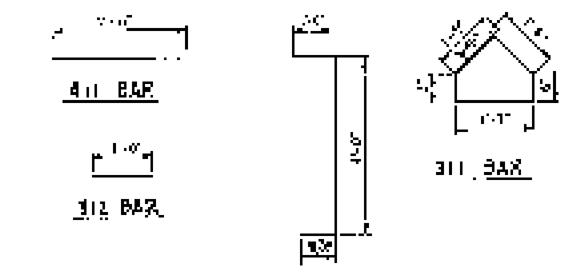
ELEVATION



SECTION AT ℄ SPAN



SECTION AT BEAM END



SPAN	BEAM	DIMENSIONS (IN FEET)														NUMBER OF STRANDS						INITIAL TENSION		FINAL TENSION	D.L. DEFL.
1	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
2	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
3	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

PRESTRESSED BEAM NOTES

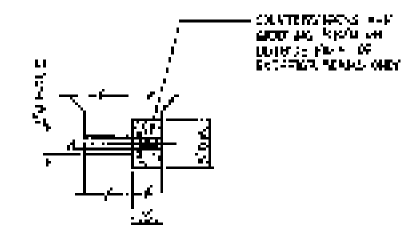
1. [illegible]
2. [illegible]
3. [illegible]
4. [illegible]
5. [illegible]
6. [illegible]
7. [illegible]
8. D.L. DEFL. [illegible]

GIRDER REINFORCING

MARK	NO. REQ'D	LENGTH
B11	[illegible]	[illegible]
B12	[illegible]	[illegible]
B1	[illegible]	[illegible]
S11	[illegible]	[illegible]

GIRDER QUANTITIES

ITEM	TOTAL
[illegible] CONCRETE	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]



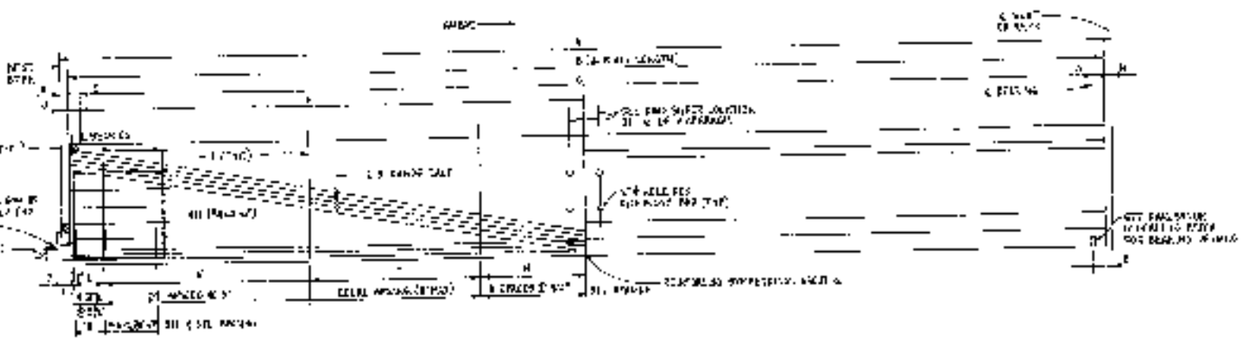
RECESS DETAILS FOR DIAPHRAGM BAR

SUPERSTRUCTURE DETAILS

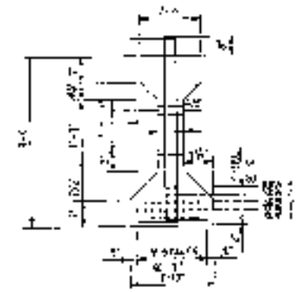
DEPARTMENT OF TRANSPORTATION

GEORGIA STATE HIGHWAY PROJECT NO. [illegible]

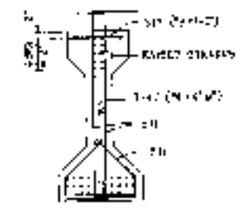
REVISIONS | DATE | SCALE: NONE



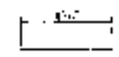
ELEVATION



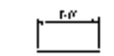
SECTION AT 4 SPAN



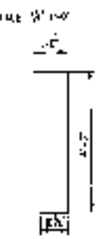
SECTION AT BEAM END



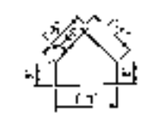
#4 BAR



#12 BAR



#11 BAR



#11 BAR

DIMENSIONS (IN FEET)

BAR	DEPT	A	B	C	D	F	P	G	H	I	J	K
1	1-6	23.7711	37.4058	32.2101	1.2764	0.5863	35.2581	0.4147	0.2203	1.2630	0.7958	1.00
1	7	36.8853	64.4453	44.4[illegible]	.1755	0.8[illegible]	41.7[illegible]	0.7[illegible]	0.3[illegible]	1.0155	0.8[illegible]	1.00
1	10	35.4[illegible]	63.8437	39.[illegible]	1.1955	0.6[illegible]	31.5150	0.4[illegible]	0.2[illegible]	1.0252	0.1[illegible]	1.00
1	11	34.8314	3[illegible]	42.9214	1.1[illegible]	0.3[illegible]	121.2[illegible]	0.4[illegible]	0.2[illegible]	1.0[illegible]	0.3[illegible]	1.00
1	12	34.4[illegible]	51.9416	39.[illegible]	1.1233	0.3[illegible]	3[illegible] 0155	0.4161	0.2[illegible]	1.0233	0.3[illegible]	1.00
1	1-8	33.9[illegible]	48.2642	41.4[illegible]	0.2[illegible]	0.2[illegible]	35.7[illegible]	0.4[illegible]	0.2[illegible]	1.2[illegible]	0.7[illegible]	1.00
2	8	37.2[illegible]	58.3[illegible]	45.1[illegible]	0.3[illegible]	0.2[illegible]	32.8[illegible]	0.4[illegible]	0.2[illegible]	1.2[illegible]	0.7[illegible]	1.00
2	[illegible]	33.5[illegible]	54.2[illegible]	34.0[illegible]	0.3[illegible]	0.2[illegible]	29.0[illegible]	0.4[illegible]	0.2[illegible]	1.2[illegible]	0.7[illegible]	1.00
2	12	33.5[illegible]	53.[illegible]	35.[illegible]	0.3[illegible]	0.2[illegible]	31.2[illegible]	0.4[illegible]	0.2[illegible]	1.2[illegible]	0.7[illegible]	1.00
2	1-8	33.[illegible]	51.2[illegible]	35.5[illegible]	1.2[illegible]	0.1[illegible]	33.7[illegible]	0.3[illegible]	0.2[illegible]	1.2[illegible]	0.7[illegible]	1.00
3	10	37.[illegible]	58.[illegible]	45.[illegible]	1.2[illegible]	0.4[illegible]	37.5[illegible]	0.3[illegible]	0.2[illegible]	1.2[illegible]	0.7[illegible]	1.00
3	11	35.2[illegible]	5[illegible]	4[illegible]	1.2[illegible]	0.4[illegible]	31.4[illegible]	0.3[illegible]	.1[illegible]	1.2[illegible]	0.7[illegible]	1.00
3	12	35.[illegible]	37.1[illegible]	[illegible]	1.2[illegible]	0.4[illegible]	34.0[illegible]	0.3[illegible]	.1[illegible]	1.2[illegible]	0.7[illegible]	1.00

LENGTH OF STIRRUPS

BAR	REQ'D 1	STR 1	REQ'D 2	STR 2	REQ'D 3	STR 3	TOTAL	EXTRA STIRRUPS	TOTAL LENGTH PER BEAM	TOTAL LENGTH PER SPAN	TOTAL LENGTH PER BRIDGE	TOTAL WEIGHT (LB)
1	8	15	5	2	3	2	33	8	23,[illegible]	152,[illegible]	541,[illegible]	8,[illegible]
1	6	10	5	1	5	1	18	4	23,[illegible]	207,[illegible]	388,[illegible]	0.[illegible]
1	6	10	5	0	5	0	16	4	19,[illegible]	462,[illegible]	388,[illegible]	0.[illegible]
1	6	10	5	0	5	0	16	4	19,[illegible]	462,[illegible]	388,[illegible]	0.[illegible]
1	6	10	5	0	5	1	18	4	23,[illegible]	462,[illegible]	966,[illegible]	0.[illegible]
1	8	15	5	2	5	2	24	8	34,[illegible]	584,[illegible]	872,[illegible]	0.[illegible]
2	8	15	5	2	5	2	28	8	38,[illegible]	528,[illegible]	487,[illegible]	0.[illegible]
2	6	13	5	0	5	0	16	6	28,[illegible]	328,[illegible]	482,[illegible]	3.[illegible]
2	6	13	5	0	5	0	16	6	28,[illegible]	538,[illegible]	482,[illegible]	3.[illegible]
2	6	13	5	0	5	0	16	6	28,[illegible]	769,[illegible]	517,[illegible]	3.[illegible]
2	8	15	5	2	5	2	24	8	38,[illegible]	647,[illegible]	910,[illegible]	8.[illegible]
2	8	15	5	2	5	2	22	8	39,[illegible]	684,[illegible]	210,[illegible]	0.[illegible]
2	8	15	5	2	5	2	24	8	36,[illegible]	684,[illegible]	210,[illegible]	0.[illegible]

BILL OF REINFORCING

MARK	NO. REQ'D.	LENGTH
311	8[illegible]	[illegible]
312	5[illegible]	11'-8"
4[illegible]	8[illegible]	[illegible]
4[illegible]	2[illegible]	[illegible]

BRIDGE QUANTITIES

ITEM	TOTAL
CLASS C YARDS [illegible]	5[illegible]
LB. [illegible] REINFORCING	[illegible]
LIN. FT. [illegible]	[illegible]

NOTE:
FOR DETAILS OF [illegible] FOR SUPERSTRUCTURE SEE PLAN SHEET.

BRIDGE NO. 33

TYPE 1 [illegible]

DEPARTMENT OF TRANSPORTATION

1-75 OVER MOONEY CREEK

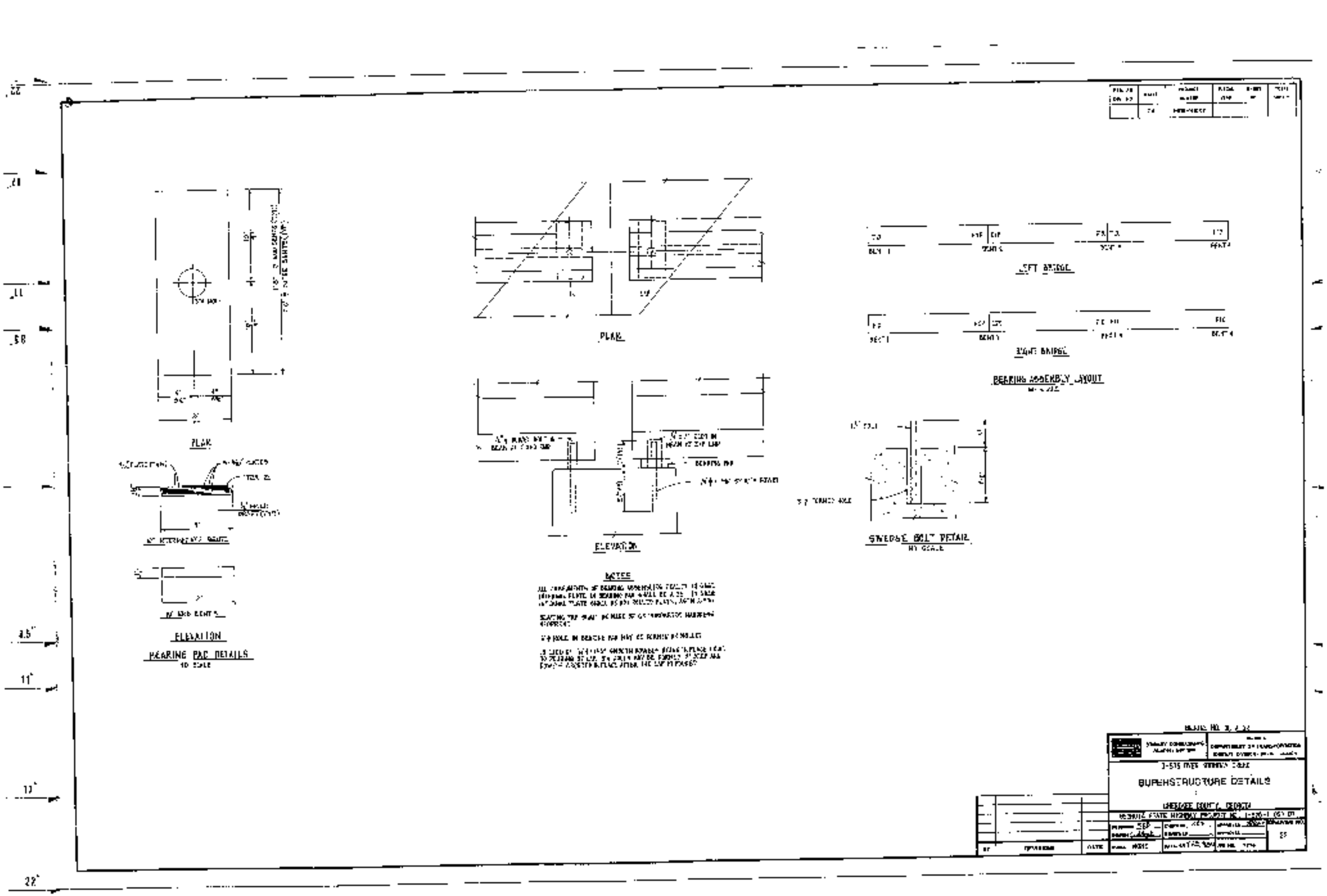
SUPERSTRUCTURE DETAILS

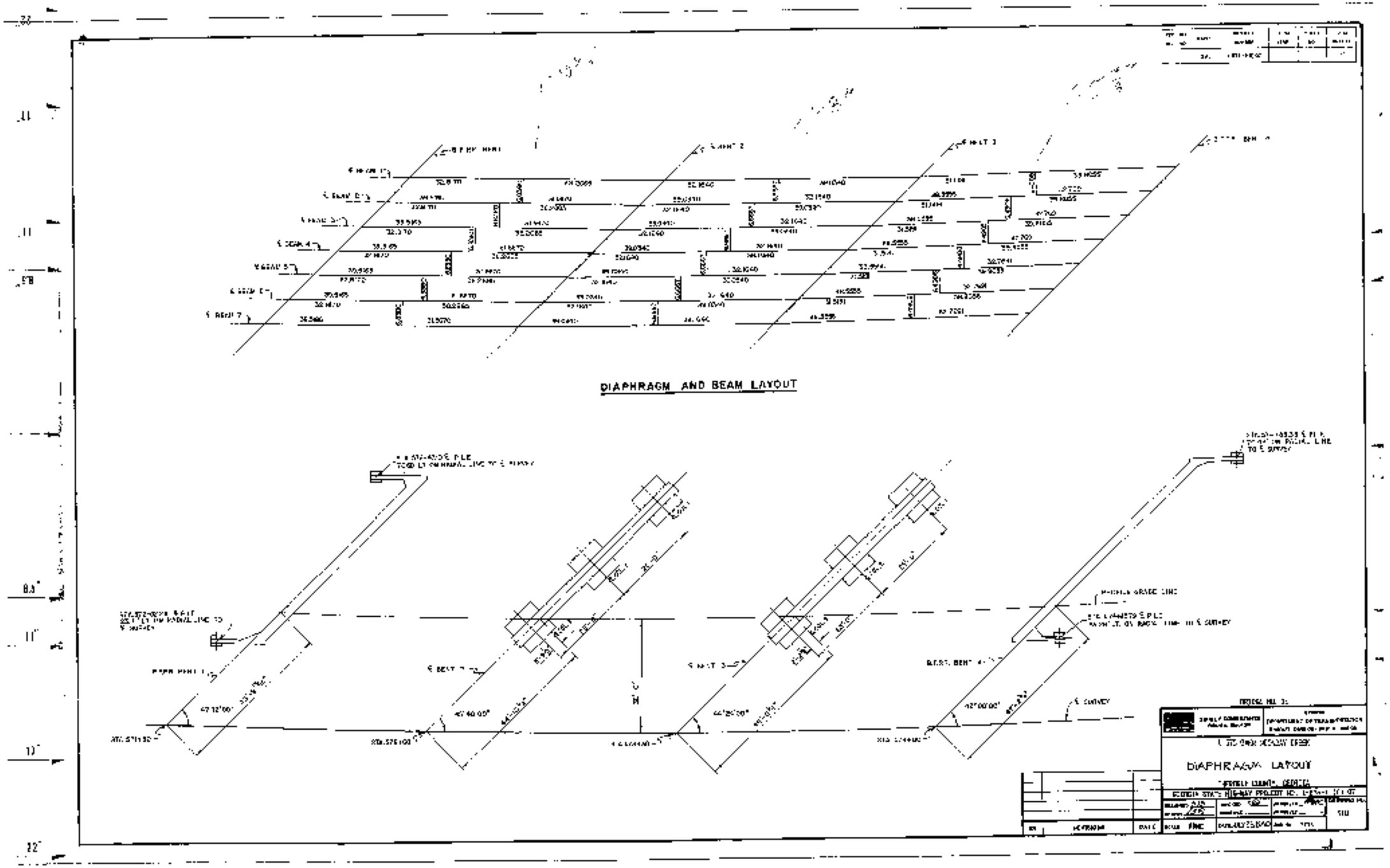
DRAWN: [illegible] CHECKED: [illegible]

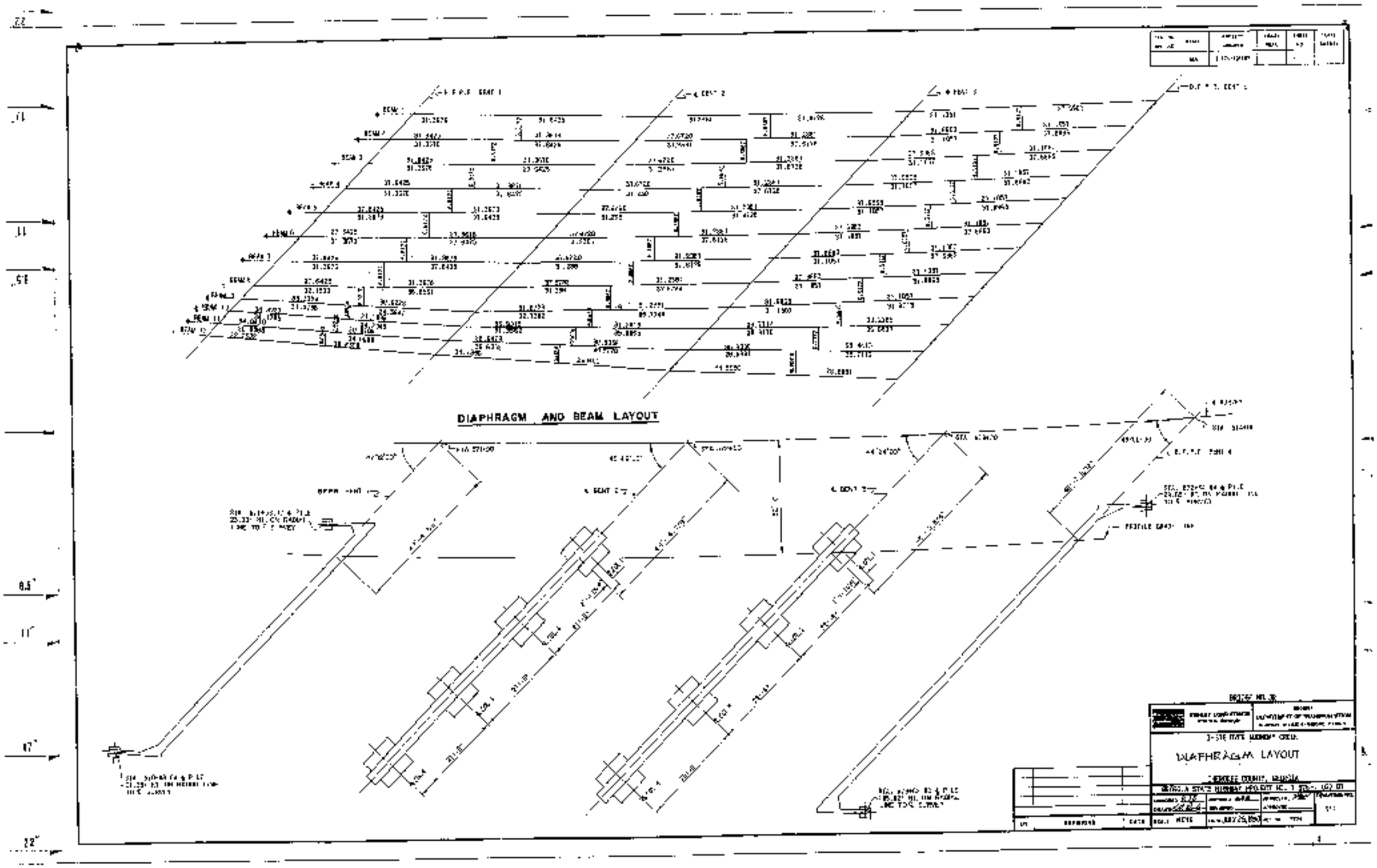
GEORGIA STATE HIGHWAY PROJECT NO. I 5[illegible]-1 (6) CT

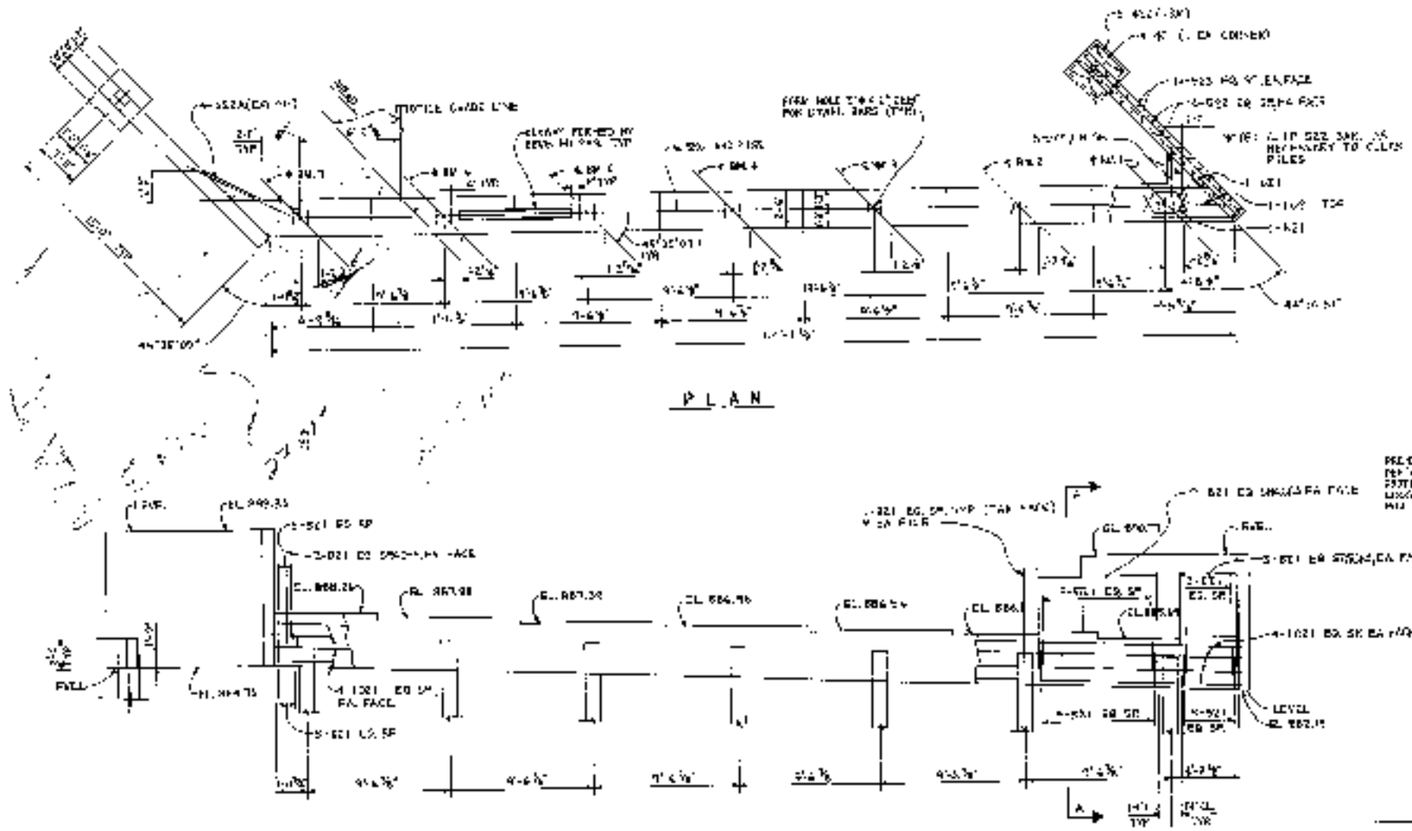
DATE [illegible] 1[illegible]

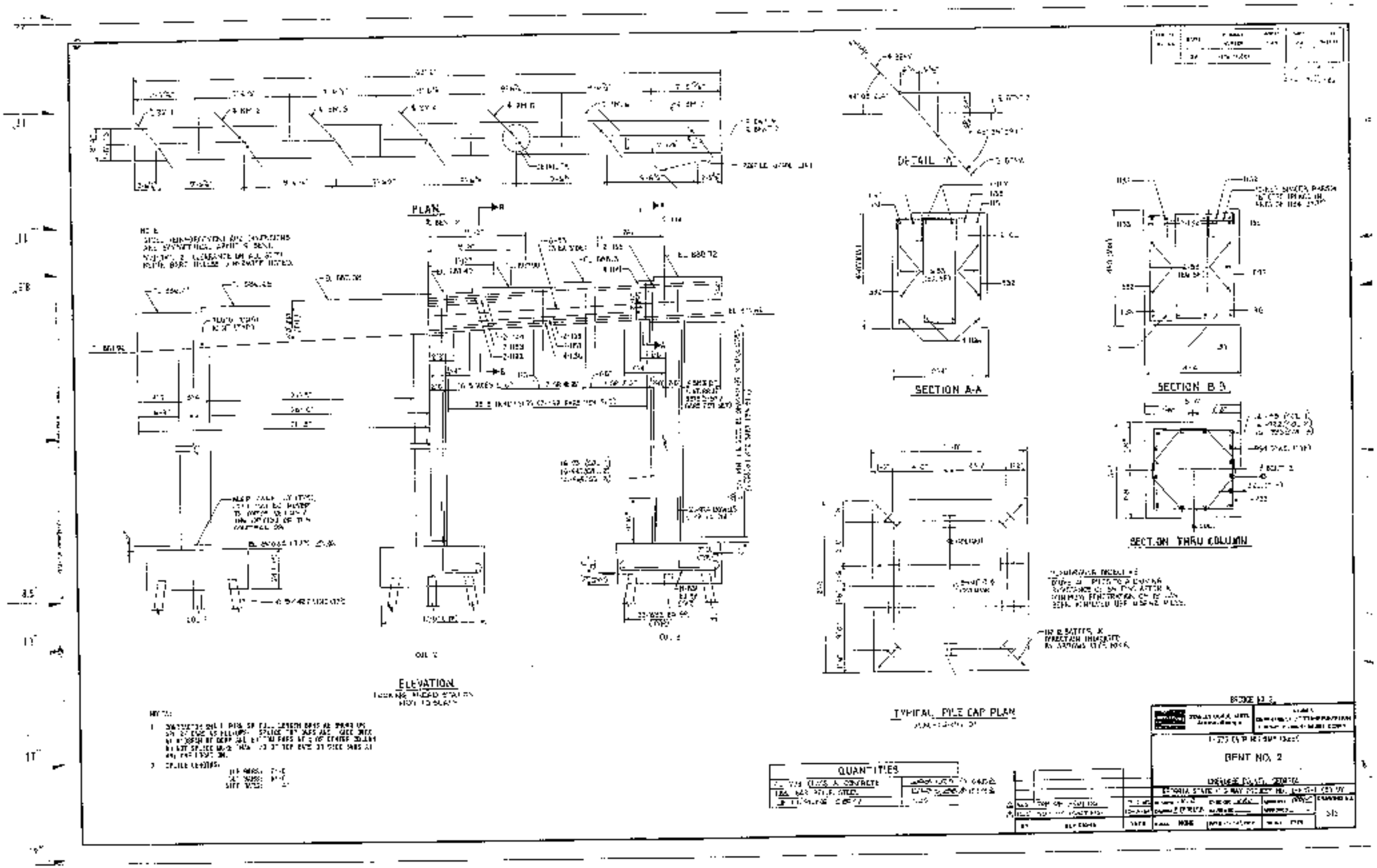
SHEET 33

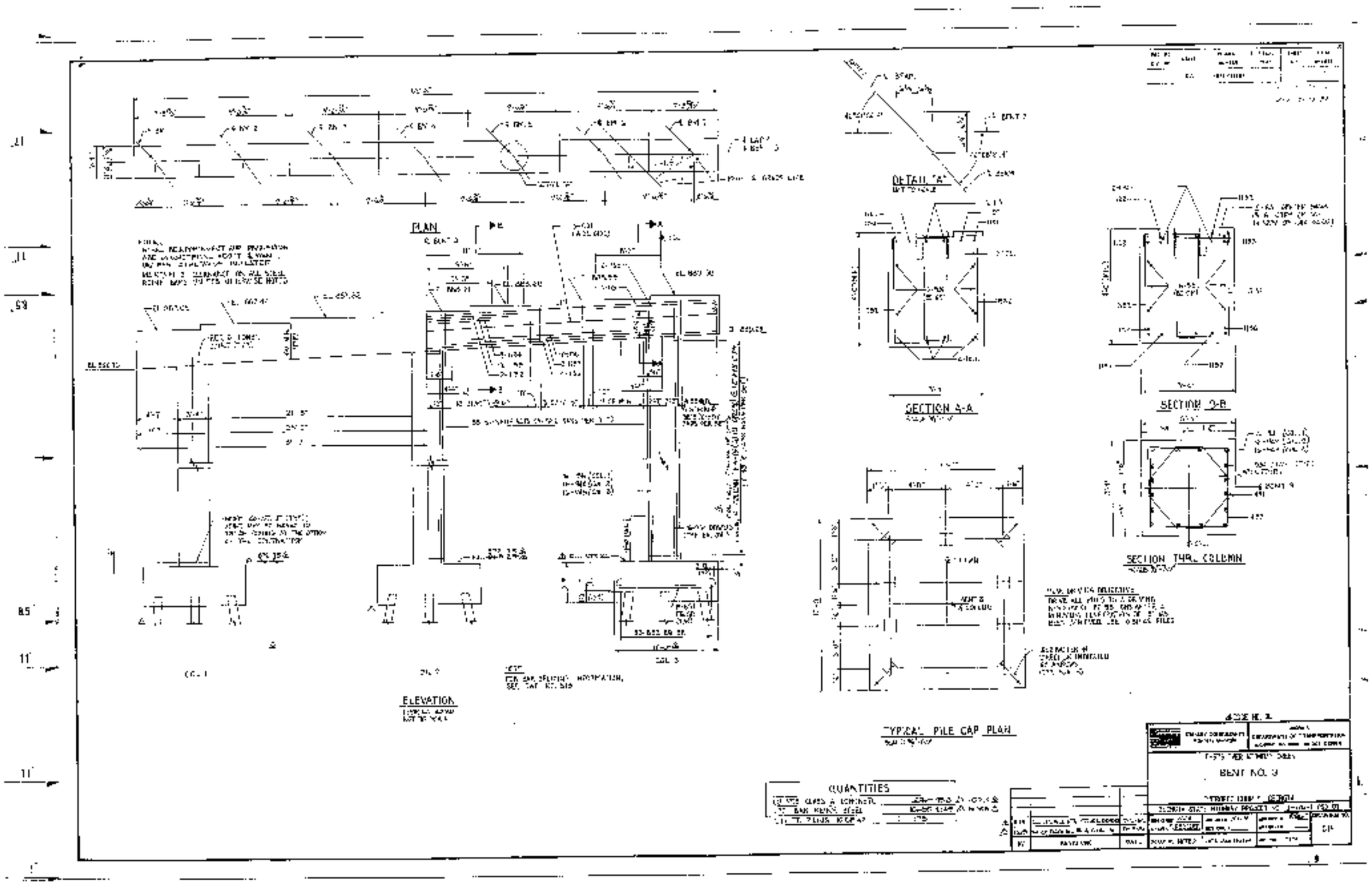

PLAN
ELEVATION
BEARING PAD DETAILS
PLAN
ELEVATION
NOTES
LEFT BRIDGE
RIGHT BRIDGE
BEARING ASSEMBLY LAYOUT
SWEDGE BOLT DETAIL
SUPERSTRUCTURE DETAILS
3.5"
11"
13"
22"

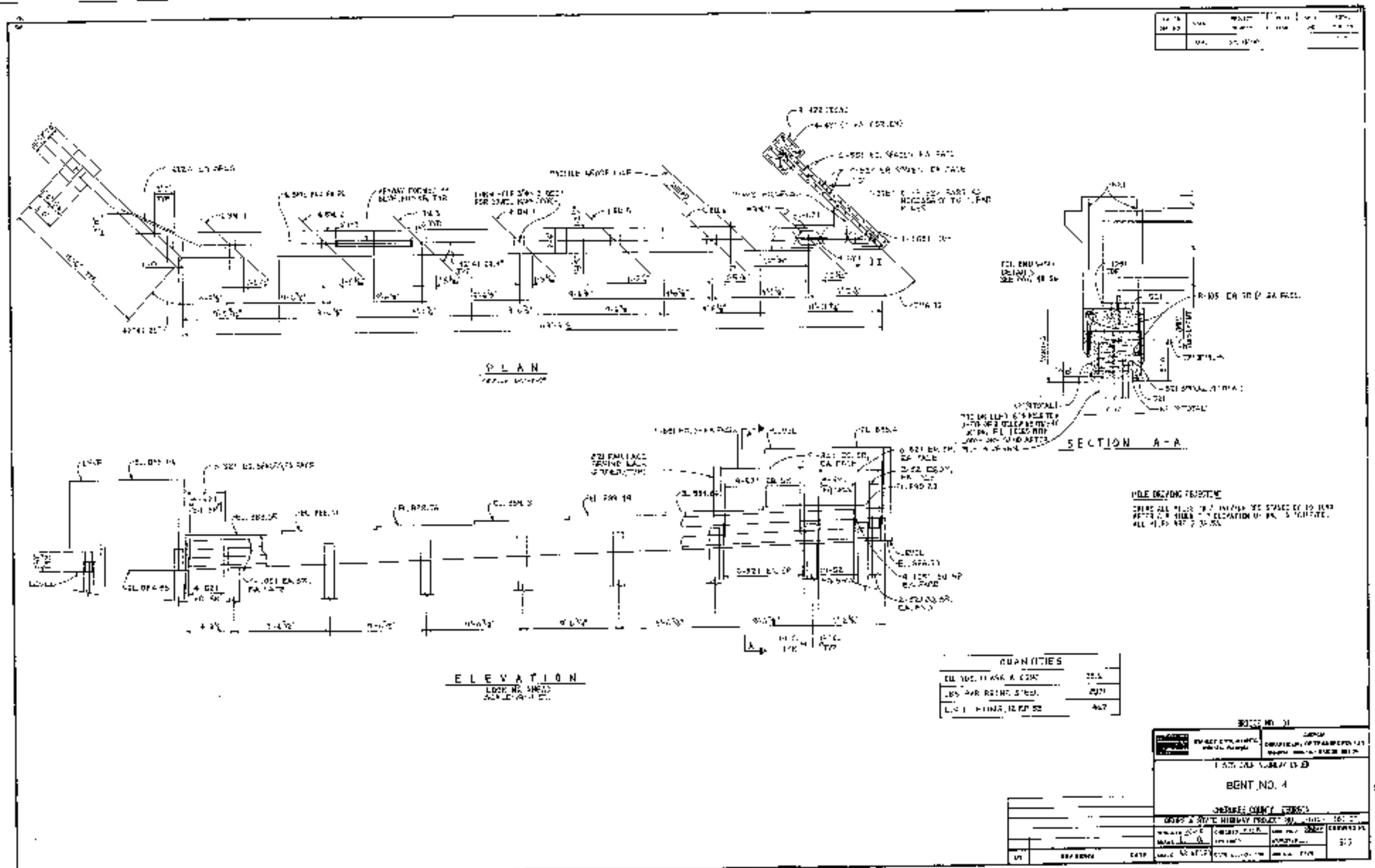

DIAPHRAGM AND BEAM LAYOUT
DIAPHRAGM LAYOUT

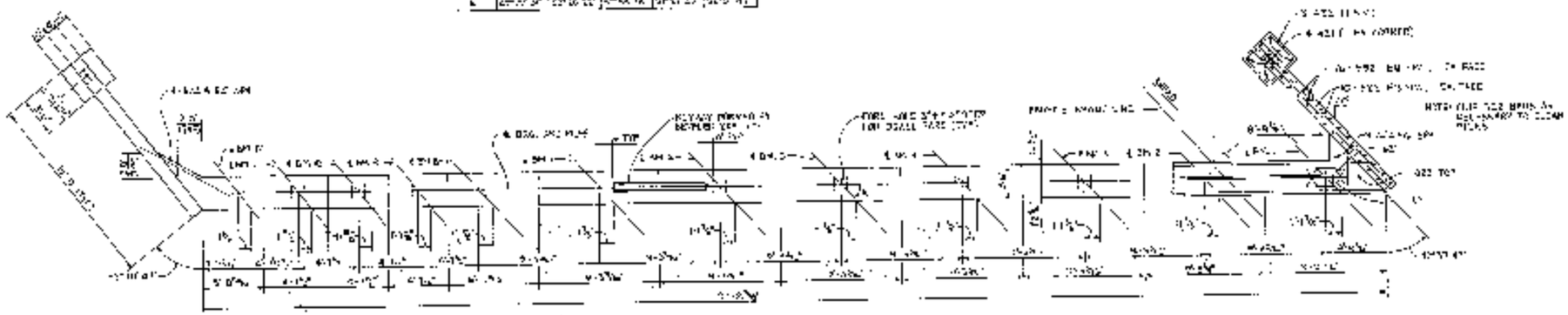

DIAPHRAGM AND BEAM LAYOUT
DIAPHRAGM LAYOUT


PLAN
ELEVATION
LOCKING BARS
SECTION A-A
QUANTITIES
BENT NO. 1

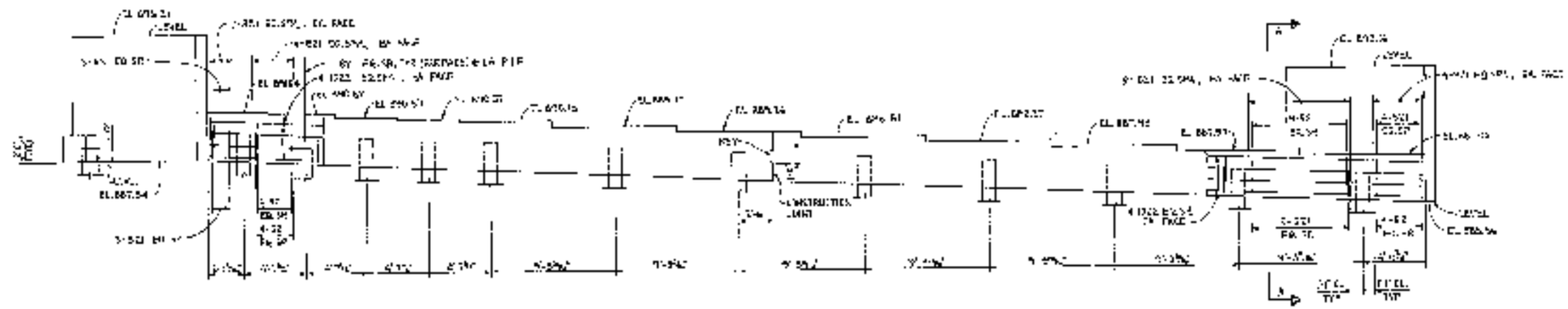

PLAN
ELEVATION
DETAIL "A"
SECTION A-A
SECTION B-B
SECTION THRU COLUMN
TYPICAL PILE CAP PLAN
QUANTITIES
BENT NO. 2


PLAN
ELEVATION
DETAIL "A"
SECTION A-A
SECTION B-B
SECTION THRU COLUMN
TYPICAL PILE CAP PLAN
QUANTITIES
BENT NO. 3

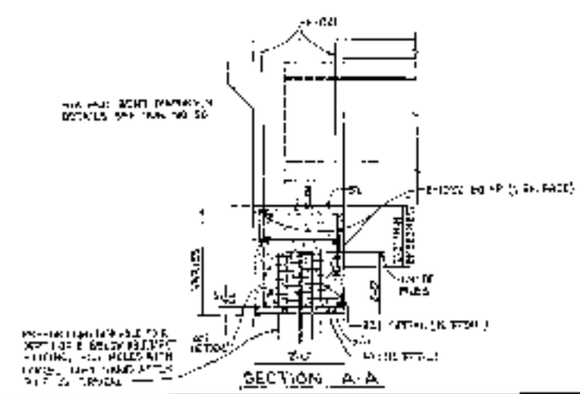

PLAN
ELEVATION
SECTION A-A
QUANTITIES
BENT NO. 4



PLAN



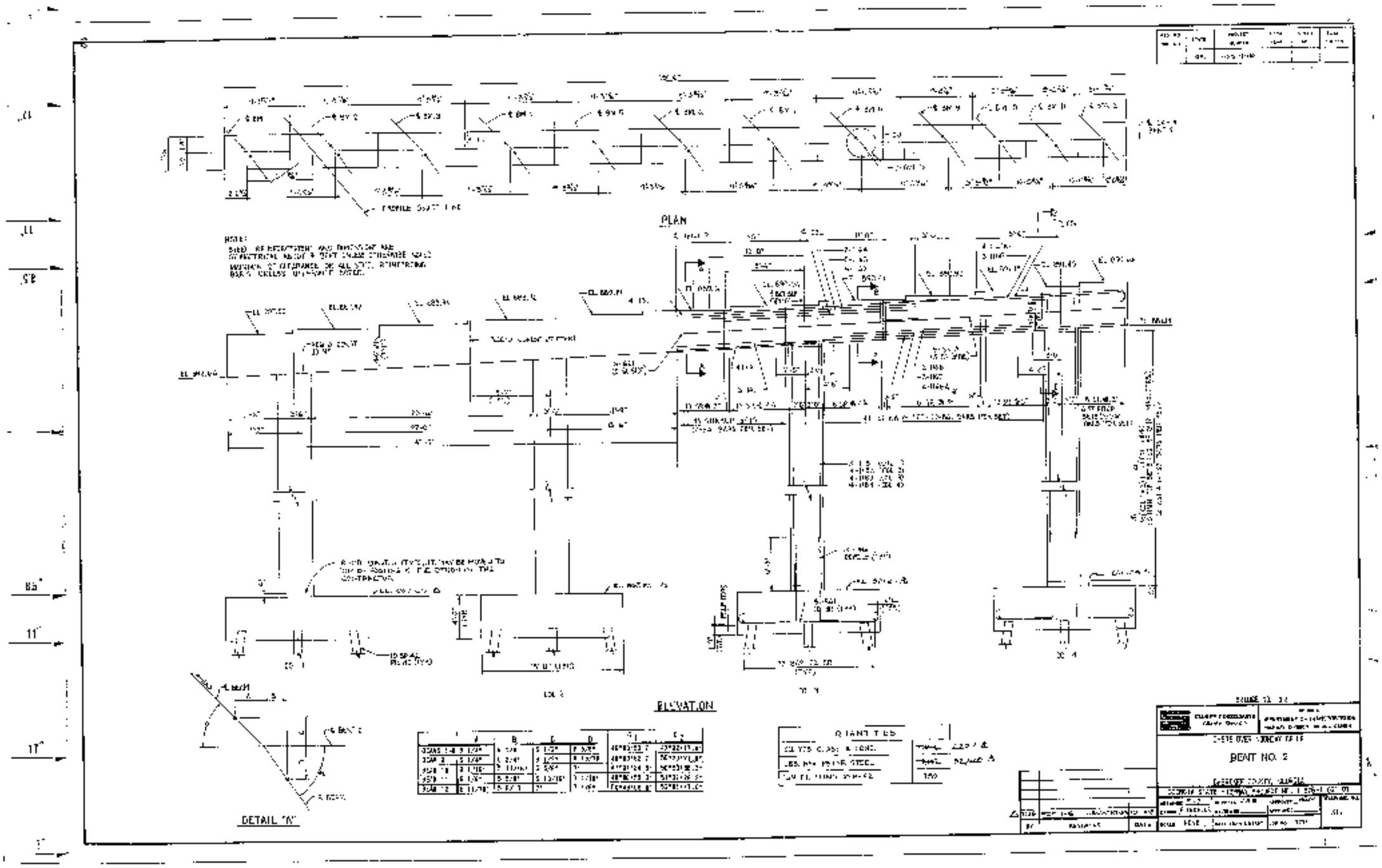
ELEVATION

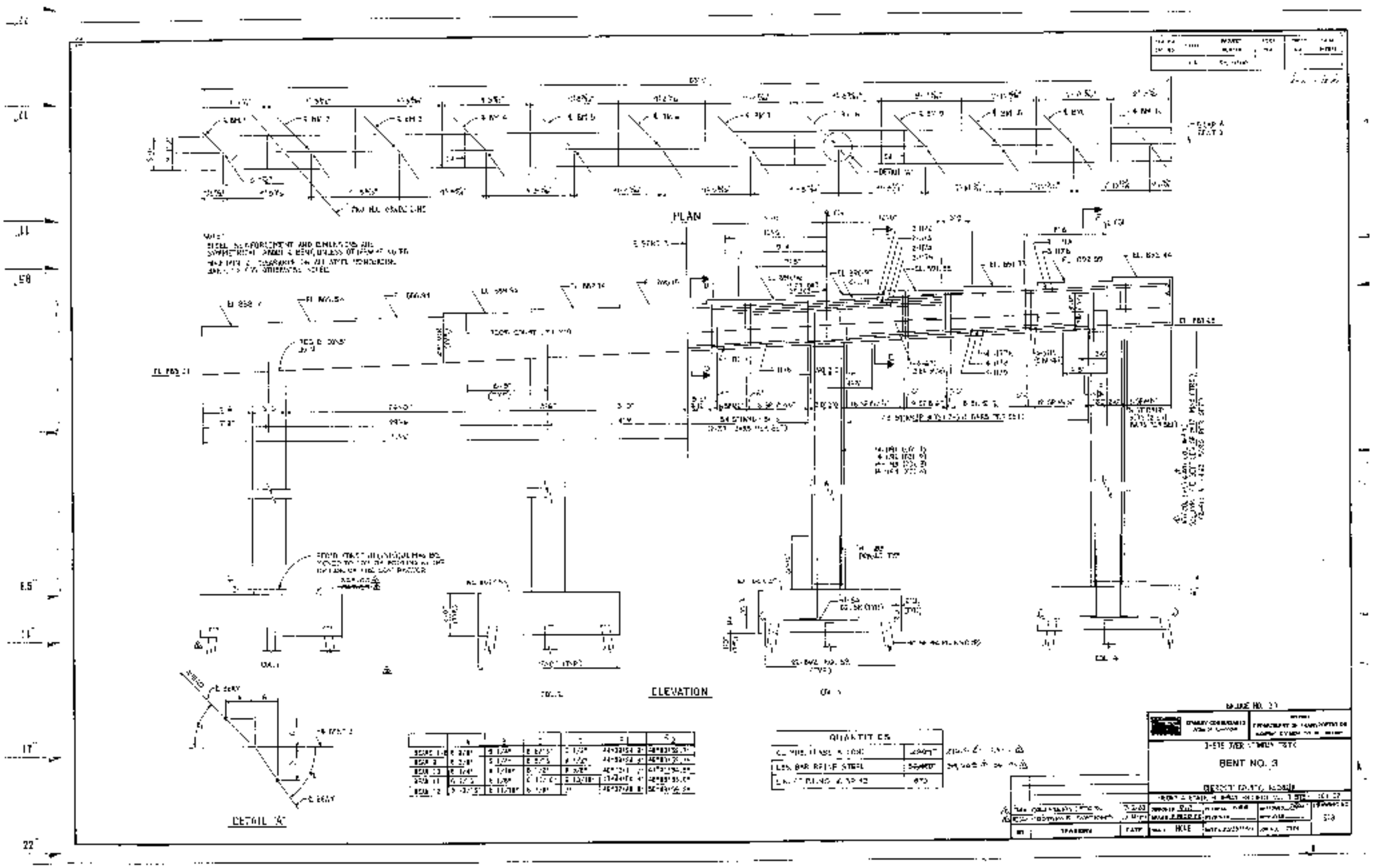


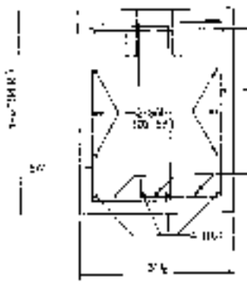
SECTION A-A

QUANTITIES	
CONC CLASS A 28%	[illegible]
LBS. FOR REINF. STEEL	[illegible]
[illegible]	[illegible]

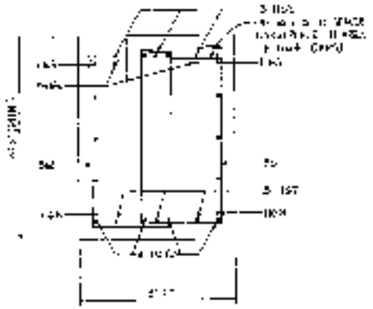
SEWT NO.1


PLAN
ELEVATION
DETAIL "A"
QUANTITIES
BENT NO. 2

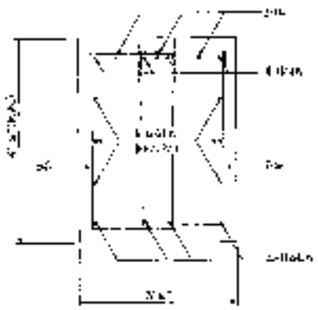

PLAN
ELEVATION
DETAIL "A"
QUANTITIES
BENT NO. 3



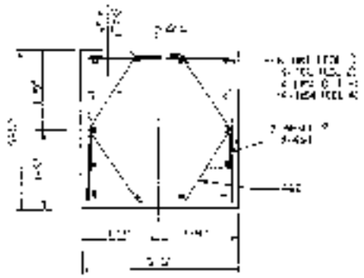
SECTION A-A



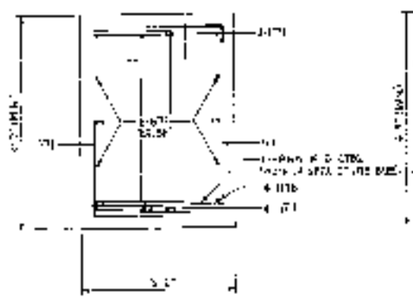
SECTION B-B



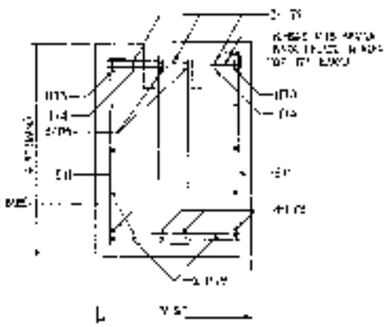
SECTION C-C



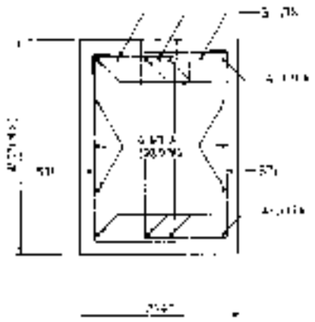
SECTION THRU COLUMNS @ BENTS 2



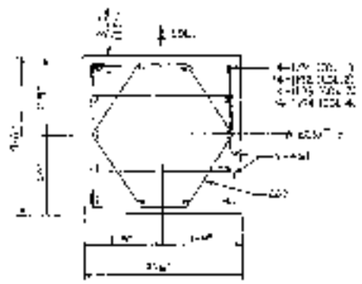
SECTION D-D



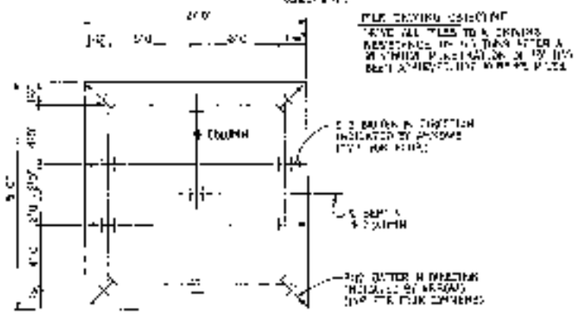
SECTION E-E



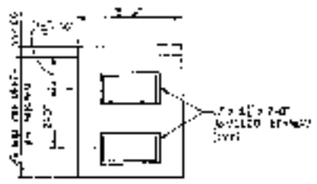
SECTION F-F



SECTION THRU COLUMNS @ BENT 3

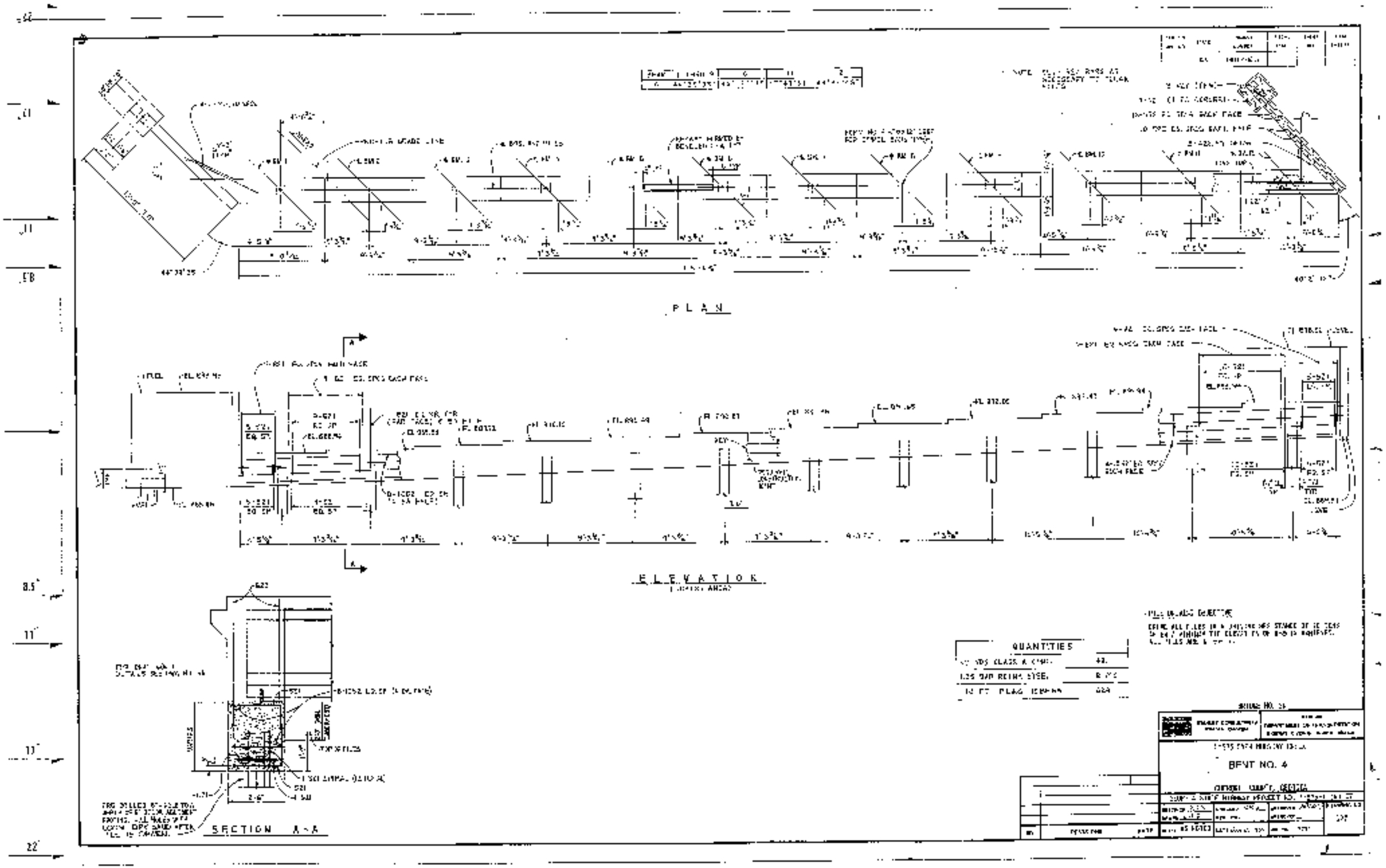


TYPICAL PILE CAP PLAN
BENTS 2 & 3



PIER CAP CONSTRUCTION JOINT DETAIL

BENT NO. 2 & 3 DETAILS


PLAN
ELEVATION
SECTION A-A
QUANTITIES
BENT NO. 4

CALCULATION SHEET

PROJECT: I-75 / I-575 NORTHWEST CORRIDOR
JOB NUMBER NH000-0575-01(028)
CALC NO. BR#40

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: 057-0040-0 **Cherokee** SUFF. RATING 90.97

Location & Geography

*	Structure I.D.No:	057-0040-0	
200	Bridge Information	01	
* 6A	Feature Int:	NOONDAY CREEK	
* 6B	Critical Bridge:	0	
* 7A	Route Number Carried:	SR00417	
* 7B	Facility Carried:	I-575 (NBL)	
* 9	Location:	.6 MI W 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:	00	Date: 02/01/1901
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: 34-06.0	MMS Prefix: SR	
* 17	Longitude: 84-31.9	MMS Suffix: 00	MP: 24.79
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:	001.71	
* 208	Inspection Area: 09	Initials: JMC	
	Engineer's Initial:	sgm	

* Location I.D. No.: 057-00417D-007.93N

* 104	Highway System:	1	
* 26	Functional Classification:	11	
* 204	Federal Route Type:	1	No.: 05751
105	Federal Lands Highway:	0	
* 110	Truck Route:	1	
206	School Bus Route:	0	
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:	45	
35	Structure Flared:	1	
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:	003	
44	Structure Type Appr:	0 00	
46	No. Spans Appr:	0000	
226	Bridge Curve Horz:	1	Vert: 0
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:	5	
	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	
	Sc	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.5
202 Plans Available: 4
249 Prop. Proj. No. 0000000000000000
250 Approval Status: 0000
251 P.I. No.: 0000000
252 Contract Date: 02/01/1901
260 Seismic No.: 00011
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: 140610 Year: 2025

Hydraulic Data

215 Waterway Data
Highwater Elev.: 0000.0 Year: 1900
Avg. Streambed Elev.: 0883.8 Freq.: 050
Drainage Area: 00043
Area Of Opening: 001510
113 Scour Critical: 5
216 Water Depth: 02.2 Br. Height: 26.0
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: 0 Diver: ZZZ

* Location I.D. No.: 057-00417D-007.93N

Measurements

* 29 ADT: 093740 Year: 2005
109 % Trucks: 0
* 28 Lanes On: 03 Under: 00
210 No. Tracks On: 00 Under: 00
* 48 Max. Span Length: 0070
* 49 Structure Length: 210
51 Br. Rwdy. Width: 63.20
52 Deck Width: 66.40
* 47 Tot. Horz. Cl: 63.20
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: 1
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: 8.00
Deck Thick Approach: 0.00
246 Overlay Thickness: 0.00
212 Year Last Painted: Sup: 0000 Sub: 0000

Ratings

65 Inventory Rating Method: 1
63 Inventory Rating Method: 1
66 Inventory Type: 2 Rating: 36
64 Operating Type: 2 Rating: 96
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: 8
58 Deck Condition: 7
59 Superstructure Condition: 8
* 227 Collision Damage: 0
60A Substructure Condition: 8
60B Scour Condition: 7
60C Underwater Condition: N
71 Waterway Adequacy: 9
61 Channel Protection Cond: 7
68 Deck Geometry: 9
69 UnderClr. Horz/Vert: N
72 Appr. Alignment: 8
62 Culvert: N

Posting Data

70 Bridge Posting Required: 5
41 Struct Open, Posted, Cl: A
* 103 Temporary Structure: 0
232 Posted Loads H-Modified: 00
HS-Modified: 00
Type 3: 00
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
Bridge Inspector: Jerry Cooper
Location ID: 057-00417D-007.93N
Structure ID: 057-0040-0

Inspection Date: 3/29/2006
Over: NOONDAY CREEK
County: Cherokee
Road Name: I-575 (NBL)

Inspection Area: 09
Bridge Status: 01

EVALUATION & DEFICIENCIES

SubStructure: **Year Painted:** 0000

Concrete caps at both abutments.
Bents 2, and 3 have a concrete cap and 4 concrete columns per bent.
Very minor cracks in both abutment caps.

SuperStructure: **Year Painted:** 0000

3 span p.s.c. "I" beam - 12 beams per span.
Neoprene bearings.
Good except for minor edge beam cracks .

Deck:

8" concrete slab poured continuous.
Concrete S.I.P. deck forms.
Evazote joints at both abutments.
Remaining joints are silicone covered with Sand epoxy.
Some type of Sand epoxy has been added to the deck.

General:

Built in 1982 - Project # I-575-1 (6) 07 CT.5
The inventory load capacity = HS-20+M. <-- Design.
Hand tools and ladder used.

Condition Rating

Component	Material	Rating
Substructure	Concrete	8
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

Not a 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-007.93N
Structure ID: 057-0040-0

Inspection Date: 3/29/2006
Over: NOONDAY CREEK
County: Cherokee
Road Name: I-575 (NBL)

Inspection Area: 09

SubStructure Data

Bent#	Type	Foundation	Col	#Cols	Piling	#Piles	Sway	CAP	Remarks
1	A	DP		0		0		C	
2	B	SF	C	4		0		C	
3	B	SF	C	4		0		C	
4	A	DP		0		0		C	

SuperStructure Data

Span#	Beam Type	Spacing	Length	#Beams	Remarks
1	Concrete "I" Beam	6.40	70.00	12	P. S. C. Type III
2	Concrete "I" Beam	6.40	70.00	12	P. S. C. Type III
3	Concrete "I" Beam	6.40	70.00	12	P. S. C. Type III

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	

BRIDGE INVENTORY DATA LISTING GEOI A DEPARTMENT OF TRANSPORTATION

Structure ID: 057-0041-0 **Cherokee** SUFF. RATING 90.97

Location & Geography

*	Structure I.D.No:	057-0041-0	
200	Bridge Information	01	
* 6A	Feature Int:	NOONDAY CREEK	
* 6B	Critical Bridge:	0	
* 7A	Route Number Carried:	SR00417	
* 7B	Facility Carried:	I-575 (SBL)	
* 9	Location:	.6 MI W 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:	00	Date: 02/01/1901
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: 34-06.0	MMS Prefix: SR	
* 17	Longitude: 84-31.9	MMS Suffix: 00	MP: 24.80
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:	001.72	
* 208	Inspection Area:	09	Initials: JMC
	Engineer's Initial:	sgm	

* Location I.D. No.: 057-00417D-007.94N

* 104	Highway System:	1	
* 26	Functional Classification:	11	
* 204	Federal Route Type:	1	No.: 05751
105	Federal Lands Highway:	0	
* 110	Truck Route:	1	
206	School Bus Route:	0	
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:	45	
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:	J-O-O-O	
259	Pile Encasement:	3	
* 43	Structure Type Main:	5	02
45	No. Spans Main:	003	
44	Structure Type Appr:	0	00
46	No. Spans Appr:	0000	
226	Bridge Curve Horz:	1	Vert: 0
111	Pier Protection:	0	
107	Deck Structure Type:	1	
108	Wearing Surface Type:	1	
	Mi	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	
	Sc	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.5
202 Plans Available: 4
249 Prop. Proj. No. 0000000000000000
250 Approval Status: 0000
251 P.I. No.: 0000000
252 Contract Date: 02/01/1901
260 Seismic No.: 00011
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: 140610 Year: 2025

Hydraulic Data

215 Waterway Data
Highwater Elev.: 0000.0 Year: 1900
Avg. Streambed Elev.: 0883.8 Freq.: 050
Drainage Area: 00043
Area Of Opening: 001510
113 Scour Critical: 5
216 Water Depth: 02.1 Br. Height: 23.8
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: 0 Diver: ZZZ

* Location I.D. No.: 057-00417D-007.94N

Measurements

* 29 ADT: 093740 Year: 2005
109 % Trucks: 0
* 28 Lanes On: 02 Under: 00
210 No. Tracks On: 00 Under: 00
* 48 Max. Span Length: 0070
* 49 Structure Length: 210
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: 1 Fwrd: 1
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: 7.40
Deck Thick Approach: 0.00
246 Overlay Thickness: 0.00
212 Year Last Painted: Sup: 0000 Sub: 0000

Ratings

65 Inventory Rating Method: 1
63 Inventory Rating Method: 1
66 Inventory Type: 2 Rating: 45
64 Operating Type: 2 Rating: 99
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: 6
58 Deck Condition: 7
59 Superstructure Condition: 8
* 227 Collision Damage: 0
60A Substructure Condition: 6
60B Scour Condition: 5
60C Underwater Condition: N
71 Waterway Adequacy: 9
61 Channel Protection Cond: 7
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 DEPARTMEN . OF TRANSPORTATION

Bridge Component Report

District: 6
Bridge Inspector: Jerry Cooper
Location ID: 057-00417D-007.94N
Structure ID: 057-0041-0

Inspection Date: 3/29/2006
Over: NOONDAY CREEK
County: Cherokee
Road Name: I-575 (SBL)

Inspection Area: 09

SubStructure Data

Bent#	Type	Foundation	Col	#Cols	Piling	#Piles	Sway	CAP	Remarks
1	A	DP		0		0		C	
2	B	DP	C	3		0		C	
3	B	DP	C	3		0		C	
4	A	DP		0		0		C	

SuperStructure Data

Span#	Beam Type	Spacing	Length	#Beams	Remarks
1	Concrete "I" Beam	6.40	70.00	7	P. S. C. Type III
2	Concrete "I" Beam	6.40	70.00	7	P. S. C. Type III
3	Concrete "I" Beam	6.40	70.00	7	P. S. C. Type III

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	

GEORGIA DEPARTMENT OF TRANSPORTATION

Bridge Inspection Report

District: 6
Bridge Inspector: Jerry Cooper
Location ID: 057-00417D-007.94N
Structure ID: 057-0041-0

Inspection Date: 3/29/2006
Over: NOONDAY CREEK
County: Cherokee
Road Name: I-575 (SBL)

Inspection Area: 09
Bridge Status: 01

EVALUATION & DEFICIENCIES

SubStructure: **Year Painted:** 0000

Concrete caps at both abutments.
Bents 2, and 3 have a concrete cap and 3 concrete columns .
Minor cracks in both abutment caps.
Bank scour exposing footings at bent 2 and 3 .
The footings are beginning to undermine 1.1' at the present time.

SuperStructure: **Year Painted:** 0000

3 span p.s.c. "I" beam - 7 beams per span.
Neoprene bearings.
Minor edge beam cracks .

Deck:

7.4" concrete slab poured continuous.
Evazote joints at both abutments.
Remaining joints are silicone covered with epoxy.
Concrete s.i.p. deck forms.
Some type of Sand epoxy has been added to the deck.

General:

Built in 1982 - Project # I-575-1 (6) 07 CT.5.
The inventory load capacity = HS-20+M. <-- Design.
Hand tools and ladder used.

Condition Rating

Component	Material	Rating
Substructure	Concrete	6
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

Not a School Bus Route.

Structure Does Not Require Posting

GEORGIA DEPARTMENT OF TRANSPORTATION

Waterway Report

District: 6
Bridge Inspector: Jerry Cooper
Location ID: 057-00417D-007.93N
Structure ID: 057-0040-0

Inspection Date: 3/29/2006
Over: NOONDAY CREEK
County: Cherokee
Road Name: I-575 (NBL)

Inspection Area: 09
Skew: 45

Span #:	1	2	3
Length:	**70.0**	**70.0**	**70.0**

Upstream -
Upstream +

		1	2	3	4
04/22/1998	DEM		20.70	28.20	7.40
03/09/2000	JMC-WBR		20.70	28.60	7.40
05/28/2002	JMC-WBR		20.80	28.90	7.50
03/17/2004	JMC-WBR		20.80	28.90	7.50
03/29/2006	JMC-WBR		20.90	28.20	7.50

Downstream -
Downstream +

		1	2	3	4
04/22/1998	DEM		19.40	22.10	6.80
03/09/2000	JMC-WBR		22.20	22.00	6.80
05/28/2002	JMC-WBR		22.40	22.00	7.00
03/17/2004	JMC-WBR		22.40	22.00	7.00
03/29/2006	JMC-WBR		22.40	22.20	7.00

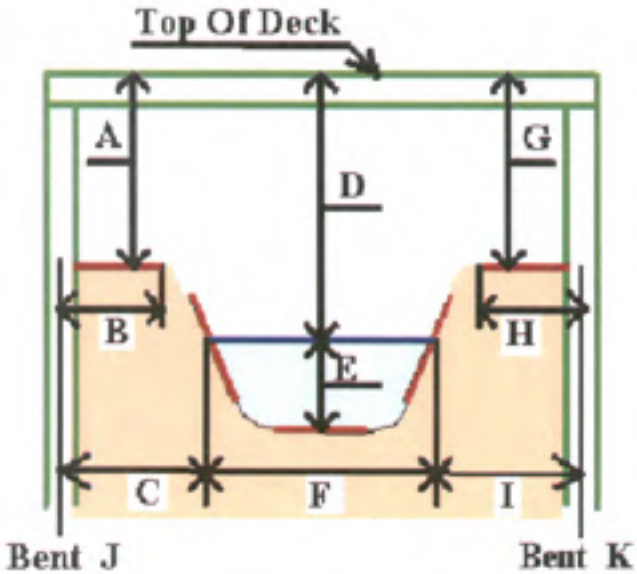
GEORGIA DEPARTMENT OF TRANSPORTATION

Waterway Report

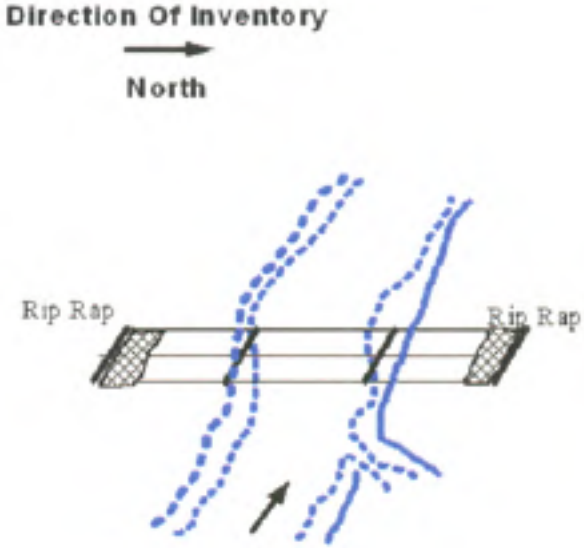
District: 6
Bridge Inspector: Jerry Cooper
Location ID: 057-00417D-007.93N
Structure ID: 057-0040-0

Inspection Date: 3/29/2006
Over: NOONDAY CREEK
County: Cherokee
Road Name: I-575 (NBL)

Inspection Area: 09
Skew: 45



A:	22
B:	0
C:	12
D:	26.0
E:	02.2
F:	55
G:	22
H:	64
I:	73
J:	2
K:	4



Side view at the Channel.

B, C, H, & I are measured to center of bent or B.F.P.R.

1 2 3 4

Location of Bridge Height -5' From bent #3

45 = SubStructure
45 = Channel Skew

0 = Stream Angle

Scour Condition: 7 **Waterway Adequacy:** 9 **Channel Protection:** 7

Comments:
Bridge in super elevated curve upstream high side.

GEORGIA DEPARTMENT OF TRANSPORTATION

Waterway Report

District: 6
Bridge Inspector: Jerry Cooper
Location ID: 057-00417D-007.94N
Structure ID: 057-0041-0

Inspection Date: 3/29/2006
Over: NOONDAY CREEK
County: Cherokee
Road Name: I-575 (SBL)

Inspection Area: 09
Skew: 45

Span #:	1	2	3
Length:	**70.0**	**70.0**	**70.0**

Upstream - Upstream +		1	2	3	4
04/22/1998	DEM		23.00	19.90	7.70
03/09/2000	JMC-WBR		24.00	21.60	7.70
05/28/2002	JMC-WBR		24.10	21.70	7.70
03/17/2004	JMC-WBR		24.00	21.70	7.70
03/29/2006	JMC-WBR		24.00	21.90	7.70

Downstream - Downstream +		1	2	3	4
04/22/1998	DEM		20.00	15.70	5.90
03/09/2000	JMC-WBR		20.00	21.00	6.00
05/28/2002	JMC-WBR		20.20	21.50	6.00
03/17/2004	JMC-WBR		20.20	21.50	6.00
03/29/2006	JMC-WBR		20.20	21.80	6.00

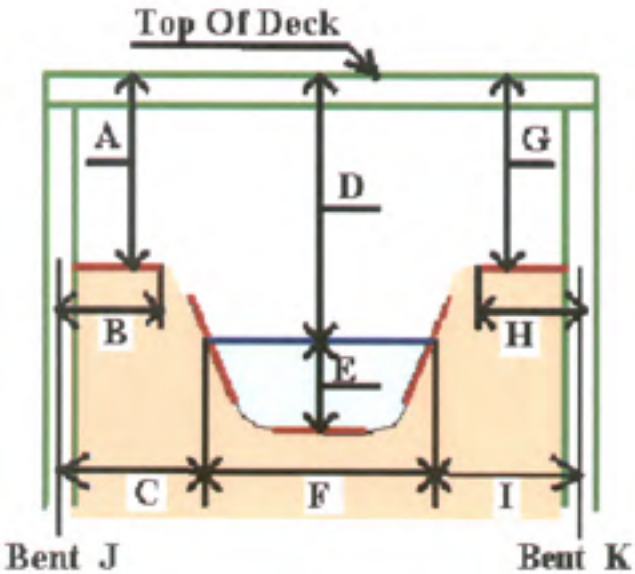
GEORGIA DEPARTMENT OF TRANSPORTATION

Waterway Report

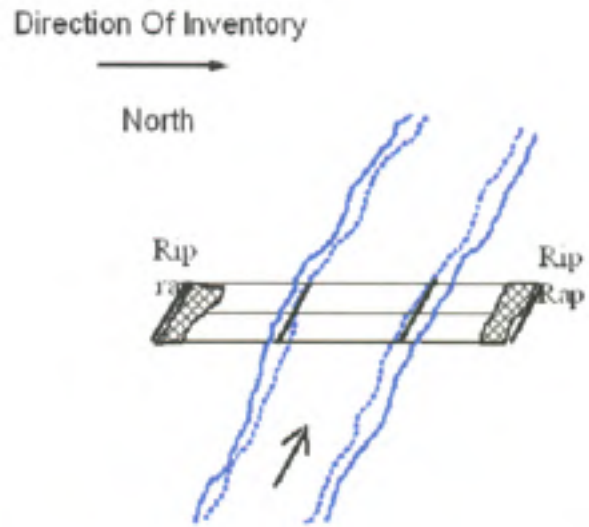
District: 6
Bridge Inspector: Jerry Cooper
Location ID: 057-00417D-007.94N
Structure ID: 057-0041-0

Inspection Date: 3/29/2006
Over: NOONDAY CREEK
County: Cherokee
Road Name: I-575 (SBL)

Inspection Area: 09
Skew: 45



A:	17
B:	59
C:	66
D:	23.8
E:	02.1
F:	63
G:	17
H:	0
I:	11
J:	1
K:	3



Side view at the Channel.

B, C, H, & I are measured to center of bent or B.F.P.R.

Footings exposed at bt. 2 and 3 with 1.1' undermining

1 2 3 4

Location of Bridge Height +5' from bent #2

Scour Condition: 5 **Waterway Adequacy:** 9 **Channel Protection:** 7

45 = SubStructure
45 = Channel Skew

0 = Stream Angle

Comments:
Bridge in super elevated curve upstream high side.

CALCULATION SHEET

PROJECT: I-75 / I-575 NORTHWEST CORRIDOR
JOB NUMBER NH000-0575-01(028)
CALC NO. BR#40

SUBJECT: Hydraulic Information
BY: JCR DATE: 11/30/2009

SHEET NO.
SHEET REV.

HYDRAULIC TABLE (50-YEAR STORM)

NH000-0575-01(028)
I-575 over Noonday Creek North, Cherokee County, Georgia
P.I. No. 713640

	FULL VALLEY (ft)	*EXISTING BRIDGE* *Parallel Bridges DS/US* (ft)	*PROPOSED BRIDGE* *Widening* (ft)
FLOODSTAGE ELEVATION DOWNSTREAM BR SECTION 35328	885.72	885.78	885.62
FLOODSTAGE ELEVATION APPROACH SECTION 36148	885.81	887.34	887.18
AREA OF OPENING UNDER FLOODSTAGE (SF)	**********	1181	1173
DISCHARGE THROUGH BRIDGE (CFS)	**********	7774.0	7774.0
DISCHARGE OVER ROADWAY (CFS)	**********	0.0	0.0
MEAN VELOCITY AT BRIDGE SECTION (FT/S)	0.96	6.58	6.63
CHANNEL VELOCITY AT BRIDGE SECTION (FT/S)	1.93	7.44	7.33
2 - YEAR FLOODSTAGE ELEVATION BRIDGE SECTION 35328	879.20	879.22	879.25
BACKWATER HEIGHT	**********	1.53	1.37
BR. SEL. METHOD	**********	WSPRO/Energy only	Energy only

HYDRAULIC TABLE (100-YEAR STORM)

NH000-0575-01(028)
I-575 over Noonday Creek North, Cherokee County, Georgia
P.I. No. 713640

	FULL VALLEY *(ft)*	*EXISTING BRIDGE* *Parallel Bridges DS/US* *(ft)*	*PROPOSED BRIDGE* *Widening* *(ft)*
FLOODSTAGE ELEVATION DOWNSTREAM BR SECTION 35328	886.78	886.71	886.71
FLOODSTAGE ELEVATION APPROACH SECTION 36148	886.87	888.45	888.45
AREA OF OPENING UNDER FLOODSTAGE (SF)	**********	1290	1305
DISCHARGE THROUGH BRIDGE (CFS)	**********	9108.0	9108.0
DISCHARGE OVER ROADWAY (CFS)	**********	0.0	0.0
MEAN VELOCITY AT BRIDGE SECTION (FT/S)	0.92	7.06	6.98
CHANNEL VELOCITY AT BRIDGE SECTION (FT/S)	1.82	8.01	7.74
2 - YEAR FLOODSTAGE ELEVATION BRIDGE SECTION 35328	879.20	879.22	879.25
BACKWATER HEIGHT	**********	1.58	1.58
BR. SEL. METHOD	**********	Energy only/Energy only	Energy only

HYDRAULIC TABLE (500-YEAR STORM)

NH000-0575-01(028)
I-575 over Noonday Creek North, Cherokee County, Georgia
P.I. No. 713640

	FULL VALLEY *(ft)*	*EXISTING BRIDGE* *Parallel Bridges DS/US* *(ft)*	*PROPOSED BRIDGE* *Widening* *(ft)*
FLOODSTAGE ELEVATION DOWNSTREAM BR SECTION 35328	889.03	889.02	889.02
FLOODSTAGE ELEVATION APPROACH SECTION 36148	889.11	891.34	891.26
AREA OF OPENING UNDER FLOODSTAGE (SF)	**********	1680	1675
DISCHARGE THROUGH BRIDGE (CFS)	**********	12749.0	12749.0
DISCHARGE OVER ROADWAY (CFS)	**********	0.0	0.0
MEAN VELOCITY AT BRIDGE SECTION (FT/S)	0.93	7.59	7.61
CHANNEL VELOCITY AT BRIDGE SECTION (FT/S)	1.70	9.14	8.76
2 - YEAR FLOODSTAGE ELEVATION BRIDGE SECTION 35328	879.20	879.22	879.25
BACKWATER HEIGHT	**********	2.23	2.15
BR. SEL. METHOD	**********	Energy only/Energy only	Energy only

NH000-0575-01(028)
I-575 over Noonday Creek North, Cherokee County, Georgia
P.I. No. 713640

PROPOSED BRIDGE CLEARANCE

Widening Bridge

	English Units
MINIMUM PROFILE GRADE ELEVATION	
DEPTH OF CROSS SLOPE	
DEPTH OF SLAB AND BEAM	
BOTTOM OF BEAM ELEVATION	885.93
MINIMUM BOTTOM OF BEAM ELEVATION	885.93
50 YEAR FLOODSTAGE ELEVATION*	885.62
CLEARANCE (2 ft Required)	0.31
MINIMUM BOTTOM OF BEAM ELEVATION	885.93
100 YEAR FLOODSTAGE ELEVATION*	886.71
CLEARANCE (1 ft Required)	-0.78

*Floodstage taken from Downstream Bridge Section

CALCULATION SHEET

PROJECT: I-75 / I-575 NORTHWEST CORRIDOR
JOB NUMBER NH000-0575-01(028)
CALC NO. BR#40

SUBJECT: Bridge Foundation Investigation
BY: JCR DATE: 11/30/2009

SHEET NO.
SHEET REV.

Preliminary Foundation Recommendations
Bridge 40: I-575 over Noonday Creek (North)
Northwest Corridor Project
GDOT Project No. NH000-0073-05(242), PI No. 714130
Cobb County, Georgia

WILLMER ENGINEERING INC.
Project No. ATL-171-3463BFI3

Document No.: ATL-171-3463BFI3-40
Revision: A
Issue Date: October 14, 2009
Document Status: Issued for Review

Prepared For

GEORGIA TRANSPORTATION PARTNERS
Atlanta, Georgia

Prepared By

WILLMER ENGINEERING INC.
3772 Pleasantdale Road
Suite 165
Atlanta, Georgia 30340-4270

770.939.0089

PWR AND AUGER REFUSAL ELEVATIONS (feet)

Bent No.	Reference Boring No.	Top of PWR	Auger Refusal
1	B-1	849	847
	B-2	854	851
2	B-10	849	846
	B-12	852	845
3	B-23	856	852
	BB-2	860	855
	B-24	863	862
4	B-27	858	854
	B-28	853	847

* PWR was not encountered in this boring.

MAXIMUM PILE DESIGN LOADS

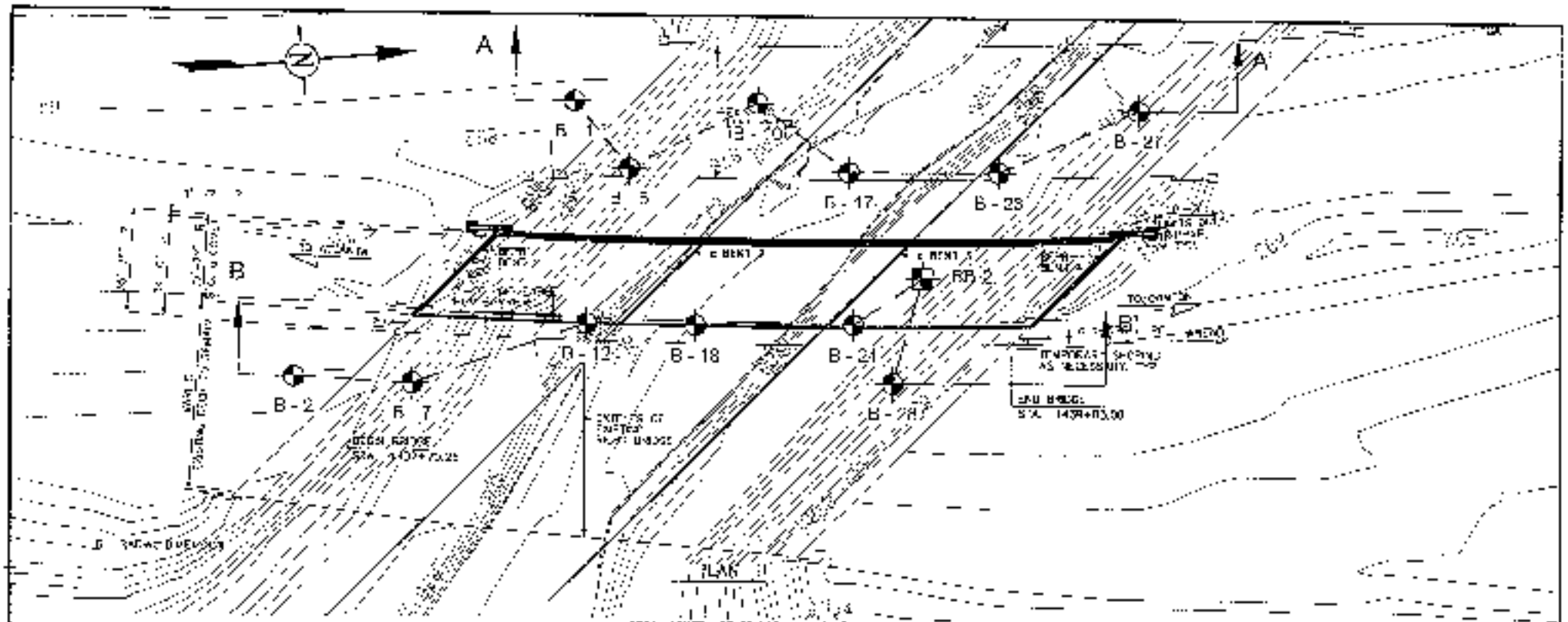
Pile Type	Load Transfer (%) Friction	Load Transfer (%) End Bearing	Design Load
H-Piles	10	90	HP 10x42 = 55 Tons
			HP 12x53 = 70 Tons
			HP 14x73 = 96 Tons
			HP 14x89 = 117 Tons

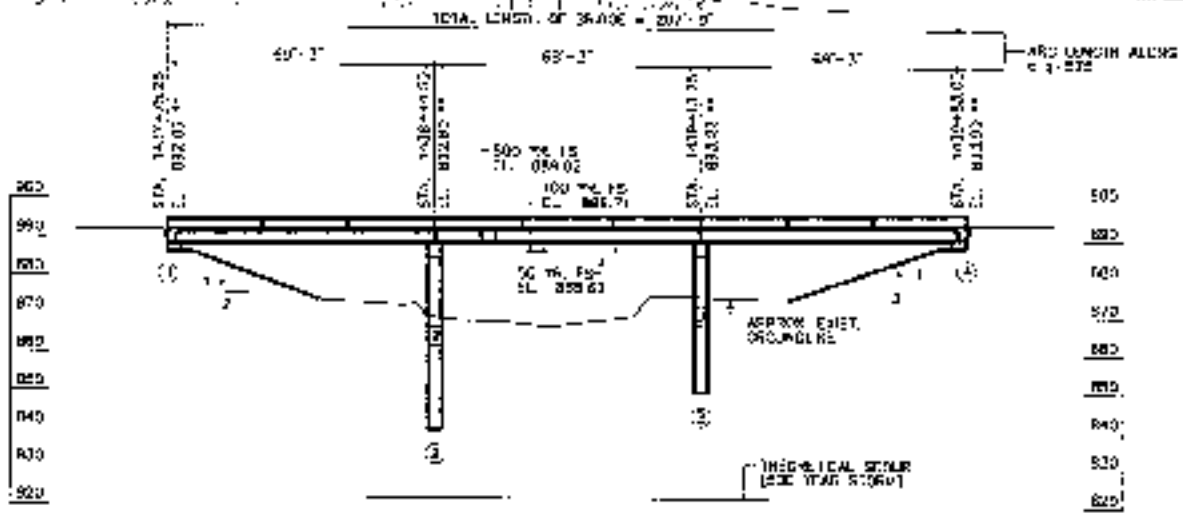
FOUNDATION RECOMMENDATIONS

Bent No.	Drilled Shaft Skin Friction (ksf) PWR	Drilled Shaft Skin Friction (ksf) Rock	Drilled Shaft End Bearing (ksf)	Spread Footing Bearing (ksf)	Pile Footing (Type)	Pile Bent (Type)
1						H
2			100			
3			100			
4						H

ELEVATIONS (feet)

Bent No.	Reference Boring No.	Bottom of Drilled Shaft	Bottom of Spread Footing	H-Pile Minimum Tip	H-Pile Estimated Tip
1–Left	B-1			847±	847±
1–Right	B-2			855±	851±
2–Left	B-10	839 or below			
2–Right	B-12	837 or below			
3–Left	BB-2, B-23	845 or below			
3–Right	BB-2, B-24	849 or below			
4–Left	B-27			854±	854±
4–Right	B-28			853±	847±





LEGEND:

B - 1 BORING LOCATION (GDOT, 1978)

RB - 2 BORING LOCATION (WILLMER, 2007)

SCALE 1" = 50'	
DATE: 10/14/2008	
DRAWN BY: JK	
REVISED BY: JK	

GEORGIA DEPARTMENT OF TRANSPORTATION
PLANNING, ENVIRONMENT, ENVIRONMENTAL ENGINEERING
1710 PROFESSIONAL BOULEVARD, SUITE 100
ATLANTA, GA 30341-4101

FIGURE 2 - BORING LOCATION PLAN
I-575 OVER NOONDAY CREEK (NORTH)
NORTHWEST CORRIDOR PROJECT
CHEROKEE COUNTY, GEORGIA
WILLMER PROJECT No. ATL-171 34528-13

GDOT PROJECT NUMBER
NHD00-0075-02(042)
PI No. 724130

Project: I-575 over Noonday Creek (North)

Location: Cherokee County, Georgia

Project Number: 171-3463BFI3-40; GDOT Proj. # : NH000-0073-03(242); PI # : 714130

HOLE No. BB-2

Sheet 1 of 1

Location: Bent- 3

Azimuth: -- Angle from Horizontal: 90 Surface Elevation (ft): 876.72 Station: ST 1439+52, 20' LT. of CL

Drilling Equipment: CME 550 Drilling Method: HSA

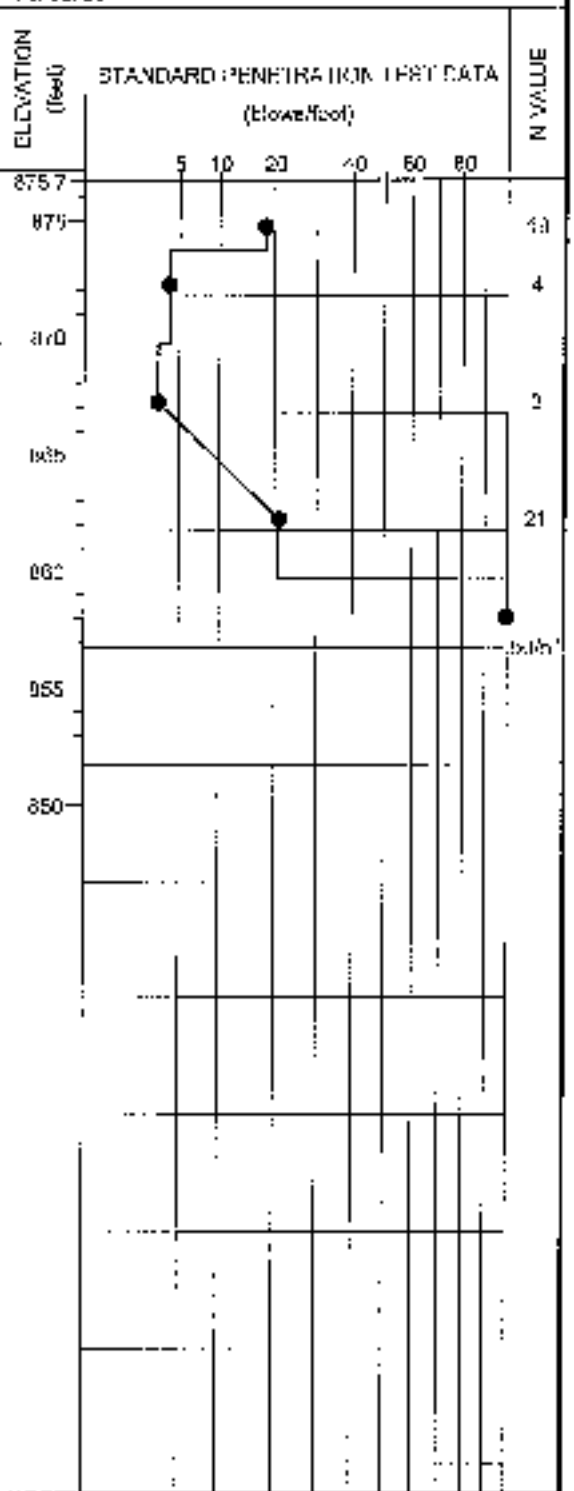
Core Boxes: 1 Samples: 5 Overburden (ft): 22 Rock (ft): 6 Total Depth (ft): 27.0

Logged By: EO Date Drilled: 11/15/07

VERTICAL DEPTH (ft)	GRAPHIC LOG	SAMPLE TYPE	RQD (%)	MATERIAL DESCRIPTION	ELEVATION (feet)
		SS		FILL: Medium dense reddish brown and gray medium to fine **SAND**	FILL
5		SS		ALLUVIUM: Very loose gray and black clayey medium to fine **SAND**	SC
10		SS		RESIDUUM: Very loose to medium dense gray and brown silty medium to fine **SAND** (micaceous)	SM
15		SS			
20		SS		PARTIALLY WEATHERED ROCK: Sampled as gray and white silty medium to fine **SAND** (micaceous)	PWR
25		NQ	100 92	ROCK CORE: Moderately hard gray and white **BIOTITE GNEISS** with oblique fracturing along foliations	

Auger refusal encountered at 22 feet below existing ground surface.

Groundwater was encountered at 7 feet below existing ground surface at time of boring completion and at 24 hours after boring completion.



SAMPLER TYPE

SS - Split Spoon
S - Shelby Tube
NQ - Rock Core 1-7/8"
NX - Rock Core 2-1/8"
CU - Cuttings
CT - Continuous Tube

DRILLING METHOD

HSA - Hollow Stem Auger
CFA - Continuous Flight Augers
DC - Driving Casing
RW - Rotary Wash
RC - Rock Core

Hole No. BB-2

DOT 480

DEPARTMENT OF TRANSPORTATION

OFFICE OF MATERIALS AND RESEARCH, FOREST PARK, GEORGIA
GEOTECHNICAL ENGINEERING

BRIDGE SUBSURFACE INVESTIGATION

Project No. NHOCO-0073-03(242)

PROJECT P.I. No. 714130 COUNTY CHEROKEE DATE 10/3/78

LOCATION I-575 over Noonday Creek (North) BORING NO. B-1

BENT NO. 1 FOOTING GROUND ELEV. 873.43

PROPOSED FOOTING ELEV. PARTY CHIEF HOLLIS

ELEV.	BORING LOG		BLOW	UNIFIED	γ	W	Gs	% SOIL	% CLAY	L.L.	PI	C	φ	
	GR. EL. 0													
B20														
GWT	Very Loose Mtlc. Micac. Silty Sand W/ Gravel	1s	2											
		2s	1											
B50														
	Loose Same	3s	9											
	Dense Mtlc. Micac. Sandy Silt (W.R.)	4s	27											
B80	Very Dense Same	5	60+											
	Rock													
	Refusal on Rock W/ Button Bit													
B110														
B140														
B170														

The Department of Transportation formally disclaims any responsibility for interpretations or conclusions as to constructability or its advisability.

No claim will be considered if the contractor or bases on site alternates in his bidding or in his construction operations and finds that it is unsuitable.

The Geotechnical Investigation report is not considered as a part of the plans and specifications contained on the plans.

037 693

DEPARTMENT OF TRANSPORTATION

OFFICE OF MATERIALS AND RESEARCH, FOREST PARK, GEORGIA
GEOTECHNICAL ENGINEERING

BRIDGE SUBSURFACE INVESTIGATION

Project No. NH000-0075-08(242)

PROJECT PI No. 7 4139 COUNTY CHEROKEE DATE 10/1 / 78

LOCATION I-575 over Noonday Creek (North) BORING NO. B-2

BENT NO. 1 FOOTING GROUND ELEV. 874.18

PROPOSED FOOTING ELEV. PARTY CHIEF HOLUS

ELEV	BORING LOG		BLOW	SNEED	γ	W	Bc	% 200	% CLAY	LL	PI	C	φ
	Gr. Er.												
870	V. Loose Mtle. Micas. Sandy Silt (Org.)	1s	0										
	Loose Mtle. Micas. Sandy Silt	2s	6										
860	Dense Same (W.R.)	3s	40										
	V. Dense Same (W.R.)	4s	60=7"										
	Rock												
850	Refusal on Rock												
840													
830													
820													
810													

(1) Information at Transportation is [illegible] the [illegible] assumes no responsibility for its accuracy.

[illegible] considered in this contract or [illegible] on this information in [illegible] in [illegible] construction operations and [illegible]

The foundation investigation report is not considered as a part of the plans and specifications to be given on this job.

DOT 490

DEPARTMENT OF TRANSPORTATION

OFFICE OF MATERIALS AND RESEARCH, FOREST PARK, GEORGIA
GEOTECHNICAL ENGINEERING

BRIDGE SUBSURFACE INVESTIGATION

Project No. NHCCO-0073-03(242)

PROJECT PI No. 714130 COUNTY CHEROKEE DATE 10/20/78
I-575 over Noonday Creek (North)

LOCATION BORING NO. B-5

BENT NO. 1 FOOTING GROUND ELEV. 873.7L

PROPOSED FOOTING ELEV. PARTY CHIEF HOLLIS

ELEV	BORING LOG		BLOW	UNIFIED	γ	W	Gs	% 200	% CLAY	LL	PI	φ	ø
	Gr. El. 1												
870	Very Loose Mic.												
GWT	Micas. Sandy Silt	1s	2										
	Medium Dense Mic. Micas. Silty Sand	2s	13										
860													
	Medium Dense Mic. Micas. Sdy. Silt (W.R.)	3s	20										
	Very Dense Sand Weathered Rock	4s	50+7"										
850	Refusal on Rock												
840													
830													
820													
810													

The Department of Transportation assumes no responsibility for the information given on this form or its accuracy or its source.

No claims for compensation shall be made or based on the information or lack of information in this document unless specifically stated that it is accurate.

This document and/or the report is not considered as part of the plan and specifications or contract on this job.

PCT 450

DEPARTMENT OF TRANSPORTATION

OFFICE OF MATERIALS AND RESEARCH, FOREST PARK, GEORGIA
GEOTECHNICAL ENGINEERING

BRIDGE SUBSURFACE INVESTIGATION

Project No: NH000 C/3-C2(242)

PROJECT PI No 7 4139 COUNTY CHEROKEE DATE 10/10/78

LOCATION I-575 over Noonday Creek (North) BORING NO. B-7

BENT NO. 1 FOOTING GROUND ELEV. 874.39

PROPOSED FOOTING ELEV. PARTY CHIEF HOLLIS

ELEV.	BORING LOG		BLOW	ONFILED	γ	W	Us	% 200	% CLAY	LL	PI	Q	Ø
	Gr. El. 7												
870	V.Lse Mltc.Micas.Cy Sandy Silt (Org)	1s	0										
	Very Loose Mltc. Micas. Silty Sand	2s	4										
860	Loose Mltc.Micas. Sandy Silt (W.R.)	3s	7										
		4s	62										
850	Very Dense Same	5s	60+3"										
		6s	50+3"										
840	Weathered Rock												
	Refusal on Rock												
830													
820													
810													

The Department of Transportation assumes no responsibility for the accuracy of this information.

No claim will be considered if the contractor relies on this information or its binding is not based on his own observations and finds that it is inaccurate.

This preliminary investigation report is not considered as a part of the Plans and Specifications or Contract on this job.

DOT 400

DEPARTMENT OF TRANSPORTATION

OFFICE OF MATERIALS AND RESEARCH, FOREST PARK, GEORGIA
GEOTECHNICAL ENGINEERING

BRIDGE SUBSURFACE INVESTIGATION

Project No. NH000-0073-00(242)

PROJECT PI No. 714130 COUNTY CHEROKEE DATE 10/12/88

LOCATION I-575 over Noonday Creek (North) BORING NO. B-10

BENT NO. 2 FOOTING GROUND ELEV 875.72

PROPOSED FOOTING ELEV PARTY CHIEF HOLLIS

ELEV	BORING LOG		BLOW	UNIFIED	γ	W	#4	% 200	% CLAY	LL	PI	C	φ	
	Gr. El. 7													
870	Loose Mte. Micas. Sandy Silt	1s	10											
	Loose Mte. Micas. Silty Sand	2s	10											
860	Med. Dense Mte. Micas. Sandy Silt (W.R.)	3s	13											
		4s	23											
850	Very Dense Gome Rock	5s	50/.7											
	Refusal on Rock													
840														
830														
820														
810														

The Department of Transportation is making this subsurface report available to contractors without assuming responsibility for its accuracy.

No data may be extrapolated if the comments notes in this information indicate sliding or other geological occurrences and does not be necessarily.

This information must be an integral part of the contract as a part of the plans and specifications is contained on the job.

DOT 495

DEPARTMENT OF TRANSPORTATION

OFFICE OF MATERIALS AND RESEARCH, FOREST PARK, GEORGIA
GEOTECHNICAL ENGINEERING

BRIDGE SUBSURFACE INVESTIGATION

Project No. N-000 0073 00(242)

PROJECT PI No. 714130 COUNTY CHEROKEE DATE 10/1/78
I-575 over Noonday Creek (North)
LOCATION _____ BORING NO. B-12

BENT NO. 2 FOOTING _____ GROUND ELEV. 874.41

PROPOSED FOOTING ELEV. _____ PARTY CHIEF HOLLIS

ELEV	BORING LOG		BLOW	UNIFIED	γ	φ	qu	% 200	% CLAY	LL	PI	C	φ
	Gr. El.												
870	V. Loose Mtc. Micas. Silty Sand W/ Wood	1s	4										
	Medium Dense Mtc. Micas. Silty Sand	2s	13										
860	Medium Dense Mtc. Micas. Sandy Silt (W.R.)	3s	11										
		4s	22										
850	Very Dense Same	5s	50+0"										
	Weathered Rock												
	Refusal on Rock												
840													
830													
820													
810													

The Department will [illegible] in making this identification report available to subsequent owners its responsibility for its accuracy.

No warranty is made as to the accuracy or validity of this information for the taking or the construction specified and does not [illegible] this information.

This Subsurface Investigation Report is not considered as a part of the plans and specifications or contract for the job.

DOT 980

DEPARTMENT OF TRANSPORTATION

OFFICE OF MATERIALS AND RESEARCH, FOREST PARK, GEORGIA
GEOTECHNICAL ENGINEERING

BRIDGE SUBSURFACE INVESTIGATION

Project No. NHCOO-0073-03(243)

PROJECT PI No. 714130 COUNTY CHEROKEE DATE 10/17/78

LOCATION I-575 over Noonday Creek (North) BORING NO. B-17

BENT NO. 2 FOOTING GROUND ELEV. 868.92

PROPOSED FOOTING ELEV. PARTY CHIEF HOLLIS

Washboring

ELEV	BORING LOG		BLOW	UNIFIED	γ	W	Gs	% 200	% CLAY	LL	PI	C	φ	
	Gr. El.													
870	Top of Water													
860	Loose Silty Sand W/ Gravel													
850	Washboring Refusal on Rock													
840														
830														
820														
810														

The Department of Transportation is making this information available to prospective bidders as a convenience and assumes no responsibility for its accuracy.

No claim will be considered if the contractor relies on this information in his bidding or in his construction scheduling and/or bidding.

This borehole investigation report is not considered as a part of the Plans and Specifications or Contract of the Job.

DOT 400

DEPARTMENT OF TRANSPORTATION

OFFICE OF MATERIALS AND RESEARCH, FOREST PARK, GEORGIA
GEOTECHNICAL ENGINEERING

BRIDGE SUBSURFACE INVESTIGATION

Project No. NH000-0073-03(242)

PROJECT PI No. 714130 COUNTY CHEROKEE DATE 10/10/78

LOCATION I-575 over Noonday Creek (North) BORING NO. B-18

BENT NO. 2 FOOTING GROUND ELEV. 867.32

PROPOSED FOOTING ELEV. PARTY CHIEF HOLLIS

Washboring

ELEV	BORING LOG		BLOW	UNIFIED	%	W	Gs	% SOIL	% CLAY	LL	PI	σ	φ	
870	Top of Water Gr. El. 4													
	Very Loose Silty Sand W/ Gravel													
860	Sand & Gravel													
	Washboring Refusal on Rock													
850														
840														
830														
820														

The Department of Transportation in making this foundation report available to contractors makes no representation as to its accuracy.

No claim will be considered if the subsurface conditions encountered in the construction operations differ from those shown in this report.

This foundation investigation report is not considered as a part of the plans and specifications or contract of the job.

DOT 493

DEPARTMENT OF TRANSPORTATION

OFFICE OF MATERIALS AND RESEARCH, FOREST PARK, GEORGIA
GEOTECHNICAL ENGINEERING

BRIDGE SUBSURFACE INVESTIGATION

Project No. M1000-0073-03(242)

PROJECT P.I. No. 714130 COUNTY CHEROKEE DATE 10/17/78

LOCATION I-575 over Noonday Creek (North) BORING NO. B-23

BENT NO. 3 FOOTING GROUND ELEV. 874.03

PROPOSED FOOTING ELEV. PARTY CHIEF BOLLIE

ELEV	BORING LOG		BLOW	UNIFIED	γ	W	Gs	% 200	% CLAY	LL	PI	C	φ	
	G.E.E.													
870	Loose Mic. Micas. Sandy Silt	1s	8											
GWT	Medium Dense Gray Silty Sand	2s	18											
850	Dense Mic. Micas. Sandy Silt	3s	33											
	Very Dense Sand	4s	60+											
	Weathered Rock													
830	Refusal on Rock													
810														

The Department of Transportation is making this information available to its contractors but assumes no responsibility for its accuracy.

We make no representation of the conditions to be met in the ground in the application of the specifications and for the intended purposes.

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DOT 490

DEPARTMENT OF TRANSPORTATION

OFFICE OF MATERIALS AND RESEARCH, FOREST PARK, GEORGIA
GEOTECHNICAL ENGINEERING

BRIDGE SUBSURFACE INVESTIGATION

Project No. NHCCO-0073-00(242)

PROJECT PI No. 714130 COUNTY CHEROKEE DATE 10/17/08

LOCATION I-575 over Noonday Creek (North) BORING NO. B-24

BENT NO. 3 FOOTING GROUND ELEV. 875.84

PROPOSED FOOTING ELEV. PARTY CHIEF HOLLIS

ELEV	BORING LOG		BLOW	UNSIED	γ	W	Gs	% SCO	% CLAY	LL	PI	C	Ø
	Gr.El.												
870	Medium Dense Mitc. Sandy Silt	1s	13										
	Very Loose Gray Silty Sand	2s	0										
860	Refusal on Rock	rock											
850													
840													
830													
820													

The Department of Transportation [illegible] this borehole report [illegible] to assume responsibility for its accuracy.

No claim will be considered if the contractor relies on this information [illegible] the geotechnical [illegible] and only that is available.

This boring information reported herein is not intended to be a part of the plans and specifications or subject to the [illegible]

DOT 490

DEPARTMENT OF TRANSPORTATION

OFFICE OF MATERIALS AND RESEARCH, FOREST PARK, GEORGIA
GEOTECHNICAL ENGINEERING

BRIDGE SUBSURFACE INVESTIGATION

Project No. NH-000-0073-03(242)

PROJECT PI No. 714130 COUNTY CHEROKEE DATE 10/18/78

LOCATION I-575 over Noonday Creek (North) BORING NO. B-27

BENT NO. 3 FOOTING GROUND ELEV. 873.59

PROPOSED FOOTING ELEV. PARTY CHIEF HOLLIS

ELEV	BORING LOG		BLOW	UNIFIED	γ	W	Bs	% 200	% CLAY	LL	PI	C	Ø	
	Gr. El.													
870	Very Loose Mic													
GWL	Micas. Sandy Silt	1s	2											
	Loose Gray Silty	2s	6											
860	Sand													
	Micaceous Silty Sand w/ Gravel	3s	50/7"											
	Weathered Rock													
	Refusal on Rock													
850														
840														
830														
820														
810														

The Department of Transportation, in making this information available, does not imply that its interpretations are acceptable to all parties.

No claim will be considered if the contractor relies on the information as the basis for his construction operations and fails that this assumption.

This boring location investigation report is not considered as part of the Plans and Specifications or Contract of the job.

DOT 480

DEPARTMENT OF TRANSPORTATION

OFFICE OF MATERIALS AND RESEARCH, FOREST PARK, GEORGIA
GEOTECHNICAL ENGINEERING

BRIDGE SUBSURFACE INVESTIGATION

Project No. NH000-0073-03(242)

PROJECT PI No. 714130 COUNTY CHEROKEE DATE 10/26/79

LOCATION I-575 over Noonday Creek (North) BORING NO. B-26

BENT NO. 4 FOOTING GROUND ELEV. 874.64

PROPOSED FOOTING ELEV. PARTY CHIEF HOLLIS

ELEV	BORING LOG		BLOW	UNIFIED	γ	W	Gs	% 200	% CLAY	LL	PI	C	φ
	Gr. El.												
870	Loose Mtc. Micas Sandy Silt	1s	8										
Gwt	Very Loose Gray Silty Sand	2s	1										
860	Med. dense mtc. micas silty sand w/gravel	3s	15										
	Very Dense Sand	4s	60=7"										
850	V. Dense Mtc. Micas Sandy Silt (W.R.) Weathered Rock	5s	80=5"										
	Refusal on Rock												
840													
830													
820													
810													

The Department of Transportation [illegible] this boring log as [illegible] for its accuracy.

No [illegible] will be [illegible] the contract [illegible] this information [illegible] the Geologist or the [illegible] operator and finds that it is accurate.

This [illegible] investigation report is not considered as a part of the Plans and Specifications or Contract on this job.